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STORMWATER MANAGEMENT PLAN

MS4 GENERAL PERMIT COMPLIANCE

JUNE 2019

TOWN OF
Salisbury
MASSACHUSETTS

swmp

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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."

Printed Name Neil J. Harrington

Signature Neil J. Harrington Date 6/24/19

1.0 INTRODUCTION / OVERVIEW

1.1 Regulatory Summary and Purpose

The Federal Water Pollution Control Act (WPCA), initially enacted in 1948, established ambient water quality standards to specify acceptable levels of pollution in lieu of preventing the causes of water pollution. The 1972 amendments to the WPCA, referred to as the Clean Water Act (CWA), implemented measures which were focused on establishing effluent limitations on point sources, or 'any discernable, confined, and discrete conveyance… from which pollutants are or may be discharged."

The 1972 CWA introduced the National Pollutant Discharge Elimination System (NPDES). The NPDES program was established as the fundamental regulatory mechanism of the CWA, requiring direct dischargers of pollutants into waters of the United States to obtain a NPDES permit. Between 1972 and 1987, the NPDES permit program focused on improving surface water quality by reducing pollutants of industrial process wastewater and municipal sewage. During this period, several nationwide studies on water quality, most notably the United States Environmental Protection Agency (EPA) National Urban Runoff Plan (NURP), identified stormwater discharges as a significant source of water pollution.

The results of the NURP and similar studies, resulted in the reauthorization of the CWA in 1987 with the passage of the Water Quality Act (WQA). The WQA established a legal framework and required EPA to develop a comprehensive phased program for regulating municipal and industrial stormwater discharges under the NPDES permit program.

The NPDES Phase 1 Rule, which was issued in November 1990, addressed stormwater dischargers from medium to large municipal separate storm sewer systems (MS4s), which were communities serving a population of at least 100,000 people, as well as stormwater discharges from 11 categories of industrial activity.

The NPDES Phase 2 Rule, which was promulgated in December 1999, addressed small MS4s serving a population of less than 100,000 people in urbanized areas. The Phase 2 Rule requires nationwide coverage of all operators of small MS4s that are located within the boundaries of the Bureau of the Census-defined "urbanized area" (UA) based on the latest decennial census. The Phase 2 rule requires that all MS4s located within "urbanized areas" automatically comply with the Phase 2 stormwater regulations. Appendix B of this report provides a map of the Phase II stormwater "permit compliance area" for Salisbury as determined by the USEPA using the latest decennial (year 2010) census. Since Salisbury is located within an urbanized area, the EPA has designated the Town of Salisbury as a Phase 2 Community, which must comply with the NPDES regulations. In the Commonwealth of Massachusetts, the EPA retains primacy as the Phase 2 permitting authority. On May 1, 2003, the EPA and the Massachusetts Department of Environmental Protection (MADEP) jointly issued the NPDES General Permit for Discharges from Small MS4s and in July 2003, Salisbury submitted the required Notice of Intent (NOI) for inclusion under this General Permit.

The 2003 NPDES Phase 2 MS4 General Permit (2003 MS4 Permit) required the Town of Salisbury to develop, implement, and enforce a Stormwater Management Program (SWMP). The objectives of the

SWMP were to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA.

This Stormwater Management Plan will specifically satisfy the requirements set forth by the NPDES Phase 2 regulations which expanded Phase 1's efforts to preserve, protect, and improve the nation's water resources from polluted stormwater runoff to include additional operators of "traditional" (i.e. cities and towns) and "non-traditional" (i.e. Federal and state agencies) MS4s. The 2003 MS4 Permit expired on May 1, 2008 but was administratively continued for covered permittees until a new MS4 Permit was issued on April 4th, 2016, and became effective on July 1, 2018. A copy of the 2016 MS4 Permit is included in Appendix C. On September 30, 2018, the Town submitted a Notice of Intent to EPA to obtain coverage under the 2016 MS4 Permit. A copy of this Notice of Intent is included in Appendix D. EPA posted the Town's Notice of Intent for public comment on March 1, 2019 for a 30-day period. The Town received authorization from EPA to discharge under the 2016 MS4 Permit on April 5, 2019. https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/salisbury-auth.pdf

Since the Town of Salisbury was previously covered under the 2003 Small MS4 General Permit, the Town currently has many practices and programs in place related to stormwater management and pollution prevention. This plan coordinates and incorporates these programs, policies, guidelines and practices into one document and expands their reach to encompass the requirements and goals of the 2016 MS4 Permit. The objectives of the MS4 Permit are accomplished through the implementation of Best Management Practices (BMPs) for each of the following six minimum control measures.

- Public education and outreach;
- Public involvement / participation;
- Illicit discharge detection and elimination;
- Construction site stormwater runoff control;
- Post-construction stormwater management in new development or redevelopment; and
- Pollution prevention/good housekeeping.

The Town's efforts to comply with these BMPs, as outlined in their Notice of Intent, are included in Section 2.0.

1.2 Town Governance and Structure

The Town of Salisbury has a Town Manager, Town Clerk, and Board of Selectmen, which is the governing body. The Public Works, through its Director, is responsible for maintaining town roads, facilities and infrastructure.

Various entities within the Town have the responsibility for implementation of the MS4 Permit requirements as outlined in this plan and include the following:

- Department of Public Works,
- Planning and Development,
- Conservation Commission, and
- Board of Health.

Specific representatives from each of these departments or committees that are responsible for implementation of the SWMP are outlined in the table below:

Table 1.1
PARTIES RESPONSIBLE FOR SWMP IMPLEMENTATION

Name	Title	Affiliation
Lisa DeMeo, P.E.	Director	Department of Public Works
Angelica Medina	Business Manager	Department of Public Works
Raymond Cote	Highway Foreman	Highway Division, DPW
Lisa Pearson	Planning and Development Director	Planning and Development
Michelle Rowden	Conservation Agent	Conservation Commission
John Morris	Director of Public Health	Board of Health
Scott Carrigan	Fire Chief	Fire Department
Thomas Fowler	Chief of Police	Police Department

1.3 Town Demographic Information

Salisbury is located in Essex County and has a total area of 17.9 square miles (46.2 square kilometers). As of the 2010 census, the population was 8,283 people. The Town is bounded by Seabrook, New Hampshire to the north, the Atlantic Ocean to the east, Amesbury to the west and the Merrimack River and Newburyport to the south. The Town is primarily land based with 15.4 square miles (40.0 square kilometers) of land and 2.4 square miles (6.2 square kilometers) of water.

Territory comprised of densely settled tracts and adjacent urban developed areas that meet the minimum population requirements set forth by the EPA, according to the 2000 and 2010 census data, shall be referred to as urbanized area. Rural land uses and sparsely populated tracts shall be categorized as non-regulated for the purposes of the MS4 permit. Salisbury is almost entirely comprised of urbanized area (UA) as shown in the regulated area map in Appendix B, except for the southeastern portion of town. Areas that have not been deemed urbanized by the 2000 and 2010 census are not considered regulated as a part of this report and are not subject to the BMPs suggested in this plan.

Principal highways located within the boundaries of Salisbury include Route 1, known locally as Lafayette Road and Bridge Road and runs from north to south; Interstate 95, which runs adjacent to Route 1. Furthermore, Beach Road, Elm Street, Rabbit Road, and Main Street are additional primary roadways maintained by MassDOT while all other routes are maintained by the Town. There are approximately 18.3 miles of state-maintained roadways within town.

Climate within the Town of Salisbury ranges from January average minimum temperature of 21 degrees Fahrenheit (°F) to July average maximum temperature of 80°F. The approximate average

annual precipitation is 50 inches, distributed throughout the year. The rainiest month is October, with an average total accumulation of 4.1 inches of rain.

1.4 Water Resources

Salisbury is located entirely within the Merrimack River watershed. The primary waterbodies are the Merrimack River (MA84A-06) that includes the Back River segment, Black Rock Creek and Smallpox Creek. The Merrimack River is 117-miles long that flows northeast through Massachusetts and emptying into the Atlantic Ocean. This water body is impaired according to the Final 2014 303(d) List of Impaired Waters. All impairments and outfalls discharging to these water bodies are summarized in Table 1.2 below:

Table 1.2
RECEIVING WATERS AND IMPAIRMENTS

Waterbody	Impairment	Number of Outfalls Discharging to Receiving Water
Merrimack River – Confluence Indian River, West Newbury/Amesbury to mouth at Atlantic Ocean, Newburyport/Salisbury (includes Back River, Salisbury) (MA84A-06) *(Class B Water)*	Enterococcus, Fecal Coliform, PCB in Fish Tissue	3
Wooded Marsh Area off of Folly Mill Road	No Impairments	6
Wooded Marsh Area near Lucy Brook and east of Black Snake Road	No Impairments	3
Salt Marsh Area south of Ferry Lots Lane	No Impairments	3
Marsh Area off of Mingo Road	No Impairments	1
Meader Brook	No Impairments	1
Wooded Marsh Area off of Catherine Way	No Impairments	2
Wooded Marsh Area at the end of Linda Lane	No Impairments	1
Wooded Marsh Area off of Fanaras Drive	No Impairments	3
Wooded Marsh Area east of Jak-Len Drive	No Impairments	1
Wooded Marsh Area at the end of Jon Street	No Impairments	1
Wooded Marsh Area west of Cushing Street	No Impairments	1

Wooded Marsh Area south of Collins Road	No Impairments	1
Wooded Marsh Area west of True Road	No Impairments	1
Marsh Area at the end of Kendell Lane	No Impairments	1
Wooded Marsh Area off of Mudnock Road	No Impairments	7
Marsh Area northwest of Allen Drive	No Impairments	1
Salt Marsh Area east of 2nd Street	No Impairments	1
Salt Marsh Area off of Ferry Road	No Impairments	1
Vincent Creek	No Impairments	2
Marsh Area at Island Way	No Impairments	2
Wooded Marsh Area off of Ferry Road	No Impairments	7
Marsh Area west of Bridge Road	No Impairments	1
Wooded Marsh Area off of CCC Road	No Impairments	1
Wooded Marsh Area east of Vic-Lin Drive	No Impairments	1
Unnamed Tributary off of Bartlett Street	No Impairments	1
Smallpox Brook	No Impairments	4
Wooded Marsh Area off of Corporal Patten Way	No Impairments	4
Marsh Area east of Lincoln Avenue	No Impairments	2
Wooded Marsh Area surrounding Meaders Lane	No Impairments	6
Wooded Marsh Area east of Taft Street	No Impairments	1
Wooded Marsh Area at the end of Michael's Way	No Impairments	1
Wooded Marsh Area between Old County and Beach Road	No Impairments	2
Salt Marsh Area west of Cable Avenue	No Impairments	2
Salt Marsh Area west of North End Boulevard	No Impairments	1
Salt Marsh Area at the end of Florence Avenue	No Impairments	1

Salt Marsh Area at the end of Lewis Avenue	No Impairments	1
Dead Creek	No Impairments	1
Salt Marsh Area at the end of 10th Street West	No Impairments	1
Salt Marsh Area at the end of 9th Street West	No Impairments	1
Wooded Marsh Area north of Baker Road	No Impairments	1
Salt Marsh Area off of Beach Road	No Impairments	1
Wooded Marsh Area east of WWTF	No Impairments	2
Wooded Marsh Area east of School House Lane	No Impairments	3
Wooded Marsh Area north of Souther Lane	No Impairments	1

1.5 Interconnections

The Town of Salisbury also has 3 locations where the MS4 connects with another MS4 under another municipality's jurisdiction. The catchments associated with these junction points have been delineated, and they have been labeled, sampled, and analyzed. They are included on the town-wide drainage map located in Appendix D with the Notice of Intent and are summarized in Table 1.3 below:

Table 1.3 INTERCONNECTIONS		
Interconnection ID	Connecting Municipality or State Entity	Discharges To/Receives Flow from Salisbury's MS4
ITC-001	Amesbury	Salisbury's MS4 Discharges to Amesbury's MS4
ITC-002	MassDOT	Salisbury's MS4 Discharges to MassDOT's MS4
ITC-003	MassDOT	Salisbury's MS4 Discharges to MassDOT's MS4

1.6 Endangered Species and Historic Properties Determination

The 2016 MS4 Permit requires Salisbury to demonstrate that all activities regulated under the MS4 Permit will not adversely affect endangered and threatened species or critical habitat, or impact federal historic properties on the National Register of Historic Properties (NRHP). The Town must demonstrate that there are either no critical habitat or any endangered species within its boundaries, and if such a habitat does exist, that outfall discharges and any associated best management practice shall not interfere with that habitat. Salisbury must also certify that no discharge will affect a property that is listed or eligible for listing on the NRHP, that any such effects have written acknowledgements from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other representative that such effects shall be mitigated, and written proof that any best management practices constructed under this permit will include measures to minimize harmful effects on these properties.

Through consultation with the US Fish & Wildlife Service (USFWS), it was determined that the only endangered species in Salisbury is the roseate tern. It was also determined that there are three threatened species, including red knot, piping plover and northern long-eared bat. Correspondence with USFWS is appended to the Town's Notice of Intent included in Appendix D. Actions currently included in this SWMP will not affect this species. Therefore, the Town was able to certify eligibility under USFWS Criterion B for coverage under the permit. Prior to construction of any structural BMPs, the Town will consult with USFWS to confirm that the proposed project will not impact the roseate tern, red knot, piping plover, northern long-eared bat or any other endangered or threatened species that may be identified in the future.

Salisbury was able to certify eligibility under Criterion A in their Notice of Intent filing as it relates to the Historic Properties Preservation Act. The Town has one federal historic property, Ann's Diner (03001264). This historic property is located at a minimum of 1000 feet away from any impaired water body. The Town was previously covered under the 2003 Small MS4 Permit, and it has been determined to be very unlikely that any existing outfall discharges would impact this historic property and conditions have not changed since that determination. Prior to construction of any structural BMPs, the Town will consult with the State Historic Preservation Officer by submitting a completed Project Notification Form to confirm that the proposed project will not impact any federal historic properties.

2.0 MINIMUM CONTROL MEASURES

2.1 Introduction

This section of the report provides a summary of the regulatory requirements for each of the six minimum control measures as defined under the MS4 General Permit by the EPA. It also provides a summary of those stormwater management practices that the Town currently employs. As part of the requirements of the Notice of Intent submitted to EPA on September 30, 2018, as included in Appendix D, the Town has established a list of the Best Management Practices (BMPs) that it plans to implement in order to comply with each of the six minimum control measures. These BMPs will be implemented over the next five years (i.e. the permit term). However, the Town will have up to 10 years to implement some of the permit requirements as indicated. The Town's progress with respect to implementation of the BMPs, and other stormwater related activities, are summarized in annual reports submitted to EPA in accordance with the MS4 Permit. Under the 2003 MS4 Permit, the Town did make progress in complying with some of the requirements of the 2016 MS4 Permit. Links to Annual Reports submitted to EPA, in compliance with the 2003 MS4 Permit, between 2004 and 2018, are included in Appendix E.

The BMPs selected for each minimum control measure are summarized and briefly described in this section. Specific details for each BMP including measurable goals, implementation dates and individuals responsible for implementation are stated in each of the respective sections for each control measure in this plan. The Department of Public Works, Board of Health, and Planning and Development Department will be responsible for implementation and/or future enforcement of each of the BMPs for the six minimum control measures.

Compliance with requirements of the permit related to water quality limited waters is included in Section 6.0.

Checklists outlining requirements for Permit Years 1 through 5 are included in Appendix F.

2.2 Permit Requirements and Implementation Timeframes

2.2.1 Public Education and Outreach

The public education and outreach minimum control measure requires the Town to make educational information available to the public and other target audiences specified by the permit. Salisbury has been participating in public education and outreach activities since the 2003 MS4 Permit was enacted.

Regulatory Requirement:

Section 2.3.2 of the 2016 MS4 General Permit requires permittees to "implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public education program is to increase knowledge and change behavior of the public so that pollutants in stormwater are reduced."

Existing Town Practices:

Since the 2003 MS4 Permit became effective, the Town of Salisbury has implemented several public education initiatives. The Town has continued investment in Greenscapes North Shore Coalition (NSC) that provides stormwater educational materials. Greenscapes NSC resources are available directly on the Town's website (https://www.salisburyma.gov/), as well as distributed throughout the Town in the form of brochures and pamphlets. The Conservation Commission page carries links of greenscaping practices and low impact stormwater techniques available for public use (https://www.salisburyma.gov/conservation-commission/pages/general-information). The Town also includes the following on their website:

- Helpful stormwater tips from the Merrimack Valley Planning Commission, as well as from the EPA on green infrastructure and low impact development projects. https://www.salisburyma.gov/public-works/pages/stormwater-management
- Links to the Town's bylaws and regulations, which includes the Sewers Bylaw and Site Plan Review Rules and Regulations that control illicit discharges and post-construction stormwater management. https://www.salisburyma.gov/home/pages/charter-and-bylaws
- Information about the Town's MS4 program, outlining nonpoint source pollution and stormwater runoff, as well as illicit discharges. https://www.salisburyma.gov/public-works/pages/stormwater-management

In addition to the existing public education initiatives that the Town currently has in place, the new iteration of the permit requires additional messaging. Salisbury must distribute two targeted messages within five years to the following target audiences:

1. Residents;
2. Businesses, Institutions and Commercial Facilities;
3. Developers (Construction); and
4. Industrial Facilities.

In order to accomplish this, the Town will implement the following BMPs:

BMP: Brochures/Pamphlets
Description: Greenscapes NSC will develop and provide brochures supplying residents with information on how rain gardens work and how they can be applied at the resident's home.
Targeted Audiences: Residents
Responsible Department/Parties: Greenscapes NSC
Measurable Goals: The Greenscapes NSC will make all brochures and pamphlets available to the residents by placing them in Town Hall and track the number collected by the end of the year, as well as resident testimonials.
Implementation Timeframe: To be completed during Permit Year 1 (FY2019).

BMP: Workshop/Brochures/Pamphlets
Description: Provide a workshop and associated literature covering Low Impact Development (LID) options for reducing runoff and promoting on-site infiltration. Pricing, maintenance and ordinances will also be discussed.
Targeted Audiences: Developers (Construction)
Responsible Department/Parties: Greenscapes NSC

Measurable Goals: The Greenscapes NSC workshop intends to increase LID use by landscapers, developers, and contractors and track the number of attendees to the workshop.
Implementation Timeframe: To be completed during Permit Year 1 (FY2019) and materials to be maintained throughout the permit term.

BMP: Brochures/Pamphlets
Description: Develop and provide brochure that will include general information on LIDs that can assist in stormwater management and pollution prevention. Content will be targeted to "environmental contacts" at industrial facilities, or property managers where applicable.
Targeted Audiences: Industrial Facilities
Responsible Department/Parties: Greenscapes NSC
Measurable Goals: Greenscapes NSC will track the number of brochures and pamphlets distributed and will follow up with a phone call to the targeted audience.
Implementation Timeframe: To be completed during Permit Year 2 (FY2020) and materials to be maintained throughout the permit term.

BMP: Workshop
Description: Waterworks presentation that will discuss specific best management practices for parking lots; how to reduce impervious surfaces and maintain the space for more sustainability.
Targeted Audiences: Businesses, Institutions, and Commercial Facilities
Responsible Department/Parties: Greenscapes NSC and Planning
Measurable Goals: Track the number of attendees, as well as the number of presentations redistributed to commercial representatives.
Implementation Timeframe: To be completed during Permit Year 2 (FY2020) and materials to be maintained throughout the permit term.

BMP: Workshop
Description: Provide workshop and literature, following the workshop, regarding LID held in year one. Town bylaws and associated incentives will be outlined.
Targeted Audiences: Developers (construction)
Responsible Department/Parties: Greenscapes NSC and Planning
Measurable Goals: The number of attendees will be tracked.
Implementation Timeframe: To be completed during Permit Year 3 (FY2021) and continued for the duration of the permit, as feasible.

BMP: Meeting/Presentation
Description: Presentation will discuss proper "greenscaping" practices on a business/commercial level. Content will be targeted to property managers and will include salt/sand storage and landscape management.
Targeted Audiences: Business, Institutions, and Commercial Facilities
Responsible Department/Parties: Greenscapes NSC and Planning
Measurable Goals: The number of attendees will be tracked.
Implementation Timeframe: To be completed during Permit Year 4 (FY2022) and information to be maintained throughout the permit term, as feasible.

BMP: Meeting/Presentation
Description: Presentation will promote proper "greenscaping" practices on an industrial level. Content will be targeted to property managers and will include salt/sand storage and landscape management.

Targeted Audiences: Industrial Facilities
Responsible Department/Parties: Greenscapes NSC
Measurable Goals: The number of attendees will be tracked.
Implementation Timeframe: To be completed during Permit Year 4 (FY2022) and maintained for the duration of the permit, as feasible.

BMP: Meeting/Presentation
Description: Greenscapes NSC will conduct a "Greenscapes 101" presentation for residents. The presentation will discuss the importance of clean and plentiful water.
Targeted Audiences: Residents
Responsible Department/Parties: Greenscapes NSC and Planning
Measurable Goals: The number of attendees and resident testimonials will be tracked.
Implementation Timeframe: To be completed during Permit Year 5 (FY2023) and maintained for the duration of the permit, as feasible.

Public education materials utilized in the implementation of the Town's SWMP are included in Appendix G.

2.2.2 Public Involvement / Participation

Regulatory Requirement:

Section 2.3.3 of the 2016 MS4 Permit requires the permittee to "provide opportunities to engage the public to participate in the review and implementation of the permittee's SWMP." Public participation benefits the program by increasing public support, including additional expertise and involving community groups/organizations to strengthen the overall program.

Existing Town Practices:

The Town of Salisbury has been proactive in providing opportunities for public participation and involvement in stormwater management practices. The DPW supports volunteers in holding community clean up events including waste oil collection once per month, paint collection on a quarterly basis, and an annual Town Cleanup day. Furthermore, the Town works with the Salisbury Elementary school by providing lessons and interacting with students on how to keep water clean using Greenscapes NSC resources.

In addition to continuing the above practices, the Town will also allow for public review of this stormwater management plan by posting on the Town's website. These BMPs and others that the town has committed to have been detailed below.

BMP: Public Participation
Description: Provide for public review of the SWMP and Annual Reports.
Responsible Department/Parties: DPW Administration
Measurable Goals: The Town will make this SWMP and annual MS4 stormwater reports available to the public at Town Hall and/or on the Town's website (https://www.salisburyma.gov/public-works/pages/stormwater-management).
Implementation Timeframe: To be implemented during Permit Year 1 (FY2019) and for the duration of the permit as the SWMP is updated annually.

BMP: Public Participation
Description: Participate in Waste Oil Collection Day.
Targeted Audiences: Residents.
Responsible Department/Parties: DPW Operations
Measurable Goals: Participate in hazardous materials collection day every two years. Track the number of Salisbury residents that visit the facility, and the amount of waste collected.
Implementation Timeframe: To be implemented during Permit Year 2 (FY2020) and tracked for the duration of the permit.

BMP: Public Participation
Description: Participate in Paint Collection Day.
Responsible Department/Parties: DPW Operations
Measurable Goals: Participate in hazardous materials collection day every two years. Track the number of Salisbury residents that visit the facility, and the amount of waste collected.
Implementation Timeframe: To be implemented during Permit Year 2 (FY2020) and tracked for the duration of the permit.

BMP: Public Participation
Description: Maintain relationships with Women in Transition, Trial Court, Middleton Inmates, Beach Betterment Association, and Probation Department Organizations.
Responsible Department/Parties: DPW Operations
Measurable Goals: Continue year-round cleanup work with these organizations.
Implementation Timeframe: To be implemented during Permit Year 1 (FY2019) and tracked for the duration of the permit.

BMP: Public Participation
Description: Salisbury will continue to participate in recycling collection at the transfer station.
Responsible Department/Parties: DPW Operations
Measurable Goals: Allow for residents to bring recyclables to the transfer station. Track the number of Salisbury residents that visit the station, and the amount of recyclables collected.
Implementation Timeframe: To be implemented during Permit Year 1 (FY2019) and tracked for the duration of the permit.

BMP: Public Participation
Description: The DPW will continue to participate in yard waste collection at the transfer station.
Responsible Department/Parties: DPW Operations
Measurable Goals: Allow for residents to bring yard waste to the transfer station. Track the number of Salisbury residents that visit the station, and the total yard waste collected.
Implementation Timeframe: To be implemented during Permit Year 1 (FY2019) and tracked for the duration of the permit.

BMP: Merrimack Valley Stormwater Coalition
Description: Salisbury DPW shall maintain a relationship with the Merrimack Valley Stormwater Coalition.
Responsible Department/Parties: DPW Operations
Measurable Goals: Continue to attend monthly meetings.
Implementation Timeframe: To be implemented during Permit Year 1 (FY2019) and tracked for the duration of the permit.

2.2.3 Illicit Discharge Detection and Elimination

Regulatory Requirement:

Section 2.3.4 of the 2016 MS4 General Permit requires the permittee to develop a written Illicit Discharge Detection and Elimination (IDDE) program. The IDDE program is designed to "systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges."

Existing Town Practices:

Under the 2003 MS4 Permit, the Town established legal authority to prohibit illicit discharges, investigate suspected illicit discharges, and implement enforcement procedures through the amendment of their Sewers Bylaw. As of the last annual report under the 2003 permit, the Merrimack Valley Planning Commission (MVPC) has mapped stormwater structures throughout the Town. Connectivity and data compilation for full mapping of all stormwater features, as well as testing outfalls and stream sampling is to be completed in accordance with the new permit requirements. Salisbury is in the process of completing year one of infiltration and inflow investigations to the sanitary sewer system throughout the Town for fiscal year 2019.

Under the new MS4 Permit, the Town is required to implement their Illicit Discharge Detection and Elimination Investigation Program by presenting a defined approach to investigate, identify and remove illicit connections. The Town is required to develop the written plan in Year 1 and then continue to implement the plan throughout the permit term. The Town will continue to update their drainage system map, as needed, as additional investigation is performed through TV, smoke and dye testing of sewer and drainage pipes to identify illicit connections. Additionally, the Town will continue their effort to provide IDDE educational outreach by making information available through the Town's website and continue to train employees on IDDE.

These new permit requirements can be achieved by implementing the following BMPs:

BMP: SSO Inventory
Description: Develop an inventory where Sanitary Sewer Overflows (SSO) have discharged to the Town's MS4 within the 5 years prior to the permit effective date and update annually moving forward. The inventory must include the following: location of overflow, where the overflow discharged to, date and time of occurrence, estimated discharge volume, cause of the discharge, and mitigation completed or planned with implementation time frames.
Responsible Department/Parties: DPW Admin
Measurable Goals: Develop and maintain a list of SSOs.
Implementation Timeframe: To be completed during Permit Year 1 and updated annually (FY2019).

BMP: Storm Sewer System Map
Description: Update drainage map, as needed to address permit requirements and continue to update during IDDE program implementation.
Responsible Department/Parties: DPW Admin
Implementation Timeframe: Update the Town's existing drainage map to include a full inventory of the Town's storm drain system including the following with 2 years of the permit effective date:

- all outfalls and receiving waters,
- open channel conveyances,

- interconnections with other MS4s,
- municipally-owned stormwater treatment structures,
- impaired waterbodies,
- and initial catchment delineations.

Within 10 years of the permit effective date, this map shall also include:

- location of outfalls with an accuracy of +/- 30 feet,
- all pipes,
- manholes,
- catch basins *(already mapped)*,
- refined catchment delineations, and
- municipal sanitary sewer system *(already mapped)*.

In addition, EPA suggests adding any information regarding:

- storm and sanitary sewer material, size and age,
- privately-owned stormwater treatment structures,
- septic systems and areas likely to be affected by septic leaching (where applicable),
- seasonal high water table elevations,
- topography,
- orthography,
- alignments, dates and representation of illicit discharge remediation,
- and locations of suspected, confirmed and corrected illicit discharges.

Implementation Timeframe: To be completed during Permit Year 1 and updated annually (FY2019).

BMP: Written IDDE Program
Description: Create written IDDE plan that includes elements of the Town's IDDE Program, outlining program responsibilities and procedures, and meets the conditions of the permit.
Responsible Department/Parties: DPW Admin
Measurable Goals: Develop a written IDDE plan and continue to follow and implement the guidelines and practices in the program.
Implementation Timeframe: To be completed within 1 year of the effective date of the permit (FY2019).

BMP: Implement IDDE Program
Description: Implement catchment investigations according to program and permit conditions, including TV inspection, smoke testing and dye testing as needed to isolate and identify illicit connections.
Responsible Department/Parties: DPW Admin
Measurable Goals: Implement and enforce practices set forth in written IDDE plan and IDDE bylaw. Track the number of illicit connections that are identified and removed annually.
Implementation Timeframe: Begin after IDDE plan is written, starting investigations in problem catchments and then moving to high and low priority areas in that order. All problem, high and low priority catchments must be investigated within 10 years of the permit effective date (FY2028).

BMP: Public Works Staff Training
Description: Train employees on IDDE program components and implementation.
Responsible Department/Parties: DPW Admin

Measurable Goals: Provide annual training to municipal employees on illicit discharge detection and monitoring. Track the number of employees that receive training and the dates on which the training was held.
Implementation Timeframe: To be completed within 1 year of the effective date of the permit (FY2019).

BMP: Conduct Dry Weather Screening
Description: Conduct dry weather screening and sampling procedures in accordance with permit conditions
Responsible Department/Parties: DPW Admin
Measurable Goals: Visit every regulated outfall, record current conditions, and obtain samples of any flow that is present. Send any samples to an external laboratory to test for the presence of any indicators.
Implementation Timeframe: To be completed within 3 years of the permit effective date (FY2022).

BMP: Conduct Wet Weather Screening
Description: Conduct wet weather screening in accordance with outfall screening procedure and permit conditions.
Responsible Department/Parties: DPW Admin
Measurable Goals: Less than 24 hours after a rain event, visit any outfall determined to require additional screening (i.e. any outfall that has one or more system vulnerability factors) and obtain samples of any flow that is present and send to an external laboratory to be tested for any indicators.
Implementation Timeframe: Begin during Permit Year 4 (FY2022) and complete within 10 years of the permit effective date (FY2029).

BMP: Ongoing Screening
Description: Conduct Dry and Wet weather screening (as necessary).
Responsible Department/Parties: DPW Admin
Measurable Goals: Complete ongoing outfall screening upon completion of IDDE program implementation.
Implementation Timeframe: To be performed once initial screening of outfalls and IDDE investigations are complete (FY2029).

BMP: Catchment Prioritization and Ranking
Description: Assess and rank the potential for all catchments to have illicit discharges.
Responsible Department/Parties: DPW Admin
Measurable Goals: The Town has assessed within existing catchments the potential for illicit discharges by obtaining and evaluating data regarding the following:

- Sensitivity or critical nature of the receiving water or environment;
- Severity of the illicit connection indicator parameters;
- Potential for direct or indirect public exposure;
- Areas with chronic problems and inadequate level of service; and
- Areas proposed for infrastructure capital improvements.

Implementation Timeframe: To be completed within 1 year of the permit effective date (FY2019).

BMP: Follow-up Ranking
Description: Update catchment prioritization and ranking as additional dry weather screening information becomes available.
Responsible Department/Parties: DPW Admin

Measurable Goals: Complete ongoing outfall screening upon completion of IDDE program implementation.
Implementation Timeframe: To be performed once initial screening of outfalls and IDDE investigations are complete (FY2029).

BMP: Catchment Investigation Procedures
Description: Develop written catchment investigation procedures and incorporate into the IDDE Plan.
Responsible Department/Parties: DPW
Measurable Goals: Amend written IDDE Plan as needed with catchment investigation procedures.
Implementation Timeframe: To be completed 18 months after the effective date of the permit (FY2019).

2.2.4 Construction Site Stormwater Runoff Control

Regulatory Requirement:

Section 2.3.5 of the 2016 MS4 Permit requires the permittee to create a program to "minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the US through the permittee's MS4." The permittee will conduct site plan reviews, site inspections and include procedures for public involvement.

Existing Town Practices:

The 2003 MS4 Permit required the Town to develop, implement and enforce a program to address stormwater runoff from construction activities that disturb greater than one acre and discharge into the MS4, or minor projects which are part of a larger common project which disturb one acre or more. As part of that program, the Town was to develop a new or update an existing regulatory mechanism to address construction runoff.

Erosion and sediment control requirements can be found in the Town's *Site Plan Review Requirements Rules and Regulations* (https://ecode360.com/10446719), the *Subdivision Plans Rules and Regulations* (https://ecode360.com/10446905), and *Earth Filling Bylaw* (https://ecode360.com/10444632). The *Site Plan Review Requirements* under the Planning Board Rules and Regulations contains language about erosion and sedimentation control measures to retain sediment within the construction site and to avoid contact with wetlands and waterbodies during and after construction.

To attain compliance with the 2016 MS4 Permit, the Town will implement the following BMPs to supplement the guidelines set forth in their Erosion and Sediment Control Ordinance.

BMP: Site Inspection and Enforcement of Erosion and Sediment Control (ESC) measures
Description: Update written site inspection and enforcement procedures that meet permit requirements and begin implementation. Refer to Section 3 of this plan for specific updates to regulatory measures related to construction site runoff control.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Continue to enforce erosion and sediment control measures and report on the number of site plan reviews, inspections and enforcements that occur annually.
Implementation Timeframe: Complete within 1 year of the effective date of the permit (FY2019).

BMP: Site Plan Review

Description: Develop written procedures for site plan reviews, inspection and enforcement.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Report on the number of site plan reviews conducted, inspections conducted, and enforcement actions taken annually.
Implementation Timeframe: Complete within 1 year of the effective date of the permit (FY2019).

BMP: Erosion and Sediment Control
Description: Review and update existing regulations as needed to include language that requires construction operators to implement a sediment and erosion control program that include BMPs that are appropriate for conditions at the construction site.
Responsible Department/Parties: Planning Department, DPW, Town Attorney
Measurable Goals: Continue to enforce existing sediment and erosion control requirements, and update regulations as needed within one year of the permit effective date.
Implementation Timeframe: To be updated within 1 year and enforced every year after the permit effective date (FY2019).

BMP: Waste Control
Description: Review and update, as needed, the Town's existing stormwater regulations to ensure the control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter and sanitary wastes.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Review and update the Town's existing regulations as needed, and implement.
Implementation Timeframe: To be completed during the first year after the effective permit date (FY2019).

2.2.5 Post-Construction Stormwater Management

Regulatory Requirement:

Section 2.3.6 of the 2016 MS4 Permit requires the permittee to require developers to "reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites."

In this case, a site is defined as the "area extent of construction activities which includes but is not limited to the creation of new impervious cover and improvement of existing impervious cover."

New Development is defined as construction activity that results in a total earth disturbance area equal to or greater than one acre on land that did not have any impervious area before work began.

Redevelopment is defined as any construction activity that disturbs greater than or equal to one acre and does not meet the requirements to be designated as new development.

Existing Town Practices and Amendments:

The Town of Salisbury has incorporated post-construction stormwater management control measures into the Town's *Zoning Bylaw (Site Plan Review)* in May of 2012. It requires that any activity that disturbs an acre of land or more is subject to a Site Plan Review and will be reviewed as a minor project. The Site Plan Review Requirements under the Planning Board Rules and Regulations requires the design of

erosion and sedimentation control measures to be consistent with design standards of the Massachusetts Stormwater Management Handbook.

In order to comply with the requirements of the 2016 MS4 Permit, the Town will implement in the following BMP's:

BMP: As-Built Plans for Onsite Stormwater Control
Description: Review and update, as needed, existing procedures that require submission of as-built drawings and long-term operation and maintenance to meet permit requirements.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Require submission of as-built plans for completed projects within two years of construction completion. Update existing regulations as needed within two years of permit effective date.
Implementation Timeframe: Complete within 2 years of the permit effective date (FY2020).

BMP: Target Properties to Reduce Impervious Areas
Description: Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce frequency, volume, and pollutant loads associated with stormwater discharges, and updated annually.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: This goal can be achieved through disconnecting impervious surfaces, introducing low impact development and green infrastructure practices, or re-defining zoning regulations to change maximum sizes of parking lots and lane widths. Report annually on progress and retrofitted properties targeted by this effort.
Implementation Timeframe: Complete within 4 years of the permit effective date, and report annually regarding the number of retrofits identified thereafter, to maintain at least 5 retrofits always for the duration of the permit (FY2022).

BMP: Allow for Green Infrastructure
Description: Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Complete assessment and implement recommendations of the report.
Implementation Timeframe: Complete within 4 years of the permit effective date (FY2022)

BMP: Street Design and Parking Lot Guidelines
Description: Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.
Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Complete assessment and implement recommendations of the report where feasible.
Implementation Timeframe: Complete within 4 years of the permit effective date (FY2022).

BMP: Ensure the Requirements of the MA Stormwater Handbook are met
Description: Ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and all applicable requirements of the Massachusetts Stormwater Handbook.

Responsible Department/Parties: Planning Department, DPW
Measurable Goals: Adopt amendment or modification of a regulatory mechanism to meet permit requirements.
Implementation Timeframe: Complete within 2 years of the permit effective date (FY2020).

2.2.6 Pollution Prevention / Good Housekeeping for Permittee-Owned Operations

Regulatory Requirement:

Section 2.3.7 of the 2016 MS4 Permit requires the permittee to "implement an operations and maintenance program for permittee-owned operations that has a goal of preventing or reducing pollutant runoff and protecting water quality from all permittee-owned operations."

This minimum control measure includes a training component and has the ultimate goal of preventing or reducing stormwater pollution from municipal activities and facilities such as parks and open spaces, buildings and facilities, vehicles and equipment, and providing for the long-term operation and maintenance of MS4 infrastructure.

Existing Town Practices:

Salisbury continues to employ several good housekeeping measures that were adopted during the 2003 MS4 Permit. The Town currently sweeps all streets and municipally owned parking lots once per year in the spring. At least 60% of the Town's catch basins are cleaned annually. The Town has sent representatives to training sessions offered by Essex County Highway Association and Bay State Roads, as well as a MS4 technical session at the MassDOT Public Works Exposition in 2017 related to stormwater management. The Town has also continued to resolve problematic stormwater system areas addressing design and construction of stormwater improvements and flood management.

To comply with the 2016 MS4 Permit, catch basins must be no more than 50% full at any given time. To achieve this, all structures must be cleaned, measured, logged and monitored to prevent excessive sediment accumulation. These measures are summarized in the following BMP practices:

BMP: O&M Procedures
Description: Create written operation and maintenance (O&M) procedures addressing proper storage of materials, lawn maintenance and landscaping activities, protective practices, use and storage of petroleum products, employee training, waste management procedures for buildings and facilities, location of fueling areas, evaluation of possible leaks, and storage locations of Town-owned vehicles and equipment.
Responsible Department/Parties: DPW Operations
Measurable Goals: Create and implement standard operation and maintenance procedures for all municipal activities and facilities. The Town will be as specific with standard operating procedures as possible and ensure the continued implementation of all maintenance activities.
Implementation Timeframe: Complete within 2 years of the permit effective date (FY2020).

BMP: Inventory all Permittee-Owned Property

Description: Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment and update annually.
Responsible Department/Parties: DPW Operations
Measurable Goals: Create inventory and update annually.
Implementation Timeframe: Complete within 2 years of the permit effective date (FY2020).

BMP: Infrastructure O&M
Description: Establish and implement a program for repair and rehabilitation of MS4 infrastructure.
Responsible Department/Parties: DPW Operations
Measurable Goals: Create and implement an operation and maintenance plan for stormwater infrastructure.
Implementation Timeframe: Complete within 2 years of the permit effective date (FY2020).

BMP: Stormwater Pollution Prevention Plan (SWPPP)
Description: Create SWPPPs for all waste handling facilities, including the DPW facility on Lafayette Road and the Town's Recycling Center on Old County Road and perform required training and inspection.
Responsible Department/Parties: DPW Operations
Measurable Goals: Contract an external firm to develop comprehensive SWPPP for the Town's facilities. The SWPPP shall include practices to address minimizing or preventing exposure, good housekeeping, preventative maintenance, spill prevention responses, erosion and sediment control, runoff management, salt pile storage, employee training, and other control measures specific to the Town.
Implementation Timeframe: To be completed during Permit Year 2 (FY2020).

BMP: Catch Basin Cleaning
Description: Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule.
Responsible Department/Parties: DPW Operations
Measurable Goals: Clean catch basins on established schedule and report number of catch basins cleaned and volume of material removed annually. The Town shall optimize the cleaning effort such that all catch basins have been located, measured, cleaned and monitored to ensure that each basin does not become more than 50% full of debris and refuse.
Implementation Timeframe: Complete and implement catch basin optimization plan within two years of permit effective date (FY2019).

BMP: Street Sweeping Program
Description: Sweep all streets and permittee-owned parking lots in accordance with permit conditions.
Responsible Department/Parties: DPW Operations
Measurable Goals: Sweep all streets and permittee-owned parking lots once in the spring and once in the fall to meet permit requirements including requirements specific to impaired waters. Track number of miles swept, or mass of volume of debris removed.
Implementation Timeframe: Complete and implement within 1 year of the permit effective date (FY2019).

BMP: Road Salt Use Optimization Program
Description: Develop and implement procedures for winter road maintenance including the use and storage of salt and sand; to minimize the use of sodium chloride and other salts, and evaluate

opportunities for use of alternative materials; and ensure that snow disposal activities do not result in discharge of snow into waters of the U.S.
Responsible Department/Parties: DPW Operations
Measurable Goals: Sweep all streets and permittee-owned parking lots once in the spring and once in the fall to meet permit requirements including requirements specific to impaired waters. Track number of miles swept, or mass of volume of debris removed.
Implementation Timeframe: Complete and implement within 1 year of the permit effective date (FY2019).

BMP: Inspections and Maintenance of Stormwater Treatment Structures
Description: Create an inventory of all municipally-owned BMP's and establish and implement inspection and maintenance procedures and frequencies.
Responsible Department/Parties: DPW Operations
Measurable Goals: Inspect and maintain treatment structures at least annually. Track number of structures maintained and inspected annually.
Implementation Timeframe: Complete and implement within 1 year of the permit effective date (FY2019).

BMP: Catch Basin Cleaning Optimization
Description: Develop and implement a plan to optimize inspection, cleaning, and maintenance of catch basins to ensure that permit conditions are met.
Responsible Department/Parties: DPW Operations
Measurable Goals: Collect date to develop optimization plan, including depth from bottom of sump to invert of outlet pipe, depth from bottom of sump to catch basin rim, and depth to top of sediment to catch basin rim and implement.
Implementation Timeframe: Complete and implement catch basin optimization plan within two years of the permit effective date (FY2020).

3.0 REGULATORY STANDARDS

3.1 Introduction

In order to prevent pollutants from entering the drainage system and being discharged to the environment with stormwater, Salisbury has implemented a wide variety of Best Management Practices (BMPs) categorized under the six minimum control measures as discussed earlier in this document. The control measures for Illicit Discharge Detection and Elimination, Construction Site Stormwater Runoff Control, and Post-Construction Stormwater Management are focused on improving stormwater pollution prevention into the future through the implementation of the following:

- Regulatory mechanisms establishing legal authority, prohibitions and requirements.
- Design and construction standards governing stormwater infrastructure.
- Requirements for long-term Operation and Maintenance (O&M) of structural BMPs.

Additional information regarding the Town's current regulatory mechanisms adopted under the 2003 MS4 Permit, as well as the status of the Town's compliance with the 2016 MS4 Permit regulatory requirements are included in this section.

3.2 Existing Stormwater Regulatory Mechanisms

Under the 2003 MS4 Permit, the Town developed new ordinances, as well as amendments to bylaws and rules and regulations, to comply with the permit, and to improve stormwater management town-wide. The requirements adopted were progressive, and in many cases, exceeded the permit requirements.

3.2.1 Earth Filling Bylaw (§77)

The Town's Earth Filling Bylaw was adopted on October 27, 2003. Excerpts of this bylaw as it pertains to stormwater management in Salisbury is included in Appendix H. This bylaw outlines sediment and erosion control requirements, regulates earth filling operations and defines the requirements as part of a site plan if filling involves more than 2,000 cubic yards. Furthermore, the Earth Filling Bylaw outlines stabilization techniques and perimeter controls in reference to sedimentation and erosion.

3.2.2 Zoning Bylaw (§300)

The 2003 MS4 Permit required the Town to develop, implement and enforce a program to address stormwater runoff from construction activities that disturb greater than one acre and discharge into the MS4. That program was also to include projects that disturb less than one acre if the project is part of a larger common plan of development which disturbs greater than one acre. As part of that

program, the Town was to develop an ordinance or other regulatory mechanism to address construction runoff.

The 2003 MS4 Permit also required the Town to develop, implement and enforce a program to address post-construction stormwater runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the MS4. That program was also to include projects less than one acre if the project is part of a larger common plan of development which disturbs greater than one acre. As part of that program, the Town was to develop an ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment.

The Salisbury Zoning Bylaw, which was adopted by the Annual Town Meeting on May 15, 1978 and amended on May 14, 2012, outlines site plan review requirements and the determination of minor and major projects. Excerpts from this bylaw as they pertain to site plan reviews in Salisbury are included in Appendix H. Article XVIII, Site Plan Review, requires that a determination of whether a Site Plan Review is required is decided by the Building Inspector. If a project requires a Site Plan Review, a determination will also be made by the Building Inspector if the project is minor or major. A project may be considered minor or major based on the following criteria:

1. Major
    a. New construction or addition of 5,000 or more square feet
    b. Renovation of 5,000 or more square feet of an existing structure that creates a significant increase in impact on traffic, infrastructure, or parking
    c. Construction of a drive-through facility
    d. Construction of 25 or more new or additional parking or loading spaces
    e. More than one new attachment Wireless Communication District (WCF), small cell type, within a year of permit application and prior to construction
    f. Any residential construction project consisting of more than three dwelling units on any single lot
2. Minor
    a. New construction or addition of 2,500 or more square feet and less than 5,000 square feet of gross floor area
    b. Construction of 15 or more and fewer than 25 new or additional parking or loading spaces
    c. Newly paved areas that are greater than 3,000 square feet that are not used for parking or loading
    d. Any activity disturbing an acre or more
    e. Reconstruction/reclamation/replacement of an existing paved area of an acre or more
    f. One new attachment WCF, small cell type

3.2.3 Sewers Bylaw (§209)

The Salisbury Sewers Bylaw was adopted on May 19, 1980 and amended on May 14, 2012. This amendment to the bylaw was implemented in part to fulfill the Town's obligation to comply with the 2003 MS4 Permit. This intent of this bylaw is to prevent pollutants from entering Salisbury's MS4, prohibit illicit connections to the MS4, and to allow the Town to investigate suspected illicit connections and remove any known illicit connections.

3.2.4 Planning Board Rules and Regulations (§465)

a. Site Plan Review Requirements

On January 11, 2006, the Town adopted Part 1 of the Planning Board Rules and Regulations which includes Article III Site Plan Review Requirements. This article was further amended on June 12, 2019. Excerpts from this regulation as they pertain to site plan review requirements in Salisbury are included in Appendix H. This regulation allows the Planning Board to implement provisions to the Zoning Bylaw. This regulation outlines the requirements of the site plan, including storm drainage systems. Major project narrative submittals require reporting on the impact of stormwater runoff on surrounding water bodies.

The Town's Site Plan Review Requirements under the Planning Board Rules and Regulations requires that adequate stormwater management is designed in accordance with Stormwater Management Volume I and II prepared by the MassDEP and Massachusetts Office of Coastal Zone Management. Furthermore, this regulation requires a stormwater runoff plan consistent with the Massachusetts Stormwater Management Policy (SWMP) to prevent pollution to surrounding water bodies, minimize erosion and sedimentation, and prevent the potential for increased runoff and flooding.

b. Subdivision of Land

The Town of Salisbury's Subdivision of Land Rules and Regulations, administered by the Planning Board, was adopted on June 1, 1975 and was further amended on June 12, 2019. This regulation outlines the procedure for submission and approval of plans and requirements for site inspections. This regulation describes the required contents and features of the definitive plan.

Article XI Administration of the Subdivision of Land Rules and Regulations describes the enforcement of site inspections. This regulation indicates that construction improvements shall be inspected by the Board, the Highway Surveyor, the Water Company, and the Board of Health and that work shall not be done until the work is satisfied by the Board.

3.3 Review of Regulatory Mechanisms for Compliance with the 2016 MS4 Permit

A comprehensive review was conducted to evaluate whether the Town's existing regulatory mechanisms for construction and post-construction stormwater management comply with the 2016 MS4 Permit requirements, and identify what modifications, if any, are needed to bring the Town into compliance.

3.3.1 Construction Site Stormwater Runoff Control

The 2016 MS4 Permit builds on the requirements of the 2003 MS4 Permit for construction site runoff control and requires the following (Year 1 requirements):

Site Inspection & Enforcement

Permit Requirement: Development of written procedures for site inspections and enforcement of sediment and erosion control measures. These procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The program shall provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be documented in the SWMP.

Excerpts from Salisbury's Regulations that Support Permit Requirement: The Planning Board Rules and Regulations, Article III Site Plan Review Requirements, Part 12 Site Plan Requirements, Item B, Plan Content includes the following language:

> "(11) Construction Site Inspection Plan. A plan outlining the frequency and contents of inspections at the construction site. Written inspection reports shall be submitted to the Planning Board within 48 hours of the inspection. The owner must retain all construction inspection records and reports for a minimum of 5 years from the date of issuance of the Certificate of Completion. At the discretion of the Board, the inspections shall be conducted by the Board's agent, designee or a professional engineer who has been approved by the Board, at the expense of the permittee. The permittee is responsible for arranging for the Board's agent/representative to be on-site when items are required to be inspected. The inspection reports must identify any incidents of non-compliance with the permit conditions.
>
> (a) Frequency. Construction Site Inspections to monitor stormwater compliance, must be performed at least as frequently as once per month. Inspections must also occur at the following intervals, at a minimum.
>
> [1] Pre-Construction. The Planning Board may require a pre-construction meeting prior to starting clearing, excavation, construction or land disturbing activity by the permittee. The permittee's technical representative, the general contractor or any other person with authority to make changes to the project, shall meet with the Board or its representative to review construction sequencing and the permitted plans and their implementation.
>
> [2] During Construction. Inspections of stormwater BMPs and sediment and erosion control measures shall occur during construction of BMPs as well as within 24 hours of the end of a storm event of 0.5 inches or greater, from the start of construction until the site is permanently stabilized.
>
> (b) Content of Inspections. A written inspection report shall be completed for every inspection performed. A "Construction Site Stormwater Inspection Report" form is available at Town Hall."

Contents of the Definitive Plan as required by Subdivision of Land (§465-28, Definitive plan) Rules and Regulations include the submittal of the "Construction Site Inspection Plan" as described above and in the Site Plan Review Requirements section of the Planning Board Rules and Regulations.

Article XVIII of the Zoning Bylaw under Site Plan Review allows that the Board may "impose reasonable conditions, limitations and safeguards" for requirements for "sewer [and] drainage." It also states that a Board's designated inspector shall complete a final inspection of the site prior to issuing a certificate of completion. However, it does not specify any interim inspections and enforcement measures.

Article VI, Administration and Enforcement, of the Zoning Bylaw note that it is the duty of the Building Inspector, or his duly authorized agents, to inspect any plans, buildings, or premises to determine that they are not in violation of the bylaw. Additionally, the Building Inspector may order the responsible party to remedy any condition which violates the bylaw.

Recommended Modification: None

Sediment and Erosion Control BMPs

Permit Requirement: Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to BMP design standards in state manuals, such as the Massachusetts Stormwater Handbook or design standards developed by the MS4. EPA supports and encourages the use of design standards in local programs. Examples of appropriate sediment and erosion control measures for construction sites include local requirements to:

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

Excerpts from Salisbury's Regulations that Support Permit Requirement: Section §77-5. B. of the Earth Filling Bylaw states that the site plan shall depict "permanent stormwater and erosion control and groundwater recharge structures and features, the methods of final stabilization of fill material and the proposed cover material and cover vegetation…elevation contours are required only for areas of fill, 100 feet beyond the perimeter of the fill areas and along abutting property lines".

Section §77-6. J. of the Earth Filling Bylaw states that "final grading shall incorporate stabilization measures and slopes of no more than 15% to prevent erosion, structural failure of fill materials, ponding of water, or excessive stormwater drainage onto abutting properties".

Article XVII, Earth Removal of the Zoning Bylaw notes that a permit is required to remove earth materials, including perimeter requirements, but little else relating to erosion and sedimentation control measures.

Site Plan Performance and Design Standards of the Planning Board Rules and Regulations (§465-13) includes sections devoted to stormwater runoff and erosion control. The site plan must include

adequate provisions for "minimizing erosion and sedimentation" and said provisions must be "adequate to retain all sediment within the site and away from wetlands, watercourses, and water bodies, both during and after construction."

Site Plan Requirements Major Narrative Submittals (§465-12) indicates that for major projects, the Board may require a "report on the potential erosion and sedimentation caused by the operation and maintenance of the proposed development and the mitigation efforts proposed. Contents of the Definitive Plan as required by Subdivision of Land (§465-28, Definitive plan) Rules and Regulations include the submittal of the same "Soils Report" as described above and in the Site Plan Review Requirements section of the Planning Board Rules and Regulations.

Chapter 465 Planning Board, Part 1 Rules and Regulations, Article III Site Plan Review Requirements, Part 13 Site Plan Performance and Design Standards, Item P, Erosion Control contains the following language:

"Erosion Control and sedimentation control measures presented in the plan shall be adequate to retain all sediment within the site and away from wetlands, watercourses, and water bodies, and the municipal storm drain system, both during and after construction. Design of erosion and sedimentation control measures shall be consistent with design standards of the Massachusetts Stormwater Management Handbook."

Projects requiring a Definitive Plan as prescribed by the Subdivision of Land Rules and Regulations are held to the same design standards for erosion and sedimentation control measures as those projects requiring a Site Plan.

Recommended Modification: None

Control of Wastes

Permit Requirement: Requirements for construction site operators within the MS4 jurisdiction to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes. These wastes may not be discharged to the MS4.

Excerpts from Salisbury's Regulations that Support Permit Requirement: Chapter 465 Planning Board, Part 1 Rules and Regulations, Article III Site Plan Review Requirements, Part 12 Site Plan Requirements, Item B, Plan Content includes the following language:

"(10) Water and waste disposal, drainage and other utilities. The locations and description of all existing and proposed septic systems, sanitary sewer, water supply, storm drainage systems (including method and calculations for ten- and one-hundred-year storm events), utilities, refuse and other waste disposal methods~~.~~, both during and after construction. Waste disposal methods during construction shall, at a minimum, provide for the disposal of any discarded building materials, concrete truck wash out, chemicals, litter, and sanitary waste."

Contents of the Definitive Plan as required by Subdivision of Land (§465-28, Definitive plan) Rules and Regulations include the Water and Waste Disposal, Drainage and Other Utilities requirements as outlined in §465-12B(10) of the Site Plan Review Requirements listed above.

Article II Sewer Use §209-6 of the Sewers Bylaw prohibits "discharge to any municipal storm sewer or natural outlet within the Town of Salisbury, or in any area under the jurisdiction of said Town, and the Water Resources Commission, Commonwealth of Massachusetts, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this bylaw."

Recommended Modification: None

Site Plan Review Inspection and Enforcement

Permit Requirement: Development of written procedures for site plan review, inspection and enforcement. The site plan review procedure shall include a pre-construction review by the permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development. The review procedure shall incorporate procedures for the consideration of potential water quality impacts, and procedures for the receipt and consideration of information submitted by the public. The site plan review procedure shall also include evaluation of opportunities for use of low impact design and green infrastructure. When the opportunity exists, the permittee shall encourage project proponents to incorporate these practices into the site design. The procedures for site inspection conducted by the permittee shall include the requirement that inspections occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans, clearly defined procedures for inspections including qualifications necessary to perform the inspections, the use of mandated inspections forms if appropriate, and procedure for tracking the number of site reviews, inspections, and enforcement actions.

Excerpts from Salisbury's Regulations that Support Permit Requirement: Sections §77-6 and §77-8 under the Earth Filling Bylaw states "Inspection of the premises may be made by the permit granting authority or its agents on reasonable advance notice to determine whether or not the provisions of the Town bylaws and any permit are being complied with… While considering an application and/or as a condition of issuing a permit, the permit granting authority may require such borings and test pits, inspections, monitoring, certifications, reports and tests by licensed site professionals, engineers, laboratories and/or other qualified persons as are deemed by the permit granting authority to be needed to evaluate the application and/or to monitor performance under a permit and/or to establish compliance with the conditions of a permit and this bylaw…. The Town Manager of the Town is hereby designated as the officer charged with the enforcement of this bylaw. The Town Manager, upon a written complaint of any Town citizen or property owner or upon such officer's own initiative (in either case after consultation with the Board of Selectmen), shall institute any appropriate action or proceedings in the name of the Town to prevent, correct, restrain or abate violation of this bylaw."

Article XVIII Site Plan Review of the Zoning Bylaw outlines the procedures for submitting and receiving approval of a site plan. The Planning Board will review the Site Plan and any requirements within the Site Plan will then be included for review by the Board in a pre-construction meeting. The Board may reject an application or impose "reasonable conditions" for inadequate Site Plans. Additionally, the "Planning Board's designated inspector shall complete a final inspection of the site within 10 calendar days of the filing of the certificate of completion application by the applicant. As a result of the approved inspections, the inspector shall submit to the Planning Department a signed certificate of completion indicating that all work has been completed to the satisfaction of the Town."

Article VI Administration and Enforcement of the Zoning Bylaw outlines the duties of the Building Inspector (or authorized agents) to inspect all plans and sites as well as order remedies for violations of the bylaws. It should be noted that only major projects are required to have a public hearing, while "any activity describing more than one acre" is considered a minor project.

Section 13 Site Plan Performance and Design Standards of Article III Site Plan Review Requirements under the Planning Board Rules and Regulations outlines the site plan review procedure and specifies what must be included in the Site Plan. Many requirements for BMPs are included here. Water Quality considerations are required of the Site Plan. A public hearing is required for approval of the definitive plan.

Section 15 Preapplication Stage in Article 4 of the Planning Board Rules and Regulations specifies an optional "Pre-application Conference" as well as the special permit review by the Planning Board.

Recommended Modification: None

3.3.2 Post-Construction Stormwater Management

The 2016 MS4 Permit builds on the requirements of the 2003 MS4 Permit for post construction runoff from new development and redevelopment and requires the following (Year 2 requirements):

Low Impact Development

Permit Requirement: Low Impact Development (LID) site planning and design strategies must be used to the maximum extent feasible.

Excerpts from Salisbury's Regulations that Support Permit Requirement: Section 13 of the Site Plan Review under the Town's Planning Board Rules and Regulations states, "The system shall be designed to treat stormwater to all applicable standards of Town, state and federal agencies. The system design shall promote on-site infiltration and minimize the discharge of pollutants to the ground and surface water."

Section 36 of the Subdivision of Land Under the Town's Planning Board Rules and Regulations states: "Natural drainage systems. No open water body or swampy area shall be filled in unless it can be shown to the Board that provision has been made in the downstream drainage system for the removal of the additional runoff caused by this change."

Furthermore, section 19 of the Flexible Residential Design Requirements under the Town's Planning Board Rules and Regulations states "The Planning Board shall encourage the use of "soft" (nonstructural) natural stormwater management techniques (such as rain gardens and open grass and bioretention swales) and other drainage techniques that do not create impervious surface and that enable infiltration where appropriate. Stormwater should be treated at the source to limit non-point source pollution."

Recommended Modification: The Town should consider revising Part 13 Site Plan Performance and Design Standards of the Planning Board Rules and Regulations to include the following Section E:

"E. Drainage. The drainage system shall be designed so that there is no net increase in the pre vs. post peak rates of stormwater discharge for the two-, ten- and one-hundred-year storm events and rates. The applicant shall demonstrate to the satisfaction of the Planning Board that the project is designed to have no measurable or significant impact as to existing vegetation, topography, wetlands, and other natural or man-made features. ***Low Impact Development (LID) shall be utilized to the maximum extent possible as determined by the Planning Board.*** *The system shall be designed to treat stormwater to all applicable standards of Town, state and federal agencies…"*

Similar modifications should be made in the Subdivision of Land Rules and Regulations.

BMP Design Guidance

Permit Requirement: The design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or State approved BMP design guidance.

Excerpts from Salisbury's Regulations that Support Permit Requirement:

Site Plan Review: (§465-13, Site plan performance and design standards). Section E, Drainage, requires that "the drainage system will be designed in accordance with Stormwater Management Volume I and II prepared by the Massachusetts Department of Environmental Protection and Massachusetts Office of Coastal Zone Management as most recently revised." Section M, requires that "A plan consistent with the Massachusetts Stormwater Management Policy (SWMP)…"

Recommended Modification: The Town should consider including language in the Subdivision of Land section referencing Volume 2 of the Massachusetts Stormwater Handbook as a BMP Design Guidance Manual.

Compliance with the Stormwater Management Standards for New Development

Permit Requirement: Stormwater Management systems on new development sites shall be designed to:

- *Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;*
- *Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2;*
- *Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3;*
- *Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5;*
- *Protect Zone 2 or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6;*
- *Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9;*
- *Require that all stormwater management systems be designed to:*

1. *Retain the volume of runoff equivalent to, or greater than, one (1) inch multiplied by the total post-construction impervious surface area on the site;*

   AND/OR

2. *Remove 90% of the average annual load of TSS generated from the total post-construction impervious surface area on the site AND 60 % of the average annual load of TP generated from the post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's Evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards may be used to calculated BMP performance.*

Excerpts from Salisbury's Regulations that Support Permit Requirement: Site Plan Review: (§465-13, Site plan performance and design standards). Section E, Drainage, requires that "the drainage system will be designed in accordance with Stormwater Management Volume I and II prepared by the Massachusetts Department of Environmental Protection and Massachusetts Office of Coastal Zone Management as most recently revised." Section M, requires that "A plan consistent with the Massachusetts Stormwater Management Policy (SWMP), where the rate of surface water runoff from the site shall not be increased after construction. If needed to meet this requirement and maximize groundwater recharge, increased runoff from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of subsurface infiltration systems or retention or detention ponds…".

Recommended Modification: Language matching the Site Plan Performance and Design Standards above should be added to the Subdivision of Land Rules and Regulations.

Section M of the Site Plan Review Requirements under the Planning Board Rules and Regulations outlines stormwater runoff requirements for a site plan. Section M requires that "A plan consistent with the Massachusetts Stormwater Management Policy (SWMP), where the rate of surface water runoff from the site shall not be increased after construction. If needed to meet this requirement and maximize groundwater recharge, increased runoff from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of subsurface infiltration systems or retention or detention ponds…". The Town should replace this statement with the following:

"(2). For new development sites, a separate, detailed Stormwater Management Plan consistent with the Massachusetts Stormwater Management Standards 1,2,3, 5, 6, and 9 will also be required for submission with the Site Plan. The Stormwater Management Plan shall include adequate provisions such that Stormwater Management systems on new development site:

- *(a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1*
- *(b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2;*
- *(c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3;*

(d) *Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5;*
(e) *Protect Zone 2 or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6;*
(f) *Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9;*
(g) *Achieve one or both of the following:*
[1] *Retain the volume of runoff equivalent to, or greater than, one (1) inch multiplied by the total post-construction impervious surface area on the site;*
AND/OR
[2] *Remove 90% of the average annual load of TSS generated from the total post-construction impervious surface area on the site AND 60 % of the average annual load of TP generated from the post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's Evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards may be used to calculated BMP performance."*

Compliance with the Stormwater Management Standards for Redevelopment

Permit Requirement: Stormwater management systems on redevelopment sites shall meet the following standards to the maximum extent feasible:

- *Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;*
- *Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2;*
- *Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3;*
- *The pretreatment and structural best management practices requirements of Standards 5 (eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook) and 6 (protect Zone 2 or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6);*
- *Stormwater management systems on redevelopment sites shall also improve existing conditions by requiring that stormwater management systems be designed to:*

1. *Retain the volume of runoff equivalent to, or greater than 0.8 inch multiplied by the total post-construction impervious surface area on the site;*

   AND/OR

2. *Remove 80% of the average annual post-construction load of TSS generated from the total post-construction impervious area on the site AND 50% of the average annual load of TP generated from the total post-construction impervious surface area on the site.*

Pollutant removal shall be calculated consistent with EPA Region 1's Evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards may be used to calculated BMP performance.

- *Stormwater management systems on redevelopment sites may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site to meet the equivalent retention or pollutant removal requirements indicated above.*

Excerpts from Salisbury's Regulations that Support Permit Requirement: Site Plan Review: (§465-13, Site plan performance and design standards). Section E, Drainage, requires that "the drainage system will be designed in accordance with Stormwater Management Volume I and II prepared by the Massachusetts Department of Environmental Protection and Massachusetts Office of Coastal Zone Management as most recently revised." Section M, requires that "A plan consistent with the Massachusetts Stormwater Management Policy (SWMP), where the rate of surface water runoff from the site shall not be increased after construction. If needed to meet this requirement and maximize groundwater recharge, increased runoff from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of subsurface infiltration systems or retention or detention ponds…".

Recommended Modification: The Town should include the following language to Section M of the Site Plan Review Requirements under the Planning Board Rules and Regulations subsequent to the recommended modification for Compliance with the Stormwater Management Standards for New Development:

"(3). For re-development sites, a separate, detailed Stormwater Management Plan consistent with the Massachusetts Stormwater Management Standards 1,2,3, 5, and 6 will also be required for submission with the Site Plan. The Stormwater Management Plan shall include adequate provisions such that Stormwater Management systems on re-development sites:

(a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1, to the maximum extent feasible;

(b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2, to the maximum extent feasible;

(c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3, to the maximum extent feasible;

(d) Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5, to the maximum extent feasible;

(e) Protect Zone 2 or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6, to the maximum extent feasible;

(f) Achieve one or all of the following:

[1] Retain the volume of runoff equivalent to, or greater than 0.8 inch multiplied by the total post-construction impervious surface area on the site;

[2] Remove 80% of the average annual post-construction load of TSS generated from the total post-construction impervious area on the site

AND 50% of the average annual load of TP generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's Evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards may be used to calculated BMP performance.

[3] Stormwater management systems on redevelopment sites may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site to meet the equivalent retention or pollutant removal requirements indicated in [1] and [2] above."

Permit Requirement: Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions where feasible and are exempt from any of the parts listed previously in part d. Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of part d fully.

Excerpts from Salisbury's Regulations that Support Permit Requirement: Section 111 of Article XVIII Site Plan Review under the Zoning Bylaw outlines the major and minor projects subject to site plan review. This section states "Reconstruction/reclamation/replacement (not overlay) of an existing paved area" is subject to site plan review. Repaving (overlay) of an existing paved area of any size is exempted from site plan review."

Recommended Modification: The Town should consider incorporating a statement to either a bylaw or within the Planning Board Rules and Regulations which requires that all projects seek to improve existing conditions where feasible.

Submission of As-Builts

Permit Requirement: The permittee shall require, at a minimum, the submission of as-built drawings no later than two (2) years after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management).

Excerpts from Salisbury's Regulations that Support Permit Requirement: Section 4 Permit Requirements of the Earth Filling Bylaw states, "No such bond shall be released, nor shall the applicant be deemed to have complied with the conditions provided for herein, until the applicant has filed with the permit granting authority a written certification from the Massachusetts licensed site professional who approved the original soil management plan that said conditions and the soil management plan have been complied with and a final, engineered record site plan showing the finished site as required under § 77-6J of this bylaw and the permit granting authority issues a letter authorizing release of the bond."

Section 42 of the Planning Board Subdivision of Land states, "As-built plans. As-built plans showing the location, grades, and other significant information regarding utilities shall be prepared by the subdivider and turned over to the Town Clerk following the final approval of the improvements as hereinafter provided."

Recommended Modification: The Town should consider including language alluding to stormwater management practices to the Subdivision of Land Section 42 Item L As-Built Plans.

Long-term Operation & Maintenance

Permit Requirement: The new development/redevelopment program shall have procedures to ensure adequate long-term operation and maintenance of stormwater management practices that are put in place after the completion of a construction project. These procedures may include the use of dedicated funds or escrow accounts for development projects or the acceptance of ownership by the permittee of all privately owned BMPs. These procedures may also include the development of maintenance contracts between the owner of the BMP and the permittee. Alternatively, these procedures may include the submission of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The procedures to require submission of as-built drawings and ensure long term operation and maintenances shall be a part of the SWMP.

Recommended Action: The Town should consider adding language to The Site Plan Review section of the Planning Board Rules and Regulations so long as provisions are made to include subdivisions in this requirement.

Revise §300-112, Item H (Certificate of completion) of the Site Plan Review under the Zoning Bylaw to read as follows:

> *"…As a result of the approved inspections, the inspector shall submit to the Planning Board, with copy to the Applicant, a signed affidavit indicating that all work has been completed to the satisfaction of the Town. Once the Board's inspector submits the affidavit, the Applicant shall prepare and submit to the Planning Board, a closeout package including a written request for a certificate of completion, as-built drawings stamped by a professional engineer, and procedures to ensure long-term operation and maintenance of structural and non-structural stormwater best management practices (including methods and funding source). Upon receipt and approval of the closeout documents, a certificate of completion signed by the Board shall be issued, officially terminating the Board's involvement in the site plan review process."*

4.0 IDDE MONITORING AND PLAN IMPLEMENTATION PROGRESS

4.1 IDDE Plan

Under the 2003 MS4 Permit, the Town established legal authority to prohibit illicit discharges, investigate suspected illicit discharges, eliminate illicit discharges, and implement enforcement procedures through adoption of their *Sewers Bylaw* in May 2012. Under the new MS4 Permit, the Town is required to implement their Illicit Discharge Detection and Elimination Investigation Program by presenting a defined approach to investigate, identify and remove illicit connections. The Town is required to develop the written plan in Year 1 and then continue to implement the plan throughout the permit term.

Under the MS4 permit, Salisbury is required to employ best management practices for the six minimal control measures in an effort to reduce the discharge of pollutants from the MS4 to the maximum extent practicable. The measures are as follows:

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

Under minimum control measure 3, Salisbury is required to implement an IDDE program that includes, but is not limited to, the following measures:

1. Develop a drainage map illustrating the locations of all outfalls from the MS4 and the names/locations of receiving waters.
2. Provide appropriate regulatory mechanisms and enforcement procedures to prohibit illicit discharges.
3. Implement a plan to detect and eliminate illicit discharges, including illegal dumping.
4. Inform public employees, businesses, and the general public of hazards associated with illicit discharges and improper disposal of waste (this is also part of the Public Education and Outreach control measure).

Salisbury has developed a comprehensive written IDDE Plan, under separate cover, to meet the requirements of the 2016 MS4 Permit.

Such measures will be performed with the goal of finding and removing all illicit discharges, which include fixed point source discharges such as illegal/improper sanitary or floor drain connections and cross connections between the sanitary and drainage infrastructure, in addition to all isolated or recurring discharges such as illegal dumping and improper disposal of waste from boats. Illicit Discharges can also be indirect sources that infiltrate into the drainage system through cracks/defects in infrastructure, such as sanitary wastes from failing sewer pipes. Exceptions do exist in the regulation for the discharge of clean water from sources such as water line flushing, fire-

fighting operations, non-contact cooling waters, and for other discharges that have separately obtained a permit from the NPDES Program.

4.1.1 Mapping

The Town has developed a comprehensive map of their drainage system, which includes outfalls, interconnections with other MS4s, catch basins, manholes, municipally owned stormwater treatment structures and impaired water bodies. Each outfall and interconnection have been analyzed to create a defined catchment area that includes surface runoff to catch basins tributary to the identified outfall or interconnection. The catchment delineation process considered each catch basin upstream from the outfall or interconnection and the area that would conceivably drain to that catch basin based on topography and impervious cover. As drainage infrastructure mapping becomes more complete over the course of the investigations performed throughout the permit term, this exercise will be refined and updated.

The Town has approximately:

- 1,100 catch basins,
- 260 storm drain manholes,
- 128 municipal outfalls,
- 10 non-municipal outfalls, and
- 3 interconnections with other MS4s.

Mapping has been in accordance with the 2016 MS4 Permit's GPS accuracy guidelines and has been recorded on a publicly available town map, the most recent version of which can be found attached to the NOI included in Appendix D of this report.

Salisbury has reviewed drainage infrastructure within Town boundaries to determine ownership. Private infrastructure or infrastructure owned and operated by another municipality or a state entity has been determined and designated in the Town's drainage GIS. The Town already has in place a comprehensive map of their municipal sanitary sewer system.

The mapping will serve as a planning tool for the implementation of the Town's IDDE Program and will demonstrate the extent of complete and planned investigations. The Town will update their mapping as needed to reflect newly discovered information and required corrections or modifications. The Town will report annually on progress toward completion of the system map in their MS4 Annual Report.

4.1.2 Catchment Prioritization and Ranking

Salisbury completed an initial inventory and priority ranking to assess the illicit discharge and SSO potential of each regulated catchment and the related public health significance. The ranking will determine the priority order for screening of outfalls and interconnections, catchment investigations for evidence of illicit discharges, and provide the basis for determining permit milestones. Major factors considered in the prioritization and ranking of catchments include:

- Past discharge complaints and reports,
- Receiving water quality,
- Density of generating sites,
- Age of development and infrastructure,

- Culverted streams, and
- Water body impairments

This inventory and ranking have been documented in the Town's IDDE Plan and will be updated annually throughout the permit term to reflect new findings from dry and wet-weather sampling and other IDDE program activities, and will be documented in the Town's MS4 Annual Reports.

4.1.3 Field Investigation

The MS4 Permit requires the Town to develop a 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.

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

- Sandbagging: If no flow is observed at a particular junction manhole or key junction manhole at the time of inspection, the drain segment in the area of concern can be isolated by placing sandbags within outlets to manholes to form a temporary dam that collects any intermittent flow for a 24 to 48-hour dry weather period to determine if any intermittent dry-weather flow is present. If intermittent flow is captured, grab samples will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. If it is determined that no flow is captured behind the sandbag after a 24 to 48-hour period, the tributary drainage pipes can be excluded as the source of any intermittent discharge.
- Dyed-water Testing: Dyed water tests will consist of pouring dyed-water into plumbing fixtures and observing the sanitary sewer and drainage system downstream in an attempt to confirm connection.
- ZoomCam Inspection: In selected tributary areas, or where indicated based on findings from other field investigation work, drainage structures will be inspected with a "zoom camera-on-a-stick" in an attempt to gather additional information and narrow the location of observed dry-weather flow.
- Smoke Testing: Smoke testing will consist of the introduction of a non-toxic smoke into drainage segments containing suspected illicit discharges and observing adjacent buildings for signs of a connection, or smoke emanating from sump pump connections, floor drains or cleanouts.
- CCTV/Video Inspections: Drainage pipes are internally inspected to pinpoint and evaluate connections. Television inspection will consist of passing a closed-circuit television camera through all or a portion of the drain segments containing suspected illicit connections.

Upon location of an illicit discharge, the Town will work to eliminate the illicit discharge as expeditiously as possible. When the specific source of an illicit discharge is identified, Salisbury will exercise its authority as necessary to require its removal. The Town will notify all responsible parties of any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities.

4.1.4 Sanitary Sewer Overflows

Sanitary Sewer Overflows (SSOs) are included in the MS4 Permit's definition of illicit discharges and can be defined as 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, power failures, vandalism, and sewer defects. This includes SSOs resulting during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems.

Salisbury will maintain and update annually an inventory, that identifies all known locations where SSOs have discharged to the MS4 within the five (5) years prior to the effective date of the MS4 Permit (July 1, 2018), and any SSOs that have occurred thereafter. This includes SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for transmission of flow between the systems. The inventory will include the following information, when available:

- Location (approximate street crossing/address and receiving water, if any);
- A clear statement of whether the discharge entered a surface water directly or entered the MS4;
- Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
- Estimated volume of the occurrence;
- Description of the occurrence indicating known or suspected cause(s);
- Mitigation and corrective measures completed with dates implemented; and
- Mitigation and corrective measures planned with implementation schedules.

Upon detection of an SSO, Salisbury will provide oral notice to EPA within 24 hours, a written notice to EPA within five (5) days and shall include the information in the updated inventory as identified above, and mitigate it as expeditiously as possible taking interim measures to minimize the discharge of pollutants to and from its MS4 until elimination is completed.

Salisbury has had four (4) SSO occurrences in the five years prior to the permit effective date to present. These include the following:

- On January 16, 2015, the first overflow event occurred at a Town easement due to a damaged force main. The Town easement connects the Ferry Lots Lane Pump Station to the wastewater treatment facility located off Elm Street by 18-inch and 12-inch force mains. The sanitary sewer overflowed directly from the damaged 18-inch force main to the ground. To resolve this event, the 18-inch force main was closed at the pump station, and the 12-inch main was placed online. The estimated volume of discharge was an ounce per day.

- On December 27, 2015, the second overflow event occurred at the pump station located at the end of Trout Way. Sanitary sewer was noticed to be leaking from the vent of the pump station. The wet well flooded when the pumps were called to run. Wastewater levels rose and discharged into the control side. The sanitary sewer overflow was estimated to be between 50-100 gallons. The event was mitigated by adding another float that was tied directly to the dialer that is in a panel separate from the recessed station. Both pumps were back in the automatic mode by December 30, 2015.

- On October 25, 2017, the third overflow event occurred at Trout Way due to a dead phone line, which prevented notification to operations staff. Due to the power loss, a pump station backed up leading to the overflow. Once the power outage was resolved approximately 10 minutes later, the overflow event ended. The volume of sanitary sewer overflow was estimated to be 100 gallons.

- The fourth overflow occurred on March 4, 2018 at Gove Lane/Meaders Lane due to a dead phone line, which prevented notification to operations staff. The entire Town was without power. Due to the power loss, the station and generator went down. Servpro was called in to clean two affected houses. The total volume of the overflow was estimated to be 100 gallons and the discharge was resolved a half hour later.

In the event of an overflow, the Town recognizes that a notification must be reported within 24 hours by phone to MassDEP, EPA, and other relevant parties. Verbal notification must also be followed by a written report in accordance with MassDEP's Sanitary Sewer Overflow (SSO) notification form within five (5) calendar days of becoming aware of the overflow, bypass, or backup.

5.0 STANDARD OPERATING PROCEDURES

5.1 MS4 Permit Requirement

As part of the minimum control measure for Pollution Prevention/Good Housekeeping for Municipal Operations, the MS4 Permit requires permittees to implement an Operations and Maintenance (O&M) program for permittee-owned facilities and activities to prevent or reduce pollutant runoff and protect water quality. The O&M Program is required to include the following elements:

1) An inventory of all permittee-owned facilities.
2) Written O&M procedures for the following activities:
    a. Parks and open space
    b. Buildings and facilities where pollutants are exposed to runoff
    c. Vehicles and equipment
3) A written program detailing the activities and procedures the permittee will implement so that MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4, to include:
    a. Optimization of routine inspections, cleaning and maintenance of catch basins.
    b. Implementation of procedures for sweeping and/or cleaning streets, and permittee-owned parking lots.
    c. Proper storage and disposal of catch basin cleanings and street sweepings.
    d. Implementation of procedures for winter road maintenance.
    e. Implementation of inspection and maintenance frequencies and procedures for storm drain systems and stormwater treatment structures.
4) Written records for all maintenance activities, inspections and training.

5.2 Inventory of Municipal Facilities

The inventory of municipal facilities will be developed during Permit Year 2.

5.3 Operation and Maintenance Procedures for Municipal Activities and Facilities

To address the MS4 Permit requirements, Standard Operating Procedures (SOPs) associated with the identified municipal activities and facilities are required to be developed within two years of the permit effective date, with the exception of procedures for winter road maintenance, which are required to be developed within one year of the permit effective date. The SOP for winter road maintenance, which includes snow removal and deicing, will be incorporated into Appendix I, along with additional SOPs that are developed in Permit Year 2.

Since 2018, the major material that the Town of Salisbury uses in snow and ice control is salt. Salt is ordered from Eastern Minerals prior to each deicing season and is stored in a covered facility located behind the Department of Public Works. The Town plows and applies salt on approximately 50 miles of streets, 4 municipal facilities, and approximately 5 miles of sidewalk. The Town plans to coordinate with a consultant that specializes in evaluating winter road maintenance practices to comply with the requirements set forth in the 2016 MS4 Permit by October 2019, preceding the winter season. The package of services that the consultant will conduct include evaluating existing operations, equipment, materials, and policies, addressing any issues, and establishing a program to implement

any necessary changes to comply with the winter road maintenance requirements established under the permit.

5.4 Catch Basin Cleaning and Optimization

The Town currently has approximately 1,100 catch basins, which are cleaned on annual basis. The Town contracts out catch basin cleaning to a private company, which is responsible for cleaning each basin and disposing of the accumulated sediments in accordance with state and local requirements. In 2018, approximately 63% of the catch basins were cleaned throughout the Town. The catch basins are cleaned using a hydraulic clamshell bucket method. Cleaning occurs town-wide, typically during summer after the street sweeping takes place. Catch basins located tributary to the Salisbury Beach area are cleaned once annually.

To meet anticipated requirements of the new MS4 Permit, the town will need to optimize catch basin inspection, cleaning and maintenance such that the following conditions are met:

- Inspection and maintenance of catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) are prioritized. Catch basins in such areas must be cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loading.

- A schedule must be established such that the frequency of routine cleaning ensures that no catch basin at any time will be more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.

- If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, the town must document the finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources.

- The Town shall maintain documentation, including metrics and other information, used to reach the determination that the established plan for cleaning and maintenance is optimal and meets the requirements of the MS4 Permit, including a log of catch basins cleaned and inspected.

- The Town must track and report the following information to EPA annually:

    - Total number of catch basins town-wide.
    - Number of catch basins inspected.
    - Number of catch basins cleaned.
    - Total volume or mass of material removed from all catch basins.

The Town will collect additional data during the 2019 cleaning season as part of their optimization plan to ensure that no catch basin is more than 50% full. Data collected will include depth from the catch basin rim to the top of sediment, to the bottom of the basin, and to the invert of the outlet pipe. Data will again be collected during the 2020 catch basin cleaning season. This data will be integrated into the Town's GIS and utilized to identify those catch basins that are filling up more

frequently and will therefore need to be cleaned more than once annually to ensure that the catch basin sump is never more than 50% full.

6.0 WATER QUALITY LIMITED WATERS

6.1 Discharges to Water Quality Limited Waters

Under Massachusetts General Law (MGL) Chapter 21, MassDEP is responsible for monitoring the waters of the Commonwealth, identifying those waters that are impaired, and developing a plan to bring them back into compliance with Massachusetts Surface Water Quality Standards. The list of impaired waters, better known as the "303(d) list," identifies impaired surface waters and the reasons for impairment.

Once a waterbody is identified as impaired, MassDEP is required by the Federal Clean Water Act (CWA) to develop a strategy for restoring the health of the impaired waterbody. The process of developing this strategy, which is generally referred to as a Total Maximum Daily Load (TMDL) includes identifying the type of pollutant, and the potential sources of the pollutant, in addition to determining the maximum amount of pollutant that can be discharged to a specific surface water body in order to meet surface water quality standards. Part of the TMDL also includes the development of a plan to help in meeting the Total Maximum Daily Load limits once they have been established. These impaired waters are listed under Category 4A in Part 2 of the Massachusetts Integrated List of Waters. As of the permit effective date, there are currently no approved TMDLs that are applicable to Salisbury.

In addition to identifying water bodies for which a Total Maximum Daily Load has already been developed, the Integrated List of Waters also identifies the 303(d) List of Impaired Waters under Category 5. The 303(d) List identifies water bodies that are impaired or threatened for one or more designated uses and require a TMDL. In Salisbury, this includes segment MA84A-06 of the Merrimack River for enterococcus, fecal coliform, and PCB in fish tissue. The Back River segment of Salisbury is also included under segment MA84A-06 of the Merrimack River.

6.2 Bacteria Impairments

Since the Merrimack River is impaired for enterococcus and fecal coliform and requires the development of a TMDL, the Town is subject to the requirements of Appendix H of the MS4 Permit, which outlines requirements related to discharges to water quality limited water bodies where bacteria or pathogens is the cause of the impairment.

6.2.1 Public Education and Outreach

The Town has a public education program for multiple purposes and has easily been able to add in specific, targeted information regarding actions that can be taken to reduce sources of bacteria from the outfalls tributary to the Merrimack River.

The Town must supplement its residential public education program by distributing information to pet owners within those catchments tributary to the Merrimack River about proper management of pet waste, including noting any existing bylaws. This message must be disseminated to all residents annually and pet owners at the time of pet license issuance and renewal, beginning in the first year of the permit.

The Town of Salisbury Department of Public Works currently advises the residents on sound environmental practices by providing educational brochures and pamphlets from Greenscapes NSC throughout the Town outlining the importance of pet owners to maintain pet waste.

The Town will also distribute information to septic system owners about proper maintenance in those catchments tributary to the Merrimack River. Approximately 40% of the Town is served by septic systems.

6.2.2 Illicit Discharges

In implementing their Illicit Discharge Detection and Elimination Program, the Town will designate all catchments that are tributary to the Merrimack River as problem or high priority under the catchment prioritization and ranking.

7.0 REPORTING, EVALUATION AND MODIFICATION

7.1 MS4 Permit Reporting

The MS4 Permit requires submission of annual reports assessing the effectiveness of the proposed BMPs and reporting if the minimum control measures were met. The initial report is due 90 days from the close of the reporting period, or September 29th, 2019, and annually thereafter. Reports are to be submitted to both EPA and MADEP. At a minimum, the report should include the following:

- The status of compliance with permit conditions, including an assessment of the appropriateness of the selected BMPs and progress toward achieving the selected measurable goals for each minimum control measure.
- Results of any information collected and analyzed, including monitoring data, if any. Outfall screening and monitoring data collected shall be submitted for both the reporting cycle and cumulative for the permit term.
- A summary of the stormwater activities planned for the next reporting cycle.
- A change in any identified best management practices or measurable goals for any minimum control measure.
- Notice of relying on another governmental entity to satisfy some of the permit obligations, if applicable.

As indicated in an earlier section, copies of past annual reports submitted by Salisbury are referenced in Appendix E of this SWMP. Salisbury will append future annual reports in compliance with the 2016 MS4 Permit as they are prepared in Appendix J.

7.2 Evaluation of SWMP Success

This SWMP should be considered a dynamic document that is modified as necessary to account for changes such as in drainage infrastructure, laws and regulations, and town leadership and policy. The success of programs implemented by the SWMP – such as IDDE – should also be evaluated to ensure that they are accomplishing the goals for which they were intended and in a method and timetable that continues to be appropriate. In addition, the SWMP should be reviewed and revised as necessary to keep text and appendices current. For example:

- After each year of stormwater monitoring to update appended findings and priorities.
- As needed to keep appended IDDE investigation, identification and removal documentation current.
- After each NPDES stormwater permit renewal to incorporate new requirements, as well as append copies of new permits and associated Notices of Intent (NOIs).

- After adoption of any new or revised ordinances or other regulatory mechanisms related to stormwater or drainage infrastructure.

Salisbury undertook this SWMP, in part, in order to ensure the protection of its water resources and the large investment in drainage infrastructure. Periodic review and revision of this written document will help achieve these goals on a perpetual basis.

7.3 Modifications to the SWMP or Notice of Intent

As discussed above, minor modifications to this SWMP should be made on a regular and frequent basis to keep it current. However, major changes to the SWMP or needed modifications to the NOI for inclusion under the NPDES Permit require an official process. In accordance with the MS4 Permit, modifications to the SWMP or NOI may be made under the following provisions:

- At any time, the Town may add (but not subtract or replace) components, controls or requirements to the SWMP.
- The Town may request to replace an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP at any time if the basis for the change is documented in the SWMP by, at a minimum:
    - An analysis of why the BMP is ineffective or infeasible (or cost prohibitive).
    - Expectations on the effectiveness of the replacement BMP.
    - An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.
- The Town shall indicate BMP modifications along with a brief explanation of the modification in each Annual Report.

At this time, Salisbury does not anticipate any major modifications to the SWMP or NOI requiring official notification.

Weston & Sampson℠

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STORMWATER MANAGEMENT PLAN APPENDICES

MS4 GENERAL PERMIT COMPLIANCE

JUNE 2019

TOWN OF
Salisbury
MASSACHUSETTS

swmp

APPENDICES

APPENDIX A

Abbreviations and Definition

ABBREVIATIONS AND DEFINITIONS

Best Management Practices (BMPs) - schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Common Plan of Development - a "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times different schedules under one plan. For example, if developer buys a 20-acre lot and builds roads, installs pipes, and runs electricity with the intention of constructing homes or other structures sometime in the future, this would be considered a larger common plan of development or sale. If the land is parceled off or sold, and construction occurs on plots that are less than one acre by separate, independent builders, this activity still would be subject to stormwater permitting requirements if the smaller plots were included on the original site plan.

Control Measure - refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director - a Regional Administrator of the Environmental Protection Agency or an authorized representative.

Discharge - when used without qualification, means the "discharge of a pollutant."

Discharge of a pollutant - any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man; or discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

Discharge-related activities - activities which cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction and operation of BMPs to control, reduce, or prevent pollution in the discharges.

Disturbance - action to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

Existing Discharger – an operator applying for coverage under this permit for discharges covered previously under an NPDES general or individual permit.

Facility or Activity - any NPDES “point source” or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES
program.

Federal Facility – any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

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

Impaired Water – a water is impaired if it does not meet one or more of its designated use(s). For purposes of this permit, "impaired" refers to categories 4 and 5 of the five-part categorization approach used for classifying the water quality standards attainment status for water segments under the TMDL program. Impaired waters compilations are also sometimes referred to as "303(d) lists." Category 5 waters are impaired because at least one designated use is not being supported or is threatened and a TMDL is needed. Category 4 waters indicate that at least one designated use is not being supported but a TMDL is not needed (4a indicates that a TMDL has been approved or established by EPA; 4b indicates other required control measures are expected in result in the attainment of water quality standards in a reasonable period of time; and 4c indicates that the nonattainment of the water quality standard is the result of pollution (e.g. habitat) and is not caused by a pollutant). See USEPA's 2006 Integrated Report Guidance, July 29, 2005 for more detail on the five-part categorization of waters [under EPA National TMDL Guidance http://www.epa.gov/owow/tmdl/policy.html]).

Impervious Surface- any surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using non porous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.

Industrial Activity - the ten categories of industrial activities included in the definition of "stormwater discharges associated with industrial activity," as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

Industrial Stormwater - stormwater runoff associated with the definition of "stormwater discharges associated with industrial activity."

Interconnection – the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is eventually conveyed to a water of the United States. Interconnections shall be treated similarly to outfalls throughout the permit.

Junction Manhole - for the purposes of this permit, a 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 Manhole - for the purposes of this permit, 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.

Municipal Separate Storm Sewer - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying stormwater;(iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Municipal Separate Storm Sewer System (MS4) - means all separate storm sewers that are defined as "large" or "medium" or "small" municipal storm sewer systems pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). For the purposes of this permit "MS4" may also refer to the permittee with jurisdiction over the sewer system.

New Development – any construction activities or land alteration resulting in total earth disturbances 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. (see part 2.3.6. of the permit)

New Discharger – for the purposes of this permit, a new discharger is an entity that discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

New Source - any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

No exposure - all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff.

One Lane Width – the width of the travel lane for a roadway. Lane width does not include shoulders, curbs, and on-street parking areas.

Outfall Catchment – the land area draining to a single outfall or interconnection. The extent of an outfall's catchment is determined not only by localized topography and impervious cover but also by the location of drainage structures and the connectivity of MS4 pipes.

Owner or operator - the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Person - an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point source - any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water.

Pollutant of concern – a pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing an impairment in a State's 303(d) list.

Redevelopment – for the purposes of part 2.3.6., any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

Runoff coefficient - the fraction of total rainfall that will appear at the conveyance as runoff.

Site – for the purposes of part 2.3.6., the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.d.)

Small Municipal Separate Storm Sewer System – all separate storm sewer systems that are (i) owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, and (ii) not defined as "large" or "medium" municipal separate storm sewer system pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings.

Small MS4 – means a small municipal separate storm sewer system.

Stormwater - stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Discharges Associated with Construction Activity - a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Stormwater Discharges Associated with Industrial Activity - the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste water (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in Appendix D of this permit. The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v).

Total Maximum Daily Loads (TMDLs) - a TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

Urbanized Area – US Census designated area comprised of a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. For the purposes of this permit, Urbanized Areas as defined by any Census since 2000 remain subject to stormwater regulation even if there is a change in the reach of the Urbanized Area because of a change in more recent Census
data.

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

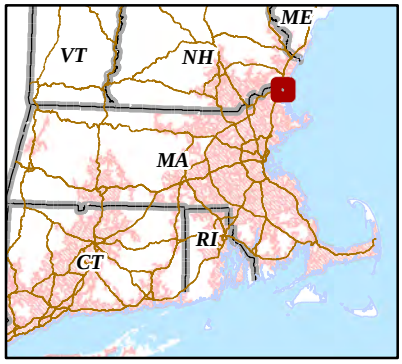
Water Quality Standards - a water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt WQS to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)).

ABBREVIATIONS AND ACRONYMS

BMP – Best Management Practice
BPJ – Best Professional Judgment
CGP – Construction General Permit
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DCIA – Directly Connected Impervious Area
EPA – U. S. Environmental Protection Agency
ESA – Endangered Species Act
USFWS – U. S. Fish and Wildlife Service
IA – Impervious Area
IDDE – Illicit Discharge Detection and Elimination
LA – Load Allocations
MS4 – Municipal Separate Storm Sewer System
MSGP – Multi-Sector General Permit
NHPA – National Historic Preservation Act
NMFS – U. S. National Marine Fisheries Service
NOI – Notice of Intent
NPDES – National Pollutant Discharge Elimination System
NRHP – National Register of Historic Places
NSPS – New Source Performance Standard
PCP – Phosphorus Control Plan
SHPO – State Historic Preservation Officer
SPCC – Spill Prevention, Control, and Countermeasure
SWMP – Stormwater Management Program
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids
WLA – Wasteload Allocation
WQS – Water Quality Standard

APPENDIX B

Regulated Area Map



NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Salisbury MA

Regulated Area:

UA Based on 2000 Census | UA Based on 2010 Census

0 1 2 3 Kilometers

0 1 2 3 Miles

Town Population: 8012

Regulated Population: 7126

(Populations estimated from 2010 Census)

EPA

Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map © 2013 Microsoft Corporation
and its data suppliers

US EPA Region 1 GIS Center Map #8824, 8/9/2013

APPENDIX C

2016 MS4 Permit

Minor Permit Modification Summary

The following permit has been modified in accordance with 40 CFR §122.63:

Permit Name: GENERAL PERMITS FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS IN MASSACHUSETTS

Issue date: April 4, 2016

Effective Date: July 1, 2018

The following minor modifications were made on November 7, 2018**:**

Page	Modification
2	Table of Contents was updated to reflect the changes below
3	Table of Contents was updated to reflect the changes below
5	Line was added before first bullet point for consistency
6	Line was removed between parts for consistency
8	Lines were added and removed between parts for consistency
8	Typos were fixed
11	Extra word was removed
11	Extra spaces were removed between words for consistency
12	Extra spaces were removed between words for consistency
12	Extra words were removed
12	Text was moved to a bullet point in the last paragraph of part 1.10.2 instead of as part of the 1.10.3 title for consistency
12	Duplicate words and symbols were deleted
13	Bullets were moved to the correct subsection, consistent with other relevant sections of the permit
14	Typos were fixed
15	Extra spaces were removed between words for consistency
16	Extra spaces were removed between words for consistency
27	Extra spaces were removed between words for consistency
27	Duplicate character was removed
29	Typo was fixed
30	Duplicate character was removed
32	Lines were added before bullet points for consistency
33	Lines were added and removed between paragraphs for consistency
34	Line was added before bullet points for consistency
34	Typo was fixed
34	Duplicate spaces were removed
35	Typo was fixed
35	Line was added before bullet points for consistency
36	Lines were added before bullet points and in between parts for consistency
37	Lines were added before bullet points and in between parts for consistency
38	Line was added in between parts for consistency
38	Typos were fixed

39	Line was added in between paragraphs for consistency
39	Typos were fixed
41	Lines were added before bullets for consistency
42	Typos were fixed
43	Typo was fixed
44	Line was added for consistency
46	Typo was fixed
50	Typo was fixed
51	Typo was fixed
54	Line was added for consistency
55	Line was added for consistency
56	Typo was fixed
56	Line was added for consistency
57	Lines were added and removed for consistency

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

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;

These permits become effective on **July 1, 2017**.

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

Signed this 4th day of April, 2016

Ken Moraff, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

Signed this 4th day of April 2016

Douglas E. Fine
Assistant Commissioner for Water Resources
Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

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1.0. Introduction

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

1.1. Areas of Coverage

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

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

1.2. Eligibility

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

1.2.1. Small MS4s Covered

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

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

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

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

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

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

1.3. Limitations on Coverage

This permit does not authorize the following:

a. Stormwater discharges mixed with sources of non-stormwater unless such non-stormwater discharges are:

- Authorized under a separate NPDES permit; or
- A non-stormwater discharge as listed in part 1.4.

b. Stormwater discharges associated with industrial activity as defined in 40 CFR §122.26 (b) (14) (i)-(ix) and (xi).

c. Stormwater discharges associated with construction activity as defined in 40 CFR §122.26(b) (14) (x) or (b) (15).

d. Stormwater discharges currently authorized under another NPDES permit, including discharges covered under other regionally issued general permits.

e. Stormwater discharges or discharge related activities that are likely to adversely affect any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA. The permittee shall follow the procedures detailed in Appendix C to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.

f. Stormwater discharges whose direct or indirect impacts do not prevent or minimize adverse effects on any Essential Fish Habitat.

g. Stormwater discharges, or implementation of a stormwater management program, which adversely affects properties listed or eligible to be listed on the National Register of Historic Places. The permittee shall follow the procedures detailed in Appendix D to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.

h. Stormwater discharges prohibited under 40 CFR § 122.4.

i. Stormwater discharges to the subsurface subject to state Underground Injection Control (UIC) regulations. Although the permit includes provisions related to infiltration and groundwater recharge, structural controls that dispose of stormwater into the ground may be subject to UIC regulation requirements. Authorization for such discharges shall be obtained from Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, Underground Injection Control, One Winter Street, Boston, MA 02108 – phone 617-292-5859.

j. Any non-traditional MS4 facility that is a "new discharger" as defined in part 5.1.4. and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or (Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride) or oil and grease

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

1.4. Non-Stormwater Discharges

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

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

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

1.5. Permit Compliance

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

1.6. Continuation of this Permit

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

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

- Authorization or denial under an alternative general permit.

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

1.7. Obtaining Authorization to Discharge

1.7.1. How to Obtain Authorization to Discharge

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

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

1.7.2. Notice of Intent

a. Operators of Small MS4s seeking authorization to discharge under the terms and conditions of this permit shall submit a Notice of Intent that contains the information identified in Appendix E. This includes operators of small MS4s that were previously authorized under the May 1, 2003 small MS4 general permit (MS4-2003 permit).

b. The NOI shall be signed by an appropriate official (see Appendix B, Subparagraph B.11, Standard Conditions).

c. The NOI shall contain the following certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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

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

1.7.3. Submission of Notice of Intent

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

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

Boston, MA 02109

Or submitted electronically to EPA at the following email address: stormwater.reports@epa.gov

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

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

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

1.7.4. Public Notice of NOI and Effective Date of Coverage

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

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

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

1.8. Individual Permits and Alternative General Permits

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

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

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

c. When an individual NPDES permit is issued, or a small MS4 is authorized to discharge under an alternative NPDES general permit, authorization under this permit automatically terminates on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

1.9. Special Eligibility Determinations

1.9.1. Documentation Regarding Endangered Species

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

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

1.9.2. Documentation Regarding Historic Properties

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

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

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

1.10. Stormwater Management Program (SWMP)

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

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

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

1.10.1. Stormwater Management Program Availability

a. The permittee shall retain a copy of the current SWMP required by this permit at the office or facility of the person listed as the program contact on the submitted Notice of Intent (NOI). The SWMP shall be immediately available to representatives from EPA, MassDEP, U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) at the time of an onsite inspection or upon request.

b. The permittee shall make the SWMP available to the public during normal business hours. The permittee shall also post the SWMP online[1] if the permittee has a website on which to post the SWMP.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- Timelines for public education requirements in part 2.3.2.c shall be extended by one (1) year and need to include one (1) message to each audience over the permit term;
- The ordinances, by-laws, or other regulatory mechanisms required by parts 2.3.4, 2.3.5 and 2.3.6 shall be completed as soon as possible, but no later than three (3) years from the permit effective date; and
- All other deadlines in part 2.3.4 shall be extended by three (3) years.
- All other deadlines in part 2.3.5, 2.3.6 and 2.3.7 shall be extended by two (2) years.
- All deadlines for discharges to water quality limited waters without a TMDL under part 2.2.2 shall be extended by two (2) years.

b. Contents of the Stormwater Management Program for New Permittees

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

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

For each permit condition in part 2.3 identify:
- The person(s) or department responsible for the measure;
- The BMPs for the control measure or permit requirement;
- The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;

- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770. Description of activities to achieve compliance with part 3.0;
- Annual program evaluation (part 4.1). Update annually and maintain copies.

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

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

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

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

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

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

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

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

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

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

2.0. Non-Numeric Effluent Limitations

The permittee shall develop, implement, and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act and the Massachusetts Water Quality Standards.

2.1. Water Quality Based Effluent Limitations

Pursuant to Clean Water Act 402(p)(3)(B)(iii), this permit includes provisions to ensure that discharges from the permittee's small MS4 do not cause or contribute to an exceedance of water quality standards, in addition to requirements to reduce the discharge of pollutants to the maximum extent practicable. The requirements found in this part and part 2.2 constitute appropriate water quality based effluent limits of this permit. Requirements to reduce the discharge of pollutants to the maximum extent practicable are set forth in part 2.3.

2.1.1. Requirement to Meet Water Quality Standards

a. The permittee shall reduce the discharge of pollutants such that the discharges from the MS4 do not cause or contribute to an exceedance of water quality standards.

b. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is subject to an approved TMDL identified in part 2.2.1, the permittee is subject to the requirements of part 2.2.1 and Appendix F of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix F. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix F applicable to it will constitute compliance with part 2.1.1.a. of the Permit.

c. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is water quality limited (see definition in Appendix A) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease) and is not subject to an approved TMDL, or the MS4 is located within a municipality listed in part 2.2.2.a.-b., the permittee is subject to the requirements of part 2.2.2 and Appendix H of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix H. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix H applicable to it will constitute compliance with part 2.1.1.a. of the Permit.

d. Except where a pollutant of concern in a discharge is subject to the requirements of part 2.2.1 and/or part 2.2.2 of this permit or is the result of an illicit discharge and subject to part 2.3.4 of this Permit, if a pollutant in a discharge from the MS4 is causing or contributing to a violation of applicable water quality criteria[2] for the receiving water, the permittee shall, as expeditiously as possible, but no later than 60 days of becoming aware of the situation, reduce or eliminate the pollutant in its discharge such that the discharge meets applicable water quality criteria.

2.1.2. Increased Discharges

a. Any increased discharge, including increased pollutant loading(s) through the MS4 to waters of the United States is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate[3]. Any authorization of an increased discharge by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

b. There shall be no increased discharges, including increased pollutant loading(s) from the MS4 to impaired waters listed in categories 5 or 4b on the most recent Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) unless the permittee demonstrates that there is no net increase in loading from the MS4 to the impaired water of the pollutant(s) for which the waterbody is impaired. The permittee may demonstrate compliance with this provision by *either:*

i. Documenting that the pollutant(s) for which the waterbody is impaired is not present in the MS4's discharge and retaining documentation of this finding with the SWMP; or

[2] Applicable water quality criteria are part of the state standards that have been federally approved as of the effective date of this permit and are compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

[3] Contact MassDEP for guidance on compliance with 314 CMR 4.04

ii. Documenting that the total load of the pollutant(s) of concern from the MS4 to any impaired portion of the receiving water will not increase as a result of the activity and retaining documentation of this finding in the SWMP. Unless otherwise determined by the Permittee, USEPA or by MassDEP that additional demonstration is necessary, compliance with the requirements of part 2.2.2 and part 2.3.6 of this Permit, including all reporting and documentation requirements, shall be considered as demonstrating no net increase as required by this part.

c. The requirements of this part are independent of permit conditions requiring reduction in discharges of pollutants as set forth in parts 2.1.1 and 2.2 (water quality based requirements) and 2.3 (requirements to reduce discharge of pollutants to the maximum extent practicable). Permittees remain subject to requirements to reduce the discharge of pollutants from the MS4 as set forth in those parts.

2.2. Discharges to Certain Impaired Waters

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

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

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

2.2.1. Discharges Subject to Requirements Related to an Approved TMDL

a. "Approved TMDLs" are those that have been approved by EPA as of the date of issuance of this permit.

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

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

1.

Arlington	Mendon
Ashland	Milford
Bellingham	Millis
Belmont	Natick
Brookline	Needham
Cambridge	Newton
Dedham	Norfolk

Dover	Sherborn
Foxborough	Walpole
Franklin	Waltham
Holliston	Watertown
Hopedale	Wayland
Hopkinton	Wellesley
Lexington	Weston
Lincoln	Westwood
Medfield	Wrentham
Medway	

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

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

1.

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

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

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

1.

Abington	Marshfield
Acushnet	Mashpee
Andover	Mattapoisett
Avon	Medfield
Barnstable	Medway
Bedford	Melrose
Bellingham	Mendon
Belmont	Milford
Berkley	Millis
Beverly	Milton
Billerica	Nahant
Bourne	Natick
Brewster	Needham
Bridgewater	New Bedford
Brockton	Newton
Brookline	Norfolk
Burlington	North Andover
Cambridge	Norton
Canton	Norwell
Chatham	Norwood
Cohasset	Orleans
Concord	Peabody
Danvers	Pembroke
Dartmouth	Plymouth
Dedham	Raynham
Dennis	Rehoboth
Dighton	Revere
Dover	Rockland
Duxbury	Rockport
East Bridgewater	Salem
Eastham	Sandwich
Essex	Saugus
Everett	Scituate
Fairhaven	Seekonk
Fall River	Sharon
Falmouth	Sherborn
Foxborough	Somerset
Franklin	Stoughton

Freetown	Swampscott
Gloucester	Swansea
Hanover	Taunton
Hanson	Tewksbury
Harwich	Wakefield
Holliston	Walpole
Hopedale	Waltham
Hopkinton	Wareham
Ipswich	Watertown
Kingston	Wellesley
Lawrence	Wellfleet
Lexington	West Bridgewater
Lincoln	Weston
Lynn	Westport
Lynnfield	Westwood
Malden	Whitman
Manchester	Wilmington
Mansfield	Winthrop
Marblehead	Yarmouth
Marion	

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

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

1.

Bourne
Barnstable
Chatham
Falmouth
Harwich
Mashpee
Orleans
Yarmouth

Permittees that operate regulated MS4s located in the municipalities above that discharge to waterbodies found on Table F-9 in Appendix F or their tributaries and any other MS4 that discharges to waterbodies found on Table F-9 in Appendix F or their

tributaries shall meet the requirements of Appendix F, part A.IV with respect to reduction of nitrogen discharges from their MS4.

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

1.

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

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

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

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

1.

Adams	North Adams
Agawam	Northampton
Amherst	Oxford
Ashburnham	Palmer
Ashby	Paxton
Auburn	Pelham
Belchertown	Pittsfield
Charlton	Richmond
Cheshire	Russell
Chicopee	Rutland
Dalton	South Hadley
Douglas	Southampton

Dudley	Southbridge
East Longmeadow	Southwick
Easthampton	Spencer
Gardner	Springfield
Granby	Sturbridge
Hadley	Sutton
Hampden	Templeton
Hatfield	Ware
Hinsdale	Webster
Holyoke	West Springfield
Lanesborough	Westfield
Leicester	Westhampton
Lenox	Westminster
Longmeadow	Wilbraham
Ludlow	Williamsburg
Millbury	Winchendon
Monson	

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

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

1.

Attleboro
North Attleborough
Plainville
Rehoboth
Seekonk
Swansea

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

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

1.

Attleboro

North Attleborough
Plainville
Rehoboth
Seekonk

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

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

1.

Attleboro
North Attleborough
Plainville
Seekonk

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

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

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

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

In the absence of a defined pollutant reduction target and where no approved TMDL has been established, this permit part and Appendix H define an iterative approach addressing pollutant reductions to waterbodies where the permittee's discharge is causing or contributing to an excursion above water quality standards due to nutrients (Total Nitrogen Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride), metals (Cadmium, Copper, Iron, Lead or Zinc) or oil and grease (Petroleum Hydrocarbons or Oil and Grease).

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

i. The requirements of this part are applicable to:

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

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

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to nitrogen (Total Nitrogen), or a tributary of such water.

ii. Permittees subject to part 2.2.2.a.i above shall meet the requirements of Appendix H part I with respect to the control of nitrogen discharges from their MS4;

iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a nitrogen (Total Nitrogen) impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.a.i and Appendix H part I.

b. Discharges to water quality limited waterbodies where phosphorus ("Total Phosphorus") is the cause of the impairment, or their tributaries

i. The requirements of this part are applicable to:

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

Abington	Lynn
Acushnet	Lynnfield
Andover	Malden
Arlington	Mansfield
Ashburnham	Marlborough
Ashland	Mashpee
Auburn	Medfield
Avon	Medford
Ayer	Melrose
Barnstable	Mendon
Bedford	Methuen
Belchertown	Millbury
Belmont	Millville
Billerica	Milton
Blackstone	North Andover
Bolton	Northbridge
Brewster	Norton
Bridgewater	Norwood
Brockton	Oxford
Burlington	Peabody
Cambridge	Pembroke
Canton	Pepperell
Carlisle	Pittsfield
Carver	Quincy
Chelmsford	Randolph
Chelsea	Reading

Clinton	Revere
Concord	Rockland
Dalton	Salem
Dedham	Scituate
Douglas	Seekonk
Dover	Sharon
Dracut	Shirley
Dunstable	Shrewsbury
East Bridgewater	Somerville
Eastham	Southampton
Easthampton	Spencer
Everett	Springfield
Falmouth	Stoneham
Fitchburg	Stoughton
Foxborough	Sudbury
Framingham	Sutton
Gloucester	Taunton
Grafton	Tewksbury
Granby	Townsend
Groton	Tyngsborough
Halifax	Upton
Hanover	Uxbridge
Hanson	Wakefield
Harvard	Walpole
Haverhill	Wareham
Hinsdale	Watertown
Hopkinton	Wayland
Hudson	West Bridgewater
Lancaster	Westfield
Lawrence	Westminster
Leicester	Westwood
Lenox	Whitman
Leominster	Wilmington
Lexington	Winchendon
Littleton	Winchester
Lowell	Winthrop
Lunenburg	Woburn
Lynn	

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to phosphorus ("Total Phosphorus"), or to a tributary of such water.

ii. The permittees subject to part 2.2.2.b.i. above shall meet all requirements of Appendix H part II with respect to the control of phosphorus discharges from the MS4.

iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a phosphorus ("Total Phosphorus") impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.b.i and Appendix H part II.

c. Discharges to water quality limited waterbodies where bacteria or pathogens is the cause of the impairment

i. The requirements of this part are applicable to:

1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where bacteria or pathogens (E. Coli, Enteroccus or Fecal Coliform) is the cause of the impairment.
2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to bacteria or pathogens.

ii. The permittees subject to part 2.2.2.c.i. shall meet all requirements of Appendix H part III with respect to reduction of bacteria or pathogens discharges from the MS4.

d. Discharges to water quality limited waterbodies where chloride (Chloride) is the cause of the impairment

i. The requirements of this part are applicable to:

1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where chloride (Chloride) is the cause of the impairment.
2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to chloride (Chloride).

ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part IV with respect to reduction of chloride discharges from the MS4.

e. Discharges to water quality limited waterbodies where oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment

i. The requirements of this part are applicable to:

1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA

approved Massachusetts 303(d) list where oil and grease, solids or metals (Oil and Grease, Petroleum Hydrocarbons TSS, Turbidity, Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment.

2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc).

ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part V with respect to reduction of solids, oil and grease or metals discharges from the MS4.

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

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

2.3.1. Control Measures

a. Permittees authorized under the MS4-2003 permit shall continue to implement their existing SWMPs while updating their SWMPs pursuant to this permit. This permit does not extend the compliance deadlines set forth in the MS4-2003 permit.

b. Implementation of one or more of the minimum control measures described in parts 2.3.2- 2.3.7 or other permit requirements may be shared with another entity (including another interconnected MS4) or the other entity may fully implement the measure or requirement, if the following requirements are satisfied:

- The other entity, in fact, implements the control measure.
- The particular control measure or component thereof undertaken by the other entity is at least as stringent as the corresponding permit requirement.
- The other entity agrees to implement the control measure on the permittee's behalf. The annual reports must specify that the permittee is relying on another entity to satisfy some of its permit obligations and specify what those obligations are.
- If the permittee is relying on another governmental entity regulated under 40 CFR §122 to satisfy all of its permit obligations, including the obligation to file annual reports, the permittee shall note that fact in its NOI, but is not required to file annual reports.
- The permittee remains responsible for compliance with all permit obligations if the other entity fails to implement the control measures (or component thereof). The permittee may enter into a legally binding agreement with the other entity regarding the other entity's performance of control measures, but the permittee remains ultimately responsible for permit compliance.

2.3.2. Public Education and Outreach

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

a. The permittee shall continue to implement the public education program required by the MS4-2003 permit by distributing educational material to the MS4 community. The educational program shall define educational goals, express specific messages, define the targeted audience for each message, and identify responsible parties for program implementation. If appropriate for the target audience, materials may be developed in a language other than English. At a minimum, the program shall provide information concerning the impact of stormwater discharges on water bodies within the community, especially those waters that are impaired or identified as priority waters. The program shall identify steps and/or activities that the public can take to reduce the pollutants in stormwater runoff and their impacts to the environment.

b. The educational program shall include education and outreach efforts for the following four audiences: (1) residents, (2) businesses, institutions (churches, hospitals), and commercial facilities, (3) developers (construction), and (4) industrial facilities, unless one of these audiences is not present in the MS4 community. In such a situation, the MS4 must document in both the NOI and SWMP which audience is absent from the community and no educational messages are required to that audience.

c. The permittee shall distribute a minimum of two (2) educational messages over the permit term to each audience identified in part 2.3.2.b. The distribution of materials to each audience shall be spaced at least a year apart. Educational messages may be printed materials such as brochures or newsletters; electronic materials such as websites; mass media such as newspaper articles or public service announcement (radio or cable); targeted workshops on stormwater management, or displays in a public area such as town/city hall. The permittee may use existing materials if they are appropriate for the message the permittee chooses to deliver or the permittee may develop its own educational materials. The permittee may partner with other MS4s, community groups or watershed associations to implement the education program to meet this permit requirement.

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

d. The permittee shall, at a minimum, consider the topics listed in part 2.3.2.d.i. – iv when developing the outreach/education program. The topics are not exclusive and the permittee shall focus on those topics most relevant to the community.

i. Residential program: effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses) on water quality; benefits of appropriate on-site infiltration of stormwater; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; proper management of pet waste; maintenance of septic systems. If the small MS4 area has areas serviced by septic systems, the permittee shall consider information pertaining to maintenance of septic systems as part of its education program.

ii. Business/Commercial/Institution program: proper lawn maintenance (use of pesticides, herbicides and fertilizer, and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses); benefits of appropriate on-site infiltration of stormwater; building maintenance (use of detergents); use of salt or other de-icing and anti-icing materials (minimize their use); proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and contamination to ground water); proper storage of materials (emphasize pollution prevention); proper management of waste materials and dumpsters (cover and pollution

prevention); proper management of parking lot surfaces (sweeping); proper car care activities (washing of vehicles and maintenance); and proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs (discharges must be dechlorinated and otherwise free from pollutants).

iii. Developers and Construction: proper sediment and erosion control management practices; information about Low Impact Development (LID) principles and technologies; and information about EPA's construction general permit (CGP). This education can also be a part of the Construction Site Stormwater Runoff Control measure detailed in part 2.3.5.

iv. Industrial program: equipment inspection and maintenance; proper storage of industrial materials (emphasize pollution prevention); proper management and disposal of wastes; proper management of dumpsters; minimization of use of salt or other de-icing/anti-icing materials; proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and ground water contamination); benefits of appropriate on-site infiltration of stormwater runoff from areas with low exposure to industrial materials such as roofs or employee parking; proper maintenance of parking lot surfaces (sweeping); and requirements for coverage under EPA's Multi-Sector General Permit.

e. The program shall show evidence of focused messages for specific audiences as well as evidence that progress toward the defined educational goals of the program has been achieved. The permittee shall identify methods that it will use to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge.

f. The permittee shall modify any ineffective messages or distribution techniques for an audience prior to the next scheduled message delivery.

g. The permittee shall document in each annual report the messages for each audience; the method of distribution; the measures/methods used to assess the effectiveness of the messages, and the method/measures used to assess the overall effectiveness of the education program.

2.3.3. Public Involvement and Participation

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

a. All public involvement activities shall comply with state public notice requirements (MGL Chapter 30A, Sections 18 – 25 – effective 7/10/2010). The SWMP and all annual reports shall be available to the public.

b. The permittee shall annually provide the public an opportunity to participate in the review and implementation of the SWMP.

c. The permittee shall report on the activities undertaken to provide public participation opportunities including compliance with part 2.3.3.a. Public participation opportunities pursuant

to part 2.3.3.b may include, but are not limited to, websites; hotlines; clean-up teams; monitoring teams; or an advisory committee.

2.3.4. Illicit Discharge Detection and Elimination (IDDE) Program

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

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

2.3.4.1. Definitions and Prohibitions

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

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

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

2.3.4.2. Elimination of Illicit Discharges

a. Upon detection of an illicit discharge, the permittee shall locate, identify and eliminate the illicit discharge as expeditiously as possible. Upon identification of the illicit source the MS4 notify all responsible parties for any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities. Where elimination of an illicit discharge within 60 days of its identification as an illicit discharge is not possible, the permittee shall establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the permittee's annual reports. The permittee shall immediately commence actions necessary for elimination. The permittee shall diligently pursue elimination of all illicit discharges. In the interim, the permittee shall take all reasonable and prudent measures to minimize the discharge of pollutants to and from its MS4.

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

2.3.4.3. Non-Stormwater Discharges

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

2.3.4.4. Sanitary Sewer Overflows

a. Upon detection of an SSO the permittee shall eliminate it as expeditiously as possible and take interim mitigation measures to minimize the discharge of pollutants to and from its MS4 until elimination is completed.

b. The permittee shall identify all known locations where SSOs have discharged to the MS4 within the previous five (5) years. This shall include SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems. Within one (1) year of the effective date of the permit, the permittee shall develop an inventory of all identified SSOs indicating the following information, if available:

1. Location (approximate street crossing/address and receiving water, if any);
2. A clear statement of whether the discharge entered a surface water directly or entered the MS4;
3. Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
4. Estimated volume(s) of the occurrence;
5. Description of the occurrence indicating known or suspected cause(s);
6. Mitigation and corrective measures completed with dates implemented; and
7. Mitigation and corrective measures planned with implementation schedules.

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

c. In accordance with Paragraph B.12 of Appendix B of this permit, upon becoming aware of an SSO to the MS4, the permittee shall provide oral notice to EPA within 24 hours. Additionally, the permittee shall provide written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence and shall include the information in the updated inventory. The notice shall contain all of the information listed in part 2.3.4.4.b. Where common notification requirements for SSOs are included in multiple NPDES permits issued to a permittee, a single notification may be made to EPA as directed in the permittee's wastewater or CSO NPDES permit and constitutes compliance with this part.

d. The permittee shall include and update the SSO inventory in its annual report, including the status of mitigation and corrective measures implemented by the permittee to address each SSO identified pursuant to this part.

e. The period between detection and elimination of a discharge from the SSO to the MS4 is not a grace period. Discharges from an MS4 that are mixed with an SSO are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

2.3.4.5. System mapping

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

a. Phase I: The system map shall be updated within two (2) years of the permit effective date to include the following information:

- Outfalls and receiving waters (required by MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems , bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
- Waterbodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of waters report pursuant to Clean Water Act section 303(d) and 305(b)
- Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations. For the purpose of this permit, a catchment is the area that drains to an individual outfall or interconnection.

b. Phase II: The system map shall be updated annually as the following information becomes available during implementation of catchment investigation procedures in part 2.3.4.8. This information must be included in the map for all outfalls within ten (10) years of the permit effective date:

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

c. Recommended elements to be included in the system map as information becomes available:

- Storm sewer material, size (pipe diameter) and age
- Sanitary sewer system material, size (pipe diameter) and age
- Privately-owned stormwater treatment structures
- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high-density urban areas
- Area where the permittee's MS4 has received or could receive flow from septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography

- Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
- Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates).

d. The mapping may be produced by hand or through computer-aided methods (e.g. GIS). The required scale and detail of the map shall be appropriate to facilitate a rapid understanding of the system by the permittee, EPA and the state. In addition, the mapping shall serve as a planning tool for the implementation and phasing of the IDDE program and demonstration of the extent of complete and planned investigations and corrections. The permittee shall update the mapping as necessary to reflect newly discovered information and required corrections or modifications.

e. The permittee shall report on the progress towards the completion of the system map in each annual report.

2.3.4.6. Written Illicit Discharge Detection and Elimination Program

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

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

a. The written (hardcopy or electronic) IDDE program shall include a reference or citation of the authority the permittee will use to implement all aspects of the IDDE program.

b. Statement of IDDE Program Responsibilities - The permittee shall establish a written (hardcopy or electronic) statement that clearly identifies responsibilities with regard to eliminating illicit discharges. The statement shall identify the lead municipal agency(ies) or department(s) responsible for implementing the IDDE Program as well as any other agencies or departments that may have responsibilities for aspects of the program (e.g., board of health responsibilities for overseeing septic system construction; sanitary sewer system staff; inspectional services for enforcing plumbing codes; town counsel responsibilities in enforcement actions, etc.). Where multiple departments and agencies have responsibilities with respect to the IDDE program specific areas of responsibility shall be defined and processes for coordination and data sharing shall be established and documented.

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

2.3.4.7. Assessment and Priority Ranking of Outfalls/Interconnections

The permittee shall assess and priority rank the outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. This ranking will determine the priority order for

screening of outfalls and interconnections pursuant to part 2.3.4.7.b, catchment investigations for evidence of illicit discharges and SSOs pursuant to part 2.3.4.8, and provides the basis for determining permit milestones of this part.

a. Outfall/Interconnection Inventory and Initial Ranking:
An initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information shall be completed within one (1) year from the effective date of the permit; an updated inventory and ranking will be provided in each annual report thereafter. The inventory shall be updated annually to include data collected in connection with the dry weather screening and other relevant inspections conducted by the permittee.

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

- An outfall means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. (40 CFR § 122.26(b)(9)). However, it is strongly recommended that a permittee inspect all accessible portions of the system as part of this process. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.
- An interconnection means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

ii. The permittee shall classify each of the permittee's outfalls and interconnections into one of the following categories:

- Problem Outfalls: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input.[4] Problem Outfalls need not be screened pursuant to part 2.3.4.7.b.
- High Priority Outfalls: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:
  - discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds;
  - determined by the permittee as high priority based on the characteristics listed below or other available information;
- Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.
- Excluded outfalls: Outfalls/interconnections with no potential for illicit discharges may be

[4] Likely sewer input indicators are any of the following:
- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

iii. The permittee shall priority rank outfalls into the categories above (except for excluded outfalls), based on the following characteristics of the defined initial catchment area where information is available:

- Past discharge complaints and reports.
- Poor receiving water quality- the following guidelines are recommended to identify waters as having a high illicit discharge potential: exceeding water quality standards for bacteria; ammonia levels above 0.5 mg/l; surfactants levels greater than or equal to 0.25 mg/l.
- Density of generating sites- Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
- Age of development and infrastructure – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- Sewer conversion – contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
- Historic combined sewer systems – contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
- Surrounding density of aging septic systems – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
- Culverted streams – any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.
- The permittee may also consider additional relevant characteristics, including location-specific characteristics; if so, the permittee shall include the additional characteristics in its written (hardcopy or electronic) IDDE program.

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

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

- sample collection,
- use of field kits,

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

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

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

iii. Screening requirements: For each outfall/interconnection:

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

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

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

3. If no flow is observed, but evidence of illicit flow exists, the permittee shall revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow (proceed as in iv. below).

4. Where dry weather flow is found at an outfall/interconnection, at least one (1) sample shall be collected, and:

    a) Samples shall be analyzed at a minimum for:

        - ammonia,
        - chlorine,
        - conductivity,
        - salinity,
        - *E. coli* (freshwater receiving water) or enterococcus (saline or brackish receiving water),
        - surfactants (such as MBAS),
        - temperature, and

- pollutants of concern[5]

b) All analyses with the exception of indicator bacteria and pollutants of concern can be performed with field test kits or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect those parameters at or below the threshold indicator concentrations of 0.5 mg/L for ammonia and 0.25 mg/L for surfactants. Sampling for residual chlorine must use a method with a detection limit of 0.02 mg/L or 20 ug/L.

iv. The permittee may rely on screening conducted under the MS4-2003 permit, pursuant to an EPA enforcement action, or by the state or EPA to the extent that it meets the requirements of part 2.3.4.7.b.iii.4. All data shall be reported in each annual report. Permittees that have conducted substantially equivalent monitoring to that required by part 2.3.4.7.b as part of an EPA enforcement action can request an exemption from the requirements of part 2.3.4.7.b by submitting a written request to EPA and retaining exemption approval from EPA as part of the SWMP. Until the permittee receives formal written approval of the exemption from part 2.3.4.7.b from EPA the permittee remains subject to all requirements of part 2.3.4.7.b.

v. The permittee shall submit all screening data used in compliance with this part in its Annual Report.

c. Follow-up ranking of outfalls and interconnections:

i. The permittee's outfall and interconnection ranking (2.3.4.7.a) shall be updated to reprioritize outfalls and interconnections based on information gathered during dry weather screening (part 2.3.4.7.b).

ii. Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or sampling results indicating sewer input[6] shall be considered highly likely to contain illicit discharges from sanitary sources, and such outfalls/interconnections shall be ranked at the top of the High Priority Outfalls category for investigation. At this time, permittees may choose to rank other outfalls and interconnections based on any new information from the dry weather screening.

iii. The ranking can be updated continuously as dry weather screening information becomes available, but shall be completed within three (3) years of the effective date of the permit.

2.3.4.8. Catchment Investigations

The permittee shall develop a systematic procedure to investigate each catchment associated with an

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

[6] Likely sewer input indicators are any of the following:

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

outfall or interconnection within their MS4 system.

a. Timelines:

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

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

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

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

ii. **Includes a manhole inspection methodology** that shall describe a storm drain network investigation that involves systematically and progressively observing, sampling (as required below) and evaluating key junction manholes (see definition in Appendix A) in the MS4 to determine the approximate location of suspected illicit discharges or SSOs. The manhole inspection methodology may either start from the outfall and work up the system or start from the upper parts of the catchment and work down the system or be a combination of both practices. Either method must, at a minimum, include an investigation of each key junction manhole within the MS4, even where no evidence of an illicit discharge is observed at the outfall. The manhole inspection methodology must describe the method the permittee will use. The manhole inspection methodology shall include procedures for dry and wet weather investigations.

iii. **Establishes procedures to isolate and confirm sources of illicit discharges** where manhole investigations or other physical evidence or screening has identified that MS4 alignments are influenced by illicit discharges or SSOs. These shall include isolation of the drainage area for implementation of more detailed investigations, inspection of additional manholes along the alignment to refine the location of potential contaminant sources, and methods such as sandbagging key junction manhole inlets, targeted internal plumbing inspections, dye testing,

[7] Likely sewer input indicators are any of the following:
- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

video inspections, or smoke testing to isolate and confirm the sources.

c. Requirements for each catchment investigation associated with an outfall/interconnection:

i. For each catchment being investigated, the permittee shall review relevant mapping and historic plans and records gathered in accordance with Part 2.3.4.8.b.i. This review shall be used to identify areas within the catchment with higher potential for illicit connections. The permittee shall identify and record the presence of any of the following specific **System Vulnerability Factors (SVFs)**:

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

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

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs;
- Any sanitary sewer and storm drain infrastructure greater than 40 years old;
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);

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

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

1. For all catchments
   a) Infrastructure information shall be incorporated into the permittee's mapping required at part 2.3.4.5; the permittee will refine their catchment delineation based on the field investigation where appropriate.

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

2. <u>For all catchments with a minimum of one (1) SVF identified</u>
    a) The permittee shall meet the requirements above for dry weather screening
    b) The permittee shall inspect and sample under wet weather conditions to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.
        1) The permittee shall conduct at least one wet weather screening and sampling at the outfall that includes the same parameters required during dry weather screening, part 2.3.4.7.b.iii.4.
        2) Wet weather sampling and screening shall proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge. EPA strongly recommends sampling during the spring (March through June) when groundwater levels are relatively high.
        3) The permit does not require a minimum rainfall event prior to wet weather screening. However, permittees may incorporate provisions that assist in targeting such discharges, including avoiding sampling during the initial period of discharge ("first flush") and/or identifying minimum storm event intensities likely to trigger sanitary sewer interconnections.
    c) This sampling can be done upon completion of any dry weather investigation but must be completed before the catchment investigation is marked as complete.

iii. All data collected as part of the dry and wet weather catchment investigations shall be recorded and reported in each annual report.

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

d. Identification/Confirmation of illicit source
Where the source of an illicit discharge has been approximated between two manholes in the permittee's MS4, the permittee shall isolate and identify/confirm the source of the illicit discharge using more detailed methods identified in their written procedure (2.3.4.8.b.iii). For outfalls that contained evidence of an illicit discharge, catchment investigations will be considered complete upon confirmation of all illicit sources.

e. Illicit discharge removal
When the specific source of an illicit discharge is identified, the permittee shall exercise its authority as necessary to require its removal pursuant to part 2.3.4.2 or 2.3.4.3.

i. For each confirmed source the permittee shall include in the annual report the following information:

- the location of the discharge and its source(s);
- a description of the discharge;
- the method of discovery;
- date of discovery;
- date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal; and
- estimate of the volume of flow removed.

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

2.3.4.9. Indicators of IDDE Program Progress

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

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

2.3.4.10 Ongoing Screening

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

2.3.4.11 Training

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

2.3.5. Construction Site Stormwater Runoff Control

Objective: The objective of an effective construction stormwater runoff control program is to minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S through the permittee's MS4. The construction site stormwater runoff control program required by this permit is a separate and distinct program from EPA's stormwater construction permit program. (http://cfpub1.epa.gov/npdes/stormwater/cgp.cfm)

a. Permittees shall implement and enforce a program to reduce pollutants in any stormwater runoff discharged to the MS4 from all construction activities that result in a land disturbance of greater than or equal to one acre within the regulated area. The permittee's program shall include disturbances less than one acre if that disturbance is part of a larger common plan of development or sale that would disturb one or more acres. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their existing program and modify as necessary to meet the requirements of this part.

b. The permittee does not need to apply its construction program requirements to projects that receive a waiver from EPA under the provisions of 40 CFR § 122.26(b) (15) (i).

c. The permittee shall develop and implement a construction site runoff control program that includes the elements in Paragraphs i. through v. of this part:

i. An ordinance or regulatory mechanism that requires the use of sediment and erosion control practices at construction sites. In addition to addressing sediment and erosion control, the ordinance must include controls for other wastes on construction sites such as demolition debris, litter and sanitary wastes. Development of an ordinance or other regulatory mechanism was a requirement of the MS4-2003 permit (See part II.B.4 and part IV.B.4).The ordinance or other regulatory mechanism required by the MS4-2003 permit shall have been effective by May 1, 2008.

ii. Written (hardcopy or electronic) procedures for site inspections and enforcement of sediment and erosion control measures. If not already existing, these procedures shall be completed within one (1) year from the effective date of the permit. The procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The program shall provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be documented in the SWMP.

iii. Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to BMP

design standards in state manuals, such as the Massachusetts Stormwater Handbook[9], or design standards developed by the MS4. EPA supports and encourages the use of design standards in local programs. Examples of appropriate sediment and erosion control measures for construction sites include local requirements to:

1. Minimize the amount of disturbed area and protect natural resources;
2. Stabilize sites when projects are complete or operations have temporarily ceased;
3. Protect slopes on the construction site;
4. Protect all storm drain inlets and armor all newly constructed outlets;
5. Use perimeter controls at the site;
6. Stabilize construction site entrances and exits to prevent off-site tracking;
7. Inspect stormwater controls at consistent intervals.

iv. Requirements for construction site operators within the MS4 jurisdiction to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes. These wastes may not be discharged to the MS4.

v. Written procedures for site plan review and inspection and enforcement. If not already existing, the procedures for site plan review and inspection and enforcement shall be completed within one (1) year from the effective date of the permit. The site plan review procedure shall include a pre-construction review by the permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development. The review procedure shall incorporate procedures for the consideration of potential water quality impacts, and procedures for the receipt and consideration of information submitted by the public. The site plan review procedure shall also include evaluation of opportunities for use of low impact design and green infrastructure. When the opportunity exists, the permittee shall encourage project proponents to incorporate these practices into the site design. The procedures for site inspections conducted by the permittee shall include the requirement that inspections occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans, clearly defined procedures for inspections including qualifications necessary to perform the inspections, the use of mandated inspection forms if appropriate, and procedure for tracking the number of site reviews, inspections, and enforcement actions. This tracking information shall be included as part of each annual report required by part 4.4.

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

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

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

[9] The handbook is available at: http://www.mass.gov/dep/water/laws/policies.htm#storm

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

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

a. Permittees shall develop, implement, and enforce a program to address post-construction stormwater runoff from all new development and redevelopment sites that disturb one or more acres and discharge into the permittees MS4 at a minimum. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their program and modify as necessary to meet the requirements of this part.

i. The permittee's new development/ redevelopment program shall include sites less than one acre if the site is part of a larger common plan of development or redevelopment which disturbs one or more acre.

ii. The permittee shall develop or modify, as appropriate, an ordinance or other regulatory mechanism within two (2) years of the effective date of the permit to contain provisions that are at least as stringent as the following:

1. Low Impact Development (LID) site planning and design strategies must be used to the maximum extent feasible.

2. The design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or State approved[10] BMP design guidance.

3. Stormwater management systems on new development sites shall be designed to:

a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;
b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2[11];
c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3[12];
d) Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5;
e) Protect Zone II or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6[13];

[10] State approved includes any state in the United States, including, but not limited to, approved guidance by the Commonwealth of Massachusetts
[11] Requirement necessary for Section 401 water quality certification by Massachusetts
[12] Requirement necessary for Section 401 water quality certification by Massachusetts
[13] Requirement necessary for Section 401 water quality certification by Massachusetts

f) Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9; and

g) Require that all stormwater management systems be designed to:

1) Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the site AND/OR

2) Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site[14] AND 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site[14]. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved[15] BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

4. Redevelopment Requirements

a) Stormwater management systems on Redevelopment sites shall meet the following sections of part 2.3.6.a.ii.3 to the maximum extent feasible:

1) Part 2.3.6.a.ii.3(a) (Massachusetts Stormwater Standard 1);
2) Part 2.3.6.a.ii.3(b) (Massachusetts Stormwater Standard 2);
3) Part 2.3.6.a.ii.3(c) (Massachusetts Stormwater Standard 3); and
4) The pretreatment and structural best management practices requirements of 2.3.6.a.ii.3(d) and 2.3.6.a.ii.3(e) (Massachusetts Stormwater Standards 5 and 6).

b) Stormwater management systems on Redevelopment sites shall also improve existing conditions by requiring that stormwater management systems be designed to:

1) Retain the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site AND/OR

2) Remove 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1 where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

c) Stormwater management systems on redevelopment sites may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site

[14] The required removal percentage is not required for each storm,it is the average removal over a year that is required
[15] See footnote 14

to meet the equivalent retention or pollutant removal requirements in part 2.3.6.a.ii.4(b).

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

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

b. Within four (4) years of the effective date of this permit, the permittee shall develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. If the assessment indicates that changes can be made, the assessment shall include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The local planning board and local transportation board should be involved in this assessment. This assessment shall be part of the SWMP. The permittee shall report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.

c. Within four (4) years from the effective date of the permit, the permittee shall develop a report assessing existing local regulations to determine the feasibility of making, at a minimum, the following practices allowable when appropriate site conditions exist:

i. Green roofs;

ii. Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and

iii. Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

The assessment should indicate if the practices are allowed in the MS4 jurisdiction and under what circumstances are they allowed. If the practices are not allowed, the permittee shall determine what hinders the use of these practices, what changes in local regulations may be made to make them allowable, and provide a schedule for implementation of recommendations. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The permittee shall report in each annual report on its findings and progress towards making the practices allowable.(Information available at: http://www.epa.gov/region1/npdes/stormwater/assets/pdf/AddressingBarrier2LID.pdf and http://www.mapc.org/resources/low-impact-dev-toolkit/local-codes-lid)

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

In determining the potential for modifying or retrofitting particular properties, the permittee shall consider factors such as access for maintenance purposes; subsurface geology; depth to water table; proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems; and opportunities for public use and education. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service; and control of discharges to water quality limited waters, first or second order streams, public swimming beaches, drinking water supply sources and shellfish growing areas.

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

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

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

a. Operations and Maintenance Programs

i. Within two (2) years from the effective date of the permit, the permittee shall develop, if not already developed, written (hardcopy or electronic) operations and maintenance

procedures for the municipal activities listed below in part 2.3.7.a.ii. These written procedures shall be included as part of the SWMP.

ii. Within two (2) year of the effective date of this permit, the permittee shall develop an inventory of all permittee owned facilities within the categories listed below. The permittee shall review this inventory annually and update as necessary.

1. Parks and open space: Establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers including minimizing the use of these products and using only in accordance manufacturer's instruction. Evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality. Protective practices include reduced mowing frequencies, proper disposal of lawn clippings, and use of alternative landscaping materials (e.g., drought resistant planting). Establish pet waste handling collection and disposal locations at all parks and open space where pets are permitted, including the placing of proper signage concerning the proper collection and disposal of pet waste. Establish procedures to address waterfowl congregation areas where appropriate to reduce waterfowl droppings from entering the MS4. Establish procedures for management of trash containers at parks and open space (scheduled cleanings; sufficient number). Establish procedures to address erosion or poor vegetative cover when the permittee becomes aware of it; especially if the erosion is within 50 feet of a surface water.

2. Buildings and facilities where pollutants are exposed to stormwater runoff: This includes schools (to the extent they are permittee-owned or operated), town offices, police, and fire stations, municipal pools and parking garages and other permittee-owned or operated buildings or facilities. Evaluate the use, storage, and disposal of petroleum products and other potential stormwater pollutants. Provide employee training as necessary so that those responsible for handling these products know proper procedures. Ensure that Spill Prevention Plans are in place, if applicable, and coordinate with the fire department as necessary. Develop management procedures for dumpsters and other waste management equipment. Sweep parking lots and keep areas surrounding the facilities clean to reduce runoff of pollutants.

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

iii. Infrastructure Operations and Maintenance

1. The permittee shall establish within two (2) year of the effective date of the permit a written (hardcopy or electronic) program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. If the permittee has an existing program to maintain its MS4 infrastructure

in a timely manner to reduce or eliminate the discharge of pollutants from the MS4, the permittee shall document the program in the SWMP.

2. The permittee shall optimize routine inspections, cleaning and maintenance of catch basins such that the following conditions are met:

   - Prioritize inspection and maintenance for catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment). Clean catch basins in such areas more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
   - Establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at anytime will be more than 50 percent full.
   - If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, the permittee shall document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources. The permittee shall describe any actions taken in its annual report.
   - For the purposes of this part, an excessive sediment or debris loading is a catch basin sump more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.
   - The permittee shall document in the SWMP and in the first annual report its plan for optimizing catch basin cleaning, inspection plans, or its schedule for gathering information to develop the optimization plan. Documentation shall include metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4. The permittee shall keep a log of catch basins cleaned or inspected.
   - The permittee shall report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins.

3. The permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. All streets with the exception of rural uncurbed roads with no catch basins or high speed limited access highways shall be swept and/or cleaned a minimum of once per year in the spring (following winter activities such as sanding). The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, water quality limited or TMDL waters or other relevant factors as determined by the permittee. The permittee shall report in each annual report the number of miles cleaned or the volume or mass of material removed.

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

4. The permittee shall ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving waters. These materials should be managed in compliance with current MassDEP policies:

   - For catch basins cleanings: http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html
   - For street sweepings: http://www.mass.gov/eea/docs/dep/recycle/laws/stsweep.pdf.

5. The permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States. For purposes of this MS4 Permit, salt shall mean any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

6. The permittee shall establish and implement inspection and maintenance frequencies and procedures for all stormwater treatment structures such as water quality swales, retention/detention basins, infiltration structures, proprietary treatment devices or other similar structures. All permittee-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.

iv. The permittee shall report in the annual report on the status of the inventory required by this part and any subsequent updates; the status of the O&M programs for the permittee-owned facilities and activities in part 2.3.7.a.ii; and the maintenance activities associated with each.

v. The permittee shall keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance activities, inspections and training required by part 2.3.7.a. The permittee shall maintain, consistent with part 4.2.a, all records associated with maintenance and inspection activities required by part 2.3.7.a.

b. Stormwater Pollution Prevention Plan (SWPPP)

The permittee shall develop and fully implement a SWPPP for each of the following permittee-owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater as determined by the permittee. If facilities are located at the same property, the permittee may develop one SWPPP for the entire property. The SWPPP is a separate and different document from the SWMP required in part 1.10. A SWPPP does not need to be developed for a facility if the permittee has either developed a SWPPP or received a no exposure certification for the discharge under the Multi-Sector General Permit or the discharge is authorized under another NPDES permit.

i. No later than two (2) years from the effective date of the permit, the permittee shall develop and implement a written (hardcopy or electronic) SWPPP for the facilities

described above. The SWPPP shall be signed in accordance with the signatory requirements of Appendix B – Subparagraph 11.

ii. The SWPPP shall contain the following elements:

1. Pollution Prevention Team
Identify the staff on the team, by name and title. If the position is unstaffed, the title of the position should be included and the SWPPP updated when the position is filled. The role of the team is to develop, implement, maintain, and revise, as necessary, the SWPPP for the facility.

2. Description of the facility and identification of potential pollutant sources
The SWPPP shall include a map of the facility and a description of the activities that occur at the facility. The map shall show the location of the stormwater outfalls, receiving waters, and any structural controls. Identify all activities that occur at the facility and the potential pollutants associated with each activity including the location of any floor drains. These may be included as part of the inventory required by part 2.3.7.a.

3. Identification of stormwater controls
The permittee shall select, design, install, and implement the control measures detailed in paragraph 4 below to prevent or reduce the discharge of pollutants from the permittee owned facility.

The selection, design, installation, and implementation of the control measures shall be in accordance with good engineering practices and manufacturer's specifications. The permittee shall also take all reasonable steps to control or address the quality of discharges from the site that may not originate at the facility.

If the discharge from the facility is to a water quality limited water and the facility has the potential to discharge the pollutant identified as causing the water quality limitation, the permittee shall identify the control measures that will be used to address this pollutant at the facility so that the discharge does not cause or contribute to a violation of a water quality standard.

4. The SWPPP shall include the following management practices:
   a) Minimize or Prevent Exposure: The permittee shall to the extent practicable either locate materials and activities inside, or protect them with storm-resistant coverings in order to prevent exposure to rain, snow, snowmelt and runoff (although significant enlargement of impervious surface area is not recommended). Materials do not need to be enclosed or covered if stormwater runoff from affected areas will not be discharged directly or indirectly to surface waters or to the MS4 or if discharges are authorized under another NPDES permit.

   b) Good Housekeeping: The permittee shall keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals. Ensure that trash containers are closed when not in use, keep storage areas well swept and free from leaking or damaged containers; and store leaking vehicles needing repair indoors.

c) Preventative Maintenance: The permittee shall regularly inspect, test, maintain, and repair all equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater to receiving waters. Inspections shall occur at a minimum once per quarter.

d) Spill Prevention and Response: The permittee shall minimize the potential for leaks, spills, and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, the permittee shall have procedures that include:

- Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.
- Response procedures that include notification of appropriate facility personnel, emergency agencies, and regulatory agencies, and procedures for stopping, containing, and cleaning up leaks, spills and other releases. Measures for cleaning up hazardous material spills or leaks shall be consistent with applicable Resource Conservation and Recovery Act (RCRA) regulations at 40 CFR section 264 and 40 CFR section 265. Employees who may cause, detect, or respond to a spill or leak shall be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the Pollution Prevention Team; and
- Contact information for individuals and agencies that shall be notified in the event of a leak, spill, or other release. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40 CFR section 110, 40 CFR section 117, or 40 CFR section 302, occurs during a 24-hour period, the permittee shall notify the National Response Center (NRC) at (800) 424-8802 in accordance with the requirements of 40 CFR section 110, 40 CFR section 117, and 40 CFR section 302 as soon as the permittee has knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency, public health or drinking water supply agencies, and owners of public drinking water supplies. Contact information shall be in locations that are readily accessible and available.

e) Erosion and Sediment Control: The permittee shall use structural and non-structural control measures at the facility to stabilize and contain runoff from exposed areas and to minimize or eliminate onsite erosion and sedimentation. Efforts to achieve this may include the use of flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion.

f) Management of Runoff: The permittee shall manage stormwater runoff from the facility to prevent or reduce the discharge of pollutants. This may include management practices which divert runoff from areas that are potential sources of pollutants, contain runoff in such areas, or reuse, infiltrate or treat stormwater to reduce the discharge of pollutants.

g) Salt Storage Piles or Piles Containing Salt: For storage piles of salt or piles containing salt used for deicing or other purposes (including maintenance of paved surfaces) for which the discharge during precipitation events discharges to the permittee's MS4, any other storm sewer system, or to a Water of the US, the permittee shall prevent exposure of the storage pile to precipitation by enclosing or covering the storage piles. Such piles shall be enclosed or covered within two (2) years of the permit effective date. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. The permittee is encouraged to store piles in such a manner as not to impact surface water resources, ground water resources, recharge areas, and wells.

h) Employee Training: The permittee shall regularly train employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP (e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team. Training shall cover both the specific components and scope of the SWPPP and the control measures required under this part, including spill response, good housekeeping, material management practices, any best management practice operation and maintenance, etc. EPA recommends annual training.

The permittee shall document the following information for each training:

- The training date, title and training duration;
- List of municipal attendees;
- Subjects covered during training

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

iii. The permittee shall conduct the following inspections:

1. Site Inspections: Inspect all areas that are exposed to stormwater and all stormwater control measures. Inspections shall be conducted at least once each calendar quarter. More frequent inspections may be required if significant activities are exposed to stormwater. Inspections shall be performed when the

facility is in operation. At least one of the quarterly inspections shall occur during a period when a stormwater discharge is occurring.

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

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

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

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

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

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

a. Permittees which discharge to public surface drinking water supply sources (Class A and Class B surface waters used for drinking water) or their tributaries should consider these waters a priority in the implementation of the SWMP.

b. Permittees should provide pretreatment and spill control measures to stormwater discharges to public drinking water supply sources or their tributaries to the extent feasible.

c. Direct discharges to Class A waters should be avoided to the extent feasible.

4.0. Program Evaluation, Record Keeping, and Reporting

4.1. Program Evaluation

a. The permittee shall annually self-evaluate its compliance with the terms and conditions of this permit and submit each self-evaluation in the Annual Report. The permittee shall also maintain the annual evaluation documentation as part of the SWMP.

b. The permittee shall evaluate the appropriateness of the selected BMPs in achieving the objectives of each control measure and the defined measurable goals. Where a BMP is found to be ineffective the permittee shall change BMPs in accordance with the provisions below. In addition, permittees may augment or change BMPs at any time following the provisions below:

- Changes adding (but not subtracting or replacing) components or controls may be made at any time.
- Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be made as long as the basis for the changes is documented in the SWMP by, at a minimum:

    - An analysis of why the BMP is ineffective or infeasible;
    - Expectations on the effectiveness of the replacement BMP; and
    - An analysis of why the replacement BMP is expected to achieve the defined goals of the BMP to be replaced.

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

c. EPA or MassDEP may require the permittee to add, modify, repair, replace or change BMPs or other measures described in the annual reports as needed:

- To address impacts to receiving water quality caused or contributed to by discharges from the MS4; or
- To satisfy conditions of this permit

Any changes requested by EPA or MassDEP will be in writing and will set forth the schedule for the permittee to develop the changes and will offer the permittee the opportunity to propose alternative program changes to meet the objective of the requested modification.

4.2. Record Keeping

a. The permittee shall keep all records required by this permit for a period of at least five years. EPA may extend this period at any time. Records include information used in the development of any written (hardcopy or electronic) program required by this permit, any monitoring results, copies of reports, records of screening, follow-up and elimination of illicit discharges; maintenance records; inspection records; and data used in the development of the notice of intent, SWMP, SWPPP, and annual reports. This list provides examples of records that should be maintained, but is not all inclusive.

b. Records other than those required to be included in the annual report, part 4.4, shall be submitted only when requested by the EPA or the MassDEP.

c. The permittee shall make the records relating to this permit, including the written (hardcopy or electronic) stormwater management program, available to the public. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests. The permittee is encouraged to satisfy this requirement by posting records online.

4.3. Outfall Monitoring Reporting

a. The permittee shall monitor and sample its outfalls at a minimum through sampling and testing at the frequency and locations required in connection with IDDE screening under part 2.3.4.7.b. and 2.3.4.8.c.ii.2. The monitoring program may also include additional outfall and interconnection monitoring as determined by the permittee in connection with assessment of SWMP effectiveness pursuant to part 4.1; evaluation of discharges to water quality limited waters pursuant to part 2.2; assessment of BMP effectiveness pursuant to part 2.2 or 2.3; or otherwise.

b. The permittee shall document all monitoring results each year in the annual report. The report shall include the date, outfall or interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results of all analyses. The annual report shall include all of this information and data for the current reporting period and for the entire permit period.

c. The permittee shall also include in the annual report results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period where that data is being used by the permittee to inform permit compliance or program effectiveness. If such monitoring or studies were conducted on behalf of the permittee, or if monitoring or studies conducted by other entities were reported to the permittee, a brief description of the type of information gathered or received shall be included in the annual report(s) covering the time period(s) the information was received.

4.4. Annual Reports

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

b. The annual reports shall contain the following information:

i. A self-assessment review of compliance with the permit terms and conditions.

ii. An assessment of the appropriateness of the selected BMPs.

iii. The status of any plans or activities required by part 2.1 and/ or part 2.2, including:

- Identification of all discharges determined to be causing or contributing to an exceedance of water quality standards and description of response including all items required by part 2.1.1;
- For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;
- For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.

iv. An assessment of the progress towards achieving the measurable goals and objectives of each control measure in part 2.3 including:

- Evaluation of the public education program including a description of the targeted messages for each audience; method of distribution and dates of distribution; methods used to evaluate the program; and any changes to the program.
- Description of the activities used to promote public participation including documentation of compliance with state public notice regulations.
- Description of the activities related to implementation of the IDDE program including: status of the map; status and results of the illicit discharge potential ranking and assessment; identification of problem catchments; status of all protocols described in part 2.3.4.(program responsibilities and systematic procedure); number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located; number of illicit discharges removed; gallons of flow removed; identification of tracking indicators and measures of progress based on those indicators; and employee training.
- Evaluation of the construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.
- Evaluation of stormwater management for new development and redevelopment including status of ordinance development (2.3.6.a.ii.), review and status of the street design assessment(2.3.6.b.), assessments to barriers to green infrastructure (2.3.6.c), and retrofit inventory status (2.3.6.d.)
- Status of the O&M Programs required by part 2.3.7.a.
- Status of SWPPP required by part 2.3.7.b. including inspection results.
- Any additional reporting requirements in part 3.0.

v. All outfall screening and monitoring data collected by or on behalf of the permittee during the reporting period and cumulative for the permit term, including but not limited to all data collected pursuant to part 2.3.4. The permittee shall also provide a description of any additional monitoring data received by the permittee during the reporting period.

vi. Description of activities for the next reporting cycle.

vii. Description of any changes in identified BMPs or measurable goals.

viii. Description of activities undertaken by any entity contracted for achieving any measurable goal or implementing any control measure.

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

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

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

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

5.0. Non-Traditional MS4s

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

5.1. Requirements for Non-Traditional MS4s

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

5.1.1. Public education

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

5.1.2. Ordinances and regulatory mechanisms

Some Non-traditional MS4s may not have authority to enact an ordinance, by-law, or other regulatory mechanisms. MS4s without the authority to enact an ordinance shall ensure that written policies or procedures are in place to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

5.1.3. Assessment of Regulations

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

5.1.4. New Dischargers

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

Consistent with these definitions, a Non-traditional MS4 is a "new discharger" if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not

physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

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

Any Non-traditional MS4 facility that is a "new discharger" and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate[16]. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

6.0 Requirements for MS4s Owned or Operated by Transportation Agencies

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

6.1 Public education

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

6.2 Ordinances and regulatory mechanisms

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

6.3 Assessment of regulations

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

6.4 New Dischargers

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of "new dischargers" under 40 CFR § 122.2: "A new discharger is any building, structure, facility or installation (a) from which there is or may be a 'discharge of pollutants' (b) that did not commence the 'discharge of pollutants' at a particular 'site' prior to August 13, 1979; (c) which is not a 'new source'; and (d) which never received a finally effective NPDES permit for discharges at that 'site.' The term "site" is defined

[16] Contact MassDEP for guidance on compliance with 314 CMR 4.04

in § 122.2 to mean "the land or water area where any 'facility or activity' is physically located or conducted including adjacent land used in connection with the facility or activity."

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

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

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate[17]. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

[17] Contact MassDEP for guidance on compliance with 314 CMR 4.04

Appendix A
Definitions, Abbreviations and Acronyms

Definitions

Best Management Practices (BMPs) - schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Common Plan of Development - A "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan. For example, if a developer buys a 20-acre lot and builds roads, installs pipes, and runs electricity with the intention of constructing homes or other structures sometime in the future, this would be considered a larger common plan of development or sale. If the land is parceled off or sold, and construction occurs on plots that are less than one acre by separate, independent builders, this activity still would be subject to stormwater permitting requirements if the smaller plots were included on the original site plan.

Control Measure - refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director - a Regional Administrator of the Environmental Protection Agency or an authorized representative.

Discharge - when used without qualification, means the "discharge of a pollutant."

Discharge of a pollutant - any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man; or discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

Discharge-related activities - activities which cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction and operation of BMPs to control, reduce, or prevent pollution in the discharges.

Disturbance - action to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

Existing Discharger – an operator applying for coverage under this permit for discharges covered previously under an NPDES general or individual permit.

Facility or Activity - any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

Federal Facility – Any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

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

Impaired Water – A water is impaired if it does not meet one or more of its designated use(s). For purposes of this permit, "impaired" refers to categories 4 and 5 of the five-part categorization approach used for classifying the water quality standards attainment status for water segments under the TMDL program. Impaired waters compilations are also sometimes referred to as "303(d) lists." Category 5 waters are impaired because at least one designated use is not being supported or is threatened and a TMDL is needed. Category 4 waters indicate that at least one designated use is not being supported but a TMDL is not needed (4a indicates that a TMDL has been approved or established by EPA; 4b indicates other required control measures are expected in result in the attainment of water quality standards in a reasonable period of time; and 4c indicates that the non-attainment of the water quality standard is the result of pollution (e.g. habitat) and is not caused by a pollutant). See *USEPA's 2006 Integrated Report Guidance, July 29, 2005* for more detail on the five part categorization of waters [under EPA National TMDL Guidance http://www.epa.gov/owow/tmdl/policy.html]).

Impervious Surface- Any surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using non porous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.

Industrial Activity - the ten categories of industrial activities included in the definition of "stormwater discharges associated with industrial activity," as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

Industrial Stormwater - stormwater runoff associated with the definition of "stormwater discharges associated with industrial activity."

Interconnection – the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is eventually conveyed to a water of the United States. Interconnections shall be treated similarly to outfalls throughout the permit.

Junction Manhole - For the purposes of this permit, a 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 Manhole - For the purposes of this permit, 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.

Municipal Separate Storm Sewer - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a combined sewer; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Municipal Separate Storm Sewer System (MS4) - means all separate storm sewers that are defined as "large" or "medium" or "small" municipal storm sewer systems pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). For the purposes of this permit "MS4" may also refer to the permittee with jurisdiction over the sewer system.

New Development – any construction activities or land alteration resulting in total earth disturbances 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. (see part 2.3.6. of the permit)

New Discharger – For the purposes of this permit, a new discharger is an entity that discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

New Source - any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

New Source Performance Standards (NSPS) – Technology-based standards for facilities that qualify as new sources under 40 CFR 122.2 and 40 CFR 122.29.

No exposure - all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff.

One Lane Width – The width of the travel lane for a roadway. Lane width does not include shoulders, curbs, and on-street parking areas.

Outfall Catchment – The land area draining to a single outfall or interconnection. The extent of an outfall's catchment is determined not only by localized topography and impervious cover but also by the location of drainage structures and the connectivity of MS4 pipes.

Owner or operator - the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Person - an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point source - any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water.

Pollutant of concern – A pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing an impairment in a State's 303(d) list.

Redevelopment – for the purposes of part 2.3.6., any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances greater than 1

acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

Reportable Quantity Release – a release of a hazardous substance at or above the established legal threshold that requires emergency notification. Refer to 40 CFR Parts 110, 177, and 302 for complete definitions and reportable quantities for which notification is required.

Runoff coefficient - the fraction of total rainfall that will appear at the conveyance as runoff.

Significant materials - includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.

Site – for the purposes of part 2.3.6., the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.d.)

Small Municipal Separate Storm Sewer System – all separate storm sewer systems that are (i) owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, and (ii) not defined as “large” or “medium” municipal separate storm sewer system pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings.

Small MS4 – means a small municipal separate storm sewer system.

Stormwater - stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Discharges Associated with Construction Activity - a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial

stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Stormwater Discharges Associated with Industrial Activity - the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in Appendix D of this permit. The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v).

Total Maximum Daily Loads (TMDLs) - A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

Urbanized Area – US Census designated area comprised of a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. For the purposes of this permit, Urbanized Areas as defined by any Census since 2000 remain subject to stormwater regulation even if there is a change in the reach of the Urbanized Area because of a change in more recent Census data.

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

Water Quality Standards - A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt WQS to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)).

ABBREVIATIONS AND ACRONYMS

BMP – Best Management Practice
BPJ – Best Professional Judgment
CGP – Construction General Permit
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 *et seq*)
DCIA – Directly Connected Impervious Area
EPA – U. S. Environmental Protection Agency
ESA – Endangered Species Act
USFWS – U. S. Fish and Wildlife Service
IA – Impervious Area
IDDE – Illicit Discharge Detection and Elimination
LA – Load Allocations
MOS – Margin of Safety
MS4 – Municipal Separate Storm Sewer System
MSGP – Multi-Sector General Permit
NHPA – National Historic Preservation Act
NMFS – U. S. National Marine Fisheries Service
NOI – Notice of Intent
NPDES – National Pollutant Discharge Elimination System
NRHP – National Register of Historic Places
NSPS – New Source Performance Standard
NTU – Nephelometric Turbidity Unit
PCP – Phosphorus Control Plan (pertaining to Charles River Watershed phosphorus TMDL requirements only – Appendix F Part A.I)
LPCP – Lake Phosphorus Control Plan (pertaining to Lake or pond phosphorus TMDL requirements only – Appendix F Part A.II)
POTW – Publicly Owned Treatment Works
RCRA – Resource Conservation and Recovery Act
SHPO – State Historic Preservation Officer
SIC – Standard Industrial Classification
SPCC – Spill Prevention, Control, and Countermeasure
SWMP – Stormwater Management Program
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids

USGS – United States Geological Survey
WLA – Wasteload Allocation
WQS – Water Quality Standard

Appendix B

Standard Permit Conditions

Standard Permit Conditions

Standard permit conditions in Appendix B are consistent with the general permit provisions required under 40 CFR 122.41.

B.1. Duty To Comply

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

A. You must comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

B. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (61 FR 252, December 31, 1996, pp. 69359-69366, as corrected in 62 FR 54, March 20, 1997, pp.13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every 4 years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties following were adjusted for inflation starting in 1996.

1. *Criminal Penalties.*

   a. *Negligent Violations*. The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than two years, or both.

   b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a

second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision be subject to a fine of not more than $1,000,000 and can fined up to $2,000,000 for second or subsequent convictions.

d. *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

2. *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $32,500 per day for each violation).

3. *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

3.1. *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $32,500).

3.2. *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $157,500).

B.2. Duty to Reapply

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain a new permit.

B.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B.4. Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

B.5. Proper Operation and Maintenance

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by you to achieve compliance with the conditions of this permit, including the requirements of your SWPPP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

B.6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

B.7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privileges.

B.8. Duty to Provide Information

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information which EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA upon request, copies of records required to be kept by this permit.

B.9. Inspection and Entry

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

A. Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

B.10. Monitoring and Records

A. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

B. You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of EPA at any time.

C. Records of monitoring information must include:

1. The date, exact place, and time of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) analyses were performed

4. The individual(s) who performed the analyses;

5. The analytical techniques or methods used; and

6. The results of such analyses.

D. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

E. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

B.11. Signatory Requirements

A. All applications, including NOIs, must be signed as follows:

1. For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

3. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

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 above 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;

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 SWPPP. A copy must be submitted to EPA, if requested.

C. Changes to Authorization. If an authorization under Appendix B, Subsection 11.B is no longer accurate because a different operator has responsibility for the overall operation of the industrial facility, a new NOI satisfying the requirements of Subsection 11.B must be submitted to EPA prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Any person signing documents required under the terms of this permit must include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

E. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

B.12. Reporting Requirements

A. Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR §122.42(a)(1).

B. Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Transfers. This permit is not transferable to any person except after notice to EPA. EPA may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See 40 CFR §122.61; in some cases, modification or revocation and reissuance is mandatory.)

D. Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

1. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms (paper or electronic) provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.

2. If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.

3. Calculations for all limitations which require averaging of measurements must use an arithmetic mean and non-detected results must be incorporated in calculations as the limit of quantitation for the analysis.

E. Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

F. Twenty-four hour reporting.

1. You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours

from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

2. The following shall be included as information which must be reported within 24 hours under this paragraph.

   a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)

   b. Any upset which exceeds any effluent limitation in the permit

   c. Violation of a maximum daily discharge limitation for any of the pollutants listed by EPA in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

3. EPA may waive the written report on a case-by-case basis for reports under Appendix B, Subsection 12.F.2 if the oral report has been received within 24 hours.

G. Other noncompliance. You must report all instances of noncompliance not reported under Appendix B, Subsections 12.D, 12.E, and 12.F, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix B, Subsection 12.F.

H. Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

B.13. Bypass

A. Definitions.

1. Bypass means the intentional diversion of waste streams from any portion of a treatment facility

2. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

B. Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential

maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix B, Subsections 13.C and 13.D.

C. Notice.

1. Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass.

2. Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix B, Subsection 12.F (24-hour notice).

D. Prohibition of bypass.

1. Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix B, Subsection 13.C.

2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix B, Subsection 13.D.1.

B.14. Upset

A. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix B, Subsection 14.C are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

C. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that you can identify the cause(s) of the upset;
2. The permitted facility was at the time being properly operated; and
3. You submitted notice of the upset as required in Appendix B, Subsection 12.F.2.b (24 hour notice).
4. You complied with any remedial measures required under Appendix B, Subsection 4.

D. Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, has the burden of proof.

APPENDIX C
ENDANGERED SPECIES GUIDANCE

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this general permit do not adversely affect endangered and threatened species or critical habitat. Applicants applying for permit coverage must assess the impacts of their stormwater discharges and discharge-related activities on federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat") to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit by following the steps in this Appendix[1].

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "take" of listed species[12]. The term "Take" is used in the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicant's activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the applicant has plans or activities in an area where endangered and threatened species are located, they may wish to ensure that they are protected from potential take liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection should confer with the appropriate United States Fish and Wildlife Service (USFWS) office or the National Marine Fisheries Service (NMFS), (jointly the Services).

Currently, there are 20 species of concern for applicants applying for permit coverage, namely the Dwarf wedgemussel *(Alasmidonta heterodon)*, Northeastern bulrush (*Scirpus ancistrochaetus*), Sandplain gerardia *(Agalinis acuta)*, Piping Plover (*Charadrius melodus*), Roseate Tern (*Sterna dougallii*), Northern Red-bellied cooter (*Pseudemys rubriventis)*, Bog Turtle (*Glyptemys muhlenbergii*), Small whorled Pogonia (*Isotria medeoloides*), Puritan tiger beetle (*Cicindela puritana*), American burying beetle (*Nicrophorus americanus*), Northeastern beach tiger beetle (*Cicindela dorsalis*), Northern Long-eared Bat *(Myotis septentriolis)*Atlantic Sturgeon *(Acipenser oxyrinchus*), Shortnose Sturgeon *(Acipenser brevirostrum)*, North Atlantic Right Whale (*Eubalaena glacialis*) Humpback Whale *(Megaptera novaengliae)*, Fin Whale (*Balaenoptera physalus)*, Kemp's Ridley Sea Turtle *(Lepidochelys kempii)*, Loggerhead Sea Turtle *(Caretta caretta)*, Leatherback Sea Turtle *(Dermochelys coriacea)*, and the Green Turtle *(Chelonia*

[1] EPA strongly encourages applicants to begin this process at the earliest possible stage to ensure the notification requirements for general permit coverage are complete upon Notice of Intent (NOI) submission.
[2] Section 9 of the ESA prohibits any person from "taking" a listed species (e.g. harassing or harming it) unless: (1) the taking is authorized through an "incidental take statement" as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conversion plan; or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

mydas). The Atlantic Sturgeon, Shortnose Sturgeon, North Atlantic Right Whale, Humpback Whale, Fin Whale, Loggerhead Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle and Green Turtle are listed under the jurisdiction of NMFS. The Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle are listed under the jurisdiction of the U.S. Fish and Wildlife Service.

Any applicant seeking coverage under this general permit, must consult with the Services where appropriate. When listed species are present, permit coverage is only available if EPA determines, or the applicant determines and EPA concurs, that the discharge or discharge related activities will have "no affect" on the listed species or critical habitat, or the applicant or EPA determines that the discharge or discharge related activities are "not likely to adversely affect" listed species or critical habitat and formal or informal consultation with the Services has been concluded and results in written concurrence by the Services that the discharge is "not likely to adversely affect" an endangered or threatened species or critical habitat.

EPA may designate the applicants as non-Federal representatives for the general permit for the purpose of carrying out formal or informal consultation with the Services (See 50 CFR §402.08 and §402.13). By terms of this permit, EPA has automatically designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the U.S. Fish and Wildlife Service. EPA has not designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the National Marine Fisheries Service. EPA has determined that discharges from MS4s are not likely to adversely affect listed species or critical habitat under the jurisdiction of the National Marine Fisheries Service. EPA has initiated informal consultation with the National Marine Fisheries Service on behalf of all permittees and no further action is required by permittees in order to fulfill ESA requirements of this permit related to species under the jurisdiction of NMFS

B. The U.S. Fish and Wildlife Service ESA Eligibility Process

Before submitting a notice of intent (NOI) for coverage by this permit, applicants must determine whether they meet the ESA eligibility criteria by following the steps in Section B of this Appendix. Applicants that cannot meet the eligibility criteria in Section B must apply for an individual permit.

The USFWS ESA eligibility requirements of this permit relating to the Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle may be satisfied by documenting that one of the following criteria has been met:

USFWS Criterion A: No endangered or threatened species or critical habitat are in proximity to the stormwater discharges or discharge related activities.

USFWS Criterion B: In the course of formal or informal consultation with the Fish and Wildlife Service, under section 7 of the ESA, the consultation resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by USFWS on a finding that the stormwater discharges and

discharge related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation).

USFWS Criterion C: Using the best scientific and commercial data available, the effect of the stormwater discharge and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the applicant and affirmed by EPA, that the stormwater discharges and discharge related activities will have "no affect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the USFWS.

1. The Steps to Determine if the USFWS ESA Eligibility Criteria Can Be Met

To determine eligibility, you must assess the potential effects of your known stormwater discharges and discharge related activities on listed species or critical habitat, PRIOR to completing and submitting a Notice of Intent (NOI). You must follow the steps outlined below and document the results of your eligibility determination.

Step 1 – Determine if you can meet USFWS Criterion A

USFWS Criterion A: You can certify eligibility, according to USFWS Criterion A, for coverage by this permit if, upon completing the Information, Planning, and Conservation (IPaC) online system process, you printed and saved the preliminary determination which indicated that federally listed species or designated critical habitats are not present in the action area. See Attachment 1 to Appendix C for instructions on how to use IPaC.

If you have met USFWS Criterion A skip to Step # 4.

If you have not met USFWS Criterion A, go to Step # 2.

Step 2 – Determine if You Can Meet Eligibility USFWS Criteria B

USFWS Criterion B: You can certify eligibility according to USFWS Criteria B for coverage by this permit if you answer "Yes" to **all** of the following questions:

1) Does your action area contain one or more of the following species: Sandplain gerardia, Small whorled Pogonia, American burying beetle, Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?
   AND
2) Did your assessment of the discharge and discharge related activities indicate that the discharge or discharge related activities "may affect" or are "not likely to adversely affect" listed species or critical habitat?
   AND
3) Did you contact the USFWS and did the formal or informal consultation result in either a "no jeopardy" opinion by the USFWS (for formal consultation) or concurrence by the

USFWS that your activities would be "not likely to adversely affect" listed species or critical habitat (for informal consultation)?
AND

4) Do you agree to implement all measures upon which the consultation was conditioned?
5) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will re-initiate informal or formal consultation with USFWS as necessary?

Use the guidance below Step 3 to understand effects determination and to answer these questions.

If you answered "Yes" to all four questions above, you have met eligibility USFWS Criteria B. Skip to Step 4.

If you answered "No" to any of the four questions above, go to Step 3.

Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C

USFWS Criterion C: You can certify eligibility according to USFWS Criterion C for coverage by this permit if you answer "Yes" to both of the following question:

1) Does your action area contain one or more of the following species: Northern Long-eared Bat, Sandplain gerardia, Small whorled Pogonia and/or American burying beetle and **does not** contain one any following species: Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?[3]
OR
2) Did the assessment of your discharge and discharge related activities and indicate that there would be "no affect" on listed species or critical habitat and EPA provided concurrence with your determination?
3) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will to conduct an endangered species screening for the proposed site and contact the USFWS if you determine that the new activity "may affect" or is "not likely to adversely affect" listed species or critical habitat under the jurisdiction of the USFWS.

Use the guidance below to understand effects determination and to answer these questions.

If you answered "Yes" to both the question above, you have met eligibility USFWS Criterion C. Go to Step 4.

If you answered "No" to either of the questions above, you are not eligible for coverage by this permit. You must submit an application for an individual permit for your stormwater discharges. (See 40 CFR 122.21).

USFWS Effects Determination Guidance:

If you are unable to certify eligibility under USFWS Criterion A, you must assess whether your stormwater discharges and discharge-related activities "may affect", will have "no affect" or are "not likely to adversely affect" listed species or critical habitat. "Discharge-related activities" include: activities which cause, contribute to, or result in point source stormwater pollutant discharges; and measures to provide treatment for stormwater discharges including the siting, construction and operational procedures to control, reduce or prevent water pollution. Please be aware that no protection from incidental take liability is provided under this criterion.

The scope of effects to consider will vary with each system. If you are having difficulty in determining whether your system is likely to cause adverse effects to a listed species or critical habitat, you should contact the USFWS for assistance. In order to complete the determination of effects it may be necessary to follow the formal or informal consultation procedures in section 7 of the ESA.

Upon completion of your assessment, document the results of your effects determination. If your results indicate that stormwater discharges or discharge related activities will have "no affect" on threatened or endangered species or critical habitat and EPA concurs with your determination, you are eligible under USFWS Criterion C of this Appendix. Your determination may be based on measures that you implement to avoid, eliminate, or minimized adverse effects.

If the determination is "May affect" or "not likely to adversely affect" you must contact the USFWS to discuss your findings and measures you could implement to avoid, eliminate, or minimize adverse effects. If you and the USFWS reach agreement on measures to avoid adverse effects, you are eligible under USFWS Criterion B. Any terms and/or conditions to protect listed species and critical habitat that you relied on in order to complete an adverse effects determination, must be incorporated into your Storm Water Management Program (required by this permit) and implemented in order to maintain permit eligibility.

If endangered species issues cannot be resolved: If you cannot reach agreement with the USFWS on measures to avoid or eliminate adverse effects then you are not eligible for coverage under this permit. You must seek coverage under an individual permit.

Effects from stormwater discharges and discharge-related activities which could pose an adverse effect include:

- *Hydrological:* Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely.
- *Habitat:* Excavation, site development, grading and other surface disturbance activities, including the installation or placement of treatment equipment may adversely affect listed species or their habitat. Stormwater from the small MS4 may inundate a listed species habitat.

- *Toxicity:* In some cases, pollutants in the stormwater may have toxic effects on listed species.

Step 4 - Document Results of the Eligibility Determination

Once the USFWS ESA eligibility requirements have been met, you shall include documentation of USFWS ESA eligibility in the Storm Water Management Program required by the permit. Documentation for the various eligibility criteria are as follows:

- USFWS Criterion A: A copy of the IPaC generated preliminary determination letter indicating that no listed species or critical habitat is present within your action area. You shall also include a statement on how you determined that no listed species or critical habitat are in proximity to your stormwater system or discharges.
- USFWS Criterion B: A dated copy of the USFWS letter of concurrence on a finding of "no jeopardy" (for formal consultation) or "not likely to adversely affect" (for informal consultation) regarding the ESA section 7 consultation.
- USFWS Criterion C: A dated copy of the EPA concurrence with the operator's determination that the stormwater discharges and discharge-related activities will have "no affect" on listed species or critical habitat.

C. Submittal of Notice of Intent

Once the ESA eligibility requirements of Part C of this Appendix have been metyoumay submit the Notice of Intent indicating which Criterion you have met to be eligible for permit coverage. Signature and submittal of the NOI constitutes your certification, under penalty of law, of eligibility for permit coverage under 40 CFR 122.21.

D. Duty to Implement Terms and Conditions upon which Eligibility was Determined

You must comply with any terms and conditions imposed under the ESA eligibility requirements to ensure that your stormwater discharges and discharge related activities do not pose adverse effects or jeopardy to listed species and/or critical habitat. You must incorporate such terms and conditions into your Storm Water Management Program as required by this permit. If the ESA eligibility requirements of this permit cannot be met, then you may not receive coverage under this permit and must apply for an individual permit.

E. Services Information

United States Fish and Wildlife Service Office

National websites for Endangered Species Information:
Endangered Species home page: http://endangered.fws.gov
ESA Section 7 Consultations: http://endangered.fws.gov/consultation/index.html
Information, Planning, and Conservation System (IPAC): http://ecos.fws.gov/ipac/

U.S. FWS – Region 5
Supervisor

New England Field Office
U.S. Fish and Wildlife Services
70 Commercial Street, Suite 300
Concord, NH 03301

Natural Heritage Network

The Natural Heritage Network comprises 75 independent heritage program organizations located in all 50 states, 10 Canadian provinces, and 12 countries and territories located throughout Latin America and the Caribbean. These programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. Developers, businesses, and public agencies use natural heritage information to comply with environmental laws and to improve the environmental sensitivity of economic development projects. Local governments use the information to aid in land use planning.

The Natural Heritage Network is overseen by NatureServe, the Network's parent organization, and is accessible on-line at: http://www.natureserve.org/nhp/us_programs.htm, which provides websites and other access to a large number of specific biodiversity centers.

U.S. Fish and Wildlife IPaC system instructions

Use the following protocol to determine if any federally listed species or designated critical habitats under USFWS jurisdiction exist in your action area:

Enter your project specific information into the "Initial Project Scoping" feature of the Information, Planning, and Conservation (IPaC) system mapping tool, which can be found at the following location:

http://ecos.fws.gov/ipac/

a. Indicate the action area[1] for the MS4 by either:
    a. Drawing the boundary on the map or by uploading a shapefile.
    Select "Continue"

c. Click on the "SEE RESOURCE LIST" button and on the next screen you can export a trust resources list.This will provided a list of natural resources of concern, which will include an Endangered Species Act Species list. You may also request an official species list under "REGULATORY DOCUMENTS" Save copies and retain for your records

[1] The action area is defined by regulation as all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action (50 CFR §402.02). This analysis is not limited to the "footprint" of the action nor is it limited by the Federal agency's authority. Rather, it is a biological determination of the reach of the proposed action on listed species. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

The documentation used by a Federal action agency to initiate consultation should contain a description of the action area as defined in the Services' regulations and explained in the Services' consultation handbook. If the Services determine that the action area as defined by the action agency is incorrect, the Services should discuss their rationale with the agency or applicant, as appropriate. Reaching agreement on the description of the action area is desirable but ultimately the Services can only consult when an action area is defined properly under the regulations.

For storm water discharges or discharge related activities, the action area should encompass the following:

- The immediate vicinity of, or nearby, the point of discharge into receiving waters.
- The path or immediate area through which or over which storm water flows from the municipality to the point of discharge into the receiving water. This includes areas in the receiving water downstream from the point of discharge.
- Areas that may be impacted by construction or repair activities. This extends as far as effects related to noise (from construction equipment, power tools, etc.) and light (if work is performed at night) may reach.

The action area will vary with the size and location of the outfall pipe, the nature and quantity of the storm water discharges, and the type of receiving waters, among other factors.

Appendix D
National Historic Preservation Act Guidance

Background

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of Federal "undertakings" on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. The term federal "undertaking" is defined in the NHPA regulations to include a project, activity, or program of a federal agency including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license or approval. See 36 CFR 800.16(y). Historic properties are defined in the NHPA regulations to include prehistoric or historic districts, sites, buildings, structures, or objects that are included in, or are eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. See 36 CFR 800.16(1).

EPA's issuance of a National Pollutant Discharge Elimination System (NPDES) General Permit is a federal undertaking within the meaning of the NHPA regulations and EPA has determined that the activities to be carried out under the general permit require review and consideration, in order to be in compliance with the federal historic preservation laws and regulations. Although individual submissions for authorization under the general permit do not constitute separate federal undertakings, the screening processes provides an appropriate site-specific means of addressing historic property issues in connection with EPA's issuance of the permit. To address any issues relating to historic properties in connection with the issuance of this permit, EPA has included a screening process for applicants to identify whether properties listed or eligible for listing on the National Register of Historic Places are within the path of their discharges or discharge-related activities (including treatment systems or any BMPs relating to the discharge or treatment process) covered by this permit.

Applicants seeking authorization under this general permit must comply with applicable, State, Tribal, and local laws concerning the protection of historic properties and places and may be required to coordinate with the State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) and others regarding effects of their discharges on historic properties.

Activities with No Potential to Have an Effect on Historic Properties

A determination that a federal undertaking has no potential to have an effect on historic properties fulfills an agency's obligations under NHPA. EPA has reason to believe that the vast majority of activities authorized under this general permit will have no potential effects on historic properties. This permit typically authorizes discharges from existing facilities and requires control of the pollutants discharged from the facility. EPA does not anticipate effects on historic properties from the pollutants in the authorized discharges. Thus, to the extent EPA's issuance of this general permit authorizes discharges of such constituents, confined to existing channels, outfalls or natural drainage areas, the permitting action does not have the potential to cause effects on historical properties.

In addition, the overwhelming majority of sources covered under this permit will be facilities that are seeking renewal of previous permit authorization. These existing dischargers should have already addressed NHPA issues in the previous general permit as they were required to certify that they were either not affecting historic properties or they had obtained written agreement from

the applicable SHPO or THPO regarding methods of mitigating potential impacts. To the extent this permit authorizes renewal of prior coverage without relevant changes in operations the discharge has no potential to have an effect on historic properties.

Activities with Potential to Have an Effect on Historic Properties

EPA believes this permit may have some potential to have an effect on historic properties the applicant undertakes the construction and/or installation of control measures that involve subsurface disturbance that involves less than 1 acre of land. (Ground disturbances of 1 acre or more require coverage under the Construction General Permit.) Where there is disturbance of land through the construction and/or installation of control measures, there is a possibility that artifacts, records, or remains associated with historic properties could be impacted. Therefore, if the applicant is establishing new or altering existing control measures to manage their discharge that will involve subsurface ground disturbance of less than 1 acre, they will need to ensure (1) that historic properties will not be impacted by their activities or (2) that they are in compliance with a written agreement with the SHPO, THPO, or other tribal representative that outlines all measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Examples of Control Measures Which Involve Subsurface Disturbance

The type of control measures that are presumptively expected to cause subsurface ground disturbance include:

- Dikes
- Berms
- Catch basins, drainage inlets
- Ponds, bioretention areas
- Ditches, trenches, channels, swales
- Culverts, pipes
- Land manipulation; contouring, sloping, and grading
- Perimeter Drains
- Installation of manufactured treatment devices

EPA cautions applicants that this list is non-inclusive. Other control measures that involve earth disturbing activities that are not on this list must also be examined for the potential to affect historic properties.

Certification

Upon completion of this screening process the applicant shall certify eligibility for this permit using one of the following criteria on their Notice of Intent for permit coverage:

> **Criterion A**: The discharges do not have the potential to cause effects on historic properties.

Criterion B: A historic survey was conducted. The survey concluded that no historic properties are present. Discharges do not have the potential to cause effects on historic properties.

Criterion C: The discharges and discharge related activities have the potential to have an effect on historic properties, and the applicant has obtained and is in compliance with a written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Authorization under the general permit is available only if the applicant certifies and documents permit eligibility using one of the eligibility criteria listed above. Small MS4s that cannot meet any of the eligibility criteria in above must apply for an individual permit.

Screening Process

Applicants or their consultant need to answer the questions and follow the appropriate procedures below to assist EPA in compliance with 36 CFR 800.

Question 1*:* Is the facility an existing facility authorized by the previous permit or a new facility and the applicant is not undertaking any activity involving subsurface land disturbance less than an acre?

YES - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.
The applicant should certify eligibility for this permit using Criterion A on their Notice of Intent for permit coverage. The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has "no potential to cause effects" (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

NO- Go to Question 2.

Question 2*:* Is the property listed in the National Register of Historic Places or have prior surveys or disturbances revealed the existence of a historic property or artifacts?

NO - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.
The applicant should certify eligibility for this permit using Criterion B on their Notice of Intent for permit coverage. The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has "no potential to cause effects" (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

YES - The applicant or their consultant should prepare a complete information submittal to the SHPO. The submittal consists of:

- Completed Project Notification Form- forms available at http://www.sec.state.ma.us/mhc/mhcform/formidx.htm;

- USGS map section with the actual project boundaries clearly indicated; and
- Scaled project plans showing existing and proposed conditions.

(1) Please note that the SHPO does not accept email for review. Please mail a paper copy of your submittal (Certified Mail, Return Receipt Requested) or deliver a paper copy of your submittal (and obtain a receipt) to:

State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Blvd.
Boston MA 02125.

(2) Provide a copy of your submittal and the proof of MHC delivery showing the date MHC received your submittal to:

NPDES Permit Branch Chief
US EPA Region 1 (OEP06-1)
5 Post Office Square, Suite 100
Boston MA 02109-3912.

The SHPO will comment within thirty (30) days of receipt of complete submittals, and may ask for additional information. Consultation, as appropriate, will include EPA, the SHPO and other consulting parties (which includes the applicant). The steps in the federal regulations (36 CFR 800.2 to 800.6, etc.) will proceed as necessary to conclude the Section 106 review for the undertaking. **The applicant should certify eligibility for this permit using Criterion C on their Notice of Intent for permit coverage.**

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

Part I: General Conditions

General Information

Name of Municipality or Organization: State

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1

Street Address Line 2

City State Zip Code 12345-6789

Email: Phone Number: (123) 456-7890

Fax Number:

Other Information

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

Stormwater Management Program (SWMP) Location (web address or physical location):

Eligibility Determination

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

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

MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete? *(Part II,III,IV or V, Subpart B.3.(a.) of 2003 permit)* If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY):

Web address where MS4 map is published:

If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted?: *(Part II,III,IV or V, Subpart B.3.(b.) of 2003 permit)* Effective Date or Estimated Date of Adoption (MM/DD/YY):

Construction/Erosion and Sediment Control (ESC) Authority Adopted?: *(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)* Effective Date or Estimated Date of Adoption (MM/DD/YY):

Post- Construction Stormwater Management Adopted?: *(Part II,III,IV or V, Subpart B.5.(a.) of 2003 permit)* Effective Date or Estimated Date of Adoption (MM/DD/YY):

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

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.
For Massachusetts list of impaired waters click here: Massachusetts 2010 List of Impaired: Waters http://www.mass.gov/dep/water/resources/10list6.pdf
For New Hampshire list of impaired waters click here: New Hampshire Final 303(d) Materials: http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/index.htm
Source of pollutants column should be completed with a preliminary source evaluation of pollutants for discharges to impaired waterbodies (see above 303(d) lists) without an approved TMDL in accordance with Section 2.2.2a of the permit

Waterbody segment that receives flow from the MS4	Number of outfalls into receiving water segment	Pollutant list (select one at a time to add)	Click impairment at left to add, or at right to remove	Pollutant(s) causing impairment, if applicable (select one at a time to remove)
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	

		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total)	Add/Remove	

		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	

Click to lengthen table

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

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 applicable waste lod allocation (WLA), identify any additional BMPs employed to specifically support the achievement of the WLA in the TMDL section at the end of Part III.

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

MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	**BMP Description**	**Targeted Audience**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal**	**Beginning Year of BMP implementation**
		Residents			
		Businesses, Institutions and Commercial Facilities			
		Developers (construction)			
		Industrial Facilities			
		Residents			
		Businesses, Institutions and Commercial Facilities			
		Developers (construction)			
		Industrial Facilities			

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

Part III: Stormwater Management Program Summary

MCM 2: Public Involvement and Participation

BMP Categorization	Brief BMP Description (enter your own text to override the drop down menu)	Responsible Department/ Parties	Additional Description/ Measurable Goal	Beginning Year of BMP implementation
Public Review	SWMP Review			
Public Participation				

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

Part III: Stormwater Management Program Summary

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)
SSO inventory			Develop SSO inventory within 1 year of effective date of permit
Storm sewer system map			Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit
Written IDDE program development			Complete within 1.5 years of the effective date of permit
Implement IDDE Program			Implement catchment investigations according to program and permit conditions
Employee Training			Train annually
Conduct dry weather screening			Conduct in accordance with outfall screening procedure and permit conditions
Conduct wet weather screening			Conduct in accordance with outfall screening procedure and permit conditions

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

Part III: Stormwater Management Program Summary

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 implementation**
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Complete written procedures of site inspections and enforcement procedures		Complete by the end of Year 1	
Site plan review	Complete written procedures of site plan review and begin implementation		Complete by the end of Year 1	
Erosion and Sediment Control	Adoption of requirements for construction operators to implement a sediment and erosion control program			
Waste Control	Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.			

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

Part III: Stormwater Management Program Summary

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

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 implementation**
As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP.		Require submission of as-built plans for completed projects	
Inventory and priority ranking of MS4-owned properties that may be retrofitted with BMPs	Conduct detailed inventory of MS4 owned properties and rank for retrofit potential		Complete 4 years after permit effective date	
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist		Complete 4 years after permit effective date	
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.		Complete 4 years after permit effective date	
Ensure any stormwater controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.	Adoption, amendment or modification of a regulatory mechanism to meet permit requirements		Complete 2 years after permit effective date	

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

Part III: Stormwater Management Program Summary

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 implementation**
Create written O&M procedures for parks and open spaces, buildings and facilities, and vehicles and equipment			Complete 2 years after permit effective date	
Inventory all permittee-owned parks and open spaces, buildings and facilities (including their storm drains), and vehicles and equipment			Complete 2 years after permit effective date	
Establish and implement program for repair and rehabilitation of MS4 infrastructure			Complete 2 years after permit effective date	
Stormwater Pollution Prevention Plan (SWPPP) for maintenance garages, transfer stations and other waste-handling facilities			Complete 2 years after permit effective date	
Catch Basin Cleaning				
Street Sweeping Program				
Road Salt use optimization program				

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

Part III: Stormwater Management Program Summary

Actions for meeting Total Maximum Daily Load (TMDL) Requirements

Use the drop-down menus to select the best categorization of your BMP and responsible party. 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)

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.**

Actions for meeting Requirements Related to water Quality Limited Waters

Part III: Stormwater Management Program Summary

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

Pollutant	**Waterbody ID(s)**	**Action Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)

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

Part IV: Notes and additional information

Use the space below to provide any additional information about your MS4 program

Click to add text

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

Part V: Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Title:

Signature Field Date:

NOI Submission

Please submit the form electronically via email using the "submit by Email" button below or send in a CD with your completed NOI. You may also print and submit via mail at the address below if you choose not to submit electronically. Outfall map required in Part I of the NOI (if applicable) can be submitted electronically as an email attachment OR as a paper copy.

Permittees that choose to submit their NOI electronically by email or by mailing a CD with the completed NOI form to EPA, will be able to download a partially filled Year 1 Annual Report at a later date from EPA.

Submit by Email — Submit by email using this button. Or, send an email with attachments to: stormwater.reports@epa.gov

Save — Save NOI for your records

EPA Submittal Address:

United States Environmental Protection Agency
5 Post Office Square - Suite 100
Mail Code - OEP06-1
Boston, Massachusetts 02109-3912
ATTN: Newton Tedder

State Submittal Address

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

APPENDIX F

Requirements for Discharges to Impaired Waters with an Approved TMDL

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Attachment 2 – Phosphorus Reduction Credits For Selected Enhanced Non-Structural BMPs

Attachment 3 - Phosphorus Reduction Credits For Selected Structural BMPs

A. Requirements for Discharges to Impaired Waters with an Approved MassDEP In State TMDL

I. Charles River Watershed Phosphorus TMDL Requirements

On October 17, 2007, EPA approved the *Final TMDL for Nutrients in the Lower Charles River Basin* (Lower Charles TMDL)[1] and on June 10, 2011 EPA approved the *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River* (Upper/Middle Charles TMDL)[2]. The following phosphorus reduction requirements address phosphorus in MS4 discharges.

1. To address the discharge of phosphorus from its MS4, the permittee shall develop a Phosphorus Control Plan (PCP) designed to reduce the amount of phosphorus in stormwater (SW) discharges from its MS4 to the Charles River and its tributaries. The PCP shall be completed in phases and the permittee shall add it as an attachment to its written SWMP upon completion and report in annual reports pursuant to part 4.4 of the Permit on its progress toward achieving its Phosphorus Reduction Requirement. The PCP shall be developed and fully implemented as soon as possible but no later than 20 years after the permit effective date in accordance with the phases and schedule outlined below. Each Phase shall contain the elements required of each phase as described in parts a.through c below. The timing of each phase over 20 years from the permit effective date is:

1-5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

a. Phase 1

1) The permittee shall complete a written Phase 1 plan of the PCP five years after the permit effective date and fully implement the Phase 1 plan of the PCP as soon as possible but no longer than 10 years after the permit effective date.
2) The Phase 1 plan of the PCP shall contain the following elements and has the following required milestones:

Item Number	Phase 1 of the PCP Component and Milestones	Completion Date
1-1	Legal analysis	2 years after permit effective date

[1] Massachusetts Department of Environmental Protection. 2007. *Final TMDL for Nutrients in the Lower Charles River Basin*. CN 301.1

[2] Massachusetts Department of Environmental Protection. 2011. *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River Basin, Massachusetts*. CN 272.0

1-2	Funding source assessment.	3 years after permit effective date
1-3	Define scope of PCP (PCP Area) Baseline Phosphorus Load and Phosphorus Reduction Requirement and Allowable Phosphorus Load	4 years after permit effective date
1-4	Description of Phase 1 planned nonstructural controls	5 years after permit effective date
1-5	Description of Phase 1 planned structural controls	5 years after permit effective date
1-6	Description of Operation and Maintenance program for structural controls	5 years after permit effective date
1-7	Phase 1 implementation schedule	5 years after permit effective date
1-8	Estimated cost for implementing Phase 1 of the PCP	5 years after permit effective date
1-9	Complete Written Phase 1 PCP	5 years after permit effective date
1-10	Full implementation of nonstructural controls	6 years after permit effective date
1-11	Performance Evaluation	6, and 7 years after permit effective date
1-12	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.80 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.80)$	8 years after permit effective date
1-13	Performance Evaluation	9 years after permit effective date
1-14	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.75	10 years after permit effective date

	$P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.75)$	

Table F-1:Phase 1 of the PCP components and Milestones

3) Description of Phase 1 PCP Components

Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances, and describes any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.

Funding source assessment – The permittee shall describe known and anticipated funding mechanisms (e.g. general funding, enterprise funding, stormwater utilities) that will be used to fund PCP implementation. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

Scope of the PCP, Baseline Phosphorus Load (P_{base}), Phosphorus Reduction Requirement (P_{RR}) and Allowable Phosphorus Load (P_{allow}) - The permittee shall indicate the area in which it plans to implement the PCP. The permittee must choose one of the following: (1) to implement its PCP in the entire area within its jurisdiction (for municipalities this would be the municipal boundary) within the Charles River Watershed; or (2) to implement its PCP only in the urbanized area portion of the permittee's jurisdiction within the Charles River Watershed. The implementation area selected by the permittee is known as the "PCP Area" for that permittee. Table F-2[3] and Table F-3[4] list the permittees subject to phosphorus reduction requirements along with the estimated Baseline Phosphorous Loads in mass/yr, the calculated Allowable Stormwater Phosphorus Load in mass/yr, the Stormwater Phosphorus Reduction Requirement in mass/yr and the respective percent reductions necessary. The two tables contain different reduction requirements for each permittee based on the PCP Area they choose (see above). If the permittee chooses to implement the PCP in its entire jurisdiction, the permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur outside the regulated area. If the permittee chooses to implement the PCP in its regulated area only, the permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural

[3] The estimated Baseline Phosphorus Load, Allowable Phosphorus Load, Phosphorus Reduction Requirement and percent reductions presented in Table F-2 apply to the entire watershed land area that drains to the Charles River and its tributaries within the permittee's jurisdiction.

[4] The estimated Baseline Phosphorus Load, Allowable Phosphorus Load, Phosphorus Reduction Requirement and percent reductions presented in Table F-3 apply only to the urbanized area portion of the permittee's jurisdiction that drains to the Charles River or its tributaries.

and non-structural controls on discharges that occur within the regulated area only.

The permittee shall select the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load that corresponds to the PCP Area selected. The selected Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load will be used to determine compliance with PCP milestones of this Phase and Phase 2 and Phase 3. If the permittee chooses to implement its PCP in all areas within its jurisdiction within the Charles River Watershed, then the permittee shall use Table F-2 to determine the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load for its PCP Area. If the permittee chooses to implement its PCP only within the regulated area within the Charles River Watershed, then the permittee shall use Table F-3 to determine the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load for its PCP Area.

The Permittee may submit more accurate land use data from 2005, which is the year chosen as the baseline land use for the purposes of permit compliance, for EPA to recalculate baseline phosphorus stormwater loads for use in future permit reissuances. Updated land use maps, land areas, characteristics, and MS4 area and catchment delineations shall be submitted to EPA along with the year 4 annual report in electronic GIS data layer form for consideration for future permit requirements[5]. Until such a time as future permit requirements reflect information submitted in the year 4 annual report, the permittee shall use the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load Table F-2 (if its PCP Area is the permittee's entire jurisdiction) or Table F-3 (if its PCP Area is the regulated area only) to calculate compliance with milestones for Phase 1, 2, and 3 of the PCP.

Description of Phase 1 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of Phase 1 planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of structural phosphorus controls during Phase 1. The ranking shall be developed through the use of available

[5] This submission is optional and needs only be done if the permittee has more accurate land use information from 2005 than information provided by MassGIS (http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/lus2005.html, retrieved 10/1/2013) or the permittee has updated MS4 drainage area characteristics and the permittee would like to update the Baseline Phosphorus Load.

screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to part 2.3.4.6 of the Permit. The permittee shall also include in this priority ranking a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of part 2.3.6.8.b of the Permit. A description and the results of this priority ranking shall be included in Phase 1 of the PCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of structural controls shall include the planned and existing measures, the areas where the measures will be implemented or are currently implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 1 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 1 Implementation Schedule – A schedule for implementation of all planned Phase 1 BMPs, including, as appropriate: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance activities, and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 1 Plan, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 8 and 10 year phosphorus load milestones established in Table F-1. The Phase 1 plan shall be fully implemented as soon as possible, but no later than 10 years after the effective date of permit.

Estimated cost for implementing Phase 1 of the PCP – The permittee shall estimate the cost of implementing the Phase 1 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to assess the validity of the funding source assessment completed by year 3 after the permit effective date and to update funding sources as necessary to complete Phase 1.

Complete written Phase 1 Plan – The permittee must complete the written Phase 1 Plan of the PCP no later than 5 years after the permit effective date. The complete Phase 1 Plan shall include Phase 1 PCP item numbers 1-1 through 1-7 in Table F-1. The permittee shall make the Phase 1 Plan

available to the public for public comment during Phase 1 Plan development. EPA encourages the permittee to post the Phase I Plan online to facilitate public involvement.

Performance Evaluation –The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[6] and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases since 2005 due to development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by part 4.4 of the Permit.

Community Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed

Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)
Arlington	106	57	49	53%
Ashland	67	23	44	34%
Bellingham	947	331	616	35%
Belmont	202	86	116	42%
Brookline	1,635	789	846	48 %
Cambridge	512	263	249	51%
Dedham	805	325	480	40%
Dover	831	137	694	17%
Foxborough	2	0	2	0%
Franklin	2,344	818	1,526	35%

[6] In meeting its phosphorus reduction requirements a permittee may quantify phosphorus reductions by actions undertaken by another entity, except where those actions are credited to MassDOT or another permittee identified in Appendix F Table F-2 or F-3.

Community Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Phosphorus Load, kg/yr**	**Stormwater Phosphorus Load Reduction Requirement kg/yr**	**Allowable Phosphorus Load, kg/yr**	**Stormwater Percent Reduction in Phosphorus Load (%)**
Holliston	1,543	395	1,148	26%
Hopedale	107	37	70	35%
Hopkinton	292	66	226	22%
Lexington	530	194	336	37%
Lincoln	593	101	492	17%
Medfield	955	277	678	29%
Medway	1,063	314	749	30%
Mendon	29	9	20	31%
Milford	1,611	663	948	41%
Millis	969	248	721	26%
Natick	1,108	385	723	35%
Needham	1,772	796	976	45%
Newton	3,884	1,941	1,943	50%
Norfolk	1,004	232	772	23%
Somerville	646	331	315	51%
Sherborn	846	131	715	16%
Walpole	159	28	131	18%
Waltham	2,901	1,461	1,400	50%
Watertown	1,127	582	545	52%
Wayland	46	15	31	33%
Wellesley	1,431	661	770	46%
Weston	1,174	281	893	24%
Westwood	376	114	262	30%
Wrentham	618	171	447	28%
Mass-DCR	421	91	330	22%

Table F-2: Baseline Phosphorus Load, Phosphorus Reduction Requirement, Allowable Phosphorus Load and Percent Reduction in Phosphorus Load from Charles River Watershed. For use when PCP Area is chosen to be the entire community within the Charles River Watershed.

Urbanized Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Watershed Phosphorus Load, kg/yr**	**Stormwater Phosphorus Load Reduction Requirement, kg/yr**	**Allowable Phosphorus Load, kg/yr**	**Stormwater Percent Reduction in Phosphorus Load (%)**
Arlington	106	57	49	53%
Ashland	67	23	44	34%
Bellingham	801	291	510	36%
Belmont	202	86	116	42%
Brookline	1,635	789	846	48 %
Cambridge	512	263	249	51%
Dedham	805	325	480	40%
Dover	282	54	228	19%
Foxborough	2	0	2	0%
Franklin	2,312	813	1,499	35%
Holliston	1,359	369	990	27%
Hopedale	107	37	70	35%
Hopkinton	280	65	215	23%
Lexington	525	193	332	37%
Lincoln	366	63	303	17%
Medfield	827	267	560	33%
Medway	1,037	305	732	29%
Mendon	10	5	5	50%
Milford	1,486	653	833	44%
Millis	501	159	342	32%
Natick	994	359	635	36%
Needham	1,771	795	976	45%
Newton	3,884	1,941	1,943	50%
Norfolk	1,001	231	770	23%
Somerville	646	331	315	51%
Sherborn	203	38	165	19%
Walpole	159	28	131	18%
Waltham	2,901	1,461	1,440	50%
Watertown	1,127	582	545	52%
Wayland	46	15	31	33%
Wellesley	1,431	661	770	46%

Urbanized Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Watershed Phosphorus Load, kg/yr**	**Stormwater Phosphorus Load Reduction Requirement, kg/yr**	**Allowable Phosphorus Load, kg/yr**	**Stormwater Percent Reduction in Phosphorus Load (%)**
Weston	1,174	281	893	24%
Westwood	346	108	238	31%
Wrentham	556	159	397	29%
Mass DCR	396	89	307	22%

Table F-3: Baseline Phosphorus Load, Phosphorus Reduction Requirement, Allowable Phosphorus Load and Percent Reduction in Phosphorus Load from Charles River Watershed. For use when PCP Area is chosen to be only the urbanized area portion of a permittee's jurisdiction within the Charles River Watershed.

b. Phase 2

1) The permittee shall complete the Phase 2 Plan of the PCP 10 years after the permit effective date and fully implement the Phase 2 plan of the PCP as soon as possible but no longer than 15 years after the permit effective date.
2) The Phase 2 plan of the PCP shall be added to the Phase 1 Plan and contain the following elements and has the following required milestones:

Item Number	Phase 2 of the PCP Component and Milestones	Completion Date
2-1	Update Legal analysis	As necessary
2-2	Description of Phase 2 planned nonstructural controls	10 years after permit effective date
2-3	Description of Phase 2 planned structural controls	10 years after permit effective date
2-4	Updated description of Operation and Maintenance Program	10 years after permit effective date
2-5	Phase 2 implementation schedule	10 years after permit effective date
2-6	Estimated cost for implementing Phase 2 of the PCP	10 years after permit effective date

2-7	Complete written Phase 2 Plan	10 years after permit effective date
2-8	Performance Evaluation.	11, and 12 years after permit effective date
2-9	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.65 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.65)$	13 years after permit effective date
2-10	Performance Evaluation	14 years after permit effective date
2-11	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.50 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.50)$	15 years after permit effective date

Table F-4: Phase 2 of the PCP components and Milestones

3) Description of Phase 2 PCP Components

Updated Legal Analysis- The permittee shall update the legal analysis completed during Phase 1 of the PCP as necessary to include any new or augmented bylaws, ordinances or funding mechanisms the permittee has deemed necessary to implement the PCP. The permittee shall use experience gained during Phase 1 to inform the updated legal analysis. The permittee shall adopt necessary regulatory changes as soon as possible to implement the Phase 2 Plan.

Description of Phase 2 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-4. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of planned Phase 2 structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices during Phase 2. The ranking shall build upon the ranking developed for Phase 1. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-4. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party[7] may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Updated description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 and 2 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 2 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 2 Implementation Schedule – A schedule for implementation of all planned Phase 2 BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M activities and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 2 Plan. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 13 and 15 year milestones established in Table F-4. The Phase 2 plan shall be fully implemented as soon as possible, but no later than 15 years after the effective date of permit.

Estimated cost for implementing Phase 2 of the PCP – The permittee shall estimate the cost of implementing the Phase 2 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to plan for the full implementation of Phase 2.

Complete written Phase 2 Plan – The permittee must complete a written Phase 2 Plan of the PCP no later than 10 years after the permit effective date. The complete Phase 2 Plan shall include Phase 2 PCP item numbers 2-1 through 2-6 in Table F-4. The permittee shall make the Phase 2 Plan available to the public for public comment during Phase 2 plan development. EPA encourages the permittee to post the Phase 2 Plan online to facilitate public involvement.

[7] See footnote 6

Performance Evaluation – The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[8] and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by part 4.4 of the Permit.

c. Phase 3

1) The permittee shall complete the Phase 3 Plan of the PCP 15 years after the permit effective date and fully implement the Phase 3 plan of the PCP as soon as possible but no longer than 20 years after the permit effective date.
2) The Phase 3 plan of the PCP shall be added to the Phase 1 Plan and the Phase 2 Plan to create the comprehensive PCP and contain the following elements and has the following required milestones:

Item Number	Phase 3 of the PCP Component and Milestones	Completion Date
3-1	Update Legal analysis	As necessary
3-2	Description of Phase 3 planned nonstructural controls	15 years after permit effective date
3-3	Description of Phase 3 planned structural controls	15 years after permit effective date
3-4	Updated description of Operation and Maintenance (O&M) Program	15 years after permit effective date
3-5	Phase 3 implementation schedule	15 years after permit effective date
3-6	Estimated cost for implementing Phase 3 of the PCP	15 years after permit effective date
3-7	Complete written Phase 3 Plan	15 years after permit effective date

[8] See footnote 9

3-8	Performance Evaluation.	16, and 17 years after permit effective date
3-9	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	18 years after permit effective date
3-10	Performance Evaluation	19 years after permit effective date
3-11	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load (P_{allow}) $P_{exp} \leq P_{allow}$	20 years after permit effective date

Table F-5:Phase 3 of the PCP components and Milestones

3) Description of Phase 3 PCP Components

Updated Legal Analysis- The permittee shall update the legal analysis completed during Phase 1 and Phase 2 of the PCP as necessary to include any new or augmented bylaws, ordinances or funding mechanisms the permittee has deemed necessary to implement the PCP. The permittee shall use experience gained during Phase 1 and Phase 2 to inform the updated legal analysis. The permittee shall adopt necessary regulatory changes as soon as possible to implement the Phase 3 Plan.

Description of Phase 3 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-5. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of planned Phase 3 structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices during Phase 3. The ranking shall build upon the ranking developed for

Phase 1 and 2. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-5. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in a municipal PCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Updated description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1, 2 and 3 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 3 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 3 Implementation Schedule – A schedule for implementation of all planned Phase 3 BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M activities and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 3 Plan. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 18 and 20 year milestones established in Table F-5. The Phase 3 plan shall be fully implemented as soon as possible, but no later than 20 years after the effective date of permit.

Estimated cost for implementing Phase 3 of the PCP – The permittee shall estimate the cost of implementing the Phase 3 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to plan for the full implementation of Phase 3.

Complete written Phase 3 Plan – The permittee must complete the written Phase 3 Plan of the PCP no later than 15 years after the permit effective date. The complete Phase 3 Plan shall include Phase 3 PCP item numbers 3-1 through 3-6 in Table F-5. The permittee shall make the Phase 3 Plan available to the public for public comment during Phase 3 Plan development. EPA encourages the permittee to post the Phase 3 Plan online to facilitate public involvement.

Performance Evaluation – The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[9] and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP

[9] See footnote 9

performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by part 4.4 of the Permit.

2. Reporting

Beginning 1 year after the permit effective date, the permittee shall include a progress report in each annual report on the planning and implementation of the PCP.

Beginning five (5) years after the permit effective date, the permittee shall include the following in each annual report submitted pursuant to part 4.4 of the Permit:

a. All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr (P_{NSred}) calculated consistent with Attachment 2 to Appendix F
b. Structural controls implemented during the reporting year and all previous years including:
    a. Location information of structural BMPs (GPS coordinates or street address)
    b. Phosphorus reduction from all structural BMPs implemented to date in mass/yr (P_{Sred}) calculated consistent with Attachment 3 to Appendix F
    c. Date of last completed maintenance and inspection for each Structural control
c. Phosphorus load increases due to development over the previous reporting period and incurred since 2005 (P_{DEVinc}) calculated consistent with Attachment 1 to Appendix F.
d. Estimated yearly phosphorus export rate (P_{exp}) from the PCP Area calculated using Equation 2. Equation 2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with the phosphorus reduction milestones required as part of each phase of the PCP.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

Equation 1. Equation used to calculate yearly phosphorus export rate from the chosen PCP Area. P_{exp}=Current phosphorus export rate from the PCP Area in mass/year. P_{base}=baseline phosphorus export rate from LPCP Area in mass/year. P_{Sred}= yearly phosphorus reduction from implemented structural controls in the PCP Area in mass/year. P_{NSred}= yearly phosphorus reduction from implemented non-structural controls in the PCP Area in mass/year. P_{DEVinc}= yearly phosphorus increase resulting from development since 2005 in the PCP Area in mass/year.

e. Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:

I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

f. Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses (see http://www.mass.gov/courts/docs/lawlib/300-399cmr/330cmr31.pdf).

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.I.1. as follows.
   a. The permittee is relieved of its additional requirements as of the date when the following conditions are met:
      i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
   b. When the criteria in Appendix F part A.I.3.a. are met, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part A.I.1 as of that date and the permittee shall comply with the following:
      i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part A.I.1 to date to reduce phosphorus in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
      ii. The permittee shall continue to implement all requirements of Appendix F part A.I.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications, and the reporting requirements of Appendix F part I.2. remain in place.

II. Lake and Pond Phosphorus TMDL Requirements

Between 1999 and 2010 EPA has approved 13 Lake TMDLs[10] completed by MassDEP covering 78 lakes and ponds within the Commonwealth of Massachusetts. Any permittee (traditional or non-traditional) that discharges to a waterbody segment in Table F-6 is subject to the requirements of this part.

1. Permittees that operate regulated MS4s (traditional and non-traditional) that discharge to the identified impaired waters or their tributaries must reduce phosphorus discharges to support achievement of phosphorus load reductions identified in the TMDLs. To address phosphorus, all permittees with a phosphorus reduction requirement greater than 0% shall develop a Lake Phosphorus Control Plan (LPCP) designed to reduce the amount of phosphorus in stormwater discharges from its MS4 to the impaired waterbody or its tributaries in accordance with the phosphorus load reduction requirements set forth in Table F-6 below. Permittees discharging to waterbodies in Table F-6 with an associated 0% Phosphorus Required Percent Reduction are subject to Appendix F part II.2.f and are relieved of the requirements of Appendix F part II.1.i through Appendix F part II.2.e Table F-6 identifies the primary municipalities[11] located within the watershed of the respective lake or pond and the percent phosphorus reductions necessary from urban stormwater sources. Any permittee (traditional or non-traditional) that discharges to a lake or pond listed in Table F-6 or its tributaries is subject to the same phosphorus percent reduction requirements associated with that lake or pond.

Primary Municipality	Waterbody Name	Required Percent Reduction
Auburn	Leesville Pond	31%
	Auburn Pond	24%
	Eddy Pond	0%
	Pondville Pond	8%
	Stoneville Pond	3%
Charlton	Buffumville Lake	28%
	Dresser Hill Pond	17%
	Gore Pond	14%
	Granite Reservoir	11%
	Jones Pond	13%
	Pierpoint Meadow Pond	27%
	Pikes Pond	38%
Dudley	Gore Pond	14%

[10] Final TMDLs for lakes and ponds in the Northern Blackstone River Watershed, Chicopee Basin, Connecticut Basin, French Basin, Millers Basin and Bare Hill Pond, Flint Pond, Indian Lake, Lake Boon, Leesville Pond, Salisbury Pond, White Island Pond, Quaboag Pond and Quacumquasit Pond can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

[11] Primary municipalities indicate the municipality in which the majority of the lake or pond is located but does not necessarily indicate each municipality that has urbanized area that discharges to the lake or pond or its tributaries.

Primary Municipality	Waterbody Name	Required Percent Reduction
	Larner Pond	55%
	New Pond	56%
	Pierpoint Meadow Pond	27%
	Shepherd Pond	25%
	Tobins Pond	62%
	Wallis Pond	54%
Gardner	Hilchey Pond	27%
	Parker Pond	47%
	Bents Pond	52%
	Ramsdall Pond	49%
Grafton	Flint Pond/Lake Quinsigamond	59%
Granby	Aldrich Lake East	0%
Hadley	Lake Warner	24%
Harvard	Bare Hill Pond	2%
Hudson	Lake Boon	28%
Leicester	Smiths Pond	30%
	Southwick Pond	64%
	Cedar Meadow Pond	17%
	Dutton Pond	23%
	Greenville Pond	14%
	Rochdale Pond	8%
Ludlow	Minechoag Pond	48%
Millbury	Brierly Pond	14%
	Dorothy Pond	1%
	Howe Reservoir	48%
Oxford	Buffumville Lake	28%
	Hudson Pond	37%
	Lowes Pond	51%
	McKinstry Pond	79%
	Robinson Pond	8%
	Texas Pond	21%
Shrewsbury	Flint Pond/Lake Quinsigamond	49%
	Jordan Pond	60%
	Mill Pond	43%
	Newton Pond	19%
	Shirley Street Pond	30%
Spencer	Quaboag Pond	29%

Primary Municipality	Waterbody Name	Required Percent Reduction
	Quacumquasit Pond	2%
	Jones Pond	13%
	Sugden Reservoir	31%
Springfield	Loon Pond	10%
	Long Pond	56%
	Mona Lake	57%
Stow	Lake Boon	28%
Templeton	Brazell Pond	62%
	Depot Pond	50%
	Bourn-Hadley Pond	49%
	Greenwood Pond 2	56%
Wilbraham	Spectacle Pond	45%
Winchendon	Lake Denison	22%
	Stoddard Pond	24%
	Whitney Pond	16%
	Whites Mill Pond	21%

Table F-6: Phosphorus impaired Lakes or Ponds subject to a TMDL along with primary municipality and required percent reduction of phosphorus from urban stormwater sources

i. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:

a. LPCP Implementation Schedule – The permittee shall complete its LPCP and fully implement all of the control measures in its LPCP as soon as possible but no later than 15 years after the effective date of the permit.

b. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:

Number	LPCP Component and Milestones	Completion Date
1	Legal Analysis	2 years after permit effective date
2	Funding source assessment	3 years after permit effective date
3	Define LPCP scope (LPCP Area)	4 years after permit effective date
4	Calculate Baseline Phosphorus, Allowable Phosphorus Load and Phosphorus Reduction Requirement	4 years after permit effective date

5	Description of planned nonstructural and structural controls	5 years after permit effective date
6	Description of Operation and Maintenance (O&M) Program	5 years after permit effective date
7	Implementation schedule	5 years after permit effective date
8	Cost and Funding Source Assessment	5 years after permit effective date
9	Complete written LPCP	5 years after permit effective date
10	Full implementation of nonstructural controls.	6 years after permit effective date
11	Performance Evaluation.	6 and 7 years after permit effective date
12	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.80 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.80)$	8 years after permit effective date
13	Performance Evaluation	9 years after permit effective date
14	1. Performance Evaluation. 2. Update LPCP 3. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.60 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.60)$ OR that the permittee has reduced their phosphorus export rate by 30kg/year (whichever is greater, unless full Phosphorus Reduction Requirement has been met)	10years after permit effective date
15	Performance Evaluation	11 and 12 years after permit effective date
16	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable	13years after permit effective date

	Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	
17	Performance Evaluation	14 years after permit effective date
18	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) $P_{exp} \leq P_{allow}$	15years after permit effective date

Table F-7: LPCP components and milestones

c. Description of LPCP Components:

Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances and describes any changes to these regulatory mechanisms that may be necessary to effectively implement the LPCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.

Scope of the LPCP (LPCP Area) - The permittee shall indicate the area in which the permittee plans to implement the LPCP, this area is known as the "LPCP Area". The permittee must choose one of the following: 1) to implement its LPCP in the entire area within its jurisdiction discharging to the impaired waterbody (for a municipality this would be the municipal boundary) or 2) to implement its LPCP in only the urbanized area portion of its jurisdiction discharging to the impaired waterbody. If the permittee chooses to implement the LPCP in its entire jurisdiction discharging to the impaired waterbody, the permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur both inside and outside the urbanized area. If the permittee chooses to implement the LPCP in its urbanized area only discharging to the impaired waterbody, the permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur within the urbanized area only.

Calculate Baseline Phosphorus Load (P_{base}), Phosphorus Reduction Requirement (P_{RR}) and Allowable Phosphorus Load (P_{allow}) –Permittees shall calculate their numerical Allowable Phosphorus Load and Phosphorus Reduction Requirement in mass/yr by first estimating their Baseline Phosphorus Load in mass/yr from its LPCP Area consistent with the methodology in Attachment 1 to Appendix F, the baseline shall only be estimated using land use phosphorus export coefficients in Attachment 1 to Appendix F and not account for phosphorus reductions resulting from implemented structural BMPs completed to date. Table F-6 contains the

percent phosphorus reduction required from urban stormwater consistent with the TMDL of each impaired waterbody. The permittee shall apply the applicable required percent reduction in Table F-6 to the calculated Baseline Phosphorus Load to obtain the permittee specific Allowable Phosphorus Load. The Allowable Phosphorus Load shall then be subtracted from the Baseline Phosphorus Load to obtain the permittee specific Phosphorus Reduction Requirement in mass/yr.

Description of planned non-structural controls – The permittee shall describe the non-structural stormwater control measures to be implemented to support the achievement of the milestones in Table F-7. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F. The permittee shall update the description of planned non-structural controls as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Description of planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices. The ranking shall be developed through the use of available screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to part 2.3.4.6 of the Permit. The permittee shall also include in this prioritization a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of part 2.3.6.8.b of the Permit. A description and the result of this priority ranking shall be included in the LPCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the milestones in Table F-7. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in the LPCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F. The permittee shall update the description of planned structural controls as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 and 2 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 2 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Implementation Schedule – An initial schedule for implementing the BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the LPCP, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Where planned structural BMP retrofits or major drainage infrastructure projects are expected to take additional time to construct, the permittee shall within four years of the effective date of the permit have a schedule for completion of construction consistent with the reduction requirements in Table F-7. The permittee shall complete the implementation of its LPCP as soon as possible or at a minimum in accordance with the milestones set forth in Table F-7. The implementation schedule shall be updated as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Cost and funding source assessment – The permittee shall estimate the cost for implementing its LPCP and describe known and anticipated funding mechanisms. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

Complete written LPCP – The permittee must complete the written LPCP 5 years after permit effective date. The complete LPCP shall include item numbers 1-8 in Table F-7. The permittee shall make the LPCP available to the public for public comment during the LPCP development. EPA encourages the permittee to post the LPCP online to facilitate public involvement. The LPCP shall be updated as needed with an update 10 years after the permit effective date at a minimum to reflect changes in BMP implementation to support achievement of the phosphorus export milestones in Table F-7. The updated LPCP shall build upon the original LPCP and include additional or new BMPs the permittee will use to support the achievement of the milestones in Table F-7.

Performance Evaluation – The permittee shall evaluate the effectiveness of the LPCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[12] and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the permit. Phosphorus reductions shall be calculated consistent with Attachment 2 (non-structural BMP performance), Attachment 3 (structural BMP performance) and Attachment 1 (reductions through land use change), to Appendix F for all BMPs implemented to date[13]. Phosphorus load increases resulting from development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus

[12] In meeting its phosphorus reduction requirements a permittee may quantify phosphorus reductions by actions undertaken by another entity, except where those actions are credited to MassDOT or another permittee identified in Appendix F Table F-7

[13] Annual phosphorus reductions from structural BMPs installed in the LPCP Area prior to the effective date of this permit shall be calculated consistent with Attachment 3 to Appendix F. Phosphorus Reduction Credit for previously installed BMPs will only be given if the Permittee demonstrates that the BMP is performing up to design specifications and certifies that the BMP is properly maintained and inspected according to manufacturer design or specifications. This certification shall be part of the annual performance evaluation during the year credit is claimed for the previously installed BMP.

loading increases and reductions in units of mass/yr shall be added or subtracted from the calculated Baseline Phosphorus Load to estimate the yearly phosphorous export rate from the LPCP Area in mass/yr. The permittee shall also include all information required in part II.2 of this Appendix in each performance evaluation.

2. Reporting

Beginning 1 year after the permit effective date, the permittee shall include a progress report in each annual report on the planning and implementation of the LPCP.

Beginning five (5) years after the permit effective date, the permittee shall include the following in each annual report submitted pursuant to part 4.4 of the Permit:

a. All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr (P_{NSred}) calculated consistent with Attachment 2 to Appendix F
b. Structural controls implemented during the reporting year and all previous years including:
    a. Location information of structural BMPs (GPS coordinates or street address)
    b. Phosphorus reduction from all structural BMPs implemented to date in mass/yr (P_{Sred}) calculated consistent with Attachment 3 to Appendix F
    c. Date of last completed maintenance for each Structural control
c. Phosphorus load increases due to development over the previous reporting period and incurred to date (P_{DEVinc}) calculated consistent with Attachment 1 to Appendix F.
d. Estimated yearly phosphorus export rate (P_{exp}) from the LPCP Area calculated using Equation 2. Equation2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with the phosphorus reduction milestones required as part of each phase of the LPCP.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

Equation 2. Equation used to calculate yearly phosphorus export rate from the chosen LPCP Area. P_{exp}=Current phosphorus export rate from the LPCP Area in mass/year. P_{base}=baseline phosphorus export rate from LPCP Area in mass/year. P_{Sred}= yearly phosphorus reduction from implemented structural controls in the LPCP Area in mass/year. P_{NSred}= yearly phosphorus reduction from implemented non-structural controls in the LPCP Area in mass/year. Area in mass/year. P_{DEVinc}= yearly phosphorus increase resulting from development since the year baseline loading was calculated in the LPCP Area in mass/year.

e. Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:

I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management

Practices being claimed for a phosphorus reduction credit are performing as originally designed.

f. Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses (see http://www.mass.gov/courts/docs/lawlib/300-399cmr/330cmr31.pdf).

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.II.1. as follows:
   a. The permittee is relieved of its additional requirements as of the date when the following conditions are met:
      i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
   b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any additional remaining requirements of Appendix F part A.II.1 as of that date and the permittee shall comply with the following:
      i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part A.II.1 to date to reduce phosphorus in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
      ii. The permittee shall continue to implement all requirements of Appendix F part A.I.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications, and the reporting requirements of Appendix F part A.II.2. remain in place.

III. Bacteria and Pathogen TMDL Requirements

There are currently approved 16 approved bacteria (fecal coliform bacteria) or mixed pathogen (fecal coliform, E. coli, and/or enterococcus bacteria) TMDLs for certain waterbodies in Massachusetts.[14] Any permittee (traditional or non-traditional) that discharges to a waterbody segment in Table F-8 is subject to the requirements of this part.

1. Traditional and non-traditional MS4s operating in the municipalities listed in Table F-8 and/or that discharge to a waterbody listed on Table F-8 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.3. Public Education: The permittee shall supplement its Residential program with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee or its agents shall disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance. The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.IV, A.V, B.I, B.II and B.III where appropriate.

            2. part 2.3.4 Illicit Discharge: Catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Abington	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
Abington	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Acushnet	MA95-31	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	MA95-32	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	MA95-33	Acushnet River	Fecal Coliform

[14] Final bacteria or pathogen TMDLs can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

Andover	MA83-04	Rogers Brook	Fecal Coliform
Andover	MA83-15	Unnamed Tributary	Fecal Coliform
Andover	MA83-18	Shawsheen River	Fecal Coliform
Andover	MA83-19	Shawsheen River	Fecal Coliform
Avon	MA62-07	Trout Brook	Escherichia Coli (E. Coli)
Barnstable	MA96-01	Barnstable Harbor	Fecal Coliform
Barnstable	MA96-02	Bumps River	Fecal Coliform
Barnstable	MA96-04	Centerville River	Fecal Coliform
Barnstable	MA96-05	Hyannis Harbor	Fecal Coliform
Barnstable	MA96-06	Maraspin Creek	Fecal Coliform
Barnstable	MA96-07	Prince Cove	Fecal Coliform
Barnstable	MA96-08	Shoestring Bay	Fecal Coliform
Barnstable	MA96-36	Lewis Bay	Fecal Coliform
Barnstable	MA96-37	Mill Creek	Fecal Coliform
Barnstable	MA96-63	Cotuit Bay	Fecal Coliform
Barnstable	MA96-64	Seapuit River	Fecal Coliform
Barnstable	MA96-66	North Bay	Fecal Coliform
Barnstable	MA96-81	Snows Creek	Fecal Coliform
Barnstable	MA96-82	Hyannis Inner Harbor	Fecal Coliform
Barnstable	MA96-92	Santuit River	Fecal Coliform
Barnstable	MA96-93	Halls Creek	Fecal Coliform
Barnstable	MA96-94	Stewarts Creek	Fecal Coliform
Bedford	MA83-01	Shawsheen River	Fecal Coliform
Bedford	MA83-05	Elm Brook	Fecal Coliform
Bedford	MA83-06	Vine Brook	Fecal Coliform
Bedford	MA83-08	Shawsheen River	Fecal Coliform
Bedford	MA83-10	Kiln Brook	Fecal Coliform
Bedford	MA83-14	Spring Brook	Fecal Coliform
Bedford	MA83-17	Shawsheen River	Fecal Coliform
Bellingham	MA72-03	Charles River	Pathogens
Bellingham	MA72-04	Charles River	Pathogens
Belmont	MA72-28	Beaver Brook	Pathogens
Berkley	MA62-02	Taunton River	Fecal Coliform
Berkley	MA62-03	Taunton River	Fecal Coliform
Berkley	MA62-20	Assonet River	Fecal Coliform
Beverly	MA93-08	Bass River	Fecal Coliform
Beverly	MA93-09	Danvers River	Fecal Coliform
Beverly	MA93-20	Beverly Harbor	Fecal Coliform
Beverly	MA93-25	Salem Sound	Fecal Coliform
Billerica	MA83-14	Spring Brook	Fecal Coliform
Billerica	MA83-17	Shawsheen River	Fecal Coliform

Billerica	MA83-18	Shawsheen River	Fecal Coliform
Bourne	MA95-01	Buttermilk Bay	Fecal Coliform
Bourne	MA95-14	Cape Cod Canal	Fecal Coliform
Bourne	MA95-15	Phinneys Harbor	Fecal Coliform
Bourne	MA95-16	Pocasset River	Fecal Coliform
Bourne	MA95-17	Pocasset Harbor	Fecal Coliform
Bourne	MA95-18	Red Brook Harbor	Fecal Coliform
Bourne	MA95-47	Back River	Fecal Coliform
Bourne	MA95-48	Eel Pond	Fecal Coliform
Brewster	MA96-09	Quivett Creek	Fecal Coliform
Brewster	MA96-27	Namskaket Creek	Fecal Coliform
Bridgewater	MA62-32	Matfield River	Escherichia Coli (E. Coli)
Brockton	MA62-05	Salisbury Plain River	Escherichia Coli (E. Coli)
Brockton	MA62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
Brockton	MA62-07	Trout Brook	Escherichia Coli (E. Coli)
Brockton	MA62-08	Salisbury Brook	Escherichia Coli (E. Coli)
Brockton	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
Brookline	MA72-11	Muddy River	Pathogens
Burlington	MA83-06	Vine Brook	Fecal Coliform
Burlington	MA83-11	Long Meadow Brook	Fecal Coliform
Burlington	MA83-13	Sandy Brook	Fecal Coliform
Cambridge	MA72-36	Charles River	Pathogens
Cambridge	MA72-38	Charles River	Pathogens
Canton	MA73-01	Neponset River	Fecal Coliform
Canton	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Canton	MA73-02	Neponset River	Fecal Coliform
Canton	MA73-05	East Branch	Fecal Coliform
Canton	MA73-20	Beaver Meadow Brook	Fecal Coliform
Canton	MA73-22	Pequid Brook	Fecal Coliform
Canton	MA73-25	Pecunit Brook	Escherichia Coli (E. Coli)
Canton	MA73-27	Ponkapog Brook	Fecal Coliform
Chatham	MA96-11	Stage Harbor	Fecal Coliform
Chatham	MA96-41	Mill Creek	Fecal Coliform
Chatham	MA96-42	Taylors Pond	Fecal Coliform
Chatham	MA96-43	Harding Beach Pond	Fecal Coliform
Chatham	MA96-44	Bucks Creek	Fecal Coliform
Chatham	MA96-45	Oyster Pond	Fecal Coliform
Chatham	MA96-46	Oyster Pond River	Fecal Coliform
Chatham	MA96-49	Frost Fish Creek	Pathogens
Chatham	MA96-50	Ryder Cove	Fecal Coliform
Chatham	MA96-51	Muddy Creek	Pathogens

Chatham	MA96-79	Cockle Cove Creek	Fecal Coliform
Chatham	MA96-79	Cockle Cove Creek	Enterococcus Bacteria
Cohasset	MA94-01	Cohasset Harbor	Fecal Coliform
Cohasset	MA94-19	The Gulf	Fecal Coliform
Cohasset	MA94-20	Little Harbor	Fecal Coliform
Cohasset	MA94-32	Cohasset Cove	Fecal Coliform
Concord	MA83-05	Elm Brook	Fecal Coliform
Danvers	MA93-01	Waters River	Fecal Coliform
Danvers	MA93-02	Crane Brook	Escherichia Coli (E. Coli)
Danvers	MA93-04	Porter River	Fecal Coliform
Danvers	MA93-09	Danvers River	Fecal Coliform
Danvers	MA93-36	Frost Fish Brook	Escherichia Coli (E. Coli)
Danvers	MA93-41	Crane River	Fecal Coliform
Dartmouth	MA95-13	Buttonwood Brook	Escherichia Coli (E. Coli)
Dartmouth	MA95-34	Slocums River	Fecal Coliform
Dartmouth	MA95-38	Clarks Cove	Fecal Coliform
Dartmouth	MA95-39	Apponagansett Bay	Fecal Coliform
Dartmouth	MA95-40	East Branch Westport River	Escherichia Coli (E. Coli)
Dartmouth	MA95-62	Buzzards Bay	Fecal Coliform
Dedham	MA72-07	Charles River	Pathogens
Dedham	MA72-21	Rock Meadow Brook	Pathogens
Dedham	MA73-02	Neponset River	Fecal Coliform
Dennis	MA96-09	Quivett Creek	Fecal Coliform
Dennis	MA96-12	Bass River	Fecal Coliform
Dennis	MA96-13	Sesuit Creek	Fecal Coliform
Dennis	MA96-14	Swan Pond River	Fecal Coliform
Dennis	MA96-35	Chase Garden Creek	Fecal Coliform
Dighton	MA62-02	Taunton River	Fecal Coliform
Dighton	MA62-03	Taunton River	Fecal Coliform
Dighton	MA62-50	Broad Cove	Fecal Coliform
Dighton	MA62-51	Muddy Cove Brook	Fecal Coliform
Dighton	MA62-55	Segreganset River	Fecal Coliform
Dighton	MA62-56	Three Mile River	Escherichia Coli (E. Coli)
Dighton	MA62-57	Three Mile River	Fecal Coliform
Dover	MA72-05	Charles River	Pathogens
Dover	MA72-06	Charles River	Pathogens
Duxbury	MA94-15	Duxbury Bay	Fecal Coliform
Duxbury	MA94-30	Bluefish River	Fecal Coliform
East Bridgewater	MA62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
East Bridgewater	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
East Bridgewater	MA62-32	Matfield River	Escherichia Coli (E. Coli)

East Bridgewater	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
East Bridgewater	MA62-38	Meadow Brook	Escherichia Coli (E. Coli)
Eastham	MA96-15	Boat Meadow River	Fecal Coliform
Eastham	MA96-16	Rock Harbor Creek	Fecal Coliform
Eastham	MA96-34	Wellfleet Harbor	Fecal Coliform
Eastham	MA96-68	Town Cove	Fecal Coliform
Essex	MA93-11	Essex River	Fecal Coliform
Essex	MA93-16	Essex Bay	Fecal Coliform
Essex	MA93-45	Alewife Brook	Escherichia Coli (E. Coli)
Essex	MA93-46	Alewife Brook	Fecal Coliform
Everett	MA93-51	Unnamed Tributary	Enterococcus Bacteria
Fairhaven	MA95-33	Acushnet River	Fecal Coliform
Fairhaven	MA95-42	New Bedford Inner Harbor	Fecal Coliform
Fairhaven	MA95-62	Buzzards Bay	Fecal Coliform
Fairhaven	MA95-63	Outer New Bedford Harbor	Fecal Coliform
Fairhaven	MA95-64	Little Bay	Fecal Coliform
Fairhaven	MA95-65	Nasketucket Bay	Fecal Coliform
Fall River	MA61-06	Mount Hope Bay	Fecal Coliform
Fall River	MA62-04	Taunton River	Fecal Coliform
Falmouth	MA95-20	Wild Harbor	Fecal Coliform
Falmouth	MA95-21	Herring Brook	Fecal Coliform
Falmouth	MA95-22	West Falmouth Harbor	Fecal Coliform
Falmouth	MA95-23	Great Sippewisset Creek	Fecal Coliform
Falmouth	MA95-24	Little Sippewisset Marsh	Fecal Coliform
Falmouth	MA95-25	Quissett Harbor	Fecal Coliform
Falmouth	MA95-46	Harbor Head	Fecal Coliform
Falmouth	MA96-17	Falmouth Inner Harbor	Fecal Coliform
Falmouth	MA96-18	Great Harbor	Fecal Coliform
Falmouth	MA96-19	Little Harbor	Fecal Coliform
Falmouth	MA96-20	Quashnet River	Fecal Coliform
Falmouth	MA96-21	Waquoit Bay	Fecal Coliform
Falmouth	MA96-53	Perch Pond	Fecal Coliform
Falmouth	MA96-54	Great Pond	Fecal Coliform
Falmouth	MA96-55	Green Pond	Fecal Coliform
Falmouth	MA96-56	Little Pond	Fecal Coliform
Falmouth	MA96-57	Bournes Pond	Fecal Coliform
Falmouth	MA96-58	Hamblin Pond	Fecal Coliform
Falmouth	MA96-62	Oyster Pond	Fecal Coliform
Foxborough	MA62-39	Rumford River	Escherichia Coli (E. Coli)
Foxborough	MA62-47	Wading River	Escherichia Coli (E. Coli)
Foxborough	MA73-01	Neponset River	Fecal Coliform

Foxborough	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Franklin	MA72-04	Charles River	Pathogens
Freetown	MA62-04	Taunton River	Fecal Coliform
Freetown	MA62-20	Assonet River	Fecal Coliform
Gloucester	MA93-12	Annisquam River	Fecal Coliform
Gloucester	MA93-16	Essex Bay	Fecal Coliform
Gloucester	MA93-18	Gloucester Harbor	Fecal Coliform
Gloucester	MA93-28	Mill River	Fecal Coliform
Hanover	MA94-05	North River	Fecal Coliform
Hanover	MA94-21	Drinkwater River	Escherichia Coli (E. Coli)
Hanover	MA94-24	Iron Mine Brook	Escherichia Coli (E. Coli)
Hanover	MA94-27	Third Herring Brook	Escherichia Coli (E. Coli)
Hanson	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Harwich	MA96-22	Herring River	Fecal Coliform
Harwich	MA96-23	Saquatucket Harbor	Fecal Coliform
Harwich	MA96-51	Muddy Creek	Pathogens
Holliston	MA72-16	Bogastow Brook	Pathogens
Hopedale	MA72-03	Charles River	Pathogens
Hopkinton	MA72-01	Charles River	Pathogens
Ipswich	MA93-16	Essex Bay	Fecal Coliform
Kingston	MA94-14	Jones River	Fecal Coliform
Kingston	MA94-15	Duxbury Bay	Fecal Coliform
Lawrence	MA83-19	Shawsheen River	Fecal Coliform
Lexington	MA72-28	Beaver Brook	Pathogens
Lexington	MA83-06	Vine Brook	Fecal Coliform
Lexington	MA83-10	Kiln Brook	Fecal Coliform
Lincoln	MA83-05	Elm Brook	Fecal Coliform
Lincoln	MA83-08	Shawsheen River	Fecal Coliform
Lynn	MA93-24	Nahant Bay	Fecal Coliform
Lynn	MA93-44	Saugus River	Fecal Coliform
Lynn	MA93-52	Lynn Harbor	Fecal Coliform
Lynnfield	MA93-30	Beaverdam Brook	Escherichia Coli (E. Coli)
Lynnfield	MA93-32	Hawkes Brook	Escherichia Coli (E. Coli)
Lynnfield	MA93-34	Saugus River	Escherichia Coli (E. Coli)
Lynnfield	MA93-35	Saugus River	Escherichia Coli (E. Coli)
Malden	MA93-51	Unnamed Tributary	Enterococcus Bacteria
Manchester	MA93-19	Manchester Harbor	Fecal Coliform
Manchester	MA93-25	Salem Sound	Fecal Coliform
Manchester	MA93-29	Cat Brook	Escherichia Coli (E. Coli)
Manchester	MA93-47	Causeway Brook	Escherichia Coli (E. Coli)
Mansfield	MA62-39	Rumford River	Escherichia Coli (E. Coli)

Mansfield	MA62-47	Wading River	Escherichia Coli (E. Coli)
Mansfield	MA62-49	Wading River	Escherichia Coli (E. Coli)
Marblehead	MA93-21	Salem Harbor	Fecal Coliform
Marblehead	MA93-22	Marblehead Harbor	Fecal Coliform
Marblehead	MA93-25	Salem Sound	Fecal Coliform
Marion	MA95-05	Weweantic River	Fecal Coliform
Marion	MA95-07	Sippican River	Fecal Coliform
Marion	MA95-08	Sippican Harbor	Fecal Coliform
Marion	MA95-09	Aucoot Cove	Fecal Coliform
Marion	MA95-56	Hammett Cove	Fecal Coliform
Marshfield	MA94-05	North River	Fecal Coliform
Marshfield	MA94-06	North River	Fecal Coliform
Marshfield	MA94-09	South River	Fecal Coliform
Marshfield	MA94-11	Green Harbor	Fecal Coliform
Mashpee	MA96-08	Shoestring Bay	Fecal Coliform
Mashpee	MA96-21	Waquoit Bay	Fecal Coliform
Mashpee	MA96-24	Mashpee River	Fecal Coliform
Mashpee	MA96-39	Popponesset Creek	Fecal Coliform
Mashpee	MA96-58	Hamblin Pond	Fecal Coliform
Mashpee	MA96-61	Little River	Fecal Coliform
Mashpee	MA96-92	Santuit River	Fecal Coliform
Mattapoisett	MA95-09	Aucoot Cove	Fecal Coliform
Mattapoisett	MA95-10	Hiller Cove	Fecal Coliform
Mattapoisett	MA95-35	Mattapoisett Harbor	Fecal Coliform
Mattapoisett	MA95-60	Mattapoisett River	Fecal Coliform
Mattapoisett	MA95-61	Eel Pond	Fecal Coliform
Mattapoisett	MA95-65	Nasketucket Bay	Fecal Coliform
Medfield	MA72-05	Charles River	Pathogens
Medfield	MA72-10	Stop River	Pathogens
Medfield	MA73-09	Mine Brook	Fecal Coliform
Medway	MA72-04	Charles River	Pathogens
Medway	MA72-05	Charles River	Pathogens
Melrose	MA93-48	Bennetts Pond Brook	Escherichia Coli (E. Coli)
Mendon	MA72-03	Charles River	Pathogens
Milford	MA72-01	Charles River	Pathogens
Millis	MA72-05	Charles River	Pathogens
Millis	MA72-16	Bogastow Brook	Pathogens
Milton	MA73-02	Neponset River	Fecal Coliform
Milton	MA73-03	Neponset River	Fecal Coliform
Milton	MA73-04	Neponset River	Fecal Coliform
Milton	MA73-26	Unquity Brook	Fecal Coliform

Milton	MA73-29	Pine Tree Brook	Fecal Coliform
Milton	MA73-30	Gulliver Creek	Fecal Coliform
Nahant	MA93-24	Nahant Bay	Fecal Coliform
Nahant	MA93-52	Lynn Harbor	Fecal Coliform
Nahant	MA93-53	Lynn Harbor	Fecal Coliform
Natick	MA72-05	Charles River	Pathogens
Natick	MA72-06	Charles River	Pathogens
Needham	MA72-06	Charles River	Pathogens
Needham	MA72-07	Charles River	Pathogens
Needham	MA72-18	Fuller Brook	Pathogens
Needham	MA72-21	Rock Meadow Brook	Pathogens
Needham	MA72-25	Rosemary Brook	Pathogens
New Bedford	MA95-13	Buttonwood Brook	Escherichia Coli (E. Coli)
New Bedford	MA95-33	Acushnet River	Fecal Coliform
New Bedford	MA95-38	Clarks Cove	Fecal Coliform
New Bedford	MA95-42	New Bedford Inner Harbor	Fecal Coliform
New Bedford	MA95-63	Outer New Bedford Harbor	Fecal Coliform
Newton	MA72-07	Charles River	Pathogens
Newton	MA72-23	Sawmill Brook	Pathogens
Newton	MA72-24	South Meadow Brook	Pathogens
Newton	MA72-29	Cheese Cake Brook	Pathogens
Newton	MA72-36	Charles River	Pathogens
Norfolk	MA72-05	Charles River	Pathogens
Norfolk	MA72-10	Stop River	Pathogens
North Andover	MA83-19	Shawsheen River	Fecal Coliform
Norton	MA62-49	Wading River	Escherichia Coli (E. Coli)
Norton	MA62-56	Three Mile River	Escherichia Coli (E. Coli)
Norwell	MA94-05	North River	Fecal Coliform
Norwell	MA94-27	Third Herring Brook	Escherichia Coli (E. Coli)
Norwell	MA94-31	Second Herring Brook	Fecal Coliform
Norwood	MA73-01	Neponset River	Fecal Coliform
Norwood	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Norwood	MA73-02	Neponset River	Fecal Coliform
Norwood	MA73-15	Germany Brook	Fecal Coliform
Norwood	MA73-16	Hawes Brook	Fecal Coliform
Norwood	MA73-17	Traphole Brook	Fecal Coliform
Norwood	MA73-24	Purgatory Brook	Fecal Coliform
Norwood	MA73-33	Unnamed Tributary	Escherichia Coli (E. Coli)
Orleans	MA96-16	Rock Harbor Creek	Fecal Coliform
Orleans	MA96-26	Little Namskaket Creek	Fecal Coliform
Orleans	MA96-27	Namskaket Creek	Fecal Coliform

Orleans	MA96-68	Town Cove	Fecal Coliform
Orleans	MA96-72	Paw Wah Pond	Fecal Coliform
Orleans	MA96-73	Pochet Neck	Fecal Coliform
Orleans	MA96-76	The River	Fecal Coliform
Orleans	MA96-78	Little Pleasant Bay	Fecal Coliform
Peabody	MA93-01	Waters River	Fecal Coliform
Peabody	MA93-05	Goldthwait Brook	Escherichia Coli (E. Coli)
Peabody	MA93-39	Proctor Brook	Escherichia Coli (E. Coli)
Pembroke	MA94-05	North River	Fecal Coliform
Plymouth	MA94-15	Duxbury Bay	Fecal Coliform
Plymouth	MA94-16	Plymouth Harbor	Fecal Coliform
Plymouth	MA94-34	Ellisville Harbor	Fecal Coliform
Raynham	MA62-02	Taunton River	Fecal Coliform
Rehoboth	MA53-03	Palmer River	Pathogens
Rehoboth	MA53-04	Palmer River	Pathogens
Rehoboth	MA53-05	Palmer River	Pathogens
Rehoboth	MA53-07	Palmer River - West Branch	Pathogens
Rehoboth	MA53-08	Palmer River - East Branch	Pathogens
Rehoboth	MA53-09	Rumney Marsh Brook	Pathogens
Rehoboth	MA53-10	Beaver Dam Brook	Pathogens
Rehoboth	MA53-11	Bad Luck Brook	Pathogens
Rehoboth	MA53-12	Fullers Brook	Pathogens
Rehoboth	MA53-13	Clear Run Brook	Pathogens
Rehoboth	MA53-14	Torrey Creek	Pathogens
Rehoboth	MA53-15	Old Swamp Brook	Pathogens
Rehoboth	MA53-16	Rocky Run	Pathogens
Revere	MA93-15	Pines River	Fecal Coliform
Revere	MA93-44	Saugus River	Fecal Coliform
Revere	MA93-51	Unnamed Tributary	Enterococcus Bacteria
Revere	MA93-52	Lynn Harbor	Fecal Coliform
Revere	MA93-53	Lynn Harbor	Fecal Coliform
Rockland	MA94-03	French Stream	Escherichia Coli (E. Coli)
Rockport	MA93-17	Rockport Harbor	Fecal Coliform
Salem	MA93-09	Danvers River	Fecal Coliform
Salem	MA93-20	Beverly Harbor	Fecal Coliform
Salem	MA93-21	Salem Harbor	Fecal Coliform
Salem	MA93-25	Salem Sound	Fecal Coliform
Salem	MA93-39	Proctor Brook	Escherichia Coli (E. Coli)
Salem	MA93-40	Proctor Brook	Enterococcus Bacteria
Salem	MA93-42	North River	Fecal Coliform
Sandwich	MA95-14	Cape Cod Canal	Fecal Coliform

Sandwich	MA96-30	Scorton Creek	Fecal Coliform
Sandwich	MA96-84	Old Harbor Creek	Fecal Coliform
Sandwich	MA96-85	Mill Creek	Fecal Coliform
Sandwich	MA96-86	Dock Creek	Fecal Coliform
Sandwich	MA96-87	Springhill Creek	Fecal Coliform
Saugus	MA93-15	Pines River	Fecal Coliform
Saugus	MA93-33	Hawkes Brook	Escherichia Coli (E. Coli)
Saugus	MA93-35	Saugus River	Escherichia Coli (E. Coli)
Saugus	MA93-43	Saugus River	Fecal Coliform
Saugus	MA93-44	Saugus River	Fecal Coliform
Saugus	MA93-48	Bennetts Pond Brook	Escherichia Coli (E. Coli)
Saugus	MA93-49	Shute Brook	Fecal Coliform
Saugus	MA93-50	Shute Brook	Escherichia Coli (E. Coli)
Scituate	MA94-01	Cohasset Harbor	Fecal Coliform
Scituate	MA94-02	Scituate Harbor	Fecal Coliform
Scituate	MA94-05	North River	Fecal Coliform
Scituate	MA94-06	North River	Fecal Coliform
Scituate	MA94-07	Herring River	Fecal Coliform
Scituate	MA94-09	South River	Fecal Coliform
Scituate	MA94-19	The Gulf	Fecal Coliform
Scituate	MA94-32	Cohasset Cove	Fecal Coliform
Scituate	MA94-33	Musquashcut Pond	Fecal Coliform
Seekonk	MA53-01	Runnins River	Fecal Coliform
Seekonk	MA53-12	Fullers Brook	Pathogens
Seekonk	MA53-13	Clear Run Brook	Pathogens
Seekonk	MA53-14	Torrey Creek	Pathogens
Sharon	MA62-39	Rumford River	Escherichia Coli (E. Coli)
Sharon	MA73-17	Traphole Brook	Fecal Coliform
Sharon	MA73-31	Unnamed Tributary	Fecal Coliform
Sherborn	MA72-05	Charles River	Pathogens
Somerset	MA61-01	Lee River	Fecal Coliform
Somerset	MA61-02	Lee River	Fecal Coliform
Somerset	MA61-06	Mount Hope Bay	Fecal Coliform
Somerset	MA62-03	Taunton River	Fecal Coliform
Somerset	MA62-04	Taunton River	Fecal Coliform
Somerset	MA62-50	Broad Cove	Fecal Coliform
Stoughton	MA73-20	Beaver Meadow Brook	Fecal Coliform
Stoughton	MA73-32	Unnamed Tributary	Escherichia Coli (E. Coli)
Swampscott	MA93-24	Nahant Bay	Fecal Coliform
Swansea	MA53-03	Palmer River	Pathogens
Swansea	MA53-06	Warren River Pond	Fecal Coliform

Swansea	MA53-16	Rocky Run	Pathogens
Swansea	MA61-01	Lee River	Fecal Coliform
Swansea	MA61-02	Lee River	Fecal Coliform
Swansea	MA61-04	Cole River	Fecal Coliform
Swansea	MA61-07	Mount Hope Bay	Fecal Coliform
Swansea	MA61-08	Kickemuit River	Pathogens
Taunton	MA62-02	Taunton River	Fecal Coliform
Taunton	MA62-56	Three Mile River	Escherichia Coli (E. Coli)
Taunton	MA62-57	Three Mile River	Fecal Coliform
Tewksbury	MA83-07	Strong Water Brook	Fecal Coliform
Tewksbury	MA83-15	Unnamed Tributary	Fecal Coliform
Tewksbury	MA83-18	Shawsheen River	Fecal Coliform
Wakefield	MA93-31	Mill River	Escherichia Coli (E. Coli)
Wakefield	MA93-34	Saugus River	Escherichia Coli (E. Coli)
Wakefield	MA93-35	Saugus River	Escherichia Coli (E. Coli)
Walpole	MA72-10	Stop River	Pathogens
Walpole	MA73-01	Neponset River	Fecal Coliform
Walpole	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Walpole	MA73-06	School Meadow Brook	Fecal Coliform
Walpole	MA73-09	Mine Brook	Fecal Coliform
Walpole	MA73-17	Traphole Brook	Fecal Coliform
Waltham	MA72-07	Charles River	Pathogens
Waltham	MA72-28	Beaver Brook	Pathogens
Wareham	MA95-01	Buttermilk Bay	Fecal Coliform
Wareham	MA95-02	Onset Bay	Fecal Coliform
Wareham	MA95-03	Wareham River	Fecal Coliform
Wareham	MA95-05	Weweantic River	Fecal Coliform
Wareham	MA95-07	Sippican River	Fecal Coliform
Wareham	MA95-29	Agawam River	Fecal Coliform
Wareham	MA95-49	Broad Marsh River	Fecal Coliform
Wareham	MA95-50	Wankinco River	Fecal Coliform
Wareham	MA95-51	Crooked River	Fecal Coliform
Wareham	MA95-52	Cedar Island Creek	Fecal Coliform
Wareham	MA95-53	Beaverdam Creek	Fecal Coliform
Watertown	MA72-07	Charles River	Pathogens
Watertown	MA72-30	Unnamed Tributary	Pathogens
Watertown	MA72-32	Unnamed Tributary	Pathogens
Watertown	MA72-36	Charles River	Pathogens
Wellesley	MA72-06	Charles River	Pathogens
Wellesley	MA72-07	Charles River	Pathogens
Wellesley	MA72-18	Fuller Brook	Pathogens

Wellesley	MA72-25	Rosemary Brook	Pathogens
Wellfleet	MA96-32	Duck Creek	Fecal Coliform
Wellfleet	MA96-33	Herring River	Fecal Coliform
Wellfleet	MA96-34	Wellfleet Harbor	Fecal Coliform
West Bridgewater	MA62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
Weston	MA72-07	Charles River	Pathogens
Westport	MA95-37	West Branch Westport River	Fecal Coliform
Westport	MA95-40	East Branch Westport River	Escherichia Coli (E. Coli)
Westport	MA95-41	East Branch Westport River	Fecal Coliform
Westport	MA95-44	Snell Creek	Escherichia Coli (E. Coli)
Westport	MA95-45	Snell Creek	Escherichia Coli (E. Coli)
Westport	MA95-54	Westport River	Fecal Coliform
Westport	MA95-58	Bread And Cheese Brook	Escherichia Coli (E. Coli)
Westport	MA95-59	Snell Creek	Fecal Coliform
Westwood	MA72-21	Rock Meadow Brook	Pathogens
Westwood	MA73-02	Neponset River	Fecal Coliform
Westwood	MA73-15	Germany Brook	Fecal Coliform
Westwood	MA73-24	Purgatory Brook	Fecal Coliform
Westwood	MA73-25	Pecunit Brook	Escherichia Coli (E. Coli)
Westwood	MA73-27	Ponkapog Brook	Fecal Coliform
Whitman	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
Whitman	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Whitman	MA62-38	Meadow Brook	Escherichia Coli (E. Coli)
Wilmington	MA83-18	Shawsheen River	Fecal Coliform
Winthrop	MA93-53	Lynn Harbor	Fecal Coliform
Yarmouth	MA96-12	Bass River	Fecal Coliform
Yarmouth	MA96-35	Chase Garden Creek	Fecal Coliform
Yarmouth	MA96-36	Lewis Bay	Fecal Coliform
Yarmouth	MA96-37	Mill Creek	Fecal Coliform
Yarmouth	MA96-38	Parkers River	Fecal Coliform
Yarmouth	MA96-80	Mill Creek	Fecal Coliform
Yarmouth	MA96-82	Hyannis Inner Harbor	Fecal Coliform

Table F-8: Bacteria or pathogens impaired waterbody names and segment IDs along with primary municipality and indicator organism identified by the applicable TMDL. The term primary municipality indicates the municipality in which the majority of the segment is located, but does not necessarily indicate each municipality that has regulated discharges to the waterbody segment.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.III.1. as follows:
    a. The permittee is relieved of additional requirements as of the date when the following conditions are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable to the receiving water

that indicates that no additional stormwater controls for bacteria/pathogens are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL

b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any additional remaining requirements of Appendix F part A.III.1 as of that date and the permittee shall comply with the following:
    i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part A.III.1 to date to reduce bacteria/pathogens in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
    ii. The permittee shall continue to implement all requirements of Appendix F part A.III.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

IV. Cape Cod Nitrogen TMDL Requirements

There are 19 approved TMDLs for nitrogen for various watersheds, ponds and bays on Cape Cod.[15] The following measuress are needed to ensure that current nitrogen loads from MS4 stormwater discharged into the impaired waterbodies do not increase.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-9 or any other MS4 (traditional and non-traditional) that discharges to any waterbody listed in Table F-9 or their tributaries shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.V, B.I, B.II and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

[15] Final nitrogen TMDLs for Cape Cod can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in in part 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; 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 (2) times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

Municipality	Waterbody Name
Barnstable	Centerville River
Barnstable	Popponesset Bay
Barnstable	Shoestring Bay
Barnstable	Cotuit Bay
Barnstable	North Bay
Barnstable	Prince Cove
Barnstable	West Bay
Barnstable	Hyannis Inner Harbor
Barnstable	Lewis Bay
Bourne	Phinneys Harbor
Chatham	Crows Pond
Chatham	Bucks Creek
Chatham	Harding Beach Pond
Chatham	Mill Creek
Chatham	Mill Pond
Chatham	Oyster Pond
Chatham	Oyster Pond River
Chatham	Stage Harbor
Chatham	Taylors Pond
Chatham	Frost Fish Creek
Chatham	Ryder Cove
Falmouth	Bournes Pond
Falmouth	Great Pond
Falmouth	Green Pond
Falmouth	Perch Pond
Falmouth	Little Pond
Falmouth	Oyster Pond
Falmouth	Quashnet River
Falmouth	Inner West Falmouth Harbor

Municipality	Waterbody Name
Falmouth	West Falmouth Harbor
Falmouth	Snug Harbor
Falmouth	Harbor Head
Harwich	Muddy Creek - Lower
Harwich	Muddy Creek - Upper
Harwich	Round Cove
Mashpee	Mashpee River
Mashpee	Great River
Mashpee	Hamblin Pond
Mashpee	Jehu Pond
Mashpee	Little River
Orleans	Areys Pond
Orleans	Little Pleasant Bay
Orleans	Namequoit River
Orleans	Paw Wah Pond
Orleans	Pleasant Bay
Orleans	Pochet Neck
Orleans	Quanset Pond
Yarmouth	Mill Creek
Yarmouth	Hyannis Inner Harbor
Yarmouth	Lewis Bay

Table F-9: Waterbodies subject to a Cape Cod nitrogen TMDL and the primary municipalities

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.IV.1. applicable to it when in compliance with this part.
    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of nitrogen are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part A.IV.1 as of that date and the permittee shall comply with the following:
        i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part A.IV.1 to date to reduce nitrogen in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
        ii. The permittee shall continue to implement all requirements of Appendix F part A.IV.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing

implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

V. Assabet River Phosphorus TMDL Requirements

On September 23, 2004 EPA approved the *Assabet River Total Maximum Daily Load for Total Phosphorus*[16]. The following measures are needed to ensure that current phosphorus loads from MS4 stormwater discharged directly or indirectly via tributaries into the Assabet River do not increase.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-10 within the Assabet River Watershed shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, B.I, B.II and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

            3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish program to properly

[16] Massachusetts Department of Environmental Protection, 2004. *Assabet River Total Maximum Daily Load for Total Phosphorus.* CN 201.0

manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; 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, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

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

Table F-10: Municipalities located in the Assabet River Watershed

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.V.1. as follows.
    a. The permittee is relieved of its additional requirements as of the date when following conditions are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part A.V.1 as of that date and the permittee shall comply with the following:
        i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part A.V.1 to

date to reduce phosphorus in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs

ii. The permittee shall continue to implement all requirements of Appendix F part A.V.1 required to be implemented prior to the date of the newly approved TMDL including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

B. Requirements for Discharges to Impaired Waters with an Approved Out of State TMDL

I. Nitrogen TMDL Requirements

Discharges from MS4s in Massachusetts to waters that are tributaries to the Long Island Sound, which has an approved TMDL for nitrogen[17], are subject to the requirements of this part.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-11 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, A.V, B.II and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

            3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of

[17] Connecticut Department of Environmental Protection. 2000. *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*

slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in in part 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; 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 (2) times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Nitrogen Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Nitrogen Source Identification Report. The report shall include the following elements:

1. 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,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high nitrogen loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during re-development

ii. The final Nitrogen Source Identification Report shall be submitted to EPA as part of the year 4 annual report.

c. Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii. or identified in the Nitrogen Source Identification Report. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual

report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high nitrogen load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs listed in Table 4-3 of Attachment 1 to Appendix H installed in the urbanized 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. The permittee shall 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 annual report.

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

Monson	

Table F-11: Massachusetts municipalities in which MS4 discharges are within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.I.1. as follows:
    a. The permittee is relieved of its additional requirements as of the date when the following conditions are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of nitrogen are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.I.1 as of that date and the permittee shall comply with the following:
        i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part B.I.1 to date to reduce nitrogen in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
        ii. The permittee shall continue to implement all requirements of Appendix F part B.I.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

II. Phosphorus TMDL Requirements

There are currently eight approved phosphorus TMDLs for certain waterbody segments in Rhode Island that identify urban stormwater discharges in Massachusetts as sources that are contributing phosphorus to the impaired segments. The TMDLs include the Kickemuit Reservoir, Upper Kikemuit River, Kickemuit River, Ten Mile River, Central Pond, Turner Reservoir, Lower Ten Mile River, and Omega Pond TMDLs[18]. Table F-12 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing phosphorus to the impaired waterbody segments in Rhode Island, the impaired receiving water, and the approved TMDL name. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-12 and that discharges to a waterbody or tributary of a waterbody listed on Table F-12 is subject to the requirements of this part.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-12 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-12 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, A.V, B.I, and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for

[18] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish program to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; 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, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Phosphorus Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Phosphorus Source Identification Report. The report shall include the following elements:

1. Calculation of total urbanized area draining to the water quality limited receiving water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high phosphorus loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during re development, including the removal of impervious area of permittee owned properties

ii. The phosphorus source identification report shall be submitted to EPA as part of the year 4 annual report.

c. Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii or identified in the Phosphorus Source Identification Report that are within the drainage area of the water quality limited water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high phosphorus load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs installed in the urbanized area by the permittee or its agents shall be tracked and the permittee shall estimate the phosphorus removal by the BMP consistent with Attachment 3 to Appendix F. The permittee shall 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 annual report.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Rehoboth	Upper Kikemuit River, Kickemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs:

Municipality	Receiving Water	TMDL Name
		Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Swansea	Upper Kikemuit River, Kickemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)

Table F-12: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing phosphorus to the impaired waterbody segments in Rhode Island, the impaired receiving water, and the approved TMDL name.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.II.1. as follows:
    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.II.1 as of that date and the permittee shall comply with the following:
        i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part B.II.1 to date to reduce phosphorus in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
        ii. The permittee shall continue to implement all requirements of Appendix F part B.II.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

III. Bacteria and Pathogen TMDL Requirements

There are currently six approved bacteria (fecal coliform bacteria) or pathogen (fecal coliform and/or enterococcus bacteria) TMDLs for certain waterbody segments in Rhode Island that identify urban stormwater discharges in Massachusetts as sources that are contributing bacteria or pathogens to the impaired segments. The TMDLs include the Kickemuit Reservoir, Upper Kikemuit River, Ten Mile River, Lower Ten Mile River and Omega Pond TMDLs[19] Table F-13 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing bacteria or pathogens to the impaired waterbody segments in Rhode Island,, the impaired receiving water, and the approved TMDL name. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-13 and that discharges to a waterbody or a tributary of a waterbody listed on Table F-13 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-13 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-13 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below::

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.3. Public Education: The permittee shall supplement its Residential program with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee or its agents shall disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance. The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, A.V, B.I, and B.II where appropriate.

            2. part 2.3.4 Illicit Discharge: Catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

[19] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Rehoboth	Upper Kikemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Table F-13: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing bacteria or pathogens to the impaired waterbody segments in Rhode Island,, the impaired receiving water, and the approved TMDL name

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.III.1. applicable to it when in compliance with this part.
    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of bacteria/pathogens are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.III.1 as of that date and the permittee shall comply with the following:
        i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part B.III.1 to date to reduce bacteria/pathogens in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
        ii. The permittee shall continue to implement all requirements of Appendix F part B.III.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation

of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

IV. Metals TMDL Requirements

There are currently five approved metals TMDL for a waterbody segment in Rhode Island that that identifies urban stormwater discharges in Massachusetts as sources that are contributing metals (Cadmium, Lead, Aluminum, Iron) to the impaired segment. The TMDLs include the Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir and Omega Pond TMDLs.[20] Table F-14 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing metals to the impaired waterbody segments in Rhode Island, the impaired receiving water, the approved TMDL name, and the pollutant of concern. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-14 and the discharge is to a waterbody or tributary of a waterbody listed on Table F-14 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-14 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-14 shall identify and implement BMPs designed to reduce metals discharges from its MS4. To address metals discharges, each permittee shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. The permittee remains subject to the requirements of part 2.3. of the permit and shall include the following enhancements to the BMPs required by part 2.3 of the permit:

            1. part 2.3.6, Stormwater Management in New Development and Redevelopment: stormwater management systems designed on commercial and industrial land use area draining to the water quality limited waterbody shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event. EPA also encourages the permittee to require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

            2. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: increased street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high density residential areas, or

[20] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

drainage areas with a large amount of impervious area. Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Table F-14: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing metals to the impaired waterbody segments in Rhode Island, the impaired receiving water, the approved TMDL name, and the pollutant of concern.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.IV.1. applicable to it when in compliance with this part.
    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of metals (Cadmium, Lead, Aluminum, Iron) are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL

b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.IV.1 as of that date and the permittee shall comply with the following:
    i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix F part B.IV.1 to date to reduce metals (Cadmium, Lead, Aluminum, Iron) in their discharges including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
    ii. The permittee shall continue to implement all requirements of Appendix F part B.IV.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

C. Requirements for Discharges to Impaired Waters with a Regional TMDL

I. The "Northeast Regional Mercury TMDL (2007)"

The Northeast Regional Mercury TMDL does not specify a wasteload allocation or other requirements either individually or categorically for the MS4 discharges and specifies that load reductions are to be achieved through reduction in atmospheric deposition sources. No requirements related to this TMDL are imposed on MS4 discharges under this part. However, if the permittee becomes aware, or EPA or MassDEP determines, that an MS4 discharge is causing or contributing to such impairment to an extent that cannot be explained by atmospheric deposition (e.g. chemical spill, acid landfill leachate or other sources), the permittee shall comply with the requirements of part 2.1.1.d and 2.3.4 of the permit.

ATTACHMENT 1 TO APPENDIX F

Method to Calculate Baseline Phosphorus Load (Baseline), Phosphorus Reduction Requirements and Phosphorus load increases due to development (P_{DEVinc})

The methods and annual phosphorus load export rates presented in Attachments 1, 2 and 3 are for the purpose of measuring load reductions for various stormwater BMPs treating runoff from different site conditions (i.e. impervious or pervious) and land uses (e.g. commercial, industrial, residential). The estimates of annual phosphorus load and load reductions due to BMPs are intended for use by the permittee to measure compliance with its Phosphorus Reduction Requirement under the permit.

This attachment provides the method to calculate a baseline phosphorus load discharging in stormwater for the impaired municipalities subject to Lakes and Ponds TMDL. A complete list of municipalities subject to these TMDLs is presented in Appendix F, Table F-6. This method shall be used to calculate the following annual phosphorus loads:

1) Baseline Phosphorus Load for Permittees
2) Phosphorus Reduction Requirement

This attachment also provides the method to calculate stormwater phosphorus load increases due to development for the municipalities subject to the Charles River TMDL requirements and the Lakes & Ponds TMDL requirements:

3) Phosphorus Load Increases due to Development

The **Baseline Phosphorus Load** is a measure of the annual phosphorus load discharging in stormwater from the impervious and pervious areas of the impaired Lake Phosphorus Control Plan (LPCP) Area.

The **Baseline Phosphorus Pounds Reduction** referred to as the permittee's **Phosphorus Reduction Requirement** represents the required reduction in annual phosphorus load in stormwater to meet the WLA for the impaired watershed. The percent phosphorus reduction for each watershed (identified in Appendix F, Table F-6) is applied to the Baseline Phosphorus Load to calculate the Phosphorus Pounds Reduction.

The **Phosphorus load increases due to development (P_{DEVinc})** is the stormwater phosphorus load increases due to development over the previous reporting period and incurred to date. Increases in stormwater phosphorus load from development will increase the permittee's baseline phosphorus load and therefore, the phosphorus reduction requirement.

Examples are provided to illustrate use of the methods. Table 1-1 below provides annual composite phosphorus load export rates (PLERs) by land use category for the Baseline Load and Phosphorus Reduction Requirement calculations. The permittee shall select the land use category that most closely represents the actual use of the watershed. For watersheds with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial land use category for the purpose of calculating phosphorus loads. Table 1-2 provides annual PLERs by land use category for impervious and pervious areas. The permittee shall select the land use category that most closely represents the actual use of the watershed. For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value. If the HSG is not known, assume HSG C conditions for the phosphorus load export rate. For watersheds with

institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial/industrial land use category for the purpose of calculating phosphorus loads. Table 1-3 provides a crosswalk table of land use codes between Tables 1-1 and 1-2 and the codes used by MassGIS.

The composite PLERs in Table 1-1 to be used for calculating Baseline Phosphorus Load are based on the specified directly connected impervious area (DCIA). If the permittee determines through mapping and site investigations that the overall DCIA for the collective area for each land use category is different than the corresponding values in Table 1-1, then the permittee is encouraged to submit this information in its annual report and request EPA to recalculate the composite PLERs for the permittees to use in refining the Baseline Phosphorus Load calculation for the LPCP.

(1) Baseline Phosphorus Load: The permittee shall calculate the **Baseline Phosphorus Load** by the following procedure:

1) Determine the total area (acre) associated with the impaired watershed;

2) Sort the total area associated with the watershed into land use categories;

3) Calculate the annual phosphorus load associated with each land use category by multiplying the total area of land use by the appropriate land use-based composite phosphorus load export rate provided in Table 1-1; and

4) Determine the Baseline Phosphorus Load by summing the land use loads.

Example 1-1 to determine Baseline Phosphorus Load:
Watershed A is 18.0 acres, with 11.0 acres of industrial area (e.g. access drives, buildings, and parking lots), 3.0 acres of medium-density residential and 4.0 acres of unmanaged wooded area.

The **Baseline Phosphorus Load** = (Baseline P Load $_{IND}$) + (Baseline P Load $_{MDR}$) + (Baseline P Load $_{FOR}$)

Where:
Baseline P Load $_{IND}$ = (TA_{IND}) x (PLER for industrial use (Table 1-1))
= 11.0 acre x 1.27 lbs/acre/year
= 14.0 lbs P/year

Baseline P Load $_{MDR}$ = (TA_{MDR}) x (PLER for medium density residential (Table 1-1))
= 3.0 acre x 0.49 lbs/acre/year
= 1.5 lbs P/year

Baseline P Load $_{FOR}$ = (TA_{FOR}) x (PLER for forest (Table 1-1))
= 4.0 acre x 0.12 lbs/acre/year
= 0.5 lbs P/year

Baseline Phosphorus Load = 14.0 lbs P/year + 1.5 lbs P/year + 0.5 lbs P/year
= **16.0 lbs P/year**

(2) Baseline Phosphorus Pounds Reduction (Phosphorus Reduction Requirement): The Baselines Phosphorus Reduction requirement is the amount of reduction in annual phosphorus load (in pounds) that the permittee is required to achieve in the Watershed. The permittee shall calculate the **Phosphorus Reduction Requirement** by multiplying the **Baseline Phosphorus Load** by the applicable percent phosphorus reduction for that watershed specified in Table F-6 (Appendix F).

Example 1-2 to determine Watershed Phosphorus Reduction Requirement:
Table F-6 identifies Watershed A's percent phosphorus reduction as 45%; therefore the Watershed Phosphorus Reduction Requirement is:

Phosphorus Reduction Requirement = (Baseline Phosphorus Load) x (0.45)
= (16.0 lbs P/year) x (0.45)
= **7.2 lbs P/year**

(3) Phosphorus load increases due to development (P_{DEVinc}): To estimate the increases in stormwater phosphorus load due to development in the Watershed (either PCP or LPCP Area), the permittee will use the following procedure:

1) Determine the total area of development by land use category and calculate the baseline load from that area using the composite PLERs in Table 1-1;

2) Distribute the total development area into impervious and pervious subareas by land use category;

3) Calculate the phosphorus load due to development (P_{DEV}) for each land use-based impervious and pervious subarea by multiplying the subarea by the appropriate phosphorus load export rate provided in Table 1-2; and

4) Determine the phosphorus load increase (P_{DEVinc}) by subtracting the baseline phosphorus load from the increased phosphorus load due to development.

Note: If structural BMPs are installed as part of new development, the P_{DEVinc} will be reduced by the amount of BMP load treated by that BMP as calculated in Attachment 3.

Example 1-3 to determine Phosphorus Load Increases: For the same 15.11 acre Watershed A as specified in Example 1-1, a permittee has tracked development in the LPCP Area in the last year that resulted in 1.5 acres of medium density residential area and 0.5 acres of forest land being converted to high density residential impervious area as detailed below. The undeveloped MDR area is pervious area, HSG C soil and the undeveloped forest area is pervious, HSG B soil.

Land Use Category	Baseline Area (acres)	P export rate (lbs P/acre/yr)*	Baseline area unchanged (acres)	P export rate (lbs P/acre/yr)**	Developed Area converted to HDR IA (acres)	P export rate (lbs P/acre/yr)**
Industrial	11.0	1.27	No change	--	No change	--
MDR	3.0	0.49	1.5	0.21	1.5	2.32

Forest	4.0	0.12	3.5	0.12	0.5	2.32

*From Table 1-1; ** From Table 1-2

The phosphorus load increase is calculated as:

Baseline Load = (Baseline P Load $_{IND}$) +
(Baseline P Load $_{MDR}$) +
(Baseline P Load $_{FOR}$)
= **16.0 lb/year** (determined in Example 1-1)

P_{DEV} = $(TA_{IND} \times PLER_{IND})+(IA_{HDR} \times PLER_{HDR})+(PA_{MDR} \times PLER_{MDR})+(PA_{FOR} \times PLER_{For})$
= (11.0 acres * 1.27) + (2.0 acres * 2.32) + (1.5 acres * 0.21) + (3.5 * 0.12)
= **19.0 lbs P/year**

$\mathbf{P_{DEVinc}}$ = P_{DEV} – Baseline Load
= 19.0 – 16.0
= **3.0 lbs/year**

Table 1-1. Annual composite phosphorus load export rates

Land Cover	Representative DCIA, %	Composite PLERs, lb/ac/yr	Composite PLERs, kg/ha/yr
Commercial	**57**	**1.13**	**1.27**
Industrial	**67**	**1.27**	**1.42**
High Density Residential	**36**	**1.04**	**1.16**
Medium Density Residential	**16**	**0.49**	**0.55**
Low Density Residential	**11**	**0.30**	**0.34**
Freeway	**44**	**0.73**	**0.82**
Open Space	**8**	**0.26**	**0.29**
Agriculture	**0.4**	**0.45**	**0.50**
Forest	**0.1**	**0.12**	**0.13**

Table 1-2: Proposed average annual distinct P Load export rates for use in estimating P Load reduction credits the MA MS4 Permit

Phosphorus Source Category by Land Use	Land Surface Cover	P Load Export Rate, lbs/acre/year	P Load Export Rate, kg/ha/yr
Commercial (Com) and Industrial (Ind)	Directly connected impervious	1.78	2.0
	Pervious	See* DevPERV	See* DevPERV
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	2.6
	Pervious	See* DevPERV	See* DevPERV
Medium -Density Residential (MDR)	Directly connected impervious	1.96	2.2
	Pervious	See* DevPERV	See* DevPERV
Low Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	1.34	1.5
	Pervious	See* DevPERV	See* DevPERV
Forest (For)	Directly connected impervious	1.52	1.7
	Pervious	0.13	0.13
Open Land (Open)	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (Ag)	Directly connected impervious	1.52	1.7
	Pervious	0.45	0.5
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group A	Pervious	0.03	0.03
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group B	Pervious	0.12	0.13
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C	Pervious	0.21	0.24
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C/D	Pervious	0.29	0.33
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group D	Pervious	0.37	0.41

Table 1-3: Crosswalk of MassGIS land-use categories to land-use groups for P Load Calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 2013/14 MA MS4
1	Crop Land	Agriculture
2	Pasture (active)	Agriculture
3	Forest	Forest
4	Wetland	Forest
5	Mining	Industrial
6	Open Land includes inactive pasture	open land
7	Participation Recreation	open land
8	spectator recreation	open land
9	Water Based Recreation	open land
10	Multi-Family Residential	High Density Residential
11	High Density Residential	High Density Residential
12	Medium Density Residential	Medium Density Residential
13	Low Density Residential	Low Density Residential
14	Saltwater Wetland	Water
15	Commercial	Commercial
16	Industrial	Industrial
17	Urban Open	open land
18	Transportation	Highway
19	Waste Disposal	Industrial
20	Water	Water
23	cranberry bog	Agriculture
24	Powerline	open land
25	Saltwater Sandy Beach	open land
26	Golf Course	Agriculture
29	Marina	Commercial
31	Urban Public	Commercial
34	Cemetery	open land
35	Orchard	Forest
36	Nursery	Agriculture
37	Forested Wetland	Forest
38	Very Low Density residential	Low Density Residential
39	Junkyards	Industrial
40	Brush land/Successional	Forest

ATTACHMENT 2 TO APPENDIX F

Phosphorus Reduction Credits for Selected Enhanced Non-Structural BMPs

The permittee shall use the following methods to calculate phosphorus load reduction credits for the following enhanced non-structural control practices implemented in the Watershed:

1) Enhanced Sweeping Program;
2) Catch Basin Cleaning;
   and
3) Organic Waste and Leaf Litter Collection program

The methods include the use of default phosphorus reduction factors that EPA has determined are acceptable for calculating phosphorus load reduction credits for these practices.

The methods and annual phosphorus load export rates presented in this attachment are for the purpose of counting load reductions for various BMPs treating storm water runoff from varying site conditions (i.e., impervious or pervious surfaces) and different land uses (e.g. industrial and commercial) within the impaired watershed. Table 2-1 below provides annual phosphorus load export rates by land use category for impervious and pervious areas. The estimates of annual phosphorus load and load reductions resulting from BMP implementation are intended for use by the permittee to measure compliance with its Phosphorus Reduction Requirement under the permit.

Examples are provided to illustrate use of the methods. In calculating phosphorus export rates, the permittee shall select the land use category that most closely represents the actual use for the area in question. For watersheds with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial land use category for the purpose of calculating phosphorus loads. Table 2-2 provides a crosswalk table of land use codes between land use groups in Table 2-1 and the codes used by Mass GIS. For pervious areas, permittees should use the appropriate value for the hydrologic soil group (HSG) if known, otherwise, assume HSG C conditions.

Alternative Methods and/or Phosphorus Reduction Factors: A permittee may propose alternative methods and/or phosphorus reduction factors for calculating phosphorus load reduction credits for these non-structural practices. EPA will consider alternative methods and/or phosphorus reduction factors, provided that the permittee submits adequate supporting documentation to EPA. At a minimum, supporting documentation shall consist of a description of the proposed method, the technical basis of the method, identification of alternative phosphorus reduction factors, supporting calculations, and identification of references and sources of information that support the use of the alternative method and/or factors in the Watershed. If EPA determines that the alternative methods and/or factors are not adequately supported, EPA will notify the permittee and the permittee may receive no phosphorus reduction credit other than a reduction credit calculated by the permittee following the methods in this attachment for the identified practices.

Table 2-1: Proposed average annual distinct P Load export rates for use in estimating P Load reduction credits in the MA MS4 Permit

Phosphorus Source Category by Land Use	Land Surface Cover	P Load Export Rate, lbs/acre/year	P Load Export Rate, kg/ha/yr
Commercial (Com) and Industrial (Ind)	Directly connected impervious	1.78	2.0
	Pervious	See* DevPERV	See* DevPERV
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	2.6
	Pervious	See* DevPERV	See* DevPERV
Medium -Density Residential (MDR)	Directly connected impervious	1.96	2.2
	Pervious	See* DevPERV	See* DevPERV
Low Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	1.34	1.5
	Pervious	See* DevPERV	See* DevPERV
Forest (For)	Directly connected impervious	1.52	1.7
	Pervious	0.13	0.13
Open Land (Open)	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (Ag)	Directly connected impervious	1.52	1.7
	Pervious	0.45	0.5
*Developed Land Pervious (DevPERV) – HSG A	Pervious	0.03	0.03
*Developed Land Pervious (DevPERV) – HSG B	Pervious	0.12	0.13
*Developed Land Pervious (DevPERV) – HSG C	Pervious	0.21	0.24
*Developed Land Pervious (DevPERV) – HSG C/D	Pervious	0.29	0.33
*Developed Land Pervious (DevPERV) – HSG D	Pervious	0.37	0.41

Notes:

- For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value from this table. If the HSG is not known, assume HSG C conditions for the phosphorus load export rate.
- Agriculture includes row crops. Actively managed hay fields and pasture lands. Institutional land uses such as government properties, hospitals and schools are to be included in the commercial and industrial land use grouping for the purpose of calculating phosphorus loading.
- Impervious surfaces within the forest land use category are typically roadways adjacent to forested pervious areas.

Table 2-2: Crosswalk of Mass GIS land use categories to land use groups for P load calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 2013/14 MA MS4
1	Crop Land	Agriculture
2	Pasture (active)	Agriculture
3	Forest	Forest
4	Wetland	Forest
5	Mining	Industrial
6	Open Land includes inactive pasture	open land
7	Participation Recreation	open land
8	spectator recreation	open land
9	Water Based Recreation	open land
10	Multi-Family Residential	High Density Residential
11	High Density Residential	High Density Residential
12	Medium Density Residential	Medium Density Residential
13	Low Density Residential	Low Density Residential
14	Saltwater Wetland	Water
15	Commercial	Commercial
16	Industrial	Industrial
17	Urban Open	open land
18	Transportation	Highway
19	Waste Disposal	Industrial
20	Water	Water
23	cranberry bog	Agriculture
24	Powerline	open land
25	Saltwater Sandy Beach	open land
26	Golf Course	Agriculture
29	Marina	Commercial
31	Urban Public	Commercial
34	Cemetery	open land
35	Orchard	Forest
36	Nursery	Agriculture
37	Forested Wetland	Forest
38	Very Low Density residential	Low Density Residential
39	Junkyards	Industrial
40	Brush land/Successional	Forest

(1) Enhanced Sweeping Program: The permittee may earn a phosphorus reduction credit for conducting an enhanced sweeping program of impervious surfaces. Table 2-2 below outlines the default phosphorus removal factors for enhanced sweeping programs. The credit shall be calculated by using the following equation:

$$Credit_{sweeping} = IA_{swept} \times PLE_{IC\text{-}land\ use} \times PRF_{sweeping} \times AF \qquad \textbf{(Equation 2-1)}$$

Where:

$Credit_{sweeping}$ = Amount of phosphorus load removed by enhanced sweeping program (lb/year)

IA_{swept} = Area of impervious surface that is swept under the enhanced sweeping program (acres)

$PLE_{IC\text{-}land\ use}$ = Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/yr) (see Table 2-1)

$PRF_{sweeping}$ = Phosphorus Reduction Factor for sweeping based on sweeper type and frequency (see Table 2-3).

AF = Annual Frequency of sweeping. For example, if sweeping does not occur in Dec/Jan/Feb, the AF would be 9 mo./12 mo. = 0.75. For year-round sweeping, AF=1.0[1]

As an alternative, the permittee may apply a credible sweeping model of the Watershed and perform continuous simulations reflecting build-up and wash-off of phosphorus using long-term local rainfall data.

Table 2-3: Phosphorus reduction efficiency factors ($PRF_{sweeping}$) for sweeping impervious areas

Frequency[1]	Sweeper Technology	$PRF_{sweeping}$
2/year (spring and fall)[2]	Mechanical Broom	0.01
2/year (spring and fall)[2]	Vacuum Assisted	0.02
2/year (spring and fall)[2]	High-Efficiency Regenerative Air-Vacuum	0.02
Monthly	Mechanical Broom	0.03
Monthly	Vacuum Assisted	0.04
Monthly	High Efficiency Regenerative Air-Vacuum	0.08
Weekly	Mechanical Broom	0.05
Weekly	Vacuum Assisted	0.08
Weekly	High Efficiency Regenerative Air-Vacuum	0.10

[1]For full credit for monthly and weekly frequency, sweeping must be conducted year round. Otherwise, the credit should be adjusted proportionally based on the duration of the sweeping season (using AF factor).

[2] In order to earn credit for semi-annual sweeping the sweeping must occur in the spring following snow-melt and road sand applications to impervious surfaces and in the fall after leaf-fall and prior to the onset to the snow season.

Example 2-1: Calculation of enhanced sweeping program credit (Credit $_{sweeping}$): A permittee proposes to implement an enhanced sweeping program and perform weekly sweeping from March 1 – December 1 (9 months) in their Watershed, using a vacuum assisted sweeper on 20.3 acres of parking lots and roadways in a high-density residential area of the Watershed. For this site the needed information is:

IA_{swept}	= 20.3 acres
$PLE_{IC\text{-}HDR}$	= 2.32 lb/acre/yr (from Table 2-1)
$PRF_{sweeping}$	= 0.08 (from Table 2-3)
AF	= (9 months / 12 months) = 0.75

Substitution into equation 2-1 yields a $Credit_{sweeping}$ of 3.2 pounds of phosphorus removed per year.

$Credit_{sweeping}$ = IA_{swept} x $PLE_{land\ use}$ x $PRF_{sweeping}$ x AF
= 20.3 acres x 2.32 lbs/acre/yr x 0.08 x 0.75
= 2.8 lbs/yr

(2) Catch Basin Cleaning: The permittee may earn a phosphorus reduction credit, $Credit_{CB}$, by removing accumulated materials from catch basins (i.e., catch basin cleaning) in the Watershed such that a minimum sump storage capacity of 50% is maintained throughout the year. The credit shall be calculated by using the following equation:

$$Credit_{CB} = IA_{CB} \times PLE_{IC\text{-}land\ use} \times PRF_{CB} \quad \textbf{(Equation 2-2)}$$

Where:

$Credit_{CB}$	=	Amount of phosphorus load removed by catch basin cleaning (lb/year)
IA_{CB}	=	Impervious drainage area to catch basins (acres)
$PLE_{IC\text{-}and\ use}$	=	Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/yr) (see Table 2-1)
PRF_{CB}	=	Phosphorus Reduction Factor for catch basin cleaning (see Table 2-4)

Table 2-4: Phosphorus reduction efficiency factor (PRF_{CB}) for semi-annual catch basin cleaning

Frequency	Practice	PRF_{CB}
Semi-annual	Catch Basin Cleaning	0.02

Example 2-2: Calculation for catch basin cleaning credit (Credit $_{CB}$):
A permittee proposes to clean catch basins in their Watershed (i.e., remove accumulated sediments and contaminants captured in the catch basins) that drain runoff from 15.3 acres of medium-density residential impervious area. For this site the needed information is:

IA_{CB}	= 15.3 acre
$PLE_{IC\text{-}MDR}$	= 1.96 lbs/acre/yr (from Table 2-1)
PRF_{CB}	= 0.02 (from Table 2-4)

Substitution into equation 2-2 yields a Credit $_{CB}$ of 0.6 pounds of phosphorus removed per year:

Credit $_{CB}$	= IA_{CB} x $PLE_{IC\text{-}MDR}$ x PRF_{CB}
	= 15.3 acre x 1.96 lbs/acre/yr x 0.02
	= 0.6 lbs/yr

(3) Enhanced Organic Waste and Leaf Litter Collection program: The permittee may earn a phosphorus reduction credit by performing regular gathering, removal and disposal of landscaping wastes, organic debris, and leaf litter from impervious surfaces from which runoff discharges to the TMDL waterbody or its tributaries. In order to earn this credit (Credit $_{leaf\ litter}$), the permittee must gather and remove all landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots at least once per week during the period of September 1 to December 1 of each year. Credit can only be earned for those impervious surfaces that are cleared of organic materials in accordance with the description above. The gathering and removal shall occur immediately following any landscaping activities in the Watershed and at additional times when necessary to achieve a weekly cleaning frequency. The permittee must ensure that the disposal of these materials will not contribute pollutants to any surface water discharges. The permittee may use an enhanced sweeping program (e.g., weekly frequency) as part of earning this credit provided that the sweeping is effective at removing leaf litter and organic materials. The Credit $_{leaf\ litter}$ shall be determined by the following equation:

$$Credit_{leaf\ litter} = (Watershed\ Area) \times (PLE_{IC\text{-}land\ use}) \times (0.05) \qquad \textbf{(Equation 2-3)}$$

Where:

Credit $_{leaf\ litter}$	= Amount of phosphorus load reduction credit for organic waste and leaf litter collection program (lb/year)
Watershed Area	= All impervious area (acre) from which runoff discharges to the TMDL waterbody or its tributaries in the Watershed
$PLE_{IC\text{-}land\ use}$	= Phosphorus Load Export Rate for impervious cover and specified land use (lbs/acre/yr) (see Table 2-1)
0.05	= 5% phosphorus reduction factor for organic waste and leaf litter collection program in the Watershed

Example 2-3: Calculation for organic waste and leaf litter collection program credit (Credit $_{\text{leaf litter}}$): A permittee proposes to implement an organic waste and leaf litter collection program by sweeping the parking lots and access drives at a minimum of once per week using a mechanical broom sweeper for the period of September 1 to December 1 over 12.5 acres of impervious roadways and parking lots in an industrial/commercial area of the Watershed. Also, the permittee will ensure that organic materials are removed from impervious areas immediately following all landscaping activities at the site. For this site the needed information to calculate the Credit $_{\text{leaf litter}}$ is:

Watershed Area = 12.5 acres; and
PLE $_{\text{IC-commercial}}$ = 1.78 lbs/acre/yr (from Table 2-1)

Substitution into equation 2-4 yields a Credit $_{\text{leaf litter}}$ of 1.1 pounds of phosphorus removed per year:

Credit $_{\text{leaf litter}}$ = (12.5 acre) x (1.78 lbs/acre/yr) x (0.05)
= 1.1 lbs/yr

The permittee also may earn a phosphorus reduction credit for enhanced sweeping of roads and parking lot areas (i.e., Credit $_{\text{sweeping}}$) for the three months of use. Using equation 2-1, Credit $_{\text{sweeping}}$ is:

Credit $_{\text{sweeping}}$ = IA $_{\text{swept}}$ x PLE $_{\text{IC-land use}}$ x PRF $_{\text{sweeping}}$ x AF **(Equation 2-1)**
IA $_{\text{swept}}$ = 12.5 acre
PLE $_{\text{IC-commercial}}$ = 1.78 lbs/acre/yr (from Table 2-1)
PRF $_{\text{sweeping}}$ = 0.05 (from Table 2-3)
AF = 3 mo./12 mo. = 0.25

Substitution into equation 2-1 yields a Credit $_{\text{sweeping}}$ of 0.28 pounds of phosphorus removed per year.

Credit $_{\text{sweeping}}$ = IA $_{\text{swept}}$ x PLE $_{\text{IC-commercial}}$ x PRF $_{\text{sweeping}}$ x AF
= 12.5 acre x 1.78 lbs/acre/yr x 0.05 x 0.25
= 0.3 lbs/yr

ATTACHMENT 3 TO APPENDIX F

Methods to Calculate Phosphorus Load Reductions for Structural Stormwater Best Management Practices

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Methods to Calculate Phosphorus Load Reductions for Structural Stormwater Best Management Practices in the Watershed

This attachment provides methods to determine design storage volume capacities and to calculate phosphorus load reductions for the following structural Best Management Practices (structural BMPs) for a Watershed:

1) Infiltration Trench;
2) Infiltration Basin or other surface infiltration practice;
3) Bio-filtration Practice;
4) Gravel Wetland System;
5) Porous Pavement;
6) Wet Pond or wet detention basin;
7) Dry Pond or detention basin; and
8) Dry Water Quality Swale/ Grass Swale.

Additionally, this attachment provides methods to design and quantify associated phosphorus load reduction credits for the following four types of semi-structural/non-structural BMPs

9) Impervious Area Disconnection through Storage (e.g., rain barrels, cisterns, etc);
10) Impervious Area Disconnection;
11) Conversions of Impervious Area to Permeable Pervious Area; and
12) Soil Amendments to Enhance Permeability of Pervious Areas.

Methods and examples are provided in this Attachment to calculate phosphorus load reductions for structural BMPs for the four following purposes:

1) To determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area is 100% impervious;
2) To determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area is 100% impervious;
3) To determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces; and
4) To determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area has impervious and pervious surfaces.

Examples are also provided for estimating phosphorus load reductions associated with the four semi-structural/non-structural BMPs.

Also, this attachment provides the methodology for calculating the annual stormwater phosphorus load that will be delivered to BMPs for treatment (BMP Load) and to be used for quantifying phosphorus load reduction credits. The methods and annual phosphorus export load rates presented in this attachment are for the purpose of counting load reductions for various BMPs treating storm water runoff from varying site conditions (i.e., impervious or pervious surfaces) and different land uses (e.g. commercial and industrial). The estimates of annual phosphorus load and load reductions by BMPs are to demonstrate compliance with the permittee's Phosphorus Reduction Requirement under the permit.

Structural BMP performance credits: For each structural BMP type identified above (BMPs 1-8), long-term cumulative performance information is provided to calculate phosphorus load reductions or to determine needed design storage volumes to achieve a specified reduction target (e.g., 65% phosphorus load reduction). The performance information is expressed as cumulative phosphorus load removed (% removed) depending on the physical storage capacity of the structural BMP (expressed as inches of runoff from impervious area) and is provided at the end of this Attachment (see Tables 3-1 through 3-18 and performance curves Figures 3-1 through 3-17). Multiple tables and performance curves are provided for the infiltration practices to represent cumulative phosphorus load reduction performance for six infiltration rates (IR), 0.17, 0.27, 0.53, 1.02, 2.41, and 8.27 inches/hour. These infiltration rates represent the saturated hydraulic conductivity of the soils. The permittee may use the performance curves provided in this attachment to interpolate phosphorus load removal reductions for field measured infiltration rates that are different than the infiltration rates used to develop the performance curves. Otherwise, the permittee shall use the performance curve for the IR that is nearest, but less than, the field measured rate. Physical storage capacity equals the total physical storage volume of the control structure to contain water at any instant in time. Typically, this storage capacity is comprised of the surface ponding storage volume prior to overflow and subsurface storage volumes in storage units and pore spaces of coarse filter media. Table 3-30 provides the formulae to calculate physical storage capacities for the structural control types for using the performance curves.

Semi-Structural/Non-structural BMP performance credits: For each semi-structural/non-structural BMP type identified above (BMPs 9-12), long-term cumulative performance information is provided to calculate phosphorus load reductions or to determine needed design specifications to achieve a desired reduction target (e.g., 50% phosphorus load reduction). The performance information is expressed as cumulative runoff volume reduction (% removed) depending on the design specifics and actual field conditions. Cumulative percent runoff volume reduction is being used to estimate the cumulative phosphorus load reduction credit for these BMPs. To represent a wide range of potential conditions for implementing these types of BMPs, numerous performance tables and curves have been developed to reflect a wide range of potential conditions and designs such as varying storage volumes (expressed in terms of varying ratios of storage volume to impervious area (0.1 to 2.0 inches)); varying ratios of impervious source area to receiving pervious area based on hydrologic soil groups (HSGs) A, B, C and D (8:1, 6:1, 4:1, 2: 1 and 1:1); and varying discharge time periods for temporary storage (1, 2 or 3 days) . The default credits are provided at the end of this Attachment (see Tables 3-19 through 3-26 and performance curves Figures 3-18 through 3-38).

EPA will consider phosphorus load reductions calculated using the methods provided below to be valid for the purpose of complying with the terms of this permit for BMPs that have not been explicitly modeled if the desired BMP has functionality that is similar to one of the simulated BMP types. Please note that only the surface infiltration and the infiltration trench BMP types were simulated to direct storm water runoff into the ground (i.e., infiltration). All of the other simulated BMPs represent practices that have either under-drains or impermeable liners and therefore, are not hydraulically connected to the sub-surface soils (i.e., no infiltration). Following are some simple guidelines for selecting the BMP type and/or determining whether the results of any of the BMP types provided are appropriate for another BMP of interest.

Infiltration Trench is a practice that provides temporary storage of runoff using the void spaces within the soil/sand/gravel mixture that is used to backfill the trench for subsequent infiltration into the surrounding sub-soils. Performance results for the infiltration trench can be used for all subsurface infiltration practices including systems that include pipes and/or chambers that provide temporary storage. Also, the results for this BMP type can be used for bio-retention systems that rely on infiltration when the majority of the temporary storage capacity is provided in the void spaces of the soil filter media and porous pavements that allow infiltration to occur.

Surface Infiltration represents a practice that provides temporary surface storage of runoff (e.g., ponding) for subsequent infiltration into the ground. Appropriate practices for use of the surface infiltration performance estimates include infiltration basins, infiltration swales, rain gardens and bio-retention systems that rely on infiltration and provide the majority of storage capacity through surface-ponding. If an infiltration system includes both surface storage through ponding and a lessor storage volume within the void spaces of a coarse filter media, then the physical storage volume capacity used to determine the long-term cumulative phosphorus removal efficiency from the infiltration basin performance curves would be equal to the sum of the surface storage volume and the void space storage volume. General design specifications for various surface infiltration systems are provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Bio-filtration is a practice that provides temporary storage of runoff for filtering through an engineered soil media. The storage capacity is typically made of void spaces in the filter media and temporary ponding at the surface of the practice. Once the runoff has passed through the filter media it is collected by an under-drain pipe for discharge. The performance curve for this control practice assumes zero infiltration. If a filtration system has subsurface soils that are suitable for infiltration, then user should use the either performance curves for the infiltration trench or the infiltration basin depending on the predominance of storage volume made up by free standing storage or void space storage. Depending on the design of the filter media manufactured or packaged bio-filter systems such as tree box filters may be suitable for using the bio-filtration performance results. Design specifications for bio-filtration systems are provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Gravel Wetland performance results should be used for practices that have been designed in accordance or share similar features with the design specifications for gravel wetland systems provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Porous Pavement performance results represent systems with an impermeable under-liner and an under-drain. *If porous pavement systems do not have an impermeable under-liner so that filtered runoff can infiltrate into sub-soils then the performance results for an infiltration trench may be used for these systems.* Design specifications for porous pavement systems are provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Extended Dry Detention Pond performance results should only be used for practices that have been designed in accordance with the design specifications for extended dry detention ponds provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf)

Dry Water Quality Swale/ Grass Swale performance results should only be used for practices that have been designed in accordance with the design specifications for a water quality dry swale provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf)

Impervious Area Disconnection using Storage (e.g., rain barrels, cistern, etc) performance results are for collecting runoff volumes from impervious areas such as roof tops, providing temporary storage of runoff volume using rain barrels, cisterns or other storage containers, and discharging stored volume to adjacent permeable pervious surfaces over an extended period of time.

Impervious Area Disconnection performance results are for diverting runoff volumes from impervious areas such as roadways, parking lots and roof tops, and discharging it to adjacent vegetated permeable surfaces that are of sufficient size with adequate soils to receive the runoff without causing negative impacts to adjacent down-gradient properties. Careful consideration must be given to the ratio of impervious area to the pervious area that will receive the discharge. Also, devices such as level spreaders to disperse the discharge and provide sheet flow should be employed whenever needed to increase recharge and avoid flow concentration and short circuiting through the pervious area. Soil testing is needed to classify the permeability of the receiving pervious area in terms of HSG.

Conversion of Impervious Area to Permeable Pervious Area phosphorus load reduction credits are for replacing existing impervious surfaces (such as traditional pavements and buildings with roof tops) with permeable surfaces. To be eligible for credit, it is essential that the area previously covered with impervious surface be restored to provide natural or enhanced hydrologic functioning so that the surface is permeable. Sub-soils beneath pavements are typically highly compacted and will require reworking to loosen the soil and the possible addition of soil amendments to restore permeability. Soil testing is needed to classify the permeability (in terms of HSG) of the restored pervious area.

Soil Amendments to Increase Permeability of Pervious Areas performance results are for the practice of improving the permeability of pervious areas through incorporation of soil amendments, tilling and establishing dense vegetation. This practice may be used to compliment other practices such as impervious area disconnection to improve overall performance and increase reduction credits earned. Soil testing is needed to classify the permeability (in terms of HSG) of the restored pervious area.

Alternative Methods:

A permittee may propose alternative long-term cumulative performance information or alternative methods to calculate phosphorus load reductions for the structural BMPs identified above or for other structural BMPs not identified in this Attachment.

EPA will consider alternative long-term cumulative performance information and alternative methods to calculate phosphorus load reductions for structural BMPs provided that the permittee provides EPA with adequate supporting documentation. At a minimum, the supporting documentation shall include:

1) Results of continuous BMP model simulations representing the structural BMP, using a verified BMP model and representative long-term (i.e., 10 years) climatic data including hourly rainfall data;
2) Supporting calculations and model documentation that justify use of the model, model input parameters, and the resulting cumulative phosphorus load reduction estimate;
3) If pollutant removal performance data are available for the specific BMP, model calibration results should be provided; and
4) Identification of references and sources of information that support the use of the alternative information and method.

If EPA determines that the long-term cumulative phosphorus load reductions developed based on alternative information are not adequately supported, EPA will notify the permittee in writing, and the permittee may receive no phosphorus reduction credit other than a reduction credit calculated by the permittee using the default phosphorus reduction factors provided in this attachment for the identified practices. The permittee is required to submit to EPA valid phosphorus load reductions for structural BMPs in the watershed in accordance with the submission schedule requirements specified in the permit and Appendix F.

Method to Calculate Annual Phosphorus Load Delivered to BMPs (BMP Load)

The **BMP Load** is the annual phosphorus load from the drainage area to each proposed or existing BMP used by permittee to claim credit against its stormwater phosphorus load reduction requirement (i.e., Phosphorus Reduction Requirement). The BMP Load is the starting point from which the permittee calculates the reduction in phosphorus load achieved by each existing and proposed BMP.

Examples are provided to illustrate use of the methods. Table 3-1 below provides annual phosphorus load export rates (PLERs) by land use category for impervious and pervious areas. The permittee shall select the land use category that most closely represents the actual use of the watershed. For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value. If the HSG is not known, assume HSG C conditions for the phosphorus load export rate. For watersheds with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial/industrial land use category for the purpose of calculating phosphorus loads. Table 3-2 provides a crosswalk table of land use codes between land use groups in Table 3-1 and the codes used by MassGIS.

BMP Load: To estimate the annual phosphorus load reduction that a storm water BMP can achieve, it is first necessary to estimate the amount of annual phosphorus load that the BMP will receive or treat (BMP Load).
For a given BMP:

1) Determine the total drainage area to the BMP;

2) Distribute the total drainage area into impervious and pervious subareas by land use category as defined by Tables 3-1 and 3-2;

3) Calculate the phosphorus load for each land use-based impervious and pervious subarea by multiplying the subarea by the appropriate phosphorus load export rate provided in Table 3-1; and

4) Determine the total annual phosphorus load to the BMP by summing the calculated impervious and pervious subarea phosphorus loads.

Example 3-1 to determine phosphorus load to a proposed BMP: A permittee is proposing a surface stormwater infiltration system that will treat runoff from an industrial site with an area of 12.87 acres (5.21 hectares) and is made up of 10.13 acres of impervious cover (e.g., roadways, parking areas and rooftops), 1.85 acres of landscaped pervious area and 0.89 acres of wooded area both with HSG C soils. The drainage area information for the proposed BMP is:

BMP Subarea ID	Land Use Category	Cover Type	Area (acres)	P export rate (lb/acre/yr)*
1	Industrial	impervious	10.13	1.78
2	Landscaped (HSG C)	pervious	1.85	0.21
3	Forest (HSG C)	pervious	0.89	0.12

*From Table 3-1

The phosphorus load to the proposed BMP (BMP Load) is calculated as:

BMP Load $= (IA_{Ind} \times PLER_{Ind}) + (PA_{Ind} \times PLER_{Ind}) + (PA_{FOREST} \times PLER_{For})$
$= (10.13 \times 1.78) + (1.85 \times 0.21) + (0.89 \times 0.12)$
= 18.53 lbs P/year

Table 3-1: Average annual distinct phosphorus load (P Load) export rates for use in estimating phosphorus load reduction credits the MA MS4 Permit

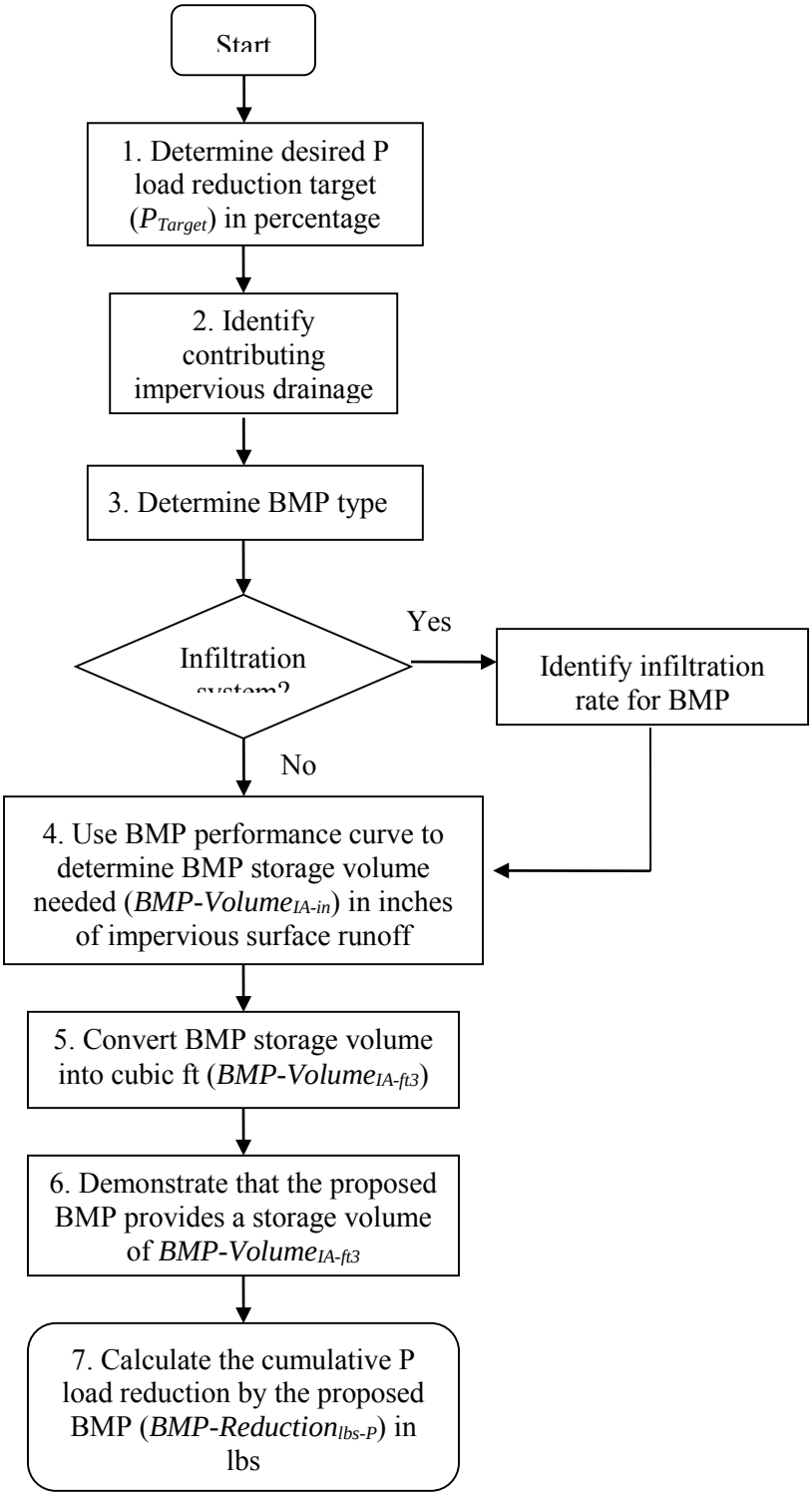
Phosphorus Source Category by Land Use	Land Surface Cover	P Load Export Rate, lbs/acre/year	P Load Export Rate, kg/ha/yr
Commercial (Com) and Industrial (Ind)	Directly connected impervious	1.78	2.0
	Pervious	See* DevPERV	See* DevPERV
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	2.6
	Pervious	See* DevPERV	See* DevPERV
Medium -Density Residential (MDR)	Directly connected impervious	1.96	2.2
	Pervious	See* DevPERV	See* DevPERV
Low Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	1.34	1.5
	Pervious	See* DevPERV	See* DevPERV
Forest (For)	Directly connected impervious	1.52	1.7
	Pervious	0.13	0.13
Open Land (Open)	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (Ag)	Directly connected impervious	1.52	1.7
	Pervious	0.45	0.5
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group A	Pervious	0.03	0.03
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group B	Pervious	0.12	0.13
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C	Pervious	0.21	0.24
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C/D	Pervious	0.29	0.33
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group D	Pervious	0.37	0.41

Table 3- 2: MassGIS land-use categories with associated land-use groups for phosphorus load calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 2013/14 MA MS4
1	Crop Land	Agriculture
2	Pasture (active)	Agriculture
3	Forest	Forest
4	Wetland	Forest
5	Mining	Industrial
6	Open Land includes inactive pasture	open land
7	Participation Recreation	open land
8	spectator recreation	open land
9	Water Based Recreation	open land
10	Multi-Family Residential	High Density Residential
11	High Density Residential	High Density Residential
12	Medium Density Residential	Medium Density Residential
13	Low Density Residential	Low Density Residential
14	Saltwater Wetland	Water
15	Commercial	Commercial
16	Industrial	Industrial
17	Urban Open	open land
18	Transportation	Highway
19	Waste Disposal	Industrial
20	Water	Water
23	cranberry bog	Agriculture
24	Powerline	open land
25	Saltwater Sandy Beach	open land
26	Golf Course	Agriculture
29	Marina	Commercial
31	Urban Public	Commercial
34	Cemetery	open land
35	Orchard	Forest
36	Nursery	Agriculture
37	Forested Wetland	Forest
38	Very Low Density residential	Low Density Residential
39	Junkyards	Industrial
40	Brush land/Successional	Forest

(1) Method to determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area is 100% impervious:

Flow Chart 1 illustrates the steps to determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area is 100% impervious.



Flow Chart 1: Method to determine BMP design volume to achieve a known phosphorous load reduction when contributing drainage area is 100% impervious.

1) Determine the desired cumulative phosphorus load reduction target (P_{target}) in percentage for the structural BMP;

2) Determine the contributing impervious drainage area (IA) in acres to the structural BMP;

3) Determine the structural BMP type (e.g., infiltration trench, gravel wetland). For infiltration systems, determine the appropriate infiltration rate for the location of the BMP in the Watershed;

4) Using the cumulative phosphorus removal performance curve for the selected structural BMP (Figures 3-1 through 3-18), determine the storage volume for the BMP (BMP-Volume $_{IA\text{-}in}$), in inches of runoff, needed to treat runoff from the contributing IA to achieve the reduction target;

5) Calculate the corresponding BMP storage volume in cubic feet (BMP-Volume $_{IA\text{-}ft^3}$) using BMP-Volume $_{IA\text{-}in}$ determined from step 4 and equation 3-1:

BMP-Volume $_{IA\text{-}ft^3}$ = IA (acre) x BMP-Volume $_{IA\text{-}in}$ x 3630 ft^3/ac-in **(Equation 3-1)**

6) Provide supporting calculations using the dimensions and specifications of the proposed structural BMP showing that the necessary storage volume, BMP-Volume $_{IA\text{-}ft^3}$, determined from step 5 will be provided to achieve the P_{Target}; and

7) Calculate the cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the structural BMP using the BMP Load (as calculated from the procedure in Attachment 1 to Appendix F) and P_{target} by using equation 3-2:

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100) **(Equation 3-2)**

Example 3-2 to determine design volume of a structural BMP with a 100% impervious drainage area to achieve a known phosphorus load reduction target:

A permittee is considering a surface infiltration practice to capture and treat runoff from 2.57 acres (1.04 ha) of commercial impervious area that will achieve a 70% reduction in annual phosphorus load. The infiltration practice would be located adjacent to the impervious area. The permittee has measured an infiltration rate (IR) of 0.39 inches per hour (in/hr) in the vicinity of the proposed infiltration practice. Determine the:

A) Design storage volume needed for an surface infiltration practice to achieve a 70% reduction in annual phosphorus load from the contributing drainage area (BMP-Volume $_{IA\text{-}ft^3}$); and

B) Cumulative phosphorus reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}P}$)

Solution:

1) Contributing impervious drainages area (IA) = 2.57 acres

BMP type is a surface infiltration practice (i.e., basin) with an infiltration rate (IR) of 0.39 in/hr

Solution continued:

3) Phosphorus load reduction target (P_{target}) = 70%

4) The performance curve for the infiltration basin (i.e., surface infiltration practice), Figure 3-8, IR = 0.27 in/hr is used to determine the design storage volume of the BMP (BMP-Volume $_{IA\text{-}in}$) needed to treat runoff from the contributing IA and achieve a P_{target} = 70%. The curve for an infiltration rate of 0.27 in/hr is chosen because 0.27 in/hr is the nearest simulated IR that is less than the field measured IR of 0.39 in/hr. From Figure 3-8, the BMP-Volume $_{IA\text{-}in}$ for a P_{target} = 70% is 0.36 in.

5) The BMP-Volume $_{IA\text{-}in}$ is converted to cubic feet (BMP-Volume $_{IA\text{-}ft^3}$) using Equation 3-1:

BMP-Volume $_{IA\text{-}ft^3}$ = IA (acre) x BMP-Volume $_{IA\text{-}in}$ x 3,630 ft^3/acre-in
BMP-Volume $_{IA\text{-}ft^3}$ = 2.57 acre x 0.36 in x 3,630 ft^3/acre-in
= **3,359 ft^3**

6) A narrow trapezoidal infiltration basin with the following characteristics is proposed to achieve the P_{Target} of 70%:

Length (ft)	Design Depth (ft)	Side Slopes	Bottom area (ft^2)	Pond surface area (ft^2)	Design Storage Volume (ft^3)
355	1.25	3:1	1,387	4,059	3,404

The volume of the proposed infiltration practice, 3,404 ft^3, exceeds the BMP-Volume $_{IA\text{-}ft^3}$ needed, 3,359 ft^3 and is sufficient to achieve the P Target of 70%.

7) The cumulative phosphorus load reduction in pounds of phosphorus for the infiltration practice (BMP-Reduction $_{lbs\text{-}P}$) is calculated using Equation 3-2. The BMP Load is first determined using the method described above.

BMP Load = IA x impervious cover phosphorus export loading rate for commercial use (see Table 3-1)
= 2.57 acres x 1.78 lbs/acre/yr
= 4.58 lbs/yr

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100)
BMP-Reduction $_{lbs\text{-}P}$ = 4.58 lbs/yr x (70/100)
= **3.21 lbs/yr**

Alternate Solution: Alternatively, the permittee could determine the design storage volume needed for an IR = 0.39 in/hr by performing interpolation of the results from the surface

infiltration performance curves for IR = 0.27 in/hr and IR = 0.52 in/hr as follows (replacing steps 3 and 4 on the previous page):

Alternate solution continued:

Using the performance curves for the infiltration basin (i.e., surface infiltration practice), Figures 3-8, IR = 0.27 in/hr and 3-9, IR = 0.52 in/hr, interpolate between the curves to determine the design storage volume of the BMP (BMP-Volume $_{IA\text{-}in}$) needed to treat runoff from the contributing IA and achieve a P_{target} = 70%.

First calculate the interpolation adjustment factor (IAF) to interpolate between the infiltration basin performance curves for infiltration rates of 0.27 and 0.52 in/hr:

$$IAF = (0.39 - 0.27)/ (0.52 – 0.27) = 0.48$$

From the two performance curves, develop the following table to estimate the general magnitude of the needed storage volume for an infiltration swale with an IR = 0.39 in/hr and a P_{target} of 70%.

Table Example 3-1-1: Interpolation Table for determining design storage volume of infiltration basin with IR = 0.39 in/hr and a phosphorus load reduction target of 70%

BMP Storage Volume	% Phosphorus Load Reduction IR = 0.27 in/hr ($PR_{IR=0.27}$)	% Phosphorus Load Reduction IR = 0.52 in/hr ($PR_{IR=0.52}$)	Interpolated % Phosphorus Load Reduction IR = 0.39 in/hr ($PR_{IR=0.39}$) **$PR_{IR=0.39}$= IAF($PR_{IR=0.52}$ – $PR_{IR=0.27}$) + $PR_{IR=0.27}$**
0.3	64%	67%	65%
0.4	74%	77%	75%
0.5	79%	82%	80%

As indicated from Table Example 3-1, the BMP-Volume $_{IA\text{-}in}$ for $PR_{IR=0.39}$ of 70% is between 0.3 and 0.4 inches and can be determined by interpolation:

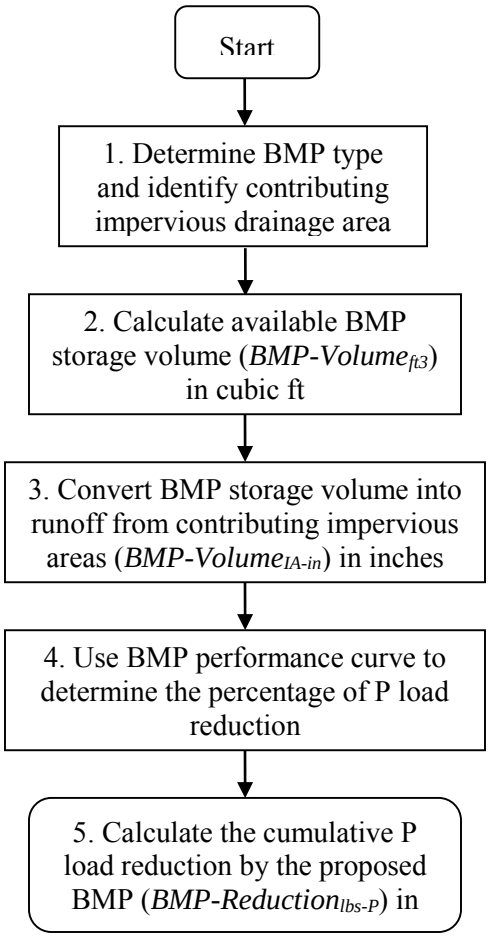
$$\text{BMP-Volume}_{IA\text{-}in} = (70\% - 65\%)/ (75\% - 65\%) \times (0.4 \text{ in} – 0.3 \text{ in}) + 0.3 \text{ in}$$
$$= 0.35 \text{ inches}$$

5 alternative) Convert the resulting BMP-Volume $_{IA\text{-}in}$ to cubic feet (BMP-Volume $_{IA\text{-}ft^3}$) using equation 3-1:

$$\text{BMP-Volume}_{IA\text{-}ft^3} = 2.57 \text{ acre} \times 0.35 \text{ in} \times 3{,}630 \text{ ft}^3/\text{acre-in}$$
$$= \mathbf{3{,}265 \text{ ft}^3}$$

(2) Method to determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area is 100% impervious:

Flow Chart 2 illustrates the steps to determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area is 100% impervious.



Flow Chart 2: Method to determine the phosphorus load reduction for a BMP with a known design volume when contributing drainage area is 100% impervious.

1) Identify the structural BMP type and contributing impervious drainage area (IA);

2) Document the available storage volume (ft^3) of the structural BMP (BMP-Volume $_{ft^3}$) using the BMP dimensions and design specifications (e.g., maximum storage depth, filter media porosity);

3) Convert BMP-Volume $_{ft^3}$ into inches of runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$) using equation 3-3:

BMP-Volume $_{IA\text{-}in}$ = BMP-Volume $_{ft^3}$/ IA (acre) x 12 in/ft x 1 acre/43560 ft^2 **(Equation 3-3)**

4) Determine the % phosphorus load reduction for the structural BMP (BMP Reduction $_{\%\text{-}P}$) using the appropriate BMP performance curve (Figures 3-1 through 3-18) and the BMP-Volume $_{IA\text{-}in}$ calculated in step 3; and

5) Calculate the cumulative phosphorus load reduction in pounds of phosphorus for the structural BMP (BMP Reduction $_{lbs-P}$) using the BMP Load as calculated from the procedure described above and the percent phosphorus load reduction determined in step 4 by using equation 3-4:

BMP Reduction $_{lbs-P}$ = BMP Load x (BMP Reduction $_{\%-P}$/100) **(Equation 3-4)**

Example 3-2: Determine the phosphorus load reduction for a structural BMP with a known storage volume capacity when the contributing drainage area is 100% impervious:

A permittee is considering a bio-filtration system to treat runoff from 1.49 acres of high density residential (HDR) impervious area. Site constraints would limit the bio-filtration system to have a surface area of 1200 ft^2 and the system would have to be located next to the impervious drainage area to be treated. The design parameters for the bio-filtration system are presented in Table Example 3-2-1.

Table Example 3-2-1: Design parameters for bio-filtration system for Example 3-2

Components of representation	Parameters	Value
Ponding	Maximum depth	0.5 ft
	Surface area	1200 ft^2
	Vegetative parameter[a]	85-95%
Soil mix	Depth	2.5 ft
	Porosity	0.40
	Hydraulic conductivity	4 inches/hour
Gravel layer	Depth	0.67 ft
	Porosity	0.40
	Hydraulic conductivity	14 inches/hour
Orifice #1	Diameter	0.5 ft

[a] Refers to the percentage of surface covered with vegetation

Determine the:

A) Percent phosphorus load reduction (BMP Reduction $_{\%-P}$) for the specified bio-filtration system and contributing impervious drainage area; and

B) Cumulative phosphorus reduction in pounds that would be accomplished by the bio-filtration system (BMP-Reduction $_{lbs-P}$)

Solution:

1) The BMP is a bio-filtration system that will treat runoff from 1.49 acres of impervious area (IA = 1.49 acre);

2) The available storage volume capacity (ft^3) of the bio-filtraton system (BMP-Volume $_{BMP-ft^3}$) is determined using the surface area of the system, depth of ponding, and the porosity of the filter media:

BMP-Volume $_{BMP-ft^3}$ = (surface area x pond maximum depth) + ((soil mix depth + gravel layer depth)/12 in/ft) x surface area x gravel layer porosity)
= (1,200 ft^2 x 0.5 ft) + ((38/12) x 1,200 ft^2 x 0.4)
= 2,120 ft^3

Solution continued:

3) The available storage volume capacity of the bio-filtration system in inches of runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$) is calculated using equation 3-3:

BMP-Volume $_{IA\text{-}in}$ = (BMP-Volume $_{ft}^3$/ IA (acre) x 12 in/ft x 1 acre/43560 ft^2
BMP-Volume $_{IA\text{-}in}$ = (2120 ft^3/1.49 acre) x 12 in/ft x 1 acre/43560 ft^2
= 0.39 in

4) Using the bio-filtration performance curve shown in Figure 3-13, a **51%** phosphorus load reduction (BMP Reduction %-P) is determined for a bio-filtration system sized for 0.39 in of runoff from 1.49 acres of impervious area; and

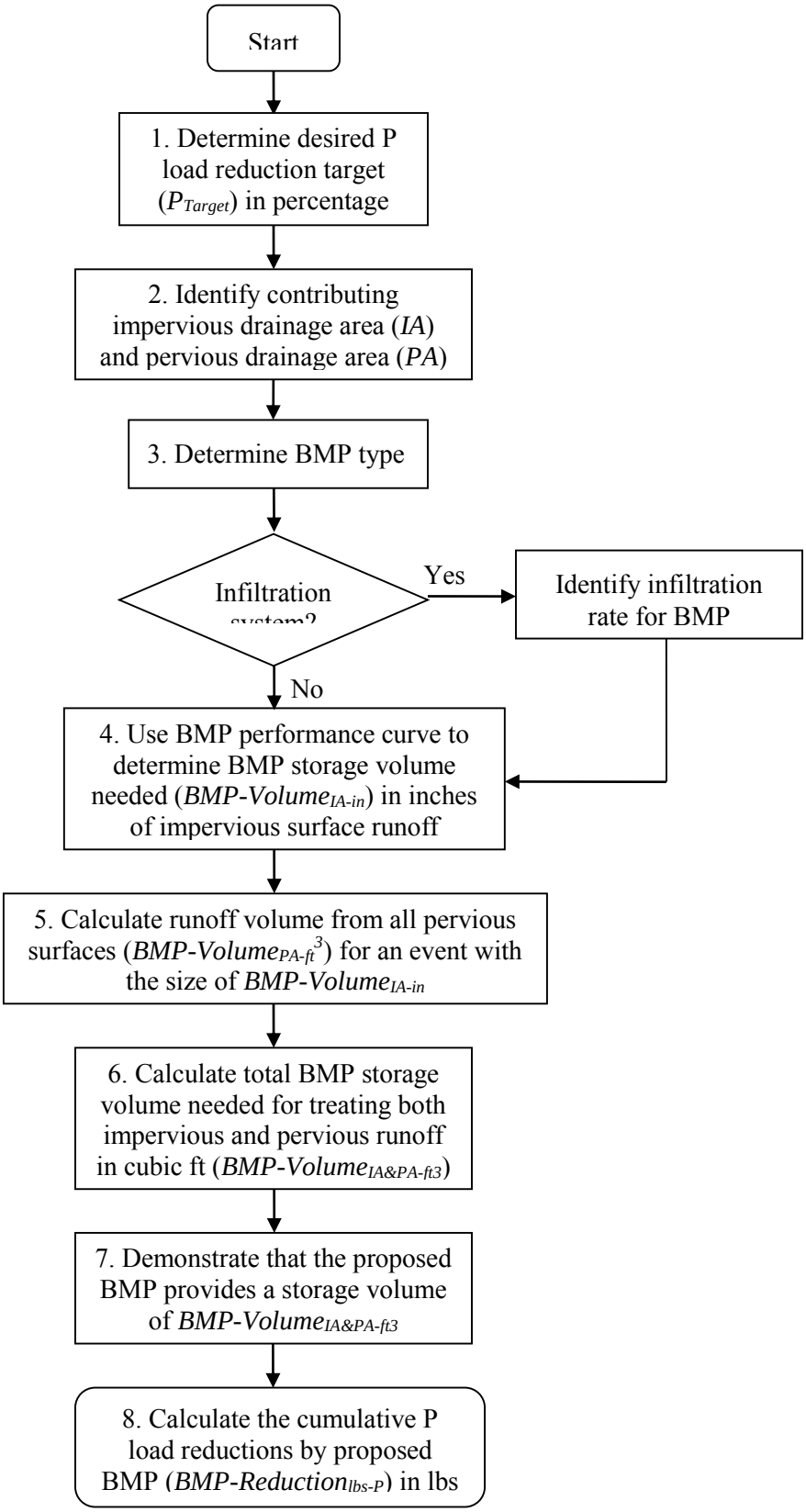
5) Calculate the cumulative phosphorus load reduction in pounds of phosphorus for the bio-filtration system (BMP Reduction $_{lbs\text{-}P}$) using the BMP Load as calculated from the procedure described above and the BMP Reduction $_{\%\text{-}P}$ determined in step 4 by using equation 3-4. First, the BMP Load is determined as specified above:

BMP Load = IA x impervious cover phosphorus export loading rate for HDR (see Table 3-1) = 1.49 acres x 2.32 lbs/acre/yr
= 3.46 lbs/yr

BMP Reduction $_{lbs\text{-}P}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100)
BMP Reduction $_{lbs\text{-}P}$ = 3.46 lbs/yr x (51/100)
= **1.76 lbs/yr**

(3) Method to determine the design storage volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces:

Flow Chart 3 illustrates the steps to determine the design storage volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces.


Start
1. Determine desired P load reduction target (P_{Target}) in percentage
2. Identify contributing impervious drainage area (*IA*) and pervious drainage area (*PA*)
3. Determine BMP type
Infiltration system?
Yes
Identify infiltration rate for BMP
No
4. Use BMP performance curve to determine BMP storage volume needed (*BMP-Volume*$_{IA\text{-}in}$) in inches of impervious surface runoff
5. Calculate runoff volume from all pervious surfaces (*BMP-Volume*$_{PA\text{-}ft}{}^{3}$) for an event with the size of *BMP-Volume*$_{IA\text{-}in}$
6. Calculate total BMP storage volume needed for treating both impervious and pervious runoff in cubic ft (*BMP-Volume*$_{IA\&PA\text{-}ft3}$)
7. Demonstrate that the proposed BMP provides a storage volume of *BMP-Volume*$_{IA\&PA\text{-}ft3}$
8. Calculate the cumulative P load reductions by proposed BMP (*BMP-Reduction*$_{lbs\text{-}P}$) in lbs

Flow Chart 3: Method to determine the design storage volume of a BMP to reach a known P load reduction when both impervious and pervious drainage areas are present.

1) Determine the desired cumulative phosphorus load reduction target (P_{target}) in percentage for the structural BMP;
2) Characterize the contributing drainage area to the structural BMP by identifying the following information for the impervious and pervious surfaces:
   Impervious area (IA) - Area (acre) and land use (e.g., commercial)

   Pervious area (PA) – Area (acre) and runoff depths based on hydrologic soil group (HSG) and rainfall depth. Table 3-3 provides values of runoff depth from pervious areas for various rainfall depths and HSGs. Soils are assigned to an HSG on the basis of their permeability. HSG A is the most permeable, and HSG D is the least permeable. HSG categories for pervious areas in the drainage area shall be estimated by consulting local soil surveys prepared by the National Resource Conservation Service (NRCS) or by a storm water professional evaluating soil testing results from the drainage area. If the HSG condition is not known, a HSG D soil condition should be assumed.

Table 3- 3: Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups (HSGs)

Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups					
Rainfall Depth, Inches	Runoff Depth, inches				
	Pervious HSG A	Pervious HSG B	Pervious HSG C	Pervious HSG C/D	Pervious HSG D
0.10	0.00	0.00	0.00	0.00	0.00
0.20	0.00	0.00	0.01	0.02	0.02
0.40	0.00	0.00	0.03	0.05	0.06
0.50	0.00	0.01	0.05	0.07	0.09
0.60	0.01	0.02	0.06	0.09	0.11
0.80	0.02	0.03	0.09	0.13	0.16
1.00	0.03	0.04	0.12	0.17	0.21
1.20	0.04	0.05	0.14	0.27	0.39
1.50	0.08	0.11	0.39	0.55	0.72
2.00	0.14	0.22	0.69	0.89	1.08

Notes: Runoff depths derived from combination of volumetric runoff coefficients from Table 5 of *Small Storm Hydrology and Why it is Important for the Design of Stormwater Control Practices*, (Pitt, 1999), and using the Stormwater Management Model (SWMM) in continuous model mode for hourly precipitation data for Boston, MA, 1998-2002.

3) Determine the structural BMP type (e.g., infiltration trench, gravel wetland). For infiltration systems, determine the appropriate infiltration rate for the location of the BMP in the Watershed;
4) Using the cumulative phosphorus removal performance curve for the selected structural BMP, determine the storage volume capacity of the BMP in inches needed to treat runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$);

5) Using Equation 3-5 below and the pervious area runoff depth information from Table 3-3-1, determine the total volume of runoff from the contributing pervious drainage area in cubic feet (BMP Volume $_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP Volume $_{IA\text{-}in}$, determined in step 4. The runoff volume for each distinct pervious area must be determined;

   BMP-Volume $_{PA\ ft^3} = \sum$ (PA x (runoff depth) x 3,630 ft^3/acre-in) $_{(PA1,\ldots\ PAn)}$ **(Equation 3-5)**

6) Using equation 3-6 below, calculate the BMP storage volume in cubic feet (BMP-Volume $_{IA\&PA\text{-}ft^3}$) needed to treat the runoff depth from the contributing impervious (IA) and pervious areas (PA);

   BMP-Volume $_{IA\&PA\text{-}ft^3}$ = BMP Volume $_{PA\text{-}ft^3}$ + (BMP Volume $_{IA\text{-}in}$ x IA (acre) x 3,630 ft^3/acre-in) **(Equation 3-6)**

7) Provide supporting calculations using the dimensions and specifications of the proposed structural BMP showing that the necessary storage volume determined in step 6, BMP-Volume $_{IA\&PA\text{-}ft^3}$, will be provided to achieve the P $_{Target}$; and

8) Calculate the cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the structural BMP using the BMP Load (as calculated from the procedure in Attachment 1 to Appendix F) and the P $_{target}$ by using equation 3-2:

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P $_{target}$ /100) **(Equation 3-2)**

Example 3-3: Determine the design storage volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces

A permittee is considering a gravel wetland system to treat runoff from a high-density residential (HDR) site. The site is 7.50 acres of which 4.00 acres are impervious surfaces and 3.50 acres are pervious surfaces. The pervious area is made up of 2.5 acres of lawns in good condition surrounding cluster housing units and 1.00 acre of stable unmanaged woodland. Soils information indicates that all of the woodland and 0.50 acres of the lawn is hydrologic soil group (HSG) B and the other 2.00 acres of lawn are HSG C. The permittee wants to size the gravel wetland system to achieve a cumulative phosphorus load reduction (P $_{Target}$) of 55% from the entire 7.50 acres.

Determine the:

A) Design storage volume needed for a gravel wetland system to achieve a 55% reduction in annual phosphorus load from the contributing drainage area (BMP-Volume $_{IA\&PA\text{-}ft^3}$); and
B) Cumulative phosphorus reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}P}$)

Example 3-3 continued:
Solution:

1) The BMP type is gravel wetland system.

2) The phosphorus load reduction target (P_{Target}) = 55%.

3) Using the cumulative phosphorus removal performance curve for the gravel wetland system shown in Figure 3-14, the storage volume capacity in inches needed to treat runoff from the contributing impervious area (BMP Volume $_{IA\text{-}in}$) is 0.71 in;

Using equation 3-5 and the pervious runoff depth information from Table 3-3, the volume of runoff from the contributing pervious drainage area in cubic feet (BMP Volume $_{PA-ft^3}$) for a rainfall size equal to 0.71 in is summarized in Table Example 3-3-A. As indicated from Table 3-3, the runoff depth for a rainfall size equal to 0.71 inches is between 0.6 and 0.8 inches and can be determined by interpolation (example shown for runoff depth of HSG C):

Runoff depth (HSG C) = (0.71 – 0.6)/(0.8 – 0.6) x (0.09 in – 0.06 in) + 0.06 in
= 0.07 inches

Table Example 3-3-A: Runoff contributions from pervious areas for HDR site

ID	Type	Pervious Area (acre)	HSG	Runoff (in)	Runoff = (runoff) x PA (acre-in)	Runoff = Runoff (acre-in) x 3630 ft^3/acre-in (ft^3)
PA1	Grass	2.00	C	0.07	0.14	508
PA2	Grass	0.50	B	0.01	0.0	0.0
PA3	Woods	1.00	B	0.01	0.0	0.0
Total	-----	**3.50**	-----	-----	**0.14**	**508**

4) Using equation 3-6, determine the BMP storage volume in cubic feet (BMP-Volume $_{IA\&PA\text{-}ft^3}$) needed to treat 0.71 inches of runoff from the contributing impervious area (IA) and the runoff of 0.14 acre-in from the contributing pervious areas, determined in step 5 is:

BMP Volume$_{IA\&PA\text{-}ft^3}$ = BMP Volume $_{PA\ ac\text{-}in}$ + (BMP Volume $_{IA\text{-}in}$ x IA (acre)) x 3,630 ft^3/acre-in)

BMP Volume$_{IA\&PA\text{-}ft^3}$ = (508 ft^3+ (0.71 in x 4.00 acre)) x 3,630 ft^3/acre-in
= 10,817 ft^3

5) Table Example 3-3-B provides design details for of a potential gravel wetland system

Solution continued:

Table Example 3-3-B: Design details for gravel wetland system

Gravel Wetland System Components	Design Detail	Depth (ft)	Surface Area (ft^2)	Volume (ft^3)
Sediment Forebay	**10% of Treatment Volume**			
Pond area	**----**	1.33	896	1,192
Wetland Cell #1	**45% of Treatment Volume**	----------	----------	----------
Pond area	**----**	2.00	1,914	3,828
Gravel layer	porosity = 0.4	2.00	1,914	1,531
Wetland Cell #2	**45% of Treatment Volume**	----------	----------	----------
Pond area	**----**	2.00	1,914	3,828
Gravel layer	porosity = 0.4	2.00	1,914	1,531

The total design storage volume for the proposed gravel wetland system identified in Table Example 3-3-C is 11,910 ft^3. This volume is greater than 11,834 ft^3 ((BMP-Volume $_{IA\&PA\text{-}ft^3}$), calculated in step 6) and is therefore sufficient to achieve a P_{Target} of 55%.

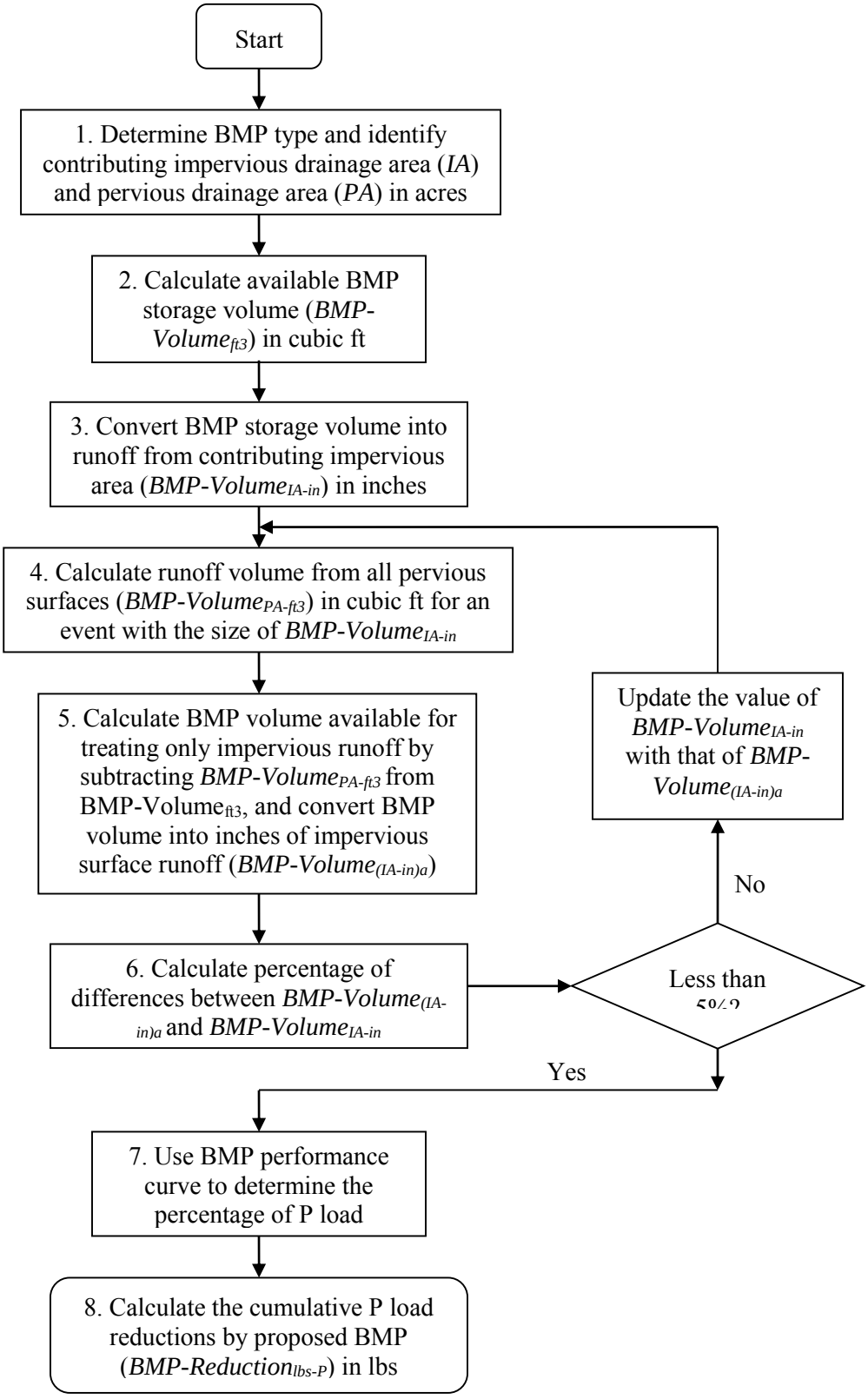
6) The cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the proposed gravel wetland system is calculated by using equation 3-2 with the BMP Load and the P_{target} = 55%.

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100) (**Equation 3-2**)

Using Table 3-1, the BMP Load is calculated:
BMP Load = (IA x PLER $_{HDR}$) + (PA lawn $_{HSG\,B}$ x PLER $_{HSG\,B}$) + (PA lawn $_{HSG\,C}$ x PLER $_{HSG\,C}$) +(PA forest x PA PLER $_{For}$)
= (4.00 acre x 2.32 lbs/acre/yr) + (0.50 acres x 0.12 lbs/acre/yr) + (1.00 acre x 0.21 lbs/acre/yr) + (1.00 acres x 0.13)
= 9.68 lbs/yr
BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100)
BMP-Reduction $_{lbs\text{-}P}$ = 9.68 lbs/yr x 55/100
= **5.32 lbs/yr**

(4) Method to determine the phosphorus load reduction for a structural BMP with a known storage volume when the contributing drainage area has impervious and pervious surfaces:

Flow Chart 4 illustrates the steps to determine the phosphorus load reduction for a structural BMP with a known storage volume when the contributing drainage area has impervious and pervious surfaces.


Start
1. Determine BMP type and identify contributing impervious drainage area (*IA*) and pervious drainage area (*PA*) in acres
2. Calculate available BMP storage volume (*BMP-Volume*$_{ft3}$) in cubic ft
3. Convert BMP storage volume into runoff from contributing impervious area (*BMP-Volume*$_{IA\text{-}in}$) in inches
4. Calculate runoff volume from all pervious surfaces (*BMP-Volume*$_{PA\text{-}ft3}$) in cubic ft for an event with the size of *BMP-Volume*$_{IA\text{-}in}$
5. Calculate BMP volume available for treating only impervious runoff by subtracting *BMP-Volume*$_{PA\text{-}ft3}$ from BMP-Volume$_{ft3}$, and convert BMP volume into inches of impervious surface runoff (*BMP-Volume*$_{(IA\text{-}in)a}$)
6. Calculate percentage of differences between *BMP-Volume*$_{(IA\text{-}in)a}$ and *BMP-Volume*$_{IA\text{-}in}$
Less than
No
Update the value of *BMP-Volume*$_{IA\text{-}in}$ with that of *BMP-Volume*$_{(IA\text{-}in)a}$
Yes
7. Use BMP performance curve to determine the percentage of P load
8. Calculate the cumulative P load reductions by proposed BMP (*BMP-Reduction*$_{lbs\text{-}P}$) in lbs

Flow Chart 4: Method to determine the phosphorus load reduction for a BMP with known storage volume when both pervious and impervious drainage areas are present.

1) Identify the type of structural BMP and characterize the contributing drainage area to the structural BMP by identifying the following information for the impervious and pervious surfaces:

Impervious area (IA) – Area (acre) and land use (e.g., commercial)

Pervious area (PA) – Area (acre) and runoff depth based on hydrologic soil group (HSG) and size of rainfall event. Table 3-3 provides values of runoff depth for various rainfall depths and HSGs. Soils are assigned to an HSG based on their permeability. HSG categories for pervious areas in the Watershed shall be estimated by consulting local soil surveys prepared by the National Resource Conservation Service (NRCS) or by a storm water professional evaluating soil testing results from the Watershed. If the HSG condition is not known, a HSG C/D soil condition should be assumed.

2) Determine the available storage volume (ft^3) of the structural BMP (BMP-Volume $_{ft^3}$) using the BMP dimensions and design specifications (e.g., maximum storage depth, filter media porosity);

3) To estimate the phosphorus load reduction of a BMP with a known storage volume capacity, it is first necessary to determine the portion of available BMP storage capacity (BMP-Volume $_{ft^3}$) that would treat the runoff volume generated from the contributing impervious area (IA) for a rainfall event with a depth of *i* inches (in). This will require knowing the corresponding amount of runoff volume that would be generated from the contributing pervious area (PA) for the same rainfall event (depth of *i* inches). Using equation 3-6a below, solve for the BMP capacity that would be available to treat runoff from the contributing imperious area for the unknown rainfall depth of *i* inches (see equation 3-6b):

$$\text{BMP-Volume}_{ft^3} = \text{BMP-Volume}_{(IA\text{-}ft^3)i} + \text{BMP-Volume}_{(PA\text{-}ft^3)i} \quad \textbf{(Equation 3-6a)}$$

Where:

BMP-Volume $_{ft^3}$= the available storage volume of the BMP;

BMP-Volume $_{(IA\text{-}ft^3)i}$ = the available storage volume of the BMP that would fully treat runoff generated from the contributing impervious area for a rainfall event of size *i* inches; and

BMP-Volume $_{(PA\text{-}ft^3)i}$ = the available storage volume of the BMP that would fully treat runoff generated from the contributing pervious area for a rainfall event of size *i* inches

Solving for BMP-Volume $_{(IA\text{-}ft^3)i}$:

$$\text{BMP-Volume}_{(\text{IA-ft}^3)i} = \text{BMP-Volume}_{\text{ft}^3} - \text{BMP-Volume}_{(\text{PA-ft}^3)i} \quad \textbf{(Equation 3-6b)}$$

To determine $\text{BMP-Volume}_{(\text{IA-ft}^3)i}$, requires performing an iterative process of refining estimates of the rainfall depth used to calculate runoff volumes until the rainfall depth used results in the sum of runoff volumes from the contributing IA and PA equaling the available BMP storage capacity ($\text{BMP-Volume}_{\text{ft}^3}$). For the purpose of estimating BMP performance, it will be considered adequate when the IA runoff depth (in) is within 5% IA runoff depth used in the previous iteration.

For the first iteration (1), convert the $\text{BMP-Volume}_{\text{ft}^3}$ determined in step 2 into inches of runoff from the contributing impervious area ($\text{BMP Volume}_{(\text{IA-in})1}$) using equation 3-7a.

$\text{BMP-Volume}_{(\text{IA-in})1} = (\text{BMP-Volume}_{\text{ft}^3}/\text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre})$ **(Equation 3-7a)**;

For iterations 2 through n (2…n), convert the BMP Volume $_{(\text{IA-ft}^3)2\ldots n}$, determined in step 5a below, into inches of runoff from the contributing impervious area ($\text{BMP Volume}_{(\text{IA-in})2\ldots n}$) using equation 3-7b.

$\text{BMP-Volume}_{(\text{IA-in})2\ldots n} = (\text{BMP-Volume}_{(\text{IA-ft}^3)2\ldots n} / \text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre})$ **(Equation 3-7b)**;

4) For 1 to n iterations, use the pervious runoff depth information from Table 3-3 and equation 3-8 to determine the total volume of runoff (ft^3) from the contributing PA (BMP Volume $_{\text{PA-ft}^3}$) for a rainfall size equal to the sum of $\text{BMP-Volume}_{(\text{IA-in})1}$, determined in step 3. The runoff volume for each distinct pervious area must be determined.

$\text{BMP Volume}_{(\text{PA-ft}^3)1\ldots n} = \sum ((\text{PA} \times (\text{runoff depth})_{(\text{PA1, PA2..PAn})} \times (3{,}630 \text{ ft}^3/\text{acre-in})$ **(Equation 3-8)**

5) For iteration 1, estimate the portion of BMP Volume that is available to treat runoff from only the IA by subtracting $\text{BMP-Volume}_{\text{PA-ft}^3}$, determined in step 4, from $\text{BMP-Volume}_{\text{ft}^3}$, determined in step 2, and convert to inches of runoff from IA (see equations 3-9a and 3-9b):

$\text{BMP-Volume}_{(\text{IA-ft}^3)2} = ((\text{BMP-Volume}_{\text{ft}^3} - \text{BMP Volume}_{(\text{PA-ft}^3)1})$ **(Equation 3-9a)**

$\text{BMP-Volume}_{(\text{IA-in})2} = (\text{BMP-Volume}_{(\text{IA-ft}^3)2}/\text{IA (acre)}) \times (12 \text{ in/ft} \times 1 \text{ acre}/43{,}560 \text{ ft}^2)$ **(Equation 3-9b)**

If additional iterations (i.e., 2 through n) are needed, estimate the portion of BMP volume that is available to treat runoff from only the IA ($\text{BMP-Volume}_{(\text{IA-in})3..n+1}$) by subtracting $\text{BMP Volume}_{(\text{PA-ft}^3)2..n}$, determined in step 4, from $\text{BMP Volume}_{(\text{IA-ft}^3)3..n+1}$, determined in step 5, and by converting to inches of runoff from IA using equation 3-9b):

6) For iteration a (an iteration between 1 and n+1), compare BMP Volume $_{(IA\text{-}in)a}$ to BMP Volume $_{(IA\text{-}in)a\text{-}1}$ determined from the previous iteration (a-1). If the difference in these values is greater than 5% of BMP Volume $_{(IA\text{-}in)a}$ then repeat steps 4 and 5, using BMP Volume $_{(IA\text{-}in)a}$ as the new starting value for the next iteration (a+1). If the difference is less than or equal to 5 % of BMP Volume $_{(IA\text{-}in)a}$ then the permittee may proceed to step 7;

7) Determine the % phosphorus load reduction for the structural BMP (BMP Reduction $_{\%\text{-}P}$) using the appropriate BMP performance curve and the BMP-Volume $_{(IA\text{-}in)n}$ calculated in the final iteration of step 5; and

8) Calculate the cumulative phosphorus load reduction in pounds of phosphorus for the structural BMP (BMP Reduction $_{lbs\text{-}P}$) using the BMP Load as calculated from the procedure in Attachment 1 to Appendix F and the percent phosphorus load reduction (BMP Reduction $_{\%\text{-}P}$) determined in step 7 by using equation 3-4:

BMP Reduction $_{lbs\text{-}P}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100) **(Equation 3-4)**

Example 3-4: Determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area has impervious and pervious surfaces

A permittee is considering an infiltration basin to capture and treat runoff from a portion of the medium density residential area (MDR). The contributing drainage area is 16.55 acres and has 11.75 acres of impervious area and 4.8 acres of pervious area (PA) made up mostly of lawns and landscaped areas that is 80% HSG D and 20% HSG C. An infiltration basin with the following specifications can be placed at the down-gradient end of the contributing drainage area where soil testing results indicates an infiltration rate (IR) of 0.28 in/hr:

Table Example 3-4-A: Infiltration basin characteristics

Structure	Bottom area (acre)	Top surface area (acre)	Maximum pond depth (ft)	Design storage volume (ft^3)	Infiltration Rate (in/hr)
Infiltration basin	0.65	0.69	1.65	48,155	0.28

Determine the:

A) Percent phosphorus load reduction (BMP Reduction $_{\%\text{-}P}$) for the specified infiltration basin and the contributing impervious and pervious drainage area; and

B) Cumulative phosphorus reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}P}$)

Example continued:

Solution:

1) A surface infiltration basin is being considered. Information for the contributing impervious (IA) and pervious (PA) areas are summarized in Tables Example 3-4-A and Example 3-4-B, respectively.

Table Example 3-4-B: Impervious area characteristics

ID	Land use	Area (acre)
IA1	MDR	11.75

Table Example 3-4-C: Pervious area characteristics

ID	Area (acre)	Hydrologic Soil Group (HSG)
PA1	3.84	D
PA2	0.96	C

2) The available storage volume (ft^3) of the infiltration basin (BMP-Volume $_{ft^3}$) is determined from the design details and basin dimensions; BMP-Volume $_{ft^3} = 48{,}155\ ft^3$.

3) To determine what the BMP design storage volume is in terms of runoff depth (in) from IA, an iterative process is undertaken:

Solution Iteration 1

For the first iteration (1), the BMP-Volume$_{ft^3}$ is converted into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)1}$) using equation 3-5a.

BMP Volume $_{(IA\text{-}in)1}$ = (48,155 ft^2/ 11.75 acre) x (12 in/ft /43,560 ft^2/acre)
= 1.13 in

4-1) The total volume of runoff (ft^3) from the contributing PA (BMP Volume $_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP Volume $_{(IA\text{-}in)1}$ determined in step 3 is determined for each distinct pervious area identified in Table Example 3-4-B using the information from Table 3-3 and equation 3-5. Interpolation was used to determine runoff depths.

BMP Volume $_{(PA\text{-}ft^3)1}$ = ((3.84 acre x (0.33 in) + (0.96 acre x (0.13 in)) x 3,630 ft^3/acre-in
= 5052 ft^3

5-1) For iteration 1, the portion of BMP Volume that is available to treat runoff from only the IA is estimated by subtracting the BMP Volume $_{(PA\text{-}ft^3)1}$, determined in step 4-1, from BMP Volume$_{ft^3}$, determined in step 2, and converted to inches of runoff from IA:

BMP Volume $_{(IA\text{-}ft^3)2}$ = 48,155 ft^3 – 5052 ft^3
= 43,103 ft^3
BMP Volume $_{(IA\text{-}in)2}$ = (43,103 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.01 in

Solution continued:

6-1) The % difference between BMP Volume $_{(IA\text{-}in)\,2}$, 1.01 in, and BMP Volume $_{(IA\text{-}in)1}$, 1.13 in is determined and found to be significantly greater than 5%:

% Difference = ((1.13 in – 1.01 in)/1.01 in) x 100
= 12%

Therefore, steps 4 through 6 are repeated starting with BMP Volume $_{(IA\text{-}in)\,2}$ = 1.01 in.

Solution Iteration 2

4-2) BMP-Volume $_{(PA\text{-}ft^3)2}$ = ((3.84 acre x 0.21 in) + (0.96 acre x 0.12 in)) x 3,630 ft^3/acre-in
= 3,358 ft^3

5-2) BMP-Volume $_{(IA\text{-}ft^3)\,3}$ = 48,155 ft^3 – 3,358 ft^3
= 44,797 ft^3
BMP-Volume $_{(IA\text{-}in)\,3}$ = (44,797 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.05 in

6-2) % Difference = ((1.05 in – 1.01 in)/1.05 in) x 100
= 4%

The difference of 4% is acceptable.

7) The % phosphorus load reduction for the infiltration basin (BMP Reduction $_{\%\text{-}P}$) is determined by using the infiltration basin performance curve for an infiltration rate of 0.27 in/hr and the treatment volume (BMP-Volume $_{Net\ IA\text{-}in}$ = 1.05 in) calculated in step 5-2 and is **BMP Reduction $_{\%\text{-}P}$ = 93%**.

The performance curve for IR = 0.27 is used rather than interpolating between the performance curves for IR = 0.27 in/hr and 0.52 in/hr to estimate performance for IR = 0.28 in/hr. An evaluation of the performance curves for IR = 0.27 in/hr and IR = 0.52 in/hr for a design storage volume of 1.05 in indicate a small difference in estimated performance (BMP Reduction $_{\%\text{-}P}$ = 93% for IR = 0.27 in/hr and BMP Reduction $_{\%\text{-}P}$ = 95% for IR = 0.52 in/hr).

8) The cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the proposed infiltration basin is calculated by using equation 3-2 with the BMP Load and the P $_{target}$ of 93%.
BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P $_{target}$ /100) **(Equation 3-2)**

Using Table 3-1, the BMP load is calculated:
BMP Load = (IA x impervious cover phosphorus export loading rate for industrial)
+ (PA $_{HSG\,D}$ x pervious cover phosphorus export loading rate for HSG D)
+ (PA $_{HSG\,C}$ x pervious cover phosphorus export loading rate for HSG C)

Solution continued:

= (11.75 acre x 1.96 lbs/acre/yr) + (3.84 acre x 0.37 lbs/acre/yr)
+ (0.96 acre x 0.21 lbs/acre/yr)
= 24.65 lbs/yr

BMP-Reduction $_{lbs-P}$ = 24.22 lbs/yr x 93/100 = **22.93 lbs/yr**

Example 3-5: Determine the phosphorus load reduction for disconnecting impervious area using storage with delayed release.

A commercial operation has an opportunity to divert runoff from 0.75 acres of impervious roof top to a 5000 gallon (668.4 ft^3) storage tank for temporary storage and subsequent release to 0.09 acres of pervious area (PA) with HSG C soils.
Determine the:

A) Percent phosphorus load reduction rates (BMP Reduction $_{\%-P}$) for the specified impervious area (IA) disconnection and storage system assuming release times of 1, 2 and 3 days for the stored volumes to discharge to the pervious area; and
B) Cumulative phosphorus reductions in pounds that would be accomplished by the system (BMP-Reduction $_{lbs-P}$) for the three storage release times, 1, 2 and 3 days.

Solution:

1. Determine the storage volume in units of inches of runoff depth from contributing impervious area:
   Storage Volume $_{IA-in}$ = (668.4 ft^3/(0.75 acre x 43.560 ft^2/acre)) x 12 inch/ft
   = 0.25 inches

2. Determine the ratio of the contributing impervious area to the receiving pervious area:
   IA:PA = 0.75 acres/0.09 acres
   = 8.3
3. Using Table 3-21 for a IA:PA ratio of 8:1, determine the phosphorus load reduction rates for a storage volume of 0.25 inches that discharges to HSG C with release rates of 1, 2 and 3 days: Using interpolation the reduction rates are shown in Table 3-5-A:

Table Example 3-5-A: Reduction Rates

Percent Phosphorus load reduction for IA disconnection with storage HSG C			
Storage Volume $_{IA-in}$	Storage release rate, days		
	1	2	3
0.25	39%	42%	43%

4. The cumulative phosphorus load reduction in pounds of phosphorus for the IA disconnection with storage (BMP-Reduction $_{lbs-P}$) is calculated using Equation 3-2. The BMP Load is first determined using the method described above.

Solution continued:

BMP Load = IA x phosphorus export loading rate for commercial IA (see Table 3-1)
= 0.75 acres x 1.78 lbs/acre/yr
= 1.34 lbs/yr

BMP Reduction $_{lbs-P}$ = BMP Load x (BMP Reduction $_{\%-P}$/100)

BMP Reduction $_{lbs-P}$ = 1.34 lbs/yr x (39/100)
= **0.53 lbs/yr**

Table Example 3-5-B presents the BMP Reduction $_{lbs-P}$ for each of the release rates:

Table Example 3-5-B: Reduction Load

Phosphorus load reduction for IA disconnection with storage HSG C, lbs			
Storage Volume $_{IA-in}$	Storage release rate, days		
	1	2	3
0.25	0.53	0.56	0.58

Example 3-6: Determine the phosphorus load reduction for disconnecting impervious area with and without soil augmentation in the receiving pervious area.

The same commercial property as in example 3-5 wants to evaluate disconnecting drainage from the 0.75 acre impervious roof top and discharging it directly to 0.09 acres of pervious area (PA) with HSG C. Also, the property has the opportunity to purchase a small adjoining area (0.06 acres), also HSG C,to increase the size of the receiving PA from 0.09 to 0.15 acres and to allow the property owner to avoid having to install a drainage structure to capture overflow runoff from the PA. The property owner has been informed that the existing PA soil can be tilled and augmented with soil amendments to support denser vegetative growth and improve hydrologic function to approximate HSG B.

Determine the:

A) Percent phosphorus load reduction rates (BMP Reduction $_{\%-P}$) for the specified impervious area (IA) disconnection to both the 0.09 and 0.15 acre receiving PAs with and without soil augmentation; and
B) Cumulative phosphorus reductions in pounds that would be accomplished by the IA disconnection for the various scenarios (BMP-Reduction $_{lbs-P}$).

Solution:

1. Determine the ratio of the contributing impervious area to the receiving pervious area:
   IA:PA = 0.75 acres/0.09 acres
   = 8.3
   IA:PA = 0.75 acres/0.15 acres
   = 5.0

Solution Continued:

2. Using Table 3-26 and Figure 3-40 for a IA:PA ratios of 8:1 and 5:1, respectively, determine the phosphorus load reduction rates for IA disconnections to HSG C and HSG B:

Table Example 3-6-A: Reduction Rates

Percent Phosphorus load reduction rates for IA disconnection		
Receiving PA	**IA:PA**	
	8:1	5:1
HSG C	7%	14%
HSG B (soil augmentation)	14%	22%

3. The cumulative phosphorus load reduction in pounds of phosphorus for the IA disconnection with storage (BMP-Reduction $_{lbs-P}$) is calculated using Equation 3-2. The BMP Load was calculated in example 3-5 and is 1.34 lbs/yr.

BMP Reduction $_{lbs-P}$ = BMP Load x (BMP Reduction $_{\%-P}$/100)
For PA of 0.09 acres HSG C the BMP Reduction $_{lbs-P}$ is calculated as follows:
BMP Reduction $_{lbs-P(0.09ac- HSG C)}$ = 1.34 lbs/yr x (7/100)
= **0.09 lbs/yr**
Table Example 3-6-B presents the BMP Reduction $_{lbs-P}$ for each of the scenarios:

Table Example 3-6-B: Reduction

Pounds Phosphorus load reduction for IA disconnection, lbs/yr		
Receiving PA	**Area of Receiving PA, acres**	
	0.09	**0.15**
HSG C	0.09	0.19
HSG B (soil augmentation)	0.19	0.29

Example 3-7: Determine the phosphorus load reduction for converting impervious area to permeable/pervious area.

A municipality is planning upcoming road reconstruction work in medium density residential (MDR) neighborhoods and has identified an opportunity to convert impervious surfaces to permeable/pervious surfaces by narrowing the road width of 3.7 miles (mi) of roadway from 32 feet (ft) to 28 ft and eliminating 3.2 miles of 4 ft wide paved sidewalk (currently there are sidewalks on both sides of the roadways targeted for restoration). The newly created permeable/pervious area will be tilled and treated with soil amendments to support vegetated growth in order to restore hydrologic function to at least HSG B.
Determine the:

A) Percent phosphorus load reduction rate (BMP Reduction $_{\%\text{-P}}$) for the conversion of impervious area (IA) to permeable/pervious area (PA); and
B) Cumulative phosphorus reduction in pounds that would be accomplished by the project (BMP-Reduction $_{\text{lbs-P}}$).

Solution:

1. Determine the area of IA to be converted to PA:
   New PA = (((3.7 mi x 4 ft) + (3.2 mi x 4 ft)) x 5280 ft/mi)/43,560 ft^2/acre
   = 3.35 acres

2. Using Table 3-27, the phosphorus load reduction rate for converting IA to HSG B is 94.1%
3. The BMP Load is first determined using the method described above.
   BMP Load = IA x phosphorus export loading rate for MDR IA (see Table 3-1)
   = 3.35 acres x 1.96 lbs/acre/yr
   = 6.57 lbs/yr
4. The cumulative phosphorus load reduction in pounds of phosphorus for the IA conversion (BMP-Reduction $_{\text{lbs-P}}$) is calculated using Equation 3-2.
   BMP Reduction $_{\text{lbs-P}}$ = BMP Load x (BMP Reduction $_{\%\text{-P}}$/100)
   BMP Reduction $_{\text{lbs-P}}$ = 6.57 lbs/yr x (94.1/100)
   = 6.18 lbs/yr

Table 3- 4: Infiltration Trench (IR = 0.17 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.17 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	14.7%	27.6%	48.6%	64.1%	74.9%	82.0%	91.6%	95.4%
Cumulative Phosphorus Load Reduction	18%	33%	57%	73%	83%	90%	97%	99%

Figure 3- 1: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.17 in/hr)

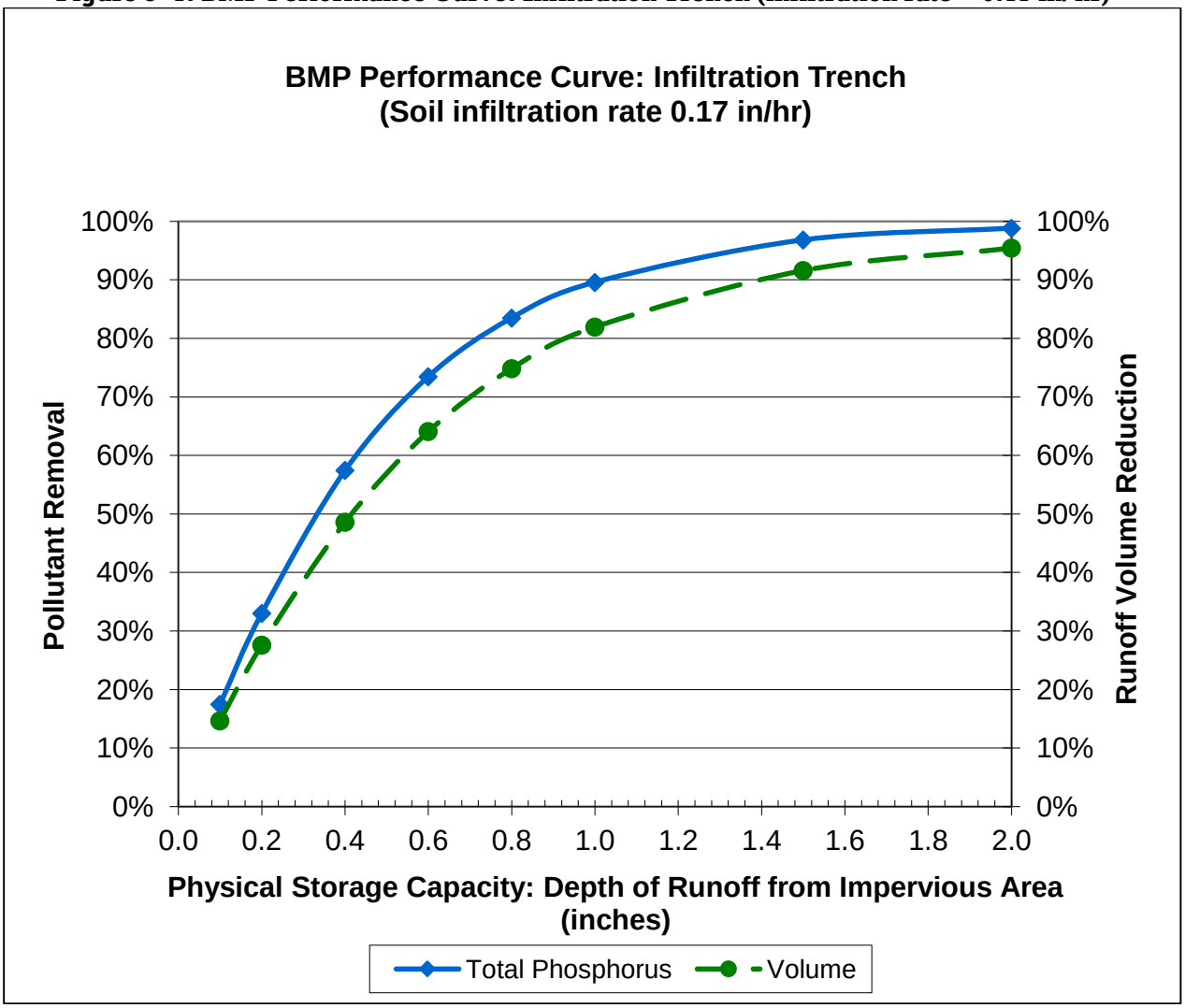


Table 3- 5: Infiltration Trench (IR = 0.27 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	17.8%	32.5%	55.0%	70.0%	79.3%	85.2%	93.3%	96.3%
Cumulative Phosphorus Load Reduction	20%	37%	63%	78%	86%	92%	97%	99%

Figure 3- 2: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.27 in/hr)

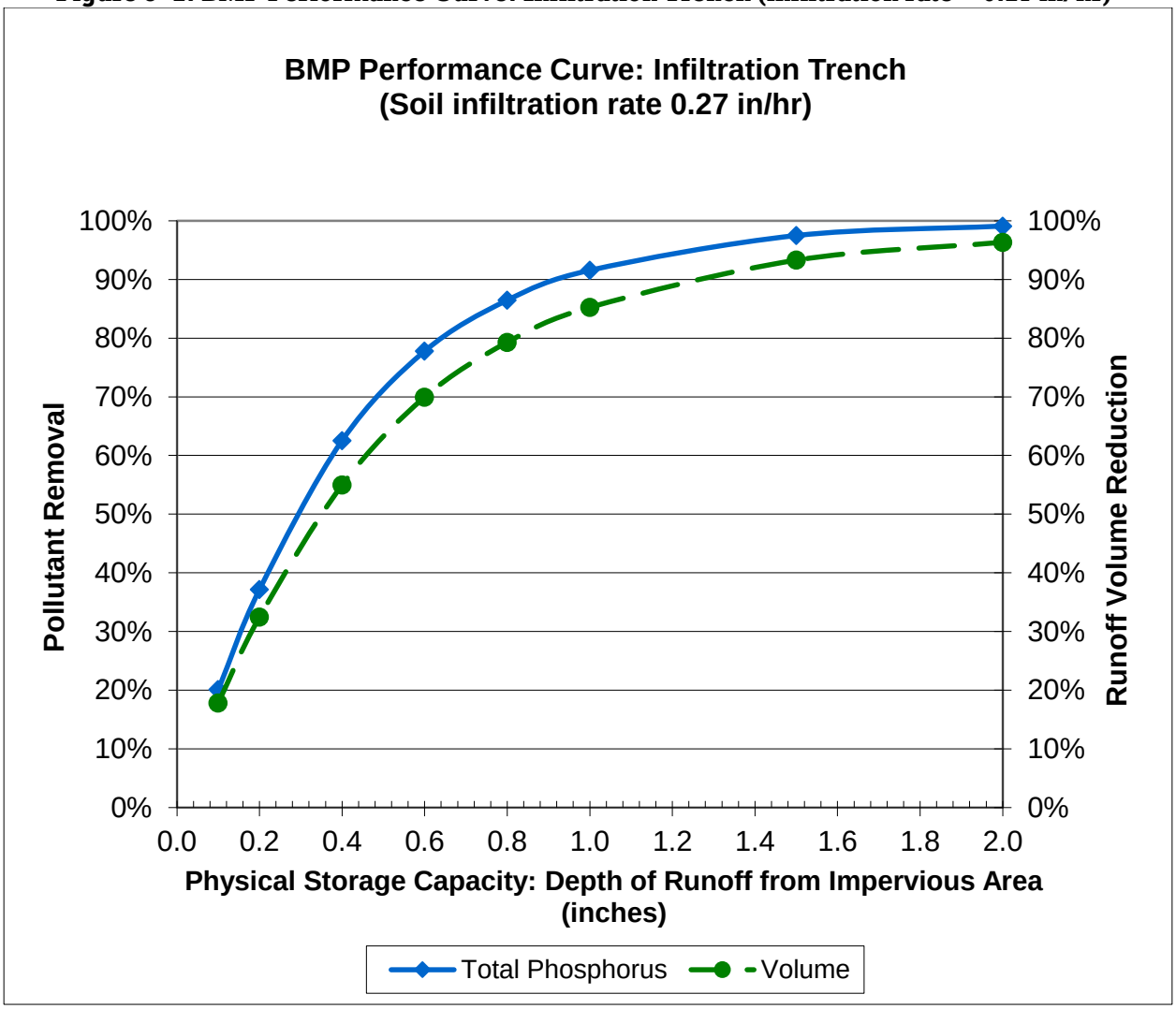


Table 3- 6: Infiltration Trench (IR = 0.52 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.52 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	22.0%	38.5%	61.8%	75.7%	83.7%	88.8%	95.0%	97.2%
Cumulative Phosphorus Load Reduction	23%	42%	68%	82%	89%	94%	98%	99%

Figure 3- 3: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.52 in/hr)

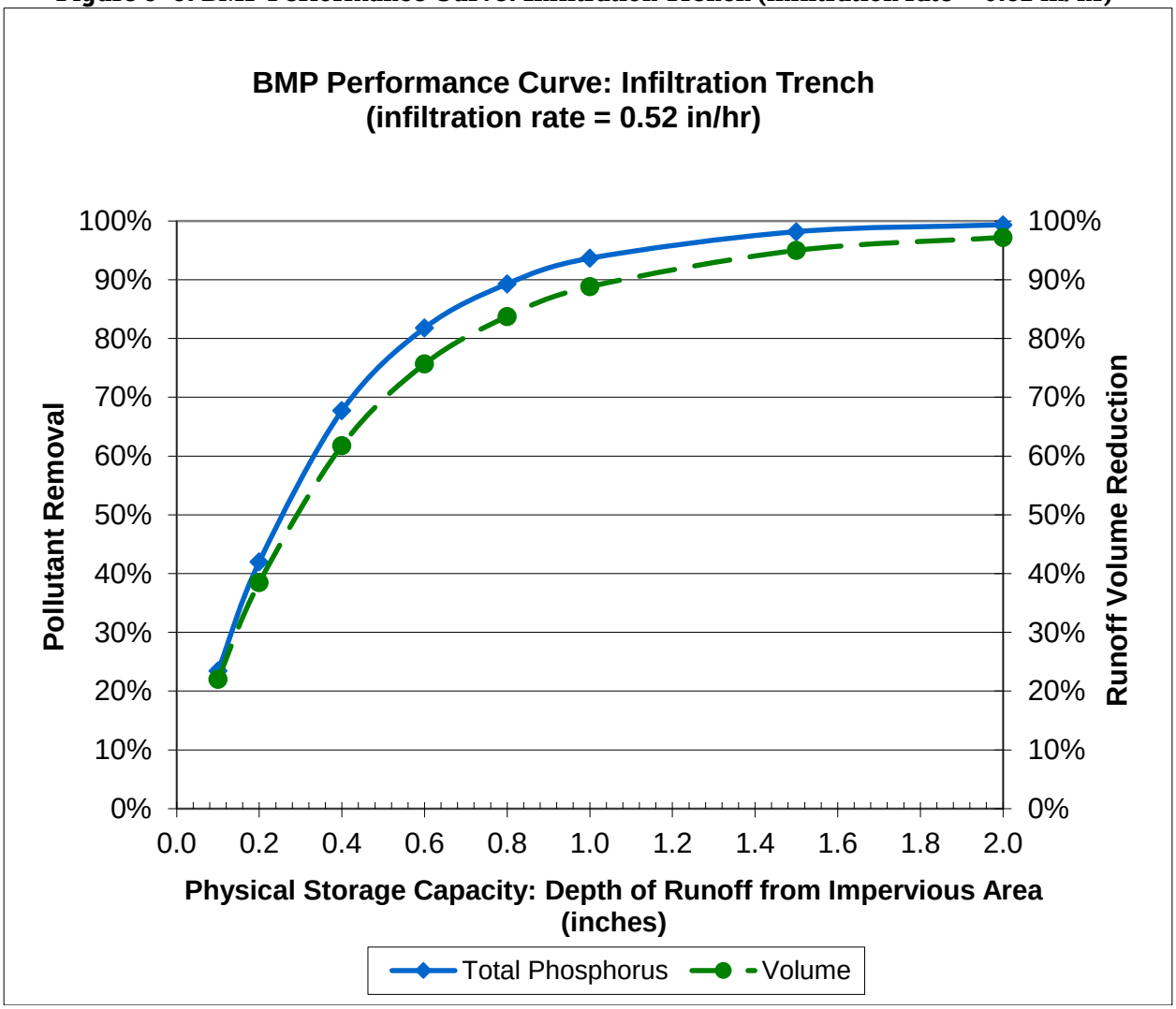


Table 3- 7: Infiltration Trench (IR = 1.02 in/hr) BMP Performance Table

Infiltration Trench (IR = 1.02 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	26.3%	44.6%	68.2%	81.0%	88.0%	92.1%	96.5%	98.3%
Cumulative Phosphorus Load Reduction	27%	47%	73%	86%	92%	96%	99%	100%

Figure 3- 4: BMP Performance Curve: Infiltration Trench (infiltration rate = 1.02 in/hr)

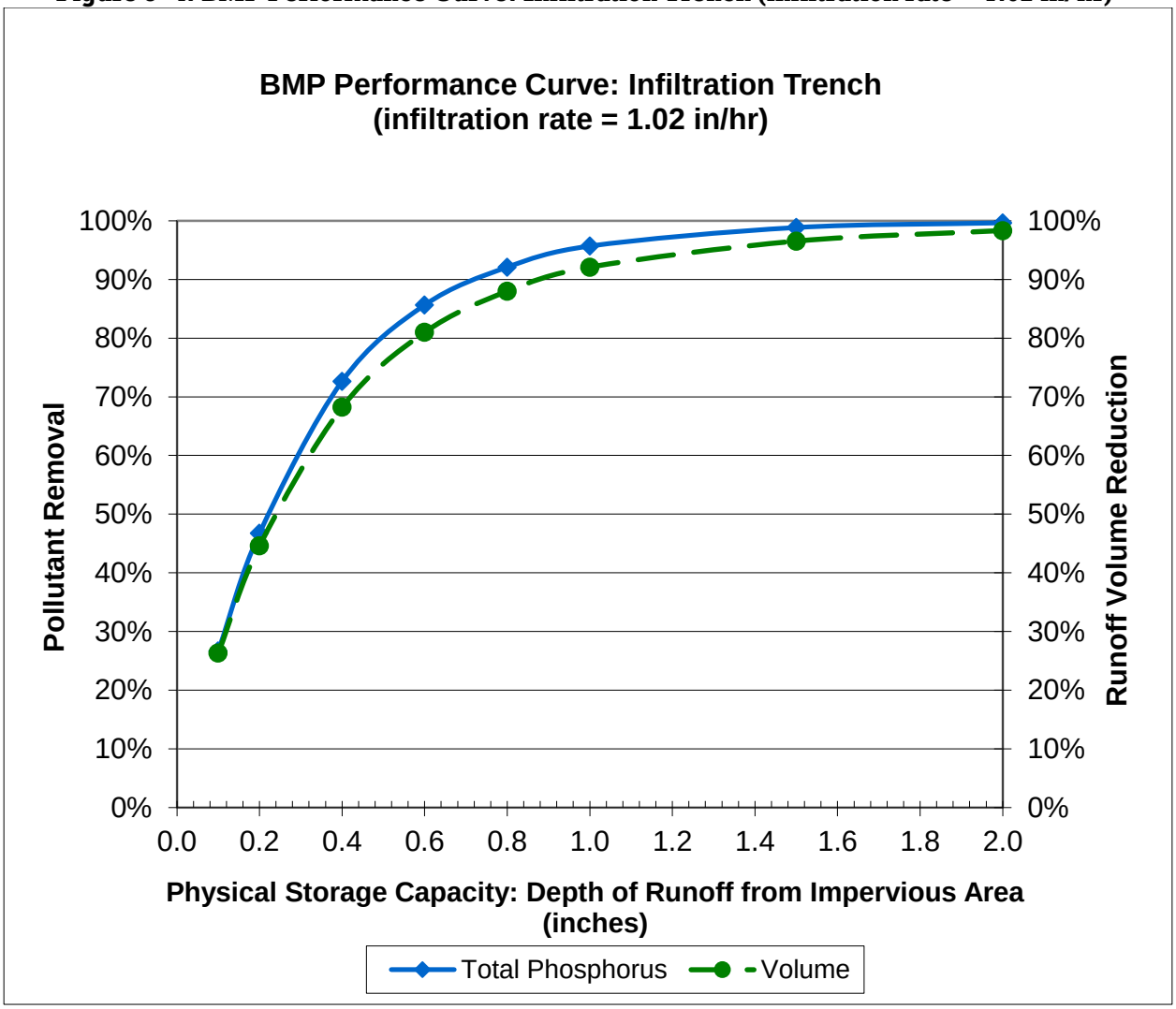


Table 3- 8: Infiltration Trench (IR = 2.41 in/hr) BMP Performance Table

Infiltration Trench (IR = 2.41 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	34.0%	54.7%	78.3%	88.4%	93.4%	96.0%	98.8%	99.8%
Cumulative Phosphorus Load Reduction	33%	55%	81%	91%	96%	98%	100%	100%

Figure 3- 5: BMP Performance Curve: Infiltration Trench (infiltration rate = 2.41 in/hr)

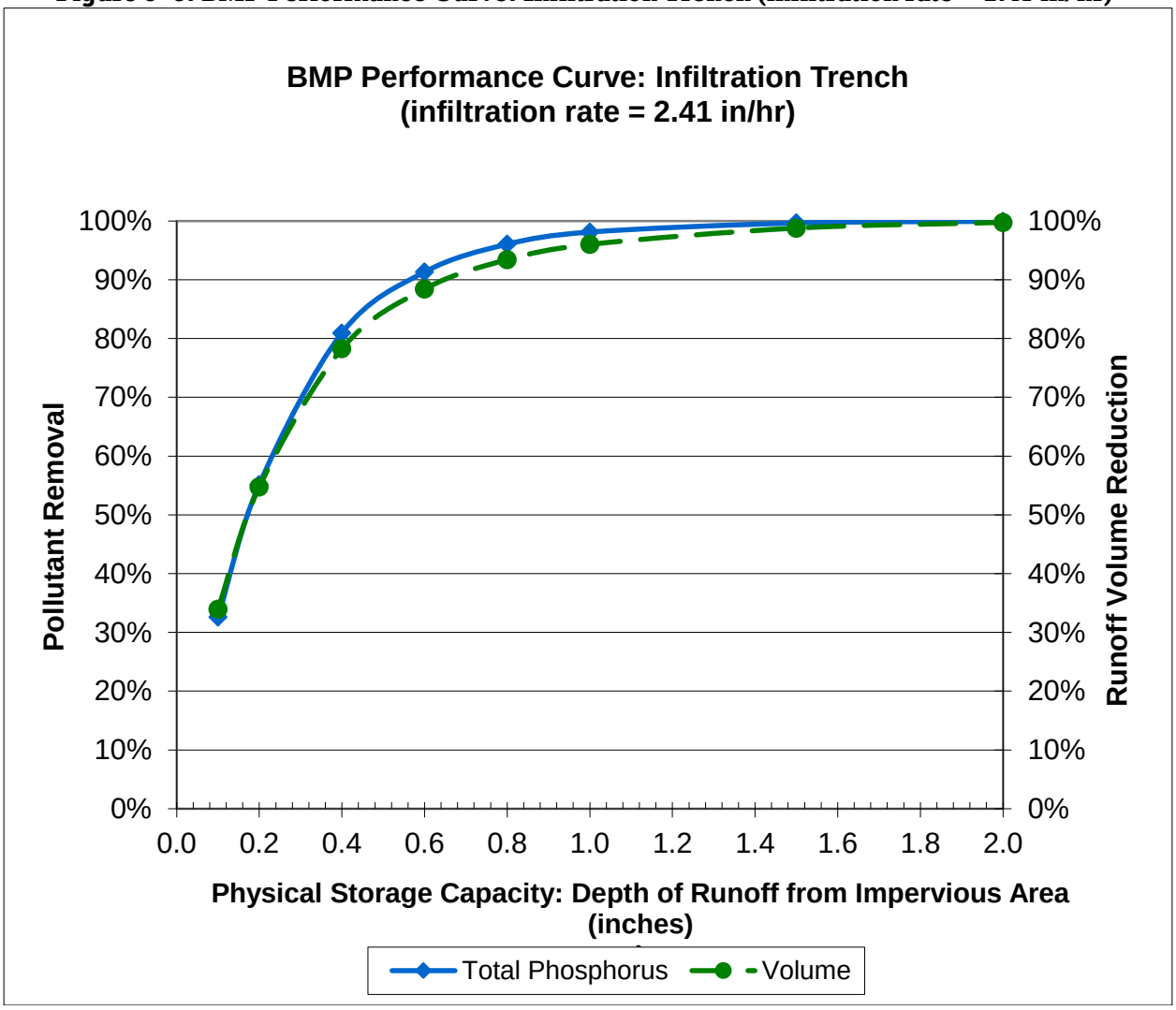


Table 3- 9: Infiltration Trench (8.27 in/hr) BMP Performance Table

Infiltration Trench (8.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	53.6%	76.1%	92.6%	97.2%	98.9%	99.5%	100.0%	100.0%
Cumulative Phosphorus Load Reduction	50%	75%	94%	98%	99%	100%	100%	100%

Figure 3- 6: BMP Performance Curve: Infiltration Trench (infiltration rate = 8.27 in/hr)

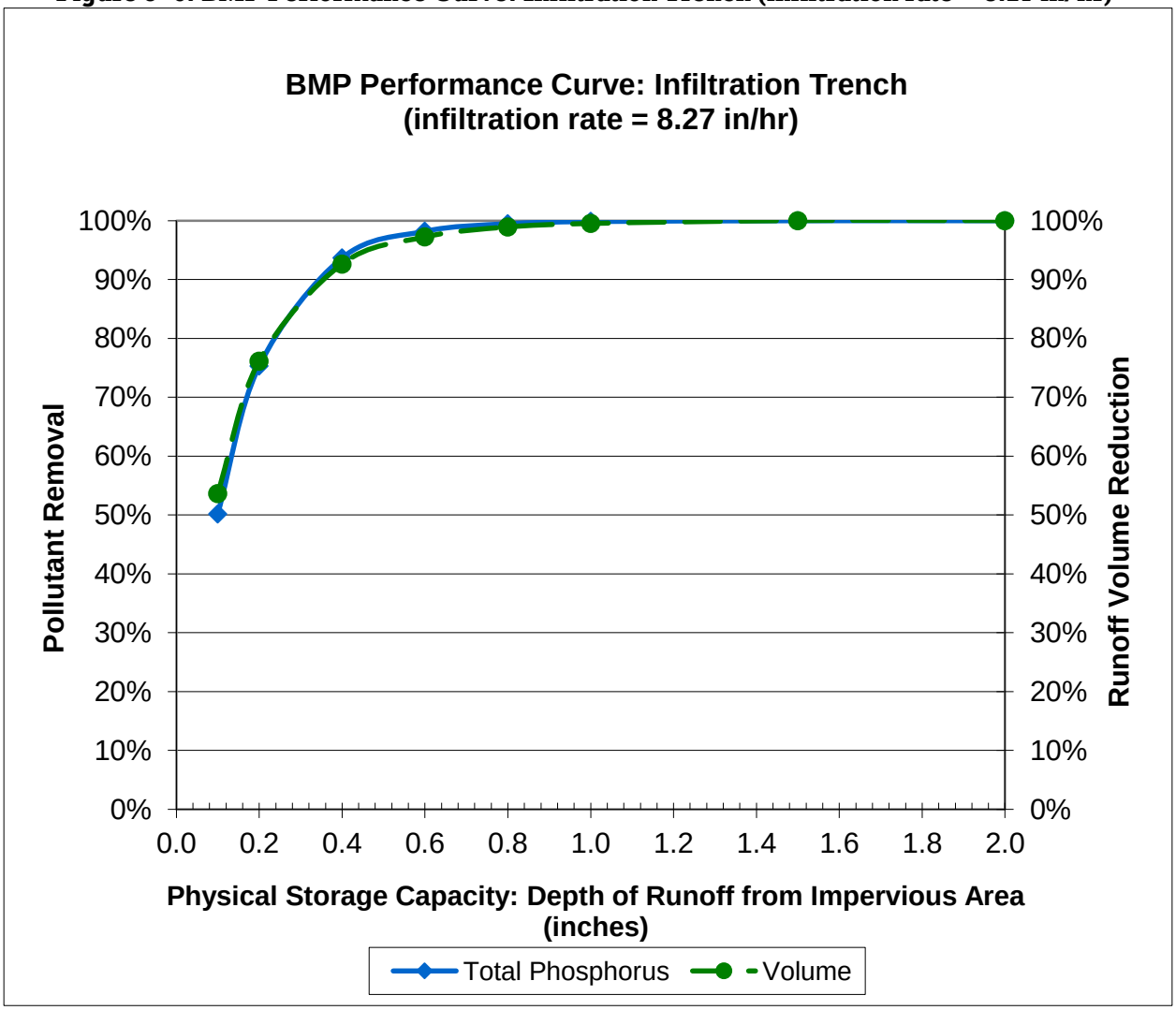


Table 3- 10: Infiltration Basin (0.17 in/hr) BMP Performance Table

Infiltration Basin (0.17 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	13.0%	24.6%	44.2%	59.5%	70.6%	78.1%	89.2%	93.9%
Cumulative Phosphorus Load Reduction	35%	52%	72%	82%	88%	92%	97%	99%

Figure 3- 7: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.17 in/hr)

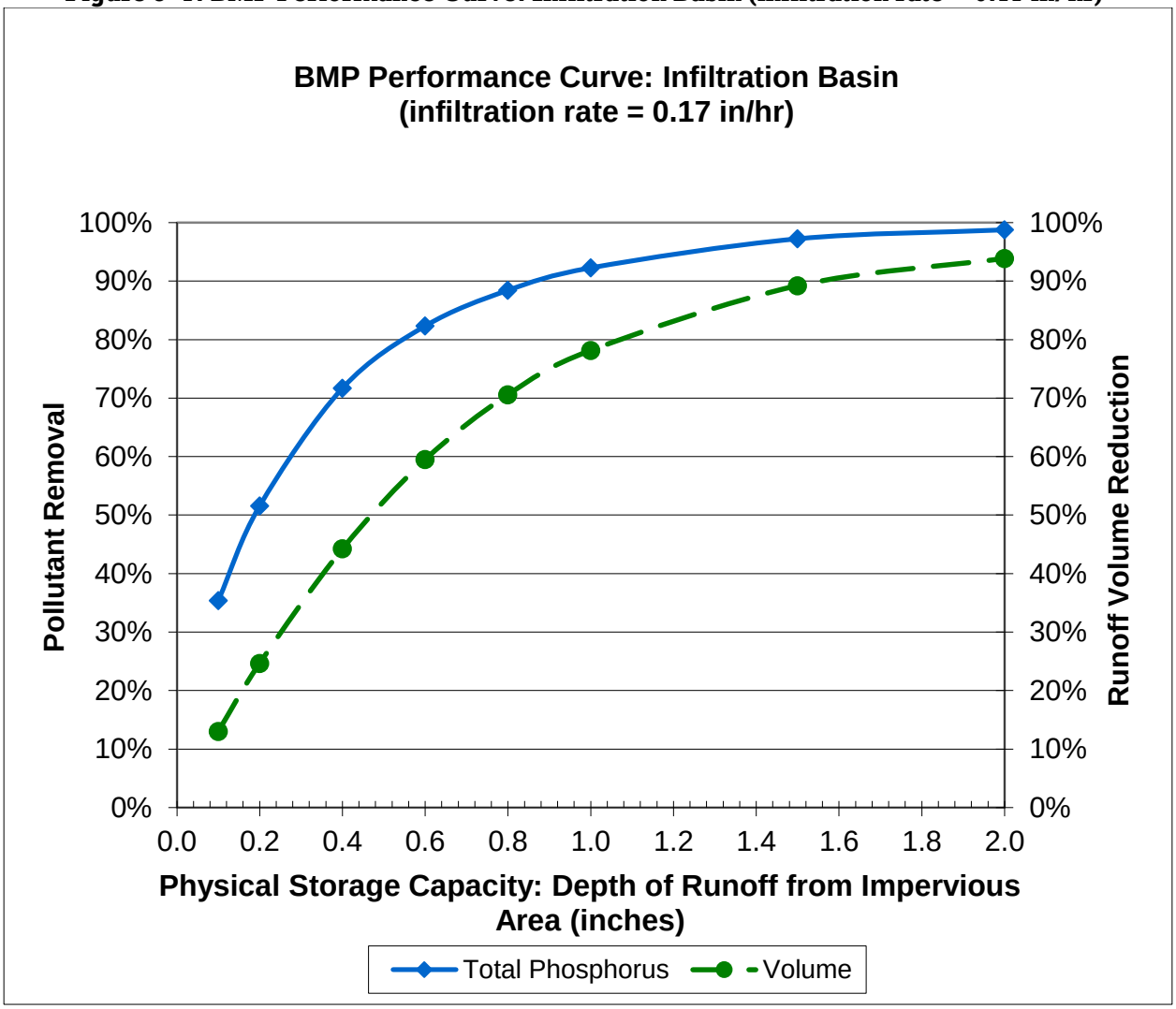


Table 3- 11: Infiltration Basin (0.27 in/hr) BMP Performance Table

Infiltration Basin (0.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	16.3%	29.8%	51.0%	66.0%	76.0%	82.4%	91.5%	95.2%
Cumulative Phosphorus Load Reduction	37%	54%	74 %	85%	90%	93%	98%	99%

Figure 3- 8: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.27 in/hr)

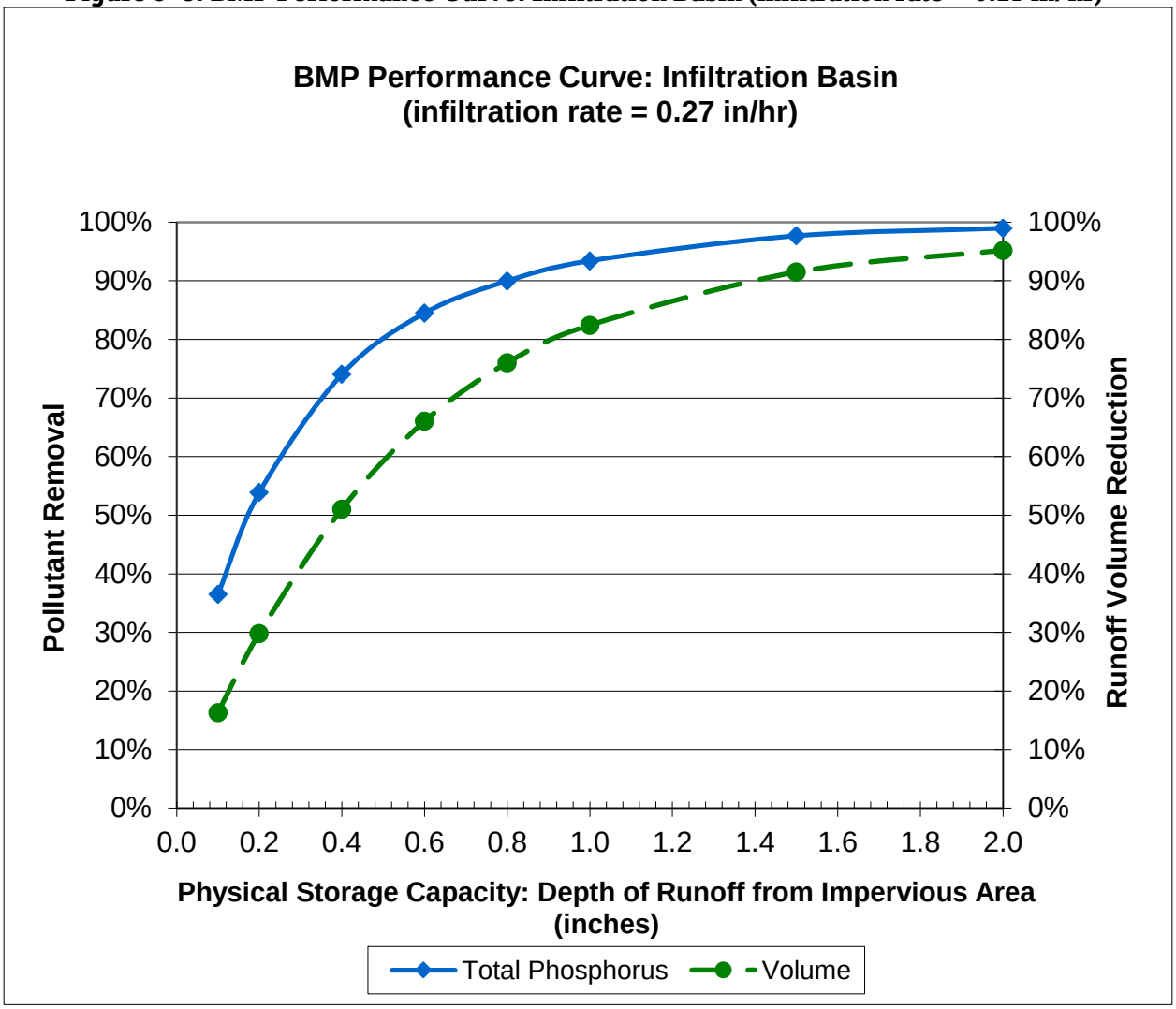


Table 3- 12: Infiltration Basin (0.52 in/hr) BMP Performance Table

Infiltration Basin (0.52 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	20.2%	35.6%	58.0%	72.6%	81.3%	86.9%	94.2%	96.7%
Cumulative Phosphorus Load Reduction	38%	56%	77%	87%	92%	95%	98%	99%

Figure 3- 9: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.52 in/hr)

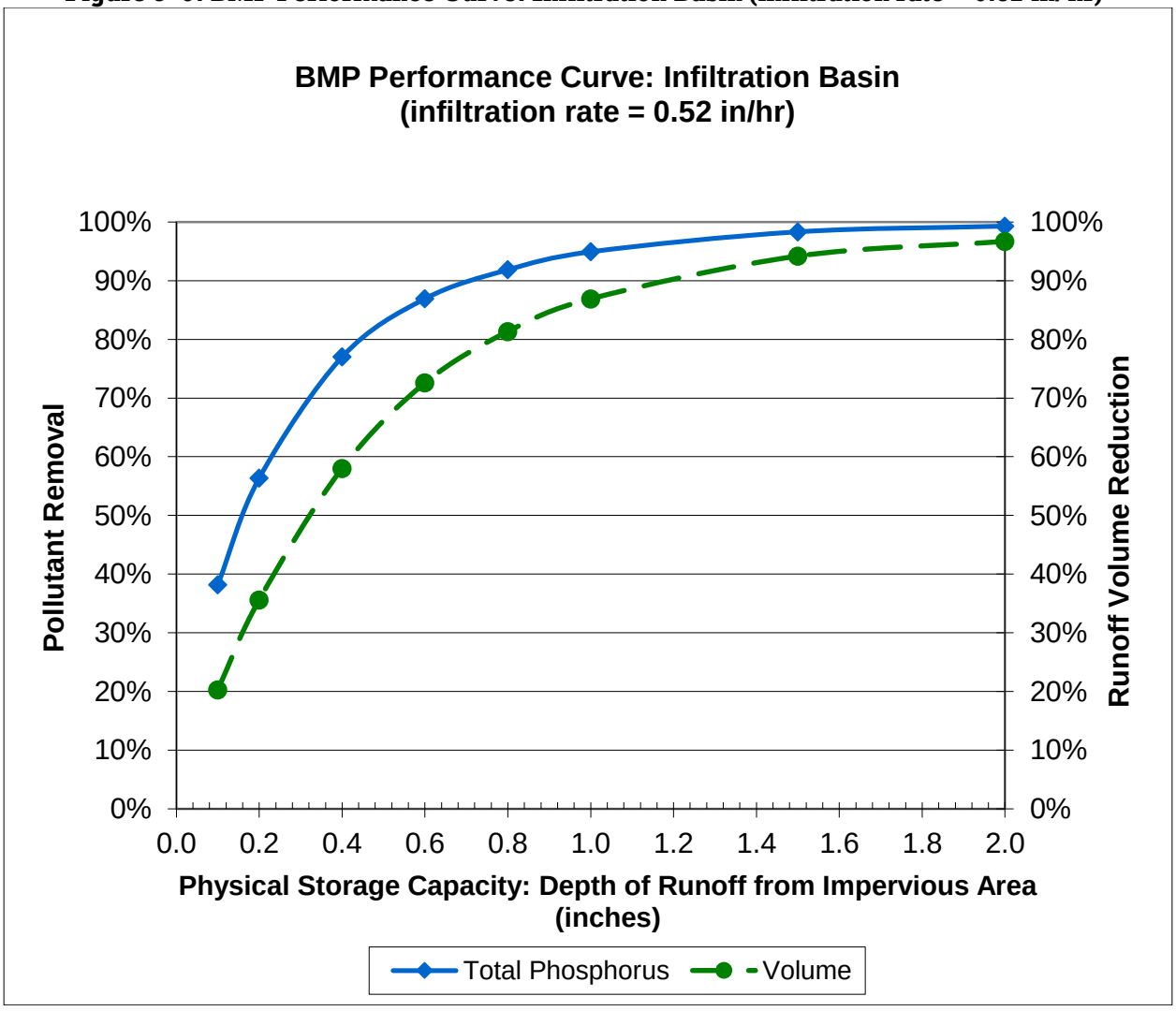


Table 3- 13: Infiltration Basin (1.02 in/hr) BMP Performance Table

Infiltration Basin (1.02 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	24.5%	42.0%	65.6%	79.4%	86.8%	91.3%	96.2%	98.1%
Cumulative Phosphorus Load Reduction	41%	60%	81%	90%	94%	97%	99%	100%

Figure 3- 10: BMP Performance Curve: Infiltration Basin (Soil infiltration rate = 1.02 in/hr)

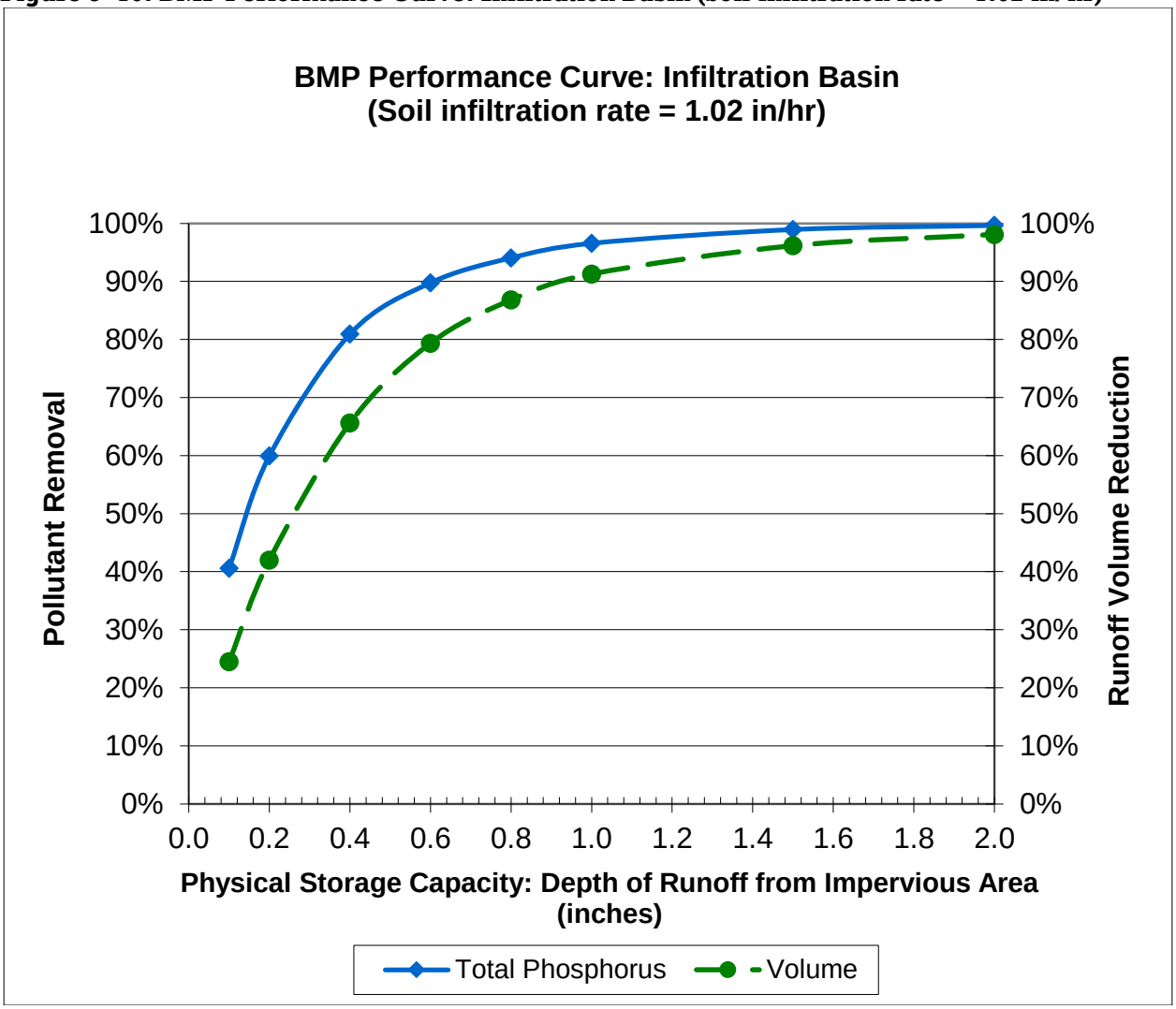


Table 3- 14: Infiltration Basin (2.41 in/hr) BMP Performance Table

Infiltration Basin (2.41 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	32.8%	53.8%	77.8%	88.4%	93.4%	96.0%	98.8%	99.8%
Cumulative Phosphorus Load Reduction	46%	67%	87%	94%	97%	98%	100%	100%

Figure 3- 11: BMP Performance Curve: Infiltration Basin (infiltration rate = 2.41 in/hr)

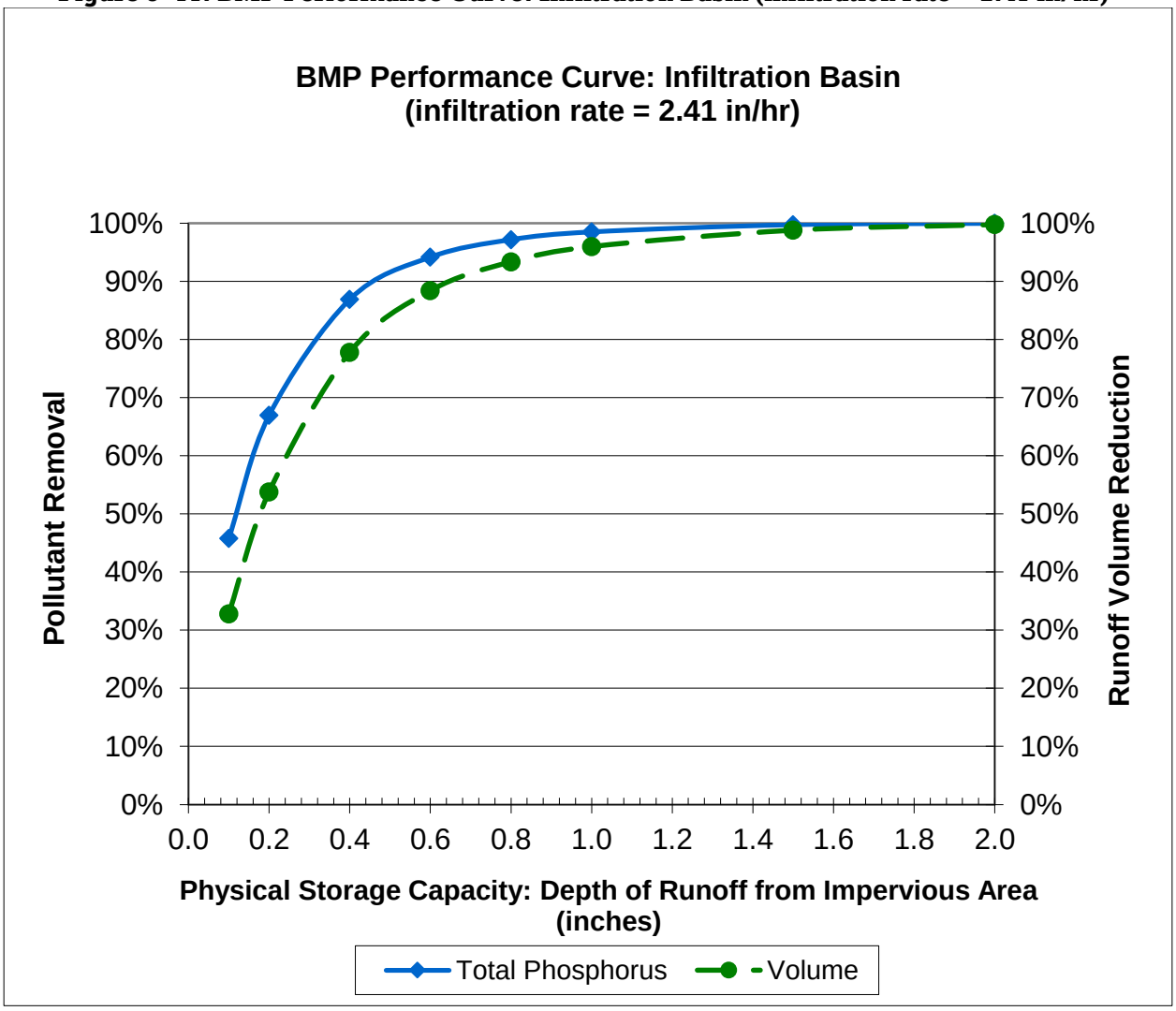


Table 3- 15: Infiltration Basin (8.27 in/hr) BMP Performance Table

Infiltration Basin (8.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	54.6%	77.2%	93.4%	97.5%	99.0%	99.6%	100.0%	100.0%
Cumulative Phosphorus Load Reduction	59%	81%	96%	99%	100%	100%	100%	100%

Figure 3- 12: BMP Performance Curve: Infiltration Basin (infiltration rate = 8.27 in/hr)

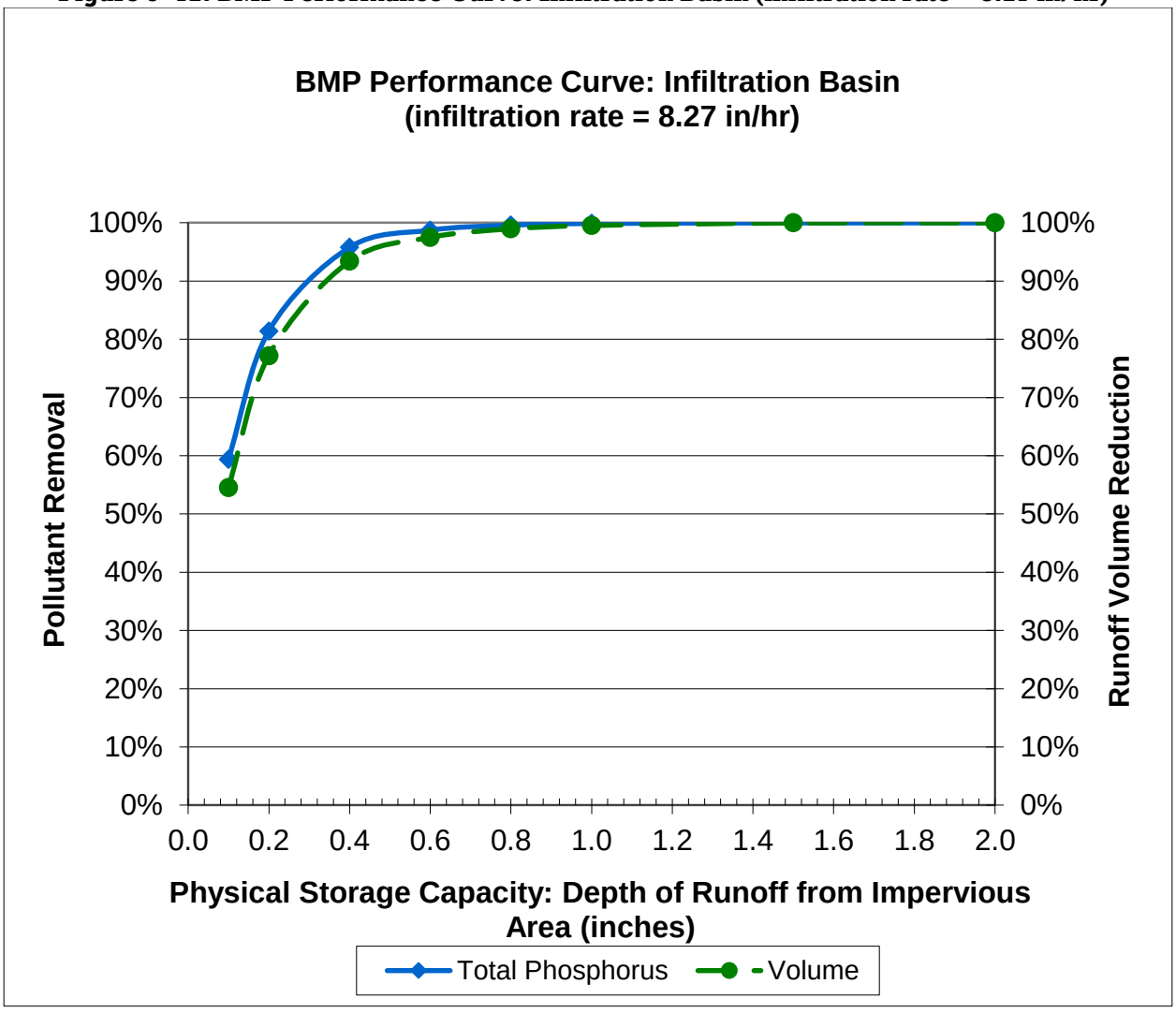


Table 3- 16: Biofiltration BMP Performance Table

Biofiltration BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	34%	53%	64%	71%	76%	84%	89%

Figure 3- 13: BMP Performance Curve: Biofiltration

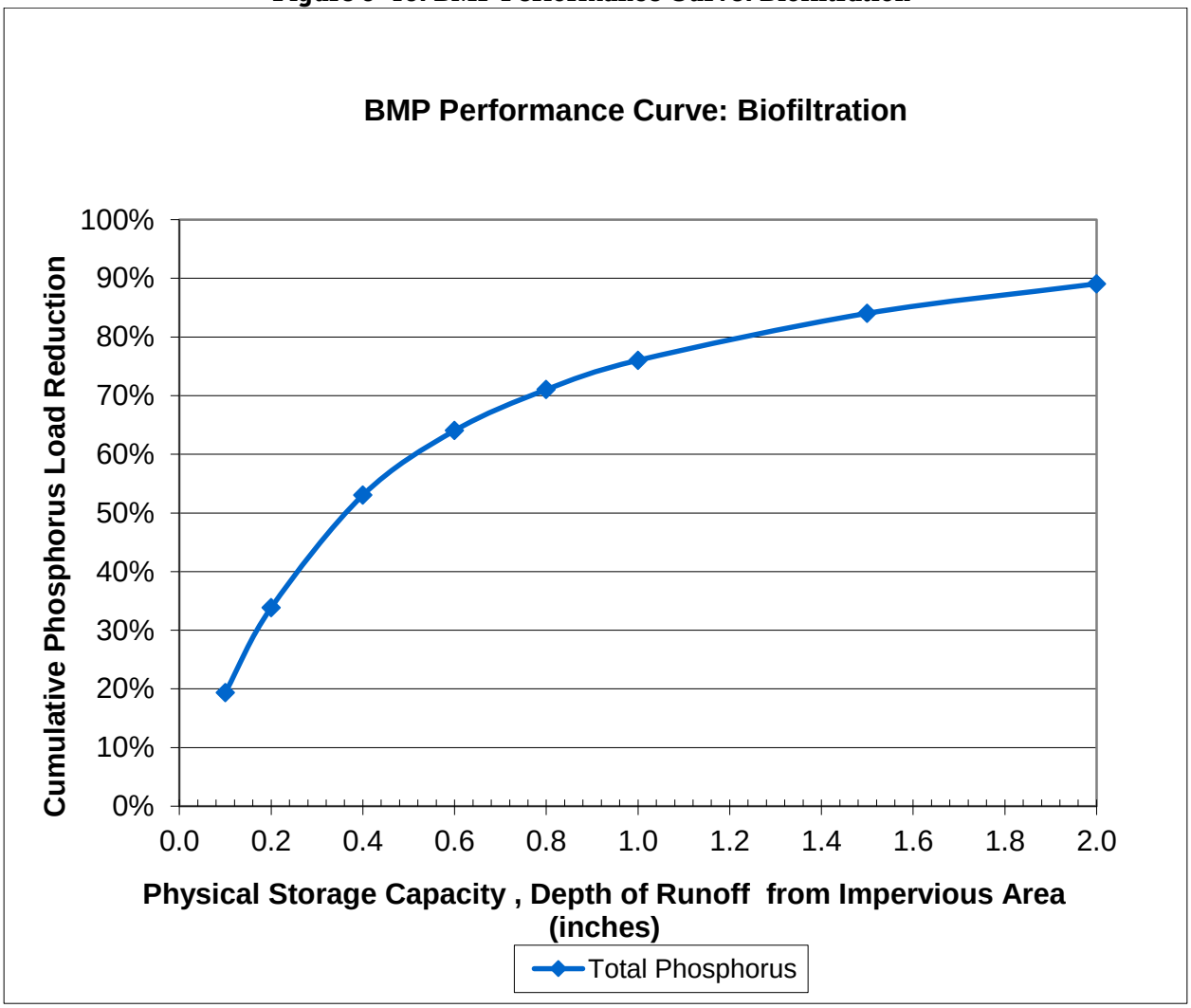


Table 3- 17: Gravel Wetland BMP Performance Table

Gravel Wetland BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	26%	41%	51%	57%	61%	65%	66%

Figure 3- 14: BMP Performance Curve: Gravel Wetland

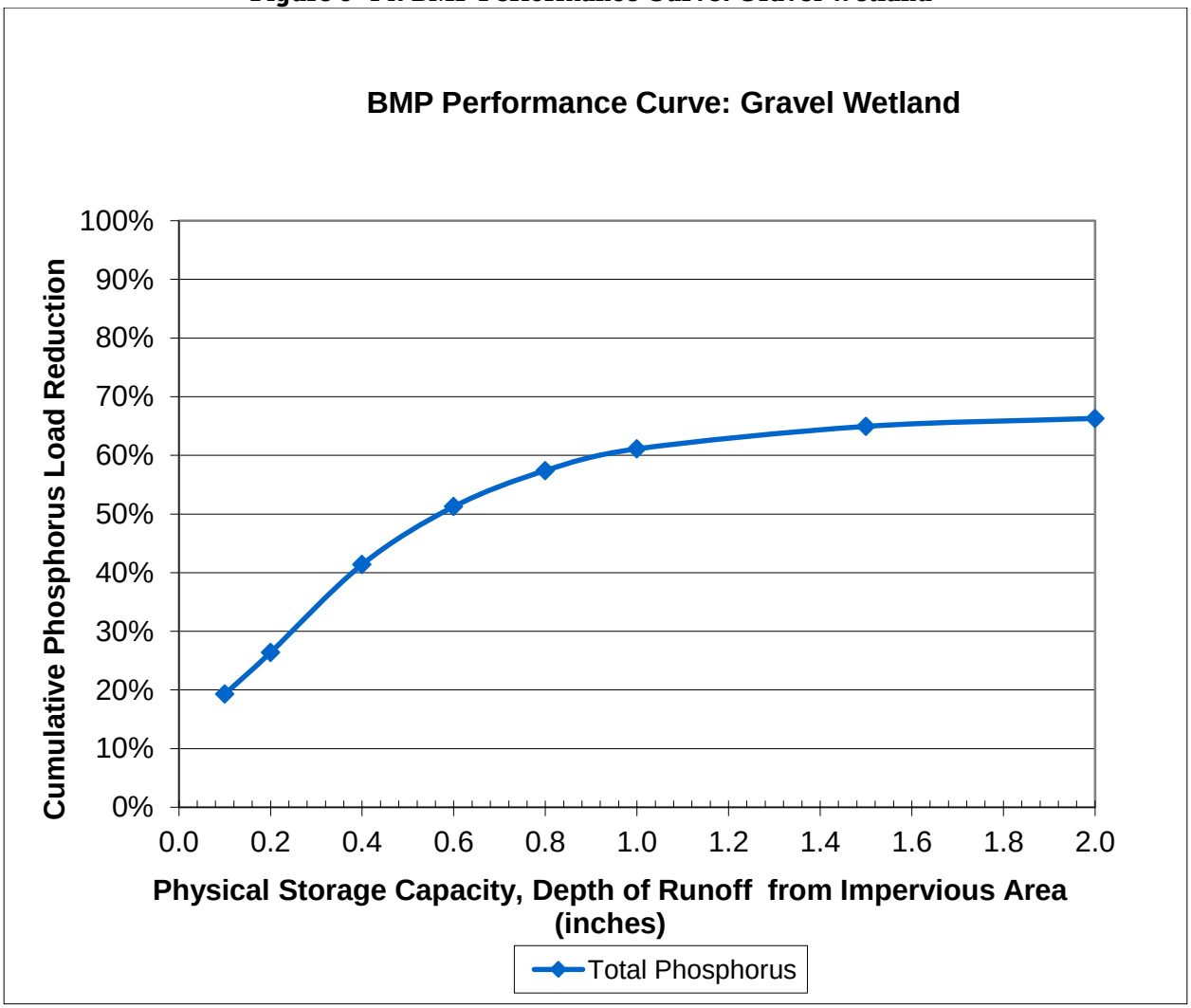


Table 3- 18: Porous Pavement BMP Performance Table

Porous Pavement BMP Performance Table: Long-Term Phosphorus Load Reduction				
BMP Capacity: Depth of Filter Course Area (inches)	12.0	18.0	24.0	32.0
Cumulative Phosphorus Load Reduction	62%	70%	75%	78%

Figure 3- 15: BMP Performance Curve: Porous Pavement

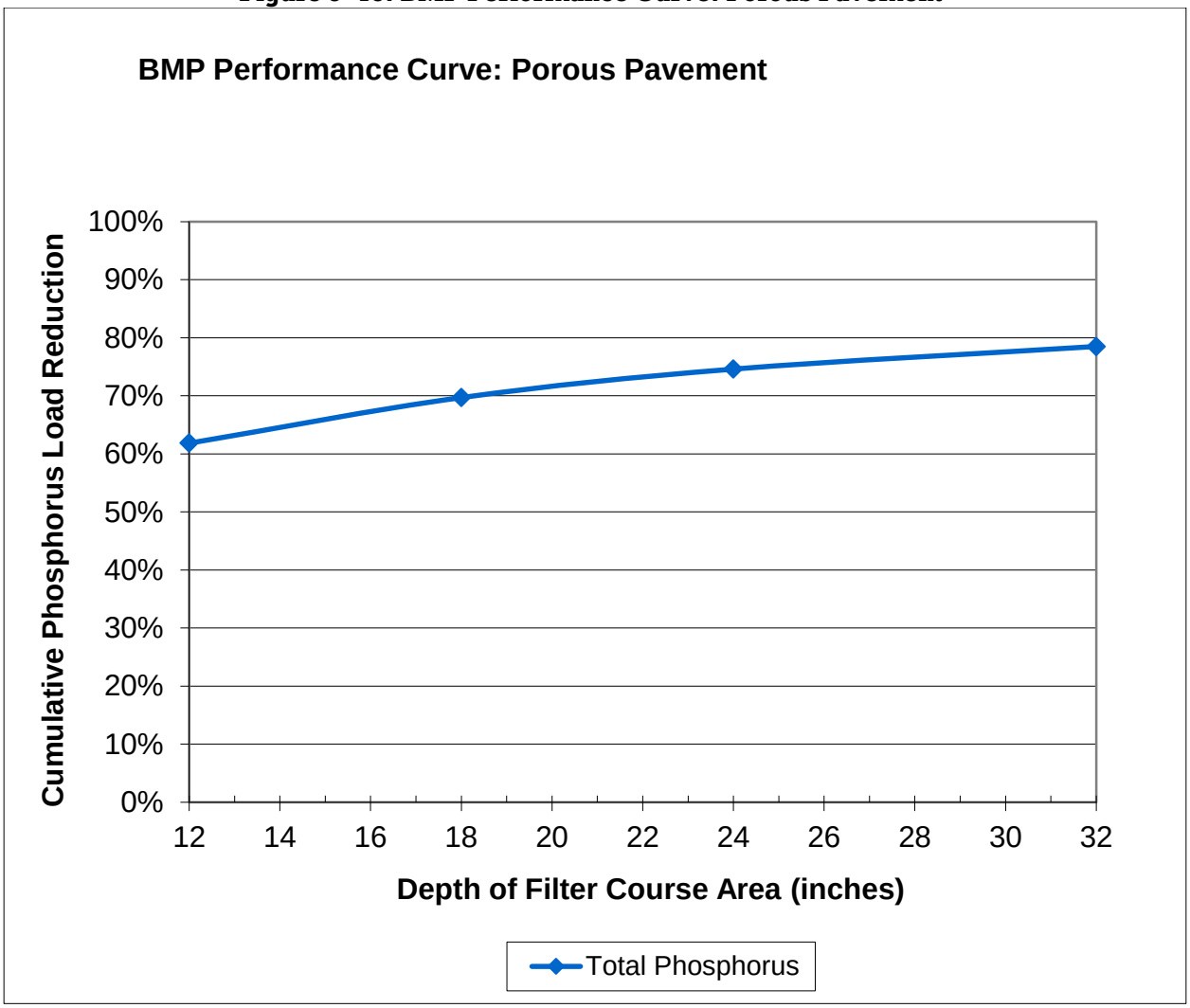


Table 3- 19: Wet Pond BMP Performance Table

Wet Pond BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	14%	25%	37%	44%	48%	53%	58%	63%

Table 3- 20: Dry Pond BMP Performance Table

Dry Pond BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	3%	6%	8%	9%	11%	12%	13%	14%

Figure 3- 16: BMP Performance Curve: Dry Pond

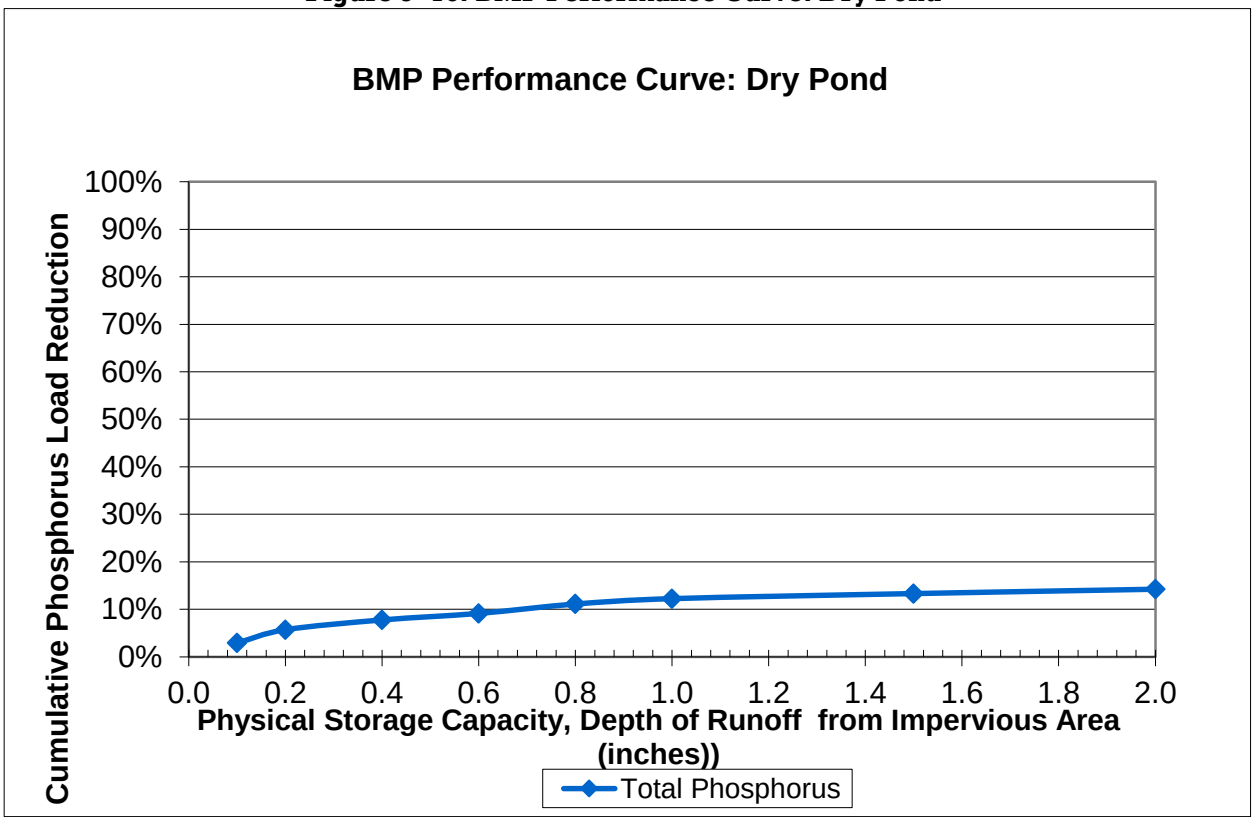


Table 3- 21: Grass Swale BMP Performance Table

Grass Swale BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	2%	5%	9%	13%	17%	21%	29%	36%

Figure 3- 17: BMP Performance Curve: Grass Swale

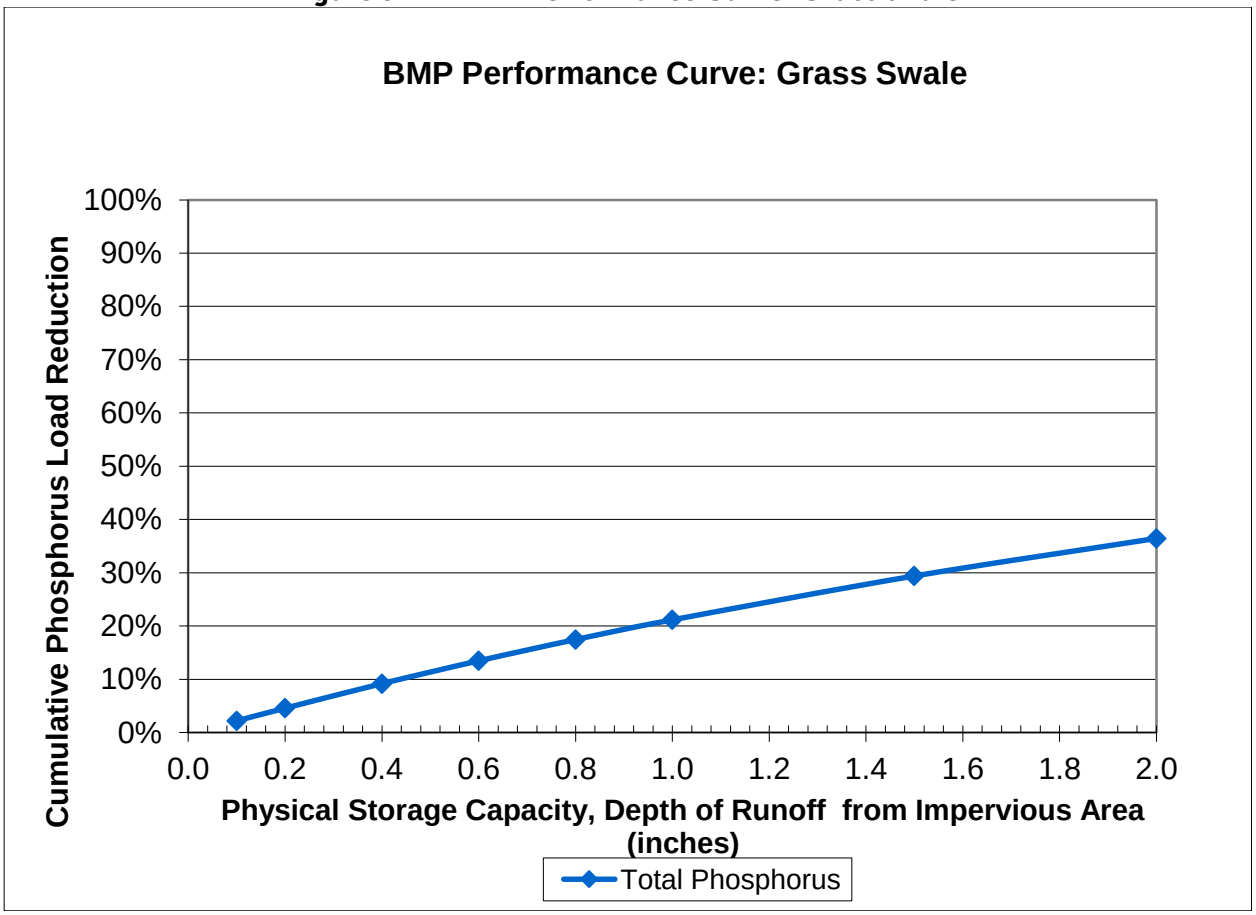


Table 3- 22: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1

Impervious Area Disconnection through Storage : Impervious Area to Pervious Area Ratio = 8:1												
Storage volume to impervious area ratio	Total Runoff Volume (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	22%	22%	21%
0.2 in	40%	38%	37%	40%	38%	37%	37%	38%	37%	24%	26%	27%
0.3 in	52%	50%	49%	52%	50%	49%	40%	46%	49%	24%	26%	27%
0.4 in	61%	59%	58%	59%	59%	58%	40%	48%	54%	24%	26%	27%
0.5 in	67%	66%	64%	62%	66%	64%	40%	48%	56%	24%	26%	27%
0.6 in	70%	71%	70%	62%	70%	70%	40%	48%	56%	24%	26%	27%
0.8 in	71%	78%	77%	62%	73%	77%	40%	48%	56%	24%	26%	27%
1.0 in	71%	80%	80%	62%	73%	79%	40%	48%	56%	24%	26%	27%
1.5 in	71%	81%	87%	62%	73%	81%	40%	48%	56%	24%	26%	27%
2.0 in	71%	81%	88%	62%	73%	81%	40%	48%	56%	24%	26%	27%

Figure 3- 18: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG A Soils

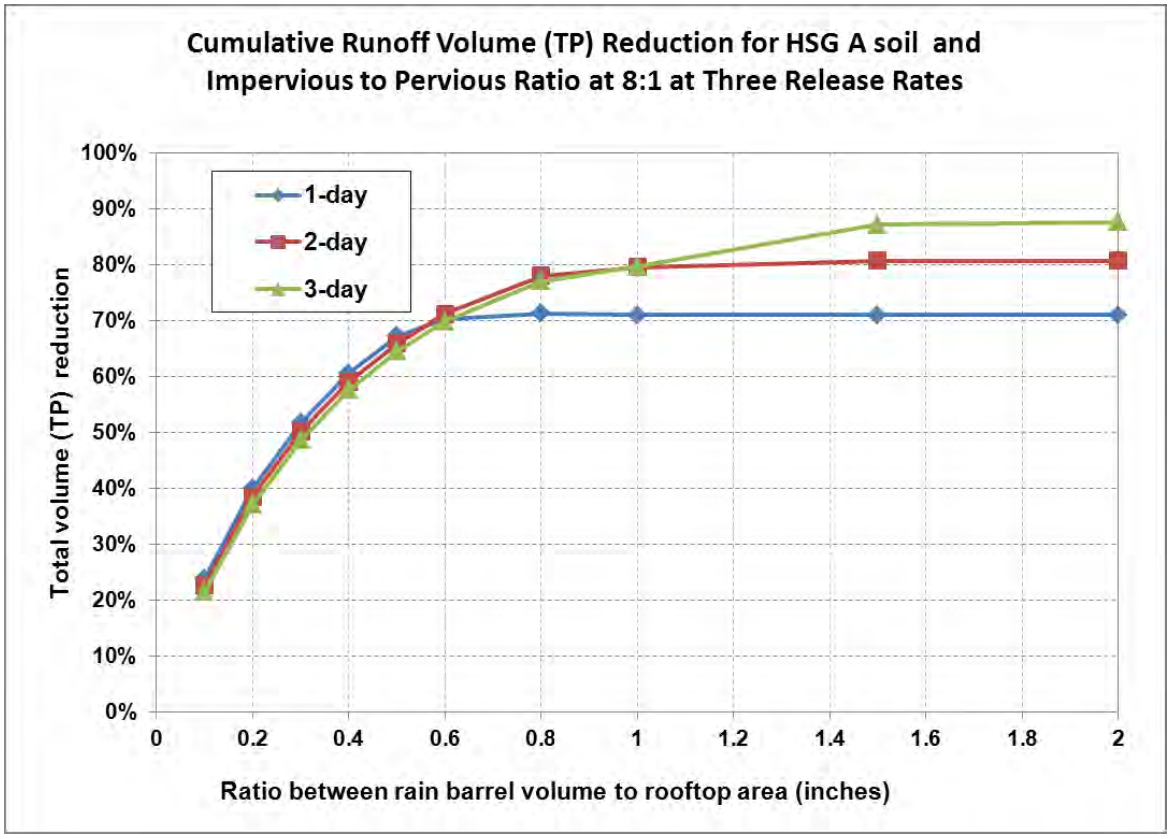


Figure 3- 19: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG B Soils

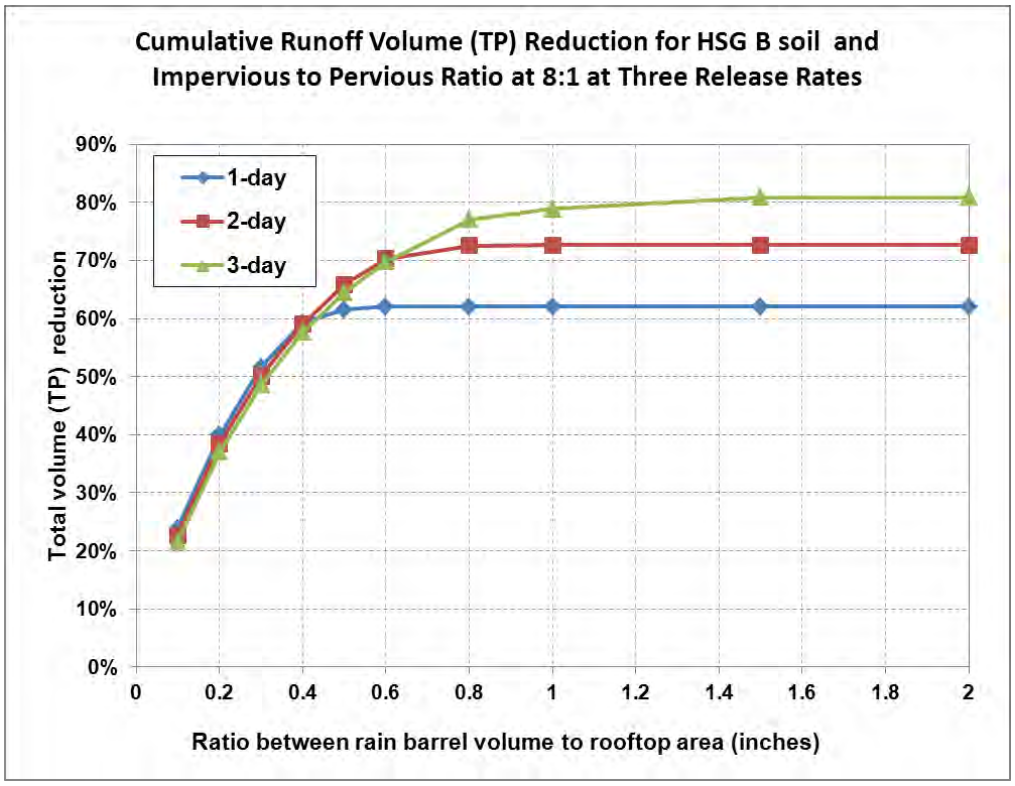


Figure 3- 20: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG C Soils

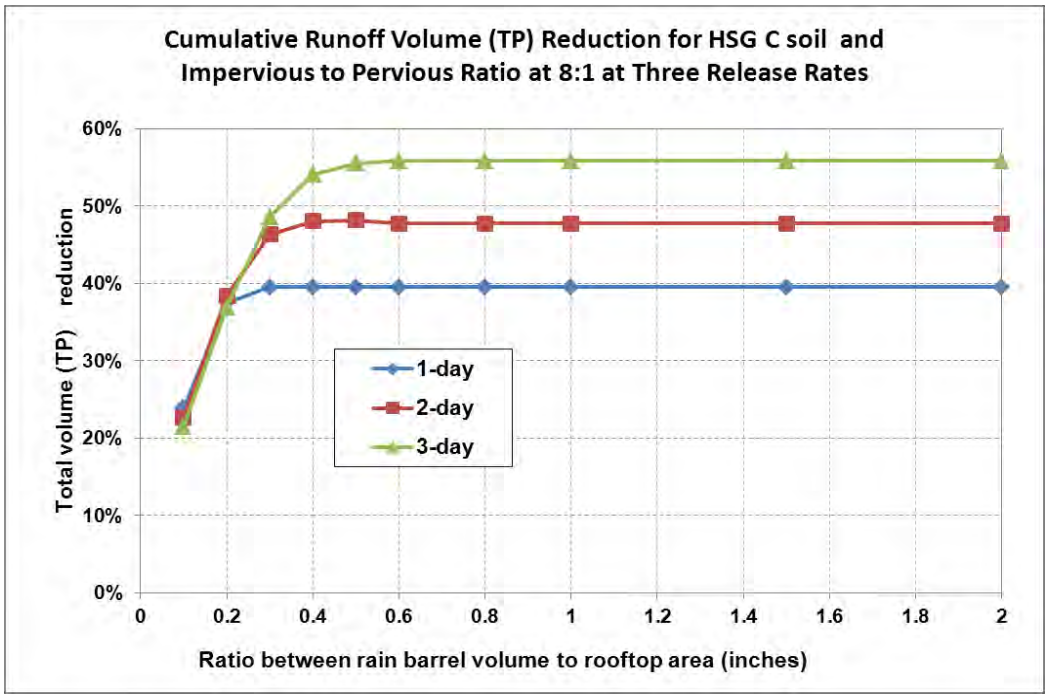


Figure 3- 21: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG D Soils

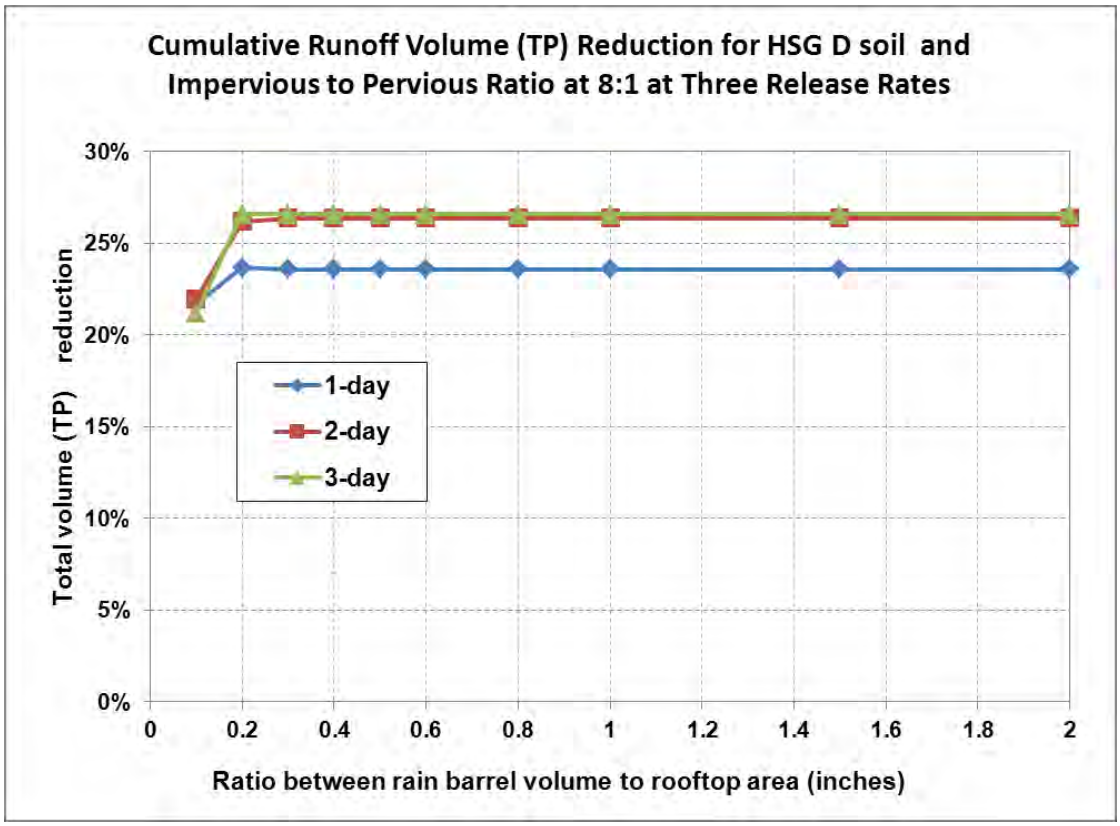


Table 3- 23: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1												
Rain barrel volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	23%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	28%	30%	33%
0.3 in	52%	50%	49%	52%	50%	49%	47%	50%	49%	29%	31%	34%
0.4 in	61%	59%	58%	61%	59%	58%	48%	55%	58%	29%	31%	34%
0.5 in	67%	66%	64%	67%	66%	64%	48%	57%	63%	29%	31%	34%
0.6 in	73%	71%	70%	70%	71%	70%	48%	57%	65%	29%	31%	34%
0.8 in	78%	78%	77%	71%	78%	77%	48%	57%	66%	29%	31%	34%
1.0 in	79%	81%	80%	71%	79%	80%	48%	57%	66%	29%	31%	34%
1.5 in	79%	87%	88%	71%	80%	87%	48%	57%	66%	29%	31%	34%
2.0 in	79%	87%	91%	71%	80%	87%	48%	57%	66%	29%	31%	34%

Figure 3- 22: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG A Soils

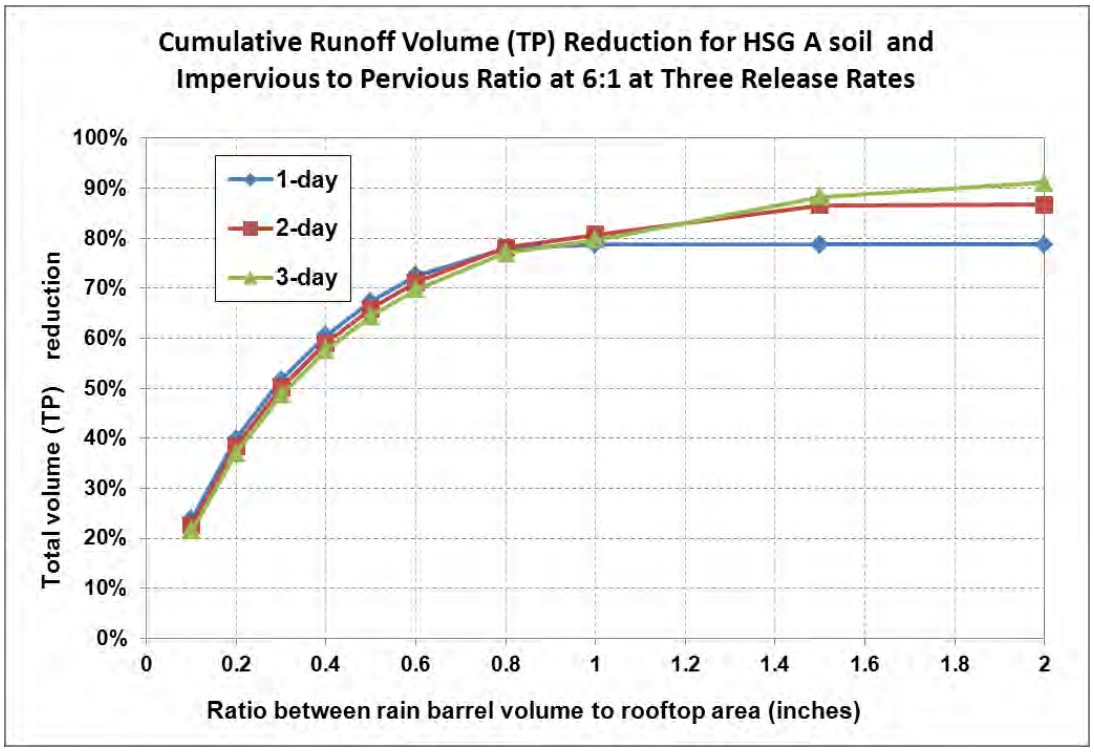


Figure 3- 23: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG B Soils

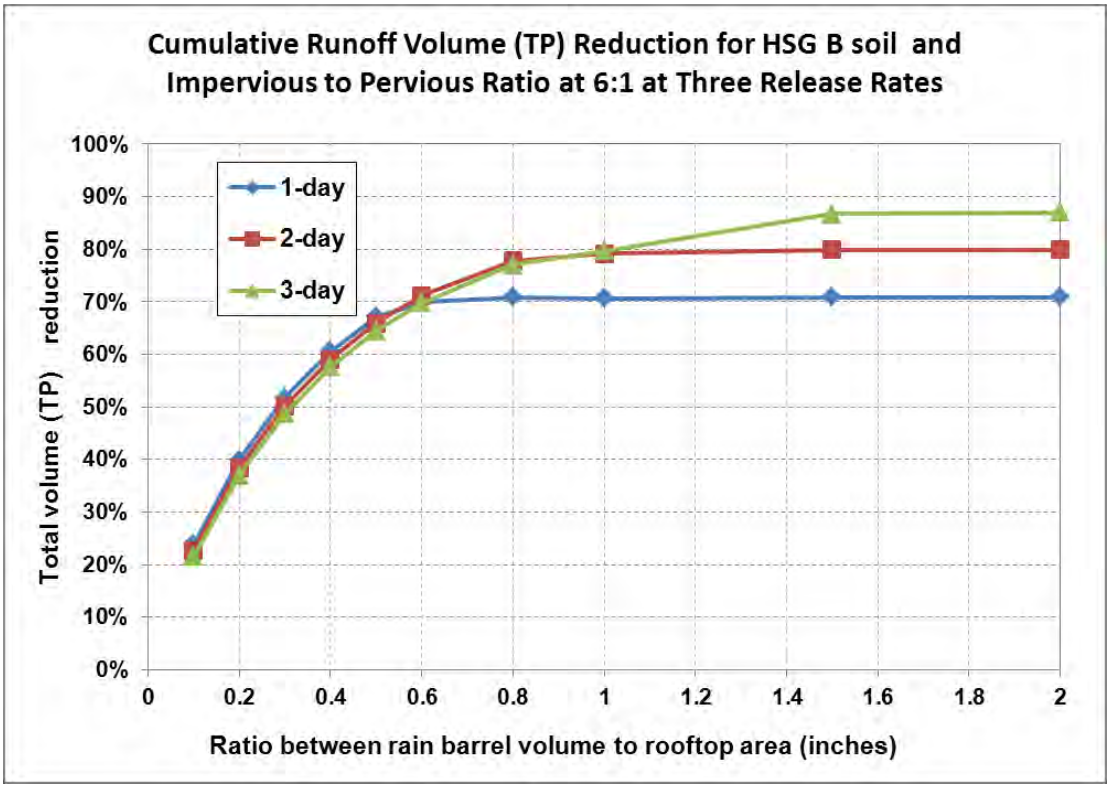


Figure 3- 24: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG C Soils

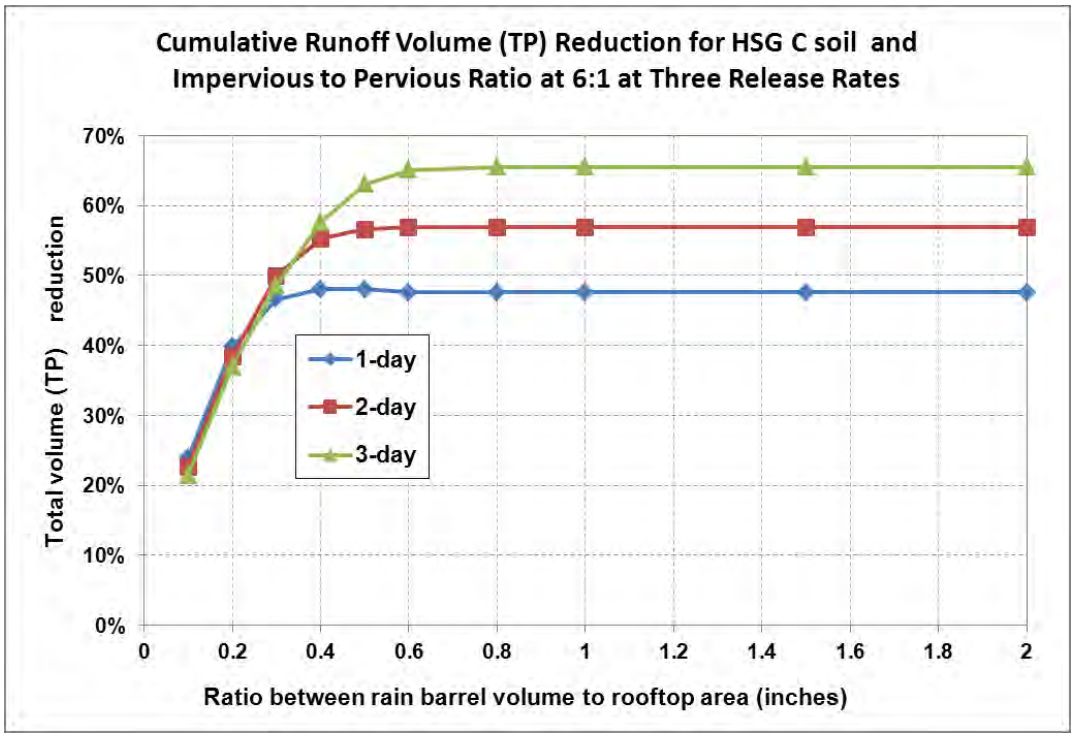


Figure 3- 25: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG D Soils

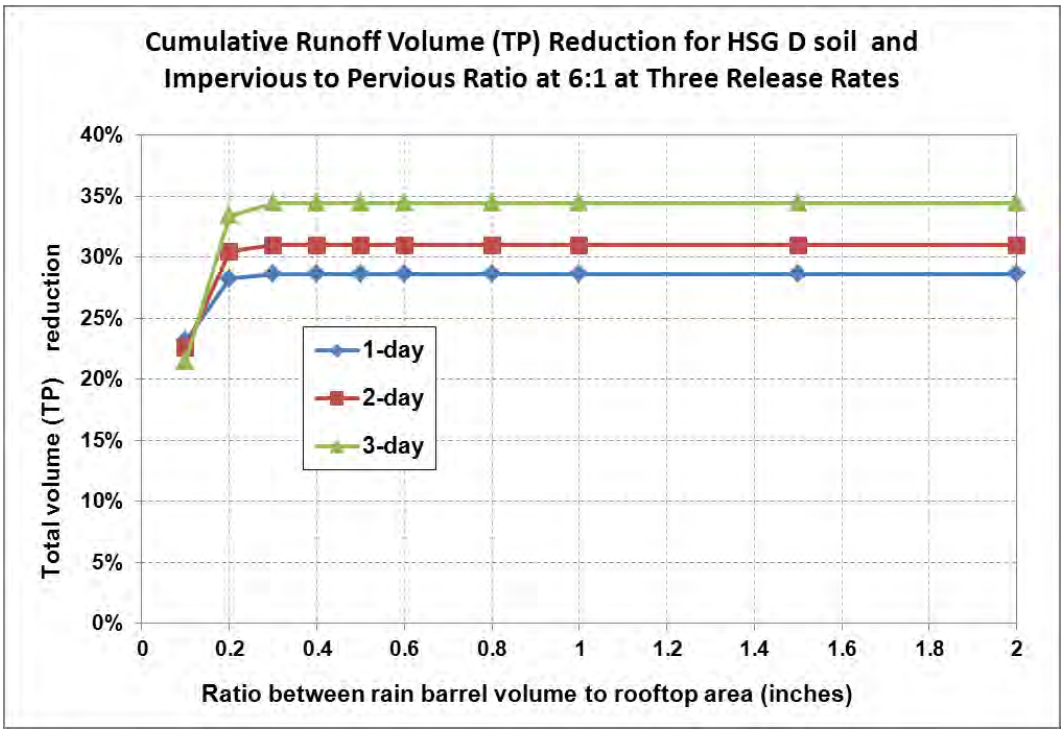


Table 3- 24: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1												
Storage volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	24%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	37%	37%	37%
0.3 in	52%	50%	49%	52%	50%	49%	52%	50%	49%	39%	42%	45%
0.4 in	61%	59%	58%	61%	59%	58%	58%	59%	58%	39%	42%	47%
0.5 in	67%	66%	64%	67%	66%	64%	60%	65%	64%	40%	42%	47%
0.6 in	73%	71%	70%	73%	71%	70%	61%	68%	70%	40%	42%	47%
0.8 in	79%	78%	77%	79%	78%	77%	61%	69%	75%	40%	42%	47%
1.0 in	82%	81%	80%	80%	81%	80%	61%	69%	76%	40%	42%	47%
1.5 in	87%	89%	88%	80%	87%	88%	61%	69%	76%	40%	42%	47%
2.0 in	87%	91%	91%	80%	88%	91%	61%	69%	76%	40%	42%	47%

Figure 3- 26: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG A Soils

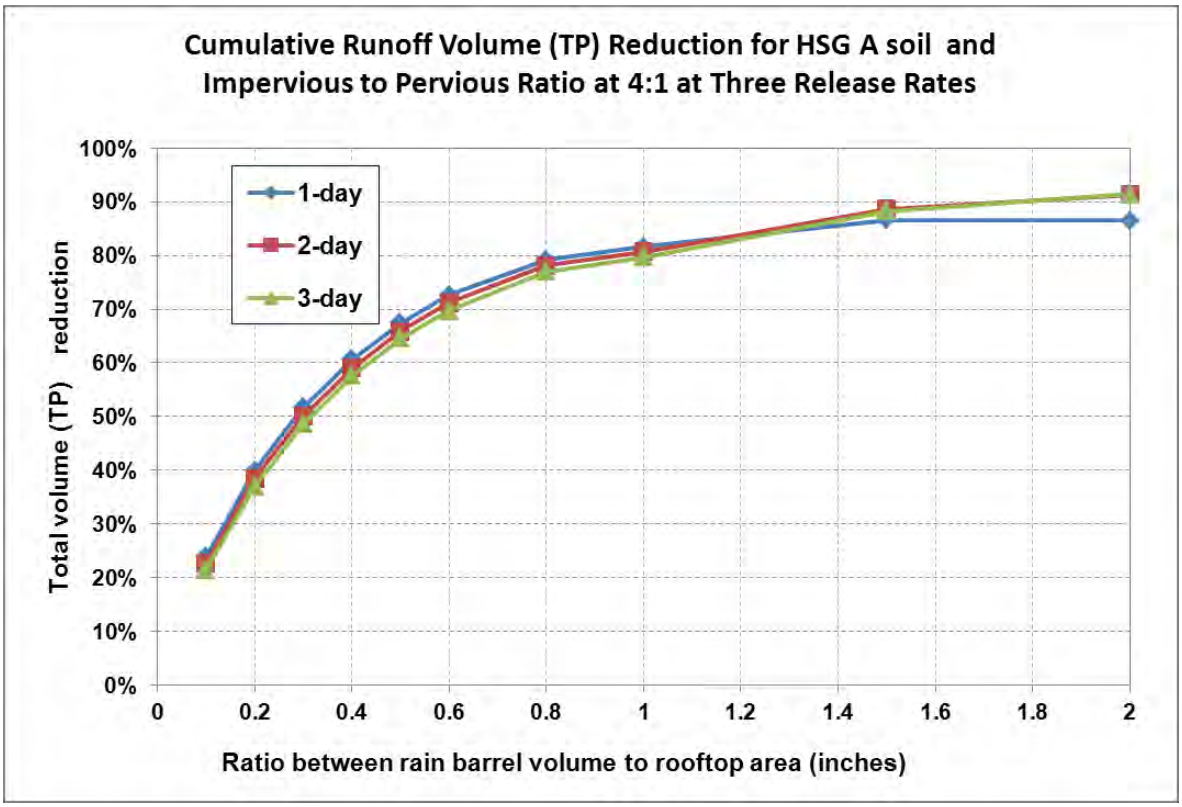


Figure 3- 27: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG B Soils

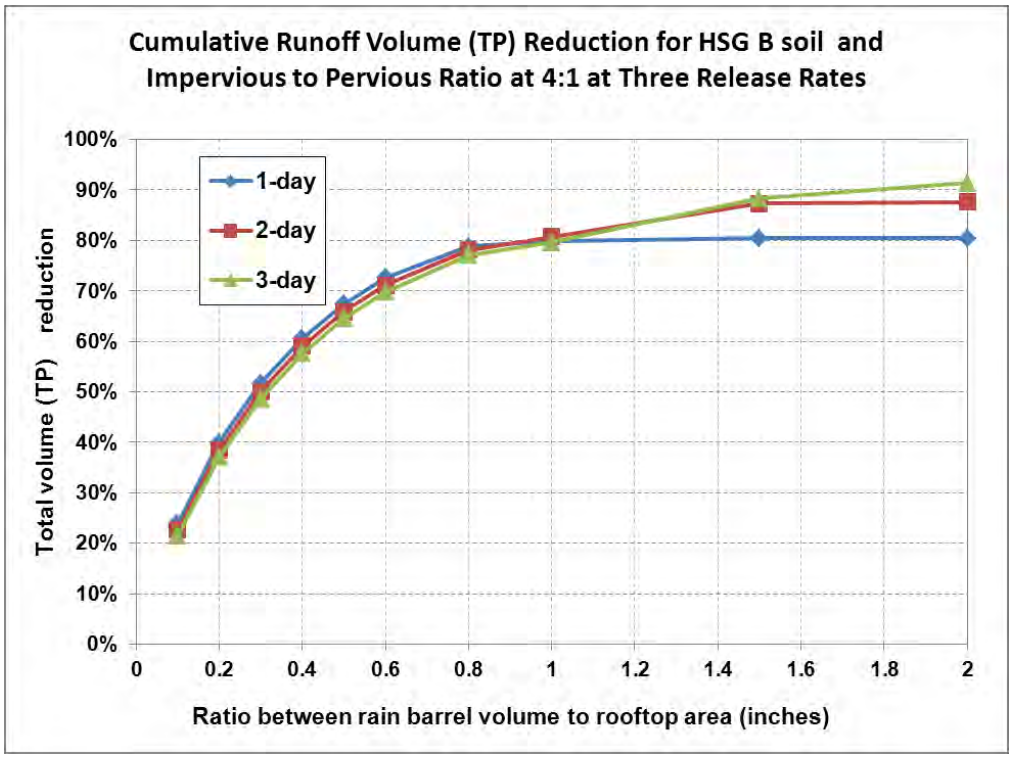


Figure 3- 28: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG C Soils

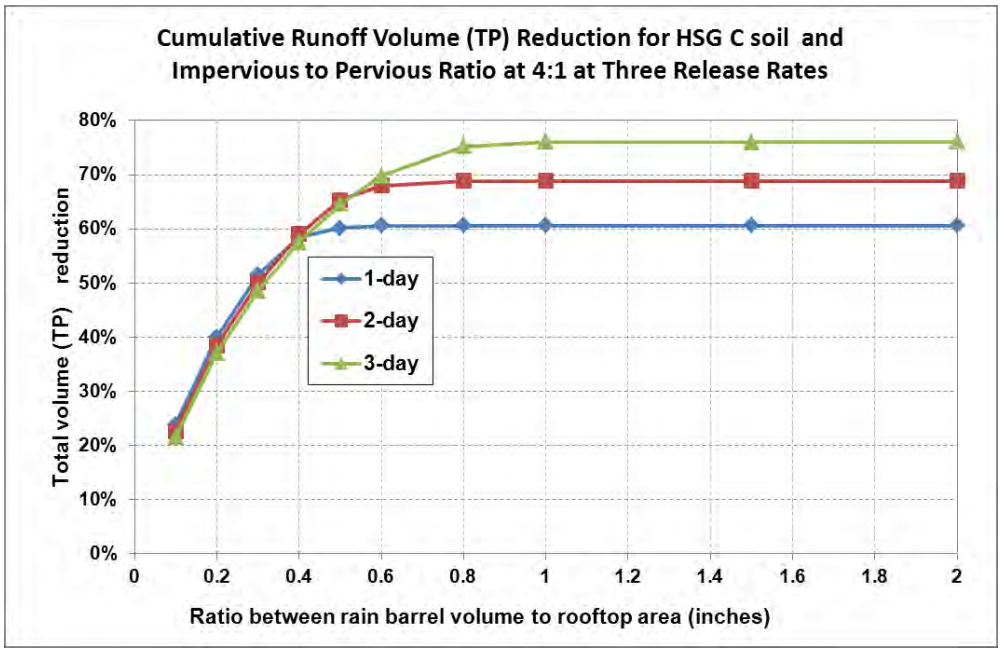


Figure 3- 29: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG D Soils

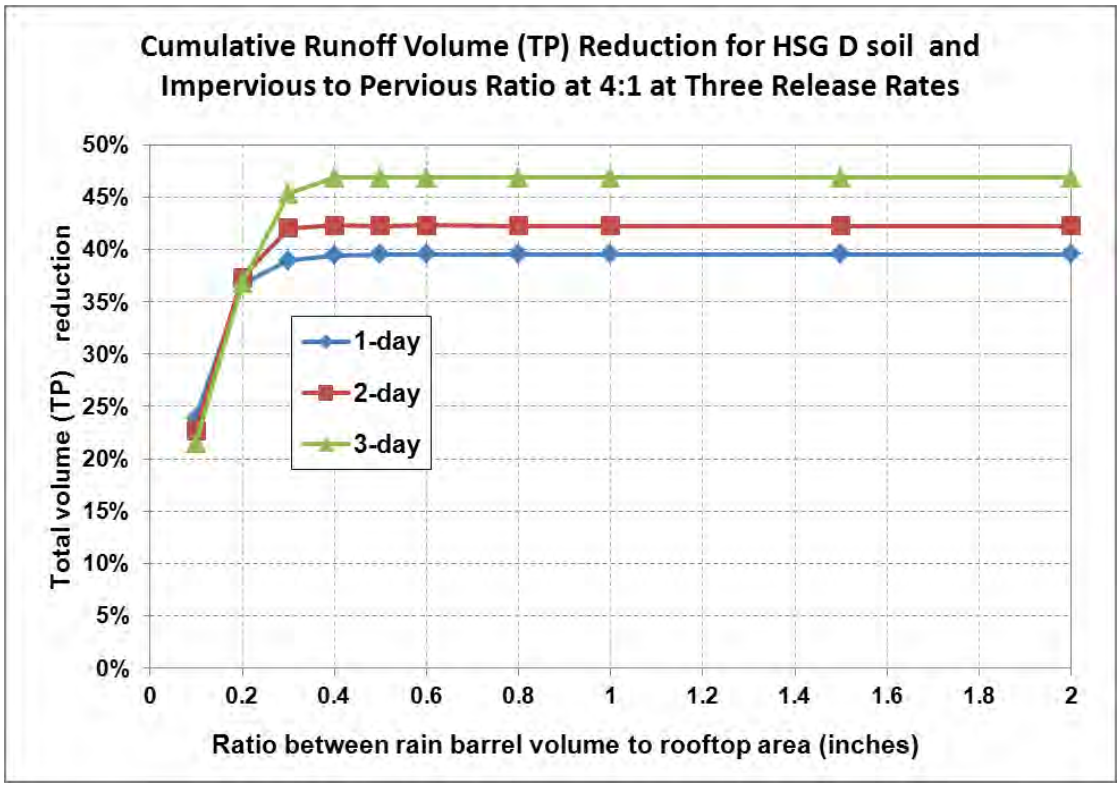


Table 3- 25: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 2:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 2:1												
Storage volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	24%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	40%	38%	37%
0.3 in	52%	50%	49%	52%	50%	49%	52%	50%	49%	51%	50%	49%
0.4 in	61%	59%	58%	61%	59%	58%	61%	59%	58%	57%	58%	57%
0.5 in	67%	66%	64%	67%	66%	64%	67%	66%	64%	59%	62%	63%
0.6 in	73%	71%	70%	73%	71%	70%	72%	71%	70%	59%	62%	67%
0.8 in	79%	78%	77%	79%	78%	77%	77%	78%	77%	59%	62%	67%
1.0 in	82%	81%	80%	82%	81%	80%	78%	81%	80%	59%	62%	67%
1.5 in	89%	89%	88%	89%	89%	88%	78%	84%	88%	59%	62%	67%
2.0 in	92%	92%	91%	91%	92%	91%	78%	84%	89%	59%	62%	67%

Figure 3- 30: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG A Soils

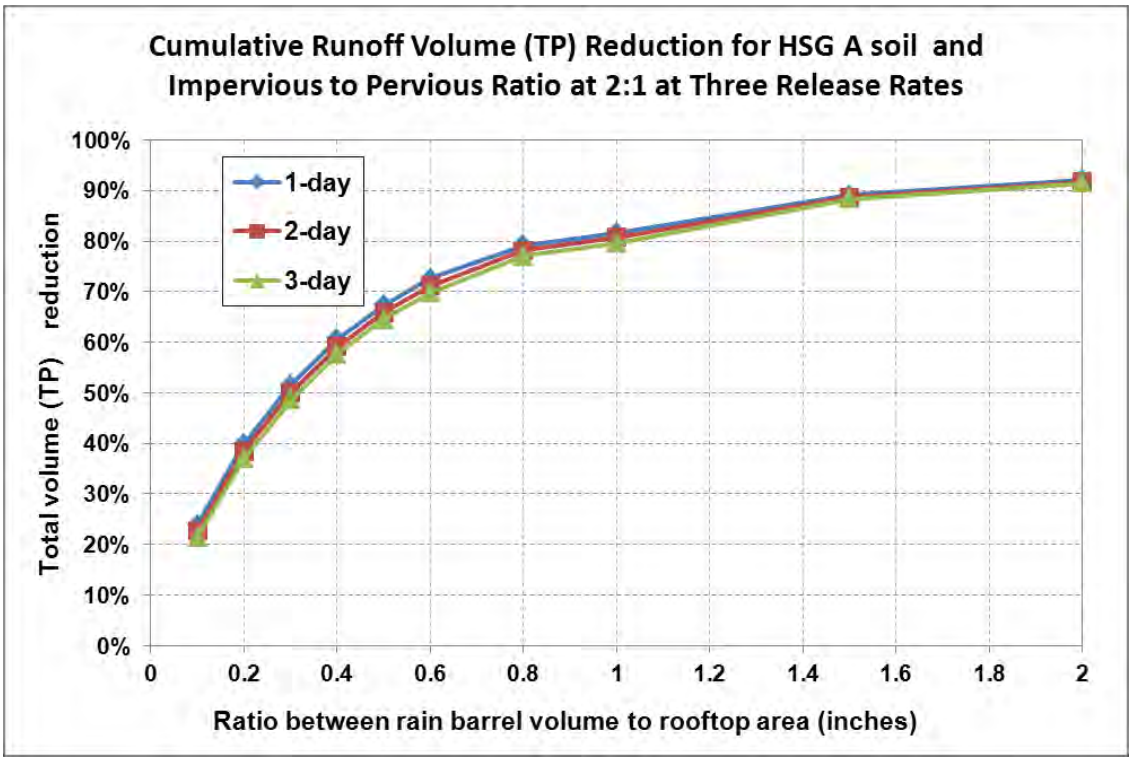


Figure 3- 31: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG B Soils

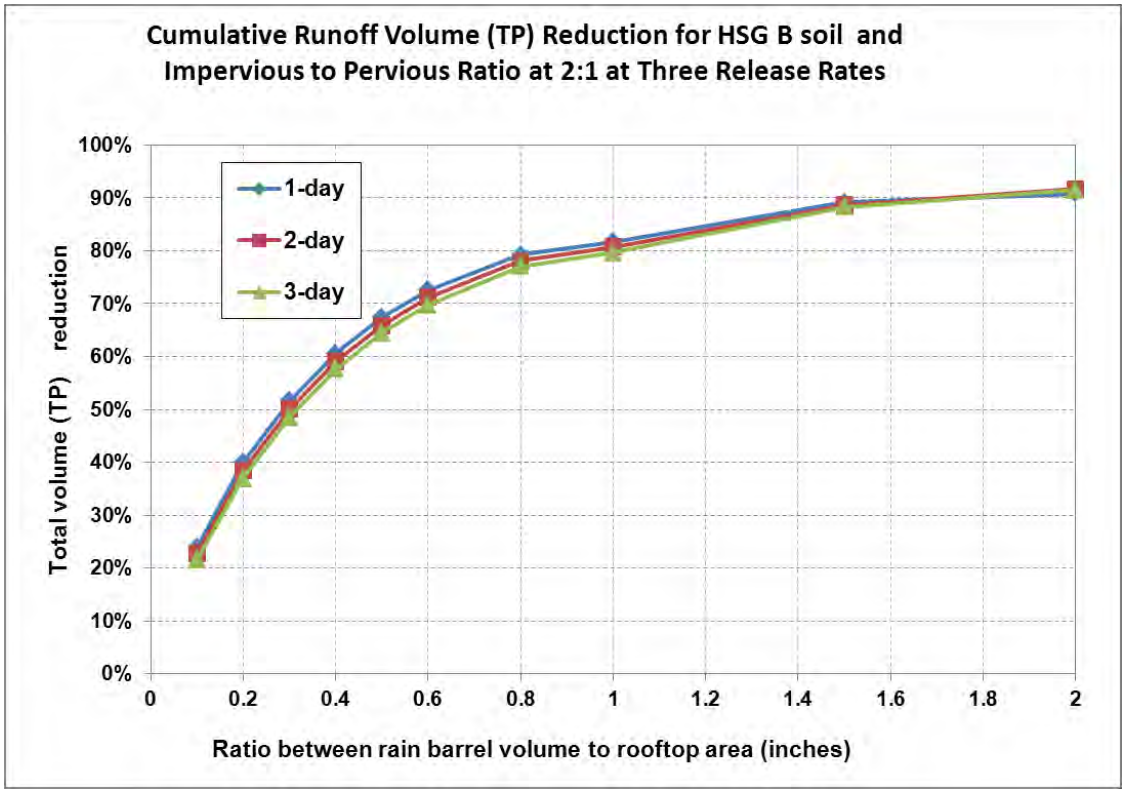


Figure 3- 32: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG C Soils

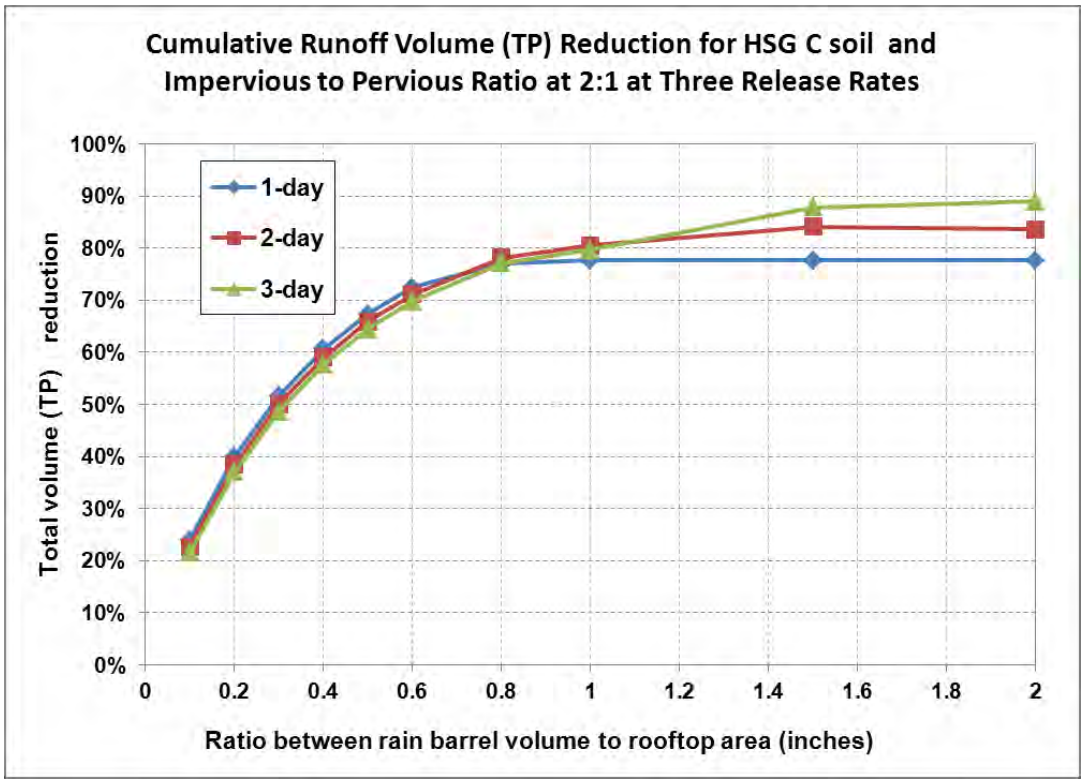


Figure 3- 33: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG D Soils

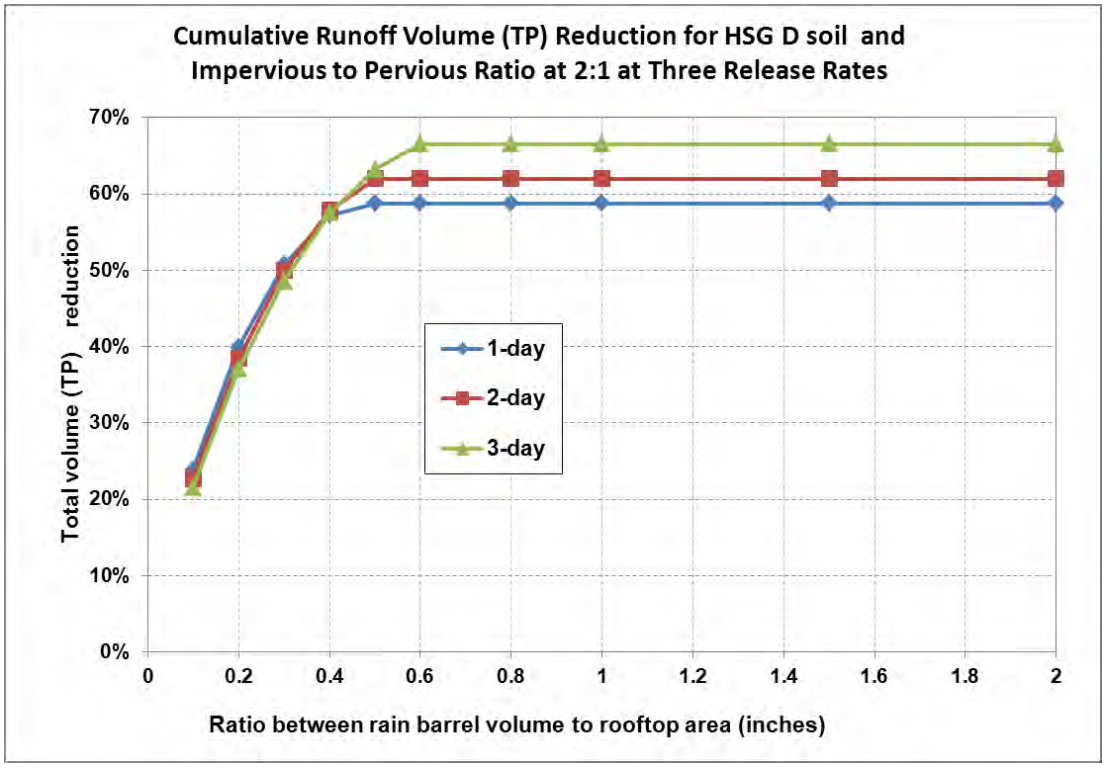


Table 3- 26: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1												
Storage volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	24%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	40%	38%	37%
0.3 in	52%	50%	49%	52%	50%	49%	52%	50%	49%	52%	50%	49%
0.4 in	61%	59%	58%	61%	59%	58%	61%	59%	58%	61%	59%	58%
0.5 in	67%	66%	64%	67%	66%	64%	67%	66%	64%	67%	66%	64%
0.6 in	73%	71%	70%	73%	71%	70%	73%	71%	70%	72%	71%	70%
0.8 in	79%	78%	77%	79%	78%	77%	79%	78%	77%	78%	78%	77%
1.0 in	82%	81%	80%	82%	81%	80%	82%	81%	80%	79%	80%	80%
1.5 in	89%	89%	88%	89%	89%	88%	89%	89%	88%	80%	82%	86%
2.0 in	92%	92%	91%	92%	92%	91%	91%	92%	91%	80%	82%	86%

Figure 3- 34: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG A Soils

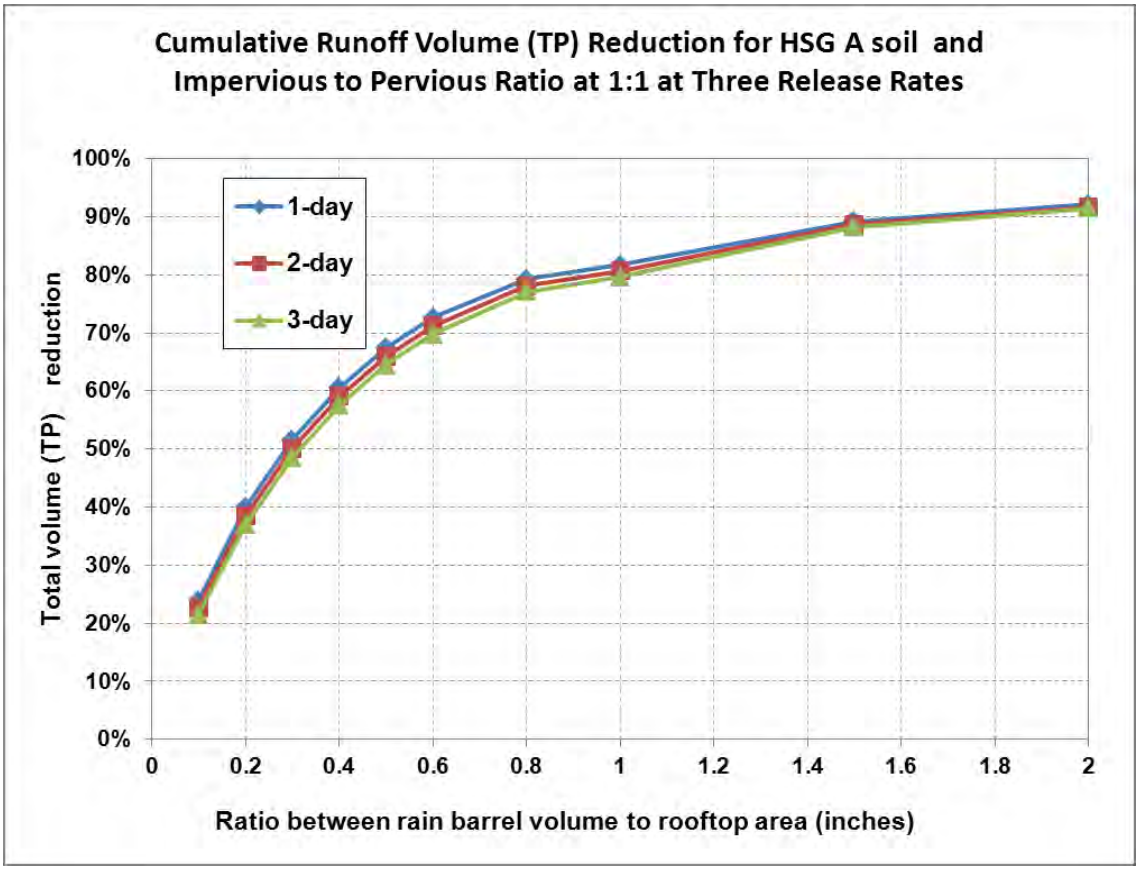


Figure 3- 35: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG B Soils

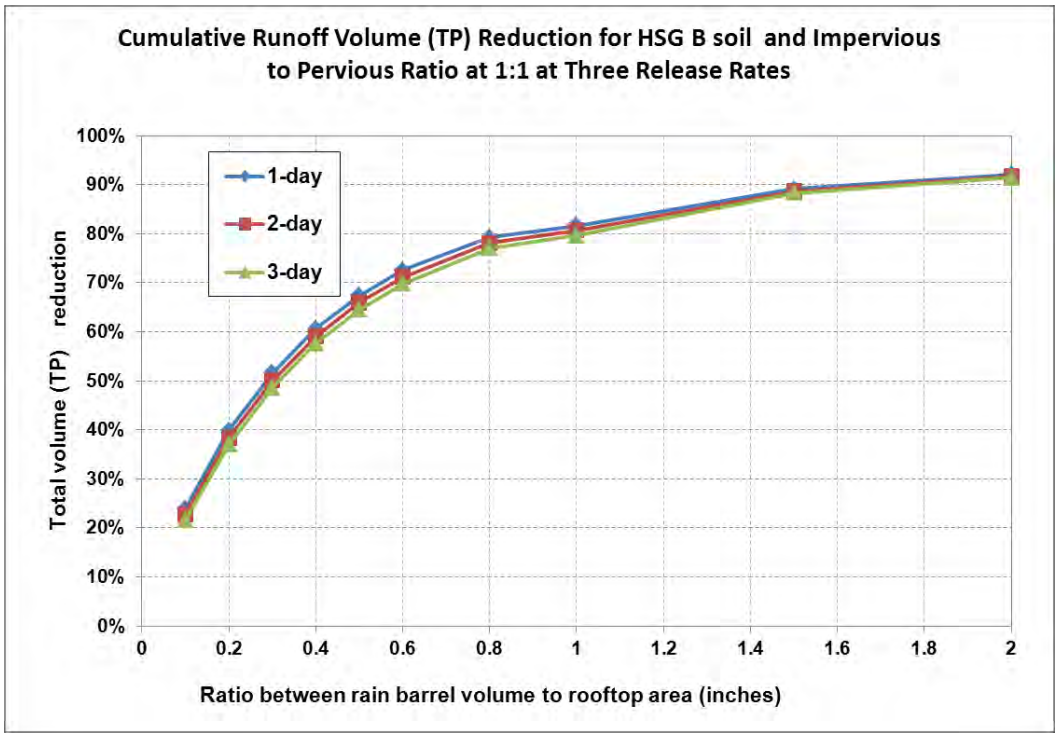


Figure 3- 36: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG C Soils

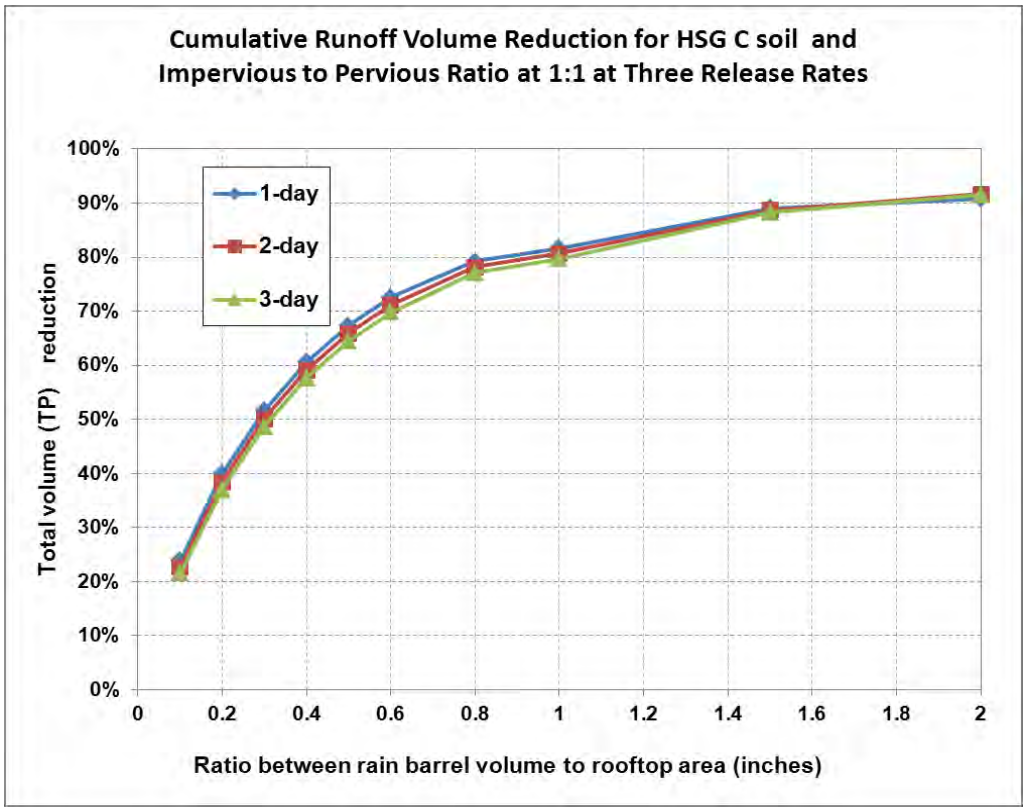


Figure 3- 37: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG D Soils

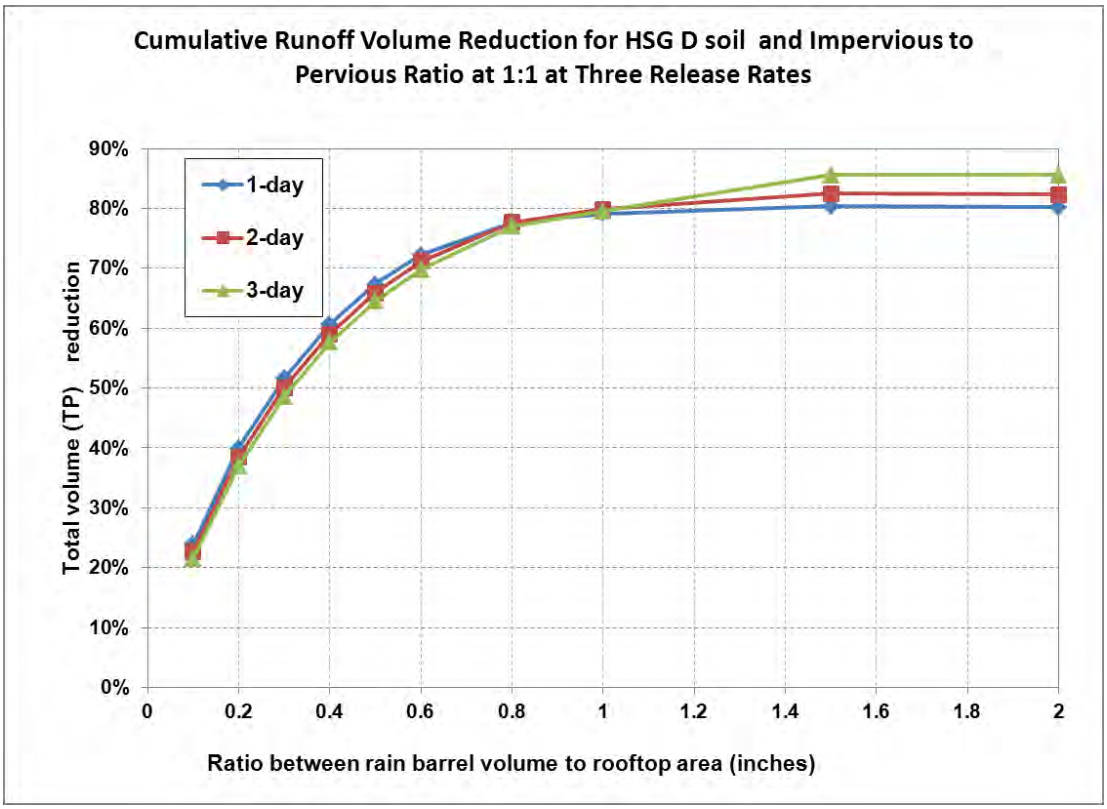


Table 3- 27: Impervious Area Disconnection Performance Table

Impervious area to pervious area ratio	Soil type of Receiving Pervious Area			
	HSG A	HSG B	HSG C	HSG D
8:1	30%	14%	7%	3%
6:1	37%	18%	11%	5%
4:1	48%	27%	17%	9%
2:1	64%	45%	33%	21%
1:1	74%	59%	49%	36%
1:2	82%	67%	60%	49%
1:4	85%	72%	67%	57%

Figure 3- 38: Impervious Area Disconnection Performance Curves

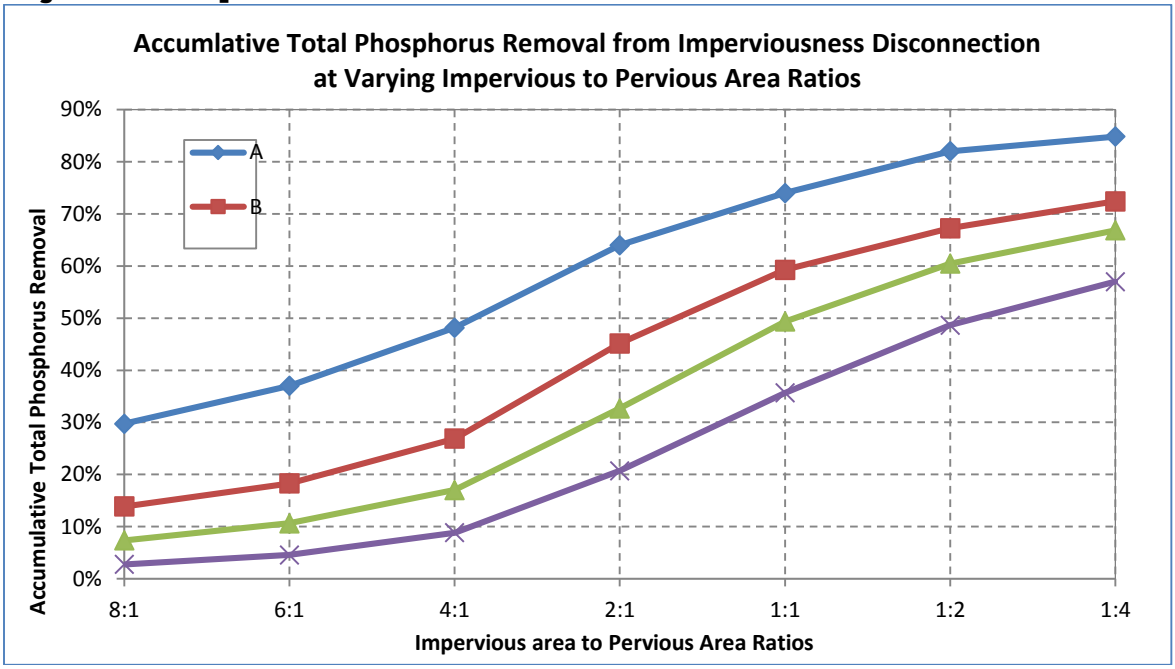


Table 3- 28: Performance Table for Conversion of Impervious Areas to Pervious Area based on Hydrological Soil Groups

Land-Use Group	Cumulative Reduction in Annual Stormwater Phosphorus Load				
	Conversion of impervious area to pervious area-HSG A	Conversion of impervious area to pervious area-HSG B	Conversion of impervious area to pervious area-HSG C	Conversion of impervious area to pervious area-HSG C/D	Conversion of impervious area to pervious area-HSG D
Commercial (Com) and Industrial (Ind)	98.5%	93.5%	88.0%	83.5%	79.5%
Multi-Family (MFR) and High-Density Residential (HDR)	98.8%	95.0%	90.8%	87.3%	84.2%
Medium -Density Residential (MDR)	98.6%	94.1%	89.1%	85.0%	81.4%
Low Density Residential (LDR) - "Rural"	98.2%	92.4%	85.9%	80.6%	75.9%
Highway (HWY)	98.0%	91.3%	84.0%	78.0%	72.7%
Forest (For)	98.2%	92.4%	85.9%	80.6%	75.9%
Open Land (Open)	98.2%	92.4%	85.9%	80.6%	75.9%
Agriculture (Ag)	70.6%	70.6%	70.6%	70.6%	70.6%

Table 3- 29: Performance Table for Conversion of Low Permeable Pervious Area to High Permeable Pervious Area based on Hydrological Soil Group

Land Cover	Cumulative Reduction in Annual SW Phosphorus Load from Pervious Area				
	Conversion of pervious area HSG D to pervious area-HSG A	Conversion of pervious area HSG D to pervious area-HSG B	Conversion of pervious area HSG D to pervious area-HSG C	Conversion of pervious area HSG C to pervious area-HSG A	Conversion of pervious area HSG C to pervious area-HSG B
Developed Pervious Land	92.7%	68.3%	41.5%	83.5%	79.5%

Table 3-30 Method for determining stormwater control design volume (DSV) (i.e., capacity) using Long-term cumulative performance curves

Stormwater Control Type	Description	Applicable Structural Stormwater Control Performance Curve	Equation for calculating Design Storage Capacity for Estimating Cumulative Reductions using Performances Curves
Infiltration Trench	Provides temporary storage of runoff using the void spaces within the soil/sand/gravel mixture that is used to backfill the trench for subsequent infiltration into the surrounding sub-soils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = void space volumes of gravel and sand layers DSV = (L x W x D_{stone} x n_{stone})+ (L x W x D_{sand} x n_{sand})
Subsurface Infiltration	Provides temporary storage of runoff using the combination of storage structures (e.g., galleys, chambers, pipes, etc.) and void spaces within the soil/sand/gravel mixture that is used to backfill the system for subsequent infiltration into the surrounding sub-soils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Water storage volume of storage units and void space volumes of backfill materials. Example for subsurface galleys backfilled with washed stone: DSV = (L x W x $D)_{galley}$ + (L x W x D_{stone} x n_{stone})
Surface Infiltration	Provides temporary storage of runoff through surface ponding storage structures (e.g., basin or swale) for subsequent infiltration into the underlying soils.	Infiltration Basin (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Water volume of storage structure before bypass. Example for linear trapezoidal vegetated swale DSV = (L x ((W_{bottom}+$W_{top@Dmax}$)/2) x D)
Rain Garden/Bio-retention (no underdrains)	Provides temporary storage of runoff through surface ponding and possibly void spaces within the soil/sand/gravel mixture that is used to filter runoff prior to infiltration into underlying soils.	Infiltration Basin (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Ponding water storage volume and void space volumes of soil filter media. Example for raingarden : DSV = (A_{pond} x D_{pond}) + (A_{soil} x D_{soil} x $n_{soil\ mix}$)
Tree Filter (no underdrain)	Provides temporary storage of runoff through surface ponding and void spaces within the soil/sand/gravel mixture that is used to filter runoff prior to infiltration into underlying soils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Ponding water storage volume and void space volumes of soil filter media. DSV = (L x W x $D_{ponding}$) + (L x W x D_{soil} x $n_{soil\ mix}$)
Bio-Filtration (w/underdrain)	Provides temporary storage of runoff for filtering through an engineered soil media. The storage capacity includes void spaces in the filter media and temporary ponding at the surface. After runoff has passed through the filter media it is collected by an under-drain pipe for discharge. Manufactured or packaged bio-filter systems such as tree box filters may be suitable for using the bio-filtration performance results.	Bio-filtration	DSV = Ponding water storage volume and void space volume of soil filter media. Example of a linear biofilter: DSV = (L x W x $D_{ponding}$)+ (L x W x D_{soil} x n_{soil})
Gravel Wetland	Based on design by the UNH Stormwater Center (UNHSC). Provides temporary surface ponding storage of runoff in a vegetated wetland cell that is eventually routed to an underlying saturated gravel internal storage reservoir (ISR) for nitrogen treatment. Outflow is controlled by an elevated orifice that has its invert elevation equal to the top of the ISR layer and provides a retention time of at least 24 hours.	Gravel Wetland	DSV = pretreatment volume + ponding volume + void space volume of gravel ISR. DSV = ($A_{pretreatment}$ x $D_{preTreatment}$)+ ($A_{wetland}$ x $D_{ponding}$)+ (A_{ISR} x D_{gravel} x n_{gravel})
Porous Pavement with subsurface infiltration	Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces of a subsurface gravel reservoir prior to infiltration into subsoils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = void space volumes of gravel layer DSV = (L x W x D_{stone} x n_{stone})
Porous pavement w/ impermeable underliner w/underdrain	Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces prior to discharge by way of an underdrain.	Porous Pavement	Depth of Filter Course = D_{FC}
Wet Pond	Provides treatment of runoff through routing through permanent pool.	Wet Pond	DSV= Permanent pool volume prior to high flow bypass DSV=A_{pond} x D_{pond} (does not include pretreatment volume)
Extended Dry Detention Basin	Provides temporary detention storage for the design storage volume to drain in 24 hours through multiple out let controls.	Dry Pond	DSV= Ponding volume prior to high flow bypass DSV=A_{pond} x D_{pond} (does not include pretreatment volume)
Dry Water Quality Swale/Grass Swale	Based on MA design standards. Provides temporary surface ponding storage of runoff in an open vegetated channel through permeable check dams. Treatment is provided by filtering of runoff by vegetation and check dams and infiltration into subsurface soils.	Grass swale	DSV = Volume of swale at full design depth DSV=Lswale x Aswale
Definitions: DSV= Design Storage Volume = physical storage capacity to hold water; **VSV** = Void Space Volume; **L** = length, **W** = width, **D** = depth at design capacity before bypass, **n** = porosity fill material, **A**= average surface area for calculating volume; **Infiltration rate** = saturated soil hydraulic conductivity			

Appendix G
Massachusetts Small MS4 Permit Monitoring Requirements
For Discharges into Impaired Waters – Parameters and Methods

Pollutant Causing Impairment	Monitoring Parameter	EPA or Approved Method No.
Aluminum	Aluminum, Total	200.7; 200.8; 200.9
Ammonia (Un-ionized)	Ammonia – Nitrogen	350.1
Arsenic	Arsenic, Total	200.7; 200.8; 200.9
Cadmium	Cadmium, Total	200.7; 200.8; 200.9
Chlordane	NMR	608; 625
Chloride	Chloride	300
Chromium (total)	Chromium, Total	200.7; 200.8; 200.9
Copper	Copper, Total	200.7; 200.8; 200.9
DDT	NMR	608; 625
DEHP (Di-sec-octyl phthalate)	NMR	---
Dioxin (including 2,3,7,8-TCDD)	NMR	613; 1613
Dioxin (2,3,7,8-Tetrachlorodibenzo-p-dioxin only)	NMR	613
Lead	Lead, Total	200.7; 200.8; 200.9
Mercury in Water Column	NMR unless potentially present such (e.g., salvage yards crushing vehicles with Hg switches)	200.7; 200.8; 200.9
Nitrogen (Total)	Nitrogen, Total	351.1/351.2 + 353.2
Pentachlorophenol (PCP)	NMR	---
Petroleum Hydrocarbons	Oil and Grease	1664
Phosphorus (Total)	Phosphorus, Total	365.1; 365.2; 365.3; SM 4500-P-E
Polychlorinated biphenyls	NMR	---
Polycyclic Aromatic Hydrocarbons (PAHs) (Aquatic Ecosystems)	PAHs	610; 1625
Sulfide-Hydrogen Sulfide	NMR	---
Mercury in Fish Tissue	NMR	---
PCB in Fish Tissue	NMR	---
Total Dissolved Solids	Total Dissolved Solids	160.1
Total Suspended Solids (TSS)	Total Suspended Solids	160.2, 180.1
Turbidity	Total Suspended Solids and Turbidity	160.2, 180.1
Secchi disk transparency	Total Suspended Solids	160.2
Sediment Screening Value (Exceedence)	Total Suspended Solids	160.2

Sedimentation/Siltation	Total Suspended Solids	160.2
Bottom Deposits	Total Suspended Solids	160.2
Color	NMR	---
pH, High	pH	150.2
pH, Low	pH	150.2
Taste and Odor	NMR	---
Temperature, water	NMR	---
Salinity	Specific Conductance	120.1
Enterococcus	Enterococcus	1106.1; 1600; Enterolert® 12 22.
Escherichia coli	E. coli	1103.1; 1603; Colilert® 12 16, Colilert-18® 12 15 16.; mColiBlue-24®17.
Fecal Coliform	Fecal Coliform	1680; 1681
Organic Enrichment (Sewage) Biological Indicators	Enterococcus (marine waters) or E. coli (freshwater)	1106.1; 1600
Debris/Floatables/Trash	NMR	or
Foam/Flocs/Scum/Oil Slicks	Contact MassDEP	1103.1; 1603
Oil and Grease	Oil and Grease	---
Chlorophyll-a	Total Phosphorus (freshwater)	---
	Total Nitrogen (marine waters)	1664
Nutrient/Eutrophication Biological Indicators	Total Phosphorus (freshwater)	365.1; 365.2; 365.3
	Total Nitrogen (marine waters)	351.1/351.2 + 353.2
Dissolved oxygen saturation / Oxygen, Dissolved	Dissolved Oxygen	365.1; 365.2; 365.3
	Temperature	351.1/351.2 + 353.2
	BOD_5	360.1; 360.2
	Total Phosphorus (freshwater)	SM-2550
	Total Nitrogen (marine waters)	SM-5210
Excess Algal Growth	Total Phosphorus (freshwater)	365.1; 365.2; 365.3
	Total Nitrogen (marine waters)	351.1/351.2 + 353.2
Aquatic Plants (Macrophytes)	NMR	---

Abnormal Fish deformities, erosions, lesions, tumors (DELTS)	NMR	---
Abnormal Fish Histology (Lesions)	NMR	---
Estuarine Bioassessments	Contact MassDEP	---
Fishes Bioassessments	Contact MassDEP	---
Aquatic Macroinvertebrate Bioassessments	Contact MassDEP	---
Combined Biota/Habitat Bioassessments	Contact MassDEP	---
Habitat Assessment (Streams)	Contact MassDEP	---
Lack of a coldwater assemblage	Contact MassDEP	---
Fish Kills	Contact MassDEP	---
Whole Effluent Toxicity (WET)	Contact MassDEP	---
Ambient Bioassays -- Chronic Aquatic Toxicity	Contact MassDEP	---
Sediment Bioassays -- Acute Toxicity Freshwater	Contact MassDEP	---
Sediment Bioassays -- Chronic Toxicity Freshwater	Contact MassDEP	---
Fish-Passage Barrier	NMR	---
Alteration in stream-side or littoral vegetative covers	NMR	---
Low flow alterations	NMR	---
Other flow regime alterations	NMR	---
Physical substrate habitat alterations	NMR	---
Other anthropogenic substrate alterations	NMR	---
Non-Native Aquatic Plants	NMR	---
Eurasian Water Milfoil, Myriophyllum spicatum	NMR	---
Zebra mussel, Dreissena polymorph	NMR	---
Other	Contact MassDEP	---

Notes:

NMR" indicates no monitoring required

"Total Phosphorus (freshwater)" indicates monitoring required for total phosphorus where stormwater discharges to a water body that is freshwater

"Total Nitrogen (marine water)" indicates monitoring required for total nitrogen where stormwater discharges to a water body that is a marine or estuarine water

APPENDIX H

Requirements Related to Discharges to Certain Water Quality Limited Waterbodies

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Attachment 1- Nitrogen Reduction Credits For Selected Structural BMPs

I. Discharges to water quality limited waterbodies and their tributaries where nitrogen is the cause of the impairment

1. Part 2.2.2.a.i. of the permit identifies the permittees subject to additional requirements to address nitrogen in their stormwater discharges because they discharge to waterbodies that are water quality limited due to nitrogen, or their tributaries, without an EPA approved TMDL. Permittees identified in part 2.2.2.a.i of the permit must identify and implement BMPs designed to reduce nitrogen discharges in the impaired catchment(s). To address nitrogen discharges each permittee shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. The permittee remains subject to all the requirements of part 2.3. of the permit and shall include the following enhancements to the BMPs required by part 2.3 of the permit:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual

message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part II and III as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III where appropriate.

2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; 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, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Nitrogen Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Nitrogen Source Identification Report. The report shall include the following elements:

1. Calculation of total MS4 area draining to the water quality limited water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high nitrogen loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment

ii. The final Nitrogen Source Identification Report shall be submitted to EPA as part of the year 4 annual report.

c. Potential Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii. or identified in the Nitrogen Source Identification Report that are within the drainage area of the impaired water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high nitrogen load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. 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. The permittee shall 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 annual report.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part I.1. applicable to it when in compliance with this part.

a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
   i. The receiving water and all downstream segments are determined to no longer be impaired due to nitrogen by MassDEP and EPA concurs with such determination.
   ii. An EPA approved TMDL for the receiving water or downstream receiving water indicates that no additional stormwater controls for the control of nitrogen are necessary for the permittee's discharge based on wasteload allocations as part of the approved TMDL.

b. In such a case, the permittee shall document the date of the determination provided for in paragraph a. above or the approved TMDL date in its SWMP and is relieved of any additional requirements of Appendix H part I.1. as of the applicable date and the permittee shall comply with the following:

i. The permittee shall identify in its SWMP all activities that have been implemented in accordance with the requirements of Appendix H part I.1. as of the applicable date to reduce nitrogen in its discharges, including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs

ii. The permittee shall continue to implement all requirements of Appendix H part I.1. required to be done prior to the date of determination or the date of the approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

II. Discharges to water quality limited waterbodies and their tributaries where phosphorus is the cause of the impairment

1. Part 2.2.2.b.i. of the permit identifies the permittees subject to additional requirements to address phosphorus in their stormwater discharges because they discharge to waterbodies that are water quality limited due to phosphorus, or their tributaries, without an EPA approved TMDL. Permittees identified in part 2.2.2.b.i. of the permit must identify and implement BMPs designed to reduce phosphorus discharges in the impaired catchment(s). To address phosphorus discharges each permittee shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. The permittee remains subject to the requirements of part 2.3. of the permit and shall include the following enhancements to the BMPs required by part 2.3 of the permit:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I and III as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III where appropriate.

            2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

            3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; 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, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Phosphorus Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Phosphorus Source Identification Report. The report shall include the following elements:

1. Calculation of total MS4 area draining to the water quality limited receiving water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high phosphorus loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment, including the removal of impervious area

ii. The phosphorus source identification report shall be submitted to EPA as part of the year 4 annual report.

c. Potential Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii or identified in the Phosphorus Source Identification Report that are within the drainage area of the water quality limited water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high phosphorus load potential. The permittee shall install the

remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs 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 3 to Appendix F. The permittee shall 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 annual report.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part II.1. applicable to it when in compliance with this part.

a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
   i. The receiving water and all downstream segments are determined to no longer be impaired due to phosphorus by MassDEP and EPA concurs with such determination.
   ii. An EPA approved TMDL for the receiving water or downstream receiving water indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations as part of the approved TMDL.

b. In such a case, the permittee shall document the date of the determination provided for in paragraph a. above or the approved TMDL date in its SWMP and is relieved of any additional requirements of Appendix H part II.1. as of the applicable date and the permittee shall comply with the following:
   i. The permittee shall identify in its SWMP all activities that have been implemented in accordance with the requirements of Appendix H part II.1. as of the applicable date to reduce phosphorus in its discharges, including implementation schedules for non structural BMPs and any maintenance requirements for structural BMPs
   ii. The permittee shall continue to implement all requirements of Appendix H part II.1. required to be done prior to the date of determination or the date of the approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

III. Discharges to water quality limited waterbodies where bacteria or pathogens is the cause of the impairment

1. Consistent with part 2.2.2.c.i. of the permit, permittees that discharge to waterbodies that are water quality limited due to bacteria or pathogens, without an EPA approved TMDL, are subject to the following additional requirements to address bacteria or pathogens in their stormwater discharges.

2. Additional or Enhanced BMPs

    a. The permittee remains subject to the requirements of part 2.3. of the permit and shall include the following enhancements to the BMPs required by part 2.3 of the permit:

        i. Part 2.3.2. Public Education and outreach: The permittee shall supplement its Residential program with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee or its agents shall disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance. The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens. All public education messages can be combined with requirements of Appendix H part I and II as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III where appropriate.

        ii. Part 2.3.4 Illicit Discharge: The permittee shall implement the illicit discharge program required by this permit. Catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part III.2. applicable to it when in compliance with this part.

    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The receiving water is determined to be no longer impaired due to bacteria or pathogens by MassDEP and EPA concurs with such a determination.
        ii. An EPA approved TMDL for the receiving water indicates that no additional stormwater controls are necessary for the control of bacteria or pathogens from the permittee's discharge based on wasteload allocations as part of the approved TMDL.
        iii. The permittee's discharge is determined to be below applicable water quality criteria[1] and EPA agrees with such a determination. The permittee shall submit data to EPA that accurately characterizes the concentration of bacteria or pathogens in their discharge. The characterization shall include water quality

[1] Applicable water quality criteria are the state standards that have been federally approved as of the effective date of this permit and are compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

and flow data sufficient to accurately assess the concentration of bacteria or pathogens in all seasons during storm events of multiple sizes and for the duration of the storm events including the first flush, peak storm flow and return to baseflow.

b. In such a case, the permittee shall document the date of the determination, date of approved TMDL or date of EPA concurrence that the discharge meets water quality criteria in its SWMP and is relieved of any additional requirements of Appendix H part III.2. as of that date and the permittee shall comply with the following:
    i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix H part III.2. to date to reduce bacteria or pathogens in its discharges, including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
    ii. The permittee shall continue to implement all requirements of Appendix H part III.3. required to be done prior to the date of determination date, date of approved TMDL, or date of EPA concurrence that the discharge meets water quality criteria, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications

IV. Discharges to water quality limited waterbodies where chloride is the cause of the impairment

1. Consistent with part 2.2.2.c.i. of the permit, permittees that discharge to waterbodies that are water quality limited due to chloride, without an EPA approved TMDL, are subject to the following additional requirements to address chloride in their stormwater discharges.

2. Permittees discharging to a waterbody listed as impaired due to chloride in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act sections 303(d) and 305(b) shall develop a Salt Reduction Plan that includes specific actions designed to achieve salt reduction on municipal roads and facilities, and on private facilities that discharge to its MS4 in the impaired catchment(s). The Salt Reduction Plan shall be completed within three years of the effective date of the permit and include the BMPs in part IV.4. below. The Salt Reduction Plan shall be fully implemented five years after the effective date of the permit.

3. Permittees that, during the permit term, become aware that their discharge is to a waterbody that is impaired due to chloride must update their Salt Reduction Plan within 60 days of becoming aware of the situation to include salt reduction practices targeted at lowering chloride in discharges to the impaired waterbody. If the permittee does not have a Salt Reduction Plan already in place, then the permittee shall complete a Salt Reduction Plan that includes the BMPs in part IV 4) below within 3 years of becoming aware of the situation and fully implement the Salt Reduction Plan within 5 years of becoming aware of the situation.

4. Additional or Enhanced BMPs

   a. For municipally maintained surfaces:

      i. Tracking of the types and amount of salt applied to all permittee owned and maintained surfaces and reporting of salt use beginning in the year of the completion of the Salt Reduction Plan in the permittee's annual reports;

      ii. Planned activities for salt reduction on municipally owned and maintained surfaces, which shall include but are not limited to the following unless the permittee determines one or more of the following is not applicable to its system and documents that determination as part of the Salt Reduction Plan:
         - Operational changes such as pre-wetting, pre-treating the salt stockpile, increasing plowing prior to de-icing, monitoring of road surface temperature, etc.;
         - Implementation of new or modified equipment providing pre-wetting capability, better calibration rates, or other capability for minimizing salt use;
         - Training for municipal staff and/or contractors engaged in winter maintenance activities;
         - Adoption of guidelines for application rates for roads and parking lots (see *Winter Parking Lot and Sidewalk Maintenance*

Manual (Revised edition June 2008) http://www.pca.state.mn.us/publications/parkinglotmanual.pdf; and the application guidelines on page 17 of *Minnesota Snow and Ice Control: Field Handbook for Snow Operators (September 2012)* http://www.mnltap.umn.edu/publications/handbooks/documents/snowice.pdf for examples);

- Regular calibration of spreading equipment;
- Designation of no-salt and/or low salt zones;
- Measures to prevent exposure of salt stockpiles (if any) to precipitation and runoff; and
- An estimate of the total tonnage of salt reduction expected by each activity.

b. For privately maintained facilities that discharge to the MS4:

i. Establish an ordinance, bylaw, or other regulatory mechanism requiring measures to prevent exposure of any salt stockpiles to precipitation and runoff at all commercial and industrial properties within the regulated area.

ii. Part 2.3.2. Public Education and Outreach: The permittee shall supplement its Commercial/Industrial education program with an annual message to private road salt applicators and commercial and industrial site owners on the proper storage and application rates of winter deicing material. The educational materials shall be disseminated in the November/December timeframe and shall describe steps that can be taken to minimize salt use and protect local waterbodies.

iii. Part 2.3.6, Stormwater Management in New Development and Redevelopment – establish procedures and requirements to minimize salt usage and require the use of salt alternatives where the permittee deems necessary.

c. The completed Salt Reduction Plan shall be submitted to EPA along with the annual report following the Salt Reduction Plan's completion. Each subsequent annual report shall include an update on Plan implementation progress, any updates to the Salt Reduction Plan deemed necessary by the permittee, as well as the types and amount of salt applied to all permittee owned and maintained surfaces.

5. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part IV as follows:

a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
   i. The receiving water is determined to be no longer impaired due to chloride by MassDEP and EPA concurs with such a determination.
   ii. An EPA approved TMDL for the receiving water indicates that no additional stormwater controls are necessary for the control of chloride from the

permittee's discharge based on wasteload allocations as part of the approved TMDL.

iii. The permittee's discharge is determined to be below applicable water quality criteria[2] and EPA agrees with such a determination. The permittee shall submit data to EPA that accurately characterizes the concentration of chloride in their discharge during the deicing season (November – March). The characterization shall include water quality and flow data sufficient to accurately assess the concentration of chloride in the deicing season during storm events of multiple sizes and for the duration of the storm events including the first flush, peak storm flow and return to baseflow and include samples collected during deicing activities.

b. In such a case, the permittee shall document the date of the determination, date of approved TMDL or date of EPA concurrence that the discharge meets water quality criteria in its SWMP and is relieved of any additional requirements of Appendix H part IV as of that date and the permittee shall comply with the following:

i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix H part IV to date to reduce chloride in its discharges, including implementation schedules for non-structural BMPs

ii. The permittee shall continue to implement all requirements of Appendix H part IV required to be done by the date of determination date, date of approved TMDL, or date of EPA concurrence that the discharge meets water quality criteria, including ongoing implementation of identified non-structural BMPs

[2] Applicable water quality criteria are the state standards that have been federally approved as of the effective date of this permit and are compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

V. Discharges to water quality limited waterbodies and their tributaries where solids, oil and grease (hydrocarbons), or metals is the cause of the impairment

1. Consistent with part 2.2.2.c.i. of the permit, permittees that discharge to waterbodies that are water quality limited due to solids, metals, or oil and grease (hydrocarbons), without an EPA approved TMDL, are subject to the following additional requirements to address solids, metals, or oil and grease (hydrocarbons) in their stormwater discharges.

2. Additional or Enhanced BMPs

    a. The permittee remains subject to the requirements of part 2.3. of the permit and shall include the following enhancements to the BMPs required by part 2.3 of the permit:

        i. Part 2.3.6, Stormwater Management in New Development and Redevelopment: stormwater management systems designed on commercial and industrial land use area draining to the water quality limited waterbody shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event. EPA also encourages the permittee to require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

        ii. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: increased street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high density residential areas, or drainage areas with a large amount of impervious area. Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part V.2. applicable to it when in compliance with this part.

    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The receiving water is determined to be no longer impaired due to solids, metals, or oil and grease (hydrocarbons) by MassDEP and EPA concurs with such a determination.
        ii. An EPA approved TMDL for the receiving water indicates that no additional stormwater controls are necessary for the control of solids, metals, or oil and grease (hydrocarbons) from the permittee's discharge based on wasteload allocations as part of the approved TMDL.

iii. The permittee's discharge is determined to be below applicable water quality criteria and EPA agrees with such a determination[3]. The permittee shall submit data to EPA that accurately characterizes the concentration of bacteria or pathogens in their discharge. The characterization shall include water quality and flow data sufficient to accurately assess the concentration of bacteria or pathogens in all seasons during storm events of multiple sizes and for the duration of the storm events including the first flush, peak storm flow and return to baseflow.

b. In such a case, the permittee shall document the date of the determination, date of approved TMDL or date of EPA concurrence that the discharge meets water quality criteria in its SWMP and is relieved of any additional requirements of Appendix H part V.2. as of that date and the permittee shall comply with the following:

iv. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix H part V.2. to date to reduce solids, metals, or oil and grease (hydrocarbons) in its discharges, including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs

v. The permittee shall continue to implement all requirements of Appendix H part V.3. required to be done by the date of determination date, date of approved TMDL, or date of EPA concurrence that the discharge meets water quality criteria, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications

[3] Applicable water quality criteria are the state standards that have been federally approved as of the effective date of this permit and are compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

ATTACHMENT 1 TO APPENDIX H

The estimates of nitrogen load reductions resulting from BMP installation are intended for informational purposes only and there is no associated permittee-specific required nitrogen load reduction in the Draft Permit. Nitrogen load reduction estimates calculated consistent with the methodologies below may be used by the permittee to comply with future permit requirements providing the EPA determines the calculated reductions are appropriate for demonstrating compliance with future permit requirements. This attachment provides the method and an example to calculate the BMP nitrogen load as well as methods to calculate nitrogen load reductions for structural BMPs in an impaired watershed.

BMP N Load:

The **BMP N Load** is the annual nitrogen load from the drainage area to each proposed or existing BMP used by permittee. This measure is used to estimate the amount of annual nitrogen load that the BMP will receive or treat (BMP N Load).

To calculate the BMP N Load for a given BMP:

1) Determine the total drainage area to the BMP and sort the total drainage area into two categories: total impervious area (IA) and total pervious area (PA);

2) Calculate the nitrogen load associated with impervious area (N Load $_{IA}$) and the pervious area (N Load $_{PA}$) by multiplying the IA and PA by the appropriate land use-based nitrogen load export rate provided in Table 1; and

3) Determine the total nitrogen load to the BMP by summing the calculated impervious and pervious subarea nitrogen loads.

Table 1: Annual nitrogen load export rates

Nitrogen Source Category by Land Use	Land Surface Cover	Nitrogen Load Export Rate, lbs/ac/yr	Nitrogen Load Export Rate, kg/ha/yr
All Impervious Cover	Impervious	14.1	15.8
*Developed Land Pervious (DevPERV)- HSG A	Pervious	0.3	0.3
*Developed Land Pervious (DevPERV)- HSG B	Pervious	1.2	1.3
*Developed Land Pervious (DevPERV) – HSG C	Pervious	2.4	2.7
*Developed Land Pervious (DevPERV) - HSG C/D	Pervious	3.0	3.4
*Developed Land Pervious (DevPERV) - HSG D	Pervious	3.7	4.1
Notes: For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value from this table. If the HSG is not known, assume HSG C/D conditions for the nitrogen load export rate.			

Example 1 to determine nitrogen load to a proposed BMP when the contributing drainage area is 100% impervious: A permittee is proposing a storm water infiltration system that will treat runoff from 1.49 acres of impervious area.

Table 1-1: Design parameters for Bio-filtration w/ ISR systems for Example 1

Components of representation	Parameters	Value
Ponding	Maximum depth	0.33 ft
	Surface area	645 ft^2
Soil mix	Depth	2.0 ft
	Porosity	0.24
	Hydraulic conductivity	2.5 inches/hour
Stone Reservoir (ISR)	Depth	2.50 ft
	Porosity	0.42
	Hydraulic conductivity	500 inches/hour
ISR Volume: System Storage Volume	Ratio	0.56
Orifices	Diameter	12 in
		Installed 2.5 above impermeable soil layer

Determine:

A) Percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) for the specified bio-filtration w/ISR system and contributing impervious drainage area; and

B) Nitrogen reduction in pounds that would be accomplished by the bio-filtration w/ISR system (BMP-Reduction $_{lbs\text{-}N}$)

Solution:

1) The BMP is a bio-filtration w/ISR system that will treat runoff from 1.49 acres of impervious area (IA = 1.49 acre);

2) The available storage volume capacity (ft^3) of the bio-filtration w/ISR system (BMP-Volume $_{BMP\text{-}ft^3}$) is determined using the surface area of the system, depth of ponding, the porosity of the filter media and the porosity of the stone reservoir:

BMP-Volume $_{BMP\text{-}ft^3}$ =Surface area x (pond maximum depth + (soil mix depth x soil mix porosity) + stone reservoir depth x gravel layer porosity))
= 520 ft^2 x (0.33 ft + (2.0ft x 0.24) + (2.5 ft x 0.42))
= 1,200 ft^3

3) The available storage volume capacity of the bio-filtration w/ISR system in inches of runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$) is calculated using equation 1:

BMP-Volume $_{IA\text{-}in}$ = (BMP-Volume $_{ft^3}$/ IA (acre) x 12 in/ft x 1 acre/43560 ft^2 **(Equation 1)**

Example 1 Continued:

BMP-Volume $_{IA\text{-}in}$ = (1,200 ft^3/1.49 acre) x 12 in/ft x 1 acre/43560 ft^2
= 0.22 in

4) Using the Regional Performance Curve shown in Figure 1 for a bio-filtration w/ ISR system, a **61%** nitrogen load reduction (BMP Reduction %-N) is determined for a bio-filtration w/ ISR systems sized for 0.22 in of runoff from 1.49 acres of impervious area; and

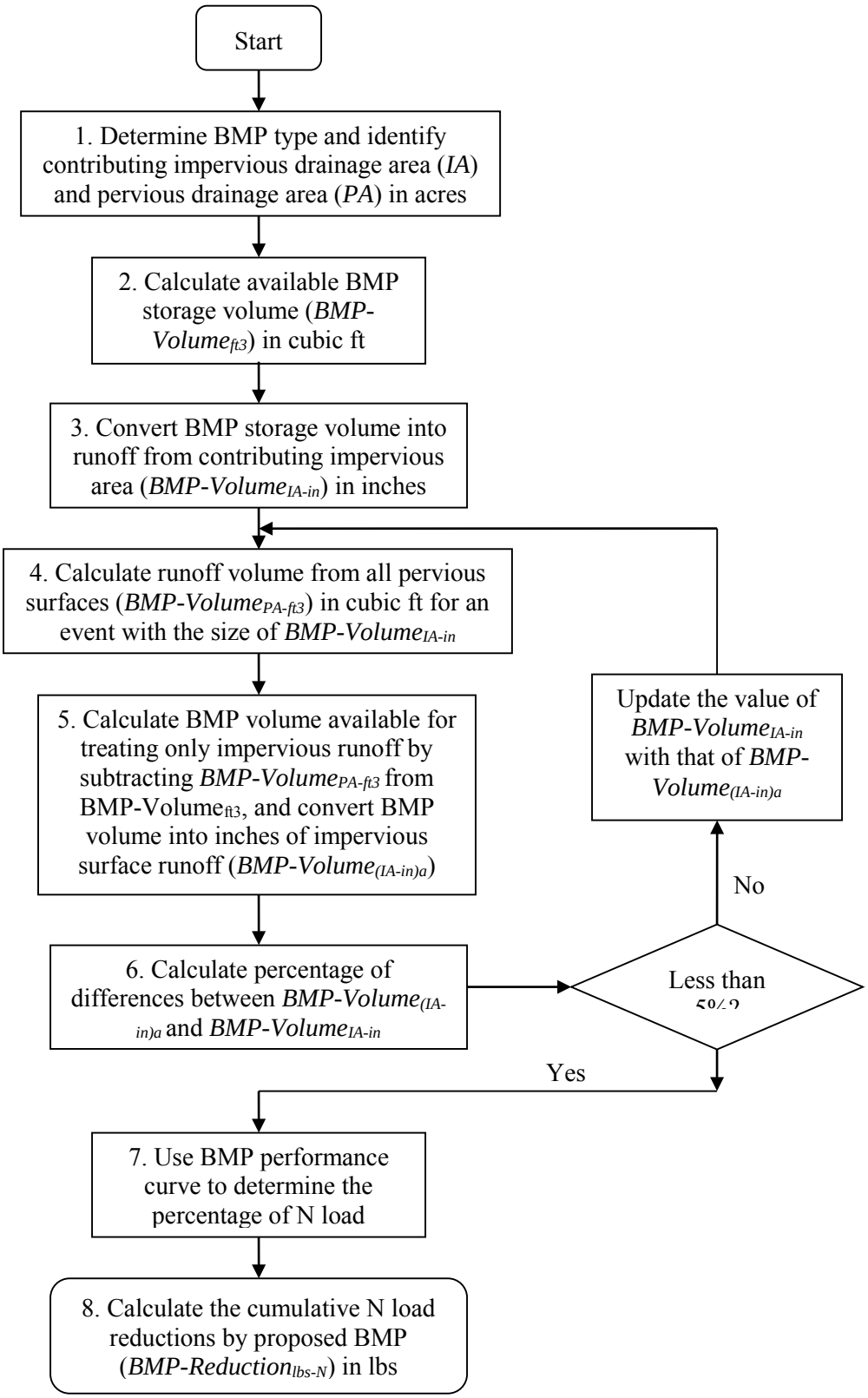
5) Calculate the nitrogen load reduction in pounds of nitrogen for the bio-filtration w/ISR system (BMP Reduction $_{lbs\text{-}N}$) using the BMP Load calculation method shown above in Example 1 and the BMP Reduction $_{\%\text{-}N}$ determined in step 4 by using equation 2.

First, the BMP Load is determined as specified in Example 1:

BMP Load = IA (acre) x 14.1 lb/ac/yr
= 1.49 acres x 14.1 lbs/acre/yr
= 21.0 lbs/yr

BMP Reduction $_{lbs\text{-}N}$ = BMP Load x (BMP Reduction $_{\%\text{-}N}$/100) **(Equation 2)**
BMP Reduction $_{lbs\text{-}N}$ = 21 lbs/yr x (61/100)
= **12.8 lbs/yr**

Method to determine the nitrogen load reduction for a structural BMP with a known storage volume when the contributing drainage area has impervious and pervious surfaces



Flow Chart 2 (previous page). Method to determine the nitrogen load reduction for a BMP with known storage volume when both pervious and impervious drainage areas are present.

1) Identify the type of structural BMP and characterize the contributing drainage area to the structural BMP by identifying the following information for the impervious and pervious surfaces:

Impervious area (IA) – Area (acre) and export rate (Table 1)

Pervious area (PA) – Area (acre) and runoff depth based on hydrologic soil group (HSG) and size of rainfall event. Table 2 provides values of runoff depth for various rainfall depths and HSGs. Soils are assigned to an HSG based on their permeability. HSG categories for pervious areas in the Watershed shall be estimated by consulting local soil surveys prepared by the National Resource Conservation Service (NRCS) or by a storm water professional evaluating soil testing results from the Watershed. If the HSG condition is not known, a HSG D soil condition should be assumed.

Table 2: Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups (HSGs)

Rainfall Depth, Inches	Runoff Depth, inches		
	Pervious HSG A/B	Pervious HSG C	Pervious HSG D
0.10	0.00	0.00	0.00
0.20	0.00	0.01	0.02
0.40	0.00	0.03	0.06
0.50	0.00	0.05	0.09
0.60	0.01	0.06	0.11
0.80	0.02	0.09	0.16
1.00	0.03	0.12	0.21
1.20	0.04	0.14	0.39
1.50	0.11	0.39	0.72
2.00	0.24	0.69	1.08

Notes: Runoff depths derived from combination of volumetric runoff coefficients from Table 5 of *Small Storm Hydrology and Why it is Important for the Design of Stormwater Control Practices*, Pitt, 1999 and using the Stormwater Management Model (SWMM) in continuous model mode for hourly precipitation data for Boston, MA, 1998-2002.

2) Determine the available storage volume (ft^3) of the structural BMP (BMP-Volume $_{ft^3}$) using the BMP dimensions and design specifications (e.g., maximum storage depth, filter media porosity);

3) To estimate the nitrogen load reduction of a BMP with a known storage volume capacity, it is first necessary to determine the portion of available BMP storage capacity (BMP-Volume $_{ft^3}$) that would treat the runoff volume generated from the contributing impervious area (IA) for a rainfall event with a depth of *i* inches (in). This will require knowing the corresponding amount of runoff volume that would be generated from the contributing pervious area (PA) for the same rainfall event (depth of *i* inches). Using equation 3 below, solve for the BMP capacity that would be available to treat runoff from the contributing imperious area for the unknown rainfall depth of *i* inches (see equation 4):

$$\text{BMP-Volume}_{ft^3} = \text{BMP-Volume}_{(IA\text{-}ft^3)i} + \text{BMP-Volume}_{(PA\text{-}ft^3)i} \quad \textbf{(Equation 3)}$$

Where:

BMP-Volume $_{ft^3}$	= the available storage volume of the BMP
BMP-Volume $_{(IA\text{-}ft^3)i}$	= the available storage volume of the BMP that would fully treat runoff generated from the contributing impervious area for a rainfall event of size *i* inches
BMP-Volume $_{(PA\text{-}ft^3)i}$	= the available storage volume of the BMP that would fully treat runoff generated from the contributing pervious area for a rainfall event of size *i* inches

Solving for BMP-Volume $_{(IA\text{-}ft^3)i}$:

$$\text{BMP-Volume}_{(IA\text{-}ft^3)i} = \text{BMP-Volume}_{ft^3} - \text{BMP-Volume}_{(PA\text{-}ft^3)i} \quad \textbf{(Equation 4)}$$

To determine BMP-Volume $_{(IA\text{-}ft^3)i}$, requires performing an iterative process of refining estimates of the rainfall depth used to calculate runoff volumes until the rainfall depth used results in the sum of runoff volumes from the contributing IA and PA equaling the available BMP storage capacity (BMP-Volume $_{ft^3}$). For the purpose of estimating BMP performance, it will be considered adequate when the IA runoff depth (in) is within 5% IA runoff depth used in the previous iteration.

For the first iteration (1), convert the BMP-Volume $_{ft^3}$ determined in step 2 into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)1}$) using equation 5.

$$\text{BMP-Volume}_{(IA\text{-}in)1} = (\text{BMP-Volume}_{ft^3} / \text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre}) \quad \textbf{(Equation 5)};$$

For iterations 2 through n (2…n), convert the BMP Volume $_{(IA\text{-}ft^3)2\ldots n}$, determined in step 5a below, into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)2\ldots n}$) using equation 6.

$$\text{BMP-Volume}_{(IA\text{-}in)2\ldots n} = (\text{BMP-Volume}_{(IA\text{-}ft^3)2\ldots n} / \text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre}) \quad \textbf{(Equation 6)};$$

4) For 1 to n iterations, use the pervious runoff depth information from Table 2 and equation 7 to determine the total volume of runoff (ft^3) from the contributing PA (BMP Volume

$_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP-Volume $_{(IA\text{-}in)1}$, determined in step 3. The runoff volume for each distinct pervious area must be determined.

BMP Volume $_{(PA\text{-}ft^3)1...n} = \sum$ ((PA x (runoff depth)$_{(PA1, PA2..PAn)}$ x (3,630 ft^3/acre-in) **(Equation 7)**

5) For iteration 1, estimate the portion of BMP Volume that is available to treat runoff from only the IA by subtracting BMP-Volume $_{PA\text{-}ft^3}$, determined in step 4, from BMP-Volume $_{ft^3}$, determined in step 2, and convert to inches of runoff from IA (see equations 8 and 9):

BMP-Volume $_{(IA\text{-}ft^3)2}$ = ((BMP-Volume$_{ft^3}$- BMP Volume $_{(PA\text{-}ft^3)1}$) **(Equation 8)**

BMP-Volume $_{(IA\text{-}in)2}$ = (BMP-Volume $_{(IA\text{-}ft^3)2}$/IA (acre)) x (12 in/ft x 1 acre/43,560 ft^2) **(Equation 9)**

If additional iterations (i.e., 2 through n) are needed, estimate the portion of BMP volume that is available to treat runoff from only the IA (BMP-Volume $_{(IA\text{-}in)3..n+1}$) by subtracting BMP Volume $_{(PA\text{-}ft^3)2..n}$, determined in step 4, from BMP Volume $_{(IA\text{-}ft^3)3..n+1}$, determined in step 5, and by converting to inches of runoff from IA using equation 9):

6) For iteration A (an iteration between 1 and n+1), compare BMP Volume $_{(IA\text{-}in)a}$ to BMP Volume $_{(IA\text{-}in)a\text{-}1}$ determined from the previous iteration (a-1). If the difference in these values is greater than 5% of BMP Volume $_{(IA\text{-}in)a}$ then repeat steps 4 and 5, using BMP Volume $_{(IA\text{-}in)a}$ as the new starting value for the next iteration (a+1). If the difference is less than or equal to 5 % of BMP Volume $_{(IA\text{-}in)a}$ then the permittee may proceed to step 7.

7) Determine the % nitrogen load reduction for the structural BMP (BMP Reduction $_{\%\text{-}N}$) using the appropriate BMP curve on Figure 1 or 2 and the BMP-Volume $_{(IA\text{-}in)n}$ calculated in the final iteration of step 5; and

8) Calculate the nitrogen load reduction in pounds of nitrogen for the structural BMP (BMP Reduction $_{lbs\text{-}N}$) using the BMP Load as calculated above in Example 1 and the percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) determined in step 7 by using equation 10:

BMP Reduction $_{lbs\text{-}N}$ = BMP Load x (BMP Reduction $_{\%\text{-}N}$/100) **(Equation 10)**

Example 2: Determine the nitrogen load reduction for a structural BMP with a known design volume when the contributing drainage area has impervious and pervious surfaces

A permittee is considering an infiltration basin to capture and treat runoff from a portion of the Watershed draining to the impaired waterbody. The contributing drainage area is 16.55 acres and is 71% impervious. The pervious drainage area (PA) is 80% HSG D and 20% HSG C. An infiltration basin with the following specifications can be placed at the down-gradient end of the contributing drainage area where soil testing results indicates an infiltration rate (IR) of 0.28 in/hr:

Example continued:

Structure	Bottom area (acre)	Top surface area (acre)	Maximum pond depth (ft)	Design storage volume (ft^3)	Infiltration Rate (in/hr)
Infiltration basin	0.65	0.69	1.65	48,155	0.28

Determine the:

A) Percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) for the specified infiltration basin and the contributing impervious and pervious drainage area; and

B) Nitrogen reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}N}$)

Solution:

1) A surface infiltration basin is being considered. Information for the contributing impervious (IA) and pervious (PA) areas are summarized in below.

Impervious area characteristics

ID	% Impervious	Area (acre)
IA1	100	11.75

Pervious area characteristics

ID	Area (acre)	Hydrologic Soil Group (HSG)
PA1	3.84	D
PA2	0.96	C

2) The available storage volume (ft^3) of the infiltration basin (BMP-Volume $_{ft^3}$) is determined from the design details and basin dimensions; BMP-Volume $_{ft^3} = 48{,}155\ ft^3$.

3) To determine what the BMP design storage volume is in terms of runoff depth (in) from IA, an iterative process is undertaken:

Solution Iteration 1

For the first iteration (1), the BMP-Volume$_{ft^3}$ is converted into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)1}$) using equation 5.

$$\text{BMP Volume}_{(IA\text{-}in)1} = (48{,}155\ ft^2 / 11.75\ \text{acre}) \times (12\ \text{in/ft} / 43{,}560\ ft^2/\text{acre})$$
$$= 1.13\ \text{in}$$

Solution Continued:

4-1) The total volume of runoff (ft^3) from the contributing PA (BMP Volume $_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP Volume $_{(IA\text{-}in)1}$ determined in step 3 is determined

for each distinct pervious area using the information from Table 2 and equation 7. Interpolation was used to determine runoff depths.

BMP Volume $_{(PA\text{-}ft^3)1}$ = ((3.84 acre x (0.33 in) + (0.96 acre x (0.13 in)) x 3,630 ft^3/acre-in
= 5052 ft^3

5-1) For iteration 1, the portion of BMP Volume that is available to treat runoff from only the IA is estimated by subtracting the BMP Volume $_{(PA\text{-}ft^3)1}$, determined in step 4-1, from BMP Volume$_{ft^3}$, determined in step 2, and converted to inches of runoff from IA:

BMP Volume $_{(IA\text{-}ft^3)\,2}$ = 48,155 ft^3 – 5052 ft^3
= 43,103 ft^3
BMP Volume $_{(IA\text{-}in)\,2}$ = (43,103 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.01 in

6-1) The % difference between BMP Volume $_{(IA\text{-}in)\,2}$, 1.01 in, and BMP Volume $_{(IA\text{-}in)1}$, 1.13 in is determined and found to be significantly greater than 5%:

% Difference = ((1.13 in – 1.01 in)/1.01 in) x 100
= 12%

Therefore, steps 4 through 6 are repeated starting with BMP Volume $_{(IA\text{-}in)\,2}$ = 1.01 in.

Solution Iteration 2

4-2) BMP-Volume $_{(PA\text{-}ft^3)2}$ = ((3.84 acre x 0.21 in) + (0.96 acre x 0.12 in)) x 3,630 ft^3/acre-in
= 3,358 ft^3

5-2) BMP-Volume $_{(IA\text{-}ft^3)\,3}$ = 48,155 ft^3 – 3,358 ft^3
= 44,797 ft^3

BMP-Volume $_{(IA\text{-}in)\,3}$ = (44,797 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.05 in

6-2) % Difference = ((1.05 in – 1.01 in)/1.05 in) x 100
= 4%

The difference of 4% is acceptable.

Solution Continued:

7) The % nitrogen load reduction for the infiltration basin (BMP Reduction $_{\%\text{-}N}$) is determined by using the RR treatment curve in Figure 2 and the treatment volume (BMP-Volume $_{\text{Net IA-in}}$ = 1.05 in) calculated in step 5-2 and is **BMP Reduction $_{\%\text{-}N}$ = 56%**.

9) The nitrogen load reduction in pounds of nitrogen (BMP-Reduction $_{\text{lbs-N}}$) for the proposed infiltration basin is calculated by using equation 11 with the BMP Load (as determined by the procedure in Example 4-1) and the N $_{\text{target}}$ of 56%.

$$\text{BMP-Reduction}_{\text{lbs-N}} = \text{BMP N Load} \times (N_{\text{target}}/100) \qquad \textbf{(Equation 11)}$$

Following example 1, the BMP load is calculated:

BMP N Load = (IA x impervious cover nitrogen export loading rate)
+ ($PA_{HSG\ D}$ x pervious cover nitrogen export loading rate, HSG D
+ ($PA_{HSG\ C}$ x pervious cover nitrogen export loading rate, HSG C)
= (16.55 acre x 15.4 lbs/acre/yr) + (3.84 acre x 3.7 lbs/acre/yr) + (0.96 acre x 2.4 lbs/acre/yr)
= 271.4 lbs/yr

BMP-Reduction $_{\text{lbs-N}}$ = 275.13 lbs/yr x 56/100 = **152.0 lbs/yr**

Figure 1: Regional BMP Performance Curve for Annual Nitrogen Load Removal: System Design by the University of New Hampshire Stormwater Center (UNHSWC)

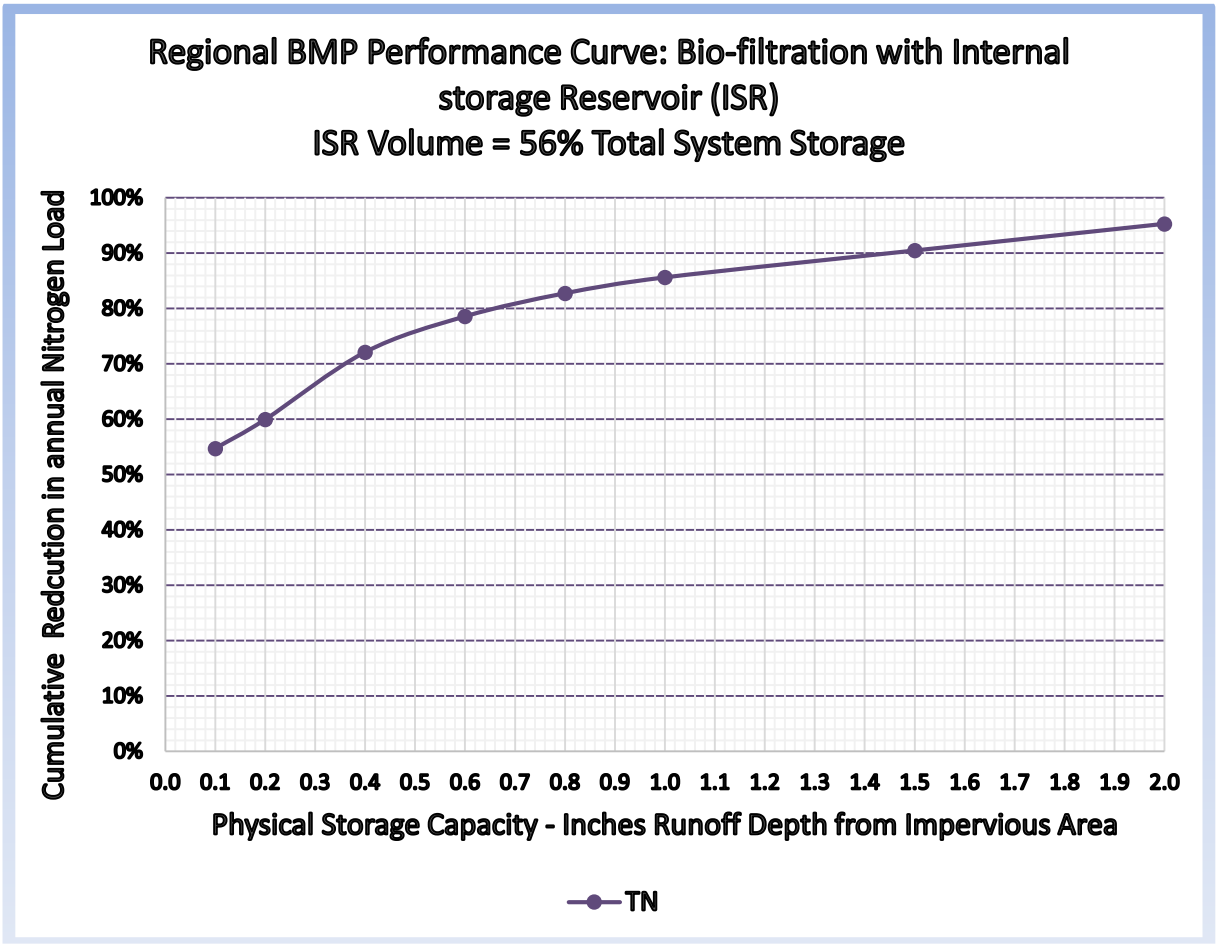
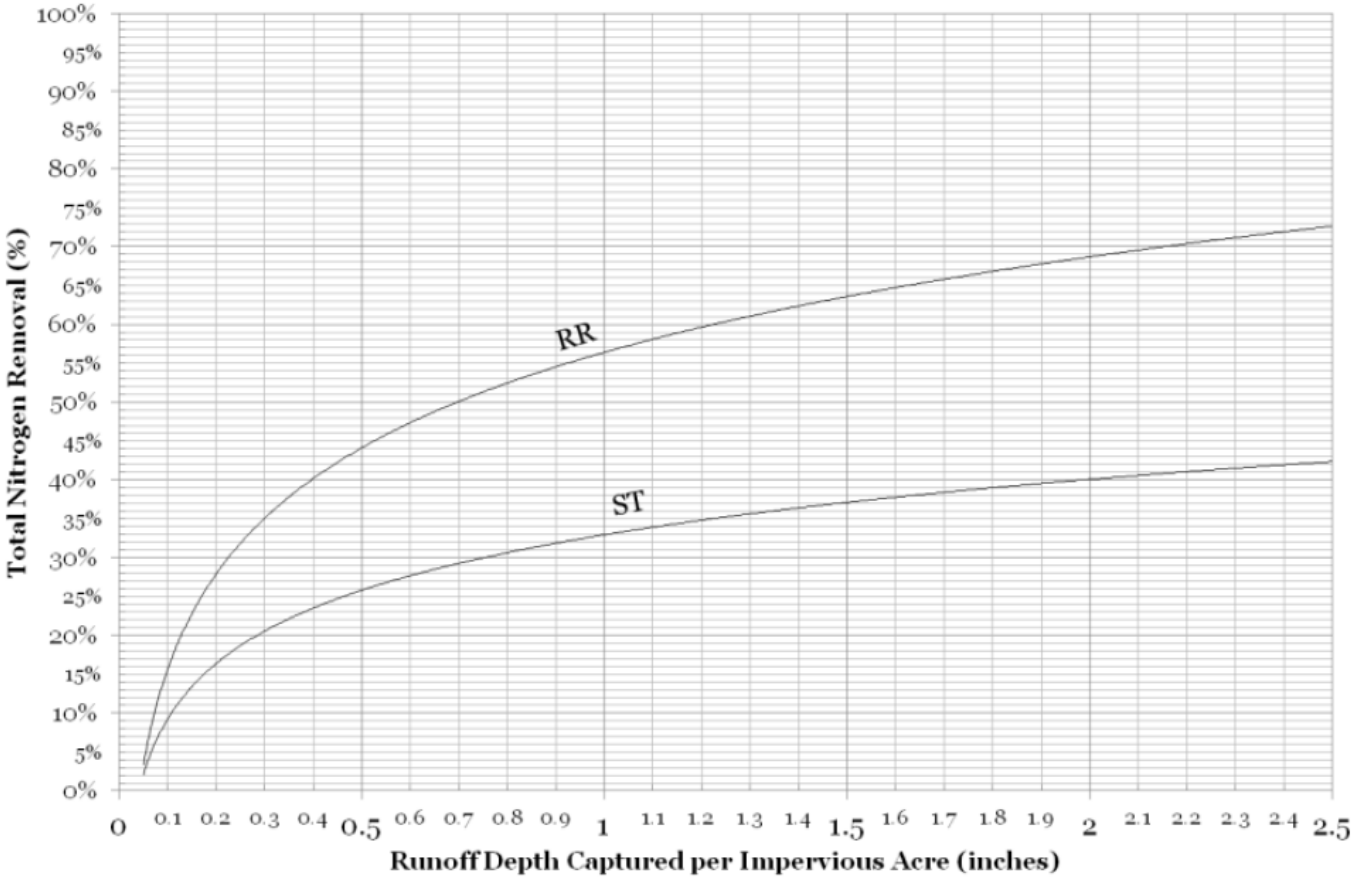


Table 3. Classification of BMP to Determine Nitrogen Reduction[1]

Structural BMP	Classification
Infiltration Trench	Runoff Reduction (RR)
Infiltration Basin or other surface infiltration practice	Runoff Reduction (RR)
Bioretention Practice	Runoff Reduction (RR)
Gravel Wetland System	Stormwater Treatment (ST)
Porous Pavement	Runoff Reduction (RR)
Wet Pond or wet detention basin	Stormwater Treatment (ST)
Dry Pond or detention basin	Runoff Reduction (RR)
Water Quality Swale	Runoff Reduction (RR)

[1]**Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards** http://chesapeakestormwater.net/wp-content/plugins/download-monitor/download.php?id=25, Retrieved 12/14/2012

Figure 2: Total Nitrogen Removal for RR and ST Practices



Adopted from: Final CBP Approved Expert Panel Report on Stormwater Retrofits http://chesapeakestormwater.net/wp-content/plugins/download-monitor/download.php?id=25, Retrieved 12/14/2012

APPENDIX D

2016 MS4 Notice of Intent

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

Part I: General Conditions

General Information

Name of Municipality or Organization: Salisbury | State: MA

EPA NPDES Permit Number (if applicable): MAR041220

Primary MS4 Program Manager Contact Information

Name: Lisa DeMeo | Title: Director of Public Works

Street Address Line 1: 39 Lafayette Road

Street Address Line 2:

City: Salisbury | State: MA | Zip Code: 01952

Email: ldemeo@salisburyma.gov | Phone Number: 978-462-7611

Fax Number:

Other Information

Stormwater Management Program (SWMP) Location: Update Existing SWMP During Permit Year 1 and Post to Town Website (2018-2019).

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☐ A ☒ B ☐ C

National Historic Preservation Act (NHPA) Determination Complete? Yes

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

MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete? *(Part II, III, IV or V, Subpart B.3.(a.) of 2003 permit)*: 90%

If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY):

Web address where MS4 map is published:

If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)

A PDF of the Town's Drainage Map, including outfalls and receiving waters, is attached.

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted? *(Part II, III, IV or V, Subpart B.3.(b.) of 2003 permit)*: Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 05/14/12

Construction/Erosion and Sediment Control (ESC) Authority Adopted? *(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)*: Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 11/01/13

Post- Construction Stormwater Management Adopted? *(Part II, III, IV or V, Subpart B.5.(a.) of 2003 permit)*: Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 05/14/12

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

Part II: Summary of Receiving Waters

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

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Merrimack River (Segment MA84A-06)	0	☐	☐	☐	☐	☐	☐	☐	☐	☒	Fecal Coliform, PCB in Fish Tissue
Black Rock Creek	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Smallpox Creek	0	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Wetlands Area off of 11th Street	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Wetlands Area off of 12th Street	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands Area off of Corporal Drive	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Marsh Area off of Seabrook Road	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Marsh Area off of Garafalo Drive	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands Area North of Pleasant Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Marsh Area off of Mudnock Road	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Marsh Area off of Cushing Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands Area off of Elm Street	0	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands Area off of Ferry Road	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Meader Brook	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Back River (Segment MA84A-06)	0	☐	☐	☐	☐	☐	☐	☐	☐	☒	Fecal Coliform, PCB in Fish Tissue
Marsh Area off of Mudnock Road	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Salt Marsh Area located at the end of Jon Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands Area East of Bayberry Lane	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Waterbody that receives flow from the MS4 and segment ID if applicable	**Number of outfalls into receiving water segment**	**Chloride**	**Chlorophyll-a**	**Dissolved Oxygen/ DO Saturation**	**Nitrogen**	**Oil & Grease/ PAH**	**Phosphorus**	**Solids/ TSS/ Turbidity**	**E. coli**	**Enterococcus**	**Other pollutant(s) causing impairments**
Salt Marsh East of Ferry Road	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands Area West of Rabbit Road	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
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Click to lengthen table

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

Part III: Stormwater Management Program Summary

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

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

MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	**BMP Description**	**Targeted Audience**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal**	**Beginning Year of BMP Implementation**
Brochures/Pamphlets	Brochure will consist of 'how-to-guide' for residents on how rain gardens work and how to install them at their home.	Residents	Greenscapes North Shore Coalition	-Number distributed -Resident testimonials	FY2019
Brochures/Pamphlets	Workshop and associated literature will cover LID options for reducing runoff and promoting on-site infiltration. Pricing, maintenance and ordinances will also be discussed.	Developers (construction)	Greenscapes North Shore Coalition	-Number of attendees -Increase in LID use	FY2019

Brochures/Pamphlets	Brochure will include general info on LIDs that can assist in stormwater management and pollution prevention. Content will be targeted to "environmental contacts" at industrial facilities, or property managers where applicable.	Industrial Facilities	Greenscapes North Shore Coalition	-Number distributed -Phone call followup	FY2020
Workshop	Waterworks presentation will discuss specific BMPs for parking lots; how to reduce impervious surfaces, and maintain the space more sustainably.	Business, Institutions and Commercial Facilities	Greenscapes North Shore Coalition and Planning	-Number of attendees -Number of presentations redistributed to commercial representatives	FY2020
Workshop	Workshop and literature will go into greater detail, following the workshop regarding low impact development held in year one. Town bylaws and associated incentives will be outlined.	Developers (construction)	Greenscapes North Shore Coalition and Planning	-Number of attendees	FY2021

Meeting	Presentation will discuss proper "greenscaping" practices on a business/commercial level. Content will be targeted to property managers and will include salt/sand storage and landscape management.	Business, Institutions and Commercial Facilities	Greenscapes North Shore Coalition and Planning	-Number of attendees	FY2022
Meeting/Presentation	Presentation will discuss proper "greenscaping" practices on an industrial level. Content will be targeted to property managers and will include salt/sand storage and landscape management.	Industrial Facilities	Greenscapes North Shore Coalition	-Number of attendees	FY2022
Meeting/Presentation	Greenscapes NS will conduct a "Greenscapes 101" presentation for residents. Presentation will discuss the importance of clean and plentiful water.	Residents	Greenscapes North Shore Coalition and Planning	-Number of attendees -Resident Testimonials	FY2023

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

Part III: Stormwater Management Program Summary (continued)

MCM 2: Public Involvement and Participation

BMP Categorization	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	Beginning Year of BMP Imple-mentation
Public Review	Provide for Public Review of SWMP and Annual Reports	DPW Admin	Allow annual review of stormwater management plan and posting of stormwater management plan on website	FY2019
Public Participation	Participate in Waste Oil Collection	DPW Operations	Continue to conduct a hazardous materials collection day every two years and track amount of material collected.	FY2020
Public Participation	Participate in Paint Collection	DPW Operations	Continue collection of a hazardous materials day every two years basis and track amount of hazardous materials collected.	FY2020
Public Participation	Participate in the Women in Transition/Trial Court/Middleton Inmates/E	DPW Operations	Maintain relationships with organizations and continue year-round cleanup work throughout town.	FY2019
Public Participation	Participate in Recycling Collection	DPW Operations	Continue to collect recyclables at the transfer station.	FY2019
Public Participation	Participate in Yard Waste Collection	DPW Operations	Continue to collect yard waste at the transfer station.	FY2019
Public Participation	Participation in the Merrimack Valley Stormwater Coalition	DPW Operations	Maintain relationship with the organization by attending meetings monthly.	FY2019

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

Part III: Stormwater Management Program Summary (continued)

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

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**
SSO inventory	Develop inventory of where SSOs have discharged over the last five years.	DPW Admin	Complete within 1 year of effective date of permit & update SSO Inventory annually.	FY2019
Storm sewer system map	Update drainage map in accordance with permit conditions and update annually during IDDE program implementation.	DPW Admin	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit. Report on progress annually.	FY2020
Written IDDE program	Create written IDDE program to meet permit conditions.	DPW Admin	Complete within 1 year of the effective date of permit and update as required.	FY2019
Implement IDDE program	Implement catchment investigations according to program and permit conditions.	DPW Admin	Begin within two years of permit effective date, and complete 10 years after effective date of permit. Track annually the number of illicit connections that are identified and removed.	FY2020
Department of Public Works staff training	Train employees on IDDE program components and implementation.	DPW Admin	Provide training to municipal employees annually. Track the number of employees that receive training.	FY2019
Conduct dry weather screening and sampling	Conduct in accordance with outfall screening procedure and permit conditions.	DPW Admin	Complete within 3 years of permit effective date. Track number of outfalls that are screened and sampled annually.	FY2021

Conduct wet weather screening and sampling	Conduct wet weather screening and sampling at outfalls/ interconnections in catchments where System Vulnerability Factors are present in accordance with permit conditions.	DPW Admin	Complete within 10 years of permit effective date. Track number of outfalls that are screened and sampled annually.	FY2022
Ongoing screening	Conduct dry weather and wet weather screening (as necessary)	DPW Admin	Complete ongoing outfall screening upon completion of IDDE investigations.	FY2029
Priority Ranking	Assess and rank the potential for all catchments to have illicit discharges. Identify catchments with System Vulnerability Factors that will necessitate wet weather sampling.	DPW Admin	Complete within 1 year of permit effective date.	FY2019
Follow-Up Ranking	Update catchment prioritization and ranking as dry weather screening information becomes available.	DPW Admin	Complete within 3 years of permit effective date.	FY2021
Catchment Investigation Procedures	Develop written catchment investigation procedures and incorporate into IDDE Plan.	DPW Admin	Complete within 18 months of permit effective date.	FY2019

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

Part III: Stormwater Management Program Summary (continued)

MCM 4: Construction Site Stormwater Runoff Control

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**
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Update written procedures for site inspections and enforcement that meet permit requirements and begin implementation.	Planning Department/DPW	Complete within 1 year of the effective date of permit. Report on the number of site inspections and enforcement actions annually.	FY2019
Site plan review	Develop written procedures for site plan review that meet permit requirements and begin implementation.	Planning Department/DPW	Complete within 1 year of the effective date of permit. Report on the number of site plan reviews conducted, inspections conducted, and enforcement actions taken annually.	FY2019
Erosion and Sediment Control	The Planning Board Rules and Regulations require sediment and erosion control. Review and update existing regulations as needed to include language that requires construction operators to implement a sediment and erosion control program that includes BMPs that are appropriate for conditions at the construction site.	Planning Department/DPW/Town Attorney	Complete within 1 year of the effective date of permit	FY2019

Waste Control	Review and update, as needed, the Town's requirements to ensure the control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.	Planning Department/DPW	Complete within 1 year of the effective date of permit	FY2019

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

Part III: Stormwater Management Program Summary (continued)

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

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**
As-built plans for on-site stormwater control	Review and update, as needed, the procedures to require submission of as-built drawings and ensure long term operation and maintenance to meet permit requirements.	Planning Department/DPW	Require submission of as-built plans and long term O&M for completed projects. Complete within 2 years of permit effective date.	FY2020
Target & rank properties for BMP retrofitting	Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce frequency, volume, and pollutant loads associated with stormwater discharges, and update annually.	Planning Department/DPW	Complete within 4 years of permit effective date and report annually on retrofitted properties.	FY2022
Allow green infrastructure practices	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist.	Planning Department/DPW	Complete within 4 years of permit effective date and report annually on retrofitted properties.	FY2022

Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover to determine if design standards for streets and parking lots can be modified to support low impact design options.	Planning Department/DPW	Complete within 4 years of permit effective date and implement recommendations of report.	FY2022
Ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and all applicable requirements of the Massachusetts Stormwater Handbook	Review, and update existing regulations as needed, to meet retention and treatment requirements of the permit, and require compliance with the Stormwater Management Standards.	Planning Department/DPW	Complete within two years of permit effective date.	FY2020

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

Part III: Stormwater Management Program Summary (continued)

MCM 6: Municipal Good Housekeeping and Pollution Prevention

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	Create written O&M procedures including all requirements contained in 2.3.7.a.ii for parks and open spaces, buildings and facilities, and vehicles and equipment.	DPW Operations	Complete and implement within 2 years of permit effective date.	FY2020
Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment	Create inventory	DPW Operations	Complete within 2 years of permit effective date and update annually.	FY2020
Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	DPW Operations	Complete within two years of permit effective date.	FY2020
Stormwater Pollution Prevention Plan (SWPPP) Development, Inspections, and Training	Create a SWPPP for the DPW Facility on Lafayette Road and other waste-handling facilities as needed.	DPW Operations	Complete and implement 2 years after effective date of permit, and provide training annually thereafter. Track number of employees trained annually.	FY2020
Catch basin cleaning	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule.	DPW Operations	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material removed annually.	FY2019

Street sweeping program	Sweep all streets and permitee-owned parking lots in accordance with permit conditions.	DPW Operations	Sweep all streets and permitee-owned parking lots once per year in the spring.	FY2019
Road salt use optimization program	Establish and implement a program to minimize the use of road salt.	DPW Operations	Implement salt use optimization during deicing season.	FY2019
Inspection and maintenance of stormwater treatment structures	Establish and implement inspection and maintenance procedures and frequencies.	DPW Operations	Inspect all stormwater treatment structures annually. Conduct maintenance as necessary. Track number of structures inspected and maintained annually.	FY2019
Catch basin cleaning optimization	Develop and implement a plan to optimize inspection, cleaning, and maintenance of catch basins to ensure that permit conditions are met.	DPW Operations	Complete within two years of permit effective date.	FY2020

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

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)

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

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. In addition, if you are subject to additional requirements due to a downstream nutrient impairment (see Part 2.2.2 of the permit) select the pollutant of concern and indicate applicable waterbody IDs or write "all waterbodies" if applicable. 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)
Enterococcus	Merrimack River (Segment MA84A-06)	Adhere to requirements in part III of Appendix H	Engineering
Fecal Coliform	Merrimack River (Segment MA84A-06)	Adhere to requirements in part III of Appendix H	Engineering

Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.1and 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.

Through initial consultation with the US Fish & Wildlife, it was determined that threatened species within Salisbury include the northern long-eared bat, the piping plover, and the red knot; and endangered species include the roseate tern. The Town further consulted with US Fish & Wildlife per Appendix C as part of the endangered species determination, and received follow-up correspondence confirming the determination of Criterion B. This letter dated September 24, 2018 has been appended to this Notice of Intent. US Fish & Wildlife concurs that actions currently proposed within this Notice of Intent are not likely to adversely impact the species listed. As structural Best Management Practices are constructed in the future, the Town will re-initiate consultation with US Fish & Wildlife prior to construction activities.

The Town's outfall mapping is estimated to be 95% complete. The Town estimates that there are at least a few additional outfalls that still need to be mapped. As the Town works to update their drainage mapping in Year 1, the Town will conduct additional field reconnaissance to locate any additional outfalls that may not be mapped. The Town's map of outfalls and receiving waters does depict some outfalls that are associated with drainage infrastructure on state roadways, and are therefore not under the Town's jurisdiction. These outfalls are noted differently on the map.

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:	Neil Harrington	Title:	Town Manager
Signature:	Neil J. Harrington	Date:	9/28/18

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

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

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

September 24, 2018

To whom it may concern:

The U.S. Fish and Wildlife Service (USFWS) reviewed the stormwater discharge activities associated with the 2016 National Pollutant Discharge and Elimination System (NPDES) Massachusetts (MA) Small Municipal Separate Storm Sewer System (MS4) general permit (MA MS4 General Permit) issued by the Environmental Protection Agency (EPA). We determined those activities may affect, but are not likely to adversely affect, certain species listed under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) when specific conditions are met. When these conditions are met, we do not need to review individual projects. These comments are provided in accordance with section 7 of the ESA and complement existing 2016 MA MS4 General Permit Appendix C Guidance. We understand the applicant is acting as a non-Federal representative of the EPA for the purpose of consultation under section 7. **This letter provides additional guidance for meeting Criterion B and should be submitted as part of your application package to the EPA.**

If the USFWS Information for Planning and Consultation website (https://ecos.fws.gov/ipac/) indicates your MA MS4 General Permit project action area may contain one or more of the following federally listed endangered species: roseate tern (*Sterna dougallii*), northern red-bellied cooter (*Pseudemys rubriventris*), dwarf wedgemussel (*Alasmidonta heterodon*), rusty patched bumble bee (*Bombus affinis*), northeastern bulrush (*Scirpus ancistrochaetus*), or American chaffseed (*Schwalbea americana*); threatened species: piping plover (*Charadrius melodus*), bog turtle (*Glyptemys muhlenbergii*), Puritan tiger beetle (*Cicindela puritana*), northeastern beach tiger beetle (*Cicindela dorsalis*), or red knot (*Calidris canutus rufa*); or their federally designated critical habitat; and the specific conditions listed below are met, you may submit this letter to complete the **MA MS4 General Permit Appendix C: Step 4** in place of a concurrence letter for informal consultation as documentation of ESA eligibility for **USFWS Criterion B.**

In addition, this letter also satisfies the requirement in the **MA MS4 General Permit Appendix C: Step 2 (3)** to contact the USFWS and obtain a concurrence letter, if you have not yet done so. If your project action area includes one or more of the above-listed species *and* one or more of the

species listed under **Criterion C,**[1] you may still use this letter to certify under **Criterion B**. All existing guidance regarding requirements for certifying eligibility according to the USFWS Criterion A, B, or C for coverage by the 2016 MS4 Permit (see MA MS4 General Permit Appendix C – Endangered Species Guidance) remains unchanged.

We have determined that proposed stormwater discharge activities covered under the 2016 MS4 Permit *may affect, but are not likely to adversely affect*, the above-listed species and the species' critical habitat when the following are true:

1. all stormwater discharges are pre-existing or previously permitted by EPA;
2. any planned operations and maintenance work covered by this permit will only affect previously disturbed areas where stormwater controls are already installed. In these situations the chance of encountering any of the subject species is discountable;
3. the project implements EPA MS4 Best Management Practices (BMPs) and meets Clean Water Act and Massachusetts Water Quality Standards. Although permitted discharges may reach the environment used by these species, BMPs reduce pollutants to the extent that discharges are not known to have measurable impacts on these species or their habitat;
4. no new construction or structural BMPs are proposed under this permit at this time; and
5. you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the Notice of Intent (NOI), you will re-initiate consultation with the USFWS as necessary (see **MA MS4 General Permit Appendix C: Step 2 (5)**).

If the above criteria are met, further consultation with the USFWS under section 7 of the ESA is not required at this time; however, if the proposed action changes in any way such that it may affect a listed species in a manner not previously analyzed or if new information reveals the presence of additional listed species that may be affected by the project, the applicant or the EPA should contact us immediately and suspend activities that may affect those species until the appropriate level of consultation is completed with our office. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you have questions or need further assistance.

Sincerely yours,

Thomas R Chapman
Supervisor
New England Field Office

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[1] Criterion C includes guidance for project action areas that may contain species for which EPA has already made a determination. These species include the northern long-eared bat (*Myotis septentrionalis*), sandplain gerardia (*Agalinis acuta*), small whorled pogonia (*Isotria medeoloides*), and/or American burying beetle (*Nicrophorus americanus*) (MA MS4 General Permit Appendix C: Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C).

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

VIA EMAIL

April 5, 2019

Neil Harrington
Town Manager

And;

Lisa DeMeo
Director of Public Works
39 Lafayette Road
Salisbury, MA. 01952
ldemeo@salisburyma.gov

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041220, Town of Salisbury

Dear Lisa DeMeo:

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

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

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

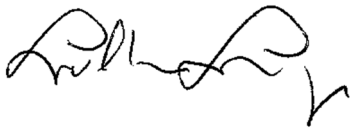
Information about the permit and available resources can be found on our website: https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit. Should you have

any questions regarding this permit please contact Newton Tedder at tedder.newton@epa.gov or (617) 918-1038.

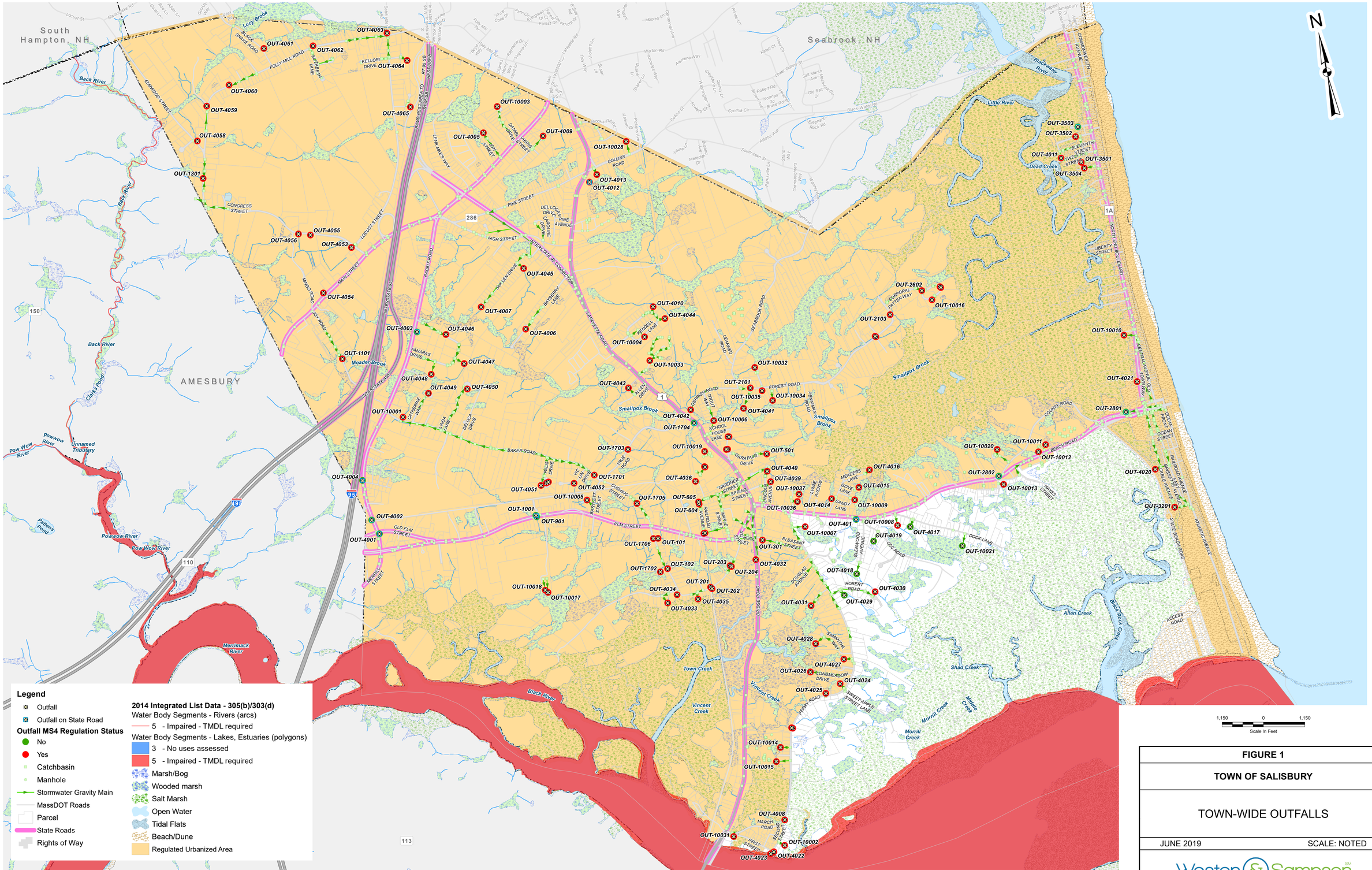
Sincerely,

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

and;



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


South Hampton, NH
Seabrook, NH
AMESBURY
Back River
Lucy Brook
Meader Brook
Smallpox Brook
Town Creek
Vincent Creek
Shad Creek
Morrill Creek
Middle Creek
Allen Creek
Black Rock Creek
Dead Creek
Little River
Blackwater River
Pow Wow River
Powwow River
Unnamed Tributary
Merrimack River
Clark's Point
Parsons Point
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APPENDIX E

2003 MS4 Annual Reports Reference

2003 MS4 PERMIT ANNUAL REPORTS REFERENCE

Year 2 Annual Report (2004-2005)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2005/sailsbury.pdf

Year 3 Annual Report (2005-2006)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2006/Salisbury06ar.pdf

Year 4 Annual Report (2006-2007)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2007/Salisbury07.pdf

Year 6 Annual Report (2008-2009)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2009/Salisbury09.pdf

Year 7 Annual Report (2009-2010)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2010/Salisbury10.pdf

Year 8 Annual Report (2010-2011)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2011/Salisbury11.pdf

Year 9 Annual Report (2011-2012)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2012/Salisbury12.pdf

Year 10 Annual Report (2012-2013)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2013/Salisbury13.pdf

Year 11 Annual Report (2013-2014)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2014/Salisbury14.pdf

Year 13 Annual Report (2015-2016)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2016/Salisbury16.pdf

Year 14 Annual Report (2016-2017)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2017/Salisbury17.pdf

Year 15 Annual Report (2017-2018)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2018/Salisbury18.pdf

APPENDIX F
SWMP Checklist

K.1 First Year Requirements

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
10/1/2018	Notice of Intent (NOI)	Prepare and Submit NOI for Permit Coverage 90 days from the permit effective date	Appendix E	Yes
6/30/2019	Stormwater Management Plan (SWMP)	Develop or update written SWMP	1.10.a & 1.10.2	Yes
6/30/2019	Illicit Discharge Detection and Elimination (IDDE)	Complete written IDDE procedures and rank outfalls for IDDE investigation.	2.3.4.6 & 2.3.4.7	Yes
6/30/2019	Sanitary Sewer Overflow (SSO)	Document all SSOs that have occurred in the last 5 years	2.3.4.4.b	Yes
6/30/2019	Construction Site Runoff Control	Create written procedures for inspection construction sites for proper sediment controls and conducting site plan reviews	2.3.5	Yes
6/30/2019	Catch Basin Cleaning	Develop and implement a catch basin cleaning schedule with a goal of ensuring no catch basin is more than 50 % full. Document catch basins inspected and cleaned, including total mass removed and proper disposal.	2.3.7.a.iii.2	Yes
6/30/2019	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned and volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2019	Winter Road Maintenance	Develop and implement winter road maintenance procedures including use and storage of sand/salt, minimize the use of salts, insure that snow is not disposed into waters.	2.3.7.a.iii.5	Yes
6/30/2019	Stormwater Infrastructure Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary.	2.3.7.a.iii.6	Yes

K.2 Second Year Requirements

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2020	Completed Map of MS4	Update town-wide MS4 mapping to include all receiving waterbody segments and associated impairments, all pipe networks, all BMPs and other relevant criteria	2.3.4.5	Underway
6/30/2020	Interconnections	All interconnecting MS4s must be noted, the waterbodies ultimately receiving discharge and associated impairments, and the number of interconnections	2.3.4.5.a	Underway
6/30/2020	Post-Construction and Runoff Control	Develop or modify an ordinance to be in compliance with the permit requirements	2.3.6.a.ii	Yes
6/30/2020	As-Built Drawings	Develop written procedures to require submission of as-built drawings to ensure long term maintenance.	2.3.6.a.iii	Yes
6/30/2025	Problem Outfall Investigation	Must begin investigation of all Problem Catchments	2.3.4.8.a	Future Activity
6/30/2020	Operation and Maintenance Procedures	Develop a written set of O&M procedures for municipal spaces and infrastructure	2.3.7.a.i & 2.3.7.a.iii	Future Activity
6/30/2020	Inventory of public Spaces	Develop an inventory of all permittee-owned facilities.	2.3.7.a.ii	Future Activity
6/30/2020	Stormwater Pollution Prevention Plans (SWPPP)	Develop written SWPPPs for permittee-owned locations specified in the permit.	2.3.7.b	Future Activity

K. 3 Third Year Requirements

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2021	Dry Weather Screening and Sampling	All outfalls and interconnections (excluding problem outfalls and excluded outfalls) are inspected for dry weather flow and sampled if present.	2.3.4.7.b	Future Activity
6/30/2021	Completed Ranking	Completed catchment ranking and prioritization	2.3.4.7.b.iii.c.iii	Future Activity

K.4 Fourth Year Requirements

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2022	Impervious Cover Investigation	Develop a report assessing impervious cover creation and guidelines and other local regulations that pertain to it.	2.3.6.b	Future Activity
6/30/2022	Green Infrastructure Investigation	Develop a report assessing the municipalities barriers and incentives for Green Infrastructure/LID techniques	2.3.6.c	Future Activity
6/30/2022	Retrofit Identification	Identify 5 permittee-owned properties that could be retrofit with stormwater BMPs.	2.3.6.d	Future Activity

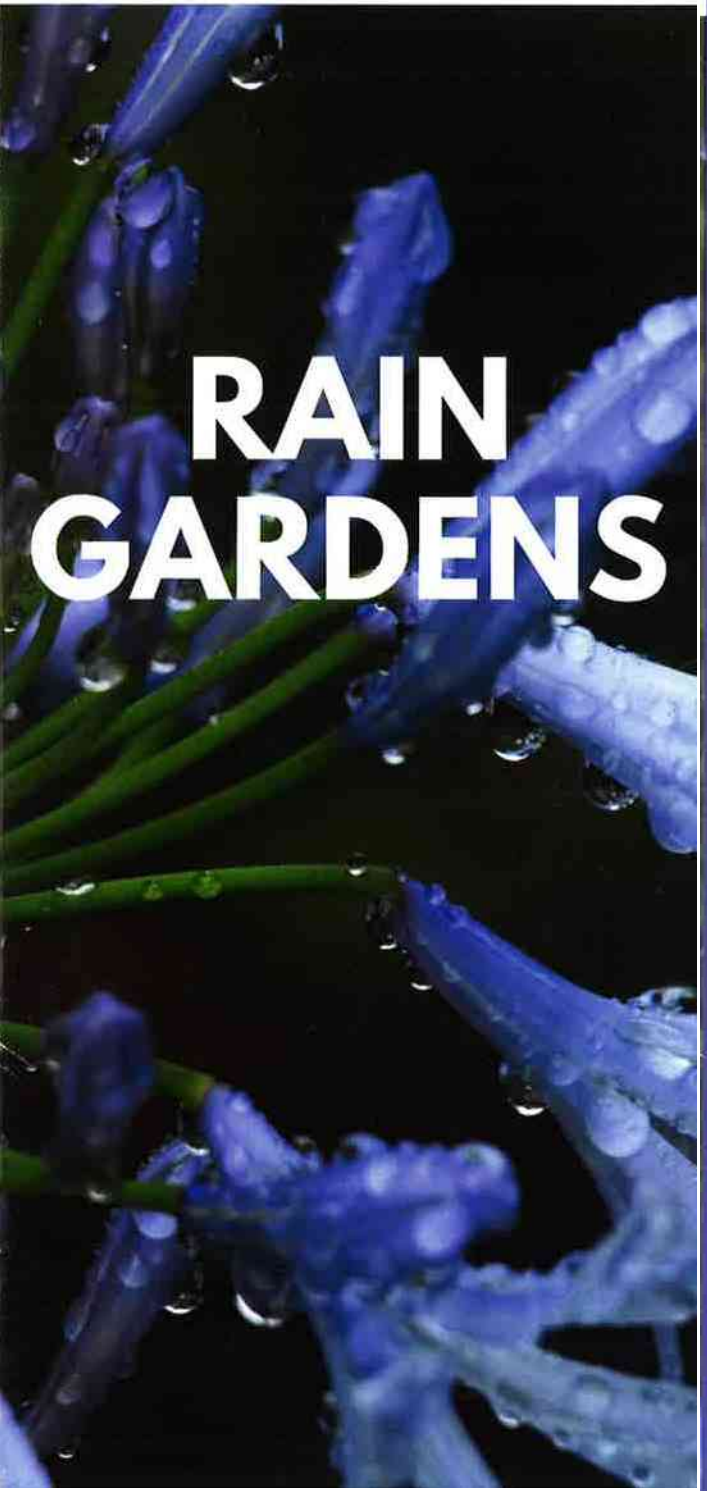
K.5 Tenth Year Requirements

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2029	Mapping Completion	Complete all mapping requirements	2.3.4.5.b	Underway
6/30/2029	Outfall Investigations	All dry and wet weather screening must be completed	2.3.4.8.a	Underway

APPENDIX G

Public Education Materials

GREENSCAPES



RAIN GARDENS

WHAT IS A RAIN GARDEN?

A rain garden is a selection of plants growing in a shallow depression, generally formed on an existing slope. It is designed to temporarily hold and soak up rain water that flows off of roofs, driveways, patios or lawns. They are a simple, cost-effective tool that homeowners, municipalities or others can use to:

- **Create Beautiful, New Outdoor Space**
- **Enhance Habitat for Native Plants and Animals**
- **Reduce Flooding in Streets and Basements**
- **Recharge Essential Groundwater Resources**
  The water held in a rain garden should infiltrate within 48 hours, preventing the garden from becoming home to mosquitoes.
- **Trap, Filter and Remove Pollutants**
  Things such as oil, grease, pet waste and fertilizer that get swept from paved areas into storm drains, and eventually our rivers, streams and oceans.

Installing a rain garden can be a rewarding project!

TOOL LIST

- Shovels
- Rakes
- Gloves
- Wheelbarrow
- Measuring Tape
- Level
- Hammers
- Stakes
- String
- Calculator
- Gravel
- Compost
- Mulch

CHOOSE YOUR PLANTS

The following list is just a handful of plants, native to New England that could thrive in your garden.

Butterfly Milkweed *Asclepias Tuberosa*
Perennial
Prefers dry to damp soil (slope/berm)
Prefers full sun

Moonbeam Coreopsis *Coreopsis Verticillata*
Perennial
Prefers wet soil (base/center)
Prefers partial sun or full shade

Wild Geranium *Geranium Maculatum*
Perennial
Prefers damp to wet soil (slope)
Prefers partial sun or full shade

Scarlet Bee Balm *Monarda Didyma*
Perennial
Tolerates most soil moisture levels
Prefers partial to full sun

Purple Coneflower *Echinacea Purpurea*
Perennial
Prefers dry to damp soil (slope/berm)
Prefers partial to full sun

Tall Switchgrass *Panicum Virgatum*
Grass
Tolerates most soil moisture levels
Prefers partial to full sun

American Cranberry *Viburnum Trilobum*
Shrub
Tolerates most soil moisture levels
Prefers partial to full sun

Bayberry Bush
Shrub
Prefers damp to dry soil (slope/berm)
Prefers partial to full sun

For more information and resources visit www.greenscapes.org

LET'S GET STARTED...

1. SELECT YOUR SITE

Explore your yard. Where does water naturally flow or collect? Avoid soggy areas, and instead try to capture the water before it reaches the wettest places in your yard. Keep the site at least 10 feet from building foundations and downspouts, and 3 feet from sidewalks or driveways.** Refer to START DIGGING Step for other yard obstacles you'll need to avoid **

2. CHECK YOUR SOIL

To ensure that your garden will drain well enough to provide a healthy habitat for your plants, you need to know more about your soil.

Dig a hole about 6" deep, 3-4" wide, and fill it with water. After a few hours, come back and fill it up again. After one hour, determine how much lower the water level is. If it has gone down 1.5" or more, the soil is sandy - you're good to go! If it has gone down less than 1.5", the soil is rich in clay or silt. In this case, there are several things you can do to prepare your site :

- Add a layer of gravel to the bottom of your site
- Add sand or coarser soils to your soil mixture
- All gardens will benefit from adding some compost to the mixture; the boost of nutrients will help your plants get established.

3. DETERMINE GARDEN SIZE

Time for a little math. To find the ideal size for your garden, you need to determine how much water will be flowing into it.

- **DRAINAGE AREA** Identify the impervious upstream areas that will drain into your garden. These include driveways, parking lots, sidewalks and roofs. Calculate the surface area (length x width) of each and add them together.
- **GARDEN AREA** Divide the total surface area by the garden depth of 8 - 10 inches. This will capture more than 90% of the runoff produced by an inch of rain.

Area = [Surface 1 + Surface 2 + . . .] ÷ Depth

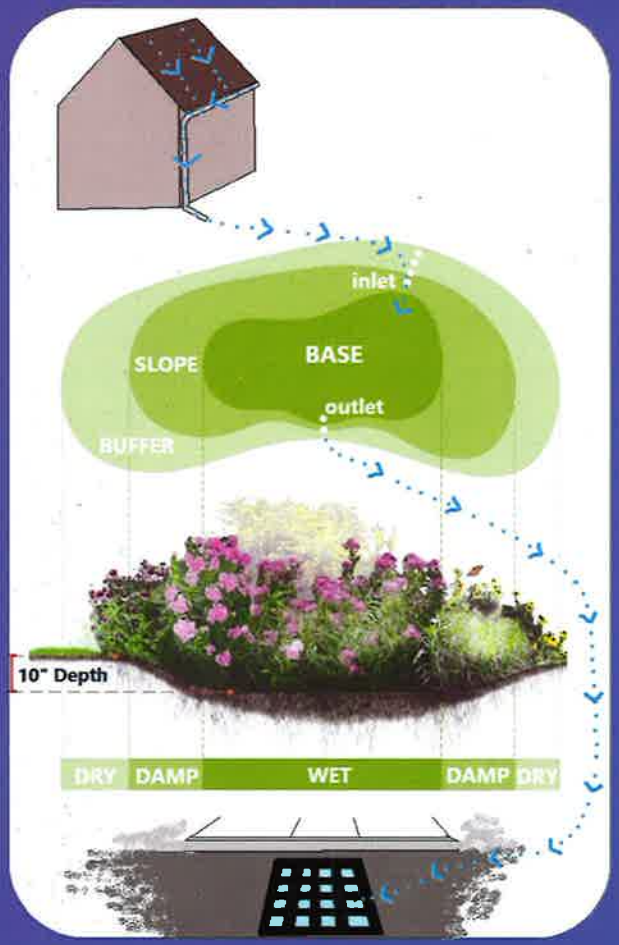
Example = [(ROOF) + (DRIVEWAY)] ÷ 10 inches

= [(20 ft x 20 ft) + (20 ft x 10 ft)] ÷ 10 in

Rain Garden Area = 60 square feet!

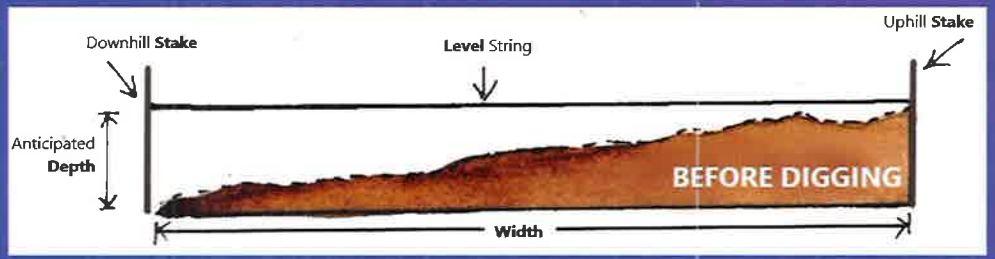
4. START DIGGING

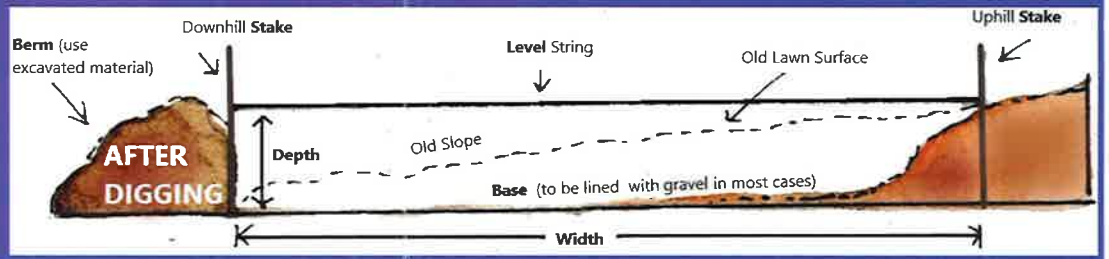
Now that you know how big your garden needs to be, you're ready to start digging.
You'll need to avoid the root zones of trees, and to stay clear of your septic tank and any other utility lines buried in your yard. Call dig-safe at:
(888) 344-7233 for help locating your utilities.
Is your home in close proximity to a wetland? If so, contact your Conservation Commission for advice on how to safely proceed.



5. TIME TO PLANT!

When preparing your garden, try not to walk on the mixed soil, to avoid compaction. After planting, give your garden a generous drink of water. Once established, native plants require little maintenance. Their root systems thrive under local soil conditions. Check the back of this brochure and www.greenscapes.org for suggested plants.





Rain and snow are clean...

...right?

Until they hit the ground.

Polluted stormwater is the #1 threat to our water.

MS4, a federal-state permit program, requires cities and towns to reduce polluted stormwater runoff by:

- Educating residents, businesses and developers
- Testing water exiting pipes
- Controlling construction site discharge
- Retaining or treating runoff from development
- Ensuring that streets and catch basins are clean
- Developing a stormwater management plan to improve operation and maintenance

What will MS4 accomplish?

- Leaks and illegal sewer and stormwater connections fixed
- Cleaner water for our rivers, ponds and their wildlife inhabitants
- Healthier places for swimming, boating and fishing

What can I do?

- Support spending on stormwater and sewer systems
- Pick up pet waste; ask for more pet waste stations
- Eliminate chemical pesticides and fertilizers
- Don't dump dirty water or oil into storm drains—ever
- Install rain barrels; use water before it reaches the ground
- Learn where rainwater goes after it hits the street
- Learn about low-impact development and green infrastructure—check out ***Greenscapes.org***

GREENSCAPES

Produced by Greenscapes North Shore Coalition

Ipswich River Watershed Association, Merrimack River Watershed Council, MVPC/8 Towns and the Great Marsh, Salem Sound Coastwatch

Providing cost savings by bringing regional public education and outreach to your community

What washes into the STORM DRAINS

Comes out into the OCEAN

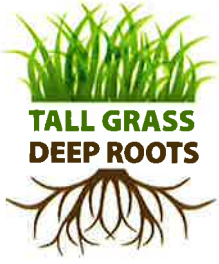
Stormwater: Why should we care?

Because it runs down into the ocean where we swim or go fishing. It is full of bacteria from organic waste, including pet waste, which causes our beaches to be closed after big rain storms. It carries trash out onto our beaches, including dangerous syringes. It picks up poisonous chemicals from our lawns and gas and oil from our vehicles.

Our lawns: Did you know?

Watering lawns consumes huge amounts of expensive water, much of which runs off, carrying herbicides, pesticides and fertilizers to water supplies, rivers and oceans. Our children and pets pick up these poisons on their little bare feet.

Here's how you can help:



- **Save money and water only when your lawn is thirsty.** Frequent, light watering discourages root growth. Encourage deep root growth by watering weekly or use a rain gauge. Water only in the morning to reduce evaporation.
- **Leave grass clippings on the lawn as natural mulch and fertilizer.**
- **Sharpen mower blades for healthy grass.**
- **Keep your grass at least 3" tall for deeper roots.**
- **Switch from a chemically-treated lawn to natural turf.** Approximately 80% of synthetic lawn products wash into our rivers, lakes and ocean.

Is your landscaper a Greenscaper?

You'll know your landscaping company is a Greenscaper <u>if it</u>...

- ✔ Tests soil to determine best lawn treatments and schedules
- ✔ Gives you its list of products safe for your lawn, family & pets
- ✔ Applies products when needed and not on a fixed schedule
- ✔ Sets your sprinkler system to run only when needed

<u>Then..</u>

- ✔ Your family and pets will be safer from dangerous chemicals
- ✔ Your lawn will be healthier
- ✔ Your beaches and ocean will be less polluted from runoff of chemicals and wasted water
- ✔ **YOU WILL SAVE MONEY** on chemicals, products and water!

greenscapes

www.greenscapes.org

This flyer was created by Nahant Swim Inc. for the Massachusetts Greenscapes™ Coalition.

design: mary jo mitchell

Scoop it!

Scoop the Poop–
Whenever and Wherever

...even in your own yard,
...even in the woods or remote locations,
...even in the snow,
...even if you have a small dog.

- **Always bring bags**
  Be prepared, bring more than one.
- **Always put filled bags in trash cans!**
  Even bio-degradable bags.
- **Never put dog waste into a storm drain!**
  Storm drains flow directly into our local waters — they are not connected to the sanitary sewer.
- **Never leave bags of poop**
  by the side of the road, in bushes, or lying around.

Scooping Poop is not just about the mess – it's about clean water and our health!

www.greenscapes.org

Did you know?
Unscooped poop pollutes our water!

Doggy doo has twice as much bacteria as human waste!

Rain washes the bacteria into the nearest river. It ends up in the ocean.

Kids are most affected! Symptoms are flu-like, vomiting, diarrhea, ear infections, rashes, fever.

All dogs pollute, even small dogs! Consider this:

A 40 lb. dog produces 7.8 billion fecal coliform bacteria per day!

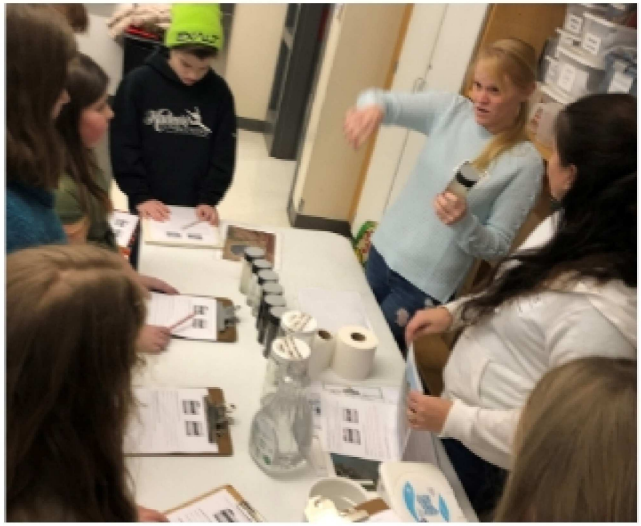
Giardia, Salmonella, and Campylobacter are some of the parasites, viruses and bacteria in doggy poo that can be transmitted to humans.

greenscapes **www.greenscapes.org**

Produced by Greenscapes Massachusetts Coalition:
Ipswich River Watershed Association
MVPC/8 Towns and the Great Marsh
North & South Rivers Watershed Association
Salem Sound Coastwatch

These students (and their parents) are now experts on how to.....

KEEP WATER CLEAN AND PLENTIFUL



We worked with 72 students and 5 parent volunteers, who we could not have done this program without!

These photos are from a program conducted at the Salisbury Elementary School, presented by :

GREENSCAPES

APPENDIX H

Regulatory Mechanisms

Chapter 77

EARTH FILLING

GENERAL REFERENCES

Building construction — See Ch. 49.	**Zoning — See Ch. 300.**
Wetlands protection — See Ch. 266.	**Planning Board regulations — Ch. 465.**

§ 77-1. Purpose.

The purpose of this bylaw is to regulate earth filling operations for the protection of human health, public safety, welfare, and the integrity of the natural resources of the Town of Salisbury.

§ 77-2. Applicability.

The filling of any lot or lots as part of a single project or series of related projects with greater than 500 cubic yards in total of topsoil, borrow, rock, sod, loam, peat, humus, clay, sand or gravel ("earth material") within any twenty-four-month period shall be done only in accordance with this bylaw. Filling includes transporting earth material from one location (inside or outside of the Town) and depositing the earth material in another location in the Town. Filling does not include redistributing earth material within a single site. No solid or hazardous waste, refuse, junk, industrial waste, volatile, explosive or flammable materials, garbage, building materials, construction and demolition debris, glass, metal, toxic, infectious, radioactive, corrosive, or reactive material or waste may be used as fill in the Town.

§ 77-3. Exemptions.

A. Five hundred cubic yards or less. Filling of any lot or lots with 500 cubic yards or less of earth material within any twenty-four-month period is permitted without an earth fill permit (but is subject to other requirements of law and other Town bylaws and regulations).

B. Five hundred cubic yards to 2,000 cubic yards. Filling of any lot or lots with more than 500 cubic yards and less than 2,000 cubic yards in total within any twenty-four-month period is permitted without an earth fill permit (but is subject to other requirements of law and other Town bylaws and regulations), if such filling is directly related and entirely incidental to:

   (1) Work done in accordance with a valid order of conditions or other approval issued by the Town Conservation Commission or the Massachusetts Department of Environmental Protection (DEP).

(2) The construction of a building or structure for which a valid building permit has been issued and filling is directly related and entirely incidental to the construction, provided that site preparation filling prior to issuance of a building permit is not exempt.

(3) The construction of ways within subdivisions that have been approved by the Planning Board, provided that other site preparation filling within subdivisions is not exempt.

(4) The construction or reconstruction of a septic system the design of which has been approved by the Board of Health.

(5) Utility construction in public and private ways or incidental to municipal operations and activities.

(6) The routine landscaping (not including significant changes in topography) of a lot with a one- or two-family residence thereon by the resident owner thereof so long as the existing topography of the parcel in no location exceeds a fifteen-percent grade.

§ 77-4. Permit requirements.

A. Permits. The permit granting authority shall be either the Town Manager or the Board of Selectmen, according to the volume of fill for which a permit is sought. All non-exempt filling between 500 cubic yards and 2,000 cubic yards shall require a small project filling permit from the Town Manager. Filling in excess of 2,000 cubic yards shall require a large project filling permit from the Board of Selectmen.

B. Small project filling permit. Any person planning any filling activity requiring a small project filling permit from the Town Manager shall submit an application, on a form to be provided by the Town Manager. Where deemed necessary by the Town Manager when considering issuance of a small project filling permit (or the Building Inspector when considering issuance of a building permit), an applicant may be required to submit a site plan showing the area to be filled. If the Town Manager requires submission of a site plan, the application shall not be deemed complete until the site plan is submitted to the Town Manager.

C. Large project filling permit. Any person planning any filling activity requiring a large project filling permit from the Board of Selectmen shall submit an application on a form approved by the Board of Selectmen, a soil management plan satisfying the requirements of this bylaw, and a site plan prepared and certified by a registered land surveyor or engineer.

D. Application submission. The applicant shall submit three copies of the application, any required soil management plan and any required site plan to the permit granting authority and shall at the same time submit one copy to each of the Building Inspector, the DPW Director, the Conservation Commission, the Health Officer and the Planning Board,

for their records. Each of them may forward to the permit granting authority their comments, observations and recommendations. To allow other Town officials time to comment on applications, the permit granting authority shall wait at least 20 days after submission of a complete application before issuing a permit.

E. Site plan requirements. Where a site plan is required it shall meet the requirements of § 77-5B of this bylaw.

F. Performance bonds. Where deemed necessary by the permit granting authority a performance bond in the amount determined and on the terms specified by the permit granting authority shall be posted in the name of the Town assuring satisfactory performance in the fulfillment of the requirements of this bylaw and such other conditions as the permit granting authority may impose as conditions to the issuance of the filling permit or any subsequent changes to such conditions. No such bond shall be released, nor shall the applicant be deemed to have complied with the conditions provided for herein, until the applicant has filed with the permit granting authority a written certification from the Massachusetts licensed site professional who approved the original soil management plan that said conditions and the soil management plan have been complied with and a final, engineered record site plan showing the finished site as required under § 77-6J of this bylaw and the permit granting authority issues a letter authorizing release of the bond. The permit granting authority shall act on a requested release of bond within 65 days after the applicant submits a written request for such release.

G. Hearings. Before granting or materially modifying a large project filling permit, the Board of Selectmen shall hold a public hearing within 30 days after receipt of a completed application and shall give due consideration to the location of the proposed earth filling, to the general character of the neighborhood surrounding such location, to the protection of water supplies and aquifers, to the safety of the public on the public ways in the vicinity, and to the recommendations of the Building Inspector, the DPW Director, the Conservation Commission, the Health Officer and the Planning Board. At least seven days prior to said hearing, the applicant shall publish notice of the hearing in a local daily newspaper and notify all owners of land abutting or within 300 feet of the property line of the land where the earth filling is proposed (including, but not limited to, owners of land directly opposite said land on any public or private street or way, and in another municipality or across a body of water) by certified mail as to the time, place and purpose of the hearing. The notification shall be at the applicant's expense. The applicant shall provide the Board of Selectmen with proof of such publication and notification prior to the hearing.

H. Other approvals. If any proposed earth filling for which a permit is required under this bylaw also requires an order of conditions from the Conservation Commission and/or a site plan review by the Planning Board and/or any approval by any other Town board or official, the

permit granting authority may grant a permit that is conditional on receipt of the other required approval(s).

I. General permit terms. If the applicant is not the owner of the property to be filled, the owner of the property shall also sign the application as an applicant and shall guarantee performance of the other applicant(s). Permits for earth filling under this bylaw shall be transferable only to a person who agrees in writing to assume all of the obligations of the permit holder and who is approved as an assignee by the permit granting authority. Permits shall be issued for a term not to exceed two years. A permit may be renewed upon reapplication. The public hearing may be waived by the permit granting authority for large project filling permit renewals.

J. Approval deadlines. The Town Manager shall act on completed applications for small project filling permits within 45 days after the date of submission of a complete application, including any required site plan. If the Town Manager fails to act within such forty-five-day period, the application shall be deemed to be approved. The Board of Selectmen shall act on completed applications for large project filling permits within 45 days after the closing of the public hearing on the application. If the Board of Selectmen fails to act within such forty-five-day period, the application shall be deemed to be approved.

§ 77-5. Large project filling permit application requirements.

Each copy of an application for a large project filling permit to the Board of Selectmen shall be accompanied by a written statement describing the proposed regulated activity, together with the following information:

A. Soil management plan.

(1) The soil management plan shall be signed by a Massachusetts licensed site professional (LSP). The LSP shall specifically state that "The subject plan meets the requirements of Salisbury's Earth Filling Bylaw and any other applicable federal or state law or regulation pertaining to the transport, use and/or disposal of earth and other materials for fill."

(2) The soil management plan must contain sufficient detail to document that the requirements of this Earth Filling Bylaw will be met. The plan shall specifically require that bills of lading in the form specified by the Board of Selectmen and procedures approved by the Board of Selectmen will be exclusively used for the transport and acceptance of earth materials for fill.

(3) The soil management plan shall include the following at a minimum and shall include any other information required by the Board of Selectmen:

(a) Complete descriptions of pre-fill environmental conditions and findings and sample locations;

(b) Procedures for verification of fill material origin and acceptance;

(c) Recordkeeping practices;

(d) Site security, fill operation inspection and site control;

(e) Transport routes, times and days of operation, locations of equipment parking and storage and duration of fill activities;

(f) Qualifications of applicant personnel responsible for adhering to the soil management plan and this bylaw;

(g) Erosion, dust, and stormwater controls and inspection and maintenance thereof;

(h) Effects of the filling on groundwater recharge;

(i) Quality assurance/quality control procedures;

(j) Emergency response and notification procedures, including telephone numbers and contact individuals/firms;

(k) Total proposed earth material fill volume;

(l) Daily personnel procedures and operation management procedures, including types, numbers, locations and hours of operation of any processing equipment on site;

(m) Environmental monitoring plan to maintain protection of human health, public safety, welfare and the environment during and following fill operations; and

(n) Cover material, revegetation, erosion and pollution control, and monitoring and maintenance plan.

B. Site plan. If filling involves more than 2,000 cubic yards of fill, a registered land surveyor or engineer shall prepare the site plan. The site plan shall depict the following information:

(1) Existing conditions, including grades, man-made features, elevations, property boundaries, dimensions, owners of land who are entitled to notice under § 77-4G of this bylaw, access points, water bodies and watercourses, wetlands, and environmental sample locations;

(2) Process diagrams indicating fill sequence, transport routes, and security measures;

(3) Drainage, water flow and sedimentation control before and after the proposed filling and stormwater and erosion control and groundwater recharge structures and features to be utilized during fill operations;

(4) Final grade plans depicting proposed finish fill elevations, slopes, permanent stormwater and erosion control and groundwater recharge structures and features, the methods of final stabilization of fill material and the proposed cover material and cover vegetation;

(5) Unless otherwise determined by the permit granting authority, map scales shall be no more than 60 feet to the inch and elevation contour intervals shall not exceed two feet. Elevation contours are required only for areas of fill, 100 feet beyond the perimeter of the fill areas and along abutting property lines. Appropriate permanent benchmarks with elevations marked thereon and referenced to the National Geodetic Vertical Datum (NGVD) shall be placed in the field and shown on the plans.

§ 77-6. Standards for filling.

A. Permitted fill materials. All fill materials shall include only clean sand, gravel, clay, stone, quarried rock or other subsurface products free from solid waste, with an aggregate size of six inches or less, and have no solid waste, refuse, junk, industrial waste, or volatile, explosive or flammable materials. The fill material shall have no concentration of oil or hazardous material, toxic substance or infectious biological material greater that federal, state or local reportable or action criteria or materially greater than pre-fill conditions prevailing in the area to be filled. The fill material shall also be free from organic material such as trees, stumps, garbage, building materials, and construction and demolition debris and shall contain 15% or less of total organic carbon by lab analysis.

B. Site preparation. The area to be filled shall be cleared of stockpiled or otherwise disposed of organic and inorganic materials, such as fallen trees and brush, tree stumps, rubbish, junk, building/construction/ demolition materials, and any other accumulated debris. Topsoil shall also be removed from the area to be filled prior to filling. The area to be filled corresponds to the horizontal limits of the fill activity as represented on a plan view drawing. **[Amended 5-14-2012ATM by Art. 17]**

C. Fencing and gates. Temporary fencing, where deemed appropriate by the permit granting authority for the protection of the general public during fill operations, shall be at least six feet high with suitable gates to exclude unauthorized persons from the site.

D. Groundwater recharge and drainage. Provision shall be made for promoting groundwater recharge, for preventing increased runoff from the site and for safe drainage of water, for preventing excessive water accumulation, and for preventing wind or water erosion from carrying material onto adjoining properties.

E. Cleaning of vehicles, roads and streets; covering of loads. Provisions shall be made for the cleaning of all vehicles before they leave the site and for daily cleaning of all public roadways in the vicinity of the site that have been affected by vehicles engaged in filling activity. Provisions also shall be made for covering loads in vehicles traveling on public roadways.

F. Dust control. Dust shall be controlled through watering or other appropriate means.

G. Buffer strips. The permit granting authority may require that a twenty-foot buffer strip shall be maintained at all boundaries and not disturbed.

H. Screening of processing equipment. The visibility, sound, and airborne particulates from processing equipment shall be screened from adjacent premises through the design and location of such equipment and through use of natural vegetation, planting, overburden piles, and surge piles as screening.

I. Final cover. All filling shall require coverage with a minimum of four inches of organic topsoil and shall be seeded and mulched to stabilize the fill material. Where filling is incidental to facilitate parking of vehicles, the fill material shall be covered by a suitable binding material to prevent airborne dust and erosion.

J. Finish elevations and grading. The permit granting authority may specify finished grades, elevations and contour intervals which filling will conform to. Final fill material grades shall conform in contour, slope, and elevation to the natural topography of the surrounding area or preexisting contours as evidenced by historical maps or photographs. Final grading shall incorporate stabilization measures and slopes of no more than 15% to prevent erosion, structural failure of fill materials, ponding of water, or excessive stormwater drainage onto abutting properties.

K. Additional conditions. The permit granting authority may set reasonable conditions in addition to the above, including but not limited to duration of the permit, hours of the day during which filling may take place, maximum load sizes, truck routes to be used to access the site, and grasses, shrubs and trees to be planted.

L. Permit terms; inspection; suspension and revocation. No permit shall be issued under the provisions of this bylaw to extend for a term of more than two years. Prior to filling and at any time during a permitted filling activity, inspection of the premises may be made by the permit granting authority or its agents on reasonable advance notice to determine whether or not the provisions of the Town bylaws and any permit are being complied with. If the permit granting authority determines that the provisions of the bylaw or the provisions of any permit are being violated, the permit granting authority may issue a temporary cease and desist order, which shall remain in effect until terminated in writing by the permit granting authority. If, after notice to the permit holder(s)

and a public hearing, the permit granting authority determines that the conditions of any large or small project filling permit are not being complied with, the permit granting authority may revoke the permit, after which the operation shall be discontinued and the area restored in accordance with the orders of the permit granting authority.

M. Inspections, certifications, reports and tests. While considering an application and/or as a condition of issuing a permit, the permit granting authority may require such borings and test pits, inspections, monitoring, certifications, reports and tests by licensed site professionals, engineers, laboratories and/or other qualified persons as are deemed by the permit granting authority to be needed to evaluate the application and/or to monitor performance under a permit and/or to establish compliance with the conditions of a permit and this bylaw. It shall be a condition of all permits that the applicant pay for all such borings and test pits, inspections, monitoring, certifications, reports and tests and that they be conducted by persons selected by and responsible to the permit granting authority. Payments received from applicants for such borings and test pits, inspections, monitoring, certifications, reports and tests shall be deposited into a revolving fund authorized annually by Town Meeting pursuant to MGL c. 44, § 53E 1/2. Failure of any applicant or permit holder to make timely payment of any application fee or of any fees for any borings and test pits, inspection, certification, monitoring, report or test or to carry out any step or to submit any information required by the permit granting authority shall be grounds for denial of a permit and/or for issuance of a cease and desist order and/or for revocation of the permit.

§ 77-7. Documentation requirements.

A. Permit required to commence filling operations. No fill operations are to commence until a letter indicating the granting of a permit and, if required, receipt and acceptance of the soil management plan and the site plan has been issued to the applicant by the permit granting authority.

B. Bills of lading and LSP letters. Each permit holder shall file a bill of lading with the Town Manager for each load of fill placed within the Town. Each bill of lading document shall be accompanied by a signed and dated letter from an LSP which specifies:

(1) The point of origin of the material and the receiving location for the material;

(2) That the material is not otherwise prohibited from use as fill material in accordance with this bylaw or other applicable federal or state laws, regulations, standards or guidelines; and

(3) That the LSP has compared analytical results of testing of the fill materials to the existing, pre-fill conditions at the fill location and determined:

(a) That the concentration of the substances in the materials intended for use as fill are not significantly greater than existing, pre-fill conditions for that location; and

(b) That the fill material complies with the requirements of § 77-6A of this bylaw.

C. Weekly documentation requirements. Copies of bill of lading documents and required LSP letters covering all fill placed during each week of filling operations are to be provided to the Town Manager by the end of business on the fifth business day following each week of active operation. Failure to provide these records on a weekly basis will result in suspension of fill activities.

§ 77-8. Enforcement; violations and penalties; fees.

A. Enforcement action. The Town Manager of the Town is hereby designated as the officer charged with the enforcement of this bylaw. The Town Manager, upon a written complaint of any Town citizen or property owner or upon such officer's own initiative (in either case after consultation with the Board of Selectmen), shall institute any appropriate action or proceedings in the name of the Town to prevent, correct, restrain or abate violation of this bylaw. In the case where the Town Manager is requested in writing to enforce this bylaw against any person allegedly in violation of the same and the Town Manager declines to act, the officer shall notify, in writing, the party requesting such enforcement of any action or refusal to act and the reasons therefor.

B. Fines. Violation of this bylaw shall be punishable by a fine of $100 for each offense. Each day that such violation continues shall constitute a separate offense. Fines shall be recovered by indictment or on complaint before the district court initiated by the Town Manager, or, as an alternative to initiating criminal proceedings, the Town Manager may give the offender a written notice to appear before the clerk of the district court not later than 21 days after the date of such notice for a noncriminal disposition in accordance with MGL c. 40, § 21D.

C. Other laws or regulations. This bylaw shall not be construed to authorize the use of any land or structure for any purpose that is prohibited by any other provision of the General Laws or by any other bylaw, rule or regulation of the Town, nor shall compliance with any such provision authorize the use of any land in any manner inconsistent with this bylaw, except as required by the General Laws.

D. Validity and severability. The invalidity of one or more sections, subsections, clauses or provisions of this bylaw shall not invalidate or impair the bylaw as a whole or any other part thereof.

E. Fees. The following fees shall apply to applications under this bylaw: **[Amended 5-20-2013 ATM by Art. 17]**

(1) For permits allowing filling of from 500 to 2,000 cubic yards in any twenty-four-month period, the application fee shall be established by the Town Manager and approved by the Board of Selectmen.

(2) For permits allowing filling over 2,000 cubic yards, the application fee shall be established by the Board of Selectmen.

§ 77-9. Transitional rules.

All earth filling that takes place after the effective date of this bylaw shall be subject to the requirements of this bylaw. All persons engaged in non-exempt earth filling of any lot in the Town when this bylaw becomes effective shall file an application for a permit under this bylaw within 30 days thereafter. If the Town Manager determines in his reasonable discretion that such a person has not filed a required application on time, the Town Manager may issue a temporary order to suspend or limit such operations. Any such temporary order shall remain in effect until terminated or modified by the Town Manager or a permit is granted by the Town Manager or Board of Selectmen. Any fill placed in the Town pending the granting of a permit under this bylaw shall be subject to the documentation requirements of § 77-7B and C of this bylaw and to the fees provided for under § 77-8E.

ARTICLE III
Site Plan Review Requirements

§ 465-10. Authority.

The Planning Board is the site plan review authority for Article XVIII of the Town of Salisbury Zoning Bylaw. This bylaw allows the Planning Board to adopt rules and regulations to implement the provisions of the bylaw, including but not limited to specifying the content and number of required plans, application procedures, filing and review fees, design criteria, development standards, and other general requirements consistent with the bylaw. In any case where the rules and regulations found below contradict the actual Zoning Bylaw, the Zoning Bylaw shall supersede.

§ 465-11. Review procedures.

A. The procedures for submitting a site plan review application are outlined in Article XVIII of the Town of Salisbury Zoning Bylaws. The following is a summary of that procedure:

(1) All applicants are encouraged to review the application with the Planning Department prior to filing.

(2) Public hearings for major projects, which have been noticed according to MGL c. 40A, § 11, will be held within 30 days of the date the complete application was stamped in by the Town Clerk. Minor projects will be reviewed by the Planning Board under general business.

(3) The Planning Board will make a final decision within 60 days of the commencement of the public hearing or, if no public hearing is required, within 60 days from the date of submission.

(4) The Planning Board must issue a certificate of completion before occupancy permits are issued. The Planning Board will check any filing for completeness before filing with the Town Clerk.

B. Entire text of the site plan procedure may be found in Article XVIII of the Salisbury Zoning Bylaw.[1]

§ 465-12. Site plan requirements.

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1. Editor's Note: See Ch. 300, Zoning.

A. Materials for review. A registered architect, landscape architect, or professional engineer shall sign and date and place his seal upon all pertinent documents and plans. All original site plan shall be prepared on standard twenty-four-inch by thirty-six-inch plan sheets at a minimum scale of one inch equals 40 feet. Elevation drawings, where required, shall be drawn at a minimum scale of one inch equals eight feet.

B. Plan content. The following information shall be included on the site plan for a major or minor project. Any of the following information submitted to another Town board or commission in connection with the proposed project may be submitted to the Board in lieu of the following.

(1) Location and boundaries. The location and boundaries of the lot, zoning district, adjacent streets or ways, applicable information from Article IV, Dimensional Regulations, of the Zoning Bylaw, the location and owners' names of all adjacent properties. Plans shall also show any deeds of easement, rights-of-way, covenants and any other agreements affecting the use of the site.

(2) Structures. Existing and proposed structures, including dimensions, footprint, total gross floor area, number of stories, floor elevations, and building height(s). See § 300-5, Definitions, of the Zoning Bylaw.

(3) Signage. The location, dimensions, height, lighting, and other characteristics of all proposed signs.

(4) Landscaping. Proposed landscape features, including the locations and a description of buffer areas, screening, fencing, and a planting plan. The Planning Board may require a registered landscape architect to prepare a planting plan, unless the Planning Board deems a licensed plant nursery person or landscape designer appropriate for small projects such as minor additions or alterations.

(5) Traffic. The plan shall show pedestrian, bicycle, and vehicular traffic flow patterns and show adequate access to and from the site and adequate circulation within the site. The Planning Board encourages accommodation of public transportation and/or private vanpooling arrangements.

(6) Parking. The location of parking and loading areas, driveways, access and egress points, bicycle racks, and bus stops or dropoff areas.

(7) Public access. The location and description of proposed public access areas, including parks, conservation areas, gardens, bikeways, pathways or sidewalk areas. Riverfront sites shall include indications of compliance with state and federal regulations.

(8) Lighting. Existing and proposed exterior lighting, including locations, lighting source, and fixture types. A photometric analysis of proposed lighting will be required.

(9) Topography. Existing and proposed topography of the site, including contours (two-foot intervals), the location of wetlands, streams, water bodies, aquifers, aquifer recharge areas, drainage swales, areas subject to flooding, and unique natural land features, including all stone walls, trees over eight inches in caliper, and the general location of the tree line.

(10) Water and waste disposal, drainage and other utilities. The locations and description of all existing and proposed septic systems, sanitary sewer, water supply, storm drainage systems (including method and calculations for ten- and one- hundred-year storm events), utilities, refuse and other waste disposal methods, both during and after construction. Waste disposal methods during construction shall, at a minimum, provide for the disposal of any discarded building materials, concrete truck wash out, chemicals, litter, and sanitary waste.

(11) Construction Site Inspection Plan. A plan outlining the frequency and contents of inspections at the construction site. Written inspection reports shall be submitted to the Planning Board within 48 hours of the inspection. The owner must retain all construction inspection records and reports for a minimum of 5 years from the date of issuance of the Certificate of Completion. At the discretion of the Board, the inspections shall be conducted by the Board's agent, designee or a professional engineer who has been approved by the Board, at the expense of the permittee. The permittee is responsible for arranging for the Board's agent/representative to be on-site when items are required to be inspected. The inspection reports must identify any incidents of non-compliance with the permit conditions.

(a) Frequency. Construction Site Inspections to monitor stormwater compliance, must be performed at least as frequently as once per month. Inspections must also occur at the following intervals, at a minimum.

[1] Pre-Construction. The Planning Board may require a pre-construction meeting prior to starting clearing, excavation, construction or land disturbing activity by the permittee. The permittee's technical representative, the general contractor or any other person with authority to make changes to the project, shall meet with the Board or its representative to review construction sequencing and the permitted plans and their implementation.

[2] During Construction. Inspections of stormwater BMPs and sediment and erosion control measures shall occur during construction of BMPs as well as within 24 hours of the end of a storm event of 0.5 inches or greater, from the start of construction until the site is permanently stabilized.

(b) Content of Inspections. A written inspection report shall be completed for every inspection performed.

C. Project narrative submittals. For major projects, minor projects which disturb one acre of land or more, or minor projects which are part of a larger common project which disturb one acre of land or more, the Planning Board may require the

materials or information listed below, as it deems necessary. If not requested at the time of the public hearing, this information shall be requested not more than 30 days from the date of commencement of the public hearing and will not extend the review period, unless mutually agreed upon in writing.

(1) Surface and ground water pollution. A report on the impact of stormwater runoff on adjacent and downstream water bodies, subsurface groundwater, and water tables.

(2) Soils. A report on the potential erosion and sedimentation caused by the operation and maintenance of the proposed development and the mitigation efforts proposed. To this end, high-intensity soil mapping, i.e., test borings and analysis, may be required.

(3) Environmental and community impact analysis. For projects with significant environmental impact to wetlands, floodplains, or other sensitive resources the Board may request a report following the submission requirements of the

Planning Board's rules and regulations, including a report on the relationship of the proposed development to the natural and man-made environment, and compatibility of the proposed development with adjacent or surrounding land uses and neighborhoods. This analysis shall be a guide to the Planning Board in its deliberations and will build into the Board's decisionmaking process consideration of the environment and community impacts of the proposed development. An EIR required through the Massachusetts Environmental Policy Act (MEPA) process, which addresses the Planning Board's concerns, may be substituted in lieu of this report.

(4) Traffic impacts.

(a) A report on existing pedestrian and vehicular traffic volume, composition, peak-hour levels, and existing street and sidewalk capabilities, and analysis of existing and resulting level of services (LOS) for the following:

[1] The nearest and/or most impacted public roadway intersection.

[2] The estimated average daily traffic generation, including composition and peak-hour levels.

[3] The directional flows resulting from the proposed development.

[4] Any proposed methods to mitigate the estimated traffic impact, such as promoting the use of public transportation, or other appropriate means.

[5] The methodology and sources used to derive existing data and estimations.

[6] The feasibility of traffic-calming measures such as textured crosswalks, bike lanes, roundabouts, rumble strips, street trees, or bulb-outs.

(b) A detailed traffic access and impact study may also be required for the project. At the applicant's expense, the Planning Board may engage a traffic consultant to review said report and make its

recommendations to the Planning Board 30 days before final action is required.

(5) Architectural style. Plans and other drawings shall include architectural elevations of all sides of all new buildings and

of those sides of existing buildings that are proposed to be altered in any way. A registered architect who shall sign the plan and place his/her seal upon it shall prepare the renderings or elevations. The drawings shall be prepared at a minimum scale of 1/8 inch equals one foot and shall show the following:

(a) Exterior material, including trim, and colors.

(b) Type, pitch, and material of roofs.

(c) Size, type, and spacing of windows, doors and other openings.

(d) Size, location, colors, and copy of signs affixed to or hanging from the building.

(e) The relationship in massing, scale, and height to other existing structures in the immediate vicinity.

(f) Elevations or renderings of new construction, renovation or expansions (or model may be provided at the option of the applicant).

(g) Cross sections of the site and buildings.

(h) Product literature on proposed light fixtures.

(6) Other permits required.

(a) All completed or pending actions of the Zoning Board of Appeals relative to the application, including an estimated schedule of application and approval.

(b) A listing of state and federal permits, licenses, and approvals necessary, including Chapter 91.

§ 465-13. Site plan performance and design standards.

Site plans shall be prepared in compliance with the following list of design standards, the Salisbury Zoning Bylaw and the Salisbury Planning Board Rules and Regulations, as well as all applicable site plan standards of the Architectural Access Board, American Disabilities Act, AASHTO and any other local, state, and federal standards not specifically enumerated herein. In the event there is a conflict in standards, the jurisdictional standard shall apply, unless otherwise waived.

A. Architectural/building design. Consideration shall be given to ensure that buildings are appropriate in scale, massing, height, roofline, and building materials to ensure that the architecture shall be in harmony with the surrounding neighborhood and the Town.

B. Landscaping. Landscaping and screening shall be provided with regard to the impact of the adjacent properties, the public highway and to the site itself. Plant materials that are selected for the site should be noninvasive and indigenous to the area or be able to survive New England winters.

C. Lighting. The goals of exterior lighting shall be to make development safe and to identify and accent key elements in the project's design. Fixtures shall be of the cutoff luminaire type and be consistent with the overall architectural theme of the development. Accessways, parking areas, and pedestrian walkways shall have adequate lighting for security and safety reasons. Flood and area lighting is prohibited.

D. Pedestrian and vehicular access and traffic impacts. Applicants must demonstrate that the project will minimize pedestrian and vehicular traffic and safety impacts on Town roads. In the case of multi-tenant properties, these requirements are directed at the immediate vicinity of the proposed renovation, addition, expansion, or new building rather than the site as a whole.

E. Drainage. The drainage system shall be designed so that there is no net increase in the pre vs. post peak rates of stormwater discharge for the two-, ten- and one-hundred-year storm events and rates. The applicant shall demonstrate to the satisfaction of the Planning Board that the project is designed to have no measurable or significant impact as to existing vegetation, topography, wetlands, and other natural or man-made features. The system shall be designed to treat stormwater to all applicable standards of Town, state and federal agencies. The system design shall promote on-site infiltration and minimize the discharge of pollutants to the ground and surface water. Drainage systems shall have an emergency overflow for events above and beyond the one-hundred-year storm event. Additionally, the drainage system will be designed in accordance with Stormwater Management Volume I and II prepared by the Massachusetts Department of Environmental Protection and Massachusetts Office of Coastal Zone Management as most recently revised. In special cases, the site drainage can utilize the Town's drainage system with the approval of the Department of Public Works. The

Planning Board requires that proper calculations be submitted. A minimum of one foot of freeboard shall be provided for all detention/retention structures.

F. Parking and loading.

(1) Parking lots and access drives shall be designed to prevent motorists from stacking onto the public way. Parking lanes shall be sized according to the internal circulation pattern. Parking shall be prohibited between buildings and street layout, except for handicap access if required by the ADA. Parking for large trucks shall be provided as determined by the Planning Board.

(2) All parking lots, drives and loading areas shall be paved, unless otherwise prohibited by state or local regulations.

(3) The installation of alternative surfaces in low traffic areas may be allowed, provided that a determination is made that the alternative surface will not lead to dust or erosion, having an adverse impact on adjacent properties or users of the site.

(4) Parking should be located to the side or rear of the building. Parking under buildings in areas shall only be permitted to the extent that provision has been made for the front elevation to be no higher than the minimum required by state and local regulations. The buildings shall include neighborhood-friendly elements, such as decks and porches at sidewalk level, fronting the highest use pedestrian or public way.

(5) Curb cuts for parking access shall not exceed 24 feet or 25% of the property's frontage on a public way, whichever is greater.

(6) Screening of ground floor parking from pedestrian view with appropriate doors, building elements or landscapingfeatures is required for parking along public ways. Parking lots shall be designed to include median strips and landscape islands to improve internal circulation. Additionally, landscaped or naturally vegetated islands should interrupt rows of parking. Loading shall be designed to be convenient to the loading and unloading of vehicles and to avoid conflicts with the internal circulation pattern. Curbing shall be vertical granite at the access drive radii. Each site shall have only one curb cut per street frontage, except where is it deemed that more than one

curb cut is necessary for emergency access purposes or to enhance the site.

G. Service facilities. Service facilities such as garbage collection, recycling containers, refrigeration units, utility areas and other facilities not specifically identified shall be screened aroundtheir perimeters. Screening may consist of fencing and/or natural vegetation. Screening shall have an effective height and width to screen from public view said service facility.

H. Construction. Construction requirements for roads, parking, streets, and drainage shall be in accordance with the Massachusetts Highway Standards, as published by the State of Massachusetts. Upon request, the Planning Board may allow alternative construction specifications if deemed appropriate for the proposed use by the Board, or if mandated by the Conservation Commission, subject to the issuance of a variance from the Zoning Board of Appeals, if needed.

(1) All access drives and parking areas shall be graded, paved, and drained in accordance with standards enumerated in this section, unless the Planning Board allows an alternative to pavement as described above.

(2) Curbing shall be placed at the edges of all paved surfaces, and also at the edges of graveled parking areas and access drives. Wheel stops shall be placed where parking spaces abut sidewalks and/or walkways for pedestrians. Guardrails shall be placed along parking spaces and drive aisles where slopes exceed 3:1. Curbing shall not be bituminous concrete.

(3) All utility connections shall be underground and constructed in accordance with the requirements of the Town and other utility companies.

(4) Bollards shall be placed along the sides of the building exposed to vehicle traffic.

I. Access connections.

(1) Separation between access connections on all collector and arterials shall be based on the posted speed limit in accordance with the following table:

Posted Speed Limit (mph)	Access Connection Spacing (feet)
20	140
30	210
40	280
50	350

(2) The width of the access connections at the property line of the development shall not exceed 25 feet, unless the traffic impact study identifies, and the Planning Board agrees to, the need for turning lanes from the development onto the adjacent public road.

(3) The access connection shall provide a minimum distance of 40 feet in depth between the property line and the beginning of any parking areas, turning areas and/or stacking lanes within the development.

(4) For a site at an intersection where no alternatives exist, such as joint or cross access, the Planning Board may allow construction of an access connection at a location suitably removed from the intersection. In such cases, the applicant shall provide directional restrictions (i.e., right in/right out only and/or a restrictive median) as required by the Planning Board.

J. Shared driveways. A system of joint-use driveways and cross- access easements shall be established wherever feasible and the proposed development shall incorporate the following:

(1) A service driveway or cross-access corridor extending the width of the parcel.

(2) A design speed of 10 miles per hour and sufficient width to accommodate two-way travel aisles.

(3) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross access via a service drive. (A leveling area shall be provided having a grade of minus 1% for a distance of 30 feet, measured from the nearest exterior line of the intersecting street to the point of vertical curvature.)

K. Drive-through facilities.

(1) Drive-through facilities shall provide a minimum of eight stacking spaces (within the site) before the order board. The facility shall provide another four stacking spaces between the order board and the transaction window. If the facility has two transaction windows the four stacking spaces may be split between each of the windows. An additional stacking space shall be provided after the last transaction window(s).

(2) Each stacking space shall be a minimum of 20 feet in length and 10 feet in width along straight portions. Stacking spaces and stacking lanes shall be a minimum of 12 feet in width along curved segments.

(3) Stacking lanes shall be delineated from traffic aisles, other stacking lanes and parking areas with striping, curbing, landscaping and the use of alternative paving materials or raised medians.

(4) Entrances to stacking lane(s) shall be clearly marked and a minimum of 60 feet from the intersection with the public street. The distance shall be measured from the property line along the street to the beginning of the entrance.

(5) Stacking lanes shall be designed to prevent circulation congestion, both on site and on adjacent public streets. The circulation shall separate drive-through traffic from site circulation, not impede or impair access into or out of parking spaces, not impede or impair vehicle or pedestrian traffic movement, and minimize conflicts between pedestrian and vehicular traffic with physical and visual separation between the two. Stacking lanes shall not interfere with required loading and trash storage areas, and loading or trash operations shall not impede or impair vehicle movement. If said separate stacking lane is curbed, an emergency bypass or exit shall be provided.

(6) Stacking lanes shall not enter or exit directly into a public right-of-way. Stacking lanes shall be integrated with the on- site circulation pattern.

(7) The intersection of stacking lanes and walk-in customer access shall be a minimum of 50 feet from any access connections and/or transaction windows. Said intersections shall be provided with a crosswalk. These crosswalks shall use enriched paving and striping and include warning signage aimed at both the pedestrian and vehicle.

(8) Any outdoor service facilities (including menu boards, speakers, etc.) shall be a minimum of 100 feet from the property line of residential uses.

(9) Menu boards shall be a maximum of 30 square feet with a maximum height of six feet in height and shall be shielded from any public street and residential properties.

L. Utilities.

(1) Except for preexisting overhead connections, all electric, telephone, cable television and other such utilities shall be underground from the roadway utilities.

(2) In order to minimize design and permitting conflicts, the applicant must demonstrate that the proposed development will be permitted to connect to the public sewer, water, and other service systems. If sewerage is not currently installed, dry sewer will be required for all development located east of Interstate 95. If sewerage is to be treated on site, the application shall include, if completed, a copy of the plan submitted in accordance with the regulations of the Board of Health.

M. Stormwater runoff. The site plan shall include adequate provisions for measures to prevent pollution of surface or ground water, minimizing erosion and sedimentation, and measures to prevent changes in groundwater levels, increased runoff, and potential for flooding. Neighboring properties shall not be adversely affected by excessive runoff. The plan shall include:

(1) A plan consistent with the Massachusetts Stormwater Management Policy (SWMP), where the rate of surface water runoff from the site shall not be increased after construction. If needed to meet this requirement and maximize groundwater recharge, increased runoff from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of subsurface infiltration systems or retention or detention ponds. Dry wells shall be used only where other methods are unfeasible and shall require oil, grease, and sediment traps to facilitate removal of contaminants

(2) A detailed stormwater management plan will also be required.

N. Water quality. Groundwater recharge shall be maximized and groundwater quality shall be protected. Various techniques may

be required to maximize recharge, such as perforated drainpipes, reduction of paved areas, and reduction of building coverage. Installing grease traps and/or gas/oil separators to improve water quality may also be required. Where the groundwater elevation is close to the surface extra site grading precautions may be taken to maintain the protective function of the overburden.

O. Wetlands. In order to minimize design and permitting conflicts, when wetland replacement or mitigation is required, the application shall include a copy of the plan submitted in accordance with the regulations of the Salisbury Conservation Commission.

P. Erosion control. Erosion and sedimentation control measures presented in the plan shall be adequate to retain all sediment within the site and away from wetlands, watercourses, and water bodies, and the municipal storm drain system, both during and after construction. Design of erosion and sedimentation control measures shall be consistent with design standards of the Massachusetts Stormwater Management Handbook.

Q. Environmental impact assessment.

(1) Purpose:

(a) To describe the impacts of the proposed development with respect to on-site and off-site environmental quality.

(b) To enable Town officials to determine and evaluate those methods to be used by the applicant to promote the environmental health of the community and to minimize the environmental degradation of the Town's natural resources

(2) Scope: a written description of existing, general physical conditions of the site and a description of proposed measures for mitigation of any potential adverse impacts on the natural environment.

(3) Standards:

(a) Emissions.

(b) Soil runoff.

(c) Earth removal.

(d) Tree removal.

(e) Noise pollution.

(f) Light pollution.

(4) The Planning Board may waive in part or in whole any requirements contained in the assessment which it deems inapplicable to the project proposal. The applicant may wish to discuss the requirements with the Planning Board for preparation of the statement prior to submission of a plan. The Planning Board can waive the EIS for projects that require a Massachusetts Environmental Policy Act (MEPA) review; however, the Planning Board may require specific information in the EIS that the Board deems was not adequately addressed in the MEPA review.

R. Community impact assessment.

(1) Purpose: to evaluate the impact of the proposed project on Town services and surrounding neighborhood and the fiscal and economic impacts of the proposed development on the Town.

(2) Scope: a written description of:

(a) Site design and neighborhood impact.

(b) Pedestrian impact.

(c) Historic impact.

(d) Infrastructure impact.

(e) Proposed methods of mitigation for any adverse impacts.

(f) Projections of costs arising from increased demands for public services and infrastructure.

(g) Projections of benefits from increased tax revenues, employment (construction and permanent), and value of public infrastructure to be provided.

(h) Projections of the impacts of the proposed development on the values of adjoining properties.

(i) Five-year projection of Town revenues and costs resulting from the proposed development.

(3) Standards. Design elements shall be compatible with the character and scale of neighboring properties and structures and existing local plans (if any):

(a) Location and configuration of proposed structures, parking areas and open space.

(b) Outdoor lighting.

S. Traffic impact assessment.

(1) Purpose: to evaluate the impact of the proposed project on traffic patterns in the surrounding neighborhood.

(2) Scope: document the methodology and sources used to provide existing data and estimations:

(a) Existing traffic conditions.

(b) Projected traffic conditions.

(c) Projected traffic impact generated by the development.

(d) Proposed mitigation.

ARTICLE VIII
Procedure for Submission and Approval of Plans

§ 465-27. Preliminary plan.

A. General. In the case of a subdivision showing lots in a residential zone a preliminary plan may be submitted by the subdivider for discussion and action by the Planning Board. In the case of a nonresidential subdivision the subdivider is required to file a preliminary plan. The submission of such a preliminary plan will enable the subdivider, the Board, other municipal agencies and owners of property abutting the subdivision to discuss and clarify any problems of such subdivision before a definitive plan is prepared. Therefore, it is strongly recommended that a preliminary plan be filed in every case. A properly executed application Form B (see Forms)[1] shall be filed with the preliminary plan submitted to the Planning Board. The plan shall be submitted by delivery at a meeting of the Board or by registered mail to the Board, in care of the Town Clerk. If so mailed, the date of mailing shall be the date of submission of the plan. In addition, written notice shall be given by the applicant to the Town Clerk, by delivery or by registered mail, that he has submitted such a plan.[2]

B. Contents. The preliminary plan may be drawn on tracing paper with pencil at a scale of one inch equals 200 feet and two prints shall be filed at the office of the Board. Said preliminary plan shall be identified as a preliminary plan and shall show sufficient information about the subdivision to form a clear basis for discussion of its problems and for the preparation of the definitive plan. Such information will include the material required by § 465-28B(1) to (7), inclusive (contents of definitive plan). During discussion of the preliminary plan the complete information required for the definitive plan (§ 465-28B) will be developed.

C. Action by Board.

(1) The Planning Board may give such preliminary plan its approval. Such approval does not constitute approval of a subdivision but does facilitate the procedure in securing final approval of the definitive plan.[3]

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1. Editor's Note: Forms are available at the office of the Planning Board.
2. Editor's Note: Amendment pending
3. Editor's Note: Amendment pending

(2) The Board may also disapprove the plan. A disapproval will be accompanied by a detailed statement of reasons for the action.

(3) Notice of its action must be given by the Planning Board to the applicant and Town Clerk within 45 days of the date of submission.[4]

§ 465-28. Definitive plan.

A. General. Any person who submits a definitive plan of a subdivision to the Planning Board for approval shall file with the Board the following:

(1) An original reproducible drawing of the definitive plan (including all plans, maps and cross sections required by Subsection B of this section) and five contract prints thereof, dark line on white background. The original drawing will be returned after approval or disapproval.

(2) A properly executed application Form C (see Forms).[5]

(3) Evidence that the definitive plan conforms to the approved preliminary plan or that the definitive plan includes the modifications required by the Board's action on the preliminary plan.

(4) Fees as required by Article II, Fees, of the Planning Board Rules and Regulations.[6]

(5) A location plan of the subdivision at a scale of one inch equals 800 feet, including its position within the Massachusetts Coordinate System as specified in Chapter 47 of the Acts of 1941 and showing the right-of-way lines of all proposed streets in the subdivision and their location in relation to two or more existing streets, or portions thereof, shown and readily identifiable as to locus on the Town Map and to such accuracy that the Town Map may be placed over the location plan for purposes of actual transfer.

(6) List of abutters (Form D).[7] The applicant shall file by delivery or registered mail a notice with the Town Clerk stating the date of submission for approval.

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4. Editor's Note: Amendment pending
5. Editor's Note: Forms are available at the office of the Planning Board.
6. Editor's Note: See Part 1, Art. II of this chapter. Amendment pending.
7. Editor's Note: Forms are available at the office of the Planning Board.

B. Contents. The definitive plan shall be prepared by an engineer or surveyor and shall be clearly and legibly drawn in black India ink upon tracing cloth or other stable base material such as drafting film. The plan shall be at a scale of one inch equals 40 feet. Sheet sizes shall preferably not exceed 24 inches by 36 inches. If multiple sheets are used, they shall be accompanied by an index sheet showing the entire subdivision. The definitive plan shall contain the following information. Items in Subsection B(13), (14), (15), and (17) may be submitted on the same sheet as the definitive plan or on separate sheets.

(1) Subdivision name, boundaries, true North point, date, and scale.

(2) Names and addresses of record owner and applicant.

(3) Names of all the abutters as they appear in the most recent tax list, including owners of land separated from the subdivision only by a street; and zoning district boundaries, if any.

(4) Existing and proposed lines of streets, lots, rights-of-way, easements, and public or common areas within the subdivision. (The proposed names of proposed streets shall be shown in pencil until they have been approved by the Board.) Purpose of easements shall be indicated.

(5) Location, names and present widths of streets bounding, approaching, and within reasonable proximity of the subdivision.

(6) Location of natural waterways and water bodies within and adjacent to the subdivision.

(7) Major site features, such as existing stone walls, fences, buildings, large trees, rock ridges and outcroppings, and swamps.

(8) Sufficient data, including length, bearings, radii and central angle, to determine the exact location, direction and length of every street and way line, lot line and boundary line, and to establish these lines on the ground. The location of the subdivision shall be tied to the Commonwealth of Massachusetts Coordinate Mapping System by locating corners, indicating a base line, or using a grid.

(9) Location of all the permanent monuments and bench marks, and each proposed lot marker, properly identified as to whether existing or proposed.

(10) Boundary lines, areas in square feet, and dimensions of all proposed lots, with all lots designated numerically and in sequence, and with all lots located according to the Massachusetts Coordinate Mapping System.

(11) Name of the engineer or surveyor who prepared the plan and certificates and seals of the engineer or surveyor that actually prepared the plan, and an additional certificate by the surveyor that all surveying conforms to the Technical Standards for Property Surveys of the American Congress on Surveying and Mapping.

(12) Suitable space to record the action of the Board and the signatures of the members of the Board on each sheet of the definitive plan. Where the applicant elects to secure completion of required improvements by covenant (rather than bonds or surety), there shall be a notation above such space as follows: "Approved_____, subject to covenant conditions set forth in a covenant executed by_____dated _____, and to be (recorded) (registered) herewith."

(13) Existing and proposed topography, with two-foot contour intervals, unless the Board agrees that the natural surface of the ground may be adequately represented by contours with larger intervals or by figures of elevation.

(14) Profiles on the right-of-way lines or proposed streets at a horizontal scale of one inch equals 40 feet and a vertical scale of one inch equals eight feet, or such other scale acceptable by the Board. All elevations shall refer to Town datum. Profiles shall also indicate the location of any intersecting public or private ways and the location of existing and proposed storm drains, water mains, sewers and their appurtenances, and any other underground utilities to be placed in the right-of-way.

(15) On the same sheet, there shall be drawn cross sections of the proposed streets, properly located and identified by station number, at such intervals along the streets as will adequately indicate any variations in its section, supplemented, where necessary, by lines on the layout plan showing the width

and location of proposed roadways, planting strip, gutters, sidewalks, and similar physical features.

(16) The results of percolation tests and the level of the water table for each lot proposed within the subdivision. The tests shall be executed in accordance with Regulation 14.2, "Percolation Test Procedures," of Article XI of the Massachusetts Sanitary Code.

(17) If the total area of land disturbance is greater than one acre, or if the disturbance is part of a larger common plan of development or sale which will disturb more than one acre, the Planning Board may require that the Definitive Plan include the Water and Waste Disposal, Drainage and Other Utilities requirements as outlined in §465-12B(10), a Construction Site Inspection Plan as outlined in §465-12B(11) and a Soils Report as outlined in §465-12C(2), subject to the design requirements outlined in §465-13, Site Plan Performance and Design Standards.

C. Review by Board of Health as to suitability of the land. At the time of filing of the definitive plan, the subdivider shall also file with the Board of Health two contact prints of the definitive plan, dark line on white background. The Board of Health shall, within 45 days after filing of the plan, report to the Planning Board in writing its approval or disapproval of said plan. If the Board of Health disapproves said plan, it shall make specific findings as to which, if any, of the lots shown on such plan cannot be used for building sites without injury to public health, and include such specific findings and the reasons therefor in such report, and, where possible, shall make recommendations for the adjustment thereof. Any approval of the plan by the Planning Board shall then only be given on condition that the lots or land about which such doubt exists shall not be built upon or served with any utilities (including cesspools, septic tanks, and drainage) without prior consent of the Board of Health. The Planning Board shall endorse on the plan such condition, specifying the lots or land to which such condition applies.

D. Prior approval under MGL c. 131, § 40, Wetlands Protection Act. Any person submitting a subdivision for approval by the Board, said subdivision to be built on any bank, flat, marsh, meadow, or swamp bordering on any inland or coastal waterways, shall show evidence of approval to perform such activity under the Wetlands Protection Act, MGL c. 131, § 40.[8]

E. Public hearing. Before approval, modification and approval, or disapproval of the definitive plan is given, a public hearing shall be held by the Board, notice of the time and place of which and

of the subject matter, sufficient for identification, shall be given by the Board at the expense of the applicant by advertisement in a newspaper of general circulation in the Town of Salisbury once in each of two successive weeks, the first publication being not less than 14 days before the day of such hearing, and by mailing a copy of such advertisement to the applicant and to all owners

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8. Editor's Note: See also Ch. 490 for wetlands regulations promulgated by the Conservation Commission.

of land abutting upon the land included in such plan or separated from such land only by a street as appearing on the most recent tax list.

F. Performance guarantee. Before endorsement of the Board's approval of a definitive plan of a subdivision, the applicant shall agree to complete the required improvements specified in Article IX for all lots in the subdivision, such construction and installation to be secured by one, or in part by one and in part by another, of the following methods which may from time to time be varied by the applicant.

(1) Approval with bonds or surety. The applicant shall either file a surety company performance bond or a deposit of money or negotiable securities in an amount determined by the Board to be sufficient to cover the cost of all or any part of the improvements specified in Article IX not covered by a covenant under Subsection F(2) below. Such bond or security, if filed or deposited, shall be approved as to form and manner of execution by the Town Counsel and as to sureties by the Town Treasurer and shall be contingent on the completion of such improvements within two years of the date of the bond or surety. At the discretion of the Board, a time extension may be granted.

(2) Approval with covenant. The applicant shall file a covenant Form E (see Forms),[9] executed and duly recorded by the owner of record, running with the land, whereby such ways and services as specified in Article IX, not covered by bond or deposit under Subsection F(1) above, shall be provided to serve any lot before such lot may be built upon or conveyed, other than by mortgage deed.

G. Reduction of bond or surety. The penal sum of any such bond, or the amount of any deposit held under Subsection F(1) above, may, from time to time, be reduced by the Board and the obligations of the parties thereto released by said Board in whole or part. If release is by reason of covenant, a new plan of the portion to be subject to the covenant may be required.

H. Later alternate method of guaranteeing performance. After sufficient improvements have been made by the subdivider to give the Board reason to release one or more lots from a performance guarantee and following the recording of a mortgage or mortgages on a lot or lots in the subdivision given

9. Editor's Note: Forms are available at the office of the Planning Board.

as security for advances to the subdivider by a lender, the Board may, at its option, release lots from the operation of a performance guarantee without receipt of a bond or deposit of money upon delivery to the Board of an agreement with the Board, which agreement shall be executed by the subdivider and the leader and shall provide for the retention by the lender of sufficient funds otherwise due the subdivider to secure the construction of ways and the installation of utilities. Said agreement shall provide for a schedule of disbursements which may be made to the subdivider upon completion of various stages of the work and shall further provide that in the event the work is not completed within the time set forth by the subdivider, any funds remaining undisbursed shall be available for completion.

I. Release of performance guarantee. Upon the completion of improvements required under Article IX, security for the performance of which was given by bond, deposit or covenant, or upon the performance of any covenant with respect to any lot, the applicant shall send by registered mail to the Town Clerk and to the Board a written statement in duplicate that said construction or installation in connection with which such bond, deposit or covenant has been given has been completed in accordance with the requirements contained under Article IX, such statement to contain the address of the applicant. If the Board determines that said construction or installation has not been completed, it shall specify to the applicant in writing the details wherein said construction and installation fail to comply with the requirements contained under Article IX. Upon failure of the Board to act on such application within 45 days after the receipt of the application by the Town Clerk, all obligations under the bond shall cease and terminate by operation of law, and any deposit shall be returned and any such covenant shall become void. In the event that said forty-five-day period expires without such specification, or without the release and return of the bond or return of the deposit or release of the covenant as aforesaid, the Town Clerk shall issue a certificate to such effect, duly acknowledged, which may be recorded.

J. Approval, modification or disapproval. After the required hearing, but within the period specified in the Subdivision Control Law of submission of the definitive plan, the Board shall take final action thereon. It may approve or disapprove said plan, as provided by statute.

K. Certificate of approval. The action of the Board in respect to such plan shall be by vote, copies of which shall be certified and

filed with the Town Clerk and sent by delivery or by registered mail to the applicant. If the Board modifies or disapproves such plan, it shall state in its vote the reasons for its action. Final approval, if granted, shall be endorsed on the original drawing of the definitive plan by the signatures of a majority of the Board but not until the statutory twenty-day appeal period has elapsed following the filing of the certificate of the action of the Board with the Town Clerk and said Clerk has notified the Board that no appeal has been filed, or if appeal has been taken, not until the entry of a final decree of the court sustaining the approval of such plan. After the definitive plan has been approved and endorsed, the applicant shall furnish the Board with three prints. Final approval of the definitive plan does not constitute the laying out or acceptance by the Town of streets within a subdivision.

ARTICLE IX
Design and Construction Standards

§ 465-29. Streets and underground utilities.

A. Location.

(1) All streets in the subdivision shall be designed so that, in the opinion of the Board, they will provide safe vehicular travel. Due consideration shall also be given by the subdivider to the attractiveness of the street layout in order to obtain the maximum livability and amenity of the subdivision.

(2) The proposed streets shall conform so far as applicable with the Salisbury Master Plan of 1969.

(3) Provision satisfactory to the Board shall be made for the proper projection of streets, or for access to adjoining property which has not been subdivided.

(4) Reserve strips prohibiting access to streets or adjoining property shall not be permitted, except where, in the opinion of the Board, such strips shall be in the public interest.

B. Cross sections. Cross sections shall be in accordance with the standards as shown in Table 68.[1]

C. Alignment, grade, dead-ends and intersections. These shall be in accordance with the standards in Table 69.[2]

D. Bridges. Bridges shall be designed in accordance with the standards shown in Table 70.[3]

E. Utility installation, grading and surfacing. The construction of streets and the installation of public utilities shall conform to the standards in the following subsections:

(1) Underground utilities.

(a) All water mains shall have a minimum of four feet of cover, laid to line and grade in a workmanlike manner and all necessary fittings, valves, low-point drains, hydrants and other necessary features installed.

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1. **Editor's Note: Table 68 is included at the end of this chapter.**
2. **Editor's Note: Table 69 is included at the end of this chapter.**
3. **Editor's Note: Table 70 is included at the end of this chapter.**

(b) Sanitary sewers shall have a minimum of four feet of cover. However, depth will be as required to adequately sewer the subdivision. Sewers shall be laid to true line and grade.

(c) Unsuitable material below normal pipe inverts shall be removed and replaced by material approved by the appropriate public officials. Unsuitable material shall not be used for trench backfill.

(d) Width of trench shall be equal to 4/3 diameter of the pipe plus 18 inches.

(e) Sheeting, if used, shall be cut off 12 inches above the top of pipe.

(f) Pipe shall be surrounded by six inches of compacted screen gravel if set in earth and 12 inches if set in rock.

(g) Backfill shall be compacted to 90% of the maximum dry density of the material as determined by the American Association of State Highway Officials, Designation T-180D.

(h) All underground utilities shall be tested and approved prior to installation of base course(s) and pavement.

(i) All lot connections shall be installed to the right-of-way line and so marked or surveyed so as to be easily located in the future.

(2) Street grading.

(a) The entire area within the right-of-way lines shall be cleared and grubbed. All topsoil shall be removed and all rock shall be removed to the depth indicated for the appropriate street type in Table 71.[4]

(b) All unsuitable material shall be removed and shall be replaced by a bank-run gravel or material designated by the Massachusetts Department of Public Works Standard Specifications for Highways, Bridges and Waterways (1967), Section 170.

(c) All materials used for roadway embankments shall conform to the Massachusetts Department of Public

4. **Editor's Note: Table 71 is included at the end of this chapter.**

Works Standard Specifications for Highways, Bridges and Waterways (1967), Section 150.

(d) Before the base is spread, the subgrade shall be shaped to a true surface conforming to the proposed cross section of the road and shall be compacted to the percentage of the maximum dry density of the material as indicated in Table 71.

(3) Surfacing.

(a) Materials and methods of construction for roadway surfaces shall conform to Table 71.[5]

(b) In Type I subdivisions, collector streets shall conform to the standards for medium traffic in Table 71. Minor, or feeder, streets shall conform to the standards for light traffic in Table 71.

(c) In Type II subdivisions, collector streets shall conform to the standards for heavy traffic in Table 71. Minor, or feeder, streets shall conform to the standards for medium traffic in Table 71.

(d) In Type III subdivision, all streets shall conform to the standards for heavy traffic in Table 71.

(e) If a question arises as to the standards required for particular roadways, the Planning Board shall have the authority to make a determination.

§ 465-30. Shoulders.

A. In subdivisions where shoulders are allowed, a stabilized grassed shoulder having a width of at least four feet may, at the option of the subdivider, be constructed within the roadway at its outer edge (except near certain intersections, as hereinafter provided). In no case, however, shall the total width of the pavement plus shoulder(s) be less than the roadway width for the type of street, as specified in § 465-29B.

B. Such shoulders shall consist of a layer of select gravel mixed with good quality loam in the ratio of two parts gravel and one part loam, placed on the side of the pavement surface, on top of the base layer, rolled and compacted to a transverse grade meeting that of the finished pavement, and seeded with hayseed applied

5. **Editor's Note: Table 71 is included at the end of this chapter.**

in sufficient quantity to assure adequate coverage. The seed shall be rolled in when the soil is moist.

§ 465-31. Curbing.

Curbing required in § 465-42C shall be either standard granite or precast concrete, at the election of the subdivider, except in Type III subdivisions where standard granite curbing shall be required.

§ 465-32. Sidewalks.

A. Sidewalks shall have a finished grade of 2.0% sloping toward the roadway. When unusual physical land characteristics or topographic conditions require, the Board may approve the placement of a sidewalk at a greater distance from the roadway or at a higher or lower elevation in relation thereto, provided such variation is indicated on the definitive plan.

B. In constructing all sidewalks, the material shall be removed for the full width of the sidewalk to a subgrade at least 10 inches below the approved finished grade, and also all soft spots and other undesirable material below such subgrade shall be replaced with a good binding material and rolled with a two-ton roller or equivalent. Unless the applicant elects to install cement concrete sidewalks (built according to specifications of Massachusetts Department of Public Works), the excavated area shall be filled with at least eight inches of select gravel containing some binding material and compressed and rolled to a surface slope of 2%. Sidewalks shall then be paved to a thickness of three inches with bituminous concrete pavement, applied in two courses of 1 1/2 inches.

§ 465-33. Planting strips.

A. Planting strips shall be of a width required by § 465-29B.

B. The finished grade of such planting strips shall be 2.0%, sloping toward the roadway. Where unusual physical land characteristics or topographic conditions exist, the Board may approve the construction of a planting strip at a slope greater than 2%, provided the finished slope will not project above or below a plane sloped two horizontal to one vertical upward or downward from the edge of the roadway.

C. No trees or other obstruction shall be placed or retained within the planting strip so as to be closer than two feet to the edge of the roadway.

D. The top four inches of side slopes shall consist of good quality loam, screened, raked, and rolled with a hand roller to grade. The loam shall be seeded with lawn grass seed applied in sufficient quantity to assure adequate coverage, rolled when the loam is moist.

§ 465-34. Side slopes.

A. The area in back of the sidewalk or, where no sidewalk is constructed, in back of the required planting strip shall be graded to a point where it coincides with the finished grade of abutting lots in such a manner that no portion thereof within the right-of-way lines of the street will project above a plane sloped two horizontal to one vertical from the edge of the sidewalk or grass lot, or be below a place sloped two horizontal to one vertical downward.

B. The top four inches of side slopes shall consist of good quality loam, screened, raked, and rolled with a hand roller to grade. The loam shall be seeded with lawn grass seed applied in sufficient quantity to assure adequate coverage, rolled when the loam is moist.

§ 465-35. Monuments and markers.

A. Granite or concrete monuments three feet six inches in length dressed or six inches at the top with a three-eighths-inch drill hole in the center and not less than six inches square at the bottom shall be set to finish grade as shown on plans.

B. No permanent monuments shall be installed until all construction which could destroy or disturb the monuments is completed.

§ 465-36. Drainage.

A. The construction of the drainage system, including methods of construction and quality of materials used, shall be in conformity with the definitive plan and the details shall conform to the details of the Massachusetts Department of Public Works Specifications and Standards, unless specifically excepted by the Board.

B. The quantity of stormwater carried by drains normally shall be determined by the rational method, unless an engineer shows evidence that another approach is more appropriate in a specific case. However, in no event shall the protection provided be for a lower design storm that specified below. The design storm shall be five years in normal cases involving Type I and II subdivisions,

10 years for Type III subdivision, and 50 years for bridge openings.

C. Drain and channel sizes.

(1) Pipe drains, where used, shall have a minimum diameter of 12 inches. In general, they should be designed to flow full with the hydraulic gradient at the crown. However, in flat slope areas surcharge may be allowed to one foot below ground surface. In determining the capacity of concrete pipe drains, the Manning formula should be used with the coefficient of friction "n" equal to 0.013. The minimum velocity at design flows should be 2.5 feet per second and the maximum, 15 feet per second.

(2) In cases where earth, grass-lined and stone-paved open channels are used, side slopes should be designed to ensure soil stability and to provide for the safety of children. A typical section of the channel should have a flat bottom and side slopes of one vertical on two horizontal with the top of the slope at least one foot higher than the design water surface. The maximum allowable design velocity should be three feet per second in earth or grass-lined channels and eight feet per second in stone-lined channels or open earth channels. A coefficient of friction "n" equal to 0.030 should be used for both the earth and stone-paved channels.

D. Connection to public system.

(1) Where feasible, stormwater should be directed to enter the nearest open stream channel. Stormwater shall not be permitted to cross any roadway unless piped underground. Stormwater runoff in street gutters shall not be permitted to flow upon the surface for a longer distance than 400 feet before it enters the underground system. Catch basins shall be located on both sides of the roadway on continuous grades at intervals of not more than 400 feet, at all sags in the roadway, and near the upstream corners of the roadway at intersecting streets unless the intersection is at the top of a vertical curve.

(2) Proper connections shall be made with the existing public drainage system naturally serving the subdivision. Where adjacent property is not subdivided and no public drainage exists, provisions shall be made for extension of the system at such size and grade as required by the design criteria.

(3) Wherever drainage systems are located in lands not publicly owned, proper easements shall be taken for their access and maintenance by Town personnel.

E. Natural drainage systems. No open water body or swampy area shall be filled in unless it can be shown to the Board that provision has been made in the downstream drainage system for the removal of the additional runoff caused by this change.

§ 465-37. Water.

A. Public water mains shall not be less than 10 inches in Type III subdivisions and not less than eight inches in Type I and Type II subdivisions except on short cross-connections of 500 feet or less, in which case they may be reduced to six inches. A hydrant shall be located not more than 500 feet from any existing or potential building in Type I or Type II subdivisions, and not more than 250 feet from any existing or potential building in Type III subdivisions.

B. Each hydrant shall be served directly from the water main through a six-inch lateral connection. It shall be gated with a five-inch bottom valve and shall have two-and-one-half-inch hose outlets and one five-inch pump outlet. Valves shall be located in such number and locations that lines by individual block may be isolated from maintenance purposes.

C. Private on-lot water systems shall be designed in conformity with the standards presented in Table 72.[6]

D. Community-type systems or the joint use of wells shall be subject to the standards of the Massachusetts Department of Public Health.

§ 465-38. Sewerage.

A. Where public sewers are required by § 465-42J(1) or (2) of these regulations, the following design standards shall apply:

(1) Public sewers shall be designed according to professional engineering practices.

(2) Public sewers shall be not less than eight inches in diameter.

(3) Manholes shall be located at every change in grade or horizontal alignment but not more than 300 feet apart. Sump

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6. Editor's Note: Table 72 is included at the end of this chapter.

pumps may be permitted at the discretion of the Board of Health.

B. If the developer is required by § 465-42J(3) to provide other than public sewerage disposal, and if he does elect to develop a communal sewerage system, this communal system shall be subject to the approval of the Massachusetts Department of Public Health.

C. Private on-lot sewerage systems shall be designed in conformity with Article XI of the Sanitary Code of the Department of Public Health of the Commonwealth of Massachusetts.

§ 465-39. Easements.

A. Easements for utilities across lots or centered on rear or side lot lines shall be provided where necessary and shall be at least 12 inches wide.

B. Where a subdivision is traversed by a watercourse, drainageway, channel or stream, the Board may require that there be provided stormwater easement or drainage right-of-way of adequate width to conform substantially to the lines of such watercourse, drainageway, channel or stream and to provide for construction or other necessary purpose.

§ 465-40. Open spaces.

Before approval of a plan the Board may also in proper cases require the plan to show a park or parks suitably located for playground or recreation purposes or for providing light and air. The park or parks shall not be unreasonable in area in relation to the land being subdivided and to the prospective uses of such land. The Board may by appropriate endorsement on the plan require that no building be erected upon such park or parks for a period of not more than three years without its approval.

§ 465-41. Protection of natural features.

Due regard shall be shown for all natural features, such as large trees, watercourses, scenic points, historic spots, and similar community assets, which, if preserved, will add attractiveness and value to the subdivision.

ARTICLE X
Required Improvements for Approved Subdivision

§ 465-42. Duty of subdivider; specific improvements required.

Streets shall be constructed and municipal services installed by the subdivider. The following specific improvements are required within a subdivision:

A. Streets and underground services.

(1) Underground services.

(a) All water pipes; sewers; light, power, and telephone conduits; and gas mains shall be installed underground according to the standards specified in § 465-29E(1).

(b) The installation of these underground services shall be inspected as hereinafter provided (first inspection) prior to any backfilling of trenches or other covering of structure.

(2) Street grading.

(a) Street grades shall be formed according to the standards specified in § 465-29E(2).

(b) The roadway subgrade shall be inspected (second inspection) prior to any further roadway construction.

(3) Roadway surfacing.

(a) Roadway surfaces shall be formed in accordance with the standards specified in § 465-29E(3).

(b) Roadways shall be constructed for the full length and width. The center line of such roadways shall coincide with the center line of the street rights-of-way, unless a minor variance is specifically approved by the Board.

(c) Following the construction of the base layer(s), the roadway again shall be inspected as hereinafter provided (third inspection).

B. Shoulders.

(1) Shoulders shall be constructed in accordance with the standards specified in § 465-30.

(2) Upon completion of the pavement and any shoulders, the roadway shall again be inspected as hereinafter provided (fourth inspection).

C. Curbing.

(1) Curbing materials shall conform to the standards specified in § 465-31.

(2) In Type II and III subdivisions, curbings shall be installed along each edge of the roadway in all streets.

(3) In Type I subdivisions, curbing shall be installed at nonlocal street intersections or where a street intersects another street built to Type II or III standards, then along the circumference of the roadway for the full length of the rounded curve plus a straight section at the end of the curve at least six feet long.

(4) When curbed intersections involve one or more streets having a grassed shoulder, the curbing shall be placed at the edge of the roadway and the pavement on the street or streets with such shoulders shall be widened to the full width of the roadway (thus meeting the curb) within 50 feet of the intersection, tapering down to normal width within 75 feet thereof.

D. Sidewalks.

(1) Sidewalks shall be constructed in accordance with the standards specified in § 465-32.

(2) Sidewalks of a width specified by § 465-29B shall be constructed on both sides of the roadways in subdivision Types II and III and on one side of roadway in subdivision Type I.

E. Planting strips. Planting strips shall be provided on each side of the roadway, between the cartway and the sidewalk, where sidewalks are required, in accordance with the standards specified in § 465-33.

F. Side slopes. The area in back of the sidewalk or planting strip shall be formed, graded, and loamed in accordance with the standards specified in § 465-34.

G. Monuments. Monuments of materials specified in § 465-35 shall be installed at all street intersections, at all points of change in direction or curvature of streets and at other points as shown

on the definitive plan and where, in the opinion of the Board, permanent monuments are necessary.

H. Drainage. The drainage system shall be provided and constructed in accordance with the definitive plan and in conformance with the standards specified in § 465-36 of these regulations.

I. Water. If a public water system is located within 400 feet of the subdivision, the subdivider shall connect all lots to the public water system. If a public water system is not located within 400 feet, the subdivider may install private on-lot water systems, provided they are constructed in accordance with the standards of the Massachusetts Department of Public Health.

J. Sewerage.

(1) If a public sewerage system is located within 400 feet of the subdivision, the subdivider shall connect all lots to the public sewerage system.

(2) If a public sewerage system is planned to be installed within 400 feet of the subdivision within five years of the date of submission of the definitive plan, the subdivider shall install in the street end to every lot sewerage laterals which can be connected to the public sewerage system. In order for the subdivider to determine whether such laterals are required and to design and install them properly if required, the Town shall be responsible for establishing and following a definite plan of public sewerage installation and for providing the subdivider, at the subdivider's expense, the necessary specifications and design standards of the sewerage plan.

(3) If public sewerage connections are not required according to Subsection J(2) above, or if the planned public sewerage system has not yet been installed to within 400 feet of the proposed subdivision, the subdivider shall provide other means of sewage disposal which meet the standards of the Massachusetts Department of Public Health.

(4) Sewers or sewerage systems shall be constructed in accordance with the standards specified in § 465-38.

K. Cleaning up.

(1) The entire area must be cleaned up so as to leave a neat and orderly appearance free from debris and other objectionable materials. All catch basins shall be properly cleaned out.

(2) Following the completion of this and all other items of work, a final inspection (fifth inspection) shall be made.

L. As-built plans. As-built plans showing the location, grades, and other significant information regarding utilities shall be prepared by the subdivider and turned over to the Town Clerk following the final approval of the improvements as hereinafter provided.

ARTICLE XI
Administration

§ 465-43. Inspections.

A. The applicant shall employ, at his own expense, an engineer to set all lines and grades in a manner satisfactory to the Board.

B. At the points hereinbefore indicated, the construction of required improvements shall be inspected by the Board, the Highway Surveyor, the Water Company, and Board of Health. Unless the approval of the work completed, including approval of materials used, to each point has been given in writing, no further work shall be done until such work is subsequently completed to the satisfaction of the Board, which shall be given in writing.

C. Inspection shall be requested by the subdivider at least 48 hours in advance by notice to the Board or its duly authorized representative.

D. To cover the cost of such inspection, there shall be deposited with the Board, prior to the first request for inspection, a sum equal to $10 for each 200 feet of a street being constructed or any part thereof.

§ 465-44. Variations.

Strict compliance with the requirements of these rules and regulations may be waived when in the judgment of the Board such action is in the public interest and not inconsistent with the Subdivision Control Law.

§ 465-45. Matters not covered.

For matters not covered by these rules and regulations, reference is made to MGL c. 41, §§ 81K to 81GG, inclusive.

ARTICLE X
Required Improvements for Approved Subdivision

§ 465-42. Duty of subdivider; specific improvements required.

Streets shall be constructed and municipal services installed by the subdivider. The following specific improvements are required within a subdivision:

A. Streets and underground services.

(1) Underground services.

(a) All water pipes; sewers; light, power, and telephone conduits; and gas mains shall be installed underground according to the standards specified in § 465-29E(1).

(b) The installation of these underground services shall be inspected as hereinafter provided (first inspection) prior to any backfilling of trenches or other covering of structure.

(2) Street grading.

(a) Street grades shall be formed according to the standards specified in § 465-29E(2).

(b) The roadway subgrade shall be inspected (second inspection) prior to any further roadway construction.

(3) Roadway surfacing.

(a) Roadway surfaces shall be formed in accordance with the standards specified in § 465-29E(3).

(b) Roadways shall be constructed for the full length and width. The center line of such roadways shall coincide with the center line of the street rights-of-way, unless a minor variance is specifically approved by the Board.

(c) Following the construction of the base layer(s), the roadway again shall be inspected as hereinafter provided (third inspection).

B. Shoulders.

(1) Shoulders shall be constructed in accordance with the standards specified in § 465-30.

(2) Upon completion of the pavement and any shoulders, the roadway shall again be inspected as hereinafter provided (fourth inspection).

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(1) Curbing materials shall conform to the standards specified in § 465-31.

(2) In Type II and III subdivisions, curbings shall be installed along each edge of the roadway in all streets.

(3) In Type I subdivisions, curbing shall be installed at nonlocal street intersections or where a street intersects another street built to Type II or III standards, then along the circumference of the roadway for the full length of the rounded curve plus a straight section at the end of the curve at least six feet long.

(4) When curbed intersections involve one or more streets having a grassed shoulder, the curbing shall be placed at the edge of the roadway and the pavement on the street or streets with such shoulders shall be widened to the full width of the roadway (thus meeting the curb) within 50 feet of the intersection, tapering down to normal width within 75 feet thereof.

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G. Monuments. Monuments of materials specified in § 465-35 shall be installed at all street intersections, at all points of change in direction or curvature of streets and at other points as shown

on the definitive plan and where, in the opinion of the Board, permanent monuments are necessary.

H. Drainage. The drainage system shall be provided and constructed in accordance with the definitive plan and in conformance with the standards specified in § 465-36 of these regulations.

I. Water. If a public water system is located within 400 feet of the subdivision, the subdivider shall connect all lots to the public water system. If a public water system is not located within 400 feet, the subdivider may install private on-lot water systems, provided they are constructed in accordance with the standards of the Massachusetts Department of Public Health.

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(1) If a public sewerage system is located within 400 feet of the subdivision, the subdivider shall connect all lots to the public sewerage system.

(2) If a public sewerage system is planned to be installed within 400 feet of the subdivision within five years of the date of submission of the definitive plan, the subdivider shall install in the street end to every lot sewerage laterals which can be connected to the public sewerage system. In order for the subdivider to determine whether such laterals are required and to design and install them properly if required, the Town shall be responsible for establishing and following a definite plan of public sewerage installation and for providing the subdivider, at the subdivider's expense, the necessary specifications and design standards of the sewerage plan.

(3) If public sewerage connections are not required according to Subsection J(2) above, or if the planned public sewerage system has not yet been installed to within 400 feet of the proposed subdivision, the subdivider shall provide other means of sewage disposal which meet the standards of the Massachusetts Department of Public Health.

(4) Sewers or sewerage systems shall be constructed in accordance with the standards specified in § 465-38.

K. Cleaning up.

(1) The entire area must be cleaned up so as to leave a neat and orderly appearance free from debris and other objectionable materials. All catch basins shall be properly cleaned out.

(2) Following the completion of this and all other items of work, a final inspection (fifth inspection) shall be made.

L. As-built plans. As-built plans showing the location, grades, and other significant information regarding utilities shall be prepared by the subdivider and turned over to the Town Clerk following the final approval of the improvements as hereinafter provided.

ARTICLE II
Sewer Use
[Adopted 4-9-1990 STM by Art. 5]

§ 209-5. Definitions.

Unless the context specifically indicates otherwise, the meaning of terms used in this bylaw shall be as follows:

ACT or THE ACT — The Federal Water Pollution Control Act, also known as the "Clean Water Act," as amended (33 U.S.C. § 1251 et seq.).

AUTHORIZED REPRESENTATIVE OF INDUSTRIAL USER — Either:

A. A principal executive officer of at least the level of vice president, if the industrial user is a corporation;

B. A general partner or proprietor if the industrial user is a partnership or proprietorship, respectively; or

C. A duly authorized representative of the individual designated above, if such representative is responsible for the overall operation of the facility from which the discharge of wastewater originates.

BOD (denoting "biochemical oxygen demand") — Shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at 20° C., expressed in milligrams per liter.

BUILDING DRAIN — Shall mean that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer, beginning five feet (1.5 meters) outside the inner face of the building wall.

BUILDING SEWER — Shall mean the extension from the building drain to the public sewer or other place of disposal.

COMBINED SEWER — Shall mean a sewer receiving both surface runoff and sewage.

COMMISSION — Shall mean the Board of Sewer Commissioners of the Town of Salisbury, or its authorized deputy, agent, or representative.

DOMESTIC WASTEWATER — Shall mean normal water-carried household and toilet wastes discharged from any improved property, excluding ground-, surface, or storm water.

EPA — Shall mean the Environmental Protection Agency of the U.S. Government.

EXCESSIVE — Shall mean amounts or concentrations of any constituent of a wastewater which in the judgment of the Town will cause damage to any wastewater facility, which will be produced in excessive quantities in the sludge produced at the wastewater treatment plant, which will be harmful to a wastewater treatment process, which cannot be removed in the wastewater treatment works of the Town to the degree required to meet the limited stream classification standard of the receiving water, which can otherwise endanger life, limb, the environment or public property, or which can constitute a nuisance.

FACILITIES — Shall include structures and conduits for the purpose of collecting, treating, neutralizing, or disposing of domestic wastewater and/or industrial or other wastewaters as are disposed of by means of structures and conduits, including treatment and disposal works, necessary intercepting, outfall, and outlet sewers, and pumping stations integral to such facilities with sewers, equipment, furnishings thereof and other appurtenances connected therewith.

GARBAGE — Shall mean solid wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the handling, storage, and sale of produce.

IMPROVED PROPERTY — Shall mean any property located within the Town upon which there is erected a structure intended for continuous or periodic habitation, occupancy, or use by human beings or animals and from which structure domestic wastewater and/or industrial wastes shall be or may be discharged.

INCOMPATIBLE POLLUTANT — Shall mean any pollutant, other than biochemical oxygen demand, suspended solids, pH, coliform bacteria, or additional pollutants identified in the permit, which the treatment works was not designed to treat and does not remove to substantial degree.

INDUSTRIAL ESTABLISHMENT — Shall mean any room, group of rooms, building or other enclosure used or intended for use in the operation of one business enterprise for manufacturing, processing, cleaning, laundering, assembling or preparing any product, commodity or article or from which any process waste, as distinct from domestic wastewater, may be discharged.

INDUSTRIAL USER — Shall mean a manufacturing, processing, or other nonresidential facility (such as hospitals, commercial laundries,

and tank and barrel cleaning operations) that discharges nonsanitary wastes to a public sewer.

INDUSTRIAL WASTES — Shall mean the liquid or solid wastes from industrial processes, trade, or business as distinct from sanitary sewage.

INTERFERENCE — Means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both inhibits or disrupts the POTW, the POTW's treatment processes or operations, and the POTW's processes for, use of, or disposal of sludge or of sludge products, including ash. "Interference" includes any inhibition or disruption which causes or contributes to a violation of any requirement of the Town's NPDES permit (including an increase in the magnitude or duration of a violation) or causes or contributes to the prevention of sewerage sludge or sludge product use or disposal by the Town in accordance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) [including Title II, or commonly known as the "Resource Conservation and Recovery Act (RCRA)," and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA], the Clean Air Act, the Toxic Substances Control Act and the Marine Protection Research and Sanctuaries Act.

INVERT — Shall mean the bottom inside of the sewer pipe.

NATIONAL CATEGORICAL PRETREATMENT STANDARD or PRETREATMENT STANDARD — Shall mean any regulation containing pollutant discharge limits promulgated by the U.S. Environmental Protection Agency in accordance with Section 307(b) and (c) of the Act (33 U.S.C. § 1347) which applies to a specific category of users.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT — A permit issued pursuant to Section 402 of the Act (33 U.S.C. § 1342).

NATURAL OUTLET — Shall mean any outlet into a watercourse, pond, ditch, lake, or other body of surface or ground water.

OWNER — Shall mean any person vested with ownership, legal or equitable, sole or partial, or possession of any improved property.

PASS-THROUGH — The passage of pollutants through the POTW into receiving waters in quantities or concentrations which, alone or in conjunction with discharges from other sources, are a cause of a

violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

PERSON — Shall mean any individual, firm, company, association, society, corporation, or group.

pH — Shall mean the logarithm to the base 10 of the reciprocal of the concentration of hydrogen ions in grams per liter of solution.

POLLUTANT — Any material or substance that may cause an alteration of the chemical, physical, biological or radiological integrity of the POTW or its receiving waters.

POTW (PUBLICLY OWNED TREATMENT WORKS) — The treatment works operated by the Town and its agents, including any devices and systems, whether owned by the Town or under its control, used in the collection, storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature and also including, without limiting the generality of the foregoing, the Town's wastewater treatment plant and appurtenances, the sewers, pipes, pumping stations and other devices conveying wastewater to the treatment plant, and sludge processing systems whether operated by the Town directly or by a contractor or agent of the Town.

PRETREATMENT or TREATMENT — The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a less harmful state prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. The reduction or alteration can be obtained by physical, chemical or biological processes, or process changes by other means, except as prohibited by 40 CFR 403.6(d).

PRETREATMENT REQUIREMENTS — Any substantive or procedural requirement related to pretreatment, other than a national pretreatment standard imposed on a user.

PROPERLY SHREDDED GARBAGE — Shall mean the wastes from the preparation, cooking, and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than 1/2 inch (1.27 centimeters) in any dimension.

PROPERTY, PARCEL or LOT — Shall mean an area of land as marked on the assessment drawings in the office of the Town Assessor, Salisbury, Massachusetts.

PUBLIC SEWER — Shall mean a sewer in which all owners of abutting properties have equal rights, and which is controlled by public authority.

RECEIVING WATER QUALITY STANDARDS — The Massachusetts Quality Standards, as provided by MGL c. 21, § 27.

RECEIVING WATERS — Shall mean any watercourse, river, pond, ditch, lake, aquifer, or other body of surface or ground water receiving discharge of wastewaters.

SANITARY SEWER — Shall mean a sewer which carries sewage and to which storm-, surface, and ground waters are not intentionally admitted.

SEPTAGE — The wastes, primarily of sewage origin, that are removed from a cesspool, septic tank, or similar receptacle.

SEWAGE — Shall mean a combination of the water-carried wastes from residences, business buildings, institutions, and industrial establishments, together with such ground-, surface, and storm waters as may be present.

SEWAGE WORKS — Shall mean all facilities for collecting, pumping, treating and disposing of sewage.

SEWER — Shall mean a pipe or conduit for carrying sewage.

SEWER ZONE — Shall mean those areas of the Town of Salisbury which have public sewer as defined on the Town of Salisbury Simplified Sewerage Zone Map as amended from time to time.

SHALL — Is mandatory; "may" is permissive.

SLUG LOADINGS — Shall mean:

A. Pollutants which create a fire or explosion hazard in the POTW;

B. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works is specifically designed to accommodate such discharges;

C. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;

D. Any pollutant, including oxygen-demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW;

E. Heat in amounts which will inhibit biological activity in the POTW resulting in interference, but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40° C. (104° F.).

SPILL — Shall mean the release, accidental or otherwise, of any material not normally released to the facilities which by virtue of its volume, concentration or physical or chemical characteristics creates a hazard to the facilities, their operation or their personnel. Such characteristics shall include, but are not limited to, volatile, explosive, toxic, or otherwise unacceptable materials.

STORM DRAIN or STORM SEWER — Shall mean a sewer which carries storm and surface waters and drainage but excludes sewage and industrial wastes, other than unpolluted cooling water.

SUSPENDED SOLIDS — Shall mean solids that either float on the surface of, or are in suspension in, water, sewage, or other liquids and which are removable by laboratory filtering and are referred to as "nonfilterable residue" in the laboratory test procedures prescribed by the US EPA.

TOWN — Shall mean the Town of Salisbury, in the County of Essex, Commonwealth of Massachusetts.

TOXIC POLLUTANT — Shall mean a pollutant or combination of pollutants listed as toxic in regulations promulgated by the EPA.

UNPOLLUTED WATER — Is water not containing any pollutants limited or prohibited by the effluent standards in effect, or water whose discharge will not cause any violation of receiving water quality standards.

USER — Shall mean any person who contributes, causes, or permits the contribution of sewage into the sewage works.

WASTES — Shall mean substances in liquid, solid or gaseous form that can be carried in water.

WASTEWATER TREATMENT PLANT — Shall mean any arrangement of devices and structures used for treating sewage.

WATERCOURSE — Shall mean a channel in which a flow of water occurs, either continuously or intermittently.

WELL — A private source of water utilized by a person.

§ 209-6. Prohibited discharges. [Amended 10-23-2006 ATM by Art. 2; 5-14-2012 ATM by Art. 16]

A. It shall be unlawful to discharge to any municipal storm sewer or natural outlet within the Town of Salisbury, or in any area under the jurisdiction of said Town, and the Water Resources Commission, Commonwealth of Massachusetts, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this bylaw.

B. Sewer construction in new developments.

(1) The developer of subdivisions approved by the Salisbury Planning Board after enactment of this bylaw and within 500 feet of an existing sewer shall connect into the existing sewer. Said subdivision shall be located within the Town of Salisbury Simplified Sewerage Zone Map. The cost of the sewer connection shall be borne by the developer.

(2) If the requirements of Subsection B(1) exist in the proposed subdivision, the developer shall provide sewers in the proposed streets or rights-of-way. The cost of installation of these sewers shall be borne by the developer.

(3) Connection to each house, building or property erected shall be in compliance with the provisions of this bylaw. The cost of such connections shall be borne by the developer.

(4) When a developer installs sewers in proposed streets or rights-of-way in anticipation of the extension of the public sewer, the cost of installing any subsequent building connections shall be borne by the developer.

(5) The design of any proposed sewer construction under this Subsection B shall be approved by the Commission prior to issuance of a permit.

(6) Subsequent to any construction provided by this Subsection B, no backfill shall be placed until the work has been inspected by the Commission or its representative.

§ 209-7. Building sewers and connections.

A. No unauthorized person shall uncover, make any connections with or opening into, use, alter or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the Commission. Any person proposing a new discharge into the system or a substantial change in the volume or character of pollutants that are being discharged into the system shall notify the Commission at least 45 days prior to the proposed change or connection, and in the case of industrial users, apply or reapply for an industrial sewer permit under § 209-8K.

B. There shall be six classes of building sewer permits: one for residential (Attachment I) and five for all other services; see § 209-8L (Attachment II). In all cases, the owner or his agent shall make application on a special form furnished by the Commission.

C. All costs and expenses incident to the installation and connections of the building sewer shall be borne by the owner. The owner shall indemnify the Town from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

D. A separate and independent building sewer shall be provided for every building, except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer.

E. Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the Commission, to meet all requirements of this bylaw.

F. The size, slope, alignment, materials of construction of a building sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing, and backfilling the trench, shall all conform to the requirements of the building and plumbing code and other applicable rules and regulations of the Town, including the Sewer Commission. In the absence of code provisions or in amplification thereof, the materials and procedures set forth in appropriate specifications of the American Society for Testing and Materials (ASTM) and Water Pollution Control Federation (WPCF) Manual of Practice No. 9 shall apply.

G. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the building sewer.

H. No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer.

I. The connection of the building sewer into the public sewer shall conform to the requirements of the building and plumbing code or other applicable rules and regulations of the Town or the procedures set forth in appropriate specifications of the ASTM and the WPCF Manual of Practice No. 9. All such connections shall be made gastight and watertight. Any deviation from the

prescribed procedures and materials must be approved by the Commission before installation.

J. The applicant for the building sewer permit shall notify the Commission when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the Commissioner or its representative.

K. Well user. In the event a well is a source of a commercial/ industrial Class III user's water and the building is connected to the public sewer, said user shall install and connect a meter, at his expense, from which the Town may monitor the use of the sewer.

§ 209-8. Use of the public sewers.

A. No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, or uncontaminated cooling water to any sanitary sewer.

B. Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as storm sewers, or to a natural outlet approved by the Commission. Industrial cooling water or unpolluted process waters may be discharged, on approval of the Commission, and after receipt of all appropriate state and federal discharge permits, to a storm sewer or natural outlet.

C. No person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewers:

(1) Any gasoline, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid, or gas.

(2) Any waters or wastes containing toxic or poisonous solids, liquids, or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the POTW.

(3) Any waters or wastes having a potential to produce a pH lower than 6.0 or in excess of 9.0, unless specifically permitted by the Board of Sewer Commissioners, or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the POTW.

(4) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers or other

interference with the proper operation of the sewage works, such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, unground garbage, whole blood, paunch manure, hair and fleshings, entrails and paper dishes, cups, and milk containers, either whole or ground by garbage grinders.

(5) Any liquid or vapor having a temperature higher than 104° F. (40° C.).

(6) Any substance which will cause the Commission to violate its NPDES and/or state permit or the receiving water quality standards or otherwise violate any federal or state law, regulation, or administrative rule or order.

(7) Any substance which may cause the sewerage system effluent or any other product of the system, such as residues, sludges, or scums, to be unsuitable for reclamation and reuse or to interfere with the sludge disposal process. In no case shall a substance discharged to the sewer system cause the Commission to be in noncompliance with sludge use or disposal criteria, guidelines or regulations developed under Section 405 of the Clean Water Act, or any criteria, guidelines, or regulations affecting sludge use or disposal developed pursuant to the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act, or state criteria applicable to the sludge management method being used. In no case shall a substance discharged to the sewer system cause the Commission to incur additional expense for the handling, treatment or disposal of wastewaters or sludge because of the nature or characteristics of the discharged substance.

D. No person shall discharge or cause to be discharged the following described substances, materials, waters or wastes:

(1) Any sewage containing toxic pollutants in sufficient quantity, either singly or by interaction with other pollutants, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a toxic effect in the receiving waters or sludges of the sewage treatment plant or to exceed the limitation set forth in a categorical pretreatment standard or national requirement. A toxic pollutant shall include but not be limited to any pollutant identified pursuant to Section 307(a) of the Act (33 U.S.C. § 1347).

(2) Any water or waste containing fats, wax, grease or oils, whether emulsified or not, having a maximum concentration in excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32° and 150° F. (0° and 65° C.).

(3) Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of 3/4 horsepower (0.76 hp metric) or greater shall be subject to the review and approval of the Commission.

(4) Any waters or wastes containing strong acid iron pickling wastes, or concentrated plating solutions, whether neutralized or not.

(5) Any waters or wastes containing materials identified in the composite sewage which exceed the limits established by the Commission for such materials. The Commission hereby establishes the following limits for wastes discharged into the sewers:

Effluent Characteristics	**Maximum Day (mg/l)**	**Maximum Day* (lbs/day)**
Cyanide (Total)	0.65	0.027
Cadmium	0.1	021
Silver	0.43	09
Lead	0.4	084
Aluminum	10.0	0.21
Calcium	50.0	1.05
Chromium (Tot)	2.77	0.058
Chromium (Hex)	0.25	0.053
Sodium	500.0	10.5
Copper	2.7	0.0567
Zinc	2.6	0.0546
Iron	10.0	0.21
Magnesium	10.0	0.21
Selenium	1.0	0.021
Nickel	3.6	0.0756
Beryllium	0.2	0.042

Effluent Characteristics	Maximum Day (mg/l)	Maximum Day* (lbs/day)
Mercury	0.1	021
Arsenic	1.0	0.084
Tin	4.0	0.170
Other heavy metals not above	2.0	0.042
Total Solids	1,000.0	42.0
BOD	300.0	12.5
TSS	350.0	7.35
Oils and Greases	100.0	2.1
Pet. Hydrocarbons	25.0	0.525
TPP	5.0	0.105
TTO	2.0	0.042
Phenols	0.1	021
Sulfate	20.0	0.42
Sulfite	2.0	0.042
Sulfide	20.0	0.42
Chloride	500.0	10.5
Ammonia-Nitrogen	25.0	0.525

*For industrial users discharging 2.500 gpd or less.

(a) The Town may develop or revise these limitations as may be necessary to enforce the general discharge provisions of this bylaw.

(b) Except where expressly authorized to do so by an applicable categorical pretreatment standard, no user shall ever increase the use of processed water or, in any other way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the categorical pretreatment standard.

(c) Mass limitations may be imposed on users which are using dilution to meet applicable pretreatment standards or requirements, or in other cases where the imposition of mass limitations is appropriate.

(6) Any waters or wastes containing phenols or other taste- or odor-producing substances in such concentrations exceeding limits which may be established by the Commission as necessary, after treatment of the composite sewage, to meet the requirements of the state, federal, or other public agencies or jurisdiction for such discharge to the receiving waters.

(7) Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the Commission in compliance with applicable state or federal regulations.

(8) Materials which exert or cause:

(a) Unusual concentrations of inert suspended solids (such as, but not limited to, fuller's earth, lime slurries, and lime residues) or of dissolved solids (such as, but not limited to, sodium chloride and sodium sulfate).

(b) Excessive discoloration (such as, but not limited to, dye substances and vegetable tanning solutions).

(c) Unusual BOD, chemical oxygen demand, or chlorine demand requirements in such quantities as to constitute a significant load on the sewage treatment plant.

(d) Unusual volume of flow or concentration of wastes constituting "slugs" as defined herein.

(9) Waters or wastes containing substances which are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirements of other agencies having jurisdiction over discharge to the receiving waters.

E. Upon the promulgation of the national categorical pretreatment standards for a particular industrial subcategory, the national standard, if more stringent than limitations imposed under this bylaw for sources in the subcategory, shall immediately supersede the limitations imposed under this bylaw. The Sewer Commission shall notify all affected users of the applicable reporting requirements under Subsection M of this section. State requirements and limitations on discharges shall apply in any case where they are more stringent than national requirements and limitations or those in this bylaw.

F. If any waters or wastes are discharged or are proposed to be discharged to the public sewers, which waters contain the substances or possess the characteristics enumerated in Subsections C and D of this section, and which in the judgment of the Commission may have a deleterious effect upon the sewage works, processes, equipment, or receiving waters or sludges, or which otherwise create a hazard to life or constitute a public nuisance, the Commission may, in addition to the remedies set forth in § 209-11:

(1) Halt or prevent the discharge subject to the enforcement procedures in § 209-11.

(2) Modify the industrial sewer discharge permit.

(3) Require pretreatment to an acceptable condition for discharge to the public sewers.

(4) Require control over the quantities and rates of discharge and/or require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges under the provisions of Subsection K of this section.

(5) Require the development of a compliance schedule by each industrial user for the installation of technology required to meet applicable pretreatment standards and requirements. If the Commission permits the pretreatment or equalization of waste flows, the design, installation, or modification of the plants and equipment shall be subject to the review and approval of the Commission, and subject to the requirements of all applicable codes, ordinances, and laws.

G. Grease, oil, and sand interceptors shall be provided when, in the opinion of the Commission, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, or other harmful ingredients. All interceptors shall be of a type and capacity approved by the Commission and shall be located as to be readily and easily accessible for cleaning and inspection.

H. Where preliminary treatment or flow-equalizing facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at his expense.

I. When required by the Commission, the owner of any property serviced by a building sewer carrying industrial wastes shall

install a suitable monitoring station together with such necessary meters and other appurtenances in the building sewer to facilitate observation, sampling, and measurement of the wastewater. Such monitoring station, when required, shall be accessible and safely located and shall be constructed in accordance with plans approved by the Commission. The monitoring station shall be installed by the owner at his expense and shall be maintained by him so as to be safe and accessible at all times to the Town personnel. Users that discharge wastes with a pH lower than 6.0 or in excess of 9.0, unless specifically permitted by the authority, or having any other corrosive property capable of damaging the structures, equipment, or personnel of the POTW, will be required to install a holding tank at their expense, so that representative sampling of the effluent may be taken by the Town's engineers for analysis. A primary flow measurement device must be installed in such a manner that it is the final collection point for wastes before joining sanitary discharge points entering the Town sewerage system.

J. All industries discharging into a public sewer shall perform such monitoring of their discharges as the Commission and/or other duly authorized employees of the Town may reasonably require, including installation, use, and maintenance of monitoring equipment, keeping records and making the results of such monitoring available to the Commission. All measurements, tests, and analyses of the characteristics of waters and wastes to which reference is made in this bylaw shall be determined in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater," published by the American Pubic Health Association, EPA test methods listed in 40 CFR 136, or suitable procedure adopted by the US EPA, and shall be determined at the monitoring station provided, or upon suitable samples taken at said monitoring station. In the event that no special monitoring station has been required, the monitoring station shall be a location to be determined by the Sewer Commission or an individual appointed by it. Sampling shall be carried out by customarily accepted methods to reflect the twenty-four-hour, flow-proportioned representative characteristics of the user's discharge, and the effect of constituents upon the sewage works, and to determine the existence of hazards to life, limb, and property. The particular analyses involved will determine whether a twenty-four-hour composite of all outfalls of a premises is appropriate or whether a grab sample or samples should be taken. Normally, but not always, BOD and suspended solids analyses are obtained from

twenty-four-hour composites of all outfalls whereas pH, oil, grease, chromium (+6) or volatile compound measurements are determined from periodic grab samples. Monitoring and analysis of effluent to determine compliance with national categorical pretreatment standards must be done as specified in the appropriate federal regulation.

K. All industrial or commercial users shall obtain an industrial sewer discharge permit. All new facilities or facilities under new ownership shall obtain an industrial sewer discharge permit before connecting to or contributing to the sewage works. Users required to obtain an industrial sewer permit shall complete and file with the Town an application in the form prescribed by the Town. Existing users shall apply for a sewer permit within 30 days after the effective date of this bylaw, and proposed new users shall apply at least 90 days prior to connecting to or contributing to the sewer system. Permits shall be issued for a specific time period, not to exceed five years. A permit may be issued for a period less than a year or may be stated to expire on a specific date. The user shall apply for permit reissuance a minimum of 180 days prior to the expiration of the user's existing permit. The terms and conditions of the permit may be subject to modification by the Commission during the term of the permit as discharge standards or requirements are modified or other just cause exists. The user shall be informed of any proposed changes in his permit at least 30 days prior to the effective date of the change. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance. Industrial sewer discharge permits are issued to a specific user for a specific operation. An industrial sewer discharge permit shall not be reassigned or transferred or sold to a new owner, new user, different premises, or a new or changed operation without the approval of the Commission.

L. Commercial/industrial users will receive a permit based on the following classifications:

(1) Class I. The sole discharge from the facility(ies) is of a sanitary (domestic) type of wastewater. The only special requirement is a letter annually to the Commission stating that the discharge has not changed from a sanitary type only and the quantity has not changed beyond permit limits.

(2) Class II. The discharge from the facility is both of a sanitary and commercial/industrial nature but does not require pretreatment to meet federal, state or local discharge limits.

The only special requirement other than those required if the industry is a categorical industry limit is an annual letter stating that the discharge from this facility has not changed in quantity or quality within the last year.

(3) Class III. The discharge from this facility requires pretreatment to meet the discharge standards set by federal, state or local regulations.

(a) Class IIIA. If the facility has either a low flow or the discharge only requires treatment of a compatible pollutant the Sewer Commission may place the user in this category. The user must comply with the reporting requirements set forth in Subsection M of this section and install a pretreatment device or negotiate with the Commission for a fee to pay for treatment by the Commission. The user must establish a sampling point and installation of a water meter on all incoming waterlines.

(b) Class IIIB. If the facility discharges less than 2,500 gallons per day the Commission may place it in this category where discharge limits may be based on mass limits instead of concentration. See Subsection D(5). The user must comply with the reporting requirements set forth in Subsection M of this section and must install a monitoring station and water meters on all incoming waterlines.

(c) Class IIIC. All industries discharging one or more pollutants above EPA, DEP or local limits. Special requirements are identical to categorical industries. The user must comply with the reporting requirements in Subsection M of this section and is also required to install a water meter on all incoming waterlines.

M. Users subject to categorical pretreatment standards and requirements are required to submit to the Commission records and reports as required and defined by 40 CFR 403.12 and state regulations and to comply with other reasonable requests for information from the Commission. All industrial users are required to submit to the Commission information regarding Subsection M(1)(d) through (g) below. All reports submitted to the Town must be signed by a responsible corporate officer of a corporation, a general partner of a partnership, the sole

proprietor of a sole proprietorship or a duly authorized representative of an individual.

(1) Such reports include but are not limited to:

(a) Baseline report (including compliance schedule) due within 180 days after the effective date of an applicable categorical pretreatment standard, or 180 days after the final administrative decision made upon a category determination submission under 40 CFR 403.6(a)(4), whichever is later.

(b) Report on compliance with categorical pretreatment standard deadline due within 90 days following the date for final compliance with applicable categorical pretreatment standards, or in the case of a new user, following commencement of the introduction of wastewater into the sewage treatment plant.

(c) Periodic reports on continued compliance due during the months of June and December, unless required more frequently by the Commission or in the categorical pretreatment standard.

(d) Notice of slug loading or any other potential problem or condition of violation. The industrial user must submit the following information within 24 hours of becoming aware of the violation (if this information is provided orally, a written submission must be provided within five days):

[1] A description of the discharge and cause of the violation;

[2] The period of the violation, including exact dates and times or, if not corrected, the anticipated time the violation is expected to continue;

[3] Steps being taken and/or planned to reduce, eliminate and prevent recurrence of the violation.

(e) Continuous pH measurement records as per the attached operation, maintenance and reporting requirements.

(f) Records pertaining to changes in the level or nature of business activity, production capacity, staffing or other activity which significantly alters the amount of wastewater produced, or the characteristics of the discharge.

(g) Records of on-site storage (inventories) of all toxic or hazardous substances present at the facility, including the type and maximum quantity for each material located on the premises.

(h) Records of generation rates and disposal shipments for all special and hazardous wastes, including residual substance produced or concentrated by any wastewater pretreatment systems or processes.

(i) Training records and other documentation of qualifications for all personnel involved in the handling of hazardous wastes, special wastes and wastewater pretreatment residuals.

(j) Purchasing records and logs for certain materials which have a bearing on the proper operation and maintenance of any wastewater pretreatment system. Such materials may include purchased acids, bases, polymers, filtration aids, media replacement cartridges, etc. The Town may also request the documentation of material throughout for any compounds or substances determined to be of particular concern because of interference, inhibition, pass-through, toxicity or safety to the public treatment works, the workers or the environment.

(k) Water consumption records, such as meter readings, log books, line drawings and process schematics which describe the water-using processes, the sources and final discharge points for water, including an itemization of water used in sanitary, process, cooling or product uses.

(l) Water treatment additive dosage calculations and records, particularly any toxic additives such as biocides and antifouling agents.

(m) Wastewater collection and treatment operation and maintenance records.

(n) Records of any related permits, such as direct discharge permits for cooling water disposal, hazardous waste permits, etc.

(o) Laboratory analysis records of effluents discharged into the Town sewer and any materials hauled off site for resource recovery or disposal.

(p) Records of any and all enforcement actions, notices of violation, compliance schedules, pretreatment system approval letters, etc.

(q) Documentation of design flows, capacities, rated efficiencies and settings for all pollution control devices and systems, including but not limited to the wastewater pretreatment system components such as pumps, tanks, mixers, clarifiers, filter presses, centrifuges, and pH meters, recorders, flow meters and primary flow measurement devices.

(2) Any industrial user subject to the reporting requirements established in this section shall be required to maintain for a minimum of three years all records of monitoring activities and results and shall make such records available for inspection and copying by the EPA and the Commission. The period of retention shall be extended during the course of any unresolved litigation in which the industrial user is involved. Information and data obtained from reports and other information supplied by any category of user shall be available to the public or other governmental agency without restriction unless the user specifically requests and is able to demonstrate that the release of such information would divulge trade secrets or secret processes. Any user able to make that demonstration is entitled to have those portions of reports and other requested information which would reveal trade secrets and secret processes withheld from the public, but other governmental entities may receive such information upon written request. Wastewater constituents and characteristics will not be recognized as confidential information under any circumstances.

§ 209-9. Protection from damage.

No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance, or equipment which is a part of the sewage works. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct.

§ 209-10. Powers and authority of inspectors.

A. The Commission and other duly authorized employees of the Town bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection,

observation, measurement, sampling, reviewing records, procedures and testing in accordance with the provisions of this bylaw. The Commission or its representatives shall have no authority to inquire into any processes including metallurgical, chemical, oil, refining, ceramic, paper, or other industries beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways or facilities for waste treatment.

B. While performing the necessary work on private properties referred to in Subsection A, the Commission or duly authorized employees of the Town shall observe all safety rules applicable to the premises established by the company and the company shall be held harmless for injury or death to the Town employees and the Town shall indemnify the company against loss or damage to its property by Town employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions as required in § 209-8I.

C. The Commission and other duly authorized employees of the Town bearing proper credentials and identification shall be permitted to enter all private properties through which the Town holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair, and maintenance of any portion of the sewage works lying within said easement. All entry and subsequent work, if any, on said easement shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved.

§ 209-11. Enforcement.

A. The Commission may suspend the wastewater treatment service and/or an industrial sewer discharge permit when such suspension is necessary, in the opinion of the Commission, in order to stop an actual or threatened discharge which presents or may present an imminent or substantial endangerment to the health or welfare of persons or to the environment, causes interference to the POTW, causes the Town to violate any condition of its NPDES permit, or causes the Town to violate any federal or state law, regulation, or administrative rule or order. Any person notified of a suspension of the wastewater treatment service and/or the industrial sewer discharge permit

shall immediately stop or eliminate the contribution. In the event of a failure of the person to comply voluntarily with the suspension order, the Commission shall take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW system or endangerment to any individuals. The Commission shall reinstate the industrial sewer discharge permit and/or the wastewater treatment service upon proof of the elimination of the noncomplying discharge. A detailed written statement submitted by the user describing the causes of the harmful contribution and the measures taken to prevent any future occurrence shall be submitted to the Commission within 15 days of the date of occurrence.

B. Any user who violates the following conditions of this bylaw or applicable state and federal regulations is subject to having its permit revoked, after a hearing before the Commission:

(1) Failure of a user to factually report the wastewater constituents and characteristics of its discharge;

(2) Failure of the user to report significant changes in operations, or wastewater constituents and characteristics;

(3) Refusal of reasonable access to the user's premises for the purpose of inspection or monitoring; or

(4) Violation of conditions of the permit.

C. At any time the Town Counsel may commence an action for appropriate legal and/or equitable relief in order to halt a discharge in violation of this bylaw, the Town's NPDES permit, or any federal or state law, regulation, or Town administrative rule or order, or otherwise to enforce any provision of this bylaw.

§ 209-12. Violations and penalties.

A. Any person found to be violating any provision of this bylaw except § 209-10 shall be served by the Town with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

B. Any person who is found to have failed to cease all violations as defined in Subsection A, whether intentionally, unintentionally or accidentally, may be assessed a civil penalty of up to $5,000 per day. In addition, any violation of this bylaw shall be punishable

of a fine of $50 per day. Each day in which any such violation shall continue shall be deemed a separate violation for purposes of both the civil penalty and the fine provisions of this section. Exceeding daily pretreatment standards will be deemed a separate violation as to each effluent characteristic listed in § 209-8 of this bylaw or regulated by federal or state categorical pretreatment standards.

C. Any person violating any of the provisions of this bylaw shall become liable to the Town for any expense, loss, or damage occasioned by the Town by reason of such violation.

D. In exercising its authority to halt or prevent discharges under § 209-8D(1) or enforce applicable penalties, the Commission will follow the guidelines of 40 CFR 403.8.

E. The Commission, pursuant to a filing by the Town of a certificate of acceptance of conditions for the issuance of a sewer charge lien with the Essex County Registry of Deeds, may place a lien upon the property or premises for which sewer user charges, service charges, fines, fees or penalties, as provided for in this section, are more than 60 days overdue. Notwithstanding such lien, any overdue sewer user charge or service charge may be collected through any legal means, including the shutting off of a sewer connection, which may be deemed advisable.

F. Schedule of penalties:

(1) Failure to submit reports as required: $1,000.

(2) Failure to submit reports on time: $500.

(3) Failure to perform required testing: $1,000.

(4) Failure to report slug discharge (verbal): $10,000.

(5) Failure to submit slug discharge report within 48 hours: $2,500.

G. Any person who knowingly makes false statements, representations or certifications in any application, record, report, plan or other document filed or required to be maintained pursuant to this bylaw, or permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this bylaw, shall be penalized according to the established enforcement and penalty provisions of this bylaw.

H. The Commission will publish at least once a year a list of industrial users which, during the previous 12 months, were

significantly violating applicable pretreatment standards or other pretreatment requirements. For the purposes of this provision, a significant violation is a violation which remains uncorrected 45 days after notification of noncompliance; which is part of a pattern of noncompliance over a twelve-month period; which involves a failure to accurately report noncompliance; or which resulted in the Commission exercising its emergency authority under Subsection A of this section.

§ 209-13. Fees.

A. A sewer user charge shall be paid by each user in accordance with rules and regulations approved by Sewer Commission.

B. Users subject to pretreatment standards and requirements will be charged for monitoring and analytical testing and reporting conducted by the Salisbury Sewer Department. The service charge will be calculated by allocating each user a proportional share of the total cost of the pretreatment program taking into consideration the number of sampling site visits and the number and type of analytical tests required.

C. For Contracts 1 to 8, a connection permit and inspection fee of $350 for each initial sewer permit and connection shall be paid to the Town at the time the application is filed. **[Amended 10-23-2006 ATM by Art. 2]**

D. This subsection provides for surcharges for concentrations of BOD in excess 300 mg/l and total suspended solids in excess of 350 mg/l. These surcharges are sufficient to recoup cost of treatment for such excessively strong wastewaters. These are to be $10 per hundred pounds of BOD and $13.50 per hundred pounds of suspended solids in excess of allowable concentrations.

§ 209-14. When effective.

This bylaw shall be in force and effect from and after its passage, approval, recording, and publication as provided by law.

§ 209-15. Severability.

The invalidity of any section, clause, sentence, or provision of this bylaw shall not affect the validity of any other part of this bylaw which can be given effect without such invalid part or parts.

ARTICLE VI
Administration and Enforcement

§ 300-24. Intent and purpose.

The intent and purpose of this article is to provide the specific means by which this bylaw is administered, enforced, varied, and amended, and to specify the limits of validity.

§ 300-25. Administrative official.

The duty of administering and enforcing the provisions of the bylaw is hereby conferred upon the Building Inspector who shall have such powers as are conferred upon him by this bylaw and as reasonably may be implied. He shall be appointed as presently specified by the bylaws of the Town of Salisbury.[1]

§ 300-26. Duties of Building Inspector.

A. It shall be the duty of the Building Inspector, or his duly authorized agents, to cause any plans, buildings, or premises to be examined or inspected to determine that they are not in violation of the provisions of this bylaw.

B. Where the Building Inspector, in the course of his duties, determines that any plans, buildings, or premises are in violation of the provisions of this bylaw, he shall order the responsible party in writing to remedy such conditions. Said written order shall specify the nature of the violation found to exist, the remedy ordered, the time permitted for such action and the penalties and remedies which may be invoked by the Town and the violator's right of appeal, all as provided for by this bylaw and the Zoning Act.

C. On the serving of notice by the Building Inspector to the owner for any violation of any provisions of this bylaw, a certificate of occupancy shall be required for any further use of such building or premises.

D. The Building Inspector shall maintain a permanent public record of all matters considered and all action taken by him, and such records shall form a part of the records of his office.

E. An individual permanent file for each application filed by Assessor's Map and parcel/lot for a permit as provided for by this bylaw shall be established at the time the application is

1. **Editor's Note: See Ch. 188, § 188-1.**

made. Said file shall contain one copy of the application and all supporting documents, maps, and plans; notations regarding pertinent dates and fees, and the like; as appropriate, one copy of the resolution of the ZBA in acting on the application; and the date the permit applied for was issued or denied by the Building Inspector. **[Amended 10-22-2018 ATM by Art. 20]**

F. The Building Inspector shall prepare a monthly report for the Board of Selectmen. Said report shall cite all actions taken by the Building Inspector, including all referrals made by him, and the action taken by him consequent thereon. A copy of this monthly report shall also be transmitted by the Building Inspector to the Board of Assessors, Planning Board and ZBA at the same time it is transmitted to the Board of Selectmen. The Building Inspector shall provide the Assessing Department with a copy of or access to print a copy of each permit issued within seven days after the granting of each permit. **[Amended 10-22-2018 ATM by Art. 20]**

G. All other actions of the Building Inspector shall be undertaken as provided for in the Zoning Act.

§ 300-27. Building permit and certificate of occupancy.

A. It shall be unlawful for any owner or person to erect, construct, reconstruct, or alter a structure or change the use or lot coverage, increase the intensity of use, or extend or displace the use of any building or other structure on a lot without applying for and receiving from the Building Inspector the required building permit therefor. For purposes of administration, such permit and application procedure involving a structure may be made at the same time and combined with the permit required under the Building Code. An application for a permit shall be accompanied by a plan, accurately drawn, showing the actual shape and dimensions of the lot to be built upon, the exact location of new buildings or structures to be constructed, together with the lines within which all buildings or structures are to be erected, the existing and intended use of each building or structure and such other information as may be necessary to provide for the execution and enforcement of this bylaw.

B. The actions of the Building Inspector with respect to denying or granting a building permit shall be governed by the provisions of the Zoning Act.

C. No building hereafter erected, altered substantially in its use or extent or relocated shall be used or occupied, and no change shall be made of the use of any building or of any parcel of land, unless a certificate of occupancy signed by the Building Inspector has been granted to the owner or occupant of such land or building. Such certificate shall not be granted unless the proposed use of land and building and all accessory uses comply in all respects with this bylaw, and no use shall be made of such land or building that is not authorized by such certificate of occupancy. **[Amended 10-23-2006 ATM by Art. 5]**

D. Applications for certificates of occupancy shall be filed coincident with the application for building permits and shall be issued or refused in writing for cause within five days after the Building Inspector has been notified in writing that the erection or alteration of such buildings has been completed. Failure of the Building Inspector to act within five days of receipt of said notification shall be deemed to constitute approval of the application for a certificate of occupancy. Buildings accessory to dwellings when completed at the same time shall not require a separate certificate of occupancy. Pending the issuance of a regular certificate, a temporary certificate may be issued for a period not exceeding six months, during the completion of alterations or during partial occupancy of a building, pending its completion if the building fails to conform to the provisions of the Building Code and state laws or of this bylaw to such a degree as to render it unsafe for the occupancy proposed. **[Amended 10-23-2006 ATM by Art. 5]**

§ 300-28. Fees.

Fees shall be established from time to time for this Zoning Bylaw by the Board of Selectmen.

§ 300-29. Violations and penalties.

A. If the Building Inspector shall be informed or have reason to believe that any provision of this bylaw has been, is being or may be violated, he shall make or cause to be made an investigation of the facts and inspect the property where the violation may exist. If he shall find any such violation, he shall serve a notice of violation and order to any owner or person responsible for such violation of the provisions of this bylaw or in violation of a permit or certificate issued under the provisions of this bylaw, and such order shall direct the discontinuance of the unlawful action, use, or condition and the abatement of the violation within a time to be

specified by the Building Inspector. Any owner who, having been served with a notice, ceases any work or other activity shall not leave any structure or lot in such condition as to be a hazard or menace to the public safety, health, or general welfare. Should the Building Inspector be refused an inspection by the owner and/or person responsible for said alleged violation, the building permit shall be deemed invalid.

B. If the notice of violation and order is not complied with promptly, the Building Inspector shall institute the appropriate action or proceeding at law or in equity to prevent any unlawful action, use, or condition and to restrain, correct, or abate such violation. Penalties for violations shall, upon conviction, be affixed in an amount of $50 for each offense. Each day, or portion of a day, that any violation is allowed to continue shall constitute a separate offense. **[Amended 11-6-1989 ATM by Art. 27]**

ARTICLE XVII
Earth Removal

§ 300-99. General provisions.

A. The removal of soil, loam, sand and/or gravel from land not in public use within the Town of Salisbury, except as hereinafter provided, is prohibited.

B. The failure to construct an adequate fence or barrier around an area where earth materials have been or are in the process of being removed within 30 days of the receipt of a written order to do so by the Selectmen of the Town shall constitute a separate violation of this bylaw for each day in excess of 30 days that such fence or other barrier has not been constructed.

C. The failure to have completed finished grades in permitted excavation area of at least two units horizontal for every one unit of elevation within three months after permitted earth removal has been completed shall constitute a violation of this bylaw for each week in excess of three months that such grading remains incomplete.

§ 300-100. Permitted earth removal operations.

Any person or firm may be issued a permit by the Board of Selectmen for removal of earth materials from land not in public use upon the following terms and conditions.

A. An applicant for such permit shall present a plan of the premises where such removal is contemplated showing with specificity the area where earth removal operations will occur, the present elevations or topography, the proposed finished elevations or topography, and the annualized water table elevation for such premises.

B. The applicant shall present a written outline proposal indicating the type of fence or barrier that he intends to construct around the earth removal site, and the time period in which he intends to remove the earth materials.

C. The Board of Selectmen, upon such application, may issue a permit for such earth removal in accordance with such plan and written statement or outline, and such other restrictions or conditions as it may require to ensure protection from damage to the public or natural water supply, damage to adjoining lands, roads, or structures, hazards to children and strangers, detriment

to a neighborhood, and inconvenience to the public. If the Board finds that no restrictions or conditions will adequately protect against the above hazards it may refuse to issue such permit.

D. The Board of Selectmen may require the applicant to post a bond with or without sureties for completion of the work permitted on the premises.

E. Any such permit shall expire and be of no further force or effect on December 31 in the year it was issued.

§ 300-101. Continuing earth removal operations.

A. Any earth removal operation carried over from one year to the next must be issued a permit for each calendar year it is in operation prior to any earth removal operations in that calendar year.

B. The permit procedure for each calendar year shall require submission of a plan showing with specificity the area where earth materials are to be removed in that year, including before and after elevations and slopes and the annualized water table elevation for that area. A written statement shall also be required setting forth the types of barriers or fences constructed around any new site and the time in which that year's work will be completed on the new site. No later than 45 days prior to permit expiration date, the applicant shall submit a fully certified registered engineer map showing the items recited in this subsection.

C. The Board of Selectmen may refuse to issue a permit for such continued operation if it finds that the requirements of a previous year's plan with respect to the subject premises or person or firm have not been met or completed, or if it finds such continued operations would endanger the natural water supply, adjacent lands, roads, or structures, or the safety of children or strangers.

D. The Board may issue a permit for such continued operation subject to such restrictions or conditions as it sees fit to ensure the provisions of Subsection C are satisfied, and such permit shall expire on December 31 in the year it is issued.

E. The Board shall require the applicant to post a bond with or without surety for the completion of work permitted on the premises of $5,000 per acre shown on the engineer map provided to the Town under Subsection B above.

§ 300-102. Preexisting earth removal operations.

An applicant for a permit who has operated an earth removal site continuously for the two years prior to January 1, 1985, shall not be refused a permit for such site on the grounds that such earth removal constitutes a detriment to the neighborhood or an inconvenience to the public; however, such person or firm must in each and every other respect comply with the provisions of this bylaw in any earth removal operations.

§ 300-103. Cessation of operations; suspension or revocation of permit.

A. The Board of Selectmen, upon investigation of an earth removal site, may issue a hearing notice and order with respect to any earth removal operation which it has reason to believe is in violation of the permit issued for such removal, or is otherwise in violation of this bylaw. Such notice shall require the owner and operator of the earth removal site to cease any and all earth removal until appearing at a hearing before the Board to be held no later than 10 days from the date when such notice is served, at which time the Board will hear evidence as to any alleged violation that any party or his attorney may care to present.

B. If, after such hearing, the Board determines that a violation of the terms and conditions of a permit or this bylaw has occurred, it may revoke, suspend, or modify such permit as it sees fit to ensure continued compliance with this bylaw throughout the Town.

§ 300-104. Special provisions.

A. No earth removal shall be permitted within 200 feet of a way below the elevation of the way.

B. No standing water in excess of one foot in depth shall by permitted upon an earth removal site without an adequate fence completely surrounding such water and two warning signs posted conspicuously on such fence.

C. No excavation on an earth removal site shall be permitted below the annualized water table elevation without specific express authority therefor evidenced on the face of a permit.

D. The Board of Selectmen shall have the authority to waive any of the permit procedure requirements, and barrier and grade

requirements, upon a finding that such waiver is not inconsistent with the intent and purpose of this bylaw.

§ 300-105. Violations and penalties.

Except as otherwise provided in § 300-99B and C, a violation of this bylaw is deemed to exist for each day that a violation continues to occur or exist upon any land not in public use.

A. A violation within a calendar year is punishable by a fine of $50.

B. A second violation within a calendar year is punishable by a fine of $100.

C. Each subsequent violation within a calendar year is punishable by a fine $200.

§ 300-106. Severability.

In the event any one or more provisions of this bylaw are found or determined to be illegal or unenforceable by the Massachusetts Appeals Court or the Massachusetts Supreme Judicial Court, then the illegality of any such provision shall not affect the validity of any other provisions of this bylaw which provisions will remain in full force and effect.

§ 300-107. Construal of provisions; applicability.

A. Wherever possible this bylaw is to be construed consistently with the General Laws and other bylaws of the Town. In the event the provisions of this bylaw conflict with the provisions of another Town bylaw, then this bylaw shall be controlling with respect to the issue in conflict.

B. This bylaw shall not apply to the removal of earth materials in connection with the construction of a building for which a building permit has been issued or to the removal of earth materials in accordance with a subdivision plan approved or endorsed by the Salisbury Planning Board.

§ 300-108. Removal of sand, loam or gravel.

Clause 17 of MGL c. 40, § 21 regulates the removal of sand, loam or gravel from land not in public use in the Town of Salisbury.

A. No person who is an inhabitant of the Town or noninhabitant of the Town, or company or corporation, shall remove sand, loam, or

gravel from land not in public use in the confines of the Town of Salisbury, Massachusetts.

B. Penalty for violation of bylaw: first offense, $50; second offense, $100; for each subsequent offense, $200.

ARTICLE XVIII
Site Plan Review
[Added 5-20-1996 ATM by Art. 21; amended 5-16-2005 ATM by Art. 15; 10-26-2010 ATM by Art. 14]

§ 300-109. Intent.

This bylaw recognizes that certain developments of land, though generally suitable for location in a particular zoning district, are, because of their nature, size, complexity or other reasons of probable impact, capable of affecting the stated purposes of this bylaw, unless careful consideration is given to certain critical design elements. It is the intent of this bylaw to provide a mechanism for the review of an applicant's attention to such critical design elements within developments that are subject to review.

§ 300-110. Purpose.

The purpose of this bylaw is to protect the public health, safety, and welfare; to promote balanced growth; to protect property values; and to encourage development by providing the public and the Town with an opportunity to review and comment.

§ 300-111. Reviewing authority; major and minor projects; determination of applicability.

A. The Planning Board shall be the reviewing authority for all major and minor projects subject to site plan review.

B. A determination of the applicability of the Site Plan Review Bylaw shall rest with the Building Inspector. After a filed written request, the applicant will be notified in writing whether the proposed project requires site plan review and, if so, whether it constitutes a major or minor project. Alternatively, an applicant may request an informal/advisory determination from the Building Inspector in order to expedite the process so long as adequate plans and information are provided for the Building Inspector to make a reasonable determination. Being advisory only, such a determination will not entitle the applicant to a written opinion as to whether the proposed project requires site plan review. The following criteria shall be used to determine whether a proposed project is reviewed as a major or minor project: **[Amended 5-14-2012 ATM by Art. 15; 10-23-2017 ATM by Art. 23]**

(1) Major projects.

(a) Any nonresidential construction project that includes one or more of the following is considered a major project subject to site plan approval from the Planning Board:

[1] New construction or addition of 5,000 or more square feet of gross floor area.

[2] Renovation of 5,000 or more square feet of an existing structure that creates a significant increase in impact on traffic, public infrastructure, or parking.

[3] Construction of a drive-through facility.

[4] Construction of 25 or more new or additional parking or loading spaces.

[5] More than one new attachment WCF, small cell type within a year of permit application and prior to construction.

(b) Any residential construction project consisting of more than three dwelling units on any single lot is considered a major project subject to site plan approval from the Planning Board.

(2) Minor projects.

(a) Any nonresidential construction project that includes one or more of the following is considered a minor project subject to site plan approval from the Planning Board:

[1] New construction or addition of 2,500 or more square feet of gross floor area and less than 5,000 square feet of gross floor area.

[2] Construction of 15 or more and fewer than 25 new or additional parking or loading spaces.

[3] Newly paved areas, other than driveways, that are greater than 3,000 square feet that are not used for parking or loading.

[4] Any activity disturbing an acre or more.

[5] Reconstruction/reclamation/replacement (not overlay) of an existing paved area of an acre or more.

[6] One new attachment WCF, small cell type.

(3) Repaving. Repaving (overlay) of an existing paved area of any size is exempt from site plan review.

(4) Administrative review. Any nonresidential construction project that requires a building permit but is not included within the definition of a major or minor project is subject to administrative review by the Building Inspector in accordance with the Massachusetts State Building Code, 780 CMR Chapter 1, Section 111 (Permits).

§ 300-112. Review procedure; hearing; decision.

A. Review procedure.

(1) Any person proposing a project that is determined by the Building Inspector to require site plan review (major or minor) shall obtain an application for site plan approval. Prior to filing a site plan application, the applicant is encouraged to review the proposed site plan with the Planning Department. The purpose of this pre-filing review is to address questions in order to give the applicant advice and comments prior to submitting a site plan application and thus avoid unnecessary time and costs to the applicant due to unforeseen problems and issues.

(2) Upon filing, the applicant must submit one copy of a completed site plan application and one copy of the site plan, conforming to all requirements listed in the bylaw, to the Planning Board, in care of the Planning Department.

(3) The site plan application and plan will be date stamped by the Planning Department and reviewed for completeness. Within seven calendar days, the Planning Department will notify the applicant if the application conforms to all requirements listed in the bylaw or needs additional information. Applications which include waiver requests made for specific bylaw requirements may be deemed complete for those specific bylaw requirements. If the application is deemed incomplete by the Planning Department, the applicant may either withdraw the application without prejudice or submit one copy of a revised application. If the application is deemed complete by the Planning Department, the applicant may then file with the Planning Board, in care of the Planning Department, the completed application and the required copies of the application and plan along with the appropriate application fee according to the Planning Board Rules and

Regulations and a project fee according to the Planning Board Rules and Regulations. The application will then be stamped in by the Town Clerk. The application fee will be considered nonrefundable when the application is stamped in by the Town Clerk.

(4) All Town staff comments shall be submitted to the Planning Board within 14 calendar days of receipt of a complete site plan approval application and these comments shall be available to the applicant or his representative at least 48 hours in advance of the date and time at which the application is first considered by the Planning Board at a public meeting.

(5) Major and minor project procedural differences.

(a) Major projects. A public hearing, which has been noticed according to MGL c. 40A, § 11, will be held within 30 days of the date the complete application was stamped in by the Town Clerk. The Planning Department shall send written notice by first class mail to all abutters. Legal advertisement and postage shall be paid by applicant. Final action on the major project site plan shall be taken by the Planning Board within 60 days of the date the public hearing was opened.

(b) Minor projects. The Planning Board will review the minor project site plan review application under general business at a regularly scheduled Planning Board meeting within 30 days of the date the complete application was stamped in by the Town Clerk. Final action on the site plan shall be taken by the Planning Board within 45 days of the date the application was stamped in by the Town Clerk. The Planning Department shall send written notice by first-class mail to all immediate abutters.

B. Public hearing. The public hearing for major projects, which has been noticed according to MGL c. 40A, § 11, will be held within 30 days of the date the complete application was stamped in by the Town Clerk. The Planning Department shall send written notice by first-class mail to all abutters. Legal advertisement and postage shall be paid by applicant.

C. Final action. Final action on the site plan application shall be taken by the Planning Board within 60 days of the date the public hearing was opened for major projects, and within 45 days from the date the application was stamped in by the Town Clerk

for minor projects. Failure of the Planning Board to act within the above-prescribed time frame for major and minor projects shall be deemed as approval and it shall forthwith make such endorsement on said plan and, on its failure to do so, the Town Clerk shall issue a certificate to the same effect.

D. Waivers. When reviewing minor or major projects, the Planning Board may grant waivers in regards to submittal requirements listed in the Planning Board's Rules and Regulations. Such waivers may be granted for requirements that the Planning Board judges to be unnecessary, provided that the planned construction will not have a significant impact on pedestrian and vehicular traffic patterns, public services and infrastructure, both within the site and in relation to adjacent properties and streets. Said waiver requests shall be accompanied by a statement setting forth the reasons why, in the applicant's opinion, the granting of such a waiver would be in the public interest or the specific information required is irrelevant to the project, and why a waiver would be consistent with the intent and purpose of the bylaw and the regulations. The applicant should make an effort to include all waiver request(s) with the initial filing of the application so that the Planning Department may render a decision on the application's completeness. The Planning Board shall issue waiver request approvals, and likewise, waiver request denials, in writing. The waiver request decisions may be incorporated in any final site plan approval or disapproval decision. The applicant should be prepared, in the case of a waiver denial, to supply the Planning Board with the missing requirements in a timely manner.

E. Approval. The Planning Board may approve the application after finding that the proposed project is in compliance with the purpose and intent of site plan review as noted in §§ 300-109 and 300-110, and the site plan submission requirements and the site plan performance and design standards in their entirety, notwithstanding any waiver granted. One copy of the approved site plan and approval letter, signed by the Planning Board, shall be forwarded to the Building Inspector, applicant, and Town Clerk within five days of final Planning Board action.

F. Denial. The Board may deny a site plan review application that fails to furnish adequate information required by the site plan submission requirements as set forth in the Planning Board's Rules and Regulations. Further, the Board may deny a site plan where, although proper in form, the project fails to meet the site plan performance and design standards or depicts a use or

structure so contrary to the health, safety, and welfare of the public in one regulated aspect or another that no reasonable condition can be imposed which would satisfy the problem. The disapproval letter shall specifically state the reasons for denial.

G. Conditions.

(1) In granting approval of an application the Board may impose reasonable conditions, limitations and safeguards that shall be in writing and shall be a part of such approval. Such conditions may include, but are not limited to:

(a) Controls on the location and type of access to the site.

(b) Requirements for off-site improvements to improve the capacity and safety of roads, intersections, pedestrian ways, water, sewer, drainage, and other public facilities which are directly necessitated by the proposed development.

(c) Donation and/or dedication of land for right-of-way to provide for roadway and/or intersection widening or improvements directly necessitated by the development.

(d) Conditions to minimize off-site impacts on traffic and environmental quality during construction.

(e) Requirements for screening parking facilities from adjoining premises or from the street by walls, fences, plantings, or other devices to mitigate adverse impacts.

(f) Conditions to mitigate adverse impacts to the neighborhood and abutters, including but not limited to adverse impacts caused by noise, dust, fumes, odors, lighting, headlight glare, hours of operation, water runoff or snow storage.

(2) The applicant, when other than the owner(s), and the owner(s) of land shall be responsible for any mitigation measures or conditions required as part of a favorable decision for issuance of site plan approval. The Planning Board shall send its decision, including all conditions and/or modifications, in writing to the Building Inspector, applicant, and Town Clerk.

H. Certificate of completion. A certificate of completion application, in a form approved by the Planning Department, shall be submitted by the applicant or owner to the Planning Department

upon completion of all required improvements. The Planning Board's designated inspector shall complete a final inspection of the site within 10 calendar days of the filing of the certificate of completion application by the applicant. As a result of the approved inspections, the inspector shall submit to the Planning Department a signed certificate of completion indicating that all work has been completed to the satisfaction of the Town. If the Board's inspector signs the certificate of completion, the applicant may proceed to request a final certificate of occupancy. A certificate of completion signed by the Board's inspector officially terminates the Board's involvement in the site plan review process.

I. Occupancy permits. No occupancy permits shall be issued for any building or structure, or portion(s) thereof, until a certificate of completion indicating that all work has been completed to the satisfaction of the Town is signed by the Board's designated inspector. However, occupancy permits may be issued for a portion of any building or structure if the only incomplete work shown on the site plan is landscaping or minor site work, provided that surety is posted with the Town Clerk in an amount to be set by the Planning Board at a regular meeting. The applicant may request a waiver from this requirement. The Planning Board shall establish a deadline for completion of one year from the posting of the surety. The Planning Board may require surety to be posted for site work in addition to landscaping if an unusual or unexpected event prevents the applicant from completing the site work. This allowance is subject to the review by the Planning Board by a site inspection to insure the safety and health of those who occupy the structure and use the site. This allowance may not be used for incomplete stormwater management areas or for wetlands replication that may be required by the Conservation Commission.

§ 300-113. Time frames.

A. Five-year limitation. Active development or at least substantial progress toward implementation of the approved site plan must occur within five years or the approval becomes void. In the event that an applicant is unable to meet the requirements of this article within the requisite period, the applicant may request an extension for completion or substantial development.

B. Extensions. The Planning Board may extend approvals for an additional two-year period, such extension not to be reasonably denied. Thereafter, extensions may be granted on a year-to-year

basis. A request for extension, accompanied by a schedule of completion, shall be completed by the applicant and filed with the Board in advance of its scheduling a hearing on the extension request at a regular or special Board meeting.

§ 300-114. On-site construction changes. [Amended 10-23-2017 ATM by Art. 23]

An applicant may make limited on-site changes to an approved site plan. Said changes shall be based on unforeseen conditions, situations, or emergencies. Prior to undertaking the on-site alterations, the applicant shall submit to the Planning Department a written request detailing the proposed changes and a copy of said request shall be provided to the Planning Board. The Planning Director, or their designee, shall review the request and may approve limited on-site changes that are generally consistent with the approved site plan or require Planning Board review of the request if the proposed changes are of such a nature or magnitude that they would unreasonably compromise the basis of approval under §§ 300-109 and 300-110. The Board may review any request for on-site construction changes under general business and may either approve, modify or deny the requested on-site changes. Said request shall not be unreasonably denied. An appeal of the Planning Director’s, or their designee's, decision on a limited on-site change shall be heard by the Planning Board.

§ 300-115. Fees and costs.

An application fee shall be filed with the Planning Department at time of submission of the complete application. The application fee will be considered nonrefundable when the application is stamped as received by the Town Clerk. The Board may require special investigative studies, such as traffic impact analysis or other studies necessary to make an informed decision, and shall not include any aspects of investigative study which are redundant or duplicative to that of any other local boards or commissions. Expert services may be required by the Planning Board to review plans or documents. Please refer to the Planning Board's Rules and Regulations[1] for a project review cost estimate. The applicant shall be advised of the costs prior to the studies being performed. The fees shall be paid prior to the studies being performed and will be held in escrow. An accounting of the escrowed funds shall be provided to the applicant on a regular basis and any unused balance will be returned to the applicant.

1. **Editor's Note: See Ch. 465, Planning Board.**

§ 300-116. Performance guaranty or bond.

The Board will require that the applicant file with the Board a bond, deposit of money, negotiable securities or other such surety acceptable to the Planning Board to cover costs of any construction on streets, utilities and other site improvements which, if left incomplete, could present a public hazard or nuisance. A performance agreement between the applicant and the Town will specify the manner in which the on- or off-site improvements will be completed and the specific manner in which the surety will be released.

§ 300-117. Compliance; relation to other laws.

A. The Site Plan Review Bylaw in no way relieves any applicant from compliance with the Salisbury Zoning Bylaw or any other bylaws of the Town of Salisbury, or any other state or federal laws or regulations.

B. The provisions of this article shall not supersede or replace any other provision of the Town of Salisbury Zoning Bylaw or other bylaws of the Town or any state or federal laws or regulations. In case of a conflict between any provision of this article and any provision of any other section of the Zoning Bylaw, the provisions of such other section shall govern.

§ 300-118. Adoption of rules and regulations.

A. The Planning Board may, after notice and hearing, and by a four-fifths vote of the Planning Board, adopt rules and regulations to implement the provisions of this bylaw, including but not limited to specifying the content and number of required plans, application procedures, design and development standards, and other general requirements consistent with this bylaw. The Planning Board's rules and regulations may not make any changes in dimensional controls, permitted or prohibited uses, or density limitations that are specified in any provision of the Zoning Bylaw.

B. Notwithstanding the paragraph above, the Town Manager shall appoint an ad hoc committee to draft new design and development standards for the Town. Said committee shall be composed of seven members, at least four of which shall be professional architects, civil engineers, and land use planners and one shall be a member of the Planning Board. Said committee shall consult with the Planning Department and the Building

Inspector and shall recommend, by majority vote, proposed design and development standards, which shall then be presented in the form of a zoning bylaw for approval at a subsequent Town Meeting. Any such zoning bylaw, upon adoption, shall supersede Planning Board regulations addressing design and development standards for site plan review described in the first paragraph of this section.

§ 300-119. Severability.

The provisions of this article are severable and, in the event that any provision of this article is determined to be invalid for any reason, the remaining provisions shall remain in full force and effect.

§ 300-120. Appeals procedure. [Added 10-23-2017 ATM by Art. 23]

Any decision rendered by the Planning Board pursuant to Article XVIII may be appealed by the applicant to a court of competent jurisdiction as set forth in MGL c. 40A, § 17, and no building permit specifically connected to the appeal may be issued until the appeal is resolved.

APPENDIX I

Standard Operating Procedures

STANDARD OPERATING PROCEDURE **DEPARTMENT OF PUBLIC WORKS [OR OTHER]** **PROGRAM:** Snow Removal and De-Icing	**SOP NUMBER:**	**ISSUE DATE:**

APPROVED BY:

_____

Public Works Director [or other]

MA SMALL MS4 PERMIT REQUIREMENT SUMMARY:

Part 2.3.7.a.iii.5.
The permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States. For purposes of this MS4 Permit, salt shall mean any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

Personnel

The following personnel are responsible for snow and ice removal. Employees performing the procedures in this SOP shall attend yearly stormwater pollution prevention training.

TABLE 1

Name	Responsibility
Myles Bradbury	Truck, Dump Truck, Plow and Spreader
Raymond Cote	Loader and Plow
Jason Sanborn	Truck, Plow and Spreader
Chuck St. Cyr	Dump Truck, Plow and Spreader
David Vigneaux	Dump Truck, Plow and Spreader
Linwood White	Truck and Plow
Paul Smolak	Truck and Plow
Jay Sinton	Loader and Plow

Equipment

The municipality owns and maintains ice control and snow removal equipment listed in Table 2. Equipment and vehicles are washed and maintained at the Department of Public Works located at 39 Lafayette Rd.

Plowing
When conditions warrant, plows are installed on the two larger trucks to move snow from the traveled roadway. Four smaller trucks are available for plowing of residential streets and clearing public lots.

Salt Spreaders
When conditions warrant, salt spreaders are installed on the two larger trucks to spread salt on the traveled roadway. The two salt spreaders trucks apply salt prior to snow fall as a pre-wetting measure.

TABLE 2

Equipment Number	Make	Description	Primary Use
1	Ford L8000	4 x 2 Truck	
2	Monroe MP39R11-TT	11 ft Plow	Plowing
3	Viking 132 W-HD	11 ft Wing Plow	Plowing
4	Flink LMC-5H	Dump Body Spreader	
5	John Deere 544J	3 cy capacity Loader	
6	Henke REL12	12 ft Plow (Loader)	Plowing
7	Henke SWL10AHTE	10 ft Wing Plow (Loader)	Plowing
8	International 4300	4 x 4 Axle Truck	
9	Fisher MP39RIISIL	10 ft Plow	Plowing
10	Torwel E2588-8’	Dump Body Spreader	
11	Freightliner 108SD	6 y Dump Truck	
12	Monroe MP39R11-TT	11 ft Plow	Plowing
13	Monroe 11FTMB	11 ft Wing Plow	Plowing
14	Monroe MSV-12056084	Dump Body Spreader	
15	International 2554	6 y Dump Truck	
16	Monroe MP39R11-TT	11 ft Plow	Plowing
17	Tenco TC-116-LP	11 ft Wing Plow	Plowing
18	Torwel 4DGHW6D-10-18	Dump Body Spreader	
19	Ford F-350	4 x 4 Axle Truck	
20	Fisher MP3RIISIL	8 ft Plow	Plowing

Materials

The major material used in snow and ice control is coarse salt. This material is stockpiled in advance of an event and is immediately available when needed and the stock is replenished between events.

Salt

Salt is used to expedite the melting of snow and ice from the street surface and also to keep the ice from forming a bond to the street surface. Approximately 950 tons of salt are anticipated to be used per year and are ordered from Eastern Minerals prior to each deicing season. Salt is stored in the covered facility located behind the Department of Public Works Facility. Loading areas and yards are maintained to prevent salt build-up and run-off.

Procedures

Salt Application

STANDARD OPERATING PROCEDURE **DEPARTMENT OF PUBLIC WORKS [OR OTHER]** **PROGRAM:** Snow Removal and De-Icing	**SOP NUMBER:**	**ISSUE DATE:**

1. Whenever conditions warrant, salt is applied to the roadway prior to accumulation of snow to prevent compacted snow from bonding to the roadway surface. The Director of Public Works or Highway Foreman will instruct staff when salt application is appropriate.
2. Prior to salt application, equipment will be checked to ensure proper working order and ensure proper calibration of equipment. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.
3. All municipally owned streets, parking lots, and facilities will be salted. Main streets, collector streets, and schools receive priority attention.
4. Before parking any truck or equipment after use, all fluid levels will be checked and filled. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to the Director of Public Works or Highway Foreman. The Director of Public Works or Highway Foreman will determine importance and will assign the repairs according to schedule. All deicing chemical will be washed from equipment at the wash bay or designated wash area.

Snow Plowing

1. As the storm develops and four inches of snow has accumulated, all of the drivers and available equipment will begin to plow their assigned routes. As snow accumulates to 3 inches or greater the Town will begin to plow sidewalks.
2. Prior to plowing operations, equipment will be checked to ensure proper working order. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.
3. Avoid plowing, pushing, blowing or storing excess snow, deicer, or other debris in or near creeks, watercourses or storm drainage systems.
4. Reduce plowing speed in sensitive areas (near creeks, wetlands or other water courses) to prevent snow and deicing materials from entering waterways.
5. All municipally owned streets, parking lots, and facilities will be plowed. Main streets, collector streets, and schools receive priority attention.
6. Before parking any truck or equipment after use, all fluid levels will be checked and filled. Blades or bolts, which need replacing, will be taken care of unless told to do otherwise. Chains that need repairs will be repaired. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to the Director of Public Works or Highway Foreman. The Director of Public Works or Highway Foreman will determine importance and will assign the repairs according to schedule.

Record Keeping and Documentation

1. Keep and maintain an inventory of miles or roads plowed or salted at the DPW Facility.
2. Keep records of the amounts of salt applied per season at the DPW Facility.
3. Keep a list of all employees trained at the DPW Facility.

APPENDIX J

2016 MS4 Annual Reports

*Note: Annual Reports will be appended to the Stormwater Management Plan as they are completed.

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: Town of Salisbury

EPA NPDES Permit Number: MAR041220

Primary MS4 Program Manager Contact Information

Name: Lisa DeMeo, P.E. Title: Director of Public Works

Street Address Line 1: 39 Lafayette Road

Street Address Line 2:

City: Salisbury State: MA Zip Code: 01952

Email: ldemeo@salisburyma.gov Phone Number: (978) 462-7611

Fax Number:

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.salisburyma.gov/sites/salisburyma/files/pages/salisbury_final_swmp.pdf

Date SWMP was Last Updated: June 28, 2019

If the SWMP is not available on the web please provide the physical address and an explanation of why it is not posted on the web:

Part II: Self Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4.

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☐ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☐ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

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

☒ Identify and develop inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years

- ○ The SSO inventory is attached to the email submission
- ◉ The SSO inventory can be found at the following website:

The Town will keep an inventory in their SWMP located on their website at the following location: https://www.salisburyma.gov/public-works/pages/stormwater-management.

☒ Develop written IDDE plan including a procedure for screening and sampling outfalls

☒ IDDE ordinance complete

☒ 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:

☒ Construction/ Erosion and Sediment Control (ESC) ordinance complete

☒ Develop written procedures for site inspections and enforcement of sediment and erosion control measures

☒ Develop written procedures for site plan review

☒ Keep a log of catch basins cleaned or inspected

☐ Complete inspection of all stormwater treatment structures

Annual Requirements

- ☒ Annual opportunity for public participation in review and implementation of SWMP
- ☒ Comply with State Public Notice requirements
- ☒ Keep records relating to the permit available for 5 years and make available to the public
- ☒ Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- ☒ Annual training to employees involved in IDDE program
- ☒ All curbed roadways have been swept a minimum of one time per year

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminate educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☒ Provide 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)*

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:

The Town did not inspect any stormwater treatment structures in Permit Year 1. The Town is still working to identify the location of structural BMPs and develop operation & maintenances procedures/inspection forms as required in Permit Year 2. Once all BMPs have been located, and the O&M procedures/inspection forms have been developed, the Town will be in a better position to inspect all BMPs by the end of Permit Year 2.

The Town did not provide information to owners of septic systems about proper maintenance during the Year 1 reporting period. However, septic system information was mailed out to owners in September of 2019. There are four properties not on sanitary sewer in the catchment areas discharging to the Merrimack River. This message will be distributed again in Permit Year 2 to residents operating on septic systems within a catchment area discharging to impaired waters.

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:

Listed in the NOI, the Town identified 16 receiving waters. There were 27 regulated outfalls depicted as discharging to receiving waters and no outfalls discharging to impaired receiving waters. During Permit Year 1, the list of receiving waters and outfalls have been modified as additional data was collected. There have been 63 more regulated outfalls located through field reconnaissance. Three of these additional outfalls discharge to the Merrimack River, impaired for bacteria. The Town's Outfall Map has been updated to represent these changes. In total, the Town has identified 90 regulated outfalls and 3 interconnections, and these updates are reflected in the Town's Stormwater Management Plan, as well as in the Town's Drainage Map. As the Town works to confirm outfall ownership and regulated status of outfalls, the map will continue to be updated.

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: 5

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.

BMP:Video

Message Description and Distribution Method:

The Town shared a stormwater educational video to their stormwater management web page. The video is called Think Blue Massachusetts "Fowl Water" (https://thinkbluemassachusetts.org/), and targets the process of runoff traveling through the drainage system and discharging to a receiving water.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

There were a total of 9,975 social media impressions on this video by the residents of Salisbury. This video is available at https://www.thinkbluemassachusetts.org/ms4-communities.

Message Date(s): June 23, 2019 - June 30, 2019

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:

This message was conducted in addition to the messages outlined in the NOI. This message was provided by the Merrimack Valley Stormwater Collaborative, and was shared with surrounding towns in the Merrimack River watershed.

BMP:Flyer/Brochure

Message Description and Distribution Method:

The Town distributed brochures as a 'how-to-guide' for residents on how rain gardens work and how to install them at their home. These brochures were made available at the Department of Public Works.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

There were approximately 200 brochures collected from residents at the Department of Public Works.

Message Date(s): FY2019

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:

BMP:Flyer/Brochure

Message Description and Distribution Method:

The Town provided brochures encouraging proper pet waste management at the Town Hall and the Town Clerk distributed flyers to dog owners at the time of issuance or renewal of dog licenses.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations, Town Clerk

Measurable Goal(s):

There were approximately 700 dog licenses given out during during their year term (April 1st - March 31st). The flyers were given out with each renewal or license and directly targeted residents with dogs.

Message Date(s): FY2019

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:

During the Permit Year 1 reporting period, additional outfalls were located that discharge to the Merrimack River preceding the submission of the NOI. The requirements of Appendix H were applied after these outfalls were identified.

BMP:Flyer/Brochure

Message Description and Distribution Method:

The Town distributed flyers regarding proper management of septic systems to homeowners within drainage catchment areas discharging to the Merrimack River. A letter was mailed along with the flyer outlining the requirements of the MS4 General Permit pertaining to the impaired water for bacteria.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The Town distributed the flyers directly to residents in the catchment areas that are not connected to the

sanitary sewer system. This message was mailed out in September of 2019, and the Town plans to distribute this message again in the Permit Year 2 term.

Message Date(s): September 2019

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:

During the Permit Year 1 reporting period, additional outfalls were located that discharge to the Merrimack River preceding the submission of the NOI. The requirements of Appendix H were applied after these outfalls were identified.

BMP:Presentation

Message Description and Distribution Method:

The Town worked with an engineering consulting firm, Weston & Sampson, to present to the Planning Board proposed amendments to the Town's rules and regulations to meet the requirements of the permit. This presentation was aired on television and was open to the public for viewing. In this presentation, Weston & Sampson introduced the MS4 General Permit and the requirements pertaining to construction site runoff control.

Targeted Audience: Developers (construction), Residents

Responsible Department/Parties: DPW Operations, Planning and Development

Measurable Goal(s):

This presentation was targeted towards the Planning Board to include the amendments into the Town's rules and regulations. Residents and developers of the Town attended the meeting as well.

Message Date(s): FY2019

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:

This educational measure was made in addition to the initiatives identified in the NOI.

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) during the reporting period:

The completed Stormwater Management Program (SWMP) was posted to the Town website in June 2019 and is available for public comment. Once submitted, this Annual Report will be appended to the SWMP and the version on the Town website will be updated accordingly.

Was this opportunity different than what was proposed in your NOI? Yes ☐ No ☒

Describe any other public involvement or participation opportunities conducted during the reporting period:

Salisbury provided multiple public involvement and participation opportunities during FY2019. Throughout this permit year term, the Town has maintained relationships with the following organizations: Women in Transition, Trial Court, Middleton Inmates, Beach Betterment Association, and the Probation Department. The Town has participated in year-round cleanup work with these organizations. Furthermore, the Town has maintained its relationship with Merrimack Vally Stormwater Coalition, as representatives have attended monthly meetings.

The Town participated in recycling collection at the Recycling Center. There was a total of 131.62 tons of recyclables collected during the reporting period. The Town also participated in yard waste collection at the Recycling Center. From February 2019 to the end of FY2019, there have been 530 recycling passes purchased at the Recycling Center.

During this permit year, the Town has renewed its membership with Greenscapes North Shore Coalition. In February of 2019, Greenscapes visited the Salisbury elementary school to provide a program pertaining to stormwater management. The program was called 'Keeping Water Clean', and was taught to a 5th grade class.

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: 4

Total number of SSOs removed: 4

MS4 System Mapping

Describe the status of your MS4 map, including any progress made during the reporting period (phase I map due in year 2):

The Town's MS4 Map is updated to include all municipally-owned outfalls, interconnections, catch basins,

drainage manholes, as well as stormwater treatment structures. Private and state drainage structures are also mapped. During this reporting period, additional outfalls, interconnections and drainage structures were field verified and incorporated into the MS4 Map. Initial catchments have been delineated, but are subject to refinement as additional mapping of structures is incorporated. The Town's MS4 Map is in accordance with the 2016 MS4 Permit's accuracy guidelines and is included in Appendix D of the Stormwater Management Plan.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- ○ The outfall screening data is attached to the email submission
- ○ The outfall screening data can be found at the following website:

Below, report on the number of outfalls/interconnections screened during this reporting period.

Number of outfalls screened: 0

Below, report on the percent of total outfalls/ interconnections screened to date.

Percent of total outfalls screened: 0

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ The catchment investigation data is attached to the email submission
- ○ The catchment investigation data can be found at the following website:

No Catchment Investigations were performed during the reporting period, but the System Vulnerability Factor Assessment is included as part of the Catchment Ranking and Prioritization Matrix submitted in conjunction with this Annual Report.

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:

The Town does not currently have any problem catchments based on current rankings. As information becomes available from dry weather screening and sampling, catchments will be re-prioritized and investigation of catchments will proceed in accordance with permit requirements.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ○ The illicit discharge removal report is attached to the email submission
- ○ The illicit discharge removal report can be found at the following website:

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed during this reporting period.

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 [UNITS]

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:

Employee Training

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

The Town worked with Weston & Sampson, an engineering consulting firm, to develop and implement an annual IDDE training program. The training explains the IDDE program and includes how to recognize illicit discharges and SSOs. Furthermore, the presentation includes MCM6: Pollution Prevention and Good Housekeeping for municipal activities. The presentation and other training materials have been included in the appendices of the Town's IDDE plan. The first training for Permit Year 1 was conducted on June 27, 2019, and the attendees consisted of eight employees from the DPW.

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: 6

Number of inspections completed: 21

Number of enforcement actions taken: 5

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:

The Town adopted Part 1 of the Planning Board Rules and Regulations which includes Article III Site Plan Review Requirements in January 2006. Section E of the Site Plan Performance and Design Standards includes language that require drainage systems to be designed in accordance with the Stormwater Management Volume I and II. The Planning Board and Department of Public Works are reviewing these procedures and will develop and implement any additional amendments to meet the requirements established by EPA during Permit Year 2.

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:

The Town adopted the Earth Filling Bylaw in October of 2003. Section 4, Permit Requirements, state that a final engineered record site plan showing final site is required to have complied with conditions or such that a bond is released. The Town's Planning Board Subdivision of Land dedicates a section to as-built plans to be submitted to the Town Clerk after final approval of improvements. The Planning Board and Department of Public Works are reviewing these procedures and will develop and implement any additional amendments to meet the requirements established by EPA during Permit Year 2.

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:

The Town will work on a street design and parking lots assessment, as outlined in the NOI and the report will be complete within 4 years of the permit effective date.

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:

The Town will work on the green infrastructure report, as outlined in the NOI, and the report will be complete within 4 years of the permit effective date.

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:

The Town has developed a list of all municipally owned properties, and will begin to identify at least 5 properties that could be retrofitted with BMPs in FY2022, as outlined in the NOI. The inventory will be complete within 4 years of the permit effective date.

MCM6: Good Housekeeping

Catch Basin Cleaning

Describe the status of the catch basin cleaning optimization plan:

See additional information section below.

If complete, attach the catch basin cleaning optimization plan or the schedule to gather information to develop the optimization plan:

- ○ The catch basin cleaning optimization plan or schedule is attached to the email submission
- ○ The catch basin cleaning optimization plan or schedule can be found at the following website:

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: 715

Number of catch basins cleaned: 715

Total volume or mass of material removed from all catch basins: 281.13 Tons

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

Total number of catch basins: 1,100

If applicable:

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

A contractor was hired by the Town to perform the catch basin cleaning and inspections. The contractors used an iPad to enter data on the characteristics of each catch basin, including the condition and entered comments on the capacity. The Town plans to gather additional information during catch basin cleaning and inspection for FY2020. The metrics targeted will include depth from catch basin rim to top of sediment, to the bottom of

the basin, and to the invert of the outlet pipe. The results of these measurements will be incorporated into the catch basin optimization plan.

Street Sweeping

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

During this reporting period, the Town began a program to sweep all streets and Town-owned parking lots once in the spring as required by the 2016 General Permit. The Town is working to develop a Standard Operating Procedure for street sweeping in Permit Year 2.

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

- (•) Number of miles cleaned: 250
- ( ) 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:

All uncurbed roadways with no catch basins are also swept once per year.

Winter Road Maintenance

Describe the status of the written procedures for winter road maintenance including the storage of salt and sand:

The Town implemented a Standard Operating Procedure (SOP) for Salt Use Optimization and Winter Road Maintenance in June of 2019. This SOP outlines procedures for salt material application and storage, as well as proper management of vehicle maintenance and equipment. This SOP is included in Appendix H of the Stormwater Management Plan.

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:

The Town is working to develop an inventory of all Town-owned property, which will be completed in Permit Year 2. Vehicles and equipment associated with winter road maintenance were inventoried in the Salt Use Optimization SOP as previously mentioned.

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:

The Town is working to create standard operation and maintenance procedures for all municipal activities and

facilities following requirements established by EPA. These written procedures will be completed in Permit Year 2.

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:

The Town will contract an external firm to develop SWPPPs for municipal facilities. These SWPPPs will be completed by the contractor in Permit Year 2. Once the facilities requiring a SWPPP are identified in Year 2, the number of site inspections conducted will be noted.

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:

N/A

O&M Procedures for Stormwater Treatment Structures

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

The Town will develop a written procedure for stormwater treatment structure maintenance including inspection forms for stormwater treatment structures. This procedure will be incorporated into the operation and maintenance plan for all MS4 infrastructure in the Town, and will be completed by end of Permit Year 2.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (•) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 2 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete system mapping Phase I
- Begin investigations of catchments associated with Problem Outfalls
- Develop or modify an ordinance or other regulatory mechanism for post-construction stormwater runoff from new development and redevelopment
- Establish and implement written procedures to require the submission of as-built drawings no later than two years after the completion of construction projects
- Develop, if not already developed, written operations and maintenance procedures
- Develop an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; review annually and update as necessary
- Establish a written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner
- Develop and implement a written SWPPP for maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclose or cover storage piles of salt or piles containing salt used for deicing or other purposes
- Develop, if not already developed, written procedures for sweeping streets and municipal-owned lots
- Develop, if not already developed, written procedures for winter road maintenance including storage of salt and sand
- Develop, if not already developed, a schedule for catch basin cleaning
- Develop, if not already developed, a written procedure for stormwater treatment structure maintenance
- Develop a written catchment investigation procedure *(18 months)*

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually

Provide any additional details on activities planned for permit year 2 below:

If budget allows, permit year 3 activities may be initiated or completed within the next permit year along with the year 2 required activities to maintain compliance with the general permit. All activities completed by the Town during permit year 2 will be documented in the next annual report.

Part V: Certification of Small MS4 Annual Report 2019

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: *Neil Harrington* Title: *Town Manager*

Signature: Date: 9/24/19

[Signatory may be a duly authorized representative]

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

NOI 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: MassDEP:

Paper Signature:

If you did not sign electronically above, you can print the signature page by clicking the button below.

Optional: If you did not sign electronically above, you may lock the form by clicking the "Lock Form" button below which will prompt you to save the locked version of the form. Save this locked version under a new file name.

Lock Form

confirmed GIS delineation	Temporary Outfall ID	Regulated	Location	Receiving Water	Subbasin (GIS)	Illicit Discharge Related Water Quality Impairements in Receiving Water?	Dry Weather Ranking Criteria																			Dry Weather Ranking
							Undeveloped Area	Athletic Fields/Parks/Green Space w/o Services	Cross Country through undeveloped areas	Known/suspected Illicits	Sampling Prior to 2016 shows Sewer Input	Discharge to Drinking Water Source/Swimming Area	Discharge to Other Contact Recreation	Discharge Complaints	Approved TMDL for Bacteria	Water Quality Limited Water for Bacteria	Poor Receiving Water Quality	Sewers >40 years old	Infrastructure > 40 years old	Septic Systems > 30 years old	Septic to Sewer	Culverted Streams	Density of Generated Sites	Other Relevant Factors	2016 MS4 Sampling shows Sewer Input	
							0	0	0	500	300	200	100	25	20	15	10	8	7	6	5	4	3	TBD	75	
	OUT-1301	Y	Folly Mill Road, North of Black River Road	Wooded Marsh area west of Folly Mill Road															7							7
	OUT-4059	Y	Folly Mill Road	Wooded Marsh area northwest of Folly Mill Road															7							7
	OUT-4061	Y	Black Snake Road	Wooded Marsh Area near Lucy Brook and east of Black Snake Road															7							7
	OUT-4062	Y	Folly Mill Road at Elizabeth Lane	Wooded Marsh Area near Lucy Brook and east of Black Snake Road																						0
	OUT-4063	Y	Folly Mill Road at Locust St	Wooded Marsh Area near Lucy Brook and east of Black Snake Road															7							7
	OUT-4056	Y	Folly Mill Road east of Mingo Road	Marsh Area west of Mingo Road															7							7
	OUT-1101	Y	Joy Road	Meader Brook																						0
	OUT-4005	Y	End of Jon Street	Wooded Marsh Area at the end of Jon Street															7	6						13
	OUT-4046	Y	Northern portion of Fanaras Drive	Marsh Area north of Fanaras Drive																			3			3
	OUT-4047	Y	East of Fanaras Drive	Wooded Marsh Area off of Fanaras Drive																	5		3			8
	OUT-4048	Y	South of Fanaras Drive	Wooded Marsh Area north of Catherine Way															7				3			10
	OUT-4050	Y	End of Linda Lane	Wooded Marsh Area east of Linda Lane																						0
	OUT-4049	Y	End of Catherine Way	Wooded Marsh Area north of Catherine Way																						0
	OUT-4007	Y	End of Jak-Len Drive	Marsh Area north of Fanaras Drive															7	6						13
	OUT-4006	Y	End of Bayberry Lane	160'+ from nearest marsh area (west of Bayberry Ln)															7	6						13
	OUT-4045	Y	East of Jak-Len Drive	Wooded Marsh area east of Jak-Len Drive															7	6			3			16
	OUT-4013	Y	East of the intersection of Collins Road and Lafayette Road	Wooded Marsh Area south of Collins Road																						0
	OUT-1701	Y	Baker Road	Wooded Marsh Area east of Vic-Lin Drive															7							7
	OUT-10005	Y	Bartlett St	Unnamed Tributary															7		5					12
	OUT-10018	Y	WWTF	Wooded Marsh Area east of the WWTF																						0
	OUT-10017	Y	WWTF	Wooded Marsh Area east of the WWTF																						0
	OUT-1703	Y	True Road	Wooded Marsh Area west of True Road															7							7
	OUT-1705	Y	Cushing Street	Wooded Marsh Area west of Cushing Street															7							7
	OUT-101	Y	Mudnock Road; near Elm Street	Marsh Area east of Mudnock Road																						0
	OUT-1702	Y	Mudnock Road	Wooded Marsh Area west of Mudnock Road															7							7
	OUT-102	Y	Mudnock Road	Marsh Area east of Mudnock Road															7		5					12
	OUT-4033	Y	Mudnock Road	Salt Marsh area south of Ferry Lots Lane															7							7
	OUT-4034	Y	Mudnock Road at Ferry Lots Lane	Salt Marsh area south of Ferry Lots Lane															7							7
	OUT-4010	Y	End of Kendell Lane	Marsh Area at the end of Kendell Lane																6						6
	OUT-10004	Y	Kendell Lane	Marsh Area northwest of Allen Drive															7	6			3			16
	OUT-4043	Y	Allen Drive	Smallpox Brook															7							7
	OUT-4042	Y	Gerrish Road	Smallpox Brook															7							7
	OUT-604	Y	Railroad Ave	150'+ from nearest wooded marsh area															7							7
	OUT-601	Y	Railroad Ave	100'+ from nearest wooded marsh area															7							7
	OUT-603	Y	Railroad Ave	Salt Marsh area south of Ferry Lots Lane															7							7
	OUT-202	Y	Mudnock Road; southern portion	Marsh area south of Mudnock Road															7							7
	OUT-201	Y	Mudnock Road; southern portion	Marsh area south of Mudnock Road															7							7
	OUT-204	Y	Mudnock Road; eastern portion	Marsh area south of Mudnock Road															7							7
	OUT-203	Y	Mudnock Road; eastern portion	Wooded Marsh area west of Mudnock Road																						0
	OUT-2001	Y	South of School House Lane	Wooded Marsh Area east of School House Lane																						0
	OUT-602	Y	South of School House Lane	Wooded Marsh Area east of School House Lane															7							7
	OUT-4041	Y	Seabrook Road	Smallpox Brook															7							7
	OUT-10032	Y	Souther Lane	Wooded Marsh Area north of Souther Lane																						0
	OUT-10034	Y	Morgan Ave	Smallpox Brook																						0
	OUT-501	Y	End of Garafalo Drive	Wooded Marsh Area east of School House Lane															7							7
	OUT-4040	Y	Lincoln Ave	Marsh Area east of Lincoln Ave															7		5					12
	OUT-4039	Y	Lincoln Ave	Marsh Area east of Lincoln Ave															7							7
	OUT-10037	Y	Salisbury Housing Authority	Wooded Marsh Area off of Meaders Lane															7							7
	OUT-10036	Y	Salisbury Housing Authority	Wooded Marsh Area off of Meaders Lane															7							7
	OUT-10007	Y	Ferry Road	Wooded Marsh Area east of Ferry Road															7							7
	OUT-4032	Y	Bridge Road	Marsh Area west of Bridge Road															7		5		3			15
	OUT-4016	Y	End of Meaders Lane	Salt Marsh Area off of Meaders Lane															7							7
	OUT-4015	Y	End of Gove Lane	Wooded Marsh Area off of Meaders Lane															7							7
	OUT-10009	Y	End of Short Lane	Wooded Marsh Area off of Meaders Lane															7							7
	OUT-4014	Y	End of Sandy Lane	Wooded Marsh Area off of Meaders Lane															7		5					12
	OUT-10008	Y	Start of Dock Lane	Wooded Marsh Area off of CCC Road															7							7
	OUT-4031	Y	End of Grover St	Wooded Marsh Area west of Ferry Road															7							7
	OUT-4028	Y	Southwest of Samantha Lane	Wooded Marsh Area west of Ferry Road																						0
	OUT-4027	Y	South of Samantha Lane	Wooded Marsh Area west of Ferry Road															7							7
	OUT-4026	Y	End of Longmeadow Drive	Wooded Marsh Area west of Ferry Road															7							7
	OUT-4024	Y	South of Longmeadow Drive	Wooded Marsh Area west of Ferry Road															7							7
	OUT-4025	Y	Ferry Road	Marsh Area west of Ferry Road															7							7
	OUT-1501	Y	Ferry Road north of Island Way	Vincent Creek																						0
	OUT-1401	Y	Ferry Road north of Island Way	Vincent Creek																						0
	OUT-10014	Y	Ferry Road at Island Way	Wooded Marsh Area at Island Way															7							7
	OUT-10015	Y	Ferry Road at Island Way	Salt Marsh Area at Island Way															7							7
	OUT-4008	Y	Intersection of Ferry Road and March Road	Salt Marsh Area at Ferry Road																						0
	OUT-4022	Y	Intersection of First Street and Second Street	Merrimack River		303d: "Waters Requiring a TMDL"										15			7							22
	OUT-10002	Y	East of 2nd Street	Salt Marsh Area east of 2nd St															7							7
	OUT-4023	Y	Intersection of First Street and Second Street	Merrimack River		303d: "Waters Requiring a TMDL"										15			7							22
	OUT-10031	Y	Intersection of March Road and First Street	Merrimack River		303d: "Waters Requiring a TMDL"										15			7							22
	OUT-10013	Y	Taft Street	Wooded Marsh Area east of Taft Street															7							7
	OUT-10020	Y	End of Michael's Way	Wooded Marsh Area at the end of Michael's Way																						0
	OUT-10012	Y	North of Beach Road	Wooded Marsh Area between Beach Road and Old County Road																						0
	OUT-10011	Y	North of Beach Road	Wooded Marsh Area between Beach Road and Old County Road																						0
	OUT-2103	Y	Forest Road	200'+ from nearest marsh/wooded marsh															7							7
	OUT-2602	Y	Corporal Patten Way	Wooded Marsh Area east of Corporal Patten Way																						0
	OUT-2603	Y	Corporal Patten Way	Wooded Marsh Area east of Corporal Patten Way																						0

confirmed GIS delineation	Temporary Outfall ID	Regulated	Location	Receiving Water	Subbasin (GIS)	Illicit Discharge Related Water Quality Impairements in Receiving Water?	Dry Weather Ranking Criteria																				
							Undeveloped Area	Athletic Fields/Parks/Green Space w/o Services	Cross Country through undeveloped areas	Known/suspected Illicits	Sampling Prior to 2016 shows Sewer Input	Discharge to Drinking Water Source/Swimming Area	Discharge to Other Contact Recreation	Discharge Complaints	Approved TMDL for Bacteria	Water Quality Limited Water for Bacteria	Poor Receiving Water Quality	Sewers >40 years old	Infrastructure > 40 years old	Septic Systems > 30 years old	Septic to Sewer	Culverted Streams	Density of Generated Sites	Other Relevant Factors	2016 MS4 Sampling shows Sewer Input	Dry Weather Ranking
							0	0	0	500	300	200	100	25	20	15	10	8	7	6	5	4	3	TBD	75	
	OUT-2601	Y	Corporal Patten Way	Wooded Marsh Area east of Corporal Patten Way																						0
	OUT-10016	Y	Corporal Patten Way	Wooded Marsh Area south of Corporal Patten Way																						0
	OUT-4021	Y	North End Boulevard	Salt Marsh Area north of Beach Road															7							7
	OUT-4020	Y	Cable Avenue	Salt Marsh Area west of Cable Avenue															7			5				12
	OUT-10010	Y	West of North End Boulevard	Salt Marsh Area west of North End Boulevard															7							7
	OUT-3201	Y	Cable Avenue	Salt Marsh Area west of Cable Avenue														8	7							15
	OUT-3504	Y	End of Florence Avenue	Salt Marsh Area at the end of Florence Ave															7							7
	OUT-3501	Y	End of Lewis Avenue	Salt Marsh Area at the end of Lewis Ave															7							7
	OUT-4011	Y	End of Twelfth Street	Dead Creek															7			5				12
	OUT-3502	Y	End of Tenth Street	Salt Marsh Area at the end of Tenth Street															7							7
	OUT-3503	Y	End of Ninth Street	Salt Marsh Area at the end of Ninth Street																						0
	OUT-10001	Y	Baker Road	Wooded Marsh Area north of Baker Road																						0
	OUT-10003	Y	Daniel Drive	Wooded Marsh Area east of Daniel Drive																	6			3			9
	OUT-4052	Y	Vic-Lin Drive	Wooded Marsh aArea east of Vic-Lin Drive																						0
	OUT-4035	Y	South of Mudnock Road	Salt Marsh Area south of Mudnock Road															7							7
	OUT-4044	Y	End of Kendell Lane	Wooded Marsh Area northeast of Kendell Lane															7		6					13
	OUT-10006	Y	Trout Way	Smallpox Brook															7		6					13
	OUT-605	Y	Railroad Ave	Unnamed Tributary															7							7
	OUT-606	Y	Garafalo Drive	Wooded Marsh Area north of Garafalo Drive																						0
	OUT-2003	Y	Garafalo Drive	Wooded Marsh Area north of Garafalo Drive															7							7
	OUT-10035	Y	Souther Lane	Smallpox Brook																						0
	OUT-2102	Y	Forest Road	Wooded Marsh Area off of Forest Road																						0
	OUT-2002	Y	Forest Road	Wooded Marsh Area off of Forest Road															7							7
	OUT-10033	Y	Elementary School	Marsh Area south of the Elementary School																						0
	OUT-4030	Y	End of Robert Road	Wooded Marsh Area east of Robert Road															7							7
	INTERCONNECTIONS																									0
	ITC-001	Y	Back River Road																7							7
	ITC-003	Y	Hayes Street at Beach Road																7							7
	ITC-002	Y	Beach Road at Driftway																7							7
	OUT-4058	N	FOLLY MILL ROAD AT ELMWOOD STREET																							0
	OUT-4060	N	Folly Mill Road																7							7
	OUT-4064	N	End of Kel-Lori Drive																							0
	OUT-4055	N	Folly Mill Road																7							7
	OUT-4053	N	Folly Mill Road at southern portion of Locust St																7							7
	OUT-4065	N	Natowich Way																							0
	OUT--4051	N	End of Palis Drive																							0
	OUT-4009	N	Juno Street																7	6						13
	OUT-10028	N	Collins Road																7							7
	OUT-4051	N	Palis Drive																7							7
	OUT-10029	N	Palis Drive																							0
	OUT-10030	N	Palis Drive																							0
	OUT-1706	N	Mudnock Road; near Elm Street																							0
	OUT-10019	N	Salisbury Fire Department																7							7
	OUT-4037	N	West of Lafayette Road							0																0
	OUT-4036	N	West of Lafayette Road																							0
	OUT-4038	N	West of Lafayette Road							0																0
	OUT-2101	N	Forest Road																7							7
	OUT-301	N	Pleasant Street																7							7
	STATE																									0
	OUT-4054	Y	Main Street north of Mingo Road																							0
	OUT-4003	Y	Rabbit Road between the Fanaras Drive Loop	Marsh Area west of Rabbit Road																						0
	OUT-4004	Y	Rabbit Road at Denrael Drive	Wooded Marsh Area east of Rabbit Road																						0
	OUT-4001	Y	Rabbit Road at Old Elm Street																							0
	OUT-4002	Y	West of Rabbit Road																							0
	OUT-901	Y	Elm Street	Wooded Marsh Area south of Elm Street																						0
	OUT-4012	Y	East of the intersection of Collins Road and Lafayette Road	Wooded Marsh Area south of Collins Road																						0
	OUT-1704	Y	Lafayette Road	Smallpox Brook																						0
	OUT-401	Y	Beach Road; near Glenwood Ave	Wooded Marsh Area off of Meaders Lane																						0
	OUT-2802	Y	Beach Road at Old County Road	Wooded Marsh Area north of Beach Road																						0
	OUT-2801	Y	Beach Road	Salt Marsh Area north of Beach Road																						0
	NOT REGULATED																									0
	OUT-4019	N	Between Glenwood Ave and CCC Road	Marsh Area off between Glenwood Ave and CCC Road																						0
	OUT-4017	N	South of Dock Lane	Wooded Marsh Area off of CCC Road																						0
	OUT-4018	N	End of Glenwood Road	Wooded Marsh Area at the end of Glenwood Road																						0
	OUT-10021	N	End of Dock Lane	Salt Marsh Area off of CCC Road																						0
	OUT-4029	N	South of Robert Road	Unnamed Tributary																						0

Outfall ID	Receiving Water	Eventual Recieving Water	History of SSOs	Common or Twin Invert Manholes	Common Trench Construction	Storm/Sanitary Crossings	Sanitary Lines with Underdrains	Inadequate LOS	Former Combined Sewers	Sanitary Sewer Defects	SSO Potential in Event of System Failures	Sanitary and Storm Drain Infrastructure > 40 years	Septic with Poor Soils or Water Table Separation	History of Board of Health Actions Addressing Septic Failure	Wet Weather Sampling?
SALISBURY															
OUT-1301	Wooded Marsh area west of Folly Mill Road											1			1
OUT-4059	Wooded Marsh area northwest of Folly Mill Road											1		1	2
OUT-4061	Wooded Marsh Area near Lucy Brook and east of Black Snake Road											1		1	2
OUT-4062	Wooded Marsh Area near Lucy Brook and east of Black Snake Road											1			1
OUT-4063	Wooded Marsh Area near Lucy Brook and east of Black Snake Road											1			1
OUT-4056	Marsh Area west of Mingo Road											1			1
OUT-1101	Meader Brook														0
OUT-4005	Wooded Marsh Area at the end of Jon Street											1		1	2
OUT-4046	Marsh Area north of Fanaras Drive														0
OUT-4047	Wooded Marsh Area off of Fanaras Drive														0
OUT-4048	Wooded Marsh Area north of Catherine Way											1			1
OUT-4050	Wooded Marsh Area east of Linda Lane														0
OUT-4049	Wooded Marsh Area north of Catherine Way													1	1
OUT-4007	Marsh Area north of Fanaras Drive											1			1
OUT-4006	160'+ from nearest marsh area (west of Bayberry Ln)											1			1
OUT-4045	Wooded Marsh area east of Jak-Len Drive											1		1	2
OUT-4013	Wooded Marsh Area south of Collins Road														0
OUT-1701	Wooded Marsh Area east of Vic-Lin Drive											1			1
OUT-10005	Unnamed Tributary											1			1
OUT-10018	Wooded Marsh Area east of the WWTF		1									1			2
OUT-10017	Wooded Marsh Area east of the WWTF		1									1			2
OUT-1703	Wooded Marsh Area west of True Road											1			1
OUT-1705	Wooded Marsh Area west of Cushing Street											1		1	2
OUT-101	Marsh Area east of Mudnock Road														0
OUT-1702	Wooded Marsh Area west of Mudnock Road											1			1
OUT-102	Marsh Area east of Mudnock Road											1			1
OUT-4033	Salt Marsh area south of Ferry Lots Lane											1			1
OUT-4034	Salt Marsh area south of Ferry Lots Lane											1			1
OUT-4010	Marsh Area at the end of Kendell Lane														0
OUT-10004	Marsh Area northwest of Allen Drive											1			1
OUT-4043	Smallpox Brook											1			1
OUT-4042	Smallpox Brook											1			1
OUT-604	150'+ from nearest wooded marsh area											1			1
OUT-601	100'+ from nearest wooded marsh area														0
OUT-603	Salt Marsh area south of Ferry Lots Lane											1			1
OUT-202	Marsh area south of Mudnock Road											1			1
OUT-201	Marsh area south of Mudnock Road											1			1
OUT-204	Marsh area south of Mudnock Road											1			1
OUT-203	Wooded Marsh area west of Mudnock Road														0
OUT-2001	Wooded Marsh Area east of School House Lane														0
OUT-602	Wooded Marsh Area east of School House Lane											1			1
OUT-4041	Smallpox Brook											1			1
OUT-10032	Wooded Marsh Area north of Souther Lane											1			1
OUT-10034	Smallpox Brook														0
OUT-501	Wooded Marsh Area east of School House Lane														0
OUT-4040	Marsh Area east of Lincoln Ave						1					1			2
OUT-4039	Marsh Area east of Lincoln Ave											1			1
OUT-10037	Wooded Marsh Area off of Meaders Lane											1			1
OUT-10036	Wooded Marsh Area off of Meaders Lane						1					1			2
OUT-10007	Wooded Marsh Area east of Ferry Road											1			1
OUT-4032	Marsh Area west of Bridge Road											1			1
OUT-4016	Salt Marsh Area off of Meaders Lane		1									1			2
OUT-4015	Wooded Marsh Area off of Meaders Lane		1									1			2
OUT-10009	Wooded Marsh Area off of Meaders Lane											1			1
OUT-4014	Wooded Marsh Area off of Meaders Lane											1			1
OUT-10008	Wooded Marsh Area off of CCC Road											1			1
OUT-4031	Wooded Marsh Area west of Ferry Road						1					1			2
OUT-4028	Wooded Marsh Area west of Ferry Road											1			1
OUT-4027	Wooded Marsh Area west of Ferry Road											1			1
OUT-4026	Wooded Marsh Area west of Ferry Road											1			1
OUT-4024	Wooded Marsh Area west of Ferry Road											1			1
OUT-4025	Marsh Area west of Ferry Road											1			1
OUT-1501	Vincent Creek														0
OUT-1401	Vincent Creek														0
OUT-10014	Wooded Marsh Area at Island Way											1			1
OUT-10015	Salt Marsh Area at Island Way											1			1

Outfall ID	Receiving Water	Eventual Recieving Water	History of SSOs	Common or Twin Invert Manholes	Common Trench Construction	Storm/Sanitary Crossings	Sanitary Lines with Underdrains	Inadequate LOS	Former Combined Sewers	Sanitary Sewer Defects	SSO Potential in Event of System Failures	Sanitary and Storm Drain Infrastructure > 40 years	Septic with Poor Soils or Water Table Separation	History of Board of Health Actions Addressing Septic Failure	Wet Weather Sampling?
SALISBURY															
OUT-4008	Salt Marsh Area at Ferry Road											1			1
OUT-4022	Merrimack River											1			1
OUT-10002	Salt Marsh Area east of 2nd St											1			1
OUT-4023	Merrimack River											1			1
OUT-10031	Merrimack River					1						1			2
OUT-10013	Wooded Marsh Area east of Taft Street											1			1
OUT-10020	Wooded Marsh Area at the end of Michael's Way											1			1
OUT-10012	Wooded Marsh Area between Beach Road and Old County Road														0
OUT-10011	Wooded Marsh Area between Beach Road and Old County Road														0
OUT-2103	200'+ from nearest marsh/wooded marsh											1			1
OUT-2602	Wooded Marsh Area east of Corporal Patten Way														0
OUT-2603	Wooded Marsh Area east of Corporal Patten Way														0
OUT-2601	Wooded Marsh Area east of Corporal Patten Way														0
OUT-10016	Wooded Marsh Area south of Corporal Patten Way														0
OUT-4021	Salt Marsh Area north of Beach Road											1			1
OUT-4020	Salt Marsh Area west of Cable Avenue											1			1
OUT-10010	Salt Marsh Area west of North End Boulevard											1			1
OUT-3201	Salt Marsh Area west of Cable Avenue											1			1
OUT-3504	Salt Marsh Area at the end of Florence Ave					1						1			2
OUT-3501	Salt Marsh Area at the end of Lewis Ave											1			1
OUT-4011	Dead Creek											1			1
OUT-3502	Salt Marsh Area at the end of Tenth Street											1			1
OUT-3503	Salt Marsh Area at the end of Ninth Street											1			1
OUT-10001	Wooded Marsh Area north of Baker Road													1	1
OUT-10003	Wooded Marsh Area east of Daniel Drive													1	1
OUT-4052	Wooded Marsh aArea east of Vic-Lin Drive														0
OUT-4035	Salt Marsh Area south of Mudnock Road					1						1			2
OUT-4044	Wooded Marsh Area northeast of Kendell Lane											1			1
OUT-10006	Smallpox Brook											1			1
OUT-605	Unnamed Tributary											1			1
OUT-606	Wooded Marsh Area north of Garafalo Drive														0
OUT-2003	Wooded Marsh Area north of Garafalo Drive											1			1
OUT-10035	Smallpox Brook											1			1
OUT-2102	Wooded Marsh Area off of Forest Road														0
OUT-2002	Wooded Marsh Area off of Forest Road											1			1
OUT-10033	Marsh Area south of the Elementary School														0
OUT-4030	Wooded Marsh Area east of Robert Road											1			1
INTERCONNECTIONS															0
ITC-001												1			1
ITC-003						1						1			2
ITC-002						1						1			2
OUT-4058												1			1
OUT-4060												1			1
OUT-4064															0
OUT-4055												1			1
OUT-4053												1			1
OUT-4065												1			1
OUT--4051												1			1
OUT-4009												1			1
OUT-10028												1			1
OUT-4051															0
OUT-10029															0
OUT-10030															0
OUT-1706															0
OUT-10019												1			1
OUT-4037															0
OUT-4036															0
OUT-4038															0
OUT-2101												1			1
OUT-301												1			1
STATE															0
OUT-4054															0
OUT-4003	Marsh Area west of Rabbit Road														0
OUT-4004	Wooded Marsh Area east of Rabbit Road														0
OUT-4001															0
OUT-4002															0

Outfall ID	Receiving Water	Eventual Recieving Water	History of SSOs	Common or Twin Invert Manholes	Common Trench Construction	Storm/Sanitary Crossings	Sanitary Lines with Underdrains	Inadequate LOS	Former Combined Sewers	Sanitary Sewer Defects	SSO Potential in Event of System Failures	Sanitary and Storm Drain Infrastructure > 40 years	Septic with Poor Soils or Water Table Separation	History of Board of Health Actions Addressing Septic Failure	Wet Weather Sampling?
SALISBURY															
OUT-901	Wooded Marsh Area south of Elm Street														0
OUT-4012	Wooded Marsh Area south of Collins Road														0
OUT-1704	Smallpox Brook														0
OUT-401	Wooded Marsh Area off of Meaders Lane														0
OUT-2802	Wooded Marsh Area north of Beach Road														0
OUT-2801	Salt Marsh Area north of Beach Road														0
NOT REGULATED															0
OUT-4019	Marsh Area off between Glenwood Ave and CCC Road														0
OUT-4017	Wooded Marsh Area off of CCC Road														0
OUT-4018	Wooded Marsh Area at the end of Glenwood Road														0
OUT-10021	Salt Marsh Area off of CCC Road														0
OUT-4029	Unnamed Tributary														0