



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

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

Prepared by

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

> June 2024 Version: FINAL EA Project No. 662943.14

*Subcontractor to WSP USA Environment & Infrastructure, Inc.

LIST OF APPENDIXES

- Appendix A: Authorized Representative
- Appendix B: General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems In Massachusetts
- Appendix C: Westover Arb Notice of Intent and Authorization to Discharge Letter
- Appendix D: Swmp Checklist
- Appendix E: Endangered Species Documentation
- Appendix F: Public Education Messages
- Appendix G: Sanitary Sewer Overflow Inventory
- Appendix H: Mapping Of Ms4 System
- Appendix I: Idde Program
- Appendix J: Idde Program Training
- Appendix K: List of Retrofit Oppurtunities
- Appendix L: Nitrogen Source Identification Report
- Appendix M: Structural Bmp Evaluation
- Appendix N: Planned Structural Bmps
- Appendix O: Bmp Tracking For Nitrogen Removal
- Appendix P: Annual Reports
- Appendix Q: Stormwater Design Policy

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.

Craig C. Peters, Colonel, USAF Commander



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.

Digitally signed by PETERS.CRAIG.CARLTON.1008768800 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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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.

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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 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.

PETERS.CRAIG.CARL TON.1008768800

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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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.

PETERS.CRAIG.CARLT ON.1008768800 CRAIG C. PETERS.CRAIG.CARLTON.1008768800 Date: 2019.06.25 15:50:11 -04'00' CRAIG C. PETERS, Colonel, USAF Commander

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

Appendix C

Notice of Intent and Authorization to Discharge Letter

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Part I: General Conditions

General Information

Name o	f Municipality o	or Organization: Westover A	ir Reserve B	ase		State:	MA	
EPA NPI	DES Permit Nun	nber (if applicable):						
Primai	ry MS4 Prog	ram Manager Contact	Informati	on				
Name:	Champanine S	aviengvong	Title:	Environmental Engineer				
Street A	ddress Line 1:	250 Patriot Avenue						
Street A	ddress Line 2:							
City:	Chicopee			State: MA	Zip Code:	01022		
Emai l :	champanine.sa	aviengvong@us.af.mil	Phone	Number: (413) 557-3951				
Fax Nur	nber:							
Other	Information							
Stormw (web a	ater Manageme ddress or physica	ent Program (SWMP) Locatio I location, if already completed)	n ::					
Eligibi	lity Determi	nation						

Endangered Species Act (ESA) Determination Complete? Yes	Eligibility Criteria (check all that apply):	⊠ A □ B □ C
National Historic Preservation Act (NHPA) Determination Complete?	/es 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

Part II: Summary of Receiving Waters

Please list the waterbody segments to which your MS4 discharges. For each waterbody segment, please report the number of outfalls discharging into it and, if applicable, any impairments.

Massachusetts list of impaired waters: Massachusetts 2014 List of Impaired Waters- http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf

Check off relevant pollutants for discharges to impaired waterbodies (see above 303(d) lists) without an approved TMDL in accordance with part 2.2.2.a of the permit. List any other pollutants in the last column, if applicable.

Click to lengthen table

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.

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 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 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 Imple- mentation
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

Westover Air Reserve Base

Westover Air Reserve Base		age 4 of 18

Part III: Stormwater Management Program Summary (continued)

MCM 2: Public Involvement and Participation

Brief BMP Description (enter your own text to override the drop down menu)	Responsible Department/Parties (enter your own text to override the drop down menu)	Additional Description/ Measurable Goal	Year of BMP Imple- mentation
 tormwater Management Plan Review	Environmental-Safety-Occupational Health Cross Functional Team	Allow annual review of stormwater management plan and posting of stormwater management plan on server or sharepoint	2019
azardous Material & Hazardous Waste storage & disposal	Industrial Shops	Allow Base employees to practice pollution prevention	2019

Westover Air Reserve Base

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Part III: Stormwater Management Program Summary (continued)

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

BMP Categorization (enter your own text to override the drop down menu)	BMP Description	Responsible Department/Parties (enter your own text to override the drop down menu)	Measurable Goal (all text can be overwritten)	Beginning Year of BMP Imple- mentation
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

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Part III: Stormwater Management Program Summary (continued)

MCM 4: Construction Site Stormwater Runoff Control

BMP Categorization (enter your own text to override the drop down menu or entered text)	BMP Description	Responsible Department/Parties (enter your own text to override the drop down menu)	Measurable Goal (all text can be overwritten)	Beginning Year of BMP Imple- mentation
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

Westover Air Reserve Base		Pag	ge 10 of 18

Part III: Stormwater Management Program Summary (continued)

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

BMPD
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Base
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AirF
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Page 12 of 18	s after permit 2021									
	Complete 3 years effective date of p			 						
	ntal Office									
	n to Environment									
	Adoption, amendmei or modification of a regulatory mechanisr meet permit requirements									
	design for applicable atment requirements of ments of the ook.									
r Air Keserve base	tormwater management (meet the retention or tre; nit and applicable require) usetts Stormwater Handb									
Westover	Ensure st projects r the perm Massachu									

Part III: Stormwater Management Program Summary (continued)

MCM 6: Municipal Good Housekeeping and Pollution Prevention

BMP Categorization (enter your own text to override the drop down menu or entered text)	BMP Description	Responsible Department/Parties (enter your own text to override the drop down menu)	Measurable Goal (all text can be overwritten)	Beginning Year of BMP Imple- mentation
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 permitee-owned parking lots in accordance with permit conditions	BOS Contractor, Civil Engineering	Sweep all streets and permitee-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

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Westover Air Reserve Base					

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Total Maximum Daily Load (TMDL) Requirements

Use the drop-down menus to select the applicable TMDL, action description to meet the TMDL requirements, and the responsible department/parties. If no options are applicable, or more than one, enter your own text to override drop-down menus.

Applicable TMDL	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Long Island Sound TMDL (Nitrogen)	Adhere to requirements in part B.I of Appendix F	Environmental Office

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Requirements Related to Water Quality Limited Waters

Use the drop-down menus to select the pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, enter your own text to override drop-down menus.

Pollutant	Waterbody ID(s)	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
E. Coli	MA34-19 (Stony Brook)	Adhere to requirements in part III of Appendix H	Environmental Office
Turbidity	MA34-19 (Stony Brook)	Adhere to requirements in part V of Appendix H	Environmental Office

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:	DERIN S. DURHAM, Colon	el, USAF] Title:	COMMANDER
Signature:	DURHAM.DERIN.S.105 8193743 [To be signed according to Appendix B, S	Digitally signed by DURHAM.DERIN.S.1058193743 Date: 2018.09.26 11:31:56 -04'00' Subparagraph B.11, Standard Conditions]	Date:	09/26/18

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: <u>https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit</u>. Should you have any questions regarding this permit please contact Newton Tedder at <u>tedder.newton@epa.gov</u> or (617) 918-1038.

Sincerely,

Therma Murphy

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

and;

Mada y

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 1st 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)

Dest 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 2nd Annual Report (30 September 2020)

Activities during Year 3 – Complete by 30 June 2021

Dest 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 3rd Annual Report (30 September 2021)

Activities during Year 4 – Complete by 30 June 2022

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

Solicit Comments from Public (BMP 2b; Section 4.2)

Dest 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)

I 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 4th 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 4b; 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 5th 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)

 \Box 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 6th 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)
- Enforcement Actions (DMP 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 7th 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 8th 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 9th 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 10th 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 2nd 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 11th 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)

Dest 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)

 \Box 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 12th 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)

 \Box 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 13th Annual Report (30 September 2031)

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

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 storme drain - the rain carries Spike's mess into storm drains and straigh to our rivers, beaches and bays making them unsave for swimming.

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

www.ThinkAgainThinkBlue.or



Sources of stormwater pollution at Westover





Good Housekeeping Practices in Maintenance Areas

Perform maintenance activities <u>indoors</u> if possible Use <u>DRY</u> 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 <u>minimized</u> <u>notice locations</u> 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. **<u>THIS</u> <u>MEANS: USE 7040 FOR THE INDOOR HEAT –</u> <u>NEVER DEICE WITH CHEMICALS INSIDE ANY</u>

HANGAR, 7040 OR 7000.

At this time, <u>our Chicopee Sanitary Permit DOES</u> <u>NOT ALLOW chemical deicing inside any Hangars</u>. At such time as the prohibition changes, Environmental Flight will give the update.

Best Management Practices for AIRCRAFT DEICING

- If necessary to deice outdoors, <u>perform</u> <u>deicing on Echos 1-8 and Echos 12-14</u>, which are areas that drain to an OWS and then to an engineered treatment wetland. <u>Echos 9</u> (<u>RISO</u>), 10, and 11 are not preferred deicing <u>locations</u>, however if best attempt to use <u>another Echo doesn't succeed then ensure</u> <u>event is logged</u>.
- Pad 23 and Pad 05 should be considered as preferable deicing locations, <u>rather than</u> 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.





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

EN BASEL



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







Gan anything be done here?

Clean up leaks Repair vehicle Use a drip pan while waiting



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)



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







FAX: 2897

6--

ENVIRONMENTAL MANAGEMENT SYSTEM

STATUS: MAINTENANCE

ſ	ENVIRONMENTA ASPECTS		TAL 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 LOIS 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.
	An Yole	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: SMSGTROBERTIVEY - 413-557-2036

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

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 <u>are well controlled</u> 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

Sanitary Sewer Overflow (SSO) Inventory Westover Air Reserve Base

Briefly summarize SSO incidents within previous 5 years and attach associated documentation of the incident to maintain with the SWMP and submit with each Annual Report.

LAST UPDATED: June 2024

	Location	SSO Description			Corrective Measures	Corrective Measures	Name of	
Date/Time	Include Receiving Water/Address	Cause	Volume	Source	Impacts to Receiving Water or MS4?	Implemented with Date/Time	Planned with Schedule	Recorder
There have been zero (0) SSO incidents within the previous 5 years								

Appendix H

Mapping of MS4 System



Appendix I

IDDE Program





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 2024 Version: FINAL EA Project No. 662943.14

*Subcontractor to WSP

TABLE OF CONTENTS

Page

LIST (LIST (LIST (LIST (OF TAE OF FIG OF ATT OF ACF	BLES URES CACHME RONYMS	iii ENTS		
1.	INTRODUCTION				
	1.1 1.2 1.3 1.4 1.5	MS4 PR ILLICIT ALLOW RECEIV IDDE P	ROGRAM1-1T DISCHARGES1-1VABLE NON-STORMWATER DISCHARGES1-2VING WATERS AND IMPAIRMENTS1-2ROGRAM GOALS, FRAMEWORK, AND TIMELINE1-3		
2.	AUTH	ORITY .	AND STATEMENT OF IDDE RESPONSIBILITIES		
	2.1 2.2	LEGAL STATE	AUTHORITY		
3.	STOR	MWATE	R SYSTEM MAPPING		
	3.1 3.2 3.3	PHASE PHASE ADDIT	I MAPPING		
4. 5.	SANIT ASSES	TARY SE SSMENT	EWER OVERFLOWS		
	5.1 5.2	OUTFA OUTFA	LL CATCHMENT DELINIATIONS		
6.	DRY V	WEATHI	ER OUTFALL SCREENING AND SAMPLING		
	6.1 6.2	WEATH DRY W	HER CONDITIONS		
		6.2.1 6.2.2 6.2.3	General Procedure.6-1Field Equipment.6-2Sample Collection and Analysis6-3		
	6.3	INTERI	PRETING OUTFALL SAMPLING RESULTS		
		6.3.1 6.3.2	Dry Weather Sampling Results		

	6.4	FOLL	OW-UP RANKING OF OUTFALLS AND INTERCONN	ECTIONS 6-11
7.	CAT	HCMEN	T INVESTIGAITONS	7-1
	7.1	SYSTI	EM VULNERABILITY FACTORS	
	7.2	DRY V	WEATHER MANHOLE INSPECTIONS	
	7.3	WET V	WEATHER OUTFALL SAMPLING	
	7.4	SOUR	CE ISOLATION AND CONFIRMATION	
		7.4.1	Sandbagging	
		7.4.2	Smoke Testing	
		7.4.3	Dye Testing	
		7.4.4	Closed Circuit Television/Video Inspection	
		7.4.5	Optical Brightener Monitoring	
	7.5	ILLIC	IT DISCHARGE REMOVAL	7-6
		7.5.1	Confirmatory Outfall Screening	7-7
	7.6	Ongoin	ng Screening	7-7
8.	TRA	INING		
9.	PRO	GRESS F	REPORTING	
10.	REFI	ERENCE	S	

LIST OF TABLES

Table 1-1. Impaired Receiving Waters	1-3
Table 6-1. Field Equipment – Dry Weather Outfall Screening and Sampling	6-2
Table 6-2. Sampling Parameters and Analysis Methods	6-4
Table 6-3. Required Analytical Methods, Detection Limits, Hold Times, and Preservatives	6-5
Table 6-4. Benchmark Field Measurements of Select Parameters	6-7
Table 6-5. Dry Weather Screening Summary	6-8

LIST OF FIGURES

Figure 1-1.	IDDE Investigation Procedure	1-4
115010 1 1.	IDDE III (Sugaton 1 1000au commente in the second se	T 1

LIST OF ATTACHMENTS

Attachment A.	Outfall Rankings
Attachment B	System Vulnerability Factors Inventory
Attachment C.	Dry Weather Screening Sampling Results

%	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 EPA	EA Engineering, Science, and Technology, Inc., PBC U.S. Environmental Protection Agency
H ₂ SO ₄	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
$Na_2S_2O_3$	Sodium thiosulfate
NO ₃	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

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 multisection 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.

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

 Table 1-1. Impaired Receiving Waters

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.

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.

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 ≥ 0.5 milligrams per liter (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.

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 Attachment A. Initial ranking determined eight outfalls to be high priority.

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 initial round of dry weather screening was completed in 2024. The next round of dry weather screening must be completed by 1 July 2029, 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.

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			
Field sheets	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			
Weter meliter meter	Handheld meter, if available, for testing for various water quality			
water quanty meter	parameters such as ammonia, surfactants and chlorine			
Test kits	Have extra kits on hand to sample more outfalls than are anticipated to be			
I est kits	screened in a single day			
Label tape	For labeling sample containers			
	Make sure all sample containers are clean			
Sample containers	Keep extra sample containers on hand at all times			
Sample containers	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			

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

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.

radie 0-2. Sampning Farameters and Analysis Methods						
Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit				
Ammonia	CHEMetrics [™] V-2000 Colorimeter	CHEMetrics [™] K-1410				
	Hach [™] DR/890 Colorimeter	CHEMetrics [™] K-1510 (series)				
	Hach TM Pocket Colorimeter TM II	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	NIA				
	Hach [™] Pocket Colorimeter [™] II	INA				
Conductivity	CHEMetrics [™] I-1200					
	YSI Pro30	NT A				
	YSI EC300A	INA				
	Oakton 450					
Temperature	YSI Pro30					
-	YSI EC300A	NA				
	Oakton 450					
Salinity	YSI Pro30					
	YSI EC300A	NA				
	Oakton 450					
Temperature	YSI Pro30					
	YSI EC300A	NA				
	Oakton 450					
Indicator Bacteria:	EPA-certified laboratory procedure					
E. coli (freshwater) or	(40 CFR § 136)	NA				
Enterococcus (saline water)						
Pollutants of Concern ¹	EPA-certified laboratory procedure	NA				
	(40 CFR § 136)	INA				

Notes:

¹ 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.

		, , ,	,	
Analyte or Parameter	Analytical Method	Detection Limit	Maximum Hold Time	Preservative
Ammonia	EPA: 350.2, SM: 4500-NH3C	0.05 mg/L	28 days	$Cool \le 6^{\circ}C$, H_2SO_4 to $pH < 2$, No preservative required if analyzed immediately
Surfactants	SM: 5540-C	0.01 mg/L	48 hours	$Cool \le 6^{\circ}C$
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 μs/cm	28 days	Cool ≤ 6°C
Salinity	SM: 2520		28 days	Cool ≤ 6°C
Indicator Bacteria: E.coli Enterococcus	<i>E.coli</i> EPA: 1603 SM: 9221B, 9221F, 9223 B Other: Colilert [®] , Colilert-18 [®] <i>Enterococcus</i> EPA: 1600 SM: 9230 C Other: Enterolert [®]	<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 ≤ 10°C, 0.0008% Na ₂ S ₂ O ₃
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°C, H ₂ SO ₄ 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 ₃ E-F	EPA: 0.05 mg/L SM : 0.05 mg/L	28 days	Cool \leq 6°C, H ₂ SO ₄ to pH < 2

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

Notes:

% = Percent °C = Degrees Celsius

cfu = Colony forming unit(s)

 $H_2SO_4 =$ Sulfuric acid

ICP = Inductively coupled plasma

mL = Milliliter(s)

MPN = Most probable number

 $Na_2S_2O_3 = Sodium thiosulfate$

 $NO_3 = Nitrate$

SM = Standard Method

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.

Analyte or Parameter	Benchmark			
· ·				
Ammonia	>0.5 mg/L			
Conductivity	>2,000 µS/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>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			
Enterococcus	<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			

Fable 6-4	. Benchmark	Field	Measurements	of Select	Parameters
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Notes:

 μ S/cm = MicroSiemens per centimeter

6.3.1 Dry Weather Sampling Results

Dry weather sampling was performed on 26 March 2024 in accordance with the methods and procedures outlined in this document. Weather conditions leading up to the sampling event met the requirements for dry weather screening, with no rain falling in the previous 24 hours. A YSI was used for all field measurements, and lab analysis was conducted by laboratories certified in the analysis of each contaminant of concern. A summary of sampling results is displayed in table 6-5 below, and full lab reports are included in Attachment C. Samples were collected for each regulated outfall at Westover ARB, and a duplicate sample was collected to verify lab analysis accuracy. The duplicate was collected at Outfall 004 and sampling results did not indicate any issues with the lab sampling results.

Detections of E. Coli were noted at outfalls 004, 007, and 009, which are all connected to waters impaired for bacteria, however none of the sample results were above the benchmark level. All samples were also analyzed in the field for any visual or olfactory indicators of an illicit discharge. No olfactory observations were noted, and slight discoloration was observed on two of the samples as shown in the table below.
Outfall ID	Sampling Time	Ammonia as N (mg/L)	MBAS (mg/L)	Residual Chlorine (mg/L)	E. Coli (MPN/ 100ml)	Nitrogen, Total (mg/L)	Temperature (°C)	Conductivity (µs/cm)	Salinity (mV)	Olfactory or Visual Observations
Benchmark		>5 mg/L	>0.25 mg/L	>0.02 mg/L	126 MPN/1 00mL			>2000 µs/cm		
Lab Test Method	All samples taken 2024.03.26	EPA 350.1	SM 5540C - 2011	SM 4500 Cl F-2011	E- COLI- QT	Nitrogen Total (EPA 351.2, 353.2)	YSI Field Measured	YSI Field Measured	YSI Field Measured Electrical Conductivity	
OF-01	11:45	ND	ND	ND	<1	0.91	7.9	104.6	146.0	None
OF-02	12:05	ND	ND	ND	<1	0.61	8.9	172.6	114.0	None
OF-03	12:28	ND	ND	ND	<1	1.0	10.1	100.6	132.3	None
OF-04	14:35	ND	ND	ND	52.08	0.85	10.7	398.6	148.5	None
OF-06	13:10	ND	ND	ND	<1	1.5	10.6	169.7	115.9	None
OF-07	13:00	ND	0.061	ND	29.92	0.78	10.2	66.7	117.7	None
OF-09	13:35	ND	ND	ND	18.49	ND	8.3	173.6	137.5	Slight yellow color
OF-11	11:14	ND	ND	ND	<1	ND	7.5	113.1	170.5	Slight yellow color
DUP (OF-004)	14:35	ND	ND	ND	34.05	0.88				None

Table 6-5.	Dry	Weather	Screening	Summary
	~- ,		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	\sim minimum $_{J}$

Notes:

°C = Degrees Celsius

MBAS = Methylene Blue Active Substance (Surfactant Assay)

mg = Milligram(s) mL = Milliliter(s)

mV = Millivolt(s)

MPN = Most probable number

ND = Non-detect

N = Nitrogen

SM = Standard Method

6.3.2 Analysis of Dry Weather Screening Results

The results of all samples collected were below the benchmark level outlined in this plan and in the MS4 permit and regulations. The results do not indicate evidence of an illicit discharge present at Westover ARB. These results are not conclusive evidence that there are no illicit discharges at Westover ARB. Westover ARB will continue to monitor all outfalls and stormwater infrastructure to prevent and detect any illicit discharges that may occur.

This data was used update the outfall ranking included in this report and determine if additional catchment investigation is necessary at this time, described in Section 6.4. The next required dry weather screening will be required in permit Year 11, prior to the June 2029 report update.

6.4 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

Westover ARB updated and re-prioritized the stormwater outfall ranking based on the 2024 dry weather screening and sampling. The updated list is included in Attachment A. Although sampling indicated no evidence of illicit discharge release, all outfalls are still considered high priority outfalls. This is due to the discharge location of each outfall, either to recreational facilities, facilities with impacts to public health, or to impaired waters. Per the MS4 permit, waters discharging to E. Coli impaired waters must be considered high or problem priority outfalls.

Westover ARB will update and re-prioritize the initial outfall and interconnection rankings each year based on information gathered the annual update cycle. 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. CATHCMENT INVESTIGAITONS

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 that 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 that 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.

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 fluorometers to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorometer, 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 are 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).

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.

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.

Attachment A Outfall Rankings

Attachment A Outfall Rankings Westover Air Reserve Base Revision Date: June 2024

Outfall ID	Receiving Water	Receiving Water Impairments ^c	Olfactory Indicators of Sewage	Sampling Results Indicators of Sewage ^a	Discharges to Recreational Facilities or Facilities with Impacts to Public Health ^b	Discharging to Impaired Waters	Score	Priority Ranking
	Information Scor Scoring Criter	re & ia	Yes = 3 $No = 0$	Yes = 3 Sampling Not Yet Performed = 1 No = 0	Yes = 3 No = 0	Yes = 3 No = 0		$\geq 10 = \text{Problem}$ 6 - 9 = High Priority $\leq 5 = \text{Low Priority}$
001	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	0	3	3	6	High Priority
002	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	0	3	3	6	High Priority
003	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	0	3	3	6	High Priority
004	Willamanett Brook (MA34-60) Long Island Sound	E. coli and total nitrogen	0	0	0	3	3	High Priority ^c
006	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	0	3	3	6	High Priority
007	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	0	3	3	6	High Priority
009	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	0	3	3	6	High Priority
011	Stoney Brook (MA34-19) Long Island Sound	Non-native aquatic plants, E. coli, turbidity, and total nitrogen	0	0	0	3	3	High Priority ^c

Notes:

^a Previous screening results indicate likely sewer input if any of the following are true:

• 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

^b 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

^c 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).

Attachment B System Vulnerability Factors Inventory

Attachment B System Vulnerability Factor Inventory Westover ARB **Revision Date: 5 June 2024**

							#						
								7					
					4			Areas		9	10	11	12
			2	3	Storm/Sanitary	5	6	Formerly	8	SSO Potential	Sanitary and	Septic with	History of
		1	Common or	Common	Crossings	Sanitary	Inadequate	Served by	Sanitary	In Event of	Storm Drain	Poor Soils or	BOH Actions
Outfall	Receiving	History of	Twin Invert	Trench	(Sanitary	Lines with	Sanitary Level	Combined	Infrastructure	System	Infrastructure	Water Table	Addressing
ID	Water	SSOs	Manholes	Construction	Above)	Underdrains	of Service	Sewers	Defects	Failures	>40 years Old	Separation	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
		1	1	1	1	1	1	1	1	1	1	1	1

Presence/Absence Evaluation Criteria:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages 1.
- 2. Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments 3.
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system 4.
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system 5.
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints 6.
- 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 that 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 that poor owner maintenance)

Attachment C Dry Weather Screening Sampling Results



Environment Testing

ANALYTICAL REPORT

PREPARED FOR

5 6

Attn: Nick Dunstan EA Engineering, Science, and Technology 301 Metro Center Blvd. Suite 102 Warwick, Rhode Island 02886 Generated 4/5/2024 12:31:40 PM

JOB DESCRIPTION

Westover ARB

JOB NUMBER

410-165468-1

Eurofins Lancaster Laboratories Environment Testing, LLC 2425 New Holland Pike Lancaster PA 17601





ANALYTICAL REPORT

Lab Number:L2416466Client:EA Engineering, Science and Technology 301 Metro Center Blvd. Suite 102 Warwick, RI 02886ATTN:Denise PereiraPhone:(401) 287-0362Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1Report Date:04/01/24		
Lab Number:L2416466Client:EA Engineering, Science and Technology 301 Metro Center Blvd. Suite 102 Warwick, RI 02886ATTN:Denise PereiraPhone:(401) 287-0362Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1Report Date:04/01/24		
Client:EA Engineering, Science and Technology 301 Metro Center Blvd. Suite 102 Warwick, RI 02886ATTN:Denise PereiraPhone:(401) 287-0362Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1Report Date:04/01/24	Lab Number:	L2416466
ATTN:Denise PereiraPhone:(401) 287-0362Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1Report Date:04/01/24	Client:	EA Engineering, Science and Technology 301 Metro Center Blvd. Suite 102 Warwick, RI 02886
Phone:(401) 287-0362Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1Report Date:04/01/24	ATTN:	Denise Pereira
Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1Report Date:04/01/24	Phone:	(401) 287-0362
Project Number: 64029-01-0249-LS.3.1 Report Date: 04/01/24	Project Name:	WESTOVER MS4
Report Date: 04/01/24	Project Number:	64029-01-0249-LS.3.1
	Report Date:	04/01/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019 508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:04012416:08

Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1

 Lab Number:
 L2416466

 Report Date:
 04/01/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2416466-01	OF-001	WATER	WESTOVER ARB, MA	03/26/24 11:45	03/26/24
L2416466-02	OF-002	WATER	WESTOVER ARB, MA	03/26/24 12:05	03/26/24
L2416466-03	OF-003	WATER	WESTOVER ARB, MA	03/26/24 12:28	03/26/24
L2416466-04	OF-004	WATER	WESTOVER ARB, MA	03/26/24 14:35	03/26/24
L2416466-05	OF-006	WATER	WESTOVER ARB, MA	03/26/24 13:10	03/26/24
L2416466-06	OF-007	WATER	WESTOVER ARB, MA	03/26/24 13:00	03/26/24
L2416466-07	OF-009	WATER	WESTOVER ARB, MA	03/26/24 13:35	03/26/24
L2416466-08	OF-011	WATER	WESTOVER ARB, MA	03/26/24 11:10	03/26/24
L2416466-09	DUP	WATER	WESTOVER ARB, MA	03/26/24 00:00	03/26/24



Project Name: WESTOVER MS4 Project Number: 64029-01-0249-LS.3.1
 Lab Number:
 L2416466

 Report Date:
 04/01/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.



Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1

 Lab Number:
 L2416466

 Report Date:
 04/01/24

Case Narrative (continued)

E. Coli (MPN)

L2416466-01, -08 and -09: The sample was analyzed with the method required holding time exceeded.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Cattlin Wallen Caitlin Walukevich

Title: Technical Director/Representative

Date: 04/01/24



INORGANICS & MISCELLANEOUS



							:	Serial_No:04	012416:08	
Project Name:	WESTOVE	R MS4					Lab N	lumber:	L2416466	
Project Number:	64029-01-0	249-LS.3. ⁻	1				Repo	rt Date:	04/01/24	
			:	SAMPLE	RESUL	ГS				
Lab ID:	L2416466-0)1					Date (Collected:	03/26/24 11:45	
Client ID:	OF-001						Date F	Received:	03/26/24	
Sample Location:	WESTOVE	R ARB, M	Ą				Field I	Prep:	Not Specified	
Sample Depth:										
Matrix:	Water					Dilation	Dete			
Parameter	Result	Qualifier	Units	RL	MDL	Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis	- Westborou	gh Lab								
E. Coli (MPN)	<1	M	PN/100ml	1	NA	1	-	03/26/24 19:4	8 121,9223B	JRG



Serial_No:04012416:08

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Project Number:	64029-01-02	249-LS.3.1	1				Repo	rt Date:	04/01/24	
			S	SAMPLE	RESUL	rs				
Lab ID:	L2416466-0	2					Date	Collected:	03/26/24 12:05	;
Client ID:	OF-002						Date	Received:	03/26/24	
Sample Location:	WESTOVER	R ARB, MA	4				Field	Prep:	Not Specified	
Sample Depth:										
Matrix:	Water									
Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis	- Westboroug	jh Lab								
E. Coli (MPN)	<1	M	PN/100ml	1	NA	1	-	03/26/24 19:4	8 121,9223B	JRG



Serial	No:04012416:08
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Project Name:	WESTOVER	R MS4					Lab N	umber:	L2416466	
Project Number:	64029-01-02	249-LS.3.1					Repo	rt Date:	04/01/24	
			:	SAMPLE	RESUL	rs				
Lab ID:	L2416466-0	3					Date (Collected:	03/26/24 12:28	
Client ID:	OF-003						Date F	Received:	03/26/24	
Sample Location:	WESTOVER	R ARB, MA	۱.				Field I	Prep:	Not Specified	
Sample Depth:										
Matrix:	Water						_			
Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis	- Westboroug	ıh Lab								
E. Coli (MPN)	<1	MP	N/100ml	1	NA	1	-	03/26/24 19:4	8 121,9223B	JRG



								Serial_No:04	1012416:08
Project Name:	WESTOVER	R MS4					Lab N	lumber:	L2416466
Project Number:	64029-01-02	49-LS.3.1					Repo	rt Date:	04/01/24
			S	AMPLE	RESUL	ГS			
Lab ID:	L2416466-04	4					Date	Collected:	03/26/24 14:35
Client ID:	OF-004						Date	Received:	03/26/24
Sample Location:	WESTOVER	R ARB, MA					Field	Prep:	Not Specified
Sample Depth:									
Matrix:	Water								
Parameter	Result	Qualifier U	Jnits	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method
Microbiological Analysis	- Westhoroug	hlah							
F. Coli (MPN)	52 08	MPN	N/100ml	1	NA	1	<u>-</u>	03/26/24 19:4	48 121.9223B



Analyst

JRG
						Serial_No:04	012416:08
WESTOVER	R MS4				Lab N	lumber:	L2416466
64029-01-02	249-LS.3.1				Repo	rt Date:	04/01/24
		SAMPL	E RESUL	TS			
L2416466-0	5				Date	Collected:	03/26/24 13:10
OF-006					Date	Received:	03/26/24
WESTOVER	R ARB, MA				Field	Prep:	Not Specified
Water							
Result	Qualifier Units	s RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method
Westhoroug	hlah						
<1	MPN/10	0ml 1	NA	1	_	03/26/24 19 4	8 121.9223B
	WESTOVER 64029-01-02 L2416466-02 OF-006 WESTOVER Water Result • Westboroug	WESTOVER MS4 64029-01-0249-LS.3.1 L2416466-05 OF-006 WESTOVER ARB, MA Water Result Qualifier Unit: Westborough Lab	WESTOVER MS4 64029-01-0249-LS.3.1 SAMPL L2416466-05 OF-006 WESTOVER ARB, MA Water <u>Result Qualifier Units RL</u> • Westborough Lab	WESTOVER MS4 64029-01-0249-LS.3.1 L2416466-05 OF-006 WESTOVER ARB, MA Water <u>Result Qualifier Units RL MDL</u> Westborough Lab	WESTOVER MS4 64029-01-0249-LS.3.1 SAMPLE RESULTS L2416466-05 OF-006 WESTOVER ARB, MA Water Result Qualifier Units RL MDL Dilution Factor Westborough Lab	WESTOVER MS4 Lab M 64029-01-0249-LS.3.1 Repo SAMPLE RESULTS Date OF-006 Date WESTOVER ARB, MA Field Water <u>Result Qualifier Units RL MDL Pilution Pate</u> Prepared Westborough Lab	WESTOVER MS4 Lab Number: 64029-01-0249-LS.3.1 Report Date: SAMPLE RESULTS L2416466-05 Date Collected: OF-006 Date Received: WESTOVER ARB, MA Date Received: Water Field Prep: Water Date Analyzed Westborough Lab MPN/100ml <1



Analyst

JRG

		Serial_No	:04012416:08
Project Name: Project Number:	WESTOVER MS4 64029-01-0249-LS.3.1	Lab Number: Report Date:	L2416466 04/01/24
		SAMPLE RESULTS	
Lab ID: Client ID: Sample Location:	L2416466-06 OF-007 WESTOVER ARB, MA	Date Collected: Date Received: Field Prep:	03/26/24 13:00 03/26/24 Not Specified
Sample Depth: Matrix:	Water		

Matrix:	Water								
Parameter	Result	Qualifier Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analy	ysis - Westborough	Lab							
E. Coli (MPN)	29.92	MPN/100ml	1	NA	1	-	03/26/24 19:48	121,9223B	JRG



Serial_No:04012416:08

Project Name:	WESTOVER	R MS4					Lab N	umber:	L2416466	
Project Number:	64029-01-02	249-LS.3.1					Repo	rt Date:	04/01/24	
			ę	SAMPLE	RESUL	ſS				
Lab ID:	L2416466-0	7					Date (Collected:	03/26/24 13:35	
Client ID:	OF-009						Date F	Received:	03/26/24	
Sample Location:	WESTOVER	R ARB, MA	Ą				Field I	Prep:	Not Specified	
Sample Depth: Matrix:	Water									
Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis	- Westboroug	h Lab								
E. Coli (MPN)	18.49	MF	PN/100ml	1	NA	1	-	03/26/24 19:4	8 121,9223B	JRG



								Serial_No:04	012416:08	
Project Name:	WESTOVE	R MS4					Lab N	lumber:	L2416466	
Project Number:	64029-01-0	249-LS.3.	1				Repo	rt Date:	04/01/24	
			;	SAMPLE	RESUL	rs				
Lab ID:	L2416466-0)8					Date (Collected:	03/26/24 11:10)
Client ID:	OF-011						Date I	Received:	03/26/24	
Sample Location:	WESTOVE	R ARB, M	A				Field	Prep:	Not Specified	
Sample Depth:										
Matrix:	Water					Dilution	Date	Data	Analytical	
Parameter	Result	Qualifier	Units	RL	MDL	Factor	Prepared	Analyzed	Method	Analyst
licrobiological Analysis	- Westboroug	gh Lab								
E. Coli (MPN)	<1	М	PN/100ml	1	NA	1	-	03/26/24 19:4	8 121,9223B	JRG



								Serial_No:04	012416:08	
Project Name:	WESTOVER	R MS4					Lab N	lumber:	L2416466	
Project Number:	64029-01-02	249-LS.3.1					Repo	rt Date:	04/01/24	
			:	SAMPLE	RESUL	rs				
Lab ID:	L2416466-0	9					Date (Collected:	03/26/24 00:00)
Client ID:	DUP						Date I	Received:	03/26/24	
Sample Location:	WESTOVER	R ARB, MA					Field	Prep:	Not Specified	
Sample Depth: Matrix:	Water									
Parameter	Result	Qualifier (Jnits	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analys
Microbiological Analysis	- Westboroug	lh Lab								
E. Coli (MPN)	34.05	MPI	N/100ml	1	NA	1	-	03/26/24 19:4	8 121,9223B	JRG



Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1

 Lab Number:
 L2416466

 Report Date:
 04/01/24

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	r Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis	- Westborough Lab f	or sample(s):	01-09	Batch:	WG1901	115-1			
E. Coli (MPN)	<1	MPN/100ml	1	NA	1	-	03/26/24 19:48	121,9223B	JRG



Project Name:WESTOVER MS4Project Number:64029-01-0249-LS.3.1

Serial_No:04012416:08 *Lab Number:* L2416466 *Report Date:* 04/01/24

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Info	rmation	Initial Final To			Temp			Frozen	
Container ID	Container Type	Cooler	рН	pН	deg C	Pres	Seal	Date/Time	Analysis(*)
L2416466-01A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-01B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-02B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-03A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-03B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-04A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-04B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-05A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-05B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-06A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-06B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-07A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-07B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-08A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-08B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-09A	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)
L2416466-09B	Bacteria Cup Na2S2O3 preserved	А	NA		3.6	Y	Absent		E-COLI-QT(.33)



Project Name: WESTOVER MS4

Project Number: 64029-01-0249-LS.3.1

Lab Number: L2416466

Report Date: 04/01/24

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: WESTOVER MS4 Project Number: 64029-01-0249-LS.3.1

Lab Number: L2416466 Report Date: 04/01/24

Footnotes

•

- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Waterpreserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'. Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(a)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentrations of the analyte at less than ten times (10x) the concentrations of the analyte at less than ten times (10x) the concentrations of the analyte at less than ten times (10x) the concentrations of the analyte at less than ten times (10x) the concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C -Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- **D** Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- **F** The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
- H The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I The lower value for the two columns has been reported due to obvious interference.
- J Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report



¹

Serial_No:04012416:08

Project Name: WESTOVER MS4

Project Number: 64029-01-0249-LS.3.1

Lab Number: L2416466

Report Date: 04/01/24

Data Qualifiers

- **ND** Not detected at the reporting limit (RL) for the sample.
- NJ Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- **P** The RPD between the results for the two columns exceeds the method-specified criteria.
- Q The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- **R** Analytical results are from sample re-analysis.
- **RE** Analytical results are from sample re-extraction.
- S Analytical results are from modified screening analysis.
- V The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report



Project Name: WESTOVER MS4 Project Number: 64029-01-0249-LS.3.1

 Lab Number:
 L2416466

 Report Date:
 04/01/24

REFERENCES

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625.1: alpha-Terpineol

EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethvltoluene.

EPA 8270E: <u>NPW:</u> Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; <u>SCM</u>: Dimethylnaphthalene,1,4-Diphenylhydrazine. SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility

SM 2540D: TSS.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene. Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; EPA 353.2: Nitrate-N, Nitrite-N; SM4500NO3-F: Nitrate-N, Nitrite-N; SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B EPA 524.2: THMs and VOCs; EPA 504.1: EDB, DBCP Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H, B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kieldahl-N, EPA 350.1: Ammonia-N, LACHAT 10-107-06-1-B: Ammonia-N, EPA 351.1, SM4500NO3-F, EPA 353.2: Nitrate-N, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate. EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan II, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables)

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: AI, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. EPA 200.8: AI, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. EPA 245.1 Hg. EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn. EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn. EPA 245.1 Hg. SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

					Seri	al_No:04012416:08
ALPHA	CHAIN O	F CUSTODY		Date Rec'd in Lab: 3 26	24 ALPHA	Job #: L2416466
ANALYTICAL		Project Information		Report Information - Data Del	verables Billing I	nformation
8 Walkup Drive Westboro, MA Tel: 508-898-9	320 Forbes Blvd 01581 Mansfield, MA 02048 220 Tel: 508-822-9300	Project Name: Westove	- M54	🗆 ADEx 🙀 EMAIL	Same a	s Client info PO #: 3148
Client Informatio	on	Project Location: Wistow	ARB. MA	Regulatory Requirements &	Project Information	n Requirements
Client EA F	naineerina	Project #: (4029-01-0	249-65 3.11	Yes No MA MCP Analytical Me Ves No Matrix Spike Required	thods I Yes on this SDG? (Required	No CT RCP Analytical Methods
Address: 301	Metro Center Blue	Project Manager: N. D.	instan	Yes No GW1 Standards (Info F	Required for Metals & EP	H with Targets)
#102 W	arwick, R1 0288	ALPHA Quote #: 459	769	Yes A No NPDES RGP Other State /Fed Program	C	riteria
Phone: 503	-899-8901	Turn-Around Time	the state of the state	1 18	1.1.1.1.1	
Email: NDU Additional F	NSTAN & EAEST, CoM Project Information:	Date Due:	ty confirmuit if pro-approved)	Ca260 D 624 YSIS Ca260 D 624 D 5242 S: D MCP 13 D MCP 14 D RCI ORanges & Targets D Ranges On B D Ranges & Targets D Ranges On	COLI-QT COLI-QT	SAMPLE INFO Filtration Field Lab to do Preservation Lab to do
ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date Time	Sample Sampler Matrix Initials	VOC: SVOC: METAL METAL EPH: L VPH: L D PCL	Tahi C	Sample Comments
6466-01	DF-001	3/26/24 /140	AQ ND/ND		2	2
02	OF-002	3/26/24 1205	AQ ND/ND		2	2
02	0F-003	3/26/24 1228	B AQ AP/ND		2	2
Li	0E-004	3/11/14 1435	5 AD NP/NP		2	2
01	05-005	3/04/04	AO NP/10	312		-
-0	05-006	3/14/14 13/0	AO NP/ND		2	2
05	06-007	3/21/24 1200	A ND/10		0	2
00	05-009	3/11/14 133	5 AD ND/ND		3	1
- U[0F-011	3/24/24 1110	D D D ND IND		5	2
20	DUP	3/4/1/10	A D NELLO		5	2
Container Type	Preservative	1 LLW G T	Container Tuno		~	
P= Plastic A= Amber glass V= Vial	A= None B= HCI C= HNO		Preservative		N	
G= Glass B= Bacteria cup C= Cube O= Other E= Encore D= BOD Bottle	D= HN03 D= H ₂ SO ₄ E= NaOH F= MeOH G= NaHSO ₄ H = Na ₂ S ₂ O ₃ I= Ascorbic Acid J = NH ₄ Cl K= Zn Acetate	Relinquished By:	Date/Time	Received By: 1645 Man	Date/Time 7 3/26/21 16:45	All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
Page 22 of 22	O= Other					FORM NO: 01-01 (rev. 12-Mar-2012)

Eurofins Lancaster Laboratories Environment Testing, LLC

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization

anessa M. Badman Generated 4/5/2024 12:31:40 PM

Authorized for release by Vanessa Badman, Project Manager Vanessa.Badman@et.eurofinsus.com (717)556-9762

1

Eurofins Lancaster Laboratories Environment Testing, LLC

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

• QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Varressa M. Badman

Table of Contents

Cover Page	1
Table of Contents	4
Definitions/Glossary	5
Case Narrative	6
Detection Summary	7
Client Sample Results	8
QC Sample Results	11
QC Association Summary	14
Lab Chronicle	17
Certification Summary	20
Method Summary	21
Sample Summary	22
Chain of Custody	23
Receipt Checklists	24
State Forms	25
MCP Checklist	25

3

5

Qualifiers

General Ch	emistry
Qualifier	Qualifier Description
E 1	MS and/or MSD recovery exceeds control

F1	MS and/or MSD recovery exceeds control limits.
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-165468-1

Eurofins Lancaster Laboratories Environment

Job Narrative 410-165468-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 3/27/2024 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.2°C.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

		Dete	ection Sum	mary					
Client: EA Engineering, Science, and Project/Site: Westover ARB	d Technology			-				Job ID:	410-165468-1
Client Sample ID: OF-011						Lal	b S	Sample ID: 4	10-165468-1 3
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.046	J	0.10	0.040	mg/L	1		353.2	Total/NA 4
Client Sample ID: OF-01						Lal	b S	Sample ID: 4	10-165468-2 5
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.91		0.10	0.040	mg/L	1	_	353.2	Total/NA
Nitrogen, Total	0.91	J	1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
Client Sample ID: OF-02						Lal	b S	Sample ID: 4	10-165468-3
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.61		0.10	0.040	mg/L	1	_	353.2	Total/NA
Nitrogen, Total	0.61	J	1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
Client Sample ID: OF-03						Lal	b S	Sample ID: 4	10-165468-4 10
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	1.0		0.10	0.040	mg/L	1	_	353.2	Total/NA
Nitrogen, Total	1.0		1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
Client Sample ID: OF-04						Lal	b S	Sample ID: 4	10-165468-5
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.85		0.10	0.040	mg/L	1	_	353.2	Total/NA 12
Nitrogen, Total	0.85	J	1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
Client Sample ID: OF-06						Lal	b S	Sample ID: 4	10-165468-6
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	1.5		0.10	0.040	mg/L	1	_	353.2	Total/NA
Nitrogen, Total	1.5		1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
Client Sample ID: OF-07						Lal	b S	Sample ID: 4	10-165468-7
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.78		0.10	0.040	mg/L	1	_	353.2	Total/NA
MBAS	0.061	J	0.12	0.040	mg/L	1		5540C - 2011	Total/NA
Nitrogen, Total	0.78	J	1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
Client Sample ID: OF-09						Lal	b S	Sample ID: 4	10-165468-8
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Туре
Nitrate Nitrite as N	0.28		0.10	0.040	mg/L	1	_	353.2	Total/NA
Client Sample ID: DUP.						Lal	b S	Sample ID: 4	10-165468-9
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.88		0.10	0.040	mg/L	1	-	353.2	Total/NA
Nitrogen, Total	0.88	J	1.0	0.50	mg/L	1		Total Nitrogen	Total/NA
<u> </u>									

This Detection Summary does not include radiochemical test results.

Job ID: 410-165468-1

Client Sample ID: OF-011 Date Collected: 03/26/24 11:10 Date Received: 03/27/24 09:50							Lab Samp	le ID: 410-16 Matrix	5468-1 x: Water
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 11:59	1
Nitrate Nitrite as N (EPA 353.2)	0.046	J	0.10	0.040	mg/L			03/29/24 12:27	1
Residual Chlorine (SM 4500 Cl F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND	F1	0.10	0.050	mg/L			03/28/24 12:52	1
Nitrogen, Total (EPA Total Nitrogen)	ND		1.0	0.50	mg/L			04/05/24 12:18	1
Client Sample ID: OF-01							Lab Samp	le ID: 410-16	5468-2
Date Collected: 03/26/24 11:45								Matrix	x: Water
Date Received: 03/27/24 09:50									
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 12:01	1
Nitrate Nitrite as N (EPA 353.2)	0.91		0.10	0.040	mg/L			03/29/24 12:29	1
Residual Chlorine (SM 4500 Cl F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND		0.10	0.050	mg/L			03/28/24 12:59	1
Nitrogen, Total (EPA Total Nitrogen)	0.91	J	1.0	0.50	mg/L			04/05/24 12:18	1
Client Sample ID: OF-02							Lab Samp	le ID: 410-16	5468-3
Date Collected: 03/26/24 12:05								Matrix	x: Water
Date Received: 03/27/24 09:50									
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 12:03	1
Nitrate Nitrite as N (EPA 353.2)	0.61		0.10	0.040	mg/L			03/29/24 12:31	1
Residual Chlorine (SM 4500 Cl F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND		0.10	0.050	mg/L			03/28/24 13:01	1
Nitrogen, Total (EPA Total Nitrogen)	0.61	J	1.0	0.50	mg/L			04/05/24 12:18	1
Client Sample ID: OF-03							Lab Samp	le ID: 410-16	5468-4
Date Collected: 03/26/24 12:28							-	Matrix	x: Water
Date Received: 03/27/24 09:50									
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 12:05	1
Nitrate Nitrite as N (EPA 353.2)	1.0		0.10	0.040	mg/L			03/29/24 12:33	1
Residual Chlorine (SM 4500 Cl F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND		0.10	0.050	mg/L			03/28/24 13:03	1
Nitrogen, Total (EPA Total Nitrogen)	1.0		1.0	0.50	mg/L			04/05/24 12:18	1

Job ID: 410-165468-1

Client Sample ID: OF-04							Lab Samp	le ID: 410-16	5468-5
Date Collected: 03/26/24 14:35								Matrix	c: Water
Date Received: 03/27/24 09:50									
	Result	Qualifier	RI	мы	Unit	п	Prenared	Analyzed	Dil Fac
Total Kieldahl Nitrogen (EPA 351.2)			1.0	0.50	ma/l		04/03/24 11:12	04/04/24 12:07	1
Nitrato Nitrito as N (EDA 353.2)	0.85		0.10	0.00	mg/L		04/00/24 11:12	03/29/24 12:35	1
Residual Chlorine (SM 4500 CI E-2011)		HF	0.20	0.060	ma/l			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	ma/l			03/27/24 23:05	 1
Ammonia as N (EPA 350 1)	ND		0.12	0.050	ma/l			03/28/24 13:05	1
Nitrogen Total (EPA Total	0.85	a.	1.0	0.50	ma/l			04/05/24 12:18	1
Nitrogen)	0.00	•	1.0	0.00				01/00/21 12:10	
Client Sample ID: OF-06							Lab Samp	le ID: 410-16	5468-6
Date Collected: 03/26/24 13:10								Matrix	k: Water
Date Received: 03/27/24 09:50									
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 12:09	1
Nitrate Nitrite as N (EPA 353.2)	1.5		0.10	0.040	mg/L			03/29/24 12:43	1
Residual Chlorine (SM 4500 Cl F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND		0.10	0.050	mg/L			03/28/24 13:11	1
Nitrogen, Total (EPA Total	1.5		1.0	0.50	mg/L			04/05/24 12:18	1
_Nitrogen)									
Client Sample ID: OF-07							Lab Samp	le ID: 410-16	5468-7
Date Collected: 03/26/24 13:00								Matrix	k: Water
Date Received: 03/27/24 09:50									
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 12:10	1
Nitrate Nitrite as N (EPA 353.2)	0.78		0.10	0.040	mg/L			03/29/24 12:45	1
Residual Chlorine (SM 4500 CI F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	0.061	J	0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND		0.10	0.050	mg/L			03/28/24 13:13	1
Nitrogen, Total (EPA Total Nitrogen)	0.78	J	1.0	0.50	mg/L			04/05/24 12:18	1
							Lab Samo		5469 9
							Lab Samp	IE ID. 410-10	5400-0
Date Collected: 03/26/24 13:35								Matrix	c: water
Date Received: 03/27/24 09:50									
General Chemistry	_					_			
General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
General Chemistry Analyte Total Kjeldahl Nitrogen (EPA 351.2)	Result ND	Qualifier	RL	MDL 0.50	Unit mg/L	<u> </u>	Prepared 04/03/24 11:12	Analyzed 04/04/24 12:16	Dil Fac
General Chemistry Analyte Total Kjeldahl Nitrogen (EPA 351.2) Nitrate Nitrite as N (EPA 353.2)	Result ND 0.28	Qualifier	RL 1.0 0.10	MDL 0.50 0.040	Unit mg/L mg/L	<u> </u>	Prepared 04/03/24 11:12	Analyzed 04/04/24 12:16 03/29/24 12:51	Dil Fac 1
General Chemistry Analyte Total Kjeldahl Nitrogen (EPA 351.2) Nitrate Nitrite as N (EPA 353.2) Residual Chlorine (SM 4500 Cl F-2011)	Result ND 0.28 ND	Qualifier	RL 1.0 0.10 0.20	MDL 0.50 0.040 0.060	Unit mg/L mg/L mg/L	<u>D</u>	Prepared 04/03/24 11:12	Analyzed 04/04/24 12:16 03/29/24 12:51 04/01/24 17:30	Dil Fac 1 1 1
General Chemistry Analyte Total Kjeldahl Nitrogen (EPA 351.2) Nitrate Nitrite as N (EPA 353.2) Residual Chlorine (SM 4500 CI F-2011) MBAS (SM 5540C - 2011)	Result ND 0.28 ND ND	Qualifier	RL 1.0 0.10 0.20 0.12	MDL 0.50 0.040 0.060 0.040	Unit mg/L mg/L mg/L mg/L	<u>D</u>	Prepared 04/03/24 11:12	Analyzed 04/04/24 12:16 03/29/24 12:51 04/01/24 17:30 03/27/24 23:05	Dil Fac 1 1 1 1
General Chemistry Analyte Total Kjeldahl Nitrogen (EPA 351.2) Nitrate Nitrite as N (EPA 353.2) Residual Chlorine (SM 4500 Cl F-2011) MBAS (SM 5540C - 2011) Ammonia as N (EPA 350.1)	Result ND 0.28 ND ND ND	Qualifier HF	RL 1.0 0.10 0.20 0.12 0.10	MDL 0.50 0.040 0.060 0.040 0.050	Unit mg/L mg/L mg/L mg/L mg/L	<u>D</u>	Prepared 04/03/24 11:12	Analyzed 04/04/24 12:16 03/29/24 12:51 04/01/24 17:30 03/27/24 23:05 03/28/24 13:15	Dil Fac 1 1 1 1 1 1

Client Sample ID: DUP. Date Collected: 03/26/24 00:00

Date Received: 03/27/24 09:50

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen (EPA 351.2)	ND		1.0	0.50	mg/L		04/03/24 11:12	04/04/24 12:18	1
Nitrate Nitrite as N (EPA 353.2)	0.88		0.10	0.040	mg/L			03/29/24 12:53	1
Residual Chlorine (SM 4500 CI F-2011)	ND	HF	0.20	0.060	mg/L			04/01/24 17:30	1
MBAS (SM 5540C - 2011)	ND		0.12	0.040	mg/L			03/27/24 23:05	1
Ammonia as N (EPA 350.1)	ND		0.10	0.050	mg/L			03/28/24 13:18	1
Nitrogen, Total (EPA Total	0.88	J	1.0	0.50	mg/L			04/05/24 12:18	1
Nitrogen)									

Matrix: Water

Lab Sample ID: 410-165468-9

Job ID: 410-165468-1

Dil Fac

5 7

Lab Sample ID: MB 410-490187/2-A Matrix: Water											Client Sa	mple ID: Metho Prep Type: ⁻	d Blank Fotal/NA
Analysis Batch: 490818												Prep Batch	490187
	MB	MB											
Analyte	Result	Qualifier		RL		MDL	Unit		D	P	repared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND			1.0		0.50	mg/L			04/0	3/24 11:12	04/04/24 11:47	1
Lab Sample ID: LCS 410-490187/1-A									С	lient	Sample	ID: Lab Control	Sample
Matrix: Water												Prep Type:	Total/NA
Analysis Batch: 490818												Prep Batch	490187
			Spike		LCS	LCS						%Rec	
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits	
Total Kjeldahl Nitrogen			4.86		4.95			mg/L			102	90 - 110	_
Aethod: 353.2 - Nitrogen, Nitrate	-Nitrite												
Lab Sample ID: MB 410-488685/21											Client Sa	mple ID: Metho	d Blank
Matrix: Water												Prep Type:	Total/NA
Analysis Batch: 488685													
-	MB	МВ											
Analyte	Result	Qualifier		RL		MDL	Unit		D	Р	repared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND			0.10	(0.040	mg/L					03/29/24 11:01	1
Lab Sample ID: MB 410-488685/54											Client Sa	mple ID: Metho	d Blank
Matrix: Water												Prep Type:	Total/NA
Analysis Batch: 488685													
•	МВ	МВ											

	NID								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.10	0.040	mg/L			03/29/24 12:07	1

Lab Sample ID: LCS 410-488685/52					Client	t Sampl	e ID: Lab C	ontrol Sample
Matrix: Water							Prep 1	Type: Total/NA
Analysis Batch: 488685								
	Spike	LCS	LCS				%Rec	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	

Nitrate Nitrite as N	2.00	1.89	mg/L	95	90 - 110	
Lab Sample ID: LCSD 410-488685/53			Client	Sample ID: I	ab Control Sam	ple Dup
Matrix: Water		Prep Type: Total/N				
Analysis Batch: 488685						

	Spike	LCSD	LCSD				%Rec		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Nitrate Nitrite as N	2.00	1.92		mg/L		96	90 - 110	2	20

Method: 4500 CI F-2011 - Chlorine Residual (DPD)

Lab Sample ID: MB 410-489358/1 Matrix: Water							Client S	ample ID: Metho Prep Type: 1	d Blank ſotal/NA
Analysis Batch: 489358									
	MB	МВ							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Residual Chlorine	ND		0.20	0.060	mg/L			04/01/24 17:30	1

Method: 4500 CI F-2011 - Chlorine Residual (DPD) (Continued)

Lab Sample ID: LCS 410-489358/2								Client	t Sampl	e ID: Lab C	ontrol S	ample
Matrix: Water										Prep	Type: To	tal/NA
Analysis Batch: 489358												
			Spike		LCS	LCS				%Rec		
Analyte			Added		Result	Qualifier	Unit	D	%Rec	Limits		
Residual Chlorine			1.00		0.995		mg/L		99	95 - 105		
Lab Sample ID: LCSD 410-489358/3	3						Clie	nt San	nple ID:	Lab Contr	ol Sampl	le Dup
Matrix: Water										Prep	Type: To	tal/NA
Analysis Batch: 489358												
·····,			Spike		LCSD	LCSD				%Rec		RPD
Analyte			Added		Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Residual Chlorine			1.00		0.974		mg/L		97	95 - 105	2	10
_ Lab Sample ID: 410-165468-1 DU										Client Sam	ple ID: C	DF-011
Matrix: Water										Pren	Type: To	tal/NA
Analysis Batch: 489358										Trop	1990.10	
Analysis Baton. 400000	Sample	Sample			DU	DU						RPD
Analyte	Result	Qualifier			Result	Qualifier	Unit	D			RPD	Limit
Residual Chlorine		HF			ND						NC	4
Method: 5540C - 2011 - Methly	ene Bl	ue Active S	ubstant	(MB	AS)							
Matrix: Water Analysis Batch: 487914										Prep	Туре: То	otal/NA
America										A		D!!
	R			0.10				– –	repared		2200	
		ND		0.12	(0.040 mg/L				03/27/24	23:05	1
Lab Sample ID: LCS 410-487914/5								Client	t Sampl	e ID: Lab C	ontrol S	ample
Matrix: Water										Prep	Type: To	tal/NA
Analysis Batch: 487914												
			Spike		LCS	LCS				%Rec		
Analyte			Added		Result	Qualifier	Unit	D	%Rec	Limits		
MBAS			1.00		0.989		mg/L		99	89 - 110		
	5						Clie	nt San	nple ID:	Lab Contro	ol Sampl	le Dup
Matrix: Water										Prep	Type: To	tal/NA
Analysis Batch: 487914												
			Spike		LCSD	LCSD				%Rec		RPD
Analyte			Added		Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
MBAS			1.00		0.970		mg/L		97	89 - 110	2	10
 Lab Sample ID: MRL 410-487914/4								Client	t Sampl	e ID: Lab C	ontrol S	ample
Matrix: Water										Prep	Type: To	tal/NA
Analysis Batch: 487914												
			Spike		MRL	MRL				%Rec		
Analyte			Added		Result	Qualifier	Unit	D	%Rec	Limits		
MBAS												
			0.0500		0.0462	J	mg/L LAS		92	75 - 125		

Job ID: 410-165468-1

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank

Analyzed

03/28/24 11:33

Client Sample ID: Method Blank

D

Prepared

5

Dil Fac

1

Method: EPA 350.1 - Nitrogen, A	mmonia				
_ Lab Sample ID: MB 410-488271/17					
Matrix: Water					
Analysis Batch: 488271					
	MB	МВ			
Analyte	Result	Qualifier	RL	MDL	Unit
Ammonia as N	ND		0.10	0.050	mg/L
- Lab Sample ID: MB 410-488271/54					
Matrix: Water					
Analysis Batch: 488271					
	MB	МВ			
Analyte	Result	Qualifier	RL	MDL	Unit

Analyte	Result	Qualifier	R	-	MDL	Unit		D	Prepared	Analyzed	Dil Fac
Ammonia as N	ND		0.1) (0.050	mg/L				03/28/24 12:50	1
Lab Sample ID: LCS 410-488271/15								Clien	t Sample	ID: Lab Contro	I Sample
Matrix: Water										Prep Type:	Total/NA
Analysis Batch: 488271											
			Spike	LCS	LCS					%Rec	
Analyte		4	Added	Result	Qua	lifier	Unit	D	%Rec	Limits	
Ammonia as N			2.00	2.06			mg/L		103	90 _ 110	

	2.00	2.00		ilig/L		100	50 - 110	
Lab Sample ID: LCS 410-488271/52					Client	t Sample	ID: Lab C	ontrol Sample
Matrix: Water							Prep	Type: Total/NA
Analysis Batch: 488271								
	Spike	LCS	LCS				%Rec	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Ammonia as N	2.00	1.87		mg/L		93	90 _ 110	

Lab Sample ID: LCSD 410-488271/16 Matrix: Water Analysis Batch: 488271				Clie	ent Sam	ple ID:	Lab Contro Prep	ol Sampl Type: To	e Dup tal/NA
	Spike	LCSD	LCSD				%Rec		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Ammonia as N	2.00	2.05		mg/L		102	90 - 110	0	15

Lab Sample ID: LCSD 410-488271/53 Matrix: Water Analysis Batch: 488271				Clie	nt San	nple ID:	Lab Contro Prep 1	ol Sampl Type: To	e Dup tal/NA
Analysis Batch: 488271									
	Spike	LCSD	LCSD				%Rec		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Ammonia as N	2.00	1.89		mg/L		94	90 - 110	1	15
_ Lab Sample ID: 410-165468-1 MS						(Client Sam	ple ID: C	F-011
Matrix: Water							Prep 1	ype: To	tal/NA

Prep	Type:	Tota	/NA

Analysis Batch: 488271											
	Sample	Sample	Spike	MS	MS				%Rec		
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Ammonia as N	ND	F1	2.50	2.69		mg/L		108	90 - 110		
Lab Sample ID: 410-165468-1 DU									Client Sampl	le ID: O	F-011
Matrix: Water									Prep Ty	pe: Tot	tal/NA
Analysis Batch: 488271											
	Sample	Sample		DU	DU						RPD
Analyte	Result	Qualifier		Result	Qualifier	Unit	D			RPD	Limit

Ammonia as N

ND F1

Eurofins Lancaster Laboratories Environment Testing, LLC

ND

mg/L

20

NC

QC Association Summary

2 3 4 5 6

Conoral	Chamietry
General	Chemistry

Analysis Batch: 487914

Lab Sample ID	Client Sample ID	Prep Туре	Matrix	Method Prep Batch
410-165468-1	OF-011	Total/NA	Water	5540C - 2011
410-165468-2	OF-01	Total/NA	Water	5540C - 2011
410-165468-3	OF-02	Total/NA	Water	5540C - 2011
410-165468-4	OF-03	Total/NA	Water	5540C - 2011
410-165468-5	OF-04	Total/NA	Water	5540C - 2011
410-165468-6	OF-06	Total/NA	Water	5540C - 2011
410-165468-7	OF-07	Total/NA	Water	5540C - 2011
410-165468-8	OF-09	Total/NA	Water	5540C - 2011
410-165468-9	DUP.	Total/NA	Water	5540C - 2011
MB 410-487914/3	Method Blank	Total/NA	Water	5540C - 2011
LCS 410-487914/5	Lab Control Sample	Total/NA	Water	5540C - 2011
LCSD 410-487914/6	Lab Control Sample Dup	Total/NA	Water	5540C - 2011
MRL 410-487914/4	Lab Control Sample	Total/NA	Water	5540C - 2011

Analysis Batch: 488271

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-165468-1	OF-011	Total/NA	Water	EPA 350.1	
410-165468-2	OF-01	Total/NA	Water	EPA 350.1	
410-165468-3	OF-02	Total/NA	Water	EPA 350.1	
410-165468-4	OF-03	Total/NA	Water	EPA 350.1	
410-165468-5	OF-04	Total/NA	Water	EPA 350.1	
410-165468-6	OF-06	Total/NA	Water	EPA 350.1	
410-165468-7	OF-07	Total/NA	Water	EPA 350.1	
410-165468-8	OF-09	Total/NA	Water	EPA 350.1	
410-165468-9	DUP.	Total/NA	Water	EPA 350.1	
MB 410-488271/17	Method Blank	Total/NA	Water	EPA 350.1	
MB 410-488271/54	Method Blank	Total/NA	Water	EPA 350.1	
LCS 410-488271/15	Lab Control Sample	Total/NA	Water	EPA 350.1	
LCS 410-488271/52	Lab Control Sample	Total/NA	Water	EPA 350.1	
LCSD 410-488271/16	Lab Control Sample Dup	Total/NA	Water	EPA 350.1	
LCSD 410-488271/53	Lab Control Sample Dup	Total/NA	Water	EPA 350.1	
410-165468-1 MS	OF-011	Total/NA	Water	EPA 350.1	
410-165468-1 DU	OF-011	Total/NA	Water	EPA 350.1	

Analysis Batch: 488685

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-165468-1	OF-011	Total/NA	Water	353.2	
410-165468-2	OF-01	Total/NA	Water	353.2	
410-165468-3	OF-02	Total/NA	Water	353.2	
410-165468-4	OF-03	Total/NA	Water	353.2	
410-165468-5	OF-04	Total/NA	Water	353.2	
410-165468-6	OF-06	Total/NA	Water	353.2	
410-165468-7	OF-07	Total/NA	Water	353.2	
410-165468-8	OF-09	Total/NA	Water	353.2	
410-165468-9	DUP.	Total/NA	Water	353.2	
MB 410-488685/21	Method Blank	Total/NA	Water	353.2	
MB 410-488685/54	Method Blank	Total/NA	Water	353.2	
LCS 410-488685/52	Lab Control Sample	Total/NA	Water	353.2	
LCSD 410-488685/53	Lab Control Sample Dup	Total/NA	Water	353.2	

Client Sample ID

OF-011

OF-01

OF-02

OF-03

OF-04

OF-06

OF-07

OF-09

OF-011

Method Blank

Lab Control Sample

Lab Control Sample Dup

DUP.

General Chemistry Analysis Batch: 489358

Lab Sample ID

410-165468-1

410-165468-2

410-165468-3

410-165468-4

410-165468-5

410-165468-6

410-165468-7

410-165468-8

410-165468-9

MB 410-489358/1

LCS 410-489358/2

LCSD 410-489358/3

Prep Batch: 490187

410-165468-1 DU

QC Association Summary

Prep Type

Total/NA

Matrix

Water

Method

4500 CI F-2011

Prep Batch

2 3 4 5 6

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-165468-1	OF-011	Total/NA	Water	351.2	
410-165468-2	OF-01	Total/NA	Total/NA Water		
410-165468-3	OF-02	Total/NA	Total/NA Water		
410-165468-4	OF-03	Total/NA	Total/NA Water		
410-165468-5	OF-04	Total/NA	Water	351.2	
410-165468-6	OF-06	Total/NA	Water	351.2	
410-165468-7	OF-07	Total/NA	Water	351.2	
410-165468-8	OF-09	Total/NA	Water	351.2	
410-165468-9	DUP.	Total/NA	Water	351.2	
MB 410-490187/2-A	Method Blank	Total/NA	Water	351.2	
LCS 410-490187/1-A	Lab Control Sample	Total/NA	Water	351.2	

Analysis Batch: 490818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-165468-1	OF-011	Total/NA	Water	351.2	490187
410-165468-2	OF-01	Total/NA	Water	351.2	490187
410-165468-3	OF-02	Total/NA	Water	351.2	490187
410-165468-4	OF-03	Total/NA	Water	351.2	490187
410-165468-5	OF-04	Total/NA	Water	351.2	490187
410-165468-6	OF-06	Total/NA	Water	351.2	490187
410-165468-7	OF-07	Total/NA	Water	351.2	490187
410-165468-8	OF-09	Total/NA	Water	351.2	490187
410-165468-9	DUP.	Total/NA	Water	351.2	490187
MB 410-490187/2-A	Method Blank	Total/NA	Water	351.2	490187
LCS 410-490187/1-A	Lab Control Sample	Total/NA	Water	351.2	490187

Analysis Batch: 491191

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
410-165468-1	OF-011	Total/NA	Water	Total Nitrogen	
410-165468-2	OF-01	Total/NA	Water	Total Nitrogen	
410-165468-3	OF-02	Total/NA	Water	Total Nitrogen	
410-165468-4	OF-03	Total/NA	Water	Total Nitrogen	
410-165468-5	OF-04	Total/NA	Water	Total Nitrogen	
410-165468-6	OF-06	Total/NA	Water	Total Nitrogen	
410-165468-7	OF-07	Total/NA	Water	Total Nitrogen	

General Chemistry (Continued)

Analysis Batch: 491191 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-165468-8	OF-09	Total/NA	Water	Total Nitrogen	
410-165468-9	DUP.	Total/NA	Water	Total Nitrogen	

Dilution

Factor

1

1

1

1

1

1

Run

Batch

490187

Number Analyst

490818 JCG7

488685 Q3HN

489358 UDS7

487914 UDS7

488271 JCG7

491191 UJE2

NLE3

Lab

ELLE

ELLE

ELLE

ELLE

ELLE

ELLE

ELLE

Batch

Туре

Prep

Analysis

Analysis

Analysis

Analysis

Analysis

Analysis

Batch

351.2

351.2

353.2

4500 CI F-2011

5540C - 2011

Total Nitrogen

EPA 350.1

Method

Lab Sample ID: 410-165468-1

04/03/24 11:12 - 04/03/24 14:12 1

Lab Sample ID: 410-165468-2

Lab Sample ID: 410-165468-3

Lab Sample ID: 410-165468-4

Prepared

or Analyzed

04/04/24 11:59

03/29/24 12:27

04/01/24 17:30

03/27/24 23:05

03/28/24 12:52

04/05/24 12:18

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Client Sample ID: OF-01 Date Collected: 03/26/24 11:45

Client Sample ID: OF-011

Date Collected: 03/26/24 11:10

Date Received: 03/27/24 09:50

Prep Type

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Date Received: 03/27/24 09:50

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:01
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:29
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 12:59
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

Client Sample ID: OF-02

Date Collected: 03/26/24 12:05 Date Received: 03/27/24 09:50

_	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:03
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:31
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 13:01
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

Client Sample ID: OF-03

Date Collected: 03/26/24 12:28 Date Received: 03/27/24 09:50

Γ	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:05
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:33
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30

Client Sample ID: OF-03 Date Collected: 03/26/24 12:28 Date Received: 03/27/24 09:50

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 13:03
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

Client Sample ID: OF-04

Date Collected: 03/26/24 14:35 Date Received: 03/27/24 09:50

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:07
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:35
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 13:05
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

Client Sample ID: OF-06

Date Collected: 03/26/24 13:10 Date Received: 03/27/24 09:50

_	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:09
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:43
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 13:11
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

Client Sample ID: OF-07 Date Collected: 03/26/24 13:00 Date Received: 03/27/24 09:50

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:10
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:45
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 13:13
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

Eurofins Lancaster Laboratories Environment Testing, LLC

Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 410-165468-5

Lab Sample ID: 410-165468-6

Lab Sample ID: 410-165468-7

Dilution

Factor

1

1

1

1

1

1

Run

Batch

490187

Number Analyst

490818 JCG7

488685 Q3HN

489358 UDS7

487914 UDS7

488271 JCG7

491191 UJE2

NLE3

Lab

ELLE

ELLE

ELLE

ELLE

ELLE

ELLE

ELLE

Batch

Туре

Prep

Analysis

Analysis

Analysis

Analysis

Analysis

Analysis

Batch

351.2

351.2

353.2

4500 CI F-2011

5540C - 2011

Total Nitrogen

EPA 350.1

Method

Lab Sample ID: 410-165468-8

04/03/24 11:12 - 04/03/24 14:12 1

Lab Sample ID: 410-165468-9

Prepared

or Analyzed

04/04/24 12:16

03/29/24 12:51

04/01/24 17:30

03/27/24 23:05

03/28/24 13:15

04/05/24 12:18

Matrix: Water

Matrix: Water

Client Sample ID: DUP. Date Collected: 03/26/24 00:00

Client Sample ID: OF-09

Date Collected: 03/26/24 13:35

Date Received: 03/27/24 09:50

Prep Type

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Date Received: 03/27/24 09:50

	Batch	Batch		Dilution	Batch			Prepared
Ргер Туре	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	351.2			490187	NLE3	ELLE	04/03/24 11:12 - 04/03/24 14:12 1
Total/NA	Analysis	351.2		1	490818	JCG7	ELLE	04/04/24 12:18
Total/NA	Analysis	353.2		1	488685	Q3HN	ELLE	03/29/24 12:53
Total/NA	Analysis	4500 CI F-2011		1	489358	UDS7	ELLE	04/01/24 17:30
Total/NA	Analysis	5540C - 2011		1	487914	UDS7	ELLE	03/27/24 23:05
Total/NA	Analysis	EPA 350.1		1	488271	JCG7	ELLE	03/28/24 13:18
Total/NA	Analysis	Total Nitrogen		1	491191	UJE2	ELLE	04/05/24 12:18

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

uthority	Progra	am	Identification Number	Expiration Date	
ssachusetts State			M-PA009	06-30-24	
The following analytes for which the agency c	are included in this report, bu loes not offer certification.	t the laboratory is not certif	ied by the governing authority. This lis	t may include analytes	
Analysis Method Prep Method					
Analysis Method	Prep Method	Matrix	Analyte		
Analysis Method 353.2	Prep Method	Matrix Water	Analyte Nitrate Nitrite as N		
Analysis Method 353.2 5540C - 2011	Prep Method	Matrix Water Water	Analyte Nitrate Nitrite as N MBAS		

Client: EA Engineering, Science, and Technology Project/Site: Westover ARB

Method	Method Description	Protocol	Laboratory
351.2	Nitrogen, Total Kjeldahl	EPA	ELLE
353.2	Nitrogen, Nitrate-Nitrite	EPA	ELLE
4500 CI F-2011	Chlorine Residual (DPD)	SM	ELLE
5540C - 2011	Methlyene Blue Active Substant (MBAS)	SM	ELLE
EPA 350.1	Nitrogen, Ammonia	EPA	ELLE
Total Nitrogen	Nitrogen, Total	EPA	ELLE
351.2	Nitrogen, Total Kjeldahl	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: EA Engineering, Science, and Technology Project/Site: Westover ARB

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-165468-1	OF-011	Water	03/26/24 11:10	03/27/24 09:50
410-165468-2	OF-01	Water	03/26/24 11:45	03/27/24 09:50
410-165468-3	OF-02	Water	03/26/24 12:05	03/27/24 09:50
410-165468-4	OF-03	Water	03/26/24 12:28	03/27/24 09:50
410-165468-5	OF-04	Water	03/26/24 14:35	03/27/24 09:50
410-165468-6	OF-06	Water	03/26/24 13:10	03/27/24 09:50
410-165468-7	OF-07	Water	03/26/24 13:00	03/27/24 09:50
410-165468-8	OF-09	Water	03/26/24 13:35	03/27/24 09:50
410-165468-9	DUP.	Water	03/26/24 00:00	03/27/24 09:50



Chain of Custody Record

Environment Testing

	N.Vunstan //	1. Vobberpul Bac	iman, Va	nessa					410-117	162-31832.1	
ient Contact ick Dunstan	Phone 503-899-8	901 E-M Var	ad 1essa Ba	dman@	get.euro	finsus com	State of Ongin	MA	Page 1 c	of 1	
A Engineering Science and Technology	F	WSID				Analysis	Requested		Job #		
dress:	Due Date Requested:				T				Preserva	tion Codes:	
01 Metro Center Blvd. Suite 102	TAT Requested (days)		- 1 53						A - HCL	M - Hexans N - None	
/arwick	Standard								B - NaOH C - Zn Ace	o - AsNaO2	
ate, Zip	Compliance Project: A Yes A	No							D - Nitric A E - NaHSO	Acid Q - Na2SO3	
none:	PO #								F - MeOH G - Amchi	S - H2SO4	
01-287-0378(Tel)	Purchase Order Requested		<u> </u>						H - Ascort	bic Acid U - Acetone	
dunstan@eaest.com			Va)						yn J - DI Wat	er V - MCAA W - pH 4-5	
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		Preservation Code:	XX	N S	SI	N N			X		
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5F-01	3/16/24 1145	G Water	NN	1'	1	11			3		
0F-02	3/16/24 12:05	C Water	NN	11	1	11			3		
0F-03	3/2/0/24 1228	G Water	NN	11	-1	11			3		
OF-04	3/26/24 1435	Vater	NN	11	1	11			3		
0F-06	3/2/1/24 1310	- Water	NN	1!	11	11			3		
0F-07	3/21/24 1300	G Water	NN	11	-1.	11			3		
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MF-09	3/26/24 1335	(7 Water	NN	11	-1	11			3		
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Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Login Number: 165468 List Source: Eurofins Lancaster Laboratories Environment Testing, LLC List Number: 1 Creator: Arroyo, Haley

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(=6C, not frozen).</td <td>True</td> <td></td>	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable, where thermal pres is required (=6C, not frozen).</td <td>N/A</td> <td></td>	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Job Number: 410-165468-1
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			Mas	SDEP Analyti	cal Pr	otocol Certfica	tion	Form				
Laboratory Name: Eurofins Lancaster Laboratories Environment Testing, Project #: 410-165468-1												
Project Location: Westover ARB			RTN:									
This Forn	n provide	es certifications	s for th	e following dat	a set:	list Laboratory S	amp	le ID Number(s):				
Matrices:	⊠ Grour	ndwater/Surface	Water	□ Soil/Sedim	ient	Drinking Water	[∃ Air □ Other:				
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6010 Metals CAM III A		6020 Metals CAM III D		MassDEP EPH CAM IV B		8151 Herbicides CAM V C		8330 Explosives CAM VIII A		TO-15 VO CAM IX B	С	
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С	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?											
D	Does the "Quality A Analytica	laboratory repor Assurance and C Il Data"?	t comply uality C	y with all the repo ontrol Guidelines	orting re for the	equirements specific Acquisition and Re	ed in (eportir	CAM VII A , ng of			/es	□ No
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G	Were the protocol	e reporting limits a s)?	at or bel	ow all CAM repo	rting lim	nits specified in the	selec	ted CAM			/es	□ No ¹
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Appendix J

IDDE Program Training



Illicit Discharge Detection and Elimination Training



Westover Air Reserve Base Municipal Separate Stormwater System Stormwater Management Program

June 2024

Background and Applicability

- Municipal Separate Stormwater System (MS4)
 - The 2016 revision of the Massachusetts MS4 program included the addition of Westover as a qualifying site and is required to meet the permit requirements moving forward.
 - The goal of the MS4 permit is to monitor the stormwater sewer system in place at Westover ARB and reduce the potential for pollutant discharges from the storm system into the environment.
 - One of the 6 minimum control measures included in the permit is the development and implementation of and Illicit Discharge Detection and Elimination (IDDE) Plan. (MS4 Permit Section 2.3.4)
 - The written IDDE Plan was developed in 2022 and is available by request.
 - The full Stormwater Management Program (SWMP) for the MS4 permit can be found here: <u>https://www.westover.afrc.af.mil/About-</u> <u>Us/Resources/Environmental-and-Noise/</u>



Background and Applicability

- Illicit Discharge Detection and Elimination (IDDE) Plan
 - Written plan developed in 2022 with the goal of determining if any illicit discharges exist that pose a potential to enter the MS4 storm sewer.
 - One component of the plan, as required by the permit, is to develop a training for employees involved in the IDDE program that is reviewed and completed annually.
 - The goal of this training is for relevant employees to be aware of and identify illicit discharges so that any found may be eliminated more rapidly, and no new illicit discharges are created.



What is an Illicit Discharge?

Illicit discharges are any drainage to a stormwater system that are not entirely composed of stormwater. These can be direct connections, such as cross connections between storm and sanitary sewers, or indirect, such as a failing septic system leaching sewage or an improperly used sump pump. Some discharges could be intentional, such as draining of oil into catch basins. Sanitary sewer overflows are also a source of illicit discharges.

Some discharges are exempt and not classified as an IDDE.

- Discharges pursuant to a NPDES permit
- Discharges related to firefighting activities





Illicit Discharge Examples

Illicit Discharges

- Sanitary sewer overflow
- Sanitary sewers leading into storm sewers
- Floor drains in buildings leading to storm sewers
- Inappropriate use of sump pumps – such as for floor wash water or cleaning products
- Oil or cleaning products being dumped into catch basins
- Failing septic systems leaching sewage into the stormwater system

NOT Illicit Discharges

- Firefighting activities that wash into the storm sewer
- NPDES permitted discharges related to industrial activity – not relevant at Westover
- Roof rain gutters and leaders leading to storm sewer
- Ground drainage leading to catch basins connected to the storm

sewer





How to Identify an Illicit Discharge

- Some indicators may alert you that an illicit discharge exists within the stormwater system
 - Foul or unusual odor
 - Discolored storm water
 - Staining around storm drains or other stormwater infrastructure





How to Respond to an Illicit Discharge

- If you suspect that you have identified an illicit discharge:
 - Stop discharge if reasonable to do so
 - Report suspected discharge to contacts below
- Champanine Saviengvong
 - Water Quality Program Manager
 - 413-557-3951
 - champanine.saviengvong@us.af.mil
- John Moriarty
 - Flight Chief
 - 413-557-2434
 - john.moriarty.1@us.af.mil



Moving Forward

- In the coming years, continuing investigation of potential for illicit discharges will be occurring
- Below is a general procedure for the process that will be used to identify and eliminate illicit discharges in the Westover MS4 system





Summary

- ✓ Be aware of the stormwater system on site and what should and shouldn't go into it
- ✓ Make note of any indicators of an illicit discharge
- Report any illicit discharges so that they may be investigated and addressed



Appendix K

List of Retrofit Opportunities





Westover Air Reserve Base MS4 (Municipal Separate Storm Sewer System) Retrofit Opportunities

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 2023 Version: DRAFT EA Project No. 662943.14

*Subcontractor to WSP.

CONTENTS

Page

1.	INTRODUCITON 1						
	1.1	Applicability	1				
2.	RETR	OFIT OPPORTUNITIES	. 2				

1. INTRODUCITON

This document provides a list of current locations identified by Westover Air Reserve Base (ARB) as opportunities for retrofit or modification with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its Municipal Stormwater Sewer System (MS4) through the reduction of impervious area, as required by the MS4 permit.

1.1 APPLICABILITY

Section 2.3.6.d of the MS4 permit describes the requirements of the list of retrofit opportunities. These requirements include identification of five 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. 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. As improvements are made and opportunities are completed, new opportunities must be identified each year so that a list of five opportunities is maintained.

The SWMP outlines how this document meets the above requirements in Section 4.5, with BMP 5e.

2. RETROFIT OPPORTUNITIES

Areas with significant potential for pollutant loading and large impervious cover were considered for this list. Factors such as access for maintenance, subsurface geology, depth to water table, and proximity to aquifers and subsurface structures were considered. A figure is attached displaying the location of the opportunities.

- 1. Installation of stormwater BMPs at new hangar: A new hangar is currently in development at Westover ARB. It will be constructed on land that has previously been developed and was primarily impervious surface. The new hangar will also have an impervious cover, but newly installed stormwater BMPs, designed in accordance with Massachusetts stormwater quality requirements, will reduce the pollutant load to the MS4 and reduce peak flow. The proposed system is a proprietary filtration system called the Jellyfish, produced by Contech. Under filtration testing, it has been demonstrated to remove 89% of TSS, 59% of total phosphorous, 51% of total nitrogen, and removal total copper and total zinc.
- 2. **Removal of paved roadways:** Westover has proposed the removal of paved surfaces as a part of a runway redevelopment project to mitigate impacts. The three paved surfaces described herein are all located in the same vicinity of aircraft airfield Pad 15, near outfalls 006 and 007 in an area surrounded by grassy cover. Runoff from paved surfaces contributes to releases of pollutants to the stormwater system, and increases runoff, leading to higher peak flows. Removal of this pavement would increase infiltration in the area, limiting pollutant release and curbing peak stormwater flows.
- 3. **Removal of paved roadways:** See above-mentioned #2.
- 4. Removal of paved roadways: See above-mentioned #2.
- 5. **Dogpatch redevelopment**: The area known as the Dogpatch, located near Outfall 011A, may be redeveloped and present an opportunity for stormwater retrofit and improvement. The area is currently partially paved, with some small structures that add impervious area. A redevelopment in the area would align with installation of stormwater BMPs to reduce runoff from the area. Infiltration or retention BMPs could be installed here, and would reduce peak runoff rates and pollutant discharges to the surrounding area. This redevelopment would be designed in accordance with Massachusetts stormwater quality requirements.

Attachment A

Retrofit Opportunity Locations



Appendix L

Nitrogen Source Identification Report





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 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 2024 Version: DRAFT EA Project No. 662943.14

*Subcontractor to WSP.

TABLE OF CONTENTS

Page

LIST (LIST (OF TAB OF ACF	BLES RONYMS AND ABBREVIATIONS	.i .i		
1.	INTRODUCTION 1				
	1.1 1.2	REGULATORY QUALIFICATION IDENTIFICATION REPORT REQUIREMENTS	.1 .1		
2.	CALC	ULATION OF URBANIZED AND IMPERVIOUS AREA	3		
	2.1 2.2 2.3	URBANIZED AREA IMPERVIOUS AREA DIRECTLY CONNECTED IMPERVIOUS AREA	.3 .3 .3		
3.	SCRE	ENING AND MONITORING RESULTS	5		
4.	IDENT	TIFICATION OF POTENTIAL HIGH NUTRIENT LOADING AREAS	7		
	4.1 4.2 4.3	POTENTIAL NITROGEN SOURCES CATCHMETN ASSESSMENT POTENTIAL RETROFIT OPPORTUNITIES	.7 .7 .9		
5.	REFE	RENCES 1	1		

LIST OF TABLES

Table 1. Catchment Nitrogen Loading	. 8
-------------------------------------	-----

LIST OF ACRONYMS AND ABBREVIATIONS

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

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.

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.

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.
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.

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	С	1257	156	1413
2	131.7	72.5	59.2	55.0	40.8	53.8	С	807	142	949
3	177.2	108.1	69.1	61.0	47.6	84.4	С	1266	166	1432
4	353.2	70.8	282.4	20.0	9.0	31.7	С	475	678	1153
6	170.3	94.2	76.1	55.3	41.1	70.1	С	1051	183	1234
7	163	36.7	126.3	22.5	10.7	17.4	С	261	303	564
9	142.4	21.2	121.2	14.9	5.7	8.2	А	123	36	159
11	499	46.5	452.5	9.3	2.8	14.2	А	213	136	349
1149946.5452.59.32.814.2A213136349Notes: IA = Impervious area PA = Pervious area DCIA = Directly connected impervious area HSG = Hydrologic soil groupNotes:14.2A213136349										

Table 1. Catchment Nitrogen Loading

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

lb/yr = Pound(s) of nitrogen per year

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 included compiling a list of retrofit opportunities and completing a structural BMP evaluation of retrofit opportunities at Westover ARB. The potential to reduce nitrogen loading was included in this evaluation and helped determine where retrofit opportunities would be most beneficial. These retrofit opportunities are identified in Appendix K, and evaluated in Appendix M of the SWMP. A brief list of the identified retrofit opportunities is listed below.

- Stormwater BMP installation in coordination with a new hangar development at Westover
- Removal of hardtop near the wetland areas on Westover
- Removal of unused pavement on Westover
- Installation of stormwater BMPs in coordination with the redevelopment of the "Dog Patch" area
- Installation of an infiltration basin that receives water from impervious surfaces that do not currently drain to a stormwater BMP

This list is dynamic and is intended to be updated each year as site conditions change and new stormwater system improvements are implemented.

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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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Westover Air Reserve Base MS4 (Municipal Separate Storm Sewer System) Stormwater Retrofit Opportunities

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 2024 Version: DRAFT EA Project No. 662943.14

*Subcontractor to WSP.

CONTENTS

Page

1.	INTR	ODUCIT	TON	
	1.1	Applica	cability	1
2.	RETF	ROFIT O	DPPORTUNITIES	
	2.1	Hangar	r Development and BMP Installation	2
		2.1.1 2.1.2 2.1.3 2.1.4	Description Schedule Cost Analysis Engineering and Permitting	2 2 2 2 2
	2.2	Paveme	nent Removal 1	3
		2.2.1 2.2.2 2.2.3 2.2.4	Description Schedule Cost Analysis Engineering and Permitting	
	2.3	Paveme	nent Removal 2	4
		2.3.1 2.3.2 2.3.3 2.3.4	Description Schedule Cost Analysis Engineering and Permitting	
	2.4	Dog Pa	atch Development	5
		2.4.1 2.4.2 2.4.3 2.4.4	Description Schedule Cost Analysis Engineering and Permitting	
	2.5	Infiltra	ation Basin Installation Error! Bookm	ark not defined.
3	STIM	2.5.1 2.5.2 2.5.3 2.5.4	DescriptionError! Bookm ScheduleError! Bookm Cost AnalysisError! Bookm Engineering and PermittingError! Bookm	ark not defined. ark not defined. ark not defined. ark not defined. 6
5.	SUM		•••••••••••••••••••••••••••••••••••••••	

LIST OF ATTACHMENTS

Attachment A	Retrofit Opportunity Locaitons
Attachment B.	New Hangar Supplemental Information
Attachment C.	Pavement Removal Supplemental Information
Attachment D.	Dogpatch Redevelopment Supplemental Information

1. INTRODUCITON

This document provides an evaluation of the list of locations identified by Westover Air Reserve Base (ARB) as opportunities for retrofit or modification with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its Municipal Separate Storm Sewer System (MS4) through the reduction of impervious area.

1.1 APPLICABILITY

The MS4 permit in place at Westover ARB requires opportunities to be identified for potential retrofit with BMPs to reduce impervious area and reduce flow and pollutant release to the stormwater system and the environment. This list is updated annually and located in Appendix K of the Stormwater Management Program (SWMP).

Each location identified in Appendix K must also be evaluated for feasibility and ranked to determine projects that are most viable to move forward. This requirement is described in MS4 Permit Appendix F Part B.I.1.c.i.

This evaluation must include the following three items:

- The next planned infrastructure, resurfacing, or redevelopment activity planned for the property or a planned retrofit date.
- The estimated cost of redevelopment or retrofit BMPs.
- The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

The description of this requirement and how it fits into the larger SWMP is located in Section 5.1 of the SWMP under BMP 7b.

2. RETROFIT OPPORTUNITIES

Five retrofit opportunities were identified in Appendix K of the SWMP, and an evaluation of each is described below using the requirements listed in the section above. In addition to the requirements listed in the permit, the Nitrogen Source Identification Report (SWMP Appendix L) describes that nitrogen removal and mitigation should be considered for each of the opportunities. No sources of high nitrogen loading have been identified at Westover, however impervious surface area is the primary indicator of potential nitrogen loading as identified in the Nitrogen Source Identification Report. Any relevant supplemental information that has been provided by Westover for the evaluation of each alternative is attached to this document. See SWMP Appendix K for a figure showing locations of retrofit opportunities.

2.1 HANGAR DEVELOPMENT AND BMP INSTALLATION

2.1.1 Description

A new hangar is currently under construction at Westover ARB and is designed to include installation of a stormwater filtration system that will remove TSS, phosphorous, nitrogen, copper, and zinc from the stormwater system. This is a proprietary technology that will be installed to meet all Massachusetts requirements for stormwater quality at developments. See SWMP Appendix K for descriptions and locations of retrofit opportunities. Selected design drawings showing the locations and estimated dimensions of the filtration system are included as Attachment B to this evaluation.

2.1.2 Schedule

This development on the property is currently under construction. Plans have been submitted and approved that include this BMP installation. Expected completion of the project is in summer of 2024.

2.1.3 Cost Analysis

Direct quotes from the vendor were not available, and actual pricing is still being negotiated for this product, so an approximate equivalent was priced to meet the estimation requirement. A total estimated cost of approximately \$300,000 was calculated.

2.1.4 Engineering and Permitting

No conditions have been noted that would indicate additional engineering challenges associated with this project. The full project scope and design has been completed and all engineering documentation has been submitted and stamped by a certified professional engineer.

All relevant permits have been submitted and approved for the project.

2.2 PAVEMENT REMOVAL 1

2.2.1 Description

The three proposed Pavement Removal retrofit opportunities described in this Appendix are all located near aircraft airfield Pad 15. Impermeable surface has been proposed to be removed on Westover ARB. The area proposed to be removed is displayed in Attachment A. This area is shown to be 1.0 acres of impervious surface that will be removed and restored to a grassland state.

2.2.2 Schedule

This project is being considered as a retrofit opportunity with no estimated completion date.

2.2.3 Cost Analysis

A preliminary cost estimate was developed indicating the project would cost approximately \$1,000. Low cost can be achieved by deploying military units to perform the earthwork and grass installation and storing the demolished concrete at Westover's construction rubble site. Committing government funds to carry out any projects outlined in the plan is not authorized without proper PPBE (planning, programming, budgeting, and execution) procedure, at a minimum: Air Force Form 9 Planning Document and coordination with CE leadership and Finance Department.

2.2.4 Engineering and Permitting

This project is feasible from an engineering standpoint and would consist only of removal of pavement and restoration to grassland conditions. Restoration may require tilling, decompaction, or soil amendments to restore the permeability to native equivalent conditions, as well as seeding and maintenance until established. No conditions have been observed at the site that would suggest this project is not feasible.

2.3 PAVEMENT REMOVAL 2

2.3.1 Description

A section of impermeable surface has been proposed to be removed is located near Pad 15 on the aircraft airfield. The area proposed to be removed is displayed in Attachment A. This area is shown to be 1.0 acres of impervious surface that will be removed and restored to a grassland state.

2.3.2 Schedule

This project is being considered as a retrofit opportunity, and no planned completion date has yet been set by Westover.

2.3.3 Cost Analysis

A preliminary cost estimate was developed indicating the project would cost approximately \$1,000. Low cost can be achieved by deploying military units to perform the earthwork and grass installation and storing the demolished concrete at Westover's construction rubble site. Committing government funds to carry out any projects outlined in the plan is not authorized without proper PPBE (planning, programming, budgeting, and execution) procedure, at a minimum: Air Force Form 9 Planning Document and coordination with CE leadership and Finance Department.

2.3.4 Engineering and Permitting

This project is feasible from an engineering standpoint and would consist only of removal of pavement and restoration to grassland conditions. Restoration may require tilling, decompaction, or soil amendments to restore the permeability to native equivalent conditions, as well as seeding and maintenance until established. No conditions have been observed at the site that would suggest this project is not feasible.

2.4 PAVEMENT REMOVAL 3

2.4.1 Description

A section of pavement is proposed to be removed from Westover in an area that is surrounded by grassy cover. This area is to the east of the runway near outfall 006 and 007, and is not currently used by the facility. The removal would include the removal and disposal of the pavement, and restoration of the area to grassland.

2.4.2 Schedule

This project is being considered as a retrofit opportunity, and no planned completion date has yet been set by Westover.

2.4.3 Cost Analysis

A preliminary cost estimate was developed and an approximate cost of \$1,000 was calculated. Low cost can be achieved by deploying military units to perform the earthwork and grass installation and storing the demolished concrete at Westover's construction rubble site. Committing government funds to carry out any projects outlined in the plan is not authorized without proper PPBE (planning, programming, budgeting, and execution) procedure, at a minimum: Air Force Form 9 Planning Document and coordination with CE leadership and Finance Department.

2.4.4 Engineering and Permitting

This project is feasible from an engineering standpoint and would consist only of removal of pavement and restoration to grassland conditions. No conditions have been observed at the site that would suggest this project is not feasible.

No conditions have been observed at the site that would indicate any issues in the permitting process for this project.

2.5 DOG PATCH DEVELOPMENT

2.5.1 Description

A redevelopment has been proposed in "Dog Patch" area of Westover ARB, located just north of the runway and identified in the figure included in Appendix K of the SWMP. This redevelopment includes the addition of some paved space and installation of stormwater BMPs to improve infiltration and reduce runoff to the stormwater sewer. The proposed project includes installation of a grass dry swale and two bioretention basins. A 100% design was completed by AECOM in March 2022, and the proposed stormwater drainage drawing for the project is attached to this report in Attachment D.

2.5.2 Schedule

This project has already gone through design development and revisions, and site personnel expect the project to be completed by summer of 2025.

2.5.3 Cost Analysis

For this report, only the costs associated with installation of the two bioretention basins were considered. For this report, only the costs associated with installation of the two bioretention basins were considered. An estimated cost of approximately \$300,000 was calculated. Construction costs for each bioretention basin include excavation, stone and topsoil fill, and planting of wetland plants.

2.5.4 Engineering and Permitting

The engineering for this project is feasible, and a 100% design has been completed and stamped by a certified professional engineer. Permitting for this project is reasonable, as it appears to meet all federal, state, and local requirements for a development of this type. No observations have been made at the site to indicate engineering or permitting infeasibility.

3. SUMMARY

Five stormwater retrofit opportunities were identified for this update of the SWMP, and all were evaluated for schedule, feasibility and cost. The scheduling and prioritization of these alternatives is described in Appendix N of the SWMP, Planned Structural BMPs.

Attachment A

Retrofit Opportunity Locations



Attachment B

New Hangar Supplemental Information

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GENERAL NOTES

- 1. CONTRACTOR TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE. SEE SPECIFICATION SECTION "33 40 00" FOR MORE INFORMATION.
- 2. DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- 3. SUBMIT FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS.
- 4. WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH INFORMATION CONTAINED IN THIS DRAWING AND IN THE SPECIFICATIONS.
- 5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. STRUCTURE SHALL ALSO BE DESIGNED TO WITHSTAND ANY CONSTRUCTION EQUIPMENT LOADING SUCH AS CRANES, ETC.
- 6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- 7. CONTRACTOR MUST HAVE A REGISTERED PROFESSIONAL ENGINEER DESIGN THE STRUCTURE AND IS THE DESIGNER OF RECORD. ACTUAL DIMENSIONS, DEPTHS, SOIL COVER, BACKFILL MATERIAL AND COMPACTION REQUIREMENTS, TYPE AND LOCATIONS OF GEOTEXTILE MATERIALS, MAGNITUDE OF CONSTRUCTION-PHASE AND PERMANENT SURCHARGE LOADING, AND OTHER SPECIFICS OF THE DESIGN SHALL BE DETERMINED BY CONTRACTOR'S REGISTERED PROFESSIONAL ENGINEER
- 8. CONTRACTOR TO PROVIDE UNITS THAT MEET THE PROJECT REQUIREMENTS AND SUBMIT STAMPED AND SEALED SHOP DRAWINGS AND CALCULATIONS FOR REVIEW AND APPROVAL PRIOR TO PURCHASE AND DELIVERY TO THE SITE.

INSTALLATION NOTES

- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE RESPONSIBILITY OF THE STRUCTURE MANUFACTURER.
- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES.
- MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE
- UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. ALL JOINTS BELOW PIPE INVERTS SHALL BE GROUTED.
- F. DESIGN AND INSTALLATION SHALL TAKE INTO ACCOUNT THE SITE WATER TABLE ELEVATION.

	TREATI	MENT UNITS (SQTM)		
UNIT	DRAINAGE AREA TO UNIT (AC.)	DRAINAGE BASIN IMPERVIOUSNESS (%)	TIME OF CONCENTRATION	Q (CFS)
SQTM 1	2.66	72	6 MIN	1.13
SQTM 2	0.10	78	6 MIN	0.05
SQTM 3	0.86	100	6 MIN	0.51
SQTM 4	1.51	65	6 MIN	0.58

1. THE UNITS AT THESE LOCATIONS SHALL ALSO OPERATE AS SURFACE INLETS.

- 2. STORM WATER QUALITY TREATMENT UNITS SHALL BE ABLE TO OPERATE IN A "SUBMERGED" CONDITION. 3. STORM WATER QUALITY TREATMENT UNITS SHALL BE ABLE TO PROVIDE 80% TSS AND 50% TOTAL PHOSPHATE REMOVAL FOR THE DRAINAGE
- AREA & PERCENT IMPERVIOUSNESS INDICATED PER WESTOVER MS4 GENERAL PERMIT REQUIREMENTS. 4. Q=FLOW RATE ASSOCIATED WITH FIRST 1/2" OF RUNOFF.
- 5. A 24" DIAMETER GRATED LID IS TO BE USED ON STRUCTURES SQTM-1 SQTM-3.

CEF	RTIF	IED	FINAL	-

7/7/2020



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US ARMY CORPS OF ENGINEERS LOUISVILLE DISTRICT

Attachment C

Pavement Removal Supplemental Information

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Attachment D

Dogpatch Redevelopment Supplemental Information

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AECOM

PROJECT

WESTOVER AIR RESERVE BASE -"DOG PATCH" NEW PAVEMENT STORMWATER MANAGEMENT WESTOVER, MASSACHUSETTS

CONSULTANT

AECOM 250 Apollo Drive Chelmsford, Massachusetts, 01824 978.905.2100 tel 978.905.2101 fax www.aecom.com

REGISTRATION



ISSUE/REVISION

_			
	1	2022-03-24	100% Design
-	0	2022-01-27	30% Design Concept
	I/R	DATE	DESCRIPTION

PROJECT NUMBER

60644293

SHEET TITLE

C101 PROPOSED STORMWATER DRAINAGE

SHEET NUMBER



AECOM

PROJECT

WESTOVER AIR RESERVE BASE -"DOG PATCH" NEW PAVEMENT STORMWATER MANAGEMENT WESTOVER, MASSACHUSETTS

CONSULTANT

AECOM 250 Apollo Drive Chelmsford, Massachusetts, 01824 978.905.2100 tel 978.905.2101 fax www.aecom.com

REGISTRATION



TO THIS DRAWING UNLESS THE ALTERATIONS ARE PERFORMED UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS/HER SEAL AND THE NOTATION ALTERED BY FOLLOWED BY HIS/HER SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

ISSUE/REVISION

1	2022-03-24	100% Design
0	2022-01-27	30% Design Concept
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60644293

SHEET TITLE

C201 SWM DETAIL 1

SHEET NUMBER







- 1. CLASS II CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT TO BE MONOLITHIC CONSTRUCTION.
- 2. GRADE 60 REINFORCEMENT. NO. 4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. BAR BENDING AND PLACEMENT SHALL CONFORM WITH THAT LATEST ACI STANDARDS.

HEADWALL NOT TO SCALE



- LOCKABLE PROTECTIVE CASING

AECOM

PROJECT

WESTOVER AIR RESERVE BASE -"DOG PATCH" NEW PAVEMENT STORMWATER MANAGEMENT WESTOVER, MASSACHUSETTS

CONSULTANT

AECOM 250 Apollo Drive Chelmsford, Massachusetts, 01824 978.905.2100 tel 978.905.2101 fax www.aecom.com

REGISTRATION



THIS DRAWING HAS BEEN SEALED BY A PROFESSIONAL ENGINEER. THERE SHALL BE NO ALTERATIONS TO THIS DRAWING UNLESS THE ALTERATIONS ARE PERFORMED UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS/HER SEAL AND THE NOTATION ALTERED BY FOLLOWED BY HIS/HER SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

ISSUE/REVISION

1	2022-03-24	100% Design
0	2022-01-27	30% Design Concept
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60644293

SHEET TITLE

C202 SWM DETAIL 2

SHEET NUMBER

NSI D 22" x 3





SECTION A-A



NOTES:

1. MATERIAL - CAST IRON; SEE STANDARD SPECIFICATIONS

2. MINIMUM MASS - 210 LBS.

DROP INLET GRATE



AECOM

PROJECT

WESTOVER AIR RESERVE BASE -"DOG PATCH" NEW PAVEMENT STORMWATER MANAGEMENT WESTOVER, MASSACHUSETTS

CONSULTANT

AECOM 250 Apollo Drive Chelmsford, Massachusetts, 01824 978.905.2100 tel 978.905.2101 fax www.aecom.com

REGISTRATION



THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS/HER SEAL AND THE NOTATION <u>ALTERED BY</u> FOLLOWED BY HIS/HER SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

ISSUE/REVISION

1	2022-03-24	100% Design
0	2022-01-27	30% Design Concept
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60644293

SHEET TITLE

C203 SWM DETAIL 3

SHEET NUMBER

Appendix N

Planned Structural BMPs





Westover Air Reserve Base MS4 (Municipal Separate Storm Sewer System) Planned Structural BMPs

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 2024 Version: DRAFT EA Project No. 662943.14

*Subcontractor to WSP.

CONTENTS

Page

1.	INTRODUCITON 1	Ĺ
	1.1 Applicability	l
2. 3.	RETROFIT OPPORTUNITIES	2 1
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1. INTRODUCITON

This document provides a <u>draft</u> schedule of implementation for the list of locations identified by Westover Air Reserve Base (ARB) as opportunities for retrofit or modification with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its Municipal Separate Storm Sewer System (MS4) through the reduction of impervious area. This also outlines progress made to date on implementation and installation of stormwater BMPs at Westover ARB.

1.1 APPLICABILITY

The MS4 permit in place at Westover ARB requires opportunities to be identified for potential retrofit with BMPs to reduce impervious area and reduce flow and pollutant release to the stormwater system and the environment. This list is updated annually and located in Appendix K of the Stormwater Management Program (SWMP).

From the opportunities identified in SWMP Appendix K, a schedule must be created for implementation of the opportunities. This requirement is described in MS4 Permit Appendix F Part B.I.1.c.ii.

The description of this requirement and how it fits into the larger SWMP is located in Section 5.1 of the SWMP under BMP 7c.

Page 2

June 2024

2. RETROFIT OPPORTUNITIES

Five retrofit opportunities were identified in Appendix K of the SWMP, and an evaluation of each is described in SWMP Appendix M. This evaluation considered the current planned schedule of activities on the base, cost, engineering feasibility, and permitting feasibility. From this evaluation the following schedule was developed for the projects that were selected to move forward. The below table summarizes the evaluation, and the final column provides an estimated date of completion for each project moving forward.

Stormwater	Estimated	Engineering	Permitting	Currently	Planned date
Improvement	Cost	Feasible?	Feasible?	Moving	of
Opportunity				Forward?	Completion
New ISO Hangar (on previously developed land)	\$300,000	Yes	Yes	Yes	First "Jellyfish" Structure installed May 2024. Remaining structures to be completely installed Summer 2025
Dogpatch	\$300,000	Yes	Yes	Yes	End of
Redevelopment					Summer 2024
Pavement Removal 1	\$1,000	Yes	Yes	No	To be
					considered*
Pavement Removal 2	\$500	Yes	Yes	No	To be
					considered*
Pavement Removal 3	\$500	Yes	Yes	No	To be
					considered*

*Note: Committing government funds to carry out any projects outlined in the plan is not authorized without proper PPBE (planning, programming, budgeting, and execution) procedure, at a minimum Air Force Form 9 Planning Document and also coordination with CE leadership and Finance Department.

Of the opportunities identified, two currently moving forward. The ISO Hangar Construction with installation of stormwater filtration systems is fully designed and currently under construction with the first stormwater management structure (the "jellyfish") installed in May 2024 and the last identical structure to be completed by 2025.

The Dogpatch stormwater management structure has been designed and installation expect to be completed end of Summer 2024.

For the 2024 SWMP update, one demonstration project must be completed by June 30, 2024, as described in SWMP Section 5.1, and required in MS4 Permit Appendix F Part B.I.1.c.ii. The "jellyfish" filtration system for the New ISO Hangar project is the selected project to meet this

requirement, and is scheduled to be completed by May 2024. The installation of this project is described in Section 3.

3. RETROFIT IMPLEMENTATION

Of the five retrofit opportunities identified in the Year 5 annual update of the SWMP, the New ISO Hangar project was selected to move forward. For this project, a new hangar for aircraft was designed and constructed with a heightened focus on stormwater management and water quality. A proprietary technology known as the Jellyfish Stormwater Treatment system was selected for installation at this site to meet the contaminant removal requirements for stormwater. The system is designed to passively capture and remove debris, trash, oil, coarse and fine particulates, particulate-bound pollutants, metals and nutrients from stormwater during runoff events. This system was designed in accordance with all federal, state, and local regulations, and the project design was approved by a licensed professional engineer.

As of the Year 6 annual SWMP update, this stormwater BMP has been installed, and much of the hangar structure is still under construction.

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Appendix O

BMP Tracking for Nitrogen Removal

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	 EA Engineering, Science, and Technology, Inc., PBC 		Page	1	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/20	
NUMBER:	62943.08					_

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 lo	oad =	$EIA * ER_{IA} + PA * ER_{PA}$
IA	0.42 ac	I	Impervious Area (calculated in AutoCad)
PA	0.50 ac	I	Pervious Area HSG A (calculated in AutoCad)
ER _{IA} î	14.10 lbs/	s/ac/yr l	Impervious area export rate (constant)
ER _{PA}	0.3 lbs/	s/ac/yr I	Pervious area export rate for HSG A (constant)
N Load total	6.01 lbs/	/yr ⁻	Total annual BMP nitrogen load
V pond	8539 ft [°]	:	Storage volume of pond
V _{IA-in}	5.37 in	(Contributing impervious area (from iterative process in Appendix)
N _{removal}	96 %	I	Percent nitrogen removal efficiency
Ν	5.77 lbs/	/yr l	Nitrogen removed annually

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



FILE PATH: WWARWICKFP/WARWICKFP/PROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING.DWG [IB-02] 12/20/16

	EA Engineering, Science, and Technology, Inc., PBC		Page	2	of 23	3
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/2	20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/2	20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.49 ac	Impervious Area (calculated in AutoCad)
PA	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)
N Load total	6.92 lbs/yr	Total annual BMP nitrogen load
V_{pond}	6070.2 ft [°]	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
N	6.64 lbs/yr	Nitrogen removed annually

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



FILE PATH: I/WARWICKFP/WARWICKFP/PROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING. DWG [IB-03] 12/20/16

	 EA Engineering, Science, and Technology, Inc., PBC 		Page	3	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	—
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/20	
NUMBER:	62943.08					_

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.09 ac	Impervious Area (calculated in AutoCad)
PA	0.39 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	1.34 lbs/yr	Total annual BMP nitrogen load
V _{pond}	414.1 ft [°]	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
N	0.82 lbs/yr	Nitrogen removed annually

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



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	4	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/2	20
PROJECT:	MS4 Stormwater Management Program	m Reviewed By: TLM Date: 0		06/25/2	20	
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.10 ac	Impervious Area (calculated in AutoCad)
PA	0.15 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load _{total}	1.48 lbs/yr	Total annual BMP nitrogen load
V _{pond}	1553.7 ft [°]	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
Ν	1.42 lbs/yr	Nitrogen removed annually

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



FILE PATH: I/WARWICKFPWARWICKFPRPROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING. DWG [IB-05] 12/20/16

	 EA Engineering, Science, and Technology, Inc., PBC 		Page	5	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	—
PROJECT:	MS4 Stormwater Management Program Reviewed By:			Date:	06/25/20	
NUMBER:	62943.08					_

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 =	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.14 ac	Impervious Area (calculated in AutoCad)
PA	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)
N Load total	2.16 lbs/yr	Total annual BMP nitrogen load
V _{pond}	204 ft ³	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
Ν	1.55 lbs/yr	Nitrogen removed annually

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



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	 EA Engineering, Science, and Technology, Inc., PBC 		Page	6	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	
PROJECT:	MS4 Stormwater Management Program Reviewed By:			Date:	06/25/20	
NUMBER:	62943.08					_

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.72 ac	Impervious Area (calculated in AutoCad)
PA	0.61 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	24.44 lbs/yr	Total annual BMP nitrogen load
V _{pond}	2110.5 ft°	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
N	16.62 lbs/yr	Nitrogen removed annually

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



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	7	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	—
PROJECT:	MS4 Stormwater Management Program Reviewed By:			Date:	06/25/20	
NUMBER:	62943.08					_

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.37 ac	Impervious Area (calculated in AutoCad)
PA	0.18 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	5.24 lbs/yr	Total annual BMP nitrogen load
V_{pond}	3813 ft°	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
N	5.03 lbs/yr	Nitrogen removed annually

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



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	8	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	3/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	LM Date: 06/25/20		
NUMBER:	62943.08					

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 =	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.64	ac	Impervious Area (calculated in AutoCad)
PA	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)
N Load total	23.46	lbs/yr	Total annual BMP nitrogen load
V_{pond}	44256.2	ft³	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
N	22.52	lbs/yr	Nitrogen removed annually

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



FILE PATH: WWARWICKFP/WARWICKFP/PROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING.DWG [IB-09] 12/20/16

	 EA Engineering, Science, and Technology, Inc., PBC 		Page	9	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/2	20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/2	20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.46 ac	Impervious Area (calculated in AutoCad)
PA	0.82 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	⁻ Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	⁻ Pervious area export rate for HSG A (constant)
N Load total	6.71 lbs/yr	Total annual BMP nitrogen load
V _{pond}	750 ft [°]	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
N	4.97 lbs/yr	Nitrogen removed annually

Total Area Treated	1.28	ac
Design Storage Volume	750	ft ³
Nitrogen removed	4.97	lbs/yr



	EA Engineering, Science, and Technology, Inc., PBC		Page	10	_of23	3
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/2	20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/2	20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.31 ac	Impervious Area (calculated in AutoCad)
PA	0.51 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	18.64 lbs/yr	Total annual BMP nitrogen load
V _{pond}	1306.5 ft [°]	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
N	12.30 lbs/yr	Nitrogen removed annually

Total Area Treated	1.82	ac
Design Storage Volume	1306.5	ft ³
Nitrogen removed	12.30	lbs/yr



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	11	_of23	3
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/2	20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/2	20
NUMBER:	62943.08					

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 loa	$d = IA * ER_{IA} + PA * ER_{PA}$
IA	1.88 ac	Impervious Area (calculated in AutoCad)
PA	1.55 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/a	c/yr Impervious area export rate (constant)
ER _{PA}	0.3 lbs/a	c/yr Pervious area export rate for HSG A (constant)
N Load total	26.92 lbs/yı	Total annual BMP nitrogen load
V_{pond}	9995.7 ft°	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
N	23.96 lbs/yı	Nitrogen removed annually

Total Area Treated	3.43	ac
Design Storage Volume	9995.7	ft ³
Nitrogen removed	23.96	lbs/yr



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	12	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/2	20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/2	20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	3.80 ac	Impervious Area (calculated in AutoCad)
PA	2.11 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	54.15 lbs/yr	Total annual BMP nitrogen load
V _{pond}	47571 ft°	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
Ν	51.45 lbs/yr	Nitrogen removed annually

Total Area Treated	5.90	ac
Design Storage Volume	47571	ft ³
Nitrogen removed	51.45	lbs/yr



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	EA Engineering, Science, and Technology, Inc., PBC		Page	13	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/20	
NUMBER:	62943.08					_

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 la	load =	$IA * ER_{IA} + PA * ER_{PA}$
IA	3.42 ac	1	mpervious Area (calculated in AutoCad)
PA	4.07 ac	F	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs	s/ac/yr I	mpervious area export rate (constant)
ER _{PA}	0.3 lbs	s/ac/yr F	Pervious area export rate for HSG A (constant)
N Load total	49.40 lbs/	s/yr ך	Total annual BMP nitrogen load
V _{pond}	14970 ft [°]	5	Storage volume of pond
V _{IA-in}	1.20 in	(Contributing impervious area (from iterative process in Appendix)
N _{removal}	88 %	F	Percent nitrogen removal efficiency
Ν	43.47 lbs/	s/yr N	Nitrogen removed annually

Total Area Treated	7.49	ac
Design Storage Volume	14970	ft ³
Nitrogen removed	43.47	lbs/yr


	 EA Engineering, Science, and Technology, Inc., PBC 		Page	14	of 23	
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/25/20	0
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/25/20	0
NUMBER:	62943.08					

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

BMP N load	$= IA * ER_{IA} + PA * ER_{PA}$
1.28 ac	Impervious Area (calculated in AutoCad)
1.84 ac	Pervious Area HSG A (calculated in AutoCad)
14.10 lbs/ac/y	r Impervious area export rate (constant)
0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
18.64 lbs/yr	Total annual BMP nitrogen load
10510 ft°	Storage volume of pond
1.90 in	Contributing impervious area (from iterative process in Appendix)
95 %	Percent nitrogen removal efficiency
17.71 lbs/yr	Nitrogen removed annually
	<i>BMP N load</i> 1.28 ac 1.84 ac 14.10 lbs/ac/yr 0.3 lbs/ac/yr 18.64 lbs/yr 10510 ft ³ 1.90 in 95 % 17.71 lbs/yr

Total Area Treated	3.12	ac
Design Storage Volume	10510	ft ³
Nitrogen removed	17.71	lbs/yr



FILE PATH: I/WARWICKFP/WARWICKFP/PROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING.DWG [SIS-01] 12/20/16

	 EA Engineering, Science, and Technology, Inc., PBC 		Page	15	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	Of	3/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06	3/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	2.19 ac	Impervious Area (calculated in AutoCad)
PA	0.66 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	31.01 lbs/yr	Total annual BMP nitrogen load
V _{pond}	12585 ft°	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
Ν	28.22 lbs/yr	Nitrogen removed annually

Total Area Treated	2.84	ac
Design Storage Volume	12585	ft ³
Nitrogen removed	28.22	lbs/yr



FILE PATH: I/WARWICKFP/WARWICKFP/PROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING.DWG [SIS-02] 12/20/16

	 EA Engineering, Science, and Technology Inc. PBC 		Page	16	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	3/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06	3/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	2.00 ac	Impervious Area (calculated in AutoCad)
PA	1.54 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/yı	· Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/yr	⁻ Pervious area export rate for HSG A (constant)
N Load total	28.61 lbs/yr	Total annual BMP nitrogen load
V_{pond}	16481 ft [°]	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
Ν	27.46 lbs/yr	Nitrogen removed annually

Total Area Treated	3.54	ac
Design Storage Volume	16481	ft ³
Nitrogen removed	27.46	lbs/yr



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	17	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	6/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06	6/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.28 ac	Impervious Area (calculated in AutoCad)
PA	0.94 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	18.33 lbs/yr	Total annual BMP nitrogen load
V pond	9801 ft°	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
N	17.41 lbs/yr	Nitrogen removed annually

Total Area Treated	2.22	ac
Design Storage Volume	9801	ft ³
Nitrogen removed	17.41	lbs/yr



	 EA Engineering, Science, and Technology Inc. PBC 		Page	18	of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	6/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06	6/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	3.62 ac	Impervious Area (calculated in AutoCad)
PA	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)
N Load total	51.02 lbs/yr	Total annual BMP nitrogen load
V _{pond}	23278 ft [°]	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
Ν	47.44 lbs/yr	Nitrogen removed annually

Total Area Treated	3.71	ac
Design Storage Volume	23278	ft ³
Nitrogen removed	47.44	lbs/yr



FILE PATH: I/WARWICKFP/WARWICKFP/PROJECTS/62943.08 AFRC SITES/WESTOVER/CAD/WESTOVER BMP TRACKING.DWG [SIS-05] 12/20/16

	 EA Engineering, Science, and Technology Inc. PBC 		Page	19	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	6/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06	5/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.96 ac	Impervious Area (calculated in AutoCad)
PA	0.03 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	27.64 lbs/yr	Total annual BMP nitrogen load
V _{pond}	17529 ft°	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
Ν	26.54 lbs/yr	Nitrogen removed annually

Total Area Treated	1.99	ac
Design Storage Volume	17529	ft ³
Nitrogen removed	26.54	lbs/yr



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	20	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06/2	25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06/2	25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.91 ac	Impervious Area (calculated in AutoCad)
PA	0.68 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	27.07 lbs/yr	Total annual BMP nitrogen load
V _{pond}	14150 ft [°]	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
Ν	25.98 lbs/yr	Nitrogen removed annually

Total Area Treated	2.59	ac
Design Storage Volume	14150	ft ³
Nitrogen removed	25.98	lbs/yr



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	21	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	0	6/25/20
PROJECT:	MS4 Stormwater Management Program	Reviewed By:	TLM	Date:	06	6/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.16 ac	Impervious Area (calculated in AutoCad)
PA	0.00 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	16.29 lbs/yr	Total annual BMP nitrogen load
V_{pond}	6463.6 ft ³	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
N	14.83 lbs/yr	Nitrogen removed annually

Total Area Treated	1.16	ac
Design Storage Volume	6463.6	ft ³
Nitrogen removed	14.83	lbs/yr



FILE PATH: \\WARWICKFP\WARWICKFP\PROJECTS\62943.08 AFRC SITES\WESTOVER\CADWESTOVER BMP TRACKING.DWG [S\S-08] 12/20/16

	EA Engineering, Science, and Technology, Inc., PBC		Page	22	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	3/25/20
PROJECT: MS4 Stormwater Management Program		Reviewed By:	TLM	Date:	06	\$/25/20
NUMBER:	62943.08					

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 =	$= IA * ER_{IA} + PA * ER_{PA}$
IA	1.01	ac	Impervious Area (calculated in AutoCad)
PA	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)
N Load _{total}	14.23	lbs/yr	Total annual BMP nitrogen load
V _{pond}	3080	ft³	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
Ν	11.96	lbs/yr	Nitrogen removed annually

Total Area Treated	1.01	ac
Design Storage Volume	3080	ft ³
Nitrogen removed	11.96	lbs/yr



	 EA Engineering, Science, and Technology, Inc., PBC 		Page	23	_of	23
CLIENT:	Westover Air Reserve Base	Prepared By:	ND	Date:	06	/25/20
PROJECT: MS4 Stormwater Management Program		Reviewed By:	TLM	Date:	06	/25/20
NUMBER:	62943.08					

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	$= IA * ER_{IA} + PA * ER_{PA}$
IA	0.49 ac	Impervious Area (calculated in AutoCad)
PA	0.00 ac	Pervious Area HSG A (calculated in AutoCad)
ER _{IA}	14.10 lbs/ac/y	r Impervious area export rate (constant)
ER _{PA}	0.3 lbs/ac/y	r Pervious area export rate for HSG A (constant)
N Load total	6.86 lbs/yr	Total annual BMP nitrogen load
V _{pond}	2288 ft°	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
N	6.04 lbs/yr	Nitrogen removed annually

Total Area Treated	0.49	ac
Design Storage Volume	2288	ft ³
Nitrogen removed	6.04	lbs/yr

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: Westover Air Reserve Base					
EPA NPDES Permit Number: N	MAR042051				

Primary MS4 Program Manager Contact Information

Name:	Champanine Saviengvong	Title:	Environme	ental Engineer	
Street A	Address Line 1: 250 Patriot Avenue				
Street 2	Address Line 2:				
City:	Chicopee State:	Zip Co IA	de: 01022		
Email:	champanine.saviengvong@us.af.mil	Phon	e Number:	(413) 557-3951	
Fax Nı	ımber: na				
Storm	water Management Program (SWMP) In	formation			
SWMF	P Location (web address): https://www.westove	er.afrc.af.mil/A	oout-Us/Reso	urces/Environmental	-and-Noise/
Date S	WMP was Last Updated: 9-23-2019				
If the S not pos	SWMP is not available on the web please prested on the web:	ovide the ph	ysical addro	ess and an explan	ation of why it is

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</u>	<u>(s)</u>		
	□ Bacteria/Pathogens □ Solids		
TMDL(s)			
Out State	Long Island Sound - N	litrogen [
		\square	
			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."

 \square 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

 \blacksquare 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

 \square 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

<u>Annual Requirements (Combination of Impaired Waters Requirements and TMDL Requirements as</u> 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

Page 3

Nitrogen

<u>Annual Requirements (Combination of Impaired Waters Requirements and TMDL Requirements as</u> 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]

<u>Annual Requirements (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)</u>

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

 \Box 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 \square No \square

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

BMP 1: Industrial Users (including Employees & Tenants & Contractors)	MCM: Public Education Message
--	-------------------------------

Permit Citation: 2016 Final Permit Part 2.3.2 as modified by Part 1.10.3 for new permittees and Part 5.1.1 for non-traditional MS4s.

Description: The Base Environmental Office (439 MS/CEV) will distribute a message via email or other means to any Base organization (including employees, tenants, and contractors) to discuss the following TOPICS based upon ongoing industrial activities at Westover:

- auto repair, auto washing
- salt or other de-icing and anti-icing materials (minimize their use) and the storage thereof (cover/prevent runoff to storm system and contamination to ground water)
- storage of potential pollution-generating materials (emphasize pollution prevention)
- management of waste materials and dumpsters (cover and pollution prevention)
- management of parking lot surfaces (sweeping)

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.

In the future additional stormwater pollution prevention topics can be incorporated into the education program.

Targeted Audience: Base organizations that engage in the Industrial activities as listed in MS4 Permit Section 2.3.2.d

Responsible Department: Base Environmental Office (439 MS/CEV)

Measurable Goal and Deadline:

 \Box Distribute one message within the 6-yr term of 2017-2023.

Documentation: The message will be attached to this plan (Appendix F) and to the Annual Report for the reporting year in which it occurred.

Education Message **NOT NEEDED**

Developers

MCM: Public Education

Permit Citation: 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.

Description: 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.

Education can also be a part of BMP 4 Written Procedures for Reviewing Design & Site Plans and BMP 5 Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project.

Status: As explained above, issuance of additional education messages to Developers is not needed.

Education Message **NOT NEEDED** Appendix F Message on Lawn Care, Pet Waste, & Fertilizers	MCM: Public Education			
Permit Citation: 2016 Final Permit Appendix F Part B.I.1.a.i.1.				
Part 1.10.3.b extends the deadline by 2 years.				

Description:

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.

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.

Education Message **NOT NEEDED**	MCM: Public Education		
Appendix H Message on Septic System Maintenance			
Permit Citation: 2016 Final Permit Appendix	H Part III.2.a.i.		
Part 1.10.3.a extends the deadline by 2 years. "A limited waters without a TMDL under part 2.2."	All deadlines for discharges to water quality 2 shall be extended by two (2) years."		
Description:			
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 OAEs (quality assurance evaluator). Instructions for the			

contractor can only be communicated through the QAEs and Base Contracting Officer.

Status: As explained above, additional education regarding septic system maintenance is not needed.

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 \square No \square 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: 0

Number of SSOs removed: 0

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: 0

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.

 \bigcirc The outfall screening data is attached to the email submission

 \bigcirc 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.

 \bigcirc 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:

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.

 \bigcirc 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.

0

Number of illicit discharges identified:

Number of illicit discharges removed: 0

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: 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:

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

Reports.

Describe the frequency and type of employee training conducted during the reporting period:

BMP 3e: Employee Training	MCM: IDDE
Permit Citation: 2016 Final Permit Part 2.3.4.	11
Description: The Base Environmental Office (4 training, including how to recognize illicit disch	439 MS/CEV) will perform IDDE program narges and SSOs.
Targeted Audience: Employees with IDDE Pr	ogram responsibilities.
Responsible Department: Base Environmenta	l Office (439 MS/CEV)
Measurable Goal and Deadline:	
□ Perform annual training to all applicable emp pertains to training as well. Develop IDDE Pro June 2022 (within 4 years of permit effective da	bloyees. The Part 1.10.3 deadline extension gram written procedures (and training) by 30 tte).
Documentation: The training will be attached to	to the SWMP (Appendix J) and to the Annual

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan revie	ews, inspectio	ons, and enforcement actions completed during this
reporting period.	2]
Number of site plan reviews completed:	-	
New ISO Hangar Project managed by	Army Corne	of Engineers (greater than 1 acre)

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)

0

0

Number of inspections completed: Construction has not yet begun.

Number of enforcement actions taken:

BMP 4b: Written Procedures for Inspections by Government Officials

MCM: Construction Sites

Description: 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.

Responsible Department: Base Civil Engineer

Measurable Goals and Deadlines:

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). *ETL 14-1 is in effect at Westover ARB and this requirement is fully satisfied.*

Documentation/Location:

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

BMP 4c: Written Procedures for
Reviewing Design & Site Plans

MCM: Construction Sites

Description:

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. 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.

Responsible Department: Base Civil Engineer

Measurable Goals and Deadlines:

Develop Site Plan Review written procedures by 30 June 2021. *AFI32-1023 is in effect at Westover ARB and this requirement is fully satisfied.*

Documentation/Location:

The latest version of AFI32-1023 is located at the following web address: <u>https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf</u>

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.

BMP 5b: Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project – For sites that disturb 1 acre or more	MCM: POST Construction Stormwater Management
Description: The Base's design requirements must be at least a	as stringent as the MA
Handbook Standards that are specifically called out in Permit Pa	rt 2.3.6.a.ii.
For applicable projects that are one acre or more, the Base will i □Address nitrogen removal BMP requirements of Appe ☑Use LID site planning and design strategies to the great existing guidance - Unified Facility Criteria 3-210-10 Lo □Address post construction runoff that meets the retentit of Part 2.3.6.a.ii.3 and Part 2.3.6.a.ii.4. SWMP will in Handbook Standards with EISA/UFC.) EISA 438 is the development and redevelopment projects that include "building" development and also has a footprint that e EISA 438 requires the design to maintain or restore, to technically feasible, the predevelopment hydrology of temperature, rate, volume, and duration of flow. How MS4, in that MS4 runoff management requirement app any land disturbance greater than one acre resulting for redevelopments, whereas EISA applies to only "buildi	mplement a program to: ndix F Part B.I.1.a.i.2 test feasible extent. Reference w Impact Development. on and treatment requirements clude comparison of MA e written authority for federal both aspects of being a xceeds 5,000 square feet. o the maximum extent the property with regard to the ever EISA differs from the oblies to a broader category of om development/ ngs".

ETL 14 – 1 Chapter 5.2.2 provides limited guidance on EISA 438.

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).

Responsible Department: Base Civil Engineer

Measurable Goal and Deadline:

Develop a written policy by 30 June 2021.

Documentation/Location:

Reference to the written policy will be included here once the policy is developed.

EISA 438 can be found at the following web address:

https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act

EPA's EISA guidance document can be found at the following website: https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf

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:

(For sites that disturb 1 acre or more)	
Description:	
 The Base will implement a program for: ☑ Submission of as-built drawings no la construction projects AFI 32-1023 Designing and Construction 2.3.2 requires a comprehensive design projects at Westover ARB. This produces at Westover ARB. This produces for long-term operation and maintenance. Written procedures for long-term Odalready exist and take the form of the Refer to Tab F of the Base Operating. ETL 14-1 Construction and Operation. 	ater than two (2) years after completion of acting Military Construction Projects Chapter gn and review process for all construction ocess includes reviews by the designated se Civil Engineer, and Major Command. e of stormwater management structures &M of stormwater management structures e existing scope of work of the BOS contract. g Service (BOS) contract. on and Maintenance Guidance for Storm Water
Bosponsible Department: Base Civil Engineer	
Massurable Cool and Deadline:	
Develop a written procedure by 30 June 202 treatment structure O&M and AFI 32-1023's poin effect.	1. BOS contract execution of stormwater blicy for As-Build Submittals are both already
Documentation/Location:	
The latest version of AFI32-1023 is located at t	he following web address:
https://static.e-publishing.af.mil/production/1/a	f_a4/publication/afi32-1023/afi32-1023.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
Due to "For Official Use Only" concerns, a cop	by of the BOS contract will not be posted on the
internet, rather, a copy will be provided to EPA	via email and/or mail.

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:
BMP 5d: Report Assessing Street Design and Parking Lot Guidelines

MCM: Post Construction Stormwater Management

Description: A brief evaluation of current street and parking lot design guidelines is presented below to evaluate the potential of changing these guidelines to support the use of LID technologies.

Responsible Department: Base Environmental Office (439 MS/CEV)

Measurable Goals and Deadlines:

☑ Write report assessing current street and parking lot design guidelines by 30 June 2024. *This has been completed, see documentation section below.*

Documentation/Location:

Street and parking lot designs on Air Force facilities are required to follow Unified Facilities Criteria (UFC) 3-250-01 Pavement Design for Roads and Parking Areas and UFC 3-210-10 Low Impact Development. These UFCs aim to maintain pre-development hydrology through the use of LID techniques where feasible. For instance, UFC 3-210-10 specifically requires consideration of bioretention areas, permeable pavements, cisterns, and green roofs. LID technologies are evaluated based on their cost effectiveness and ability to keep postconstruction discharges and volumes lower than pre-construction discharges and volumes. Therefore, Westover ARB determines that no changes to these regulations are required.

The latest versions of UFC 3-250-01 and UFC 3-210-10 are available at the following web addresses:

https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-250-01 https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10

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:

BMP 5c: List of Retrofit Opportunities	MCM: Post Construction Stormwater Management	
Description: A list of five permittee-owned properties that could potentially be modified with BMPs designed to reduce the frequency, volume, or pollutant loads of stormwater discharges to the MS4. Properties and infrastructure for consideration shall include those with the potential for impervious area reduction and nitrogen runoff reduction.		
Responsible Department: Base Environmental Office (439 MS/CEV)		
Measurable Goal and Deadline: □ Compile a list of five potential retrofit opportunities by 30 June 2024.		

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.

BMP 6d: Catch Basin Cleaning Program BMP 6d: Catch Basins to Minimize Sedime Discharge and Achieve Good Housekeeping / P2
--

Permit Citation: 2016 Final Permit Part 2.3.7.a.iii.2 as modified by Appendix H Part V.2.ii for solids impaired receiving waters.

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.

Description: 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 **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 prepares a report summarizing these activities and provides inspection results to Westover ARB staff.

Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.

Measurable Goal and Deadline:

Develop a catch basin cleaning program. *This program is in effect at Westover ARB and this requirement is fully satisfied.*

(Written O&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.)

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

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'

The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.

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. Z 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.

C 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: 408

Number of catch basins cleaned: 66

Total volume or mass of material removed from all catch basins:

210 cubic feet

Below, report on the total number of catch basins in the MS4 system, if known.

Total number of catch basins: 1457

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

Describe the status of the written procedures for sweeping streets and municipal-owned lots:

BMP 6f: Street and Parking Lot Sweeping Program

MCM: Written Procedures for Street Sweeping to Minimize Sediment Discharge and Achieve Good Housekeeping / P2

Description: 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.

For reference, the following are excerpts from the BOS contract:

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)

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)

Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.

Measurable Goal and Deadline:

Develop a street and parking lot sweeping program. *This program is in effect at Westover ARB and this requirement is fully satisfied.*

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

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'

The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F6.3.7.

Report on street sweeping completed during the reporting period using ONE of the three metrics below.

• Number of miles square feet cleaned:

<u>Base Proper</u>: 5,176,881 sq ft per month (minimum), resulting in 62 million sq ft swept within 12 months. <u>Airfield</u>: 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:

BMP 6g: Snow Plan / Winter Road Maintenance	MCM: Written Procedures for Winter Road Maintenance to Minimize Pollutant Discharge and Achieve Good Housekeeping / P2
Description: Westover ARB has a winter roa 1002 Snow and Ice Control, documented by th under BOS contract, Tab F, Real Property procedures, and responsibilities for the Winter the Snow Plan.	d maintenance program as required by AFI32- he Westover ARB Snow Plan, and implemented Maintenance (F6.3.5) . The specific policies, r Road Maintenance Program are contained in
Responsible Department: Monitored by the BOS contractor.	Base Civil Engineer and implemented by the
Measurable Goal and Deadline:	
Develop a winter road maintenance progra and this requirement is fully satisfied.	m. This program is in effect at Westover ARB
Documentation/Location:	
The latest version of AFI32-1002 is located at	t the following web address:
https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1002/afi32-1002.pdf	
The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F6.3.5.	
Tab F, Section F6.3.5.	

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.

Westover Air Reserve Base

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:

BMP 6a: Parks and Open Spaces	MCM: Written Procedures for O&M of Parks/Open Spaces to Achieve Good Housekeeping / P2
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Permit Citation: 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&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.

Description: Operation and maintenance procedures for parks and open spaces, including an inventory of these areas, are already established at Westover ARB. These procedures are outlined by the Integrated Natural Resources Management Plan (Air Force Reserve Command 2016) and the Vegetation Management Plan (US Forest Service 2015). These plans require the protection of natural resources, including stormwater discharge, through the implementation of several good housekeeping BMPs. For instance, the Integrated Natural Resources Management Plan indicates that fertilizer use on Westover ARB is minimized to the maximum extent possible to protect water resources.

Responsible Department: Monitored by the Base Civil Engineer and implemented by the Base Operations Support (BOS) contractor.

Measurable Goal and Deadline:

 \square Develop written operation and maintenance procedures for parks and open spaces and an inventory of these areas by 30 June 2022. *These procedures are contained in the reports referenced above and are enforced at Westover ARB. This requirement is satisfied.*

□ Within this BMP block, include the location of the written/digital inventory.

Documentation/Location:

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.

BMP 6b: Buildings and Facilities	MCM: Written Procedures for O&M of Buildings to Achieve Good Housekeeping / P2
---	--

Description: Operation and maintenance procedures for buildings and facilities where pollutants are exposed to stormwater, including an inventory of these areas, are already established at Westover ARB. Because Westover ARB is subject to the EPA MSGP, a site-wide SWPPP has been developed, is constantly updated, and includes good housekeeping and operation and maintenance requirements for areas where pollutants are exposed to stormwater. The SWPPP involves frequent inspections of these areas and requires compliance by facility operators. Westover ARB is also subject to the Oil Pollution Prevention Act which includes specific operation and maintenance requirements, the development of a Spill Prevention, Control, and Countermeasures (SPCC) Plan, and the development of a Facility Response Plan (FRP). These documents are enforced across Westover ARB.

Responsible Department: Base Civil Engineer

Measurable Goal and Deadline:

Develop a written operation and maintenance procedures and an inventory of buildings and facilities where pollutants are exposed to stormwater by 30 June 2022. *These procedures are contained in the reports referenced above and are enforced at Westover ARB. This requirement is satisfied.*

□ Within this BMP block, include the location of the written/digital inventory.

Documentation/Location:

The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.

BMP 6c: Vehicle and Equipment Storage	MCM: Written Procedures for O&M of Vehicle Storage Areas to Achieve Good Housekeeping / P2
---------------------------------------	--

Description: Procedures for storage of vehicles and equipment, including an inventory of these areas, are already established at Westover ARB. Because Westover ARB is subject to the EPA MSGP, a site-wide SWPPP has been developed, is constantly updated, and includes good housekeeping and operation and maintenance requirements for areas where equipment is stored. The SWPPP involves frequent inspections of these areas and requires compliance by facility operators. Westover ARB is also subject to the Oil Pollution Prevention Act which includes specific operation and maintenance requirements, the development of a Spill Prevention, Control, and Countermeasures (SPCC) Plan, and the development of a Facility Response Plan (FRP). These documents are enforced across Westover ARB and fulfill all the SWPPP requirements in the MS4 Permit.

Responsible Department: Base Civil Engineer

Measurable Goal and Deadline:

☑ Develop a written operation and maintenance procedures and an inventory of buildings and facilities where pollutants are exposed to stormwater by 30 June 2022 . *These procedures are contained in the reports referenced above and are enforced at Westover ARB. This requirement is satisfied.*

□ Within this BMP block, include the location of the written/digital inventory.

Documentation/Location:

The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.

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:

BMP 6h: Stormwater Pollution Prevention Plan	MCM: Good Housekeeping & Pollution Prevention	
Permit Citation: 2016 Final Permit Part 2.3.7.b stipulates the following:		
"The SWPPP is a separate and different document from the SWMP required in part 1.10. A SWPPP does not need to be developed for a facility if the permittee has either developed a		

SWPPP or received a no exposure certification for the discharge under the Multi-Sector General Permit or the discharge is authorized under another NPDES permit."

Description: Westover ARB as a whole is subject to the EPA MSGP and therefore maintains and annually updates a SWPPP.

Responsible Department: Base Environmental Office (439 MS/CEV)

Measurable Goal and Deadline:

☑ Develop a SWPPP by 30 June 2022. *A SWPPP has been completed as required by the MSGP and is in full effect site-wide.*

Documentation/Location:

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: 4 (quarterly RIAP inspections per MSGP)

Describe any corrective actions taken at a facility with a SWPPP:

N/A

O&M Procedures for Stormwater Treatment Structures

Describe the status of the written procedure for stormwater treatment structure maintenance:

	MCM: Written Procedures for O&M of
BMP 6e: Swales, Detention Basins,	Treatment Structures to Minimize
Infiltration (treatment) Structures	Sediment Discharge and Achieve Good
	Housekeeping / P2

Description: 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:

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&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)

Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.

Measurable Goal and Deadline:

Develop a stormwater infrastructure inspection and maintenance program. *This program is in effect at Westover ARB and this requirement is fully satisfied.*

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

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'

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

<u>Results</u> from any other stormwater or receiving water quality <u>monitoring or studies</u> 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
- O 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 <u>by other</u> <u>entities</u> 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-ownedlots
- 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

Westover Air Reserve Base

• 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.

Title: Chief, Environmental Engineering Flight Name: John B. Moriarty Recoverable Signature Signature: Date: 9/30/2019 X John B Moriarty JOHN B. MORIARTY Chief, Environmental Engineering Signed by: MORIARTYJOHN.B.1228530170 [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

MassDEP: 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 пате.

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 Orga	nization: Westover Air Reserve Base	
EPA NPDES Permit Number:	MAR042051	

Primary MS4 Program Manager Contact Information

Name:	Champanine Saviengvong			Title:	Env	wironmental Engineer
Street A	Address Line 1: 250 Patriot Avenu	le				
Street A	Address Line 2:					
City:	Chicopee	State:	MA	Zip Cod	le:	01022
Email:	champanine.saviengvong@us.af.	mil		Phone	e Nu	umber: (413) 557-3951

Stormwater Management Program (SWMP) Information

SWMP Location (web address):	https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and- Noise/	
Date SWMP was Last Updated:	July 2020	

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
- $\square Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters$

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**: 3

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: employees, tenants, and contractors

Responsible Department/Parties: Base Environmental Office (439 MS/CEV)

Measurable Goal(s):

Distribute one message within the 6-yr term of 2017-2023.

Message Date(s): Oct/Nov 2019; February 2020; and continuous via posters

Message Completed for: Appendix F Requirements

Was this message different than what was proposed in your NOI? Yes \odot No \bigcirc

If yes, describe why the change was made:

Westover determined a different set of audiences was applicable based on discussions with EPA. See BMP 1a in the Westover ARB SWMP.

Add an Educational Message

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 \bigcirc No \bigcirc

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: 0

Number of SSOs removed: 0

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: 0

Total number of SSOs removed: 0

MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

- \boxtimes Outfalls and receiving waters
- \boxtimes Open channel conveyances

- ⊠ Interconnections
- Municipally-owned stormwater treatment structures
- Waterbodies identified by name and indication of all use impairments
- \boxtimes 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.

 \bigcirc The outfall screening data is attached to the email submission

 \bigcirc 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

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.

 \bigcirc The catchment investigation data is attached to the email submission

 $\bigcirc\,$ 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 permitees. 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.

 \bigcirc The illicit discharge removal report is attached to the email submission

 \bigcirc 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:	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:

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	: 0
Number of inspections completed: 0	

Number of enforcement actions taken: 0

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:

 \bigcirc The catch basin cleaning optimization plan or schedule is attached to the email submission

 \bigcirc 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

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: 408

Number of catch basins cleaned: 66

Total volume or mass of material removed from all catch basins: 210 cubic feet

Below, report on the total number of catch basins in the MS4 system, if known.

Total number of catch basins: 1,457

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:	[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:

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:

- \boxtimes Parks and open spaces
- \boxtimes Buildings and facilities
- ⊠ Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- \boxtimes Parks and open spaces
- \boxtimes 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.

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

 \bigcirc The results from additional reports or studies are attached to the email submission

 \bigcirc 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:

Structulral BMP Tracking was completed during the reporting year, as requried 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:

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: [Signatory may be a duly authorized representative]	Date:

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: Westover Air Reserve Base						
EPA NPDES Permit Number:	MAR042051					

Primary MS4 Program Manager Contact Information

Name:	Champanine Saviengvong			Title: E	Environn	nental En	gineer	
Street A	Street Address Line 1: 250 Patriot Avenue							
Street A	Address Line 2:							
City:	Chicopee	State:	MA	Zip Cod	e: 0102	2		
Email:	champanine.saviengvong@us.af.	mil		Phone	Numbe	r: (413) 5	57-3951	

Stormwater Management Program (SWMP) Information

SWMP Location (web address):	https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/
Date SWMP was Last Updated:	July 2021

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: <u>https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state</u>

Impairment(<u>s)</u>					
	⊠ Bacteria/Pathogens	□ Chloride	🗌 Nitrogen	□ Phosphorus		
	Solids/ Oil/ Grease (Hydrocarbons)/ Metals					
TMDL(s)						
In State:	Assabet River Phosphor	us 🗌 Bacte	ria and Pathogen	Cape Cod Nitrogen		
	□ Charles River Watershed Phosphorus □ Lake and Pond Phosphorus					
Out of State:	Bacteria/Pathogens	☐ Metals	🛛 Nitrogen	Dependence Phosphorus		
			Cle	ar 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 3 Requirements

- Inspected and screened all outfalls/interconnections (excluding Problem and Excluded outfalls)
- \boxtimes 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
- \square The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
 - \bigcirc This is not applicable because we do not have sanitary sewer
 - This is not applicable because we did not find any new SSOs

Westover Air Reserve Base

- \bigcirc The updated SSO inventory is attached to the email submission
- \bigcirc 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
- I 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)

Westover ARB does not allow entry of pets during business hours, and all septic systems on site are owned by Wesover 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.
 - \bigcirc 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)

Page 5

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?

- \bigcirc 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**: 0

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: employees, tenants, and contractors

Responsible Department/Parties: Base Environmental Office (439 MS/CEV)

Measurable Goal(s):

Distribute one message within the 6-yr term of 2017-2023.

Message Date(s): Oct/Nov 2019; February 2020; and continuous via posters

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:

Westover determined a different set of audiences was applicable based on discussions with EPA. See BMP 1a in the Westover ARB SWMP.

Add an Educational Message

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 \bigcirc No \bigcirc

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: 0

Number of SSOs removed: 0

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
- $\bigcirc\,$ The outfall screening data is attached to the email submission
- \bigcirc 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 outfalls/interconnections screened to date.

Percent of outfalls screened: 0

Optional: Provide additional information regarding your outfall/interconnection screening:

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permitees. 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
- \bigcirc The catchment investigation data is attached to the email submission
- \bigcirc 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 permitees. 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
\bigcirc 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:	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:0Total number of illicit discharges removed:0

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:	4
--	---

Number of inspections completed: 24

Number of enforcement actions taken: 0

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: 0

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: 408

Number of catch basins cleaned: 66

Total volume or mass of material removed from all catch basins: 210 cubic feet

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 1,457

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 <u>one</u> of the three metrics below.

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: 0

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
- \bigcirc The results from additional reports or studies are attached to the email submission
- \bigcirc 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: JOHN B. MORIARTY	Title: Chief, Environmental Engineer
Signature: [Signatory may be a duly authorized representative]	Date: 09/22/21

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 Organiz	ation:Westover Air Reserve Base	
EPA NPDES Permit Number: MA	AR042051	

Primary MS4 Program Manager Contact Information

Name:	Champanine Saviengvong			Title: E	nvironme	ntal Engi	neer	
Street A	treet Address Line 1: 250 Patriot Avenue							
Street A	Address Line 2:							
City:	Chicopee	State:	MA	Zip Code	e: 01022			
Email:	champanine.saviengvong@us.af.	mil		Phone	Number:	(413) 557	7-3951	

Stormwater Management Program (SWMP) Information

SWMP Location (web address):	https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/
Date SWMP was Last Updated:	Jun 30, 2022

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.

Impairment(<u>s)</u>			
	⊠ Bacteria/Pathogens	Chloride	🛛 Nitrogen	Phosphorus
	Solids/ Oil/ Grease (Hyd	rocarbons)/ Metals		
TMDL(s)				
In State:	Assabet River Phosphoru	ıs 🗌 Bacteria	a and Pathogen	🗌 Cape Cod Nitrogen
	Charles River Watershed	Phosphorus	Lake and Pond	Phosphorus
Out of State:	Bacteria/Pathogens	☐ Metals	🛛 Nitrogen	Dependence Phosphorus
			Clea	r 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
 - \bigcirc 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

- \bigcirc The priority ranking of outfalls/interconnections is attached to the email submission
- $\ensuremath{\textcircled{\bullet}}$ 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
- \boxtimes 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 singe 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
- \boxtimes 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

 $^{\perp}$ 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.
 - \bigcirc 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: <u>https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state</u>

- 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: 0

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: Employees, tenants, and contractors

Responsible Department/Parties: Base Environmental Office (439 MS/CEV)

Measurable Goal(s):

Distribute one message within the 6-yr term of 2017-2023.

Message Date(s): Oct/Nov 2019; February 2020; continuous via posters

Message Completed for:	Appendix F Requirements 🗌	Appendix H Requirements 🗌
------------------------	---------------------------	---------------------------

Was this message different than what was proposed in your NOI? Yes \odot No \bigcirc

If yes, describe why the change was made:

Westover determined a different set of audiences was applicable based on discussions with EPA. See BMP 1a in the Westover ARB SWMP.

Add an Educational Message

***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 \bigcirc No \bigcirc

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: 0

Number of SSOs removed: 0

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: 0

Total number of SSOs removed: 0

MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

- \boxtimes Outfalls and receiving waters
- \boxtimes 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:

<u>Screening of Outfalls/Interconnections</u>

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.

- $\ensuremath{\overline{\bullet}}$ No outfalls were inspected
- The outfall screening data is attached to the email submission
- \bigcirc 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 outfalls/interconnections screened to date.

Percent of outfalls screened: 0

Optional: Provide additional information regarding your outfall/interconnection screening:

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permitees. 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.

- $\ensuremath{\textcircled{}}$ No catchment investigations were conducted
- \bigcirc The catchment investigation data is attached to the email submission
- \bigcirc 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 permitees. 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

 \bigcirc The illicit discharge removal report is attached to the email submission

 \bigcirc 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:	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

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: 4

Number of inspections completed: 98

Number of enforcement actions taken: 0

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:

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

- \bigcirc 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
- \bigcirc 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: 408

Number of catch basins cleaned: 66

Total volume or mass of material removed from all catch basins: 210 cubic feet

Below, report on the total number of catch basins in the MS4 system, if known.

Total number of catch basins: 1,457

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

- \bigcirc 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
- C 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: 470	
○ 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:

- \boxtimes Parks and open spaces
- \boxtimes Buildings and facilities
- ⊠ Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- \boxtimes Parks and open spaces
- \boxtimes Buildings and facilities
- \boxtimes Vehicles and equipment

*Winter Road Maintenance

- C 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
- \bigcirc 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: 0

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

 \bigcirc The results from additional reports or studies are attached to the email submission

 \bigcirc 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)

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 Engineer
Signature:	MORIARTY.JOH Digitally signed by MORIARTY.JOHN.B.122853017 N.B.1228530170 0 Date: 2022.09.08 13:26:21 -04'00' [Signatory may be a duly authorized representative]	Date	:09/08/22

Year 5 Annual Report Massachusetts Small MS4 General Permit New Permittees Reporting Period: July 1, 2022-June 30, 2023

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are publicly accessible

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, 2022 and June 30, 2023 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Orga	nization:Westover Air Reserve Base
EPA NPDES Permit Number:	MAR042051

Primary MS4 Program Manager Contact Information

Name:	Champanine Saviengvong			Title: E	Envi	ironmental Engin	neer	
Street Address Line 1: 250 Patriot Avenue								
Street Address Line 2:								
City:	Chicopee	State:	MA	Zip Cod	le: (01022		
Email:	champanine.saviengvong@us.af.1	nil		Phone	Nu	umber: (413) 557	-3951	

Stormwater Management Program (SWMP) Information

SWMP Location (web address):	https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/
Date SWMP was Last Updated:	Jun 30, 2023

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.

<u>Impairment(s)</u>						
	⊠ Bacteria/Pathogens	□ Chloride	🖂 Nitrogen	Dependence Phosphorus		
	Solids/ Oil/ Grease (Hydrocarbons)/ Metals					
TMDL(s)						
In State:	Assabet River Phosphoru	s 🗌 Bacteria	a and Pathogen	🗌 Cape Cod Nitrogen		
	Charles River Watershed	Phosphorus	\Box Lake and Pond Phosphorus			
Out of State:	Bacteria/Pathogens	☐ Metals	🛛 Nitrogen	Phosphorus		
			Cle	ar 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 5 Requirements

- Completed Phase I of system mapping
- Identified each outfall and interconnection discharging from MS4, classified into the relevant category, and priority ranked each catchment for investigation
 - \bigcirc 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/

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:

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 \square
 - \bigcirc This is not applicable because we do not have sanitary sewer
 - This is not applicable because we did not find any new SSOs
 - \bigcirc The updated SSO inventory is attached to the email submission
 - \bigcirc The updated SSO inventory can be found at the following publicly available website:

- Provided training to employees involved in IDDE program within the reporting period
- $\square Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters$
- \boxtimes All curbed roadways were swept at least once within the reporting period
- 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
- \boxtimes Updated inventory of all permittee owned facilities as necessary
- \boxtimes 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 or provide any additional details, please use the box below:

Bacteria/ **Pathogens** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable) <u>Annual Requirements</u>

Public Education and Outreach*

- Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- $\square Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time$
- 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:

No dogs are permitted on Westover ARB.

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 F already existing or installed in the regulated area by the permittee or its agents was tracked and the nitrogen removal by the BMP was

- Sestimated consistent with Attachment 1 to Appendix F. 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.
 - \bigcirc No BMPs were installed
 - \bigcirc 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:

Public messages are displayed at Werstover ARB, and the BOS contract manages all grass clippings and leaf litter collected.

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
- \bowtie target areas with potential for high pollutant loads
 - \bigcirc The street sweeping schedule is attached to the email submission
 - The street sweeping schedule can be found at the following publicly available website:

https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/

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:

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: <u>https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state</u>

- 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**: 0

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: Employees, tenants, and contractors

Responsible Department/Parties: Base Environmental Office (439 MS/CEV)

Measurable Goal(s):

Distribute one message within the 6-yr term of 2017-2023.

Message Date(s): Oct/Nov 2019; February 2020; continuous via posters

Message Completed for:	Appendix F Requirements 🗌	Appendix H Requirements 🗌
------------------------	---------------------------	---------------------------

Was this message different than what was proposed in your NOI? Yes \odot No \bigcirc

If yes, describe why the change was made:

Westover determined a different set of audiences was applicable based on discussions with EPA. See BMP 1a in the Westover ARB SWMP.

Add an Educational Message

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 \bigcirc No \bigcirc

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: 0

Number of SSOs removed: 0

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: 0

Total number of SSOs removed: 0

MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

- \boxtimes Outfalls and receiving waters
- \boxtimes Open channel conveyances
- \boxtimes Interconnections
- \boxtimes Municipally-owned stormwater treatment structures
- \boxtimes Waterbodies identified by name and indication of all use impairments

☑ Initial catchment delineations

Optional: Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

<u>Screening of Outfalls/Interconnections</u>

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.

- \odot No outfalls were inspected
- The outfall screening data is attached to the email submission
- \bigcirc 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 outfalls/interconnections screened to date.

Percent of outfalls screened: 0

Optional: Provide additional information regarding your outfall/interconnection screening:

All outfalls were visually inspected and no issued were identified. Formal IDDE screening to come in following year as required by MS4 permit.

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.

- \odot No catchment investigations were conducted
- \bigcirc The catchment investigation data is attached to the email submission
- \bigcirc 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:

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.

- \odot No illicit discharges were found
- \bigcirc The illicit discharge removal report is attached to the email submission
- \bigcirc 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:	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:

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period**:

Illicit Discharge Detection and Elimination training was prepared for and completed by relevant employees involved in the IDDE process.

Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during** *this reporting period*.

Number of site plan reviews completed: 0				
Number of inspections completed:	l			
Number of enforcement actions take	en: 0			

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

During the SWPPP annual evaluation, there was one active construction area that was evaluated by a third party for general stormwater practice compliance. No issues were identified. Construction stormwater general permits were completed but not reviewed in detail during the inspection.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date ordinance was completed (due in year 3): 23 December 2020

Website of ordinance or regulatory mechanism:

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/ https://static.e-publishing.af.mil/production/1/af_a4/ publication/afi32-1023/afi32-1023.pdf

As-built Drawings

Below, report on the number of as-built drawings received during this reporting period.

Number of as-built drawings received: 0

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 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.

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:

The retrofit properties inventory has been completed and is included in the SWMP in Appendix K - Retrofit Opportunities.

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: 408

Number of catch basins cleaned: 66

Total volume or weight of material removed from all catch basins: 210 cubic feet

Below, report on the total number of catch basins in the MS4 system, if known.
Total number of catch basins: 1,457

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: 470]
○ 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: 0

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.

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
- \bigcirc The results from additional reports or studies are attached to the email submission
- \bigcirc 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. If any of the above year 5 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 6 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
- Continue public education and outreach program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Sweep all curbed roadways at least once within the reporting period
- Annual training 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
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspections of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected

- Implement 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
- Enclose all road salt storage piles or facilities and implement 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

Provide any additional details on activities planned for permit year 6 below:

The year 5 plan for Westover Air Reserve Base includes the following objectives:

- Complete dry weather screening and sampling according to IDDE plan.
- Complete installation of structural BMP demonstration project.

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 Engineer
Signature	[Signatory may be a duly authorized representative]	Date:

Appendix Q

Stormwater Design Policy

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Environmental Compliance within **CONSTRUCTION** PROGRAM

BCE OFFICE INSPECTION OF:

Contractor's Logs, Constractor's SWPPP, & Project Site relative to stormwater requirements. Construction Projects over **1 ACRE**

Inspections occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans.

INSPECTION DATE	NAME OF BCE INSPECTOR	PROJECT NAME	ISSUES/OBSERVATIONS



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."

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 wavier 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 postdevelopment 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.