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STORMWATER MANAGEMENT PLAN

MS4 GENERAL PERMIT COMPLIANCE

JUNE 2019
UPDATED JUNE 2021

TOWN OF
Dedham
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 _____

Signature _____ Date _____

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 Dedham as determined by the USEPA using the latest decennial (year 2010) census. Since Dedham is located within an urbanized area, the EPA has designated the Town of Dedham 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, Dedham 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 Dedham 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 October 1, 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. A copy of the Town's Authorization to Discharge is included in Appendix D.

Since the Town of Dedham 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
- 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 Dedham has a Representative Town Meeting form of government. There is a Town Moderator who presides over the Town Meetings. The executive branch of the Government is led by a Board of Selectmen, who then appoint a Town Manager. The present-day duties of the Manager include proper administration of all town affairs. There is a Town Clerk who works full-time for the town and has many responsibilities, one of which includes taking on the role of the Clerk of Town Meetings. The Public Works 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:

- Engineering
- Department of Public Works
- Conservation Department
- Conservation Commission
- Environmental Department
- Planning Department
- Health Department
- Building Department
- Parks & Recreation
- Facilities & Maintenance Department

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
Jason Mammone, PE	Director	Engineering Department
Joseph Flanagan	Director	Department of Public Works
Jeremy Rosenberger	Town Planner	Planning & Zoning Department
Kylee Sullivan	Director	Health Department
Elissa Brown	Conservation Agent	Conservation Department
Robert Stanley	Director	Parks & Recreation
Denise Moroney	Director	Facilities & Maintenance Department
Kenneth Cimeno	Building Commissioner	Building Department

1.3 Town Demographic Information

Dedham is located in Norfolk County and has a total area of 10.6 square miles (27.6 square kilometers). It is bordered by Boston to the northeast, Canton to the southeast, Westwood to the southwest, and Needham to the northwest. As of 2017, the population was 25,364 and was comprised of six neighborhoods: The Manor, Greenlodge, Oakdale, East Dedham, Riverdale, and Precinct 1/Upper Dedham/The Village.

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. Dedham is entirely

comprised of urbanized area (UA) as shown in the regulated area map in Appendix B and only 1.8% of the town is water.

Primary U.S. and state highways located within the boundaries of Dedham include Interstate 95, Route 128, and Route1, all of which run north to south. There are also many secondary state highways within the Town of Dedham, a few of which include Route 109, Boston Providence Highway, Route 135. There are approximately 93.6 miles of U.S. and state-maintained roadways within town.

Climate within the Town of Dedham ranges from January average minimum temperature of 16.6 degrees Fahrenheit (°F) to July average maximum temperature of 79.5°F. The average annual precipitation is 48.9 inches, distributed throughout the year. The rainiest month span is mid-October to mid-November, with approximately 3.9 inches of rain.

1.4 Water Resources

Most of Dedham is located within the Charles River Watershed, with a section of the southeastern portion of town located within the Neponset River Watershed. There are multiple ponds in the Town of Dedham, which include Motley Pond, Weld Pond, Wigwam Pond, as well as other small ponds throughout the Town. The primary waterbodies are the Charles River (MA72-07) and the Neponset River (MA73-28). The Charles River flows northeast along the western side of town, and the Neponset River flows northeast along the eastern side of town. The tributaries to the Charles River located in Dedham are Arlington Stream, East Brook, Great Ditch, Little Wigwam Stream, Lowder Brook, MIT Endicott Brook, Rosemary Ditch, Stoney Lea Brook, Ursuline Stream, Vine Rock Stream, Westfield Brook, and Wigwam Brook. There are two tributaries to the Neponset River: Greenlodge Stream and Peanut Butter Brook.

The two primary water bodies are impaired for several factors according to the Final 2014 303(d) list of Impaired Waters. All impairments and outfalls discharging to these water bodies, and other receiving waters, are summarized in Table 1.2.

Table 1.2 RECEIVING WATERS AND IMPAIRMENTS		
Waterbody	Impairment	Number of Outfalls Discharging to Receiving Water
Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus	19
Mother Brook (MA73-28) *(Class B Water)*	(Low Flow Alterations*), Color, DDT, E.coli, Fecal Coliform, Mercury in Fish Tissue, Dissolved Oxygen, PCB in Fish Tissue, Total Phosphorus, Taste & Odor	39
Rock Meadow Brook (MA72-21)	Aquatic Macroinvertebrate Bioassessments, Aquatic Plants (macrophytes), Excess Algal Growth, Nutrient/Eutrophication Biological Indicators, Dissolved Oxygen, Total Phosphorus	The Town does not have any outfalls or interconnections that discharge directly to Rock Meadow Brook.
Neponset River (MA73-02)	(Debris/Floatables/Trash*), DDT, E.coli, Fecal Coliform, Foams/Flocs/Scum/Oil Slicks, Other, Dissolved Oxygen, PCB in Fish Tissue, Turbidity	The Town does not have any outfalls or interconnections that discharge directly to the Neponset River.
Arlington Stream (Tributary to Charles River)	-	1
County Jail Brook	-	2
Cutler Brook	-	2
East Brook (Tributary to the Charles River)	-	15
Greenlodge Stream (Tributary to Neponset River)	-	22
Little Wigwam Stream (Tributary to Charles River)	-	6
Lowder Brook (Tributary to Charles River)	-	16
MIT Endicott Brook (Tributary to Charles River)	-	1
Peanut Butter Brook (Tributary to Neponset	-	5

River)		
Stoney Lea Brook (Tributary to Charles River)	-	1
Ursuline Stream (Tributary to Charles River)	-	1
Vine Rock Stream (Tributary to Charles River)	-	4
Weld Stream (Tributary to Charles River)	-	4
Westfield Brook (Tributary to Charles River)	-	4
Wigwam Brook (Tributary to Charles River)	-	14

Note: Impairments with (*) have an approved TMDL. Applicable TMDLs are identified in Section 6.0.

1.5 Interconnections

The Town of Dedham also has 25 locations where the MS4 connects with another MS4 under another municipality's jurisdiction. The catchments associated with these junction points have been delineated and labeled. They are included on the town-wide drainage map, which can be found at Dedham.maps.arcgis.com and are summarized in Table 1.3 below. The Town does have interconnections with the City of Boston, and in 2012, the Town signed an inter-municipal agreement with the City of Boston regarding the management of stormwater.

Table 1.3
INTERCONNECTIONS

Interconnection and/or Drainage Area ID	Connecting Municipality	Receiving Water	Impairment
ITC001	Interconnection with State Drainage	Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC002	Interconnection with State Drainage	Charles River (MA72-07)	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native

		(Class B Water)	Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC003	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC004	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC005	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC006	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC007	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Low Flow Alterations*), Color, DDT, E.coli, Fecal Coliform, Mercury in Fish Tissue, Dissolved Oxygen, PCB in Fish Tissue, Total Phosphorus,

			Taste & Odor
ITC008	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Low Flow Alterations*), Color, DDT, E.coli, Fecal Coliform, Mercury in Fish Tissue, Dissolved Oxygen, PCB in Fish Tissue, Total Phosphorus, Taste & Odor
ITC009	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Low Flow Alterations*), Color, DDT, E.coli, Fecal Coliform, Mercury in Fish Tissue, Dissolved Oxygen, PCB in Fish Tissue, Total Phosphorus, Taste & Odor
ITC010	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Low Flow Alterations*), Color, DDT, E.coli, Fecal Coliform, Mercury in Fish Tissue, Dissolved Oxygen, PCB in Fish Tissue, Total Phosphorus, Taste & Odor
ITC011	Town Drainage to Private Storm Drain	Little Wigwam Stream	
ITC012	Interconnection with State Drainage	Unknown	
ITC013	Interconnection with State Drainage	Lowder Brook	
ITC015	Interconnection with State Drainage	Wigwam Brook	
ITC016	Interconnection with State Drainage	Unknown	
ITC017	Interconnection with State Drainage	Unknown	
ITC018	Interconnection with State Drainage	Unknown	
ITC019	Interconnection with State Drainage	Unknown	
ITC020	Interconnection with State Drainage	Wigwam Brook	
ITC021	Interconnection with State Drainage	Wigwam Brook	

ITC022	Town Discharges to Private Storm Drain	Unknown	
ITC023	Town Discharges to Private Storm Drain	Unknown	
ITC024	Town Discharges to Private Storm Drain	Little Wigwam Stream	
ITC025	Interconnection with State Drainage	Charles River (MA72-07) *(Class B Water)*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC026	Town Discharges to Private Storm Drainage	Charles River (MA72-07) *(Class B Water*	(Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Non-Native Aquatic Plants*), (Other flow regime alterations*), DDT, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus
ITC027	Interconnection with State Drainage	Wigwam Brook	
ITC029	Interconnection with MBTA Drainage	Little Wigwam Stream	

Note: Impairments which (*) have an approved TMDL. Applicable TMDLs are identified in Section 6.0.

1.6 Endangered Species and Historic Properties Determination

The 2016 MS4 Permit requires that Dedham demonstrate that all activities regulated under this 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 is no critical habitat for any endangered species within its boundaries, and if such a habitat exists, that no best management practice shall interfere with that habitat. Dedham 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 threatened species within Dedham is the 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 has determined that it can certify eligibility under USFWS Criterion C 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 northern long-eared bat or any other endangered or threatened species that may be identified in the future.

The Town has multiple federal historic properties, including Ames Schoolhouse (83004284), Dedham Village Historic District (06000785), Endicott Estate (02000128), Fairbanks House (66000367), and the Norfolk County Courthouse (72001312). Dedham can certify eligibility under NHPA Criterion A on their Notice of Intent for coverage under the permit because the Town was previously covered under the 2003 MS4 Permit, 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.

1.7 Increased Discharges

Any increased discharges (including increased pollutant loadings) through the MS4 to waters of the United States are subject to Massachusetts antidegradation regulations at 314 CMR 4.04. Section 2.1.2 of the 2016 MS4 Permit requires the Town of Dedham to comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate. Any authorization by MassDEP for an increased discharge is required to be incorporated into this SWMP.

The Town understands that there shall be no increased discharges, including increased pollutant loadings 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 Town 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. If necessary, the Town of Dedham will demonstrate compliance with this provision by either:

- 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

- 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 retain documentation of this finding in the SWMP. Unless otherwise determined by the Permittee, USEPA or by MADEP 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.

1.8 Surface Water Drinking Supplies

Section 3.0 of the MS4 Permit requires permittees to prioritize discharges to public drinking water supply sources in implementation of the SWMP. The Town does not have any discharges to surface drinking water supply sources or their tributaries.

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 December 13, 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 20 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 made significant progress in compliance with the requirements of the 2016 MS4 Permit. The Town of Dedham submitted 15 annual reports to EPA, in compliance with the 2003 MS4 Permit, between 2004 and 2018. Links to these reports 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 Town Manager, Planning Department, Building Department, Facilities Department, the Department of Public Works, Environmental Department, Engineering Department, Parks & Recreation and the Conservation 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 and approved TMDLs is included in Section 6.

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 stakeholders as specified by the permit. Dedham has been participating in public education and outreach activities since the 2003 MS4 Permit was enacted.

<u>Regulatory Requirement:</u>

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 Dedham has implemented several public education initiatives. It has developed a stormwater education program designed for school groups and scout troops. The goal of this program is to educate youth and foster the next generation of environmental stewards through fun, hands on projects. Youth participate by stenciling on the curb of storm drains "Do Not Dump, Drains to Charles River", or "Do Not Dump, Drains to Mother Brook". The Town provides education and resources for its residents on how to prevent stormwater pollution. Through Dedham's partnership with neighboring towns and the Neponset River Watershed Association they are tackling stormwater pollution. The Town of Dedham will continue to implement these practices.

In the Environmental Department section of the Dedham Town website, there is a link to Stormwater Management in the Town. Under this section, there are links to the Town's MS4 Annual Reports. The stormwater management page also contains general information about stormwater issues and infrastructure in Dedham, how to prevent stormwater pollution, including a copy of the Dedham Stormwater Best Management Practices Flyer, as well as information on their Storm Drain Stenciling Program. In addition, their website includes a copy of the Town's drainage outfall map, stormwater programs for residents, and information about green infrastructure. There is also a section that includes the Stormwater Management Rules and Regulations, Drainage and Stormwater Design Standards, and Stormwater Permit Applications. Seasonal stormwater messaging, such as notices to properly dispose of leaf litter in the fall, are posted to the home page of the Town's website as well as on the Town's various social media accounts.

Dedham is working with the Neponset Stormwater Partnership to provide public outreach to targeted audiences throughout the Town. As required in the new iteration of the permit, two targeted messages must be provided to the following audiences within five years, spaced at least one year apart:

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

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

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audience: Residents
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: To be completed during Permit Year 4 (FY2022).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Businesses, Institutions, and Commercial Facilities
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: To be completed during Permit Year 4 (FY2022).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Developers (construction)
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: To be completed during Permit Year 4 (FY2022).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Industrial Facilities.
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: To be completed during Permit Year 4 (FY2022).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Residents
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: To be completed during Permit Year 5 (FY2023).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Businesses, Institutions, and Commercial Facilities
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: To be completed during Permit Year 5 (FY2023).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Developers (construction)
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: To be completed during Permit Year 5 (FY2023).

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Industrial Facilities
Responsible Department/Parties: Environmental Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: To be completed during Permit Year 5 (FY2023).

Public education materials utilized in the implementation of the Town's SWMP through Permit Year 3 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.

Existing Town Practices:

The Town of Dedham has been proactive in providing opportunities for public participation and involvement in stormwater management practices. The Town has an Environmental Department that is comprised of two staff members. The Environmental Department works alongside the Sustainable Advisory Committee to:

- Make Dedham a more sustainable community;
- Promote transportation enhancements, municipal and residential energy efficiency, land conservation and management, stormwater management and recycling; and
- Engage residents and businesses in environmental issues affecting the community.

The Sustainable Advisory Committee is comprised of seven volunteer members who advise the Board of Selectmen, municipal departments and committees, and residents on strategies for advancing Dedham's local commitment to sound environmental practices both today and in the future. These environmental practices that the Committee works to promote are:

- Educational initiatives;
- Environmentally sensitive buildings and planning;
- Renewable energy choices by residents, commercial and municipal properties; and
- Other practices that help Dedham address the impact of pollution and climate change.

The Environmental Department supports volunteer opportunities including trail cleanups and maintenance, including maintenance of Mother Brook. The Town assists the Charles River Watershed Association annually in a town-wide Earth Day Clean-up. The Dedham Conservation Department and Environmental Department have developed a stormwater education program designed for school groups and scout troops. This program involves hands-on projects such as storm drain stenciling. Since 2009, the Town's Environmental Coordinator has worked with Eagle Scout candidates to stencil over 300 storm drains throughout town. The Department of Public Works, in coordination with the Board of Health, holds a Household Hazardous Waste and Television Collection Day to dispose of electronics, oil-based paints, pesticides, cleaning solvents, cathode ray tubes, tires and mercury containing materials.

During Permit Year 1, Dedham held a Hazardous Waste Collection Day, an Arbor Day Celebration, a Water in Dedham symposium, and assisted with various Earth Day Clean-ups. The Town held another Hazardous Waste Collection Day during Permit Year 2, and adapted their planned public involvement and participation activities to conform to the restrictions imposed on public gatherings due to the outbreak of COVID-19. The Mercury and Styrofoam collection scheduled for June 2020 was canceled due to COVID-19. Earth Day activities were posted on the Town's Facebook page and website. While no official clean-up event could be held, residents were encouraged to bring a trash

bag on walks to fill with litter or other potential stormwater pollutants. During Permit Year 3, in October 2020, Dedham held a Hazardous Waste Collection Day. On April 24, 2021, the Town held their Recycling Day and on June 12, 2021 the Town held their Cardboard Recycling Day.

In addition to continuing the above practices, the Town will 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 are detailed below.

BMP: SWMP Review
Description: The Engineering Department will make the SWMP available to the public when requested and provide for public comment annually.
Responsible Department/Parties: Engineering Department
Measurable Goals: The Town will allow for annual review of the stormwater management plan by posting of the SWMP on the Town's website and/or by making it available at the Department of Public Works building.
Beginning Year of BMP Implementation: Implemented during Permit Years 1, 2, and 3, and to be continued for the duration of the permit as the SWMP is updated annually.

BMP: Public Participation
Description: Annual event or activity such as household hazardous waste day, water testing, catch basin stenciling, or river cleanup.
Responsible Department/Parties: Environmental Department, Health Department, Department of Public Works
Measurable Goals: Citizens will learn about and help implement MS4 program through a hands-on activity annually.
Beginning Year of BMP Implementation: Implemented during Permit Years 1, 2 and 3 and to be implemented annually thereafter.

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:

Since 2007, the Town has had in place an aggressive Infiltration Removal Program focused on eliminating infiltration and inflow from the Town's sewer system through sewer and manhole rehabilitation. Since 2007, the Town has inspected 359 miles of sewer main, performed 6,352 manhole inspections, installed 188,900 linear feet (36 miles) of cured-in-place liners, installed 3,382 feet of short liners, installed 203 full-wrap lateral liners, installed 35 top hat lateral liners, cementitious lined 9.570 vertical feet of manholes, chemically root treated 300,700 linear feet (57 miles) of sewer main, and performed 47,569 linear feet (9 miles) of testing and sealing of joints. The Engineering Department has conservatively removed 6.1 million gallons per day of inflow and infiltration from the Town's sewer system. By implementing an aggressive sewer rehabilitation program, the Town has significantly

reduced the incidence of illicit connections that might otherwise be associated with failing sewer infrastructure. The Engineering Department conducts inspections to screen for illicit discharges to the storm drainage systems. The Town will continue their effort to extend IDDE educational outreach by making information available to the public through the Town's website and continue to train employees on illicit discharge detection and elimination.

These permit requirements can be achieved through implementation of the following BMPs:

BMP: SSO Inventory
Description: Develop an inventory of where Sanitary Sewer Overflows (SSOs) have discharged to the Town's MS4 within the 5 years prior to the permit effective date, and update this inventory annually going forward. The inventory must include the following: SSO location, whether the discharge entered the MS4 or a surface water directly, date and time that the SSO occurred, estimated discharge volume, known or suspected cause of the discharge, and mitigation or corrective measures completed or planned with implementation timeframes.
Responsible Department/Parties: Engineering
Measurable Goals: Develop and maintain a list of SSOs, including corrective measures taken.
Implementation Timeframe: To be completed during Permit Year 1 and updated annually (FY2019). Dedham did not have any reported SSOs during Permit Years 1, 2 and 3, or within 5 years of the permit effective date.

BMP: Storm Sewer System Map
Description: Update drainage map in accordance with permit conditions and update annually during IDDE program implementation.
Responsible Department/Parties: Engineering
Measurable Goals: Update the Town's existing drainage map to include a full inventory of the Town's storm drain system including the following within 2 years of the permit effective date:

- all outfalls and receiving waters *(already mapped),*
- open channel conveyances,
- interconnections with other MS4s *(already mapped)*,
- municipally owned stormwater treatment structures *(already mapped)*,
- impaired waterbodies (already mapped),
- and initial catchment delineations *(already mapped)*.

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

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

In addition, EPA suggests adding, but does not require, the following information:

- storm and sanitary sewer material, size and age *(some data already mapped)*,
- privately-owned stormwater treatment structures *(some already mapped)*,

- 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: Begin to update the map during Permit Year 1 and complete full system map within 10 years of the permit effective date (FY2019) (FY2028). The Town has in place a comprehensive map of their drainage system, which was updated to meet the Year 2 requirements outlined above. The map continued to be updated during Permit Year 3 to include updates to existing drainage infrastructure and the addition of new drainage infrastructure.

BMP: Written IDDE Program
Description: Create a written IDDE plan that documents all elements of the Town's IDDE Program, including program responsibilities and procedures, and meets the conditions of the permit.
Responsible Department/Parties: Engineering
Measurable Goals: Complete within one year of the effective date of permit and update as required.
Beginning Year of BMP Implementation: To be completed within 1 year of the effective date of the permit (FY2019). The Town developed a written IDDE Plan during Permit Year 1, which is available at the DPW.

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: Engineering
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). The Town began investigation of high priority catchments during Permit Year 3.

BMP: Employee Training
Description: Train employees on IDDE implementation
Responsible Department/Parties: Engineering
Measurable Goals: Conduct annual training on the Town's IDDE Program. Track the number of employees that receive training annually and the dates on which training is held.
Implementation Timeframe: IDDE training was conducted in Years 1,2, and 3, and will continue annually for the duration of the permit term.

BMP: Conduct Dry Weather Screening
Description: Conduct dry weather screening and sampling procedures in accordance with outfall screening procedure and permit conditions.
Responsible Department/Parties: Engineering
Measurable Goals: Complete all dry weather screening and sampling within 3 years of the permit effective date. Track number of outfalls that are screened and sampled annually.

Implementation Timeframe: Dry weather sampling was completed during Permit Year 3.

BMP: Conduct Wet Weather Screening
Description: Conduct wet weather screening and sampling at outfalls/interconnections in catchments where System Vulnerability Factors are present in accordance with permit conditions.
Responsible Department/Parties: Engineering
Measurable Goals: Complete all wet weather screening and sampling within 10 years of permit effective date. Track number of outfalls that are screened and sampled annually.
Implementation Timeframe: Wet weather screening began during Permit Year 3. Wet weather screening and sampling will be complete no later than 10 years from the permit effective date (FY2028).

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

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:

In 1996, the Town of Dedham adopted a stormwater management bylaw (Chapter 36 of the 1996 bylaws). This was amended in its entirety on November 16, 2015 and re-codified as Chapter 246. A copy of this bylaw is included in Appendix H. This bylaw is enforced by the Conservation Commission, or an authorized agent of the Conservation Commission. It provides the regulatory authority to ensure compliance with the provisions outlined through permitting, inspection, maintenance and enforcement. This bylaw requires that a Minor Stormwater Management Permit is obtained for the following activities: land disturbances activities of 500 square feet to 2,000 square feet, except for the construction of a new dwelling; The repair, repaving replacement, or expansion of a residential driveway with a total paved area (including any existing pavement) of 1,000 to 2,000 square feet; any commercial, institutional, or municipal alteration, development or redevelopment of 500 square feet to 1,000 square feet (except for such activities within the Aquifer Protection Overlay District, which shall require a Major Stormwater Management Permit). Any project or activity effectuating an alteration, disturbance, development or redevelopment of land and ineligible for a Minor Stormwater Management Permit that exceeds these criteria requires a Major Stormwater Management Permit. In addition to the Stormwater Management Bylaw, the Town also has a Wetlands Protections Bylaw, which, among other things, protects wetlands, water related resources and adjoining land areas in the Town of Dedham by implementing erosion and sediment control measures.

BMP: Site Inspection and Enforcement of Erosion and Sediment Control (ESC) Measures
Description: Develop written site inspection and enforcement procedures identifying who is responsible for site inspections as well as who has authority to implement enforcement procedures, including sanctions to ensure compliance.
Responsible Department/Parties: Conservation Department
Measurable Goals: Develop written procedures and 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: Completed within 1 year of the permit effective date (FY2019).

BMP: Site Plan Review
Description: Develop written procedures for conducting site plan reviews, inspection and enforcement.
Responsible Department/Parties: Planning Department, Conservation Department
Measurable Goals: Create and implement site plan review procedures and report on the number of site plan reviews conducted, inspections conducted, and enforcement actions taken annually.
Implementation Timeframe: Completed within 1 year of the effective date of the permit (FY2019). The Standard Operating Procedure (SOP) for site plan review, inspection, and enforcement has been appended to the SWMP in Appendix I.

BMP: Erosion and Sediment Control
Description: Review and update existing stormwater 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.
Responsible Department/Parties: Conservation Department, Conservation Commission
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: Completed within 1 year of the effective date of the permit (FY2019).

BMP: Waste Control
Description: Review and update, as needed, the Town's existing stormwater regulations to ensure the control of wastes at construction sites, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.
Responsible Department/Parties: Conservation Department, Building Department
Measurable Goals: Review and update the Town's existing regulations as needed, and implement.
Implementation Timeframe: Completed within 1 year of the effective date of the permit (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 established separate Rules and Regulations for Stormwater Management, which are referenced in Chapter 246 of the Town's bylaws and were most recently revised on November 15, 2018. A copy of these Rules and Regulations are included in Appendix H. For all new development and redevelopment projects, stormwater management systems must meet the Town's retention standard of two inches, and must remove 80% of the average annual load of Total Suspended Solids, and 60% of the average annual load of Total Phosphorus, generated from the total post-construction impervious area on the site. On redevelopment sites, stormwater management systems shall also improve existing conditions, and all projects must consider and, unless impracticable, propose and implement Low Impact Development (LID) Best Management Practices. The Regulations also require sediment and erosion controls at construction sites, as well as the long-term operation and maintenance of BMPs.

In order to comply with the requirements of the 2016 MS4 Permit, the Town shall implement the following BMPs:

BMP: As-Built plans for on-site stormwater control
Description: The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP.
Responsible Department/Parties: Conservation Department, Conservation Commission
Measurable Goals: Require submission of as-built plans for completed projects.
Implementation Timeframe: Completed 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 update annually.
Responsible Department/Parties: Engineering
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, for example, 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 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: Environmental Department, Conservation Department
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: 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, Conservation Department
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.
Description: Adoption, amendment, or modification of a regulatory mechanism to meet permit requirements.
Responsible Department/Parties: Conservation Commission, Conservation Department
Measurable Goals: Review, and update as needed, existing regulatory mechanism that governs post-construction stormwater management to meet the retention and treatment requirements of the permit.
Implementation Timeframe: Completed within 2 years of the permit effective date (FY2020).

2.2.6 Pollution Prevention / Good Housekeeping

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:

Dedham has an extensive list of currently employed good housekeeping measures adopted during the 2003 MS4 Permit. Catch basins are inspected and cleaned every three years. Arterial roads in town are

swept every 3 days and all other roads are swept at least three times per year. The Town also works alongside the Neponset River Watershed Association to clean up and protect the Neponset River, its tributaries and surrounding watershed lands. There are many volunteer and public outreach opportunities for townspeople to become informed and get involved.

These measures are summarized in the following BMP practices:

BMP: O&M Procedures
Description: 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.
Responsible Department/Parties: Parks & Recreation, Facilities Department, Environmental Department, Fire Department, Police, DPW
Measurable Goals: Complete and implement two years after effective date of permit.
Implementation Timeframe: Completed during Permit Year 2 (FY2020). The final O&M Plan is included in Appendix I of the SWMP.

BMP: Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment
Description: Create inventory
Responsible Department/Parties: Environmental Department, Engineering
Measurable Goals: Complete two years after effective date of permit and implement annually
Implementation Timeframe: To be completed during Permit Year 2 (FY2020).
BMP: Infrastructure O&M
Description: Establish and implement program for repair and rehabilitation of MS4 infrastructure.
Responsible Department/Parties: DPW, Engineering
Measurable Goals: Complete two years after effective date of permit
Implementation Timeframe: Completed during Permit Year 2 (FY2020).

BMP: Stormwater Pollution Prevention Plan (SWPPP)
Description: Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities.
Responsible Department/Parties: DPW, Engineering Department
Measurable Goals: Complete and implement two years after effective date of permit.
Implementation Timeframe: A SWPPP was developed for the DPW Facility 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
Measurable Goals: Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually.
Implementation Timeframe: Complete and implement catch basin optimization plan within two years of permit effective date (FY2020) and clean catch basins annually to ensure that each catch basin is no more than 50% full. The Town began collecting data in 2019 to use in developing a catch basin optimization plan. The Town continues to collect data annually and is still working to collect sufficient data to develop the plan.

BMP: Street Sweeping Program
Description: Sweep all streets and permittee-owned parking lots in accordance with permit conditions.
Responsible Department/Parties: DPW
Measurable Goals: Sweep all streets and permittee-owned parking lots once per year in the spring.
Implementation Timeframe: Complete and implement within 1 year of the permit effective date (FY2019). Continue to sweep all streets and Town-owned parking lots at least twice per year in accordance with Permit requirements for impaired receiving waters.

BMP: Road salt use optimization program
Description: Establish and implement a program to minimize the use of road salt.
Responsible Department/Parties: DPW
Measurable Goals: Implement salt use optimization during deicing season.
Implementation Timeframe: Complete and implement within 1 year of the permit effective date (FY2019). The Town has developed a written Standard Operating Procedure for Winter Road Maintenance, which includes a road salt use optimization program. That SOP has been appended to the SWMP in Appendix I.

BMP: Inspection and maintenance of stormwater treatment structures
Description: Establish and implement inspection and maintenance procedures and frequencies.
Responsible Department/Parties: DPW, Engineering
Measurable Goals: Inspect and maintain treatment structures at least annually.
Implementation Timeframe: Complete and implement within 1 year of the permit effective date (FY2019). Inspection and maintenance procedures for stormwater treatment structures were developed in Year 2 as required. All stormwater treatment structures were inspected during Permit Years 2 and 3.

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, Dedham 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 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 stormwater bylaws, as well as 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 Chapter 242 – Storm Drains

Chapter 242, Storm Drains, was adopted at Town Meeting on November 13, 2007, and later amended on November 18, 2013. The objectives of this bylaw are:

1. To prevent pollutants from entering the Town of Dedham's municipal storm drain system;
2. To prohibit illicit connections and unauthorized discharges to the Town's municipal storm drain system;
3. To require the removal of all such illicit connections;
4. To comply with state and federal statutes and regulations relating to stormwater discharges; and
5. To establish the legal authority to ensure compliance with the provisions of this bylaw through inspection, monitoring, and enforcement.

This bylaw provides the legal authority to implement and enforce the IDDE Plan developed by the Town. A copy of this bylaw is included in Appendix H. Its main purpose is to prevent any introduction of pollutants to Dedham's MS4 from stormwater discharges by any user, prohibit illicit connections to the MS4, and to allow the Town to monitor the system and remove any found illicit connections.

The bylaw is adopted under the authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Procedures Act, and pursuant to the Clean Water Act. The Department of Public Works is responsible for enforcement and has the authority to

investigate suspected illicit discharges. The Town has the authority to suspend or terminate the right to discharge to the MS4 of any discharger, including discharges associated with active construction sites. The bylaw mandates that in the case of a spill, that may result in the discharge of pollutants to the municipal drainage system or water of the Commonwealth, the person shall take all necessary steps to ensure containment, and cleanup of the release. In the event of a releasee of oil or hazardous materials, the person shall immediately notify the municipal Fire and Police Departments, the Conservation Commission and the Department of Public Works.

3.2.2 Chapter 246 – Stormwater Management

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.

Chapter 246, Stormwater Management, was adopted by Town Meeting as Chapter 36 of the 1996 Bylaws and later amended in its entirely at Town Meeting on November 16, 2015. A copy of this bylaw is included in Appendix H. This bylaw is administered by the Conservation Commission, or its designated Stormwater Officer. This bylaw is applicable to any alteration, disturbance, development or redevelopment of 500 square feet or more. This bylaw requires that a Minor Stormwater Management Permit is obtained for the following activities: land disturbance activities of 500 square feet to 2,000 square feet, except for the construction of a new dwelling; the construction or expansion of a residential driveway with a total paved area (including any existing pavement) of 1,000 square feet or more; any commercial, industrial, institutional, or municipal alteration, disturbance, development or redevelopment of 500 square feet to 1,000 square feet (except for such activities within the Aquifer Protection Overlay District, which shall require a Major Stormwater Management Permit). A Major Stormwater Permit is required for construction of any new dwelling or any dwelling replacing an existing dwelling; and any alteration, disturbance, development or redevelopment exceeding the thresholds for a Minor Stormwater Permit.

In addition to the Stormwater Management Bylaw, the Town also has a Wetlands Protections Bylaw, which, among other things, protects wetlands, water related resources and adjoining land areas in the Town of Dedham through implementation of sediment and erosion control measures.

3.2.3 Stormwater Management Rules and Regulations

The Town also established separate Rules and Regulations for Stormwater Management, which are referenced in Chapter 246 of the Town's bylaws and were revised on November 15, 2018. Updates to the Stormwater Rules and Regulations were drafted during Permit Year 2 and adopted on August 6, 2020 to meet permit requirements for Construction Site Stormwater Runoff Control and Post-

Construction Stormwater Management. A copy of the updated Rules and Regulations is included in Appendix H . For all new development and redevelopment projects, stormwater management systems must meet the Town's retention standard, and must retain two inches of runoff volume, remove 80% of the average annual load of Total Suspended Solids, and 60% of the average annual load of Total Phosphorus, generated from the total post-construction impervious area on the site. On redevelopment sites, stormwater management systems shall also improve existing conditions, and all projects must consider and, unless impracticable, propose and implement Low Impact Development (LID) Best Management Practices. The Regulations also require sediment and erosion controls at construction sites, as well as the long-term operation and maintenance of BMPs.

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. As updates to these regulations have been implemented to meet these requirements, they have been noted below.

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 Dedham's Regulations that Support Permit Requirement:

Dedham's Stormwater Rules and Regulations provide clear guidance on preconstruction, construction, and final inspections. During construction inspections, the Conservation Commission or Stormwater Officer is granted permission to inspect the project site: "Initial Site Inspection: An inspection may be made of erosion and sedimentation controls and signage prior to any land-disturbance to assess overall effectiveness and functioning to protect resources." Detailed language is included in Section 12 of the Stormwater Management Rules & Regulations which allows the Commission, Stormwater Officer or its designee the ability to enforce the stormwater bylaws, rules and regulations, orders, permits, etc. In both the Bylaw and the Rules & Regulations, the Conservation Commission is granted the authority to seek injunctive relief and issue written orders. The Town has also adopted Standard Operating Procedures (SOP) for inspection of construction sites, including sediment and erosion control measures, as developed by the Central Massachusetts Regional Stormwater Coalition. This SOP and the accompanying checklist can be found in Appendix H.

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 Dedham's Regulations that Support Permit Requirement

Appendix B of Dedham's Stormwater Management Rules & Regulations outline what is required of a Major Stormwater Management Permit. A project narrative with a description of how and where erosion and sedimentation controls will be implemented is required as well as a Proposed Conditions Plan which indicates proposed erosion controls and materials. There is a requirement in Section 5 of the Rules & Regulations that states that all projects shall comply with the Stormwater Management Handbook, but there is no explicit reference to erosion and sedimentation control. Despite the fact that applicants can be ordered to control sediment and erosion as an enforcement measure, nowhere does it state that the applicant must initially control erosion and sedimentation on site.

Recommended Modification: Dedham's Stormwater Management Rules & Regulations state that an Erosion and Sedimentation Control Plan must be submitted as part of the Major Stormwater Permit Application. However, there is no other mention of an Erosion and Sedimentation Control Plan in the body of the document. In looking at the numbering of the document, it looks as though Item No. 6 may have been details for an Erosion and Sedimentation Control Plan. Dedham's Major Stormwater Permit Application Instructions, approved in 2016, seem to indicate that both an "Erosion Sediment Control Plan", as part of the Stormwater Management Site Plan, and an "Erosion and Sediment Control Report" are required. The components of the Erosion and Sediment Control Plan have been captured elsewhere in the Stormwater Management Site Plan Requirements of the Rules and Regulations. The Erosion and Sediment Control Report from the Application Instructions seems to have been omitted in its entirety. It is recommended that the Erosion and Sediment Control Report from the Instructions is added back into the Rules & Regulations in Appendix B, under Section D, Major Permit Submission Requirements. The suggested language to be added is highlighted below:

"*6. An Erosion and Sedimentation Control Report shall be prepared in accordance with the Design Standards contained in Section 5 and contain the following elements:*

a) Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas.

b) *All pollution control measures (structural and non-structural BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. Appropriate control measures must be identified for each major construction activity and the operator responsible for the implementation of each control measure must also be identified.*
c) *The intended sequence and timing of activities that disturb soils at the site and the general sequence during the construction process in which the erosion and sediment control measures will be implemented.*
d) *Structural practices to divert flows from exposed soils, retain/detain flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains must be avoided to the degree practicable.*
e) *Interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided.*
f) *Construction and waste materials expected to be stored on-site with updates as appropriate, including descriptions of controls, and storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.*
g) *Measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust.*
h) *Measures to prevent the discharge of solid materials, including building materials, to waters of the United States, except as authorized by a permit issued under Section 404 of the CWA.*
i) *Pollutant sources from areas other than construction and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.*
j) *Proposed dewatering operations including proposed locations of discharge.*
k) *An Operation and Maintenance Schedule for structural and non-structural measures, interim grading, and material stockpiling areas."*

The reference to the Erosion and Sedimentation Control Plan should be deleted from Section D, Part 9, Item b) of Appendix B as indicated below:

"*b) Eight (8) copies of the Major Stormwater Management Permit Application Form with copies of the Existing Conditions Plan (reduced to 11" x 17"), Proposed Conditions Plan (reduced to 11" x 17"),* ~~*Erosion and Sedimentation Controls Plan (reduced to 11" x 17"),*~~ *Post-Construction O&M Plan shall be submitted.*

Updates Adopted to Meet Permit Requirement:

Portions of the updates recommended were incorporated into Appendix B of the Stormwater Rules and Regulations as part of the revisions made during Permit Year 2. The language pertaining to an erosion and sedimentation control report was added, but instead of deleting the reference to an Erosion and Sedimentation Control Plan, language was added to Section D, Part 5 of Appendix B requiring applicants to submit a separate Erosion and Sedimentation Control Plan. This modification is being incorporated to ease the process of site plan review for Town staff.

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 Dedham's Regulations that Support Permit Requirement

Conditions 16, 17, and 20 in Appendix D, Standard Conditions for Stormwater Management Permits, of Dedham's Stormwater Management Rules & Regulations contain language requiring construction site operators to control wastes, as follows:

"16. The Contractor shall clean up at least daily, all refuse, rubbish, scrap and surplus materials, debris, and unneeded construction equipment resulting from the construction operations. The site of the work and the adjacent areas shall be kept in a neat and orderly condition. Sediments that might be deposited on streets adjacent to the site shall be swept up daily.

17. A portable sanitary facility shall be located on site during construction.
…
20. All excavated earth material not used during the course of this project and all construction waste"

Additionally, Dedham's Storm Drains Bylaw (Ch. 242) specifically defines "construction wastes and residues" as a pollutant as well as many other noxious matters including "sewage" and "noxious or offensive matter of any kind." Section 7 of this Bylaw continues to prohibit the discharge of any "pollutant or non-stormwater discharge into the municipal storm drain system, into a water course, or into waters of the Commonwealth."

Recommended Modification: Existing language does not currently address concrete truck washout. The Town should add language that identifies concrete truck washout as part of the waste that construction operators must control on-site.

Updates Adopted to Meet Permit Requirement:
Condition 15 of Appendix D was updated during Permit Year 2 as follows:

"16. The Contractor shall clean up at least daily, all refuse, rubbish, concrete washout from trucks, scrap and surplus materials, debris, and unneeded construction equipment resulting from the construction operations. The site of the work and the adjacent areas shall be kept in a neat and orderly condition. Sediments that might be deposited on streets adjacent to the site shall be swept up daily."

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 Dedham's Regulations that Support Permit Requirement

Under Dedham's Stormwater Management Rules & Regulations, Major Stormwater Management Permits must include Stormwater Management Site Plans. Following the procedure outlined in Section 6 of the Stormwater Management Rules & Regulations, the Conservation Commission will review the Stormwater Management Site Plan along with additional required information before issuing a decision on the Permit Application. Construction may not begin without an approved Stormwater Management Permit.

The Site Plan to be reviewed must include proposed erosion controls and materials as well as proposed drainage facilities, including drawings of the proposed stormwater management system in a Proposed Conditions Plan (Appendix B, Application Procedures for Stormwater Management Permits, Section D.4, pB-5). The proposed drainage facilities section must include notes indicating the required inspections for the site and stormwater drainage facilities during construction. The proposed drainage facilities section must also include all measures for the protection of water quality.

The Town has a Comprehensive Site Plan Review Checklist in place that is utilized during the site plan review process. This checklist can be found in Appendix H.

Stormwater Management Rules and Regulations, Appendix D: Standard Conditions for Stormwater Management Permits

"d) Proposed erosion controls and materials to be used (i.e. straw bales, silt fence and straw wattles, compost filter mitts, etc.) must be indicated on the plan. In projects anticipated to encounter or manage groundwater, provide dewatering contingency plans, details and location(s). Hay bales may not be used as these have been found to introduce invasive species."

Section 5 of the Stormwater Management Rules & Regulations outlines the design standards required of Major Stormwater Management Permits. Included is the requirement that all projects must consider, propose, and implement Low Impact Design BMPs, which are outlined in Appendix C. Applicants must also demonstrate compliance with design standards for BMPs (Section 5. A. 5., p4).

Stormwater Management Rules and Regulations, Section 5: Design Standards, Part A: Major Stormwater Management Permits (MSMPs)

"5. All projects must consider and, unless impracticable, propose and implement Low Impact Development (LID) Best Management Practices (BMPs, See Appendix C). Applicants shall demonstrate compliance with design standards for LID BMPs through generally accepted methods."

The Stormwater Management Rules & Regulations require that a public hearing be held for all Major Stormwater Management Permit Applications (Section 6, F.1., p8). During the public hearing, the Conservation Commission may request additional information beyond what is required of the permit be submitted. The Conservation Commission has the authority to approve, approve with conditions, or deny the Stormwater Permit Application.

Stormwater Management Rules and Regulations, Section 5: Administration, Part F: Public Hearing Process

"1. A Public Hearing is required for Major Stormwater Management Permit Applications and for Minor Stormwater Management Permit Applications where Design Standards cannot be met.

…

4. During the Public Hearing, the Conservation Commission may request additional information to be submitted by the Applicant. This may include, but is not limited to:… "

Though the Conservation Commission will be reviewing the Stormwater Management Site Plan under a separate procedure, there is language within Section 7 of the Stormwater Rules & Regulations that provides for a Pre-Construction Meeting held between either Applicant's technical representative, the general contractor or any other person with authority to make changes to the project and the Conservation Commission or its representative. This meeting is to review construction sequencing and the permitted plans and their implementation. Though Section 7 of the Rules & Regulations indicate that this meeting is only required at the discretion of the Conservation Commission or Stormwater Officer, Standard Condition #12 of the Stormwater Management Permit included in Appendix D indicates that the pre-construction meeting is mandatory.

Stormwater Management Rules and Regulations, Section 7: Inspections, Part A: Construction Commencement

"1. Pre-Construction Meeting: The Conservation Commission or Stormwater Officer may require a pre-construction meeting prior to starting clearing, excavation, construction or land-disturbing activity by the Applicant. The Applicant's technical representative, the general contractor or any other person with authority to make changes to the project, shall meet with the Conservation Commission or its representative to review construction sequencing and the permitted plans and their implementation."

Stormwater Management Rules and Regulations, Appendix D: Standard Conditions for Stormwater Management Permits

"12. After installation of erosion and sedimentation controls and installation of the sign required by Standard Conditions 9, but prior to the conduct of any other site work authorized or required by this Permit, a pre-construction meeting must be held with the Conservation Commission's Agent, the Applicant, and the person and/or contractor engaged to install the stormwater management system. This is to ensure that all aspects of the Permit are fully understood, particularly the necessity to install the system in accordance with the approved design details." pD-2

Section 7 also requires that inspections occur during construction. The applicant must give notice two days prior to the construction of any structural BMPs and the Conservation Commission or Stormwater Officer may require an inspection by the applicant at any time. While the Conservation Commission or Stormwater Officer has the authority to complete their own inspection at any time and must at given interval outlines in Section 7, Part B, there is no indication of any qualifications required of the entity completing inspections on behalf of the applicant. It is recommended to change the following language, highlighted in blue below, in this section of the Stormwater Management

Rules & Regulations, such that Section 7, Part A., Item 2, be changed and moved to Section 7, Part B, Item 3:

The Town has also adopted Standard Operating Procedures (SOP) for inspection of construction sites, including sediment and erosion control measures, as developed by the Central Massachusetts Regional Stormwater Coalition. This SOP and the accompanying checklist can be found in Appendix H.

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 Dedham's Regulations that Support Permit Requirement:
Under Dedham's Stormwater Management Rules & Regulations, projects subject to both Minor and Major Stormwater Management Permits must "consider and, unless impracticable, propose and implement Low Impact Development (LID) Best Management Practices" (BMPs, See Appendix C). Applicants shall demonstrate compliance with design standards for LID BMPs through generally accepted methods" (Section 5, A&B, p4-5). Appendix C outlines Low Impact Development practices.

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 Dedham's Regulations that Support Permit Requirement:
Under Dedham's Stormwater Management Rules & Regulations, projects subject to Major Stormwater Management Permits must, at a minimum, "comply with the performance standards of the most recent version of the Massachusetts Stormwater Standards and accompanying Stormwater Management Handbook (Handbook)" (Section 5, A., p4). A few differences apply, but none that negate the intent of the Stormwater Management Handbook.

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 Dedham's Regulations that Support Permit Requirement:
Section 5 of Dedham's Stormwater Management Rules & Regulations outlines design standards, stating that projects "subject to a Major Stormwater Management Permit shall comply with the performance standards of the most recent version of the Massachusetts Stormwater Standards and accompanying Stormwater Management Handbook (Handbook), and the Town of Dedham Drainage and Stormwater Design Standards" with three differences from the handbook. One of those differences states the following:

Stormwater Management Rules and Regulations, Section 5: Design Standards, Part A. Major Stormwater Management Permits (MSMPs)
"Stormwater management systems on new development and redevelopment sites shall be designed to:

a) Retain the volume of runoff equivalent to, or greater than, two (2) inches multiplied by the total post-construction impervious surface area on the site; and
b) Remove 80% of the average annual load of Total Suspended Solids generated from the total post-construction impervious area on the site; and
c) Remove 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site.[4]

Per footnote (4) above, the required removal percentages are not required for each storm, it is the average removal over a year that is required. 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."

Recommended Modification:
Footnote (4) meets the requirement that pollutant removal be calculated by EPA Region 1's Evaluation tool. If the Town wishes to continue to require the same standards for new and redevelopment, the requirement for TSS removal should be increased to 90%, though these standards are more stringent than what is required for redevelopment projects.

Updates Adopted to Meet Permit Requirements:
The Town updated Section 5, Design Standards, of the Stormwater Management Rules and Regulations to meet this requirement during Permit Year 2. The updated language, included in subsections A.4 and A.5, distinguishes between new development and redevelopment sites, and meets the requirements of the MS4 permit as it was published in 2016 as well as the permit modifications adopted by EPA in December 2020.

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 Dedham's Regulations that Support Permit Requirement:
Similar to the previously listed permit requirement, Dedham's Stormwater Management Rules & Regulations do not distinguish between requirements for new development and redevelopment. If the Town wishes to continue to require the same standards for new and redevelopment, the requirement for TSS removal should be increased to 90%. If the Town's preference is to make a distinction between new and redevelopment, this section will need to be further modified.

The Rules & Regulations do not include a separate stipulation for stormwater management systems on redevelopment sites to utilize offsite mitigation. The current language is more stringent than this requirement and so is not needed to be in compliance. If the Town wishes to add this exception, the language of Section 5 of the Rules and Regulations will need to be changed.

Recommended Modification: Include the following language under Section 5,

"4. Stormwater management systems on redevelopment sites shall be designed to:
a) Retain the volume of runoff equivalent to, or greater than, two (2) inches multiplied by the total post-construction impervious surface area on the site; and
b) Remove 80% of the average annual load of Total Suspended Solids generated from the total post-construction impervious area on the site; and
c) Remove 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site.
5. On redevelopment sites, stormwater management systems may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site to meet the equivalent retention or pollutant removal requirements indicated in part 3 above. Stormwater management systems on redevelopment sites shall also improve existing conditions; and…"

Updates Adopted to Meet Permit Requirements:
The Town updated Section 5, Design Standards, of the Stormwater Management Rules and Regulations to meet this requirement during Permit Year 2. The updated language, included in subsections A.4 and A.5, distinguishes between new development and redevelopment sites, and meets the requirements of the MS4 permit as it was published in 2016 as well as the permit modifications adopted by EPA in December 2020.

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 above. 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 listed above fully.

Excerpts from Dedham's Regulations that Support Permit Requirement:
Both the Stormwater Management Rules & Regulations and Bylaw provide an exemption for "the maintenance or resurfacing (not including reconstruction) of any public or private way. (Bylaw § 246-6, R&R Section 4.A.9 p2).

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 Dedham's Regulations that Support Permit Requirement:
Under Dedham's Stormwater Management Rules & Regulations, Major Stormwater Management Permits require a Stormwater Management Certificate of Compliance (SMCC). In order to obtain a SMCC, the permittee must submit as-built plans detailing the actual stormwater management systems, structures and devices as installed. The plans for all projects, with the exception of single-family dwellings, must be stamped by a Professional Engineer. A Stormwater Officer or other designee of the Conservation Commission will then verify the as-built features before a SMCC can be issued by the Conservation Commission. Per the Stormwater Management Bylaw, the SMCC will be recorded at the Norfolk County Registry of Deeds and run with the title of the property. The existing regulatory language meets this permit requirement and was not changed as part of the proposed regulatory updates for Year 2.

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.

Excerpts from Dedham's Regulations that Support Permit Requirement:
Under Dedham's Stormwater Management Rules & Regulations, Major Stormwater Management Permits must include a "Post Construction Operation and Maintenance Plan (O&M)." Required components of the plan include the names and contact information of responsible parties, an inspection and maintenance schedule, estimated annual O&M budget, and inspection forms. Additionally, the plan must be signed by the property owner and recorded with the Norfolk County Registry of Deeds. The existing regulatory language meets this permit requirement as is and was not changed as part of the proposed regulatory updates for Year 2.

Phosphorous Impairment

Permit Requirement: For discharges to water quality limited water bodies and their tributaries where phosphorous is the cause of the impairment, the Town's regulatory mechanism for Stormwater Management in New Development and Redevelopment (Year 2 Permit Requirement), shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal.

Recommended Modification:
There is no language in the Stormwater Management Rules and Regulations that requires BMPs to be optimized for phosphorus removal. This language should be added to Section 5 of the Rules and Regulations and the Town should also have a methodology in place for evaluating BMP performance. Under Section 5, include the following statement, "To support compliance with the Town's MS4 Permit, all BMPs must be optimized for the removal of phosphorous. The justification and design of such BMPs must also include a methodology for assessing BMP performance. Pollutant removal shall be consistent with EPA Region 1's Evaluation tool."

Updates Adopted to Meet Permit Requirements:
As part of the Year 2 regulatory updates, language was added to Section 5, Subsections A.4 and A.5 of the Stormwater Rules and Regulations requiring stormwater systems on both new development and redevelopment sites to be optimized for phosphorus removal.

Turbidity Impairment

Permit Requirement: For discharges to water quality limited water bodies and their tributaries where turbidity is the cause of the impairment, the Town's regulatory mechanism for Stormwater Management in New Development and Redevelopment (Year 2 Permit Requirement), shall include a requirement that all new development and redevelopment stormwater management BMPs located on commercial or industrial land incorporate designs that allow for shutdown and containment to isolate the drainage system in the event of an emergency spill or other unexpected event. EPA also encourages the Town to require that any BMPs designed to infiltrate stormwater on commercial and industrial sites be designed to obtain a level of pollutant removal that is equal to or greater than the level of pollutant removal provided by a comparable biofiltration system treating the same volume of runoff.

Recommended Modification:
This language should be added to Section 5 of the Rules and Regulations. Under Section 5, include the following statement, "To support compliance with the Town's MS4 Permit, all new development and redevelopment stormwater management BMPs located on commercial or industrial land must incorporate designs that allow for shutdown and containment to isolate the drainage system in the event of an emergency spill or other unexpected event.

Updates Adopted to Meet Permit Requirements:
The following language was added to Section 5, Design Standards, of the Stormwater Rules and Regulations:

"To support compliance with the Town's MS4 Permit, all new development and redevelopment stormwater management BMPs located on commercial or industrial land must incorporate designs

that allow for shutdown and containment to isolate the drainage system in the event of an emergency spill or other unexpected event."

4.0 IDDE MONITORING AND 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 *Chapter 242 – Storm Drains* of the Town's Bylaws. 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.

As part of Minimum Control Measure No. 3, Illicit Discharge Detection and Elimination (IDDE), the Town is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its MS4 and implement procedures to prevent such discharges. This includes, but is not limited to, the following measures:

1. Developing a comprehensive map of the Town's drainage system that builds upon the outfalls and receiving waters that were previously mapped under the 2003 MS4 Permit.
2. Ensuring that appropriate regulatory mechanisms and enforcement procedures, as required under the 2003 MS4 Permit, are in place to prohibit illicit discharges.
3. Developing and implementing a written plan to detect and eliminate illicit discharges, which references the Town's authority to implement all aspects of the IDDE program, clearly identifies responsibilities with regard to eliminating illicit discharges, and outlines written procedures for dry and wet weather outfall screening and sampling and catchment investigations.
4. Providing training annually to employees involved in the IDDE program about the program, including how to recognize illicit discharges and SSOs.

Such measures will be performed with the goal of finding and removing 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 could 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.

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

4.1.1 Mapping

The Town has already developed a comprehensive map of their drainage system, which includes outfalls, pipes, manholes, catch basins, interconnections with other MS4s, municipally owned stormwater treatment structures and impaired water bodies. Outfalls 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.

Drainage Infrastructure under the Town's jurisdiction includes:

- 48.7 miles of gravity pipe/culverts ranging in size from 4-inches to 72-inches in diameter constructed of asbestos cement, brick, cast iron, corrugated metal, ductile iron, HDPE, PVC, vitrified clay, concrete, and reinforced concrete;
- 1,961 catch basins;
- 1,106 storm drain manholes;
- 156 Dedham-owned outfalls;
- 184 non-Dedham owned outfalls; and
- 27 interconnections with other MS4s.

Mapping has been in accordance with the 2016 MS4 Permit's accuracy guidelines and infrastructure has been recorded on a publicly available town map, the most recent version of which can be found at the following location: dedham.maps.arcgis.com.

The Town is also in the process of mapping privately-owned stormwater treatment structures. The Town already has in place a comprehensive map of their municipal sanitary sewer system.

Dedham 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 mapping will serve as a planning tool for the implementation and phasing of the Town's IDDE Program and demonstration of the extent of complete and planned investigations and corrections. 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

The Town 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
- Density of generating sites.
- Age of development and infrastructure
- Culverted streams
- 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 the 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, grabs 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.
- Dye Testing - dyed water is poured into plumbing fixtures and downstream drainage is observed to confirm connections.
- ZoomCam Inspections - 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 - non-toxic smoke is introduced into drainage segments containing suspected illicit discharges and adjacent buildings are observed for signs of a connection, or smoke emanating from floor drains or sump pump connections.
- CCTV/Video Inspections – drainage pipes are internally inspected to pinpoint and evaluate connections through the use of a closed-circuit television camera through all or a portion of the drain segment believed to contain the connection.

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, the Town of Dedham 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.

Dedham 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, Dedham 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.

Dedham has not had any SSO occurrences in the five years prior to the permit effective date or since the permit became effective.

The Town will maintain an SSO inventory as part of this plan and the Town's IDDE Plan. Information will also be included in the Town's MS4 Annual Reports, including the status of mitigation and corrective measures to address any identified SSOs, where applicable.

4.1.5 Dry Weather Outfall Screening and Sampling Progress

The Town conducted dry weather screening of regulated outfalls and interconnections during Permit Year 3. In accordance with outfall screening procedures and permit conditions, any outfalls found to be flowing during dry weather were sampled for temperature, salinity, conductivity, chlorine, ammonia, surfactants, E. coli, and pollutants of concern. There were 183outfalls and interconnections screened during Permit Year 3.

4.1.6 Wet Weather Outfall Screening and Sampling Progress

The Town began conducting wet weather outfall screening and sampling in catchments where at least one system vulnerability factor (SVF) was identified. During Permit Year 3, 20 outfalls were visited during wet weather conditions and flow was sampled. In accordance with outfall screening procedures and permit conditions, outfalls were sampled for temperature, salinity, conductivity, chlorine, ammonia, surfactants, E. coli, and pollutants of concern.

4.1.7 Catchment Investigations

The Town began implementing their catchment investigations during Permit Year 3. The Town started investigation of High Priority catchments in accordance with the catchment investigation procedures identified under Section 4.1.3. Catchment investigations were conducted in 17 high priority catchments.

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

Dedham has developed a comprehensive Operation and Maintenance (O&M) Plan to meet permit requirements. The O&M Plan is included in Appendix I of the SWMP. The inventory of municipally owned facilities and property, including vehicles, equipment, and stormwater treatment structures is included as Appendix A of the O&M Plan.

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, has been incorporated into Appendix I of this Stormwater Management Plan as well as Appendix H of the Town's O&M Plan. All required SOPs mentioned above were developed during Year 2 and are appended to the Town's O&M Plan, which is included in Appendix I.

5.4 Catch Basin Cleaning and Optimization

The Town currently has approximately 1,961 catch basins that they maintain, which are cleaned every three years. The DPW is responsible for the cleaning of all catch basins. The DPW has estimated that approximately one-third of all catch basins are cleaned every year, which aligns with the Town's goal.

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 continue to 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 collected data during Permit Years 1 and 2 as part of developing their optimization plan to ensure that no catch basin is more than 50% full. Data collected included 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. During Permit Year 3, the Town continued to perform some cleaning in-house, but also hired an outside contractor to assist with catch basin cleaning and data collection to help develop the Catch Basin Optimization Plan.. A tablet-based catch basin cleaning inspection form was developed and used so that this data can be easily 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.

The Town is working to collect sufficient data to prepare the catch basin cleaning optimization plan. A schedule for collecting the remaining data will be submitted with the Town's Year 3 Annual Report.

6.0 TMDLS AND 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. There are currently three approved TMDLs that are applicable to Dedham – all of which focus on bacteria and phosphorus impairments. These include the *Final TMDL of Bacteria for the Neponset River Basin,* the *Final Pathogen TMDL for the Charles River Watershed,* and the *TMDL for Nutrients in the Upper/Middle Charles River.*

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 for one or more designated uses and require the development of a TMDL. In Dedham, this includes Mother Brook (MA73-28) for phosphorus, and the Neponset River (MA73-02) for turbidity.

6.2 Bacteria/Pathogens Impairments

Both the *Final TMDL of Bacteria for the Neponset River Basin* and *the Final Pathogen TMDL for the Charles River Watershed* are applicable to Dedham. Both Mother Brook and the Neponset River are covered under the *Final TMDL of Bacteria for the Neponset River Basin*, although the Town does not have any direct discharges to the Neponset River, only discharges to tributaries of the Neponset River like Mother Brook. The portion of the Charles River that Dedham discharges to is covered under the *Final Pathogen TMDL for the Charles River Watershed.*

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 outfalls tributary to the Charles River and Mother Brook.

The Permit requires the Town to supplement its residential public education program by distributing information to pet owners within those catchments tributary to the Charles River and Mother Brook about the 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. This informational campaign can be combined with the phosphorus education requirements outlined in Section 6.3.2.1. The Town has already been distributing information on pet waste management to all dog owners at license renewal, and has also posted this information on their website, on social media and at public events. License renewal usually occurs in June each year.

The Town will also distribute information to septic system owners about proper maintenance in those catchments tributary to the Charles River and Mother Brook. Although most of the Town is on sewer, approximately 5% of the Town is still served by septic systems. The Town distributed messages to septic system owners during Permit Years 1, 2, and 3, and will continue distribution throughout the permit term.

6.3 Phosphorus Impairments

The 2016 MS4 Permit lists Dedham as a municipality requiring compliance with an approved phosphorus TMDL for the Charles River and as having a phosphorus impairment without an approved TMDL. This phosphorus impairment without an approved TMDL refers to Mother Brook.

On June 10, 2011, EPA approved the *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River*. To address phosphorus in stormwater discharges and meet the waste load allocations outlined in these TMDLs, a Phosphorus Control Plan will need to be developed and implemented within 20 years of the permit effective date as outlined in Appendix F of the MS4 Permit. The permit indicates that Dedham will have to reduce its phosphorus load by 50% to meet the established waste load allocation in these TMDLs. Dedham's baseline phosphorus load is 805 kg/yr. The required phosphorus load reduction is 404 kg/yr to arrive at an allowable phosphorus load of 401 kg/yr. The waste load allocation is to be obtained through implementation of several structural and non-structural BMPs outlined in a three-phase Phosphorous Control Plan as detailed under Section 6.3.1.

Mother Brook is also impaired for phosphorous and requires the development of a TMDL. The Town has a number of outfalls, which discharge directly to this receiving water and therefore, 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 and their tributaries where phosphorus is the cause of the impairment.

6.3.1 Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River

In order to comply with the TMDL for Nutrients in the Upper/Middles Charles River, the Town must create and implement a three-part Phosphorus Control Plan according to the schedule outlined below.

- Create a Phase 1 Phosphorus Control Plan within 5 years of the permit effective date
- Implement the Phase 1 Phosphorous Control Plan and create a Phase 2 Phosphorous Control Plan within 5 years of the permit effective date.
- Implement the Phase 2 Phosphorus Control Plan and create a Phase 3 Phosphorus Control Plan within 15 years of the permit effective date
- Implement the Phase 3 Phosphorous Control Plan within 20 years of the permit effective date.

Phase 1 of the Phosphorus Control Plan shall be drafted within 5 years of the permit effective date. It must include each of the following components to be completed by the dates associated with them:

Table 6-1: Phosphorus Control Plan Phase 1 Components

PCP Phase 1 Component	Completion Date
Legal Analysis – *The Town must perform an assessment to ensure that the existing regulatory mechanisms of the Town support implementation of the PCP and update or create any bylaws and ordinances to effectively enact the entire plan. An assessment was performed during Permit Year 2 of the Town's existing regulatory mechanisms to support implementation of the PCP.*	2 years after the effective permit date - FY2020
Funding Source Assessment – *The Town must describe all possible current and anticipated mechanisms that would be used to fund the PCP. The Town must describe in detail the steps taken to obtain such funding which may include conceptual development, outreach to affected parties, and development of legal authorities. A funding source assessment was performed during Permit Year 3 to support implementation of the PCP.*	3 years after the effective permit date - FY2021
Define Scope of PCP – *The Town must define the project area as either the entire area within the Town's jurisdiction or by all the urbanized area within the Town's jurisdiction that falls within the Charles River Watershed. In Dedham's case, these are the same area. Within the PCP Area:* • *The Baseline Phosphorus Load is 805 kg/yr* • *The Stormwater Phosphorus Load Reduction Requirement is 404 kg/yr* • *The Allowable Phosphorus Load is 401 kg/yr* • *The Stormwater Percent Reduction in Phosphorus Load is 50%*	4 years after the effective permit date - FY2022
Describe Non-Structural Controls – *The Town must describe all non-structural controls to be implemented in the PCP. It must be detailed to include the planned measures, the area of implementation, and the annual percent reduction expected from the BMP's effect. To calculate expected rate of phosphorus exported ($\boldsymbol{P_{exp}}$), add the Allowable Phosphorus Load ($\boldsymbol{P_{allow}}$) to the applicable Phosphorus Reduction Requirement ($\boldsymbol{P_{RR}}$) multiplied by 0.8* $\boldsymbol{P_{exp} \leq P_{allow} + (P_{RR} \times 0.8)}$.	5 years after the effective permit date - FY2023
Describe Structural Controls – *The Town will perform a ranking assessment to determine priority areas to retrofit or develop structural BMPs to address phosphorus discharge. It must be detailed to include the planned measures, the area of implementation, and the annual percent reduction expected from the BMP's effect. To calculate expected rate of phosphorus exported ($\boldsymbol{P_{exp}}$), add the Allowable Phosphorus Load ($\boldsymbol{P_{allow}}$) to the applicable Phosphorus Reduction Requirement ($\boldsymbol{P_{RR}}$) multiplied by 0.75* $\boldsymbol{P_{exp} \leq P_{allow} + (P_{RR} \times 0.75)}$. *If the Town decides to hire a contractor to install the chosen BMP, that third party can be included in the plan as well.*	5 years after the effective permit date - FY2023
Describe Operation and Maintenance Programs – *The Town will detail an operation and maintenance plan for each of the structural BMPs including an inspection and maintenance schedule specific to the BMP design or*	5 years after the effective permit date - FY2023

PCP Phase 1 Component	Completion Date
manufacturer specification and the responsible party for carrying out the plan.	
Phase 1 Implementation Schedule – *A schedule for implementation of all planned Phase 1 BMPs including: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance, and other assessment and evaluation components of implementation. All non-structural BMPs must be adopted 6 years after the effective date of the permit, all structural BMPs must be adopted to adhere to the phosphorus removal milestones in year 8 and 10, and the full plan must be implemented no later than 10 years after the effective date of the permit.*	5 years after the effective permit date - FY2023
Estimated Cost -*The Town must estimate the cost of implementing all aspects of the Phase 1 plan. This will confirm the validity the funding source assessment completed in year 3.*	5 years after the effective permit date - FY2023
Complete Written Phase – *The Town must complete the written Phase 1 plan no later than 5 years after the permit's effective date. The EPA encourages the Town to post the drafted plan online to allow for public involvement.*	5 years after the effective permit date - FY2023
Full Implementation of Non-Structural Controls – *The Town must have fully implemented and evaluated the effectiveness of all non-structural BMPs by 6 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	6 years after the effective permit date - FY2024
Performance Evaluation – *the Town will continue monitoring non-structural BMPs for their effectiveness at removing Phosphorus.*	6 and 7 years after the effective permit date – FY2024-2025
Full Implementation of Structural Controls and Performance Evaluation - *The Town must have fully implemented and evaluated the effectiveness of all -structural BMPs by 8 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	8 years after the effective permit date - FY2026
Performance Evaluation - *the Town will continue monitoring non-structural and structural BMPs for their effectiveness at removing Phosphorus.*	9 years after the effective permit date - FY2027
Full Implementation of Structural Controls and Performance Evaluation - *The Town must have fully implemented and evaluated the effectiveness of all BMPs by 10 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	10 years after the effective permit date - FY2028

Phase 2 of the Phosphorus Control Plan shall be completed no later than 10 years after the effective permit date and contain all the following components:

Table 6-2: Phosphorus Control Plan Phase 2 Components

PCP Phase 2 Component	Completion Date
Legal Analysis – *Update any analysis performed for Phase 1 to include any new or augmented bylaws, ordinances, or funding mechanisms deemed necessary to enact in order to complete the PCP.*	As necessary
Describe Planned Non-Structural Controls - *The Town must describe all new non-structural controls to be implemented in the PCP to reach the new reduction milestone set forth by the permit. It must be detailed to include the planned measures, the area of implementation, and the annual percent reduction expected from the BMP's effect. To calculate expected rate of phosphorus exported ($\boldsymbol{P_{exp}}$), add the Allowable Phosphorus Load ($\boldsymbol{P_{allow}}$) to the applicable Phosphorus Reduction Requirement ($\boldsymbol{P_{RR}}$) multiplied by 0.65* $\boldsymbol{P_{exp} \leq P_{allow} + (P_{RR} \times 0.65)}$.	10 years after the effective permit date – FY2028
Describe Planned Structural Controls - *The Town must describe all new structural controls to be implemented in the PCP to reach the new reduction milestone set forth by the permit. It must be detailed to include the planned measures, the area of implementation, and the annual percent reduction expected from the BMP's effect. To calculate expected rate of phosphorus exported ($\boldsymbol{P_{exp}}$), add the Allowable Phosphorus Load ($\boldsymbol{P_{allow}}$) to the applicable Phosphorus Reduction Requirement ($\boldsymbol{P_{RR}}$) multiplied by 0.50* $\boldsymbol{P_{exp} \leq P_{allow} + (P_{RR} \times 0.50)}$.	10 years after the effective permit date – FY2028
Update Operation and Maintenance Plan - *The Town will detail an operation and maintenance plan for each of the structural BMPs including an inspection and maintenance schedule specific to the BMP design or manufacturer specification and the responsible party for carrying out the plan.*	10 years after the effective permit date – FY2028
Phase 2 Implementation Schedule - *A schedule for implementation of all planned Phase 2 BMPs including: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance, and other assessment and evaluation components of implementation. All structural BMPs must be adopted to adhere to the phosphorus removal milestones in year 13 and 15, and the full plan must be implemented no later than 15 years after the effective date of the permit.*	10 years after the effective permit date – FY2028
Estimated Cost - *The Town must estimate the cost of implementing all aspects of the Phase 2 plan including installing any new BMPs and creating an ongoing operation and maintenance plan.*	10 years after the effective permit date – FY2028
Complete Written Phase - *The Town must complete the written Phase 2 plan no later than 10 years after the permit's effective date. The EPA encourages the Town to post the drafted plan online to allow for public involvement.*	10 years after the effective permit date – FY2028
Performance Evaluation - *The Town will continue monitoring non-structural BMPs for their effectiveness at removing Phosphorus.*	11 and 12 years after the effective permit date – FY2029- 2030

PCP Phase 2 Component	Completion Date
Full Implementation of Non- Structural Controls and Performance Evaluation - *The Town must have fully implemented and evaluated the effectiveness of all non-structural BMPs by 13 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	13 years after the effective permit date – FY2031
Performance Evaluation - *The Town will continue monitoring non-structural BMPs for their effectiveness at removing Phosphorus.*	14 years after the effective permit date – FY2032
Full Implementation of Structural Controls and Performance Evaluation - *The Town must have fully implemented and evaluated the effectiveness of all BMPs by 15 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	15 years after the effective permit date – FY2033

Phase 3 of the Phosphorus Control Plan shall be completed no later than 15 years after the permit effective date. It shall be fully implemented no later than 20 years after the permit effective date and contain the following components.

Table 6-3: Phosphorus Control Plan Phase 3 Components

PCP Phase 3 Components	Completion Date
Legal Analysis - *Update any analysis performed for Phase 1 and 2 to include any new or augmented bylaws, ordinances, or funding mechanisms deemed necessary to enact in order to complete the PCP.*	As necessary.
Describe Planned Non-Structural Controls - *The Town must describe all new non-structural controls to be implemented in the PCP to reach the new reduction milestone set forth by the permit. It must be detailed to include the planned measures, the area of implementation, and the annual percent reduction expected from the BMP's effect. To calculate expected rate of phosphorus exported ($\boldsymbol{P_{exp}}$), add the Allowable Phosphorus Load ($\boldsymbol{P_{allow}}$) to the applicable Phosphorus Reduction Requirement ($\boldsymbol{P_{RR}}$) multiplied by 0.30:* $\boldsymbol{P_{exp} \leq P_{allow} + (P_{RR} \times 0.30)}$.	15 years after the effective permit date – FY2033
Describe Planned Structural Controls - *The Town must describe all new structural controls to be implemented in the PCP to reach the new reduction milestone set forth by the permit. It must be detailed to include the planned measures, the area of implementation, and the annual percent reduction expected from the BMP's effect. To calculate expected rate of phosphorus exported ($\boldsymbol{P_{exp}}$), add the Allowable Phosphorus Load ($\boldsymbol{P_{allow}}$) to the applicable Phosphorus Reduction Requirement ($\boldsymbol{P_{RR}}$) :* $\boldsymbol{P_{exp} \leq P_{allow} + P_{RR}}$.	15 years after the effective permit date – FY2033
Update Operation and Maintenance Plan - *The Town will detail an operation and maintenance plan for each of the structural BMPs including an inspection and maintenance schedule specific to the BMP design or manufacturer specification and the responsible party for carrying out the plan.*	15 years after the effective permit date – FY2033

PCP Phase 3 Components	Completion Date
Phase 3 Implementation Schedule - *A schedule for implementation of all planned Phase 3 BMPs including: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance, and other assessment and evaluation components of implementation. All structural BMPs must be adopted to adhere to the phosphorus removal milestones in year 18 and 20, and the full plan must be implemented no later than 20 years after the effective date of the permit.*	15 years after the effective permit date – FY2033
Estimated Cost - *The Town must estimate the cost of implementing all aspects of the Phase 2 plan including installing any new BMPs and creating an ongoing operation and maintenance plan.*	15 years after the effective permit date – FY2033
Complete Written Phase - *The Town must complete the written Phase 3 plan no later than 15 years after the permit's effective date. The EPA encourages the Town to post the drafted plan online to allow for public involvement.*	15 years after the effective permit date – FY2033
Performance Evaluation - *The Town will continue monitoring non-structural BMPs for their effectiveness at removing Phosphorus.*	16 and 17 years after the effective permit date – FY2034-2035
Full Implementation of Non- Structural Controls and Performance Evaluation - *The Town must have fully implemented and evaluated the effectiveness of all non-structural BMPs by 18 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	18 years after the effective permit date – FY2036
Performance Evaluation - *The Town will continue monitoring non-structural BMPs for their effectiveness at removing Phosphorus.*	19 years after the effective permit date – FY2037
Full Implementation of Structural Controls and Performance Evaluation - *The Town must have fully implemented and evaluated the effectiveness of all BMPs by 20 years after the permit effective date by the method described above. All performance evaluations for each BMP will be included as an appendix to this report.*	20 years after the effective permit date – FY2038

6.3.2 Mother Brook Phosphorus Impairment

6.3.2.1 Public Education and Outreach

The Town must distribute additional educational messages to residential property owners, businesses, and commercial institutions about the proper use and disposal of grass clippings, and to encourage the use of slow release and phosphorous-free fertilizers annually in the spring, between March and April. An additional pet waste message must also be distributed to residents annually in the summer, between June and July, encouraging the proper management of pet waste and noting any existing bylaws where appropriate. In the Fall (August/September/October), an educational message detailing the proper disposal of leaf litter must be distributed to residential and commercial property owners. The Town has also been posting information on fertilizer use and disposal of leaf litter on their website, on social media and at public events.

6.3.2.2 Regulatory Updates

The Town of Dedham must also update their Rules and Regulations Regarding the Use of Public Sewers and Storm Drains to require that all new development and redevelopment stormwater management BMPs constructed within town be optimized for phosphorous removal. A comprehensive review of all existing rules and regulations must be performed within two years of the permit effective date to determine any updates that must be made to comply with this statute and any progress shall be reported here and in the Town's Annual Report. The Stormwater Rules and Regulations were updated during Permit Year 3 to require stormwater management BMPs on new development and redevelopment sites to be optimized for phosphorus removal.

In addition, as part of the assessment to identify permittee-owned property that can be retrofitted with BMPs, the incorporation of BMPs that infiltrate stormwater shall be prioritized where feasible to aid in phosphorus removal.

6.3.2.3 Good Housekeeping and Pollution Prevention

The Town shall develop and implement a program to manage grass clippings and leaf litter on all permittee-owned property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces, within 2 years of the permit effective date. That plan shall be appended here.

The Town shall increase street and municipal parking lot sweeping frequencies to a minimum of two times per year, in the spring after snowmelt and sanding practices have subsided, and in the fall after leaf fall events (September 1st to December 1st). A street sweeping schedule shall be included in this plan and in the Town's Annual Reports.

The Town developed a SOP for the sweeping of streets and permittee-owned parking lots during Permit Year 2. That SOP is included in Appendix F of the Town's O&M Plan and in Appendix I of this SWMP.

6.3.2.4 Phosphorus Source Identification

The Town must develop a comprehensive Phosphorous Source Identification Report. This report must include the following elements:

- Calculation of the total MS4 regulated area draining directly to Mother Brook and to those receiving waters tributary to Mother Brook. The analysis will reflect any updated MS4 mapping and catchment delineations.
- All screening and monitoring results for outfalls tributary to Mother Brook. Outfalls discharging directly to Mother Brook will be tested for phosphorus during dry and wet weather sampling events, where flowing.
- Calculation of Impervious Area and Directly Connected Impervious Area for each catchment.
- Identification, delineation and prioritization of potential catchments with high phosphorous loading.
- Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment, including the removal of impervious area to reduce phosphorous loadings.

This report must be appended to the Town's Year 4 Annual Report and to this SWMP upon completion.

After the submission of the report, the Town must evaluate all permittee-owned properties within the drainage area that could be candidates for a BMP retrofit. This evaluation must include:

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

This analysis must be complete within 5 years of the permit effective date, and a plan and schedule for implementation must be included in the Year 5 Annual Report. The Town must plan and install at least one structural BMP as a demonstration project within the drainage area of Mother Brook within 6 years of the permit effective date. This BMP must target a catchment with high phosphorus load potential. Any other identified BMP retrofit project must be installed according to the schedule outlined in the Year 5 Annual Report. For those structural BMPs installed, the Town must document the following in each MS4 Annual Report:

- BMP type
- Total area treated by the BMP
- Design storage volume of the BMP
- Estimated phosphorus removed in mass per year by the BMP

6.4 Oil and Grease, TSS and Turbidity Impairments

Since Segment MA73-02 of the Neponset River is impaired for turbidity and requires the development of a TMDL, the Town would normally be subject to the requirements of Appendix H of the MS4 Permit, which outlines requirements related to discharges to water quality limited water bodies where solids, metals, or oil and grease is the cause of the impairment. However, since the Town does not have any direct discharges to the Neponset River, the Town should be relieved of the requirements of Appendix H, as they relate to turbidity. However, the requirements related to this impairment are still included below for reference.

6.4.1 Regulatory Updates

If the Town had direct discharges to the Neponset River, the Town would be required to update their existing *Stormwater Management Rules and Regulations* to require that all new development and redevelopment stormwater management BMPs located on commercial or industrial land incorporate designs that allow for shutdown and containment to isolate the drainage system in the event of an emergency spill or other unexpected event. EPA also encourages the Town to require that any BMPs designed to infiltrate stormwater on commercial and industrial sites be designed to obtain a level of pollutant removal that is equal to or greater than the level of pollutant removal provided by a comparable biofiltration system treating the same volume of runoff. This review and any necessary changes must be completed within the second year of the permit.

Language was added to Section 5 of the Stormwater Rules and Regulations during Permit Year 3 to meet this requirement and was adopted by the Town.

6.4.2 Good Housekeeping and Pollution Prevention

The turbidity impairment requires an increase in the frequency of street sweeping of all municipally owned streets and parking lots in catchment areas tributary to the Neponset River with the potential for high pollutant loads. Commercial areas, high-density residential areas, and drainage areas with a large amount of impervious area must be considered priorities. The Town must include the street sweeping

schedule developed to target these areas with higher pollutant loads in their annual reports to EPA each year. This has been addressed in the Street Sweeping SOP included in Appendix I.

Also, catch basins that drain to those outfalls tributary to the Neponset River must be inspected more frequently to ensure that the sump for each basin is no more than 50% full at any given time. For those catch basins where excessive sediment or debris is located, catch basins must be cleaned more often. Additional data is still needed to develop a comprehensive catch basin optimization plan. A schedule for collecting the needed data will be submitted with the Town's Year 3 MS4 Annual Report.

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 Dedham are referenced in Appendix E of this SWMP. Dedham 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.

Dedham 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.

Currently, Dedham does not anticipate any major modifications to the SWMP or NOI requiring official notification.

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 firefighting 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 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 waste load 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).

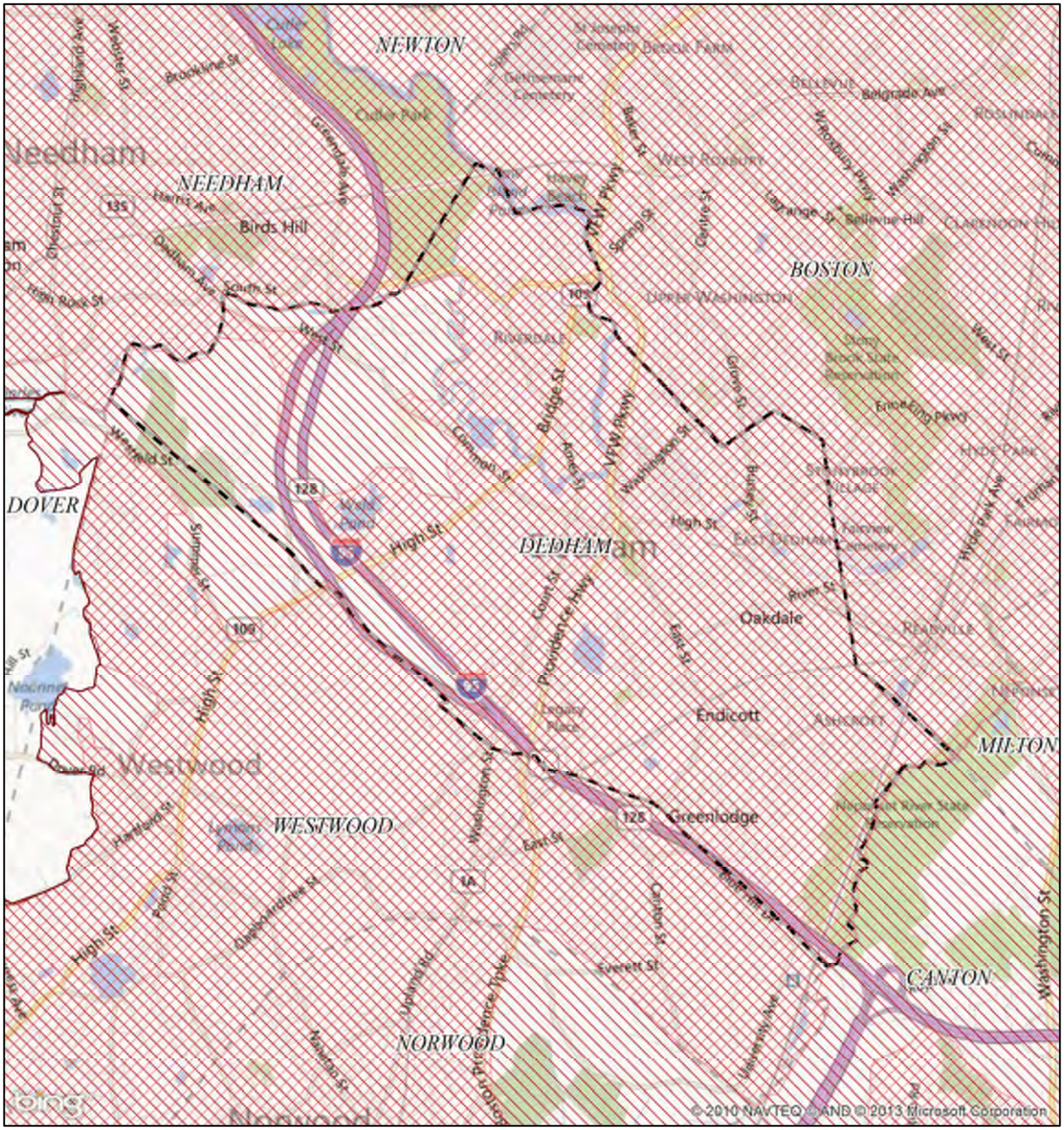
Water Quality Standards - A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt WQS to protect public health or welfare, enhance the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

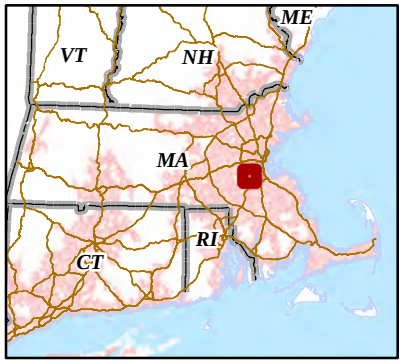
ABBREVIATIONS AND ACRONYMS

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 – Waste load Allocation
WQS – Water Quality Standard

APPENDIX B

Regulated Area Map





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas
Dedham 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: 24729

Regulated Population: 24729

(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

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

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

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

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

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

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

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

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

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

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

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

/S/Signature On File
_____
Ken Moraff, Director
Water Division
United States Environmental Protection Agency
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

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

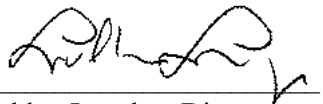

_____
Lealdon Langley, Director
Division of Watershed Management
Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

TABLE OF CONTENTS

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

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

2.1. Water Quality Based Effluent Limitations

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

2.1.1. Requirement to Meet Water Quality Standards

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

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

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

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

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

d. Pursuant to Part 2.1.1.a, upon notice from EPA or MassDEP to the permittee that a discharge of a pollutant from the MS4 that is exceeding applicable water quality standards, the permittee must, within 60 days, remedy the exceedance or eliminate the discharge. However, where such remedy or elimination within 60 days is impracticable, the permittee shall submit to EPA, by the same deadline, a schedule of actions to achieve a remedy or elimination in the shortest time not impracticable. The permittee shall implement such actions on the schedule submitted to EPA and report on progress in its annual reports unless or until EPA takes any other action that effectively replaces the schedule..

2.1.2. Increased Discharges

a. Any increased discharge, including increased pollutant loading(s) through the MS4 to waters of the United States is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate[3]. Any authorization of an increased discharge by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies conditions or requirements related to the increased discharge, such requirements may be independently enforceable under State law and may be adopted into a future permit.

b. There shall be no increased discharges, including increased pollutant loading(s) from the MS4 to impaired waters listed in categories 5 or 4b on the most recent Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) unless the permittee

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

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

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

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

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

2.2. Discharges to Certain Impaired Waters

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

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

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

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

2.2.1. Discharges Subject to Requirements Related to an Approved TMDL

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

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

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

1.

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

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

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

1.

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

Ludlow	

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 is not subject to part 2.1.1.b for those pollutants, or the MS4 is located in a town listed in part 2.2.2.a.-b, the permittee shall comply with the provisions

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

In the absence of a defined pollutant reduction target and where no approved TMDL has been established as of the issuance date of this permit, this permit part and Appendix H define an iterative approach addressing pollutant reductions to waterbodies where the permittee's discharge is not meeting applicable water quality standards due to nutrients (Total Nitrogen Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, 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, all documents submitted to EPA in accordance with Appendix F, and all annual reports shall be available to the public online if the permittee has a website on which to post these documents.

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

c. The permittee shall report on the activities undertaken to provide public participation opportunities including compliance with part 2.3.3.a. Public participation opportunities pursuant to part 2.3.3.b may include, but are not limited to, websites; hotlines; clean-up teams; monitoring teams; or an advisory committee.

2.3.4 Illicit Discharge Detection and Elimination (IDDE) Program

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

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

2.3.4.1. Definitions and Prohibitions

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

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

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

2.3.4.2. Elimination of Illicit Discharges

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

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

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

2.3.4.3. Non-Stormwater Discharges

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

2.3.4.4. Sanitary Sewer Overflows

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

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

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

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

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

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

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

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

2.3.4.5. System mapping

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

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

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

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

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

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

- Storm sewer material, size (pipe diameter) and age
- Sanitary sewer system material, size (pipe diameter) and age
- Privately-owned stormwater treatment structures
- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high-density urban areas
- Area where the permittee's MS4 has received or could receive flow from septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
- Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates).

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

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

2.3.4.6. Written Illicit Discharge Detection and Elimination Program

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

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

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

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

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

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

2.3.4.7. Assessment and Priority Ranking of Outfalls/Interconnections

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

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

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

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

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

- Problem Outfalls: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall

include any outfalls/interconnections where previous screening indicates likely sewer input.[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 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

[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.

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) <u>Follow-up ranking of outfalls and interconnections</u>:

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).

[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

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 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

[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.

[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.

vulnerability factors within each catchment.

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

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

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

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

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

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

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

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

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

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

1. <u>For all catchments</u>
   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

[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.

MS4.

1) The permittee shall conduct at least one wet weather screening and sampling at the outfall that includes the same parameters required during dry weather screening, part 2.3.4.7.b.iii.4.
2) Wet weather sampling and screening shall proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge. EPA strongly recommends sampling during the spring (March through June) when groundwater levels are relatively high.
3) The permit does not require a minimum rainfall event prior to wet weather screening. However, permittees may incorporate provisions that assist in targeting such discharges, including avoiding sampling during the initial period of discharge ("first flush") and/or identifying minimum storm event intensities likely to trigger sanitary sewer interconnections.

c) This sampling can be done upon completion of any dry weather investigation but must be completed before the catchment investigation is marked as complete.

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

d. Identification/Confirmation of illicit source

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

e. Illicit discharge removal

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

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

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

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

2.3.4.9. Indicators of IDDE Program Progress

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

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

2.3.4.10 Ongoing Screening

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

2.3.4.11 Training

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

2.3.5. Construction Site Stormwater Runoff Control

Objective: The objective of an effective construction stormwater runoff control program is to minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S through the permittee's MS4. The construction site stormwater runoff control program required by this permit is a separate and distinct program from EPA's Construction General Permit in that the former is implemented by the MS4 operator to ensure that runoff from construction sites discharging to the MS4 are controlled consistent with the MS4's applicable requirements, whereas the latter is implemented by construction site operators to comply with the terms and conditions of EPA's permit (https://www.epa.gov/npdes/2017-construction-general-permit-cgp).

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

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

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

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

ii. Written (hardcopy or electronic) procedures for site plan review, site inspections and enforcement of sediment and erosion control measures by the permittee. If not already existing, these procedures shall be completed within one (1) year from the effective date of the permit.

1. The site plan review procedure shall include:
   - a pre-construction review by the permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development;
   - consideration of potential water quality impacts;
   - procedures for the receipt and consideration of information submitted by the public; and
   - evaluating the incorporation of Low Impact Development (LID) site planning and design strategies, unless such practices are infeasible.
2. The site inspection and enforcement procedures shall include:
   - who is responsible for site inspections and the necessary qualifications for performing inspections, as well as who has authority to implement enforcement procedures;
   - the requirement that inspections of BMPs occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans
   - the use of mandated inspection forms, if appropriate; and
   - procedure for tracking the number of site reviews, inspections, and enforcement actions. This tracking information shall be included as part of each annual report required by part 4.4.

iii. Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to the requirements of EPA's Construction General Permit (including the development of a SWPPP) to the extent they are consistent with the program requirements of this part. The program may include references to BMP design standards in state manuals, such as the 2008 Massachusetts Stormwater Handbook[9], or design standards developed by the

[9] The handbook is available at: https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards

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

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

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

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

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

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

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

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

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

ii. The permittee shall develop or modify, as appropriate, an ordinance or other regulatory mechanism within three (3) years of the effective date of the permit to contain provisions that are at least as stringent as the following:

1. Low Impact Development (LID) site planning and design strategies must be implemented unless infeasible in order to reduce the discharge of stormwater from development sites..

.

2. Stormwater management systems design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook.
:

3. Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site[10].

a) Average annual pollutant removal requirements in 2.3.6.a.ii.3 are achieved through one of the following methods:
   1. installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
   2. retaining the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the new development site; or
   3. meeting a combination of retention and treatment that achieves the above standards; or
   4. utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the new development site.

4. Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site[11].

a) Average annual pollutant removal requirements in 2.3.6.a.ii.4 above are

[10] Pollutant removal is calculated based on average annual loading and not on the basis of any individual storm event

[11] Pollutant removal is calculated based on average annual loading and not on the basis of any individual storm event

achieved through one of the following methods:

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

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

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

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

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

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

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

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

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

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

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

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

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

a. Operations and Maintenance Programs

i. Within two (2) years from the effective date of the permit, the permittee shall develop, if not already developed, written (hardcopy or electronic) operations and maintenance procedures for the municipal activities listed below in part 2.3.7.a.ii. These written procedures shall be included as part of the SWMP.

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

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

2. Buildings and facilities where pollutants are exposed to stormwater runoff: This includes schools (to the extent they are permittee-owned or operated), town offices, police, and fire stations, municipal pools and parking garages and other permittee-owned or operated buildings or facilities. Evaluate the use, storage, and disposal of petroleum products and other potential stormwater pollutants. Provide employee training as necessary so that those responsible for handling these products know proper procedures. Ensure that Spill Prevention Plans are

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

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

iii. Infrastructure Operations and Maintenance

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

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

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

- The permittee shall report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins.

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

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

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

   - For catch 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 meets applicable water quality standards.

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

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

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

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

      - Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.
      - Response procedures that include notification of appropriate facility personnel, emergency agencies, and regulatory agencies, and procedures for stopping, containing, and cleaning up leaks, spills and other releases. Measures for cleaning up hazardous material spills or leaks shall be consistent with applicable Resource Conservation and Recovery Act (RCRA) regulations at 40 CFR section 264 and 40 CFR section 265. Employees

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

- Contact information for individuals and agencies that shall be notified in the event of a leak, spill, or other release. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40 CFR section 110, 40 CFR section 117, or 40 CFR section 302, occurs during a 24-hour period, the permittee shall notify the National Response Center (NRC) at (800) 424-8802 in accordance with the requirements of 40 CFR section 110, 40 CFR section 117, and 40 CFR section 302 as soon as the permittee has knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency, public health or drinking water supply agencies, and owners of public drinking water supplies. Contact information shall be in locations that are readily accessible and available.

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

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

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

h) Employee Training: The permittee shall regularly train employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP

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

The permittee shall document the following information for each training:

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

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

iii. The permittee shall conduct the following inspections:

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

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

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

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

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

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

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

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

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

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

4.0. Program Evaluation, Record Keeping, and Reporting

4.1. Program Evaluation

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

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

- Changes adding (but not subtracting or replacing) components or controls may be made at any time.
- Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be made as long as the basis for the changes is documented in the SWMP by, at a minimum:
    - An analysis of why the BMP is ineffective or infeasible;
    - Expectations on the effectiveness of the replacement BMP; and
    - An analysis of why the replacement BMP is expected to achieve the defined goals of the BMP to be replaced.

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

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

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

4.2. Record Keeping

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

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

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

4.3. Outfall Monitoring Reporting

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

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

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

4.4. Annual Reports

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

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

b. The annual reports shall contain the following information:

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

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

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

- Identification of all discharges that do not meet applicable water quality standards;
- For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;
- For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.

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

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

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

vi. Description of activities for the next reporting cycle.

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

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

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

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

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

Or submitted electronically to EPA at the following email address: stormwater.reports@epa.gov. 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[12]. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

5.1.5 Dischargers Subject to Appendix F Part A.I

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

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

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

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

6.0 Requirements for MS4s Owned or Operated by Transportation Agencies

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

6.1 Public education

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

6.2 Ordinances and regulatory mechanisms

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

6.3 Assessment of regulations

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

6.4 New Dischargers

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

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

Any transportation MS4 facility that is a "new discharger" and discharges to a waterbody listed as impaired in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, 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[13]. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

6.5 Dischargers Subject to Appendix F Part A.I

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

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

[13] 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."

Infeasible - means not technologically possible, or not economically practicable and achievable in light of best industry practices.

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

Table of Contents

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] 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

1-1	Legal analysis	2 years after permit effective date
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	5 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	10 years after permit effective date

	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 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.75)$	

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

[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.

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 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

[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.

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 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.

Alternative Schedule Request– If the permittee determines that the schedule to meet required Phase 1phosphorus reductions contained in Table F-1 is impracticable, the permittee may submit to EPA and MassDEP an Alternative Schedule Request to meet the phosphorus reduction requirements in Table F-1 on the shortest schedule that is achievable considering the factors below.[7]

a. A Phase 1 Alternative Schedule Request shall include an analysis demonstrating that the schedule to meet phosphorus reduction requirements in Table F-1 is unaffordable within the timeframe of Phase 1. EPA expects that such extraordinary circumstances would occur rarely, where meeting the phosphorus reductions in Table F-1

[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.
[7] See part A.I.4 for information regarding the Alternative Schedule Request submittal and review process.

is unaffordable.[8] A Phase 1 Alternative Schedule Request is limited to alternative schedules to meet the requirements of items numbered 1-11 through 1-14 in Table F-1. Requests must include the following:

i. A narrative of the reasons for the permittee's request for an alternative schedule, including information demonstrating the applicant's efforts and extent of progress made toward meeting the required phosphorus reductions in Table F-1,
ii. Analysis of the nonstructural controls implemented to date,
iii. A description of the planned Phase 1 structural controls for which schedule adjustment is requested,
iv. Estimated cost of the planned Phase 1 structural controls for which schedule adjustment is requested,
v. Affordability for taxpayers or ratepayers (as applicable), including a projection of sources and uses of funds, taking into consideration existing or potential financial capability and funding mechanisms (e.g., property taxes, stormwater rate changes, or stormwater utility fees), and
vi. A requested schedule to meet all phosphorus reduction requirements in Table F-1.

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	68	38	64%
Ashland	67	28	39	42%
Bellingham	947	398	549	42%
Belmont	202	105	97	52%
Boston[9]	6886	4145	2741	60%
Brookline	1,635	968	667	59%
Cambridge	512	317	195	62%

[8] EPA notes that such expectation regarding infrequency does not constitute or establish an additional criterion for the applicant to satisfy.

[9] Boston is included for reference and for non-traditional MS4s located within the city of Boston. Boston is covered by an individual Phase I MS4 permit. Boston's individual Phase I MS4 permit will also reflect this phosphorus load reduction

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 (%)**
Dedham	805	404	401	50%
Dover	831	180	652	22%
Foxborough	2	0	2	0%
Franklin	2,344	1012	1332	43%
Holliston	1,543	496	1046	32%
Hopedale	107	47	60	44%
Hopkinton	292	89	203	31%
Lexington	530	242	287	46%
Lincoln	593	127	466	21%
Medfield	955	345	611	36%
Medway	1,063	400	662	38%
Mendon	29	11	17	40%
Milford	1,611	809	802	50%
Millis	969	301	668	31%
Natick	1,108	486	622	44%
Needham	1,772	974	797	55%
Newton	3,884	2365	1519	61%
Norfolk	1,004	286	718	28%
Somerville	646	400	245	62%
Sherborn	846	156	690	18%
Walpole	159	37	121	24%
Waltham	2,901	1755	1146	60%
Watertown	1,127	703	424	62%
Wayland	46	19	27	42%
Wellesley	1,431	821	609	57%
Weston	1,174	375	799	32%
Westwood	376	150	226	40%
Wrentham	618	210	407	34%
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	68	38	64%
Ashland	67	28	39	42%
Bellingham	801	352	449	44%
Belmont	202	105	97	52%
Boston	6886	4145	2741	60%
Brookline	1,635	968	667	59%
Cambridge	512	317	195	62%
Dedham	805	404	401	50%
Dover	282	82	199	29%
Foxborough	2	0	2	0%
Franklin	2,312	1007	1305	44%
Holliston	1,359	466	892	34%
Hopedale	107	47	60	44%
Hopkinton	280	88	191	32%
Lexington	525	241	284	46%
Lincoln	366	84	282	23%
Medfield	827	335	492	41%
Medway	1,037	390	647	38%
Mendon	10	6	5	57%
Milford	1,486	798	688	54%
Millis	501	200	300	40%
Natick	994	456	538	46%
Needham	1,771	974	797	55%
Newton	3,884	2365	1519	61%
Norfolk	1,001	285	716	29%
Somerville	646	400	245	62%
Sherborn	203	52	151	26%

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 (%)**
Walpole	159	37	121	24%
Waltham	2,901	1755	1146	60%
Watertown	1,127	703	424	62%
Wayland	46	19	27	42%
Wellesley	1,431	821	609	57%
Weston	1,174	375	799	32%
Westwood	346	143	203	41%
Wrentham	556	196	361	35%
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[10] 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.

[10] See footnote 6

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.

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 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.

Alternative Schedule Request– If the permittee determines that the schedule to meet required Phase 2 phosphorus reductions contained in Table F-4 is impracticable, the permittee may submit to EPA and MassDEP an Alternative Schedule Request to meet the phosphorus reduction requirements of items numbered 2-9 and 2-11 in Table F-4 on the shortest schedule that is achievable considering the factors below.[11]

a. A Phase 2 Alternative Schedule Request shall include an analysis demonstrating that the schedule to meet the phosphorus reduction requirements in items numbered 2-9 and 2-11 in Table F-4 is impracticable. Requests must include, where relevant, the following:
    i. A narrative of the reasons for the permittee's request for an alternative schedule, including information demonstrating the applicant's efforts and extent of progress made toward meeting the required phosphorus reductions in Table F-4,

[11] See part A.I.4 for information regarding the Alternative Schedule Request submittal and review process.

ii. A description of the planned structural controls to meet applicable phosphorus reduction milestones,
iii. Suitability and availability of areas for siting and constructing structural controls, including, if appropriate, a review of third-party partnerships considered for within-watershed structural control sites,
iv. Access and acquisition of real property rights for constructing and maintaining structural controls,
v. Timelines for the permittee's planning, design, financing, easement or property interest acquisition, and procurement for and construction of structural controls,
vi. Timelines for and constraints due to the federal, state and/or local approval(s) and permitting processes for structural controls,
vii. Anticipated phosphorus reductions due to the rate of redevelopment within the community and the degree to which future redevelopment may be reasonably anticipated to achieve the desired reductions in lieu of reliance upon structural controls by the permittee,
viii. Estimated cost of the planned structural controls to meet applicable phosphorus reduction milestones,
ix. Scale of structural BMP controls required and phasing considerations with other capital improvement projects that are being implemented by the permittee or other parties that impact the permittee, municipality or relevant taxpayers or ratepayers,
x. Affordability for taxpayers or ratepayers (as applicable), including a projection of sources and uses of funds, taking into consideration existing or potential financial capability and funding mechanisms (e.g., property taxes, stormwater rate changes, or stormwater utility fees),
xi. Other relevant information, and
xii. A requested schedule to meet all phosphorus reduction requirements in Table F-4.

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
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[12] 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

[12] See footnote 6.

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 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.

Alternative Schedule Request– If the permittee determines that the schedule to meet required Phase 3 phosphorus reductions contained in Table F-5 is impracticable, the permittee may submit to EPA and MassDEP an Alternative Schedule Request to meet the phosphorus reduction requirements in items numbered 3-9 and 3-11 in Table F-5 on the shortest schedule that is achievable considering the factors below.[13]

a. A Phase 3 Alternative Schedule Request shall include an analysis demonstrating that the schedule to meet the phosphorus reduction requirements in items numbered 3-9 and 3-11in Table F-5 is impracticable. Requests must include, where relevant, the following:

[13] See part A.I.4 for information regarding the Alternative Schedule Request submittal and review process.

i. A narrative of the reasons for the permittee's request for an alternative schedule, including information demonstrating the applicant's efforts and extent of progress made toward meeting the required phosphorus reductions in Table F-5,
ii. A description of the planned structural to meet applicable phosphorus reduction milestones,
iii. Suitability and availability of areas for siting and constructing structural controls, including, if appropriate, a review of third-party partnerships considered for within-watershed structural control sites,
iv. Access and acquisition of real property rights for constructing and maintaining structural controls,
v. Timelines for the permittee's planning, design, financing, easement or property interest acquisition, and procurement for and construction of structural controls,
vi. Timelines for and constraints due to the federal, state and/or local approval(s) and permitting processes for structural controls,
vii. Anticipated phosphorus reductions due to the rate of redevelopment within the community and the degree to which future redevelopment may be reasonably anticipated to achieve the desired reductions in lieu of reliance upon structural controls by the permittee,
viii. Estimated cost of the planned structural controls to meet applicable phosphorus reduction milestones,
ix. Scale of structural BMP controls required and phasing considerations with other capital improvement projects that are being implemented by the permittee or other parties that impact the permittee, municipality or relevant taxpayers or ratepayers,
x. Affordability for taxpayers or ratepayers (as applicable), including a projection of sources and uses of funds, taking into consideration existing or potential financial capability and funding mechanisms (e.g., property taxes, stormwater rate changes, or stormwater utility fees),
xi. Other relevant information, and
xii. A requested schedule to meet all phosphorus reduction requirements in Table F-5.

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 applicable phosphorus reduction milestones.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

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 PCP 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.

4. The permittee may be relieved of the schedules and milestones contained in Table F-1, Table F-4 and/or Table F-5 as follows:

   a. The permittee is relieved of the applicable schedules and milestones when all the following conditions are met:
      i. The permittee has submitted an Alternative Schedule Request package to EPA and MassDEP.[14,15]
      ii. EPA has determined the Alternative Schedule Request submittal is complete. The Alternative Schedule Request will be deemed complete 30 days from submittal, unless EPA requests additional information from the permittee.
      iii. Following a 30-day public comment period on the complete Alternative Schedule Request, EPA approves the request in writing.[16] If EPA has not acted to approve, modify with permittee consent, or deny an Alternative

[14] Alternative Schedule Request package must be made available to the public consistent with 2.3.3. of the permit.
[15] Submittal of an alternative schedule request does not relieve the permittee of noncompliance and potential enforcement for failure to comply with any permit requirements prior to the date of approval of an Alternative Schedule.
[16] EPA may deny an alternative schedule request in the case of permittee noncompliance with permit requirements applicable to phosphorus reductions. EPA expects that an Alternative Schedule Request by a permittee that at the time of such request is in non-compliance with the applicable Table F-1, F-4 and F-5 phosphorus reduction percentage would be denied unless the permittee provides information regarding its phosphorus reduction efforts that EPA finds acceptable for this purpose.

Schedule Request within 90 days of the close of the public comment period, the Alternative Schedule Request shall be deemed approved.

b. Any action by EPA approving or denying an Alternative Schedule Request is a final agency action that shall be subject to judicial review in federal district court.

c. When the permittee meets the conditions in Appendix F part A.I.4.a, the permittee shall incorporate the approved Alternative Schedule Request and the approval date in its PCP. An approved Alternative Schedule Request will supersede any remaining schedules and milestones for the phase for which schedule adjustment is requested and approved. The permittee shall:
    i. Identify in its PCP all activities implemented to date in accordance with the requirements of Appendix F part A.I and conducted to reduce phosphorus in its discharges pursuant to the submitted Alternative Schedule Request, including non-structural BMP planning and implementation schedules and any structural BMP maintenance requirements; and
    ii. Continue to implement all requirements of Appendix F part A.I required to be implemented prior to the date of Alternative Schedule Request approval, 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. Continue to implement their PCP, and the reporting requirements of Appendix F Part A.I.2 remain in place.

II. Lake and Pond Phosphorus TMDL Requirements

Between 1999 and 2010 EPA has approved 13 Lake TMDLs[17] 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[18] 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%

[17] 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

[18] 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
	Pikes Pond	38%
Dudley	Gore Pond	14%
	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	49%
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%

Primary Municipality	Waterbody Name	Required Percent Reduction
	Newton Pond	19%
	Shirley Street Pond	30%
Spencer	Quaboag Pond	29%
	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 Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	13years after permit effective date
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. This includes BMPs implemented to date as well as BMPs to be implemented. . . The Operation and Maintenance Program shall become part of the LPCP 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 4 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[19] and tracking increases in phosphorus loading

[19] 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

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.[20] Phosphorus load increases resulting from development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus 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.

Alternative Schedule Request– If the permittee determines that the schedule to meet required phosphorus reductions contained in items 12, 14, 16 or 18 in Table F-7 is impracticable, the permittee may submit to EPA and MassDEP an Alternative Schedule Request to meet the phosphorus reduction requirements in items 12, 14, 16 or 18 in Table F-7 on the shortest schedule that is achievable considering the factors below.[21]

a. The Alternative Schedule Request shall include an analysis demonstrating that the schedule to meet phosphorus reduction requirements in items 12, 14, 16 or 18 in Table F-7 is impracticable, EPA expects that an Alternative Schedule Request to meet the phosphorus reduction requirement in item number 12 in Table F-7 would only be submitted in extraordinary circumstances and would occur rarely, where meeting the phosphorus reductions in number 12 in Table F-7 is unaffordable[22]. All Alternative Schedule Requests must include, where relevant, the following:
   i. A narrative of the reasons for the permittee's request for an alternative schedule, including information demonstrating the applicant's efforts and extent of progress made toward meeting required phosphorus reductions in Table F-7,
   ii. A description of the planned structural controls to meet applicable phosphorus reduction milestones,
   iii. Suitability and availability of areas for siting and constructing structural controls, including, if appropriate, a review of third-party partnerships considered for within-watershed structural control sites,
   iv. Access and acquisition of real property rights for constructing and maintaining structural controls,

[20] 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.
[21] See part A.II.4 for information regarding the Alternative Schedule Request submittal and review process.
[22] EPA notes that such expectation regarding infrequency does not constitute or establish an additional criterion for the applicant to satisfy

v. Timelines for the permittee's planning, design, financing, easement or property interest acquisition, and procurement for and construction of structural controls,
vi. Timelines for and constraints due to the federal, state and/or local approval(s) and permitting processes for structural controls,
vii. Anticipated phosphorus reductions due to the rate of redevelopment within the community and the degree to which future redevelopment may be reasonably anticipated to achieve the desired reductions in lieu of reliance upon structural controls by the permittee,
viii. Estimated cost of the planned structural controls to meet applicable phosphorus reduction milestones,
ix. Scale of structural BMP controls required and phasing considerations with other capital improvement projects that are being implemented by the permittee or other parties that impact the permittee, municipality or relevant taxpayers or ratepayers,
x. Affordability for taxpayers or ratepayers (as applicable), including a projection of sources and uses of funds, taking into consideration existing or potential financial capability and funding mechanisms (e.g., property taxes, stormwater rate changes, or stormwater utility fees),
xi. Other relevant information, and
xii. A requested schedule to meet all phosphorus reduction requirements from which relief is sought.

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 applicable phosphorus reduction milestones.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

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.

4. The permittee may be relieved of the schedules and milestones contained in Table F-7 as follows:

    a. The permittee is relieved of the applicable schedules and milestones when all the following conditions are met:
        i. The permittee has submitted an Alternative Schedule Request package to EPA and MassDEP.[23,24]
        ii. EPA has determined the Alternative Schedule Request submittal is complete. The Alternative Schedule Request will be deemed complete 30 days from submittal, unless EPA requests additional information from the permittee.
        iii. Following a 30-day public comment period on the complete Alternative Schedule Request, EPA approves the request in writing.[25] If EPA has not acted to approve, modify with permittee consent, or deny an Alternative Schedule Request within 90 days of the close of the public comment period, the Alternative Schedule Request shall be deemed approved.

    b. Any action by EPA approving or denying an Alternative Schedule Request is a final agency action that shall be subject to judicial review in federal district court.

    c. When the permittee meets the conditions in Appendix F part A.II.4.a, the permittee shall incorporate the approved Alternative Schedule Request and the approval date in its LPCP. An approved Alternative Schedule Request will supersede any remaining schedules and milestones in Table F-7. The permittee shall:
        i. Identify in its LPCP all activities implemented to date in accordance with the requirements of Appendix F part A.II and conducted to reduce phosphorus in its discharges pursuant to the submitted Alternative Schedule Request, including non-structural BMP planning and implementation schedules and any structural BMP maintenance requirements;
        ii. Continue to implement all requirements of Appendix F part A.II required to be implemented prior to the date of Alternative Schedule Request approval, including ongoing implementation of identified non-

[23] Alternative Schedule Request package must be made available to the public consistent with 2.3.3. of the permit.
[24] Submittal of an alternative schedule request does not relieve the permittee of noncompliance and potential enforcement for failure to comply with any permit requirements prior to the date of approval of an Alternative Schedule.
[25] EPA expects that an Alternative Schedule Request by a permittee that at the time of such request is in non-compliance with applicable Table F-7 phosphorus reduction percentages would be denied unless the permittee provides information regarding its phosphorus reduction efforts that EPA finds acceptable for this purpose.

structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications and

iii. Continue to implement their LPCP, 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.[26] 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)

[26] Final bacteria or pathogen TMDLs can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

Acushnet	MA95-32	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	MA95-33	Acushnet River	Fecal Coliform
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.[27] The following measures 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

[27] 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

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 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

Municipality	Waterbody Name
Falmouth	Little Pond
Falmouth	Oyster Pond
Falmouth	Quashnet River
Falmouth	Inner West Falmouth Harbor
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*[28]. 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.

[28] Massachusetts Department of Environmental Protection, 2004. *Assabet River Total Maximum Daily Load for Total Phosphorus.* CN 201.0

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).

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[29], 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.

[29] Connecticut Department of Environmental Protection. 2000. *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*

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).

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.[30] 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.

[30] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

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 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,	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Municipality	Receiving Water	TMDL Name
	Omega Pond and Turner Reservoir	
Rehoboth	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)
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[31] 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

[31] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

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.

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.[32] 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

[32] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

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.

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)	(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 and Nitrogen Reduction Credits for Selected Enhanced Non-Structural BMPs

The permittee shall use the following methods to calculate phosphorus and nitrogen (nutrients) 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 nutrient reduction factors that EPA has determined are acceptable for calculating nutrient load reduction credits for these practices.

The methods and annual nutrient 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. Tables 2-1 and 2-2 below provide annual phosphorus and nitrogen 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. The estimates of annual nitrogen load and load reduction resulting from BMP implementation are intended for use by the permittee to track and account for nitrogen load reductions in accordance with Appendices F and H in the permit.

Examples are provided to illustrate use of the methods. In calculating phosphorus and nitrogen 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 and nitrogen loads. Table 2-3 provides a crosswalk table of land use codes between land use groups in Tables 2-1 and 2-2, 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 Nutrient Reduction Factors: A permittee may propose alternative methods and/or nutrient reduction factors for calculating nutrient load reduction credits for these non-structural practices. EPA will consider alternative methods and/or nutrient 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 nutrient 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 nutrient 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: Average annual distinct nitrogen (N) load export rates for use in estimating N load reduction credits in the MA MS4 Permit

Nitrogen Source Category by Land Use	Land Surface Cover	N Load Export Rate, lbs./acre/year	N Load Export Rate, kg/ha/yr.
Commercial (COM) and Industrial (IND)	Directly connected impervious	15.0	16.9
	Pervious	See* DevPERV	See* DevPERV
All Residential	Directly connected impervious	14.1	15.8
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	10.5	11.8
	Pervious	See* DevPERV	See* DevPERV
Forest (FOR)	Directly connected impervious	11.3	12.7
	Pervious	0.5	0.6
Open Land (OPEN)	Directly connected impervious	11.3	12.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (AG)	Directly connected impervious	11.3	12.7
	Pervious	2.6	2.9
*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	3.1	3.5
*Developed Land Pervious (DevPERV) – HSG D	Pervious	3.6	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 conditions for the nitrogen 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 nitrogen loading.
- Impervious surfaces within the forest land use category are typically roadways adjacent to forested pervious areas.

Table 2-3: 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 and/or nitrogen reduction credit(s) for conducting an enhanced sweeping program of impervious surfaces. Table 2-4 below outlines the default nutrient removal factors for enhanced sweeping programs. The credit shall be calculated by using the following equations:

$$\text{Phosphorus Credit}_{\text{P sweeping}} = \text{IA}_{\text{swept}} \times \text{PLER}_{\text{IC-land use}} \times \text{PRF}_{\text{sweeping}} \times \text{AF} \quad \textbf{(Equation 2-1)}$$

$$\text{Nitrogen Credit}_{\text{N sweeping}} = \text{IA}_{\text{swept}} \times \text{NLER}_{\text{IC-land use}} \times \text{NRF}_{\text{sweeping}} \times \text{AF} \quad \textbf{(Equation 2-2)}$$

Where:

$\text{Credit}_{\text{sweeping}}$	=	Amount of nutrient load removed by enhanced sweeping program (lb/year)
IA_{swept}	=	Area of impervious surface that is swept under the enhanced sweeping program (acres)
$\text{PLER}_{\text{IC-land use}}$	=	Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/yr) (see Table 2-1)
$\text{NLER}_{\text{IC-land use}}$	=	Nitrogen Load Export Rate for impervious cover and specified land use (lb./acre/yr.) (see Table 2-2)
$\text{PRF}_{\text{sweeping}}$	=	Phosphorus Reduction Factor for sweeping based on sweeper type and frequency (see Table 2-4).
$\text{NRF}_{\text{sweeping}}$	=	Nitrogen Reduction Factor for sweeping based on sweeper type and frequency (see Table 2-4).
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 or nitrogen using long-term local rainfall data.

Table 2-4: Nutrient reduction efficiency factors for sweeping impervious areas

Frequency[1]	Sweeper Technology	PRF $_{sweeping}$	NFR $_{sweeping}$
2/year (spring and fall)[2]	Mechanical Broom	0.01	0.01
2/year (spring and fall)[2]	Vacuum Assisted	0.02	0.02
2/year (spring and fall)[2]	High-Efficiency Regenerative Air-Vacuum	0.02	0.02
Monthly	Mechanical Broom	0.03	0.03
Monthly	Vacuum Assisted	0.04	0.04
Monthly	High Efficiency Regenerative Air-Vacuum	0.08	0.08
Weekly	Mechanical Broom	0.05	0.06
Weekly	Vacuum Assisted	0.08	0.07
Weekly	High Efficiency Regenerative Air-Vacuum	0.10	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 $_{P\ sweeping}$): 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 to calculate the phosphorus load reduction credit is:

IA_{swept}	= 20.3 acres
$PLER_{IC\text{-}HDR}$	= 2.32 lb/acre/yr (from Table 2-1)
$PRF_{sweeping}$	= 0.08 (from Table 2-4)
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

The corresponding **<u>nitrogen</u>** load reduction credit (Credit $_{N\ sweeping}$) for the same sweeping program in the specified LPCP area is calculated as follows:

IA_{swept}	= 20.3 acres
$NLER_{IC\text{-}HDR}$	= 14.1 lb./acre/yr. (from Table 2-2)
$NRF_{sweeping}$	= 0.08 (from Table 2-4)
AF	= (9 months / 12 months) = 0.75

Substitution into equation 2-2 yields a Credit $_{sweeping}$ of 17.2 pounds of nitrogen removed per year.

Credit $_{N\ sweeping}$	= IA_{swept} x $NLER_{land\ use}$ x $NRF_{sweeping}$ x AF
	= 20.3 acres x 14.1 lbs./acre/yr. x 0.08 x 0.75
	= 17.2 lbs./yr.

(2) Catch Basin Cleaning: The permittee may earn phosphorus and/or nitrogen reduction credit(s) 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 credits shall be calculated by using the following equations:

$$\text{Credit}_{\text{P CB}} = IA_{CB} \times \text{PLER}_{\text{IC-land use}} \times PRF_{CB} \quad \textbf{(Equation 2-3)}$$

$$\text{Credit}_{\text{N CB}} = IA_{CB} \times \text{NLER}_{\text{IC-land use}} \times NRF_{CB} \quad \textbf{(Equation 2-4)}$$

Where:

Credit_{CB}	=	Amount of nutrient load removed by catch basin cleaning (lb/year)
IA_{CB}	=	Impervious drainage area to catch basins (acres)
$\text{PLER}_{\text{IC-and use}}$	=	Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/yr) (see Table 2-1)
$\text{NLER}_{\text{IC-land use}}$	=	Nitrogen Load Export Rate for impervious cover and specified land use (lb./acre/yr.) (see Table 2-2)
PRF_{CB}	=	Phosphorus Reduction Factor for catch basin cleaning (see Table 2-5)
NRF_{CB}	=	Nitrogen Reduction Factor for catch basin cleaning (See Table 2-5)

Table 2-5: Nutrient reduction efficiency factors for semi-annual catch basin cleaning

Frequency	Practice	PRF_{CB}	NRF_{CB}
Semi-annual	Catch Basin Cleaning	0.02	0.06

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 to calculate the phosphorus load reduction credit is:

IA_{CB} = 15.3 acre
$PLER_{IC\text{-}MDR}$ = 1.96 lbs/acre/yr (from Table 2-1)
PRF_{CB} = 0.02 (from Table 2-5)

Substitution into equation 2-3 yields a $Credit_{P\,CB}$ of 0.6 pounds of phosphorus removed per year:

$Credit_{P\,CB}$ = 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

Note: the same methodology is applicable for calculating the nitrogen load reduction credit (Credit $_{N\,CB}$).

(3) Enhanced Organic Waste and Leaf Litter Collection program: The permittee may earn a phosphorus and/or nitrogen reduction credit(s) 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:

$Credit_{P\,leaf\ litter} = (IA_{leaf\ litter}) \times (PLER_{IC\text{-}land\ use}) \times (0.05)$ **(Equation 2-5)**

$Credit_{N\,leaf\ litter} = (IA_{leaf\ litter}) \times (NLER_{IC\text{-}land\ use}) \times (0.05)$ **(Equation 2-6)**

Where:

$Credit_{leaf\ litter}$ = Amount of nutrient load reduction credit for organicwaste and leaf litter collection program (lb/year)
$IA_{leaf\ litter}$ = Impervious area (acre) in applicable watersheds that are subject to enhanced organic waste and leaf litter collection program
$PLER_{IC\text{-}land\ use}$ = Phosphorus Load Export Rate for impervious cover and specified land use (lbs./acre/yr.) (see Table 2-1)

$NLER_{IC\text{-}land\ use}$ = Nitrogen Load Export Rate for impervious cover and specified land use (lbs./acre/yr.) (see Table 2-2)
0.05 = 5% nutrient 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 ($Credit_{leaf\ litter}$): 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 $Credit_{leaf\ litter}$ for phosphorus is:

Watershed Area = 12.5 acres; and
$PLER_{IC\text{-}commercial}$ = 1.78 lbs/acre/yr (from Table 2-1)

Substitution into equation 2-5 yields a $Credit_{leaf\ litter}$ of 1.1 pounds of phosphorus removed per year:

$Credit_{leaf\ litter}$ = (12.5 acre) x (1.78 lbs/acre/yr) x (0.05)
= 1.1 lbs/yr

Note: The same methodology is applicable for calculating the nitrogen load reduction credit ($Credit_{N\ leaf\ litter}$) for the specified organic waste leaf litter collection program.

Associated Street/Pavement Cleaning Credit:
The permittee also may earn a nutrientreduction credit for enhanced sweeping of roads and parking lot areas (i.e., $Credit_{sweeping}$) for the three months of use. Using equation 2-1, $Credit_{sweeping}$ is:

$Credit_{sweeping} = IA_{swept} \times PLER_{IC\text{-}land\ use} \times PRF_{sweeping} \times AF$ **(Equation 2-1)**
IA_{swept} = 12.5 acre
$PLE_{IC\text{-}commercial}$ = 1.78 lbs/acre/yr (from Table 2-1)
$PRF_{sweeping}$ = 0.05 (from Table 2-3)
AF = 3 mo./12 mo. = 0.25

Substitution into equation 2-1 yields a $Credit_{P\ sweeping}$ of 0.28 pounds of phosphorus removed per year.

$Credit_{P\ sweeping} = IA_{swept} \times PLE_{IC\text{-}commercial} \times PRF_{sweeping} \times AF$
= 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 and Nitrogen Load Reductions for Structural Stormwater Best Management Practices

List of Tables

List of Figures

Methods to Calculate Phosphorus and Nitrogen 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 and nitrogen (nutrient) load reductions for the following structural Best Management Practices (structural BMPs) for a LPCP area or watershed tributary to Great Bay:

1) Infiltration Trench;
2) Surface Infiltration Practices (i.e., basins, rain gardens and bio-retention);
3) Bio-filtration Practice;
4) Gravel Wetland System;
5) Enhanced Bio-filtration with Internal Storage Reservoir (ISR);
6) Sand Filter;
7) Porous Pavement;
8) Wet Pond or wet detention basin;
9) Dry Pond or extended dry detention basin; and
10) Dry Water Quality Grass Swale with Detention.

Additionally, this attachment provides methods to design and quantify associated nutrient load reduction credits for the following four types of semi-structural BMPs

11) Impervious Area Disconnection through Storage (e.g., rain barrels, cisterns, etc.);
12) Impervious Area Disconnection;
13) Conversions of Impervious Area to Permeable Pervious Area; and
14) Soil Amendments to Enhance Permeability of Pervious Areas.

Methods and examples are provided in this Attachment to calculate phosphorus and nitrogen (nutrient) load reductions for structural BMPs for the four following purposes:

1) To determine the design volume of a structural BMP to achieve a known nutrient load reduction target when the contributing drainage area is 100% impervious;
2) To determine the nutrient load reduction for a structural BMP with a known design volume capacity when the contributing drainage area is 100% impervious;
3) To determine the design volume of a structural BMP to achieve a known nutrient load reduction target when the contributing drainage area has impervious and pervious surfaces; and
4) To determine the nutrient load reduction for a structural BMP with a known design volume capacity when the contributing drainage area has impervious and pervious surfaces.

Examples are also provided for estimating nutrient load reductions associated with the four semi-structural/non-structural BMPs.

Also, this attachment provides the methodology for calculating the annual stormwater phosphorus and/or nitrogen load that will be delivered to BMPs for treatment (BMP Load) and to be used for quantifying phosphorus and/or nitrogen load reduction credits. The methods and annual nutrient export load rates presented in this Attachment are for calculating 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 institutional). The estimates of annual phosphorus load and load reductions resulting from BMP implementation are intended for use by the permittee to demonstrate compliance with its Phosphorus Reduction Requirement in accordance with Appendix F to the permit. The estimates of annual nitrogen load and load reductions resulting from BMP implementation are intended for use by the permittee to track and account for nitrogen load reductions in accordance with Appendix H to the permit.

Structural BMP performance credits: For each structural BMP type identified above (BMPs 1-10), long-term cumulative performance information is provided to calculate phosphorus and nitrogen load reductions or to determine needed design storage volume capacities to achieve a specified reduction target (e.g., 65% phosphorus load reduction). The performance information is expressed as cumulative phosphorus and/or nitrogen 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 3-5 through 3-25 and performance curves Figures 3-1 through 3-20). 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 and nitrogen 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.

The Design Storage Volume or physical storage capacity (as referred to on the x-axis of performance curves) 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 3-5 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 11-14), long-term cumulative performance information is provided to calculate phosphorus and/or nitrogen 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 as a surrogate to estimate both the cumulative phosphorus load and nitrogen load reduction credits 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 credits are provided at the end of this Attachment (see Tables 3-26 through 3-33 and performance curves Figures 3-21 through 3-41).

EPA will consider phosphorus and/or nitrogen load reductions calculated using the methods provided below to be valid for demonstrating compliance 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. Regarding functionality, only the surface infiltration, the infiltration trench and the four semi-structural/non-structural BMP types were simulated to direct storm water runoff into the ground (i.e., infiltration). All other simulated BMPs represent practices that are not hydraulically connected to the sub-surface soils (i.e., no infiltration) and have either under-drains or impermeable liners. 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. General design specifications for infiltration trench 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).

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 (not conveyance 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 subsurface gravel wetland systems provided in *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf). Also, see report prepared by the University of New Hampshire Stormwater Center entitled *Design and Maintenance of Subsurface Gravel Wetland Systems* and dated February 4, 2015 (https://www.unh.edu/unhsc/sites/unh.edu.unhsc/files/NHDOT_SGW_02-06-15_Final_Report.pdf)

Enhanced Bio-filtration with Internal Storage Reservoir (ISR) is a practice that provides temporary storage of runoff for filtering through an engineered soil media, augmented for enhanced phosphorus removal, followed by detention and denitrification in a subsurface internal storage reservoir (ISR) comprised of gravel. Runoff flows are routed through filter media and directed to the underlying ISR via an impermeable membrane for temporary storage. An elevated outlet control at the top of the ISR is designed to provide a retention time of at least 24 hours in the system to allow for sufficient time for denitrification and nitrogen reduction to occur prior to discharge. The design storage capacity for using the cumulative performance curves is comprised of void spaces in the filter media, temporary ponding at the surface of the practice and the void spaces in the gravel ISR. The cumulative phosphorus load reduction curve for this control is intended to be used for systems in which the filter media has been augmented with materials designed and/or known to be effective at capturing phosphorus. If the filter media is not augmented to enhance phosphorus capture, then the phosphorus performance curve for the Bio-Filter should be used for estimating phosphorus load reductions. The University of New Hampshire Stormwater Center (UNHSC) developed the design of this control practice and a design template can be found at UNHSC's website (https://www.uNH.edu/uNHsc/news/uNHsc-innovative-bioretention-template-pollutant-reductions-great-bay-estuary-watershed).

Sand Filter performance results should be used for practices that have been designed in accordance or share similar features with the design specifications for sand filter 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).

Water Quality Grass Swale with Detention performance results should only be used for practices that have been designed in accordance with the design specifications for a dry water quality swale with check dams to temporarily store the target storage volume capture 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 Hydrologic 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 vegetated permeable pervious surfaces over an extended period of time. All impervious area disconnection projects must be designed to ensure that the permeable area to receive runoff from adjacent impervious areas 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.

Impervious Area Hydrologic 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. Some useful design guidelines and considerations may be found at https://www.mass.gov/files/documents/2016/08/to/practice-of-lid.pdf.

Conversion of Impervious Area to Permeable Pervious Area nutrient 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 and/or nitrogen 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 and/or nitrogen 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 and/or nitrogen load reduction estimates;
3. If pollutant removal performance data are available for the specific BMP, model calibration results should be provided; and

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 and/or nitrogen 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 and/or nitrogen 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 LPCP area in accordance with the submission schedule requirements specified in the permit and Appendix F.

Method to Calculate Annual Phosphorus and/or Nitrogen Load Delivered to BMPs (BMP Load)

The **BMP Load** is the annual phosphorus and/or nitrogen 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) or for tracking and accounting for nitrogen load reductions in nitrogen sensitive watersheds. 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. Tables 3-1 and 3-2 below provide annual nutrient load export rates by land use category for impervious and pervious areas for phosphorus (PLERs) and nitrogen (NLER), respectively. The examples are applicable for both phosphorus

and nitrogen. The permittee shall select the land use categories that most closely represents the actual uses of the drainage areas tributary to BMP. 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 and/or nitrogen load export rate. For drainage areas with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial/industrial land use category to calculate phosphorus and/or nitrogen loads. Table 3-3 provides a crosswalk table of nutrient load export rate (PLER and NLER) land use categories in Tables 3-1 and 3-2, and the corresponding land use category codes used in MassGIS.

Table 3-1: Average annual distinct phosphorus (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 calculating phosphorus loading.
- Impervious surfaces within the forest land use category are typically roadways adjacent to forested pervious areas.

Table 3-2: Average annual distinct nitrogen (N) load export rates for use in estimating N load reduction credits in the MA MS4 Permit

Nitrogen Source Category by Land Use	Land Surface Cover	N Load Export Rate, lbs./acre/year	N Load Export Rate, kg/ha/yr.
Commercial (COM) and Industrial (IND)	Directly connected impervious	15.0	16.9
	Pervious	See* DevPERV	See* DevPERV
All Residential	Directly connected impervious	14.1	15.8
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	10.5	11.8
	Pervious	See* DevPERV	See* DevPERV
Forest (FOR)	Directly connected impervious	11.3	12.7
	Pervious	0.5	0.6
Open Land (OPEN)	Directly connected impervious	11.3	12.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (AG)	Directly connected impervious	11.3	12.7
	Pervious	2.6	2.9
*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	3.1	3.5
*Developed Land Pervious (DevPERV) – HSG D	Pervious	3.6	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 conditions for the nitrogen 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 calculating nitrogen loading.
- Impervious surfaces within the forest land use category are typically roadways adjacent to forested pervious areas.

Table 3-3. MassGIS land-use categories with associated land-use groups for phosphorus (P) and nitrogen (N) load calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 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

BMP Load: To estimate the annual phosphorus and/or nitrogen load reduction for a given stormwater BMP, it is first necessary to estimate the amount of annual stormwater phosphorus and/or nitrogen load that will be directed to the BMP (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, 3-2 and 3-3;

3) Calculate the nutrient load for each land use-based impervious and pervious subarea by multiplying the subarea by the appropriate nutrient load export rate (i.e., PLER or NLER) provided in Tables 3-1 and 3-2; and

4) Determine the total annual phosphorus and/or nitrogen loads to the BMP by summing the calculated impervious and pervious subarea phosphorus and/or nitrogen loads.

Example 3-1 to determine phosphorus and nitrogen loads to a proposed BMP: A permittee is proposing a surface stormwater infiltration system that will treat runoff from an industrial site within the LPCP area that has a total drainage area of 12.87 acres comprised 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)	PLER (lb/acre/yr)*	NLER (lb/acre/yr)**
1	Industrial	impervious	10.13	1.78	15.0
2	Landscaped (HSG C)	pervious	1.85	0.21	2.4
3	Forest (HSG C)	pervious	0.89	0.12	0.5

*From Table 3-1
**From Table 3-2

The phosphorus load to the proposed BMP (BMP Load $_P$) is calculated as:

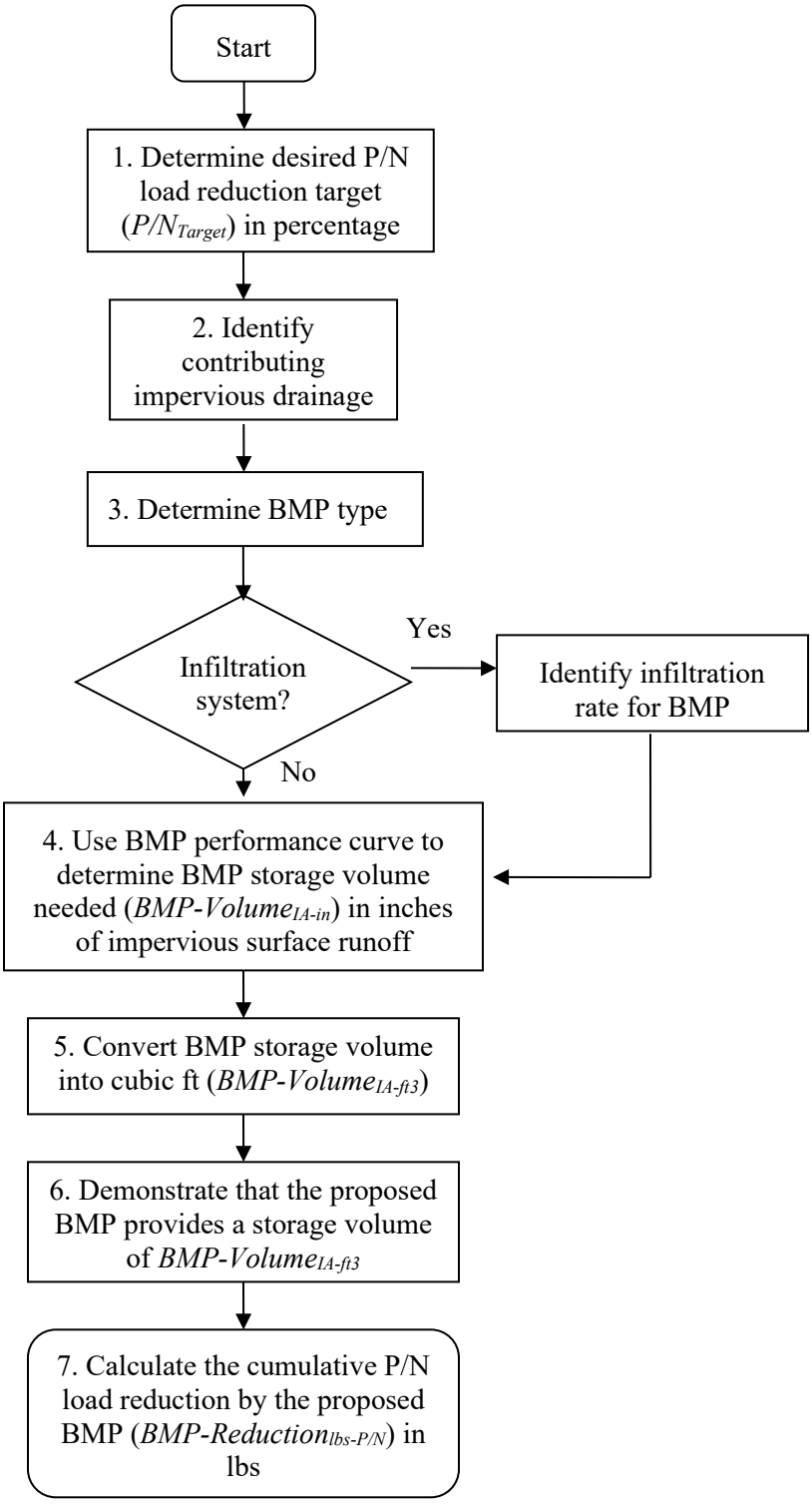
BMP Load $_P$ = (IA_{Ind} x $PLER_{Ind}$) + (PA_{Ind} x $PLER_{Ind}$) + (PA_{FOREST} x $PLER_{For}$)
= (10.13 x 1.78) + (1.85 x 0.21) + (0.89 x 0.12)
= 18.53 lbs P/year

The nitrogen load to the proposed BMP (BMP Load $_N$) is calculated as:

BMP Load $_N$ = (IA_{Ind} x $NLER_{Ind}$) + (PA_{Ind} x $NLER_{Ind}$) + (PA_{FOREST} x $NLER_{For}$)
= (10.13 x 15.0) + (1.85 x 2.4) + (0.89 x 0.5)
= 156.9 lbs N/year

(1) Method to determine the design volume of a structural BMP to achieve a known phosphorus and/or nitrogen (P/N) 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 and/or nitrogen (P/N) 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 and/or nitrogen load reduction target (P/N $_{target}$) 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 and/or nitrogen removal performance curves for the selected structural BMP (Figures 3-1 through 3-20), 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 capacity, BMP-Volume $_{IA\text{-}ft^3}$, determined from step 5 will be provided to achieve the P/N $_{Target}$; and

7) Calculate the cumulative P/N load reduction in pounds of P/N (BMP-Reduction $_{lbs\text{-}P/N}$) for the structural BMP using the BMP Load (as calculated from the procedure in Attachment 1 to Appendix F) and P/N $_{target}$ by using equation 3-2:

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P/N $_{target}$ /100) **(Equation 3-2)**

Example 3-2 to determine design storage volume capacity of a structural BMP for a 100% impervious drainage area to achieve a known phosphorus load reduction target*:
*Note: The approach used in this example is for phosphorus and is equally applicable for nitrogen.

A permittee is considering a surface infiltration practice to capture and treat runoff from 2.57 acres (1.04 ha) of commercial impervious area in the LPCP area that will achieve a 70% reduction in average 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) Phosphorus load reduction target (P $_{target}$) = 70%

2) Contributing impervious drainages area (IA) = 2.57 acres;

3) BMP type is a surface infiltration practice (i.e., basin) with an infiltration rate (IRBMP type is a surface infiltration practice (i.e., basin) with an infiltration rate (IR) of 0.39 in/hr

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%. As indicated in Table 3-5, the Design Storage Volume (DSV) of a surface infiltration practice is equal to the volume of surface ponding:

DSV = (L x ((W_{bottom}+$W_{top@Dmax}$)/2) x D) (Table 3-5: Surface Infiltration)

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 proposed DSV of 3,404 ft^3 exceeds the BMP-Volume $_{IA\text{-}ft^3}$ needed, 3,359 ft^3 and therefore 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 PLER 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):

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:

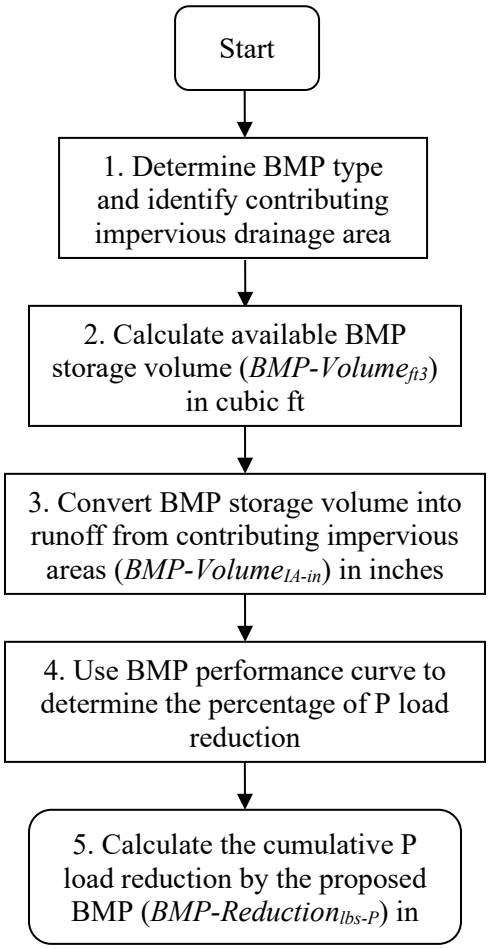
$$\text{BMP-Volume}_{IA\text{-}in} = (70\% - 65\%)/ (75\% - 65\%) \times (0.4 \text{ in} – 0.3 \text{ in}) + 0.3 \text{ in}$$
$$= 0.35 \text{ inches}$$

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) <u>Method to determine the phosphorus and/or nitrogen (N/P) load reduction credit for a structural BMP with a known design storage volume when the contributing drainage area is 100% impervious:</u>

Flow Chart 2 illustrates the steps to determine the phosphorus and/or nitrogen (N/P) 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 and/or nitrogen 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 % P/N load reduction for the structural BMP (BMP Reduction $_{\%\text{-}P}$) using the appropriate BMP performance curve (Figures 3-1 through 3-20) and the BMP-Volume $_{IA\text{-}in}$ calculated in step 3; and

5) Calculate the cumulative P/N load reduction in pounds for the structural BMP (BMP Reduction $_{lbs\text{-}P/N}$) using the BMP Load as calculated from the procedure described above and the percent P/N load reduction determined in step 4 by using equation 3-4:

BMP Reduction $_{lbs\text{-}P/N}$ = BMP Load x (BMP Reduction $_{\%\text{-}P/N}$/100) **(Equation 3-4)**

Example 3-2: Determine the nitrogen load reduction for a structural BMP with a known storage volume capacity when the contributing drainage area is 100% impervious*:
*The approach used in this example is for nitrogen and is equally applicable for phosphorus.

A permittee is considering an Enhanced Bio-filtration w/ISR system to treat runoff from 1.49 acres of high density residential (HDR) impervious area. Site constraints would limit the enhanced 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 enhanced bio-filtration w/ ISR 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	2.0 ft
	Porosity	0.35
	Hydraulic conductivity	4 inches/hour
Gravel layer	Depth	2.0 ft
	Porosity	0.45
Orifice #1	Diameter	0.08 ft

[a] Refers to the percentage of surface covered with vegetation

Determine the:

A) Percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) for the specified enhanced bio-filtration w/ISR system and contributing impervious HDR drainage area; and

B) Cumulative nitrogen reduction in pounds that would be accomplished by the system (BMP-Reduction $_{lbs\text{-}N}$)

Solution:

1) The BMP is an enhanced bio-filtration w/ISR system that will treat runoff from 1.49 acres of HDR impervious area (IA = 1.49 acre);

2) The available storage volume capacity (ft^3) of the enhanced bio-filtration system (BMP-Volume $_{BMP\text{-}ft^3}$) is determined using the surface area of the system, depth of ponding, and the porosities of the filter media and subsurface gravel ISR:

BMP-Volume $_{BMP\text{-}ft^3}$ = (surface area x pond maximum depth) + (surface area x ((soil mix depth x soil layer porosity) + (gravel layer depth x gravel layer porosity))
= (1,200 ft^2 x 0.5 ft) + (1,200 ft^2 x ((2.0 x 0.35) + (2.0 x 0.45))
= 600 + 1920

$= 2{,}520\ ft^3$

3) The available storage volume capacity of the enhanced 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 $_{IA\text{-}in}$ = (2520 ft^3/1.49 acre) x 12 in/ft x 1 acre/43560 ft^2
= 0.47 in

4) Using the enhanced bio-filtration performance curve shown in Figure 3-15, a **61%** nitrogen load reduction (BMP Reduction %-N) is determined for the system with a design storage capacity of 0.47 inches for treating runoff from 1.49 acres of impervious area; and

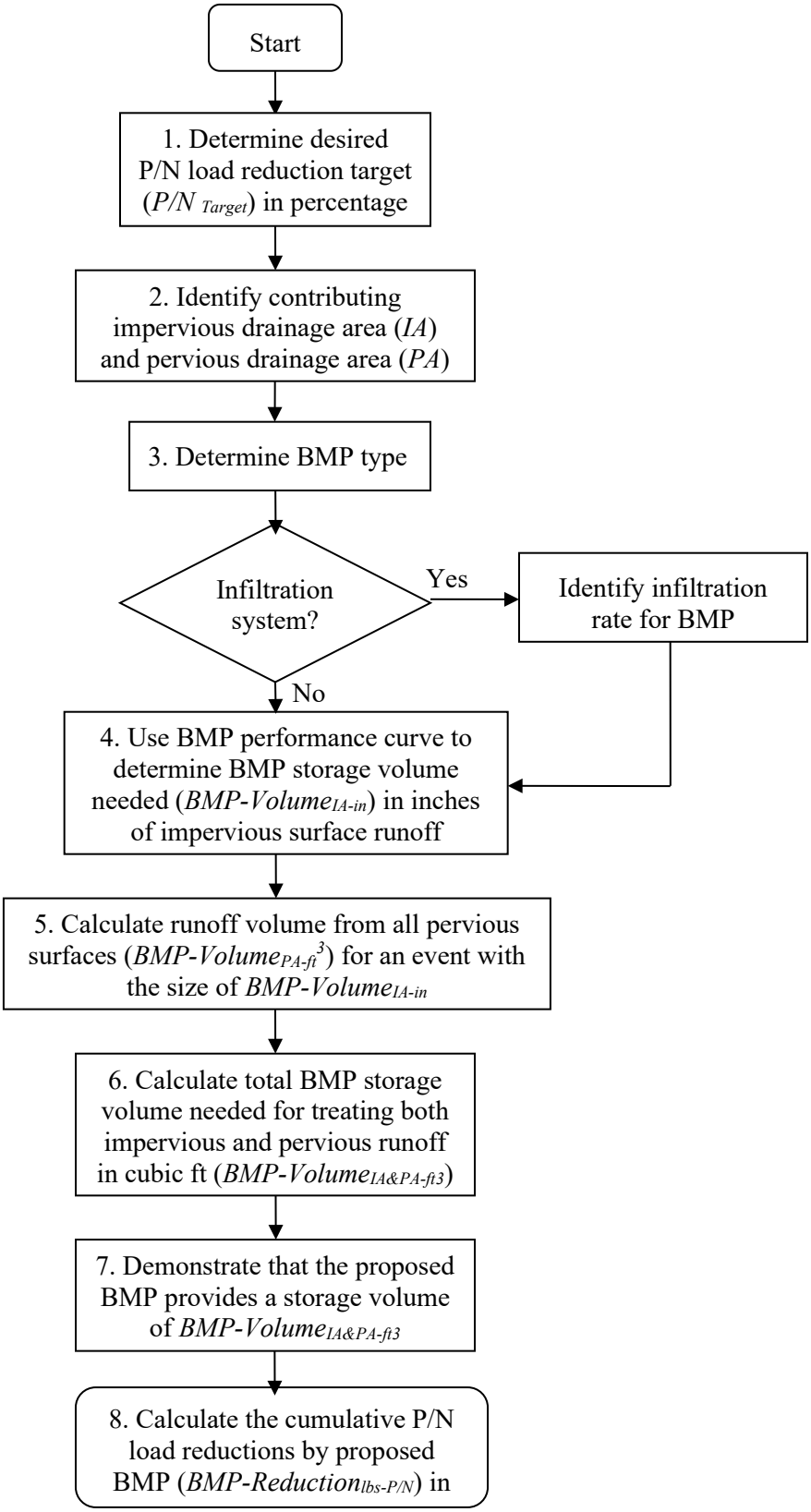
5) Calculate the cumulative nitrogen load reduction in pounds of for the enhanced bio-filtration w/ISR system (BMP Reduction $_{lbs\text{-}N}$) using the BMP Load as calculated from the procedure described above and the BMP Reduction $_{\%\text{-}N}$ determined in step 4 by using equation 3-4. First, the BMP Load is determined as specified above:

BMP Load $_N$ = IA x impervious cover nitrogen export loading rate for HDR (see Table 3-2)
= 1.49 acres x 15.8 lbs/acre/yr
= 23.5 lbs/yr

BMP Reduction $_{lbs\text{-}N}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100)
BMP Reduction $_{lbs\text{-}N}$ = 23.5 lbs/yr x (61/100)
= **14.4 lbs/yr**

(3) Method to determine the design storage volume of a structural BMP to achieve a known phosphorus and/or nitrogen 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/N load reduction target (P/N_{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 ($BMP\text{-}Volume_{IA\text{-}in}$) in inches of impervious surface runoff
5. Calculate runoff volume from all pervious surfaces ($BMP\text{-}Volume_{PA\text{-}ft}^3$) for an event with the size of $BMP\text{-}Volume_{IA\text{-}in}$
6. Calculate total BMP storage volume needed for treating both impervious and pervious runoff in cubic ft ($BMP\text{-}Volume_{IA\&PA\text{-}ft3}$)
7. Demonstrate that the proposed BMP provides a storage volume of $BMP\text{-}Volume_{IA\&PA\text{-}ft3}$
8. Calculate the cumulative P/N load reductions by proposed BMP ($BMP\text{-}Reduction_{lbs\text{-}P/N}$) in

Flow Chart 3: Method to determine the design storage volume of a BMP to reach a known P/N load reduction when both impervious and pervious drainage areas are present.

1) Determine the desired cumulative P/N load reduction target (P/N_{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), land use and hydrologic soil group (HSG).
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 P/N 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 3-4, below, 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) $_{(PA1,\ PAn)}$ **(Equation 3-5)**

> Table 3-4 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, an HSG C soil condition should be assumed.

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/N_{Target}; and
8) Calculate the cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P/N}$) for the structural BMP using the BMP Load (as calculated in example 1) and the P/N_{target} by using equation 3-2:

   BMP-Reduction $_{lbs\text{-}P/N}$ = BMP Load x (P_{target} /100) **(Equation 3-2)**

Table 3- 4: 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.

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*:

*The approach used in this example for phosphorus is equally applicable for nitrogen.

A permittee is considering a gravel wetland system to treat runoff from a high-density residential (HDR) site. The site is 7.5 acres of which 4.0 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 1.0 acre of stable unmanaged woodland. Soils information indicates that all of the woodland and 0.5 acres of the lawn is hydrologic soil group (HSG) B and the other 2.0 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 7.5 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 3-4, 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 3-4, 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 4) and is therefore sufficient to achieve a P_{Target} of 55%.

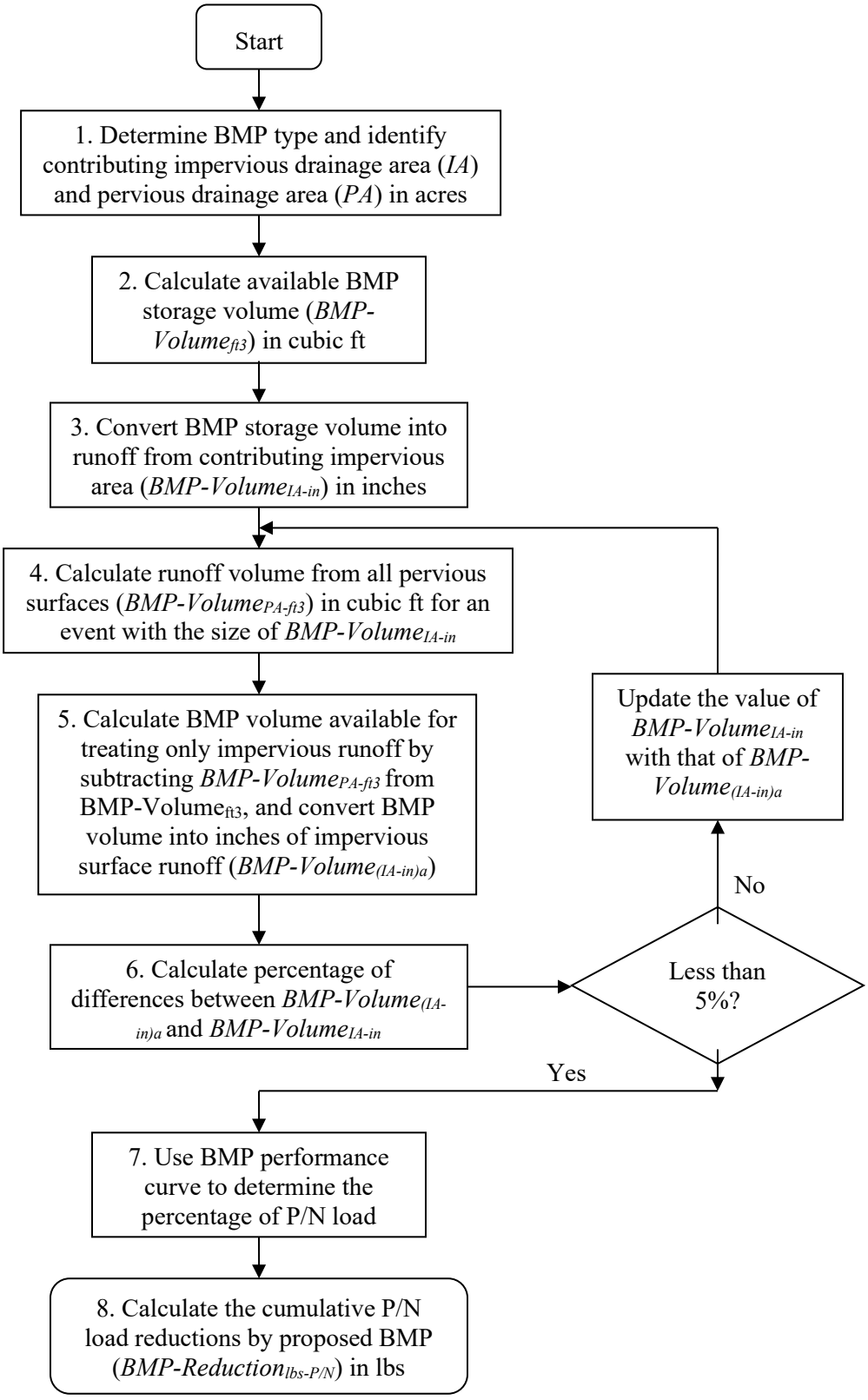
6) The cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the proposed gravel wetland system is calculated by using equation 3-2 with the BMP Load and the P_{target} = 55%.

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 $_{IC\ HDR}$) + (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) + (2.00 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 and/or nitrogen 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 and/or nitrogen (P/N) 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 5%?
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/N load
8. Calculate the cumulative P/N load reductions by proposed BMP (*BMP-Reduction$_{lbs\text{-}P/N}$*) in lbs

Flow Chart 4: Method to determine the P/N 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), land use, and hydrologic soil group (HSG

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 P/N 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):

$$\text{BMP-Volume}_{ft^3} = \text{BMP-Volume}_{(\text{IA-}ft^3)i} + \text{BMP-Volume}_{(\text{PA-}ft^3)i} \quad \textbf{(Equation 3-6a)}$$

Where:

BMP-Volume $_{ft^3}$= the available storage volume of the BMP;

BMP-Volume $_{(\text{IA-}ft^3)i}$ = 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 $_{(\text{PA-}ft^3)i}$ = 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 $_{(\text{IA-}ft^3)i}$:

$$\text{BMP-Volume}_{(\text{IA-}ft^3)i} = \text{BMP-Volume}_{ft^3} - \text{BMP-Volume}_{(\text{PA-}ft^3)i} \quad \textbf{(Equation 3-6b)}$$

To determine 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 (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 3-7a.

BMP-Volume $_{(IA\text{-}in)1}$ = (BMP-Volume$_{ft^3}$/ IA (acre)) x (12 in/ft /43,560 ft^2/acre) **(Equation 3-7a)**;

For iterations 2 through n (2…n), convert the BMP Volume $_{(IA\text{-}ft^3)2\ldots n}$, determined in step 6) below, into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)2\ldots n}$) using equation 3-7b.

BMP-Volume $_{(IA\text{-}in)2\ldots n}$ = (BMP-Volume $_{(IA\text{-}ft^3)2\ldots n}$ / IA (acre)) x (12 in/ft /43,560 ft^2/acre) **(Equation 3-7b)**;

4) For 1 to n iterations, use the pervious runoff depth information from Table 3-4 (repeated below) and equation 3-8 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 $_{(PA\text{-}ft^3)1\ldots n}$ = $\sum$ ((PA x (runoff depth$_{)\,(PA1,\ PA2..PAn)}$ x (3,630 ft^3/acre-in) **(Equation 3-8)**

Table 3-4 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, an HSG C soil condition should be assumed.

Table 3- 4: Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups (HSGs) (reprinted for ease of use in example)

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.

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 3-9a and 3-9b):

BMP-Volume $_{(IA\text{-}ft^3)2}$ = ((BMP-Volume$_{ft^3}$- BMP Volume $_{(PA\text{-}ft^3)1}$) **(Equation 3-9a)**

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 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 (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 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 % P/N load reduction for the structural BMP (BMP Reduction $_{\%\text{-}P/N}$) using the appropriate BMP performance curve and the BMP-Volume $_{(IA\text{-}in)n}$ calculated in the final iteration of steps 5 and 6; and

8) Calculate the cumulative P/N load reduction in pounds for the structural BMP (BMP Reduction $_{lbs\text{-}P/N}$) using the BMP Load as calculated Example 3-1 above and the percent P/N load reduction (BMP Reduction $_{\%\text{-}P/N}$) determined in step 7 by using equation 3-4:

BMP Reduction $_{lbs\text{-}P/N}$ = BMP Load x (BMP Reduction $_{\%\text{-}P/N}$/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:*

*The approach used in this example for phosphorus is equally applicable for nitrogen.

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 $_{lbs\text{-}P}$)

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 3-7a.

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-C using the information from Table 3-4 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

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
= 3,345 ft^3

5-2) BMP-Volume $_{(IA\text{-}ft^3)\,3}$ = 48,155 ft^3 – 3,345 ft^3
= 44,810 ft^3
BMP-Volume $_{(IA\text{-}in)\,3}$ = (44,810 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 $_{\%-P}$) is determined by using the infiltration basin performance curve for an infiltration rate of 0.27 in/hr and the treatment volume (BMP-Volume $_{Net\ IA-in}$ = 1.05 in) calculated in step 5-2 and is **BMP Reduction $_{\%-P}$ = 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 $_{\%-P}$ = 93% for IR = 0.27 in/hr and BMP Reduction $_{\%-P}$ = 95% for IR = 0.52 in/hr).

8) The cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs-P}$) for the proposed infiltration basin is calculated by using equation 3-2 with the BMP Load and the P $_{target}$ of 93%.

BMP-Reduction $_{lbs-P}$ = 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)

BMP Load = (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 $_{lbs-P}$ = 24.65 lbs/yr x 93/100 = **22.92 lbs/yr**

Example 3-5: Determine the phosphorus and nitrogen load reductions 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 and nitrogen load reduction rates (BMP Reduction $_{\%-P\&N}$) 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 and nitrogen load reductions in pounds that would be accomplished by the system (BMP-Reduction $_{lbs-P\&N}$) 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 $_{IA\text{-}in}$ = (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 3-26 or Figure 3-23 for a IA:PA ratio of 8:1, determine the phosphorus and nitrogen 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: P&N Reduction Rates

Percent Phosphorus & Nitrogen load reduction for IA disconnection with storage to PA HSG C			
Storage Volume $_{IA\text{-}in}$	Storage release rate, days		
	1	2	3
0.25	39%	42%	43%

4. The cumulative phosphorus and nitrogen load reductions in pounds of phosphorus for the IA disconnection with storage (BMP-Reduction $_{lbs\text{-}P/N}$) is calculated using Equation 3-2. The BMP Loads for phosphorus and nitrogen are first determined using the method presented in Example 3-1.

Phosphorus:

BMP Load $_{P}$ = IA (acre) x PLER $_{IC\text{-}Com}$ (see Table 3-1)
= 0.75 acres x 1.78 lbs/acre/yr
= 1.34 lbs/yr
BMP Reduction $_{lbs\text{-}P}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100)
BMP Reduction $_{lbs\text{-}P}$ = 1.34 lbs/yr x (39/100)
= **0.53 lbs/yr**

Table Example 3-5-B presents the BMP Reduction $_{lbs\text{-}P}$ for each of the release rates:

Table Example 3-5-B: P Reduction Loads

Phosphorus load reduction for IA disconnection with storage to PA HSG C, lbs			
Storage Volume $_{IA\text{-}in}$	Storage release rate, days		
	1	2	3
0.25	0.53	0.56	0.58

Nitrogen:

BMP Load $_{N}$ = IA (acre) x NLER $_{IC\text{-}Com}$ (see Table 3-2)
= 0.75 acres x 15.0 lbs/acre/yr
= 11.3 lbs/yr
BMP Reduction $_{lbs\text{-}N}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100)
BMP Reduction $_{lbs\text{-}N}$ = 11.3 lbs/yr x (39/100)
BMP Reduction $_{lbs\text{-}N}$ = **4.4 lbs/yr**

Table Example 3-5-C presents the BMP Reduction $_{lbs\text{-}N}$ for each of the release rates:

Table Example 3-5-C: N Reduction Loads

Nitrogen load reduction for IA disconnection with storage to PA HSG C, lbs			
Storage Volume $_{IA\text{-}in}$	Storage release rate, days		
	1	2	3
0.25	4.4	4.7	4.9

Example 3-6: Determine the phosphorus load reduction for disconnecting impervious area with and without soil augmentation in the receiving pervious area:*

*The approach used in this example for phosphorus is equally applicable for nitrogen

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 $_{\%\text{-}P}$) 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 $_{lbs\text{-}P}$).

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
2. Using Table 3-31 and Figure 3-41 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:*
*The approach used in this example for phosphorus is equally applicable for nitrogen.

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 $_{\%-P}$) 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 $_{lbs\text{-}P}$).

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 3-32, 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 $_{lbs\text{-}P}$) is calculated using Equation 3-2.

   BMP Reduction $_{lbs\text{-}P}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100)
   BMP Reduction $_{lbs\text{-}P}$ = 6.57 lbs/yr x (94.1/100)
   = 6.18 lbs/yr

Table 3-5 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 = $(L \times W \times D_{stone} \times n_{stone}) + (L \times W \times D_{sand} \times n_{sand})$
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: $DSV = (L \times W \times D)_{galley} + (L \times W \times D_{stone} \times n_{stone})$
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 $DSV = (L \times ((W_{bottom}+W_{top@Dmax})/2) \times D)$
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: $DSV = (A_{pond} \times D_{pond}) + (A_{soil} \times D_{soil} \times n_{soil\ mix})$
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. $DSV = (L \times W \times D_{ponding}) + (L \times W \times D_{soil} \times n_{soil\ mix})$
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: $DSV = (L \times W \times D_{ponding}) + (L \times W \times D_{soil} \times n_{soil})$
Enhanced Bio-filtration w/ Internal Storage Reservoir (ISR) (no infiltration)	Based on design by the UMA Stormwater Center (UMASC). Provides temporary storage of runoff for filtering through an engineered soil media, augmented for enhanced phosphorus removal, followed by detention and denitrification in a subsurface internal storage reservoir (ISR) comprised of gravel. An elevated outlet control at the top of the ISR is designed to provide a retention time of at least 24 hours in the system to allow for sufficient time for denitrification and nitrogen reduction to occur prior to discharge. The design storage capacity for using the cumulative performance curves is comprised of void spaces in the filter media, temporary ponding at the surface of the practice and the void spaces in the gravel ISR.	Enhanced Bio-filtration w/ISR	DSV = Ponding water storage volume and void space volume of soil filter media and gravel ISR. $DSV = (A_{bed} \times D_{ponding}) + (A_{bed} \times D_{soil} \times n_{soil}) + (A_{ISR} \times D_{gravel} \times n_{gravel})$
Gravel Wetland	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. $DSV = (A_{pretreatment} \times D_{preTreatment}) + (A_{wetland} \times D_{ponding}) + (A_{ISR} \times D_{gravel} \times n_{gravel})$
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 = $(L \times W \times D_{stone} \times n_{stone})$
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}
Sand Filter w/underdrain	Provides filtering of runoff through a sand filter course and temporary storage of runoff through surface ponding and within void spaces of the sand and washed stone layers prior to discharge by way of an underdrain.	Sand Filter	DSV = pretreatment volume + ponding volume + void space volume of sand and washed stone layers. $DSV = (A_{pretreatment} \times D_{preTreatment}) + (A_{bed} \times D_{ponding}) + (A_{bed} \times D_{sand} \times n_{sand}) + (A_{bed} \times D_{stone} \times n_{stone})$
Wet Pond	Provides treatment of runoff through routing through permanent pool.	Wet Pond	DSV= Permanent pool volume prior to high flow bypass $DSV=A_{pond} \times D_{pond}$ (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 $DSV=A_{pond} \times D_{pond}$ (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.	Water Quality Grass Swale	DSV = Volume of swale at full design depth $DSV=L_{swale} \times W_{swale} \times D_{ponding\ swale}$
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			

Table 3- 6: Infiltration Trench (IR = 0.17 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.17 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	15%	28%	49%	64%	75%	82%	92%	95%
Cumulative Phosphorus Load Reduction	18%	33%	57%	73%	83%	90%	97%	99%
Cumulative Nitrogen Load Reduction	56%	72%	87%	93%	96%	98%	99%	100%

Figure 3- 1: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.17 in/hr)

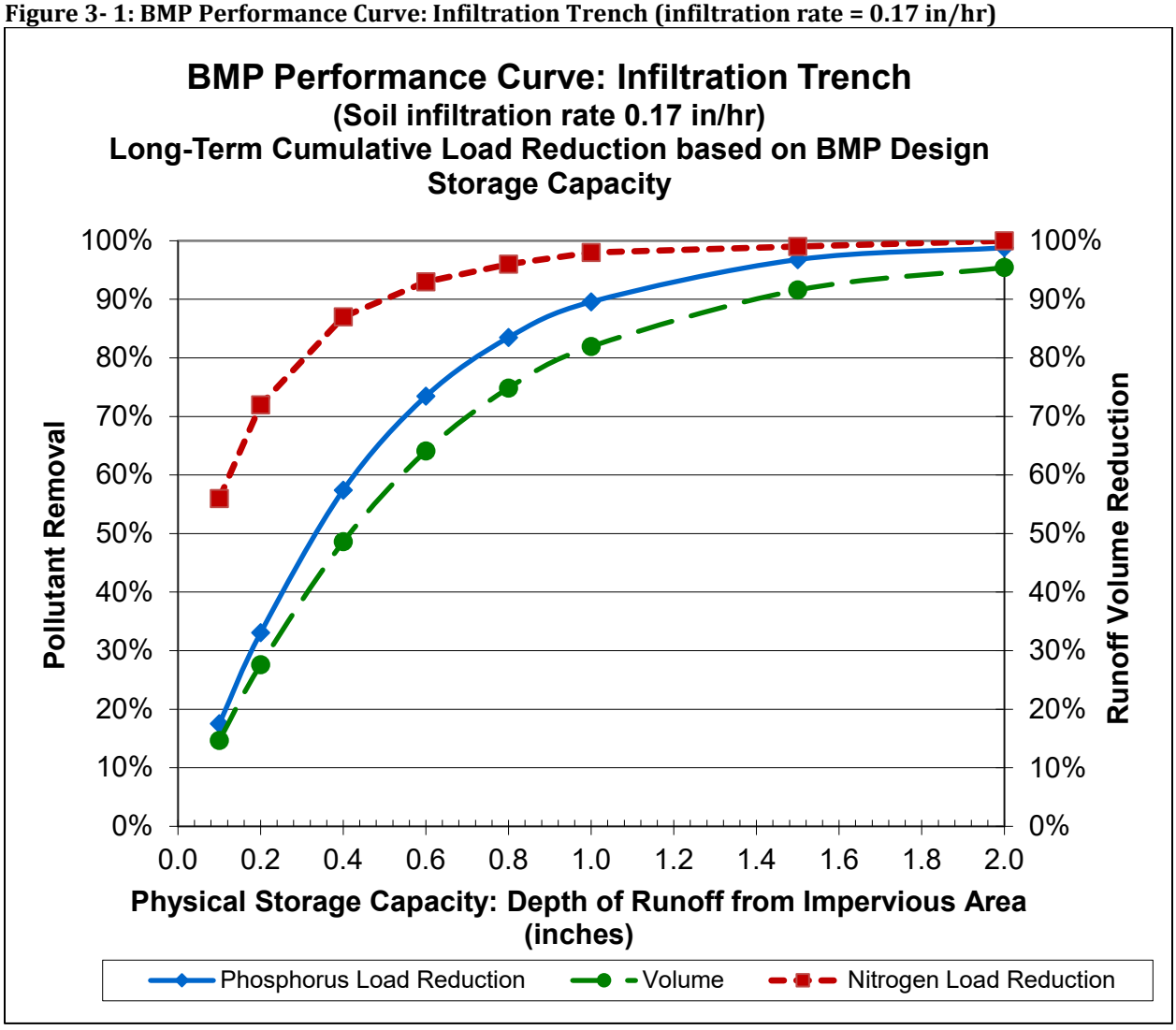


Table 3- 7: Infiltration Trench (IR = 0.27 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.27 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	57%	74%	88%	94%	97%	98%	99%	100%

Figure 3- 2: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.27 in/hr)

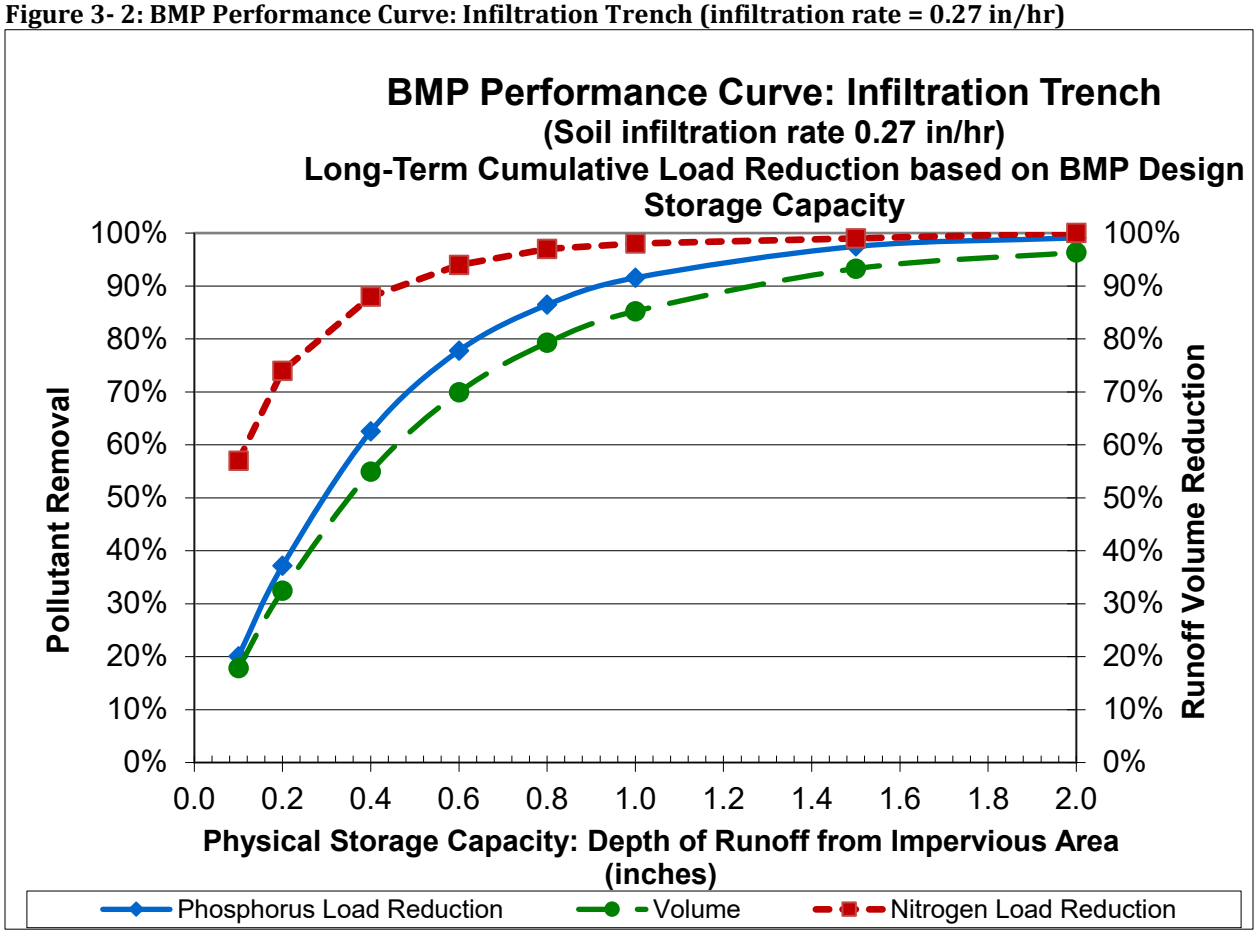


Table 3- 8: Infiltration Trench (IR = 0.52 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.52 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	59%	76%	90%	95%	98%	99%	100%	100%

Figure 3- 3: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.52 in/hr)

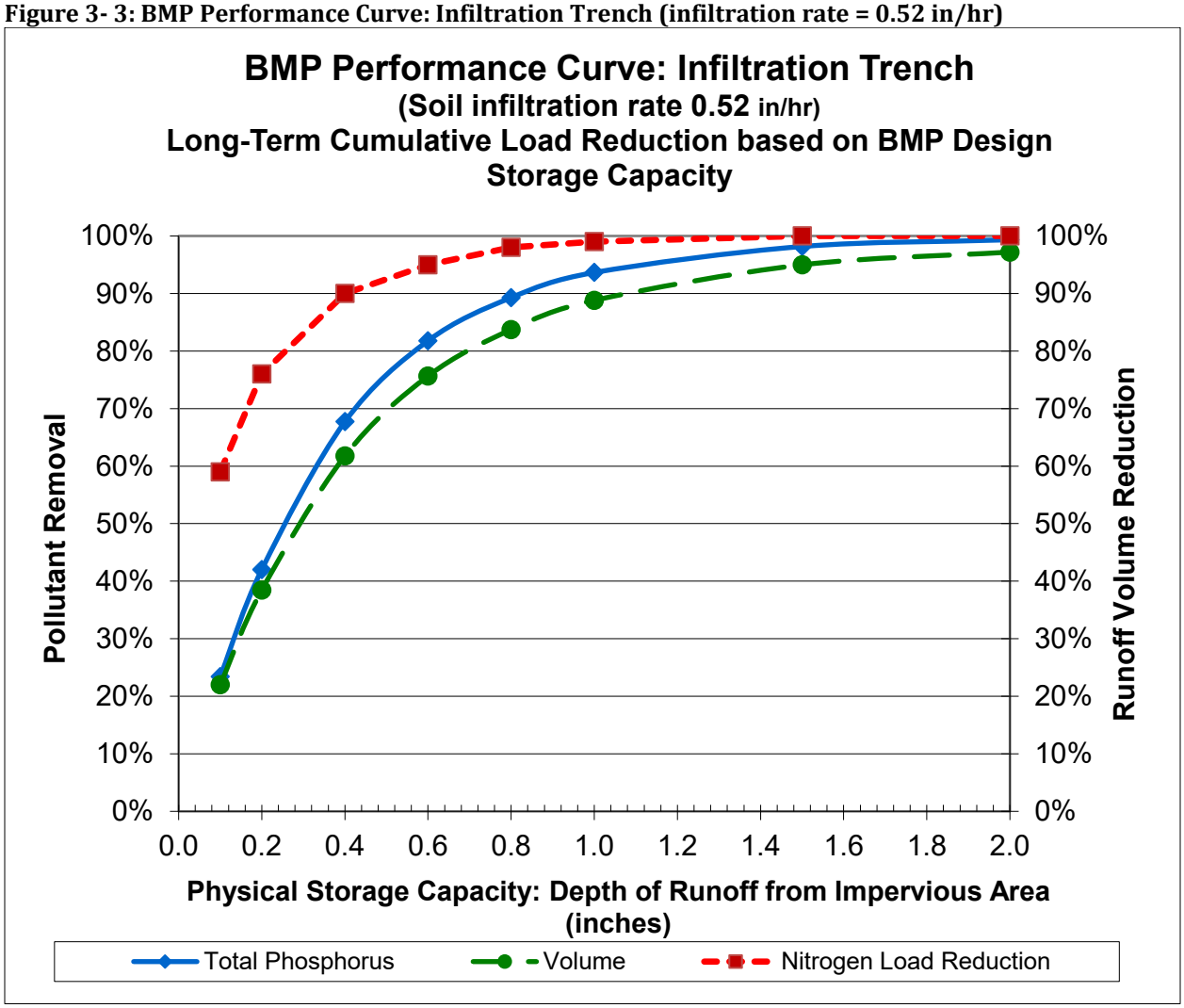


Table 3- 9: Infiltration Trench (IR = 1.02 in/hr) BMP Performance Table

Infiltration Trench (IR = 1.02 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	61%	78%	92%	97%	98%	99%	100%	100%

Figure 3- 4: BMP Performance Curve: Infiltration Trench (infiltration rate = 1.02 in/hr)

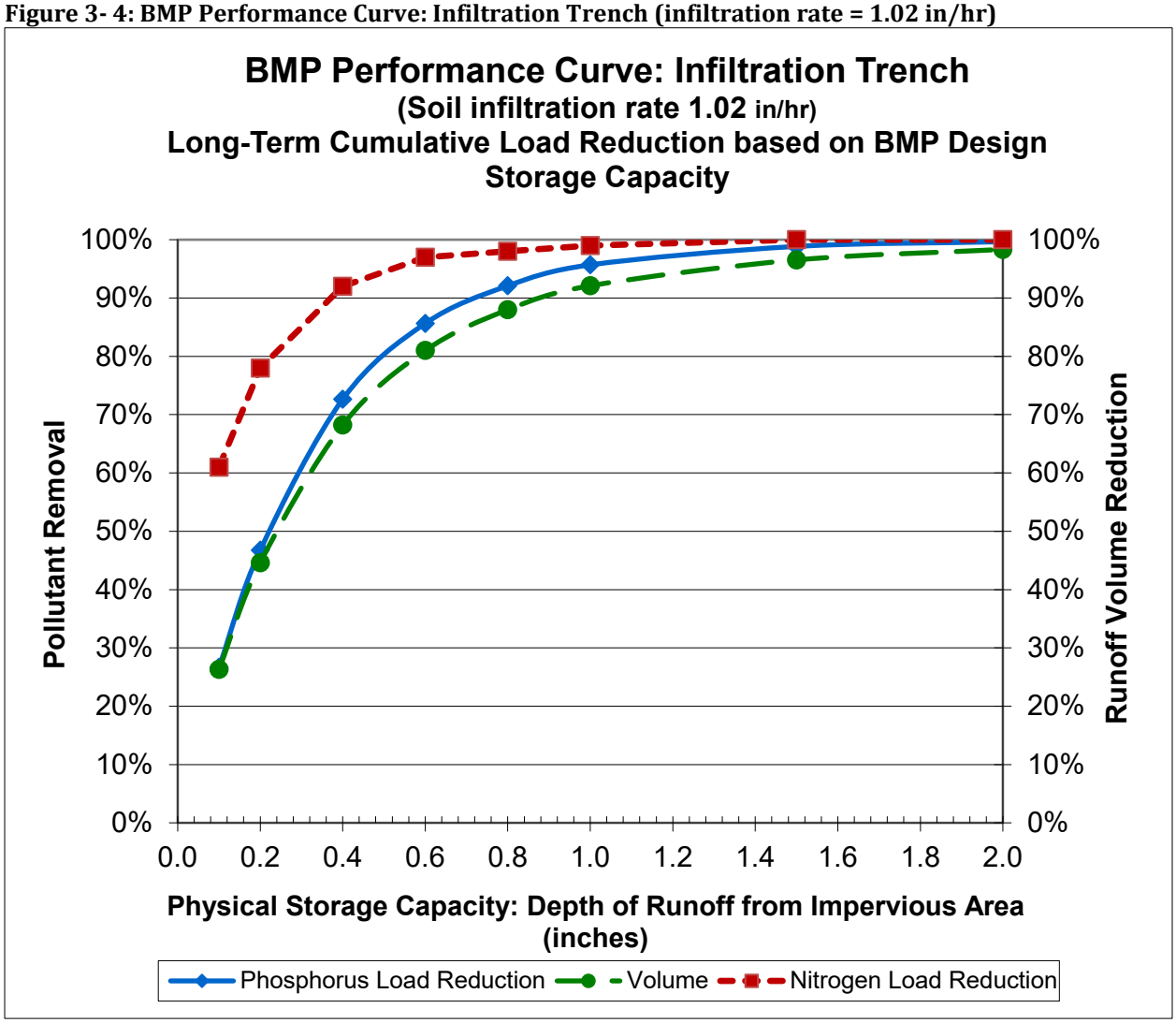


Table 3- 10: Infiltration Trench (IR = 2.41 in/hr) BMP Performance Table

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%	55%	78%	88%	93%	96%	99%	100%
Cumulative Phosphorus Load Reduction	33%	55%	81%	91%	96%	98%	100%	100%
Cumulative Nitrogen Load Reduction	65%	83%	95%	98%	99%	100%	100%	100%

Figure 3- 5: BMP Performance Curve: Infiltration Trench (infiltration rate = 2.41 in/hr)

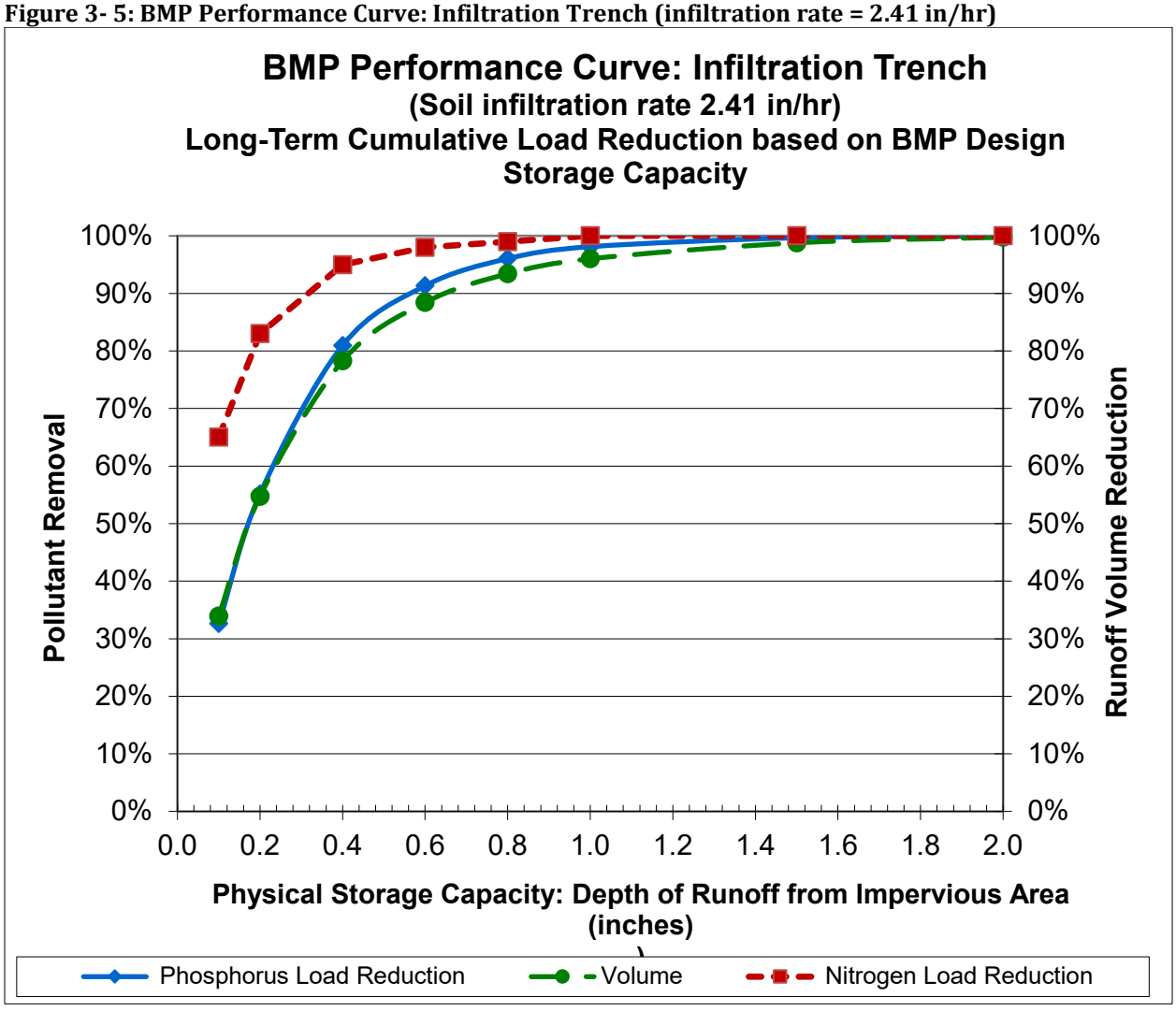


Table 3- 11: Infiltration Trench (8.27 in/hr) BMP Performance Table

Infiltration Trench (8.27 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	76%	92%	98%	100%	100%	100%	100%	100%

Figure 3- 6: BMP Performance Curve: Infiltration Trench (infiltration rate = 8.27 in/hr)

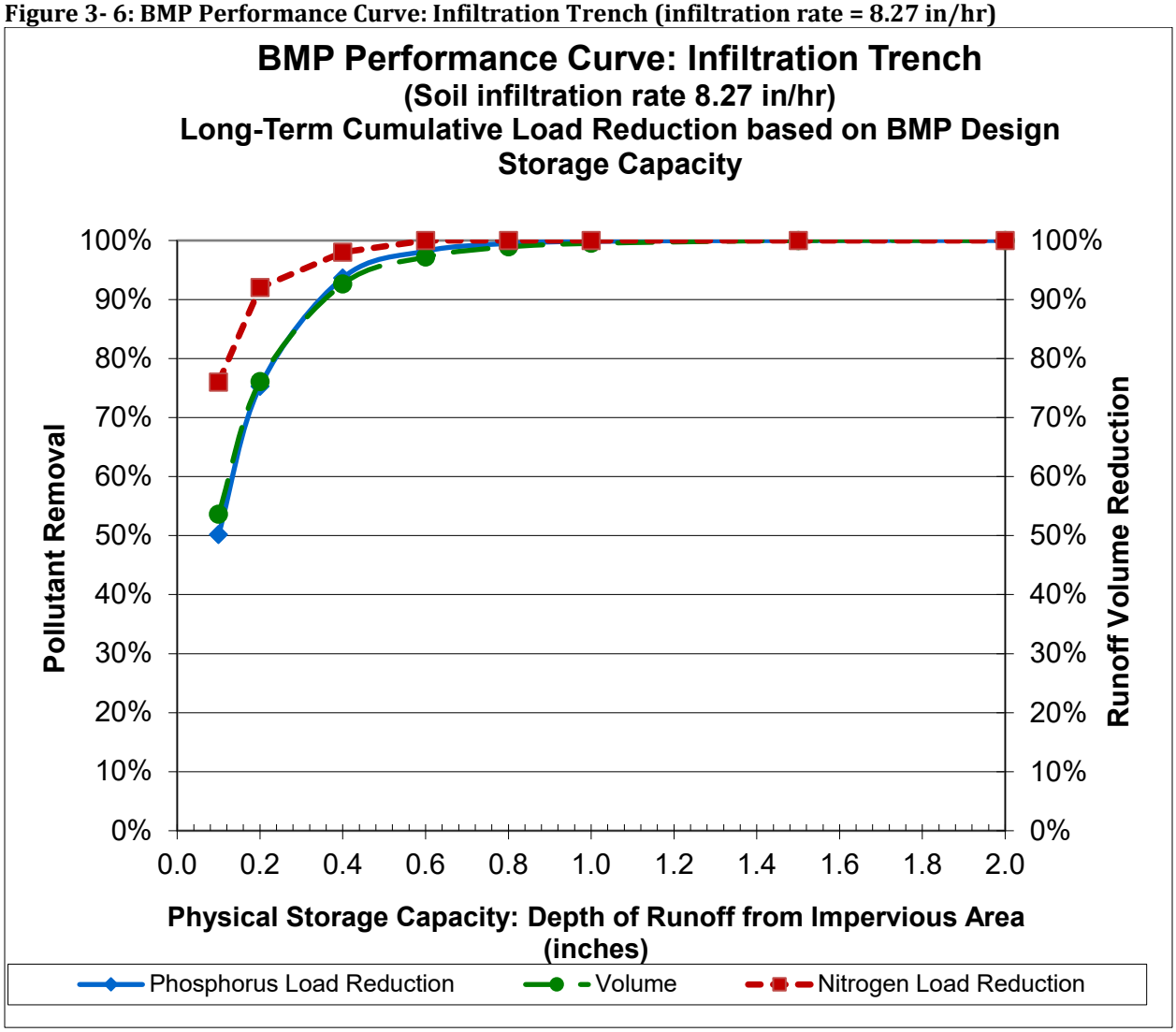


Table 3- 12: Surface Infiltration (0.17 in/hr) BMP Performance Table

Surface Infiltration (0.17 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	13%	25%	44%	59%	71%	78%	89%	94%
Cumulative Phosphorus Load Reduction	35%	52%	72%	82%	88%	92%	97%	99%
Cumulative Nitrogen Load Reduction	52%	69%	85%	92%	96%	98%	99%	100%

Figure 3- 7: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.17 in/hr)

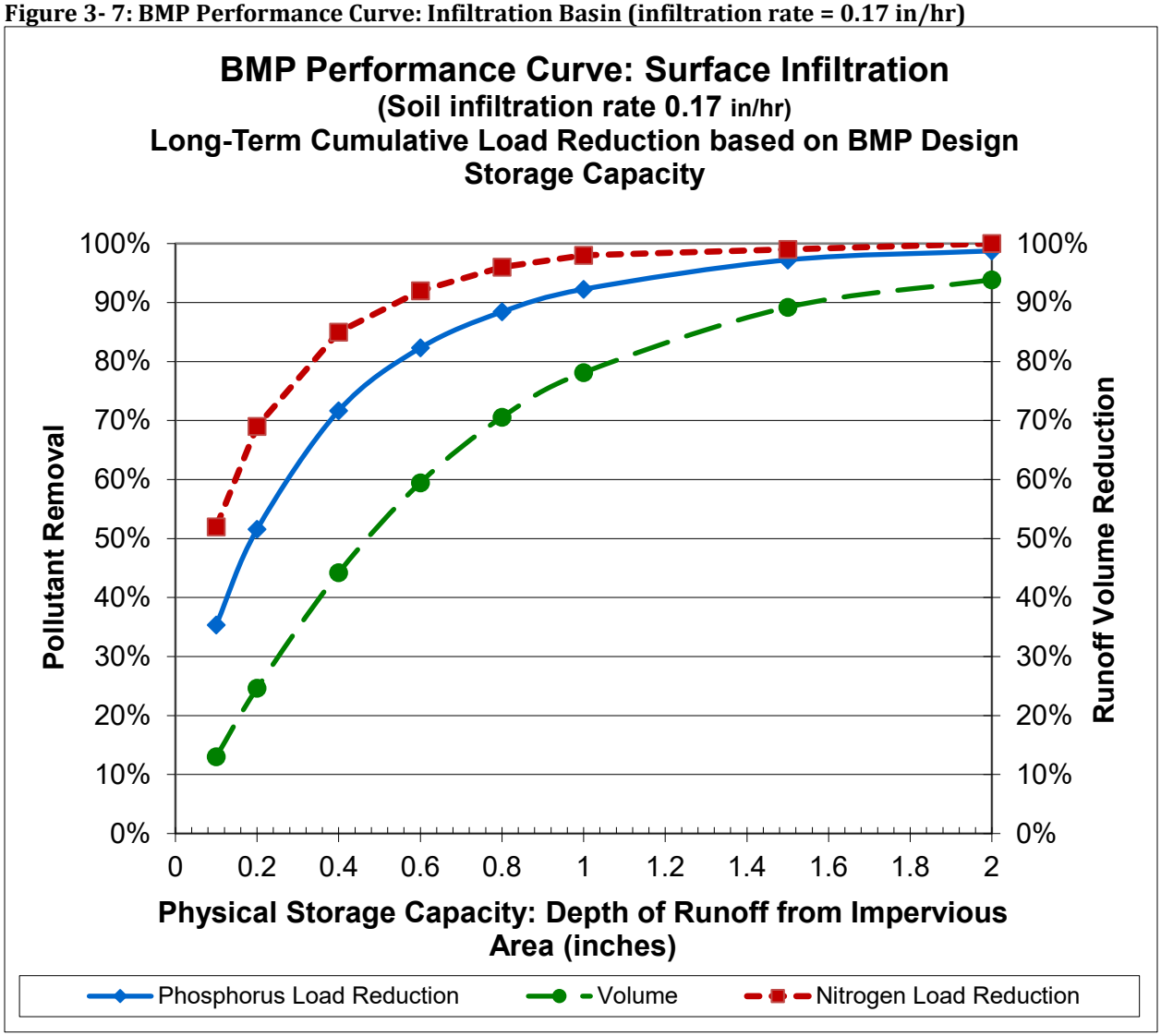


Table 3- 13: Infiltration Basin (0.27 in/hr) BMP Performance Table

Surface Infiltration (0.27 in/hr) BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	16%	30%	51%	66%	76%	82%	91%	95%
Cumulative Phosphorus Load Reduction	37%	54%	74%	85%	90%	93%	98%	99%
Cumulative Nitrogen Load Reduction	54%	71%	87%	93%	97%	98%	99%	100%

Figure 3- 8: BMP Performance Curve: Surface Infiltration (infiltration rate = 0.27 in/hr)

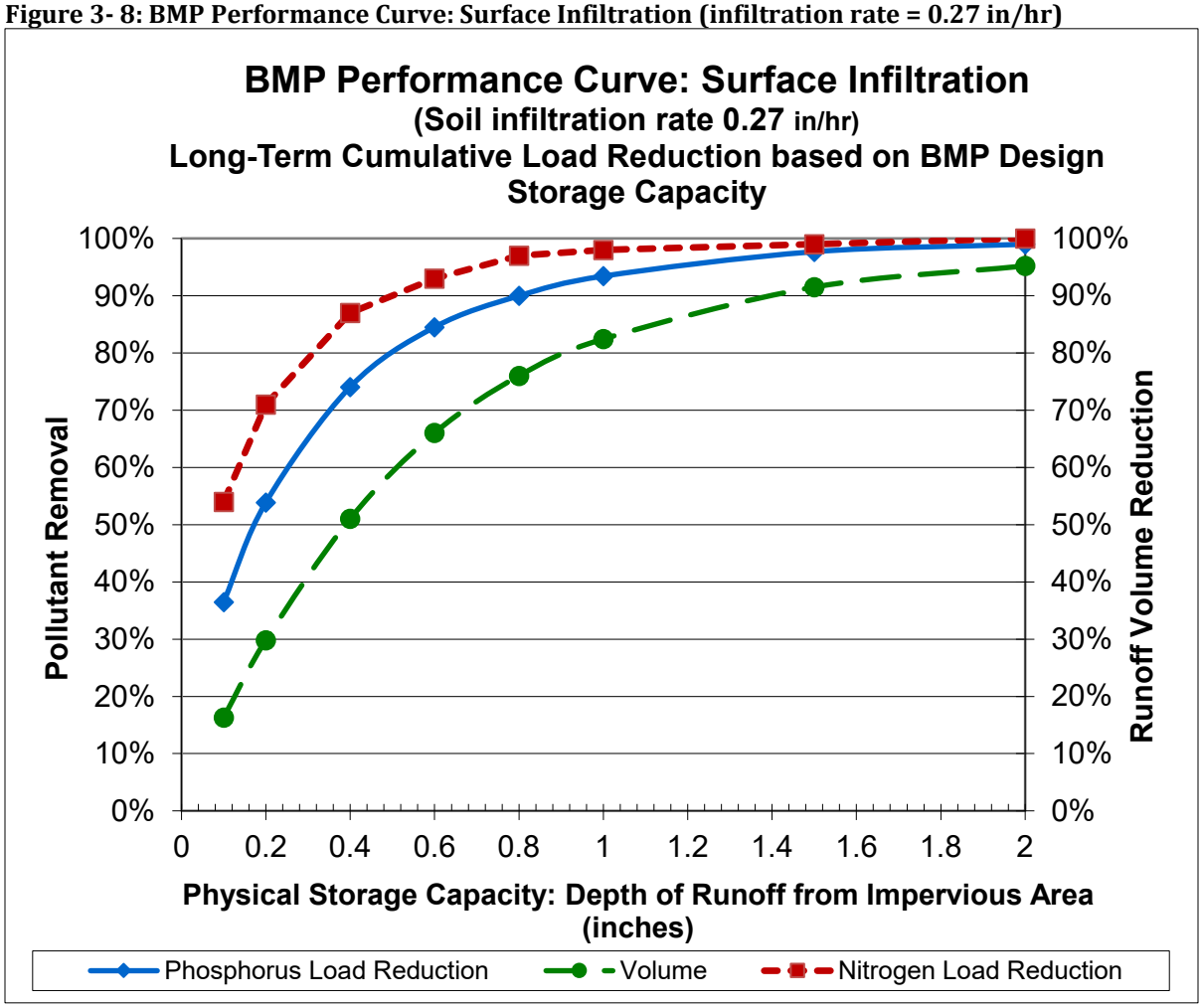


Table 3- 14: Infiltration Basin (0.52 in/hr) BMP Performance Table

Surface Infiltration (0.52 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	20%	36%	58%	73%	81%	87%	94%	97%
Cumulative Phosphorus Load Reduction	38%	56%	77%	87%	92%	95%	98%	99%
Cumulative Nitrogen Load Reduction	56%	74%	89%	94%	98%	99%	100%	100%

Figure 3- 9: BMP Performance Curve: Surface Infiltration (infiltration rate = 0.52 in/hr)

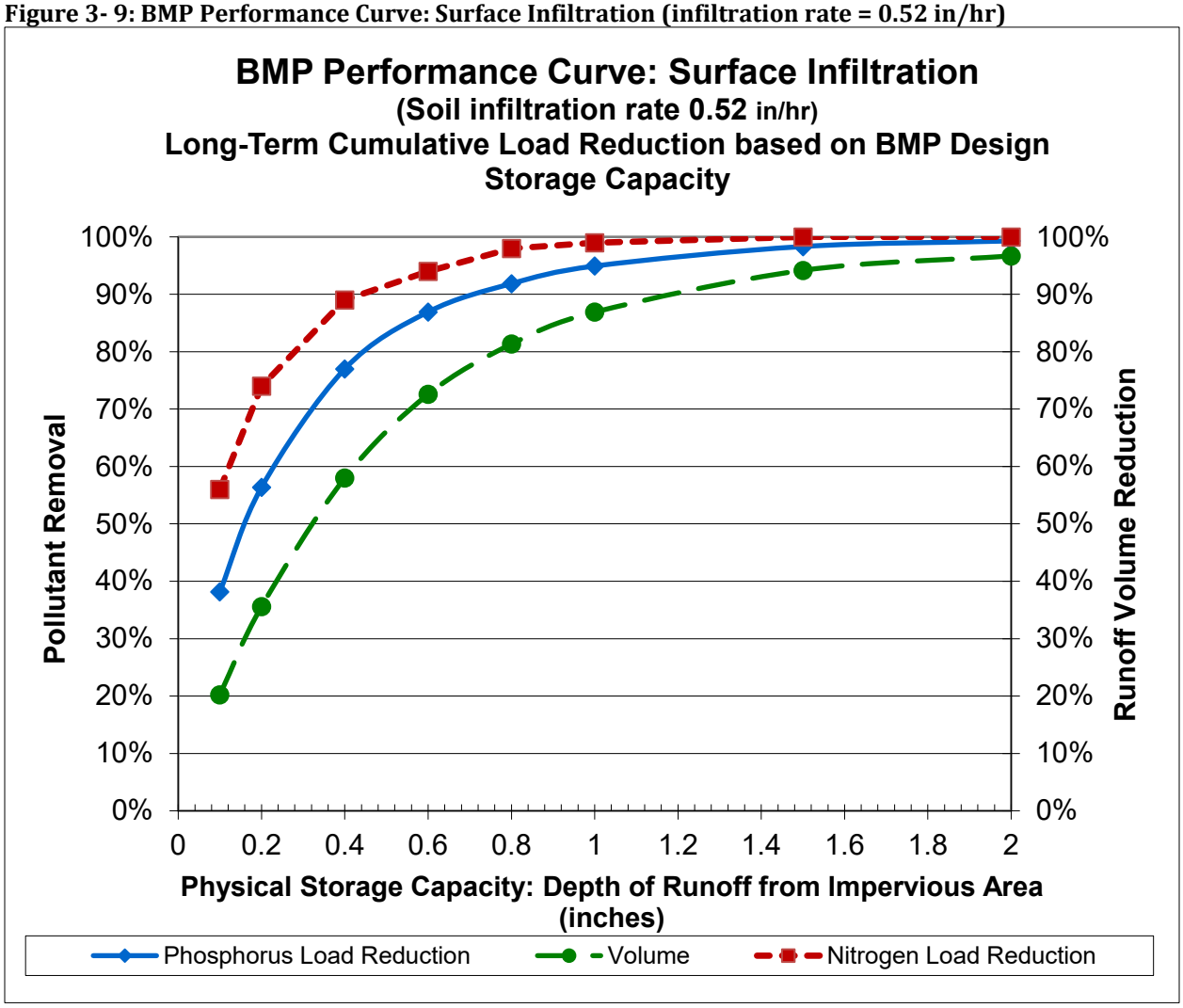


Table 3-15: Infiltration Basin (1.02 in/hr) BMP Performance Table

Surface Infiltration (1.02 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	59%	77%	92%	96%	98%	100%	100%	100%

Figure 3- 10**: BMP Performance Curve: Surface Infiltration (Soil infiltration rate = 1.02 in/hr)**

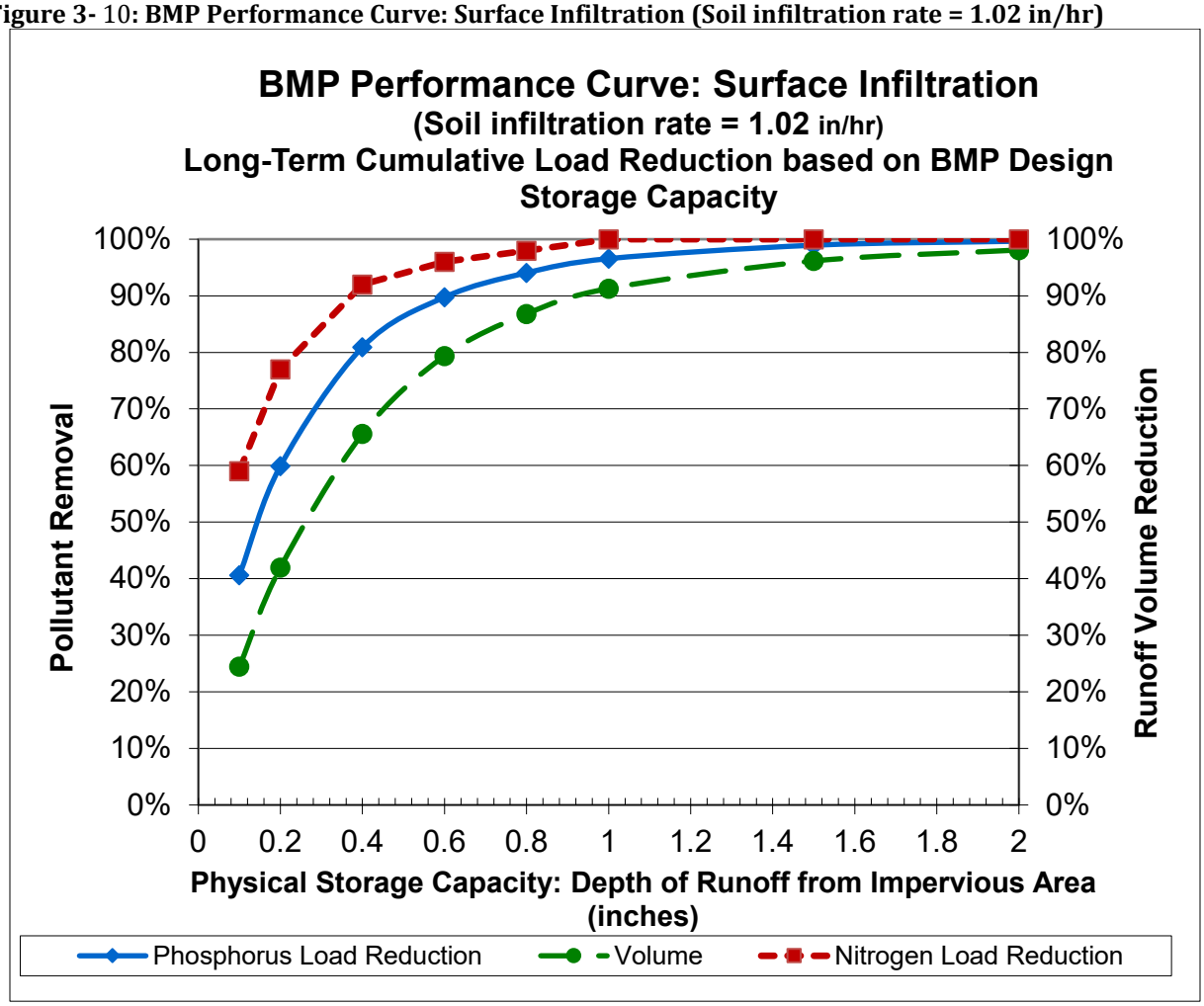


Table 3- 16: Surface Infiltration (2.41 in/hr) BMP Performance Table

Surface Infiltration (2.41 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	64%	82%	95%	98%	99%	100%	100%	100%

Figure 3- 11: BMP Performance Curve: Infiltration Basin (infiltration rate = 2.41 in/hr)

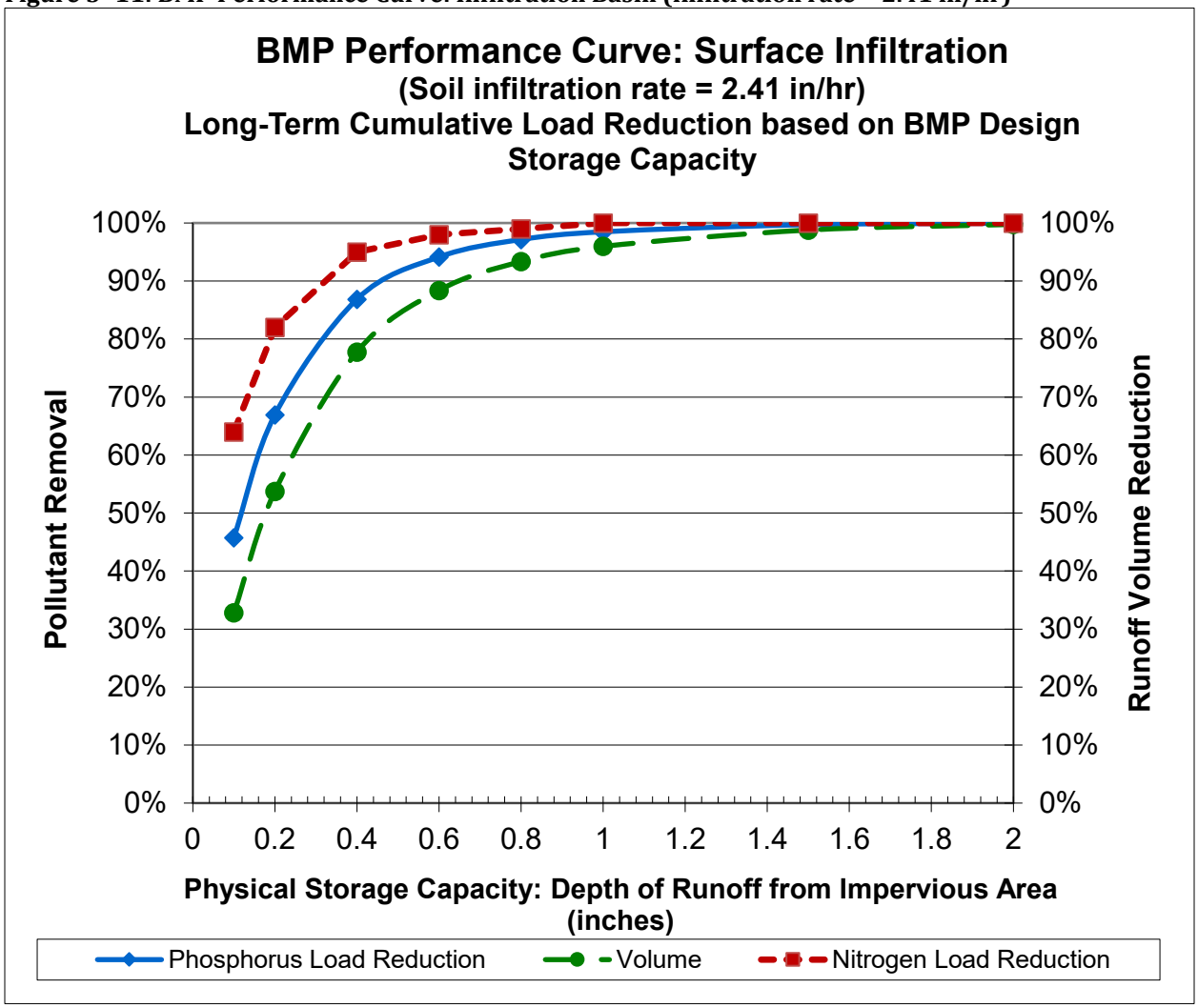


Table 3- 17: Surface Infiltration (8.27 in/hr) BMP Performance Table

Surface Infiltration (8.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	75%	92%	99%	100%	100%	100%	100%	100%

Figure 3- 12: BMP Performance Curve: Surface Infiltration (infiltration rate = 8.27 in/hr)

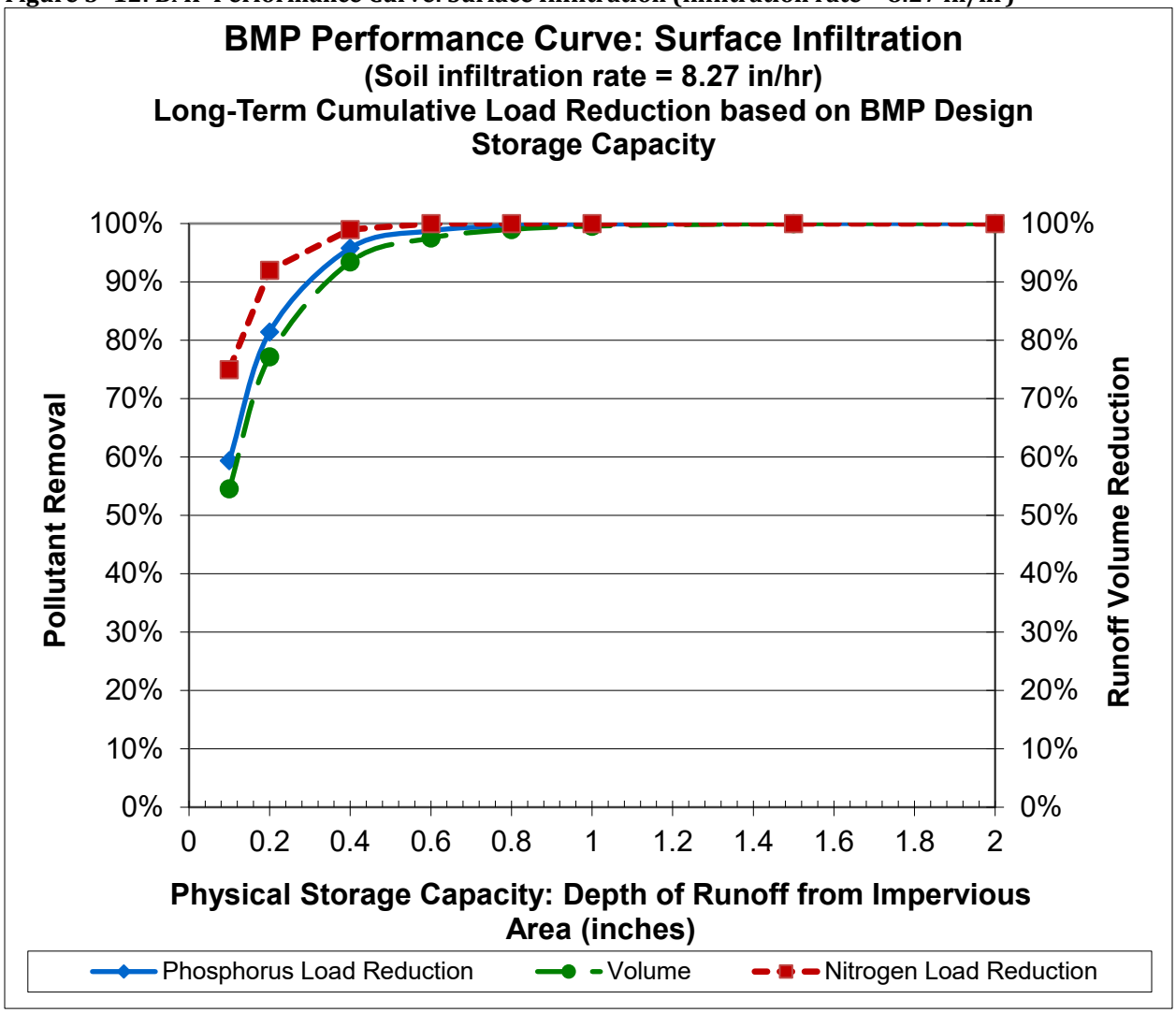


Table 3-18: Bio-filtration BMP Performance Table

Bio-filtration BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	9%	16%	23%	28%	31%	32%	37%	40%

Figure 3- 13: BMP Performance Curve: Bio-filtration

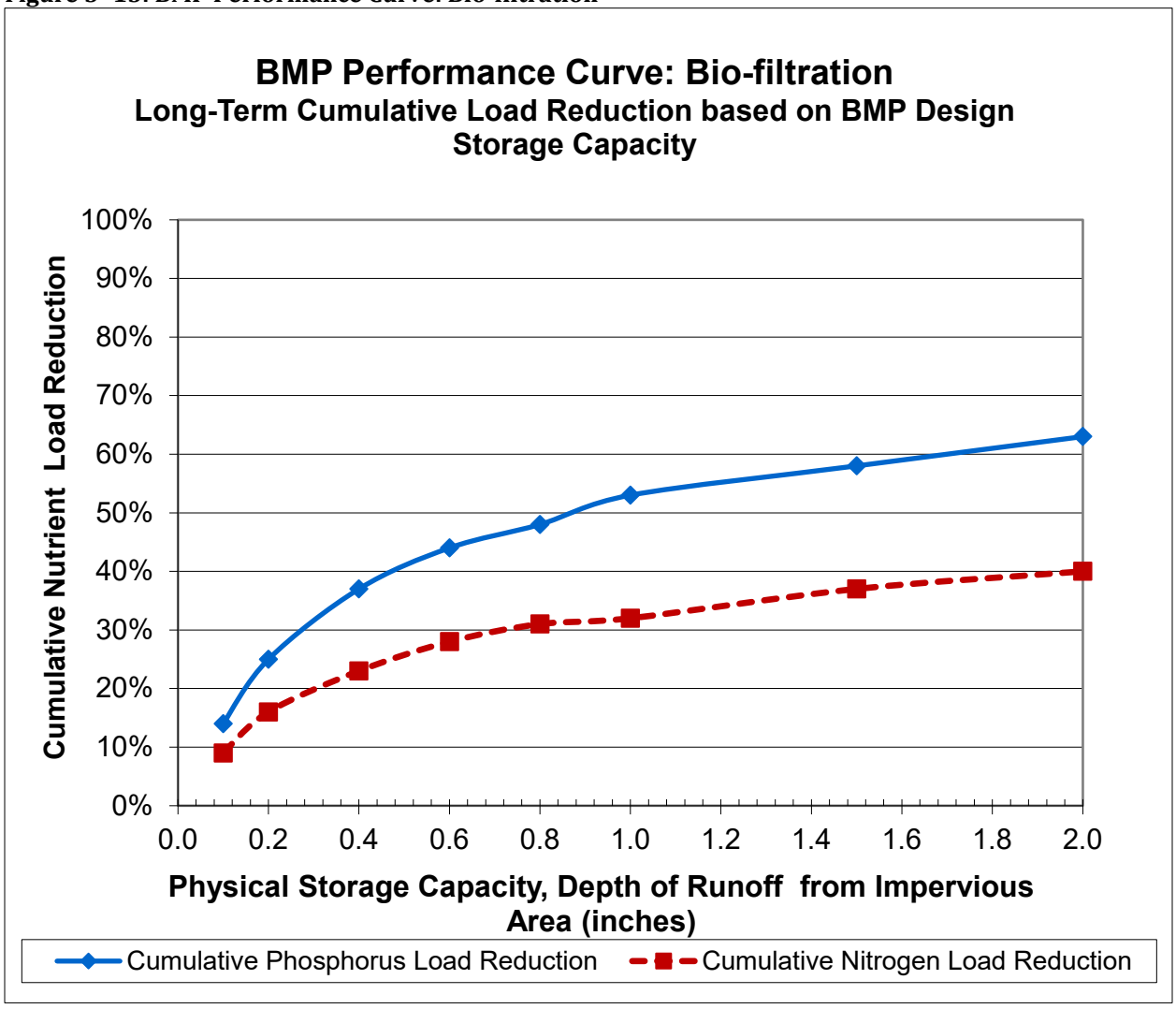


Table 3- 19: Gravel Wetland BMP Performance Table

Gravel Wetland BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	22%	33%	48%	57%	64%	68%	74%	79%

Figure 3- 14: BMP Performance Curve: Gravel Wetland

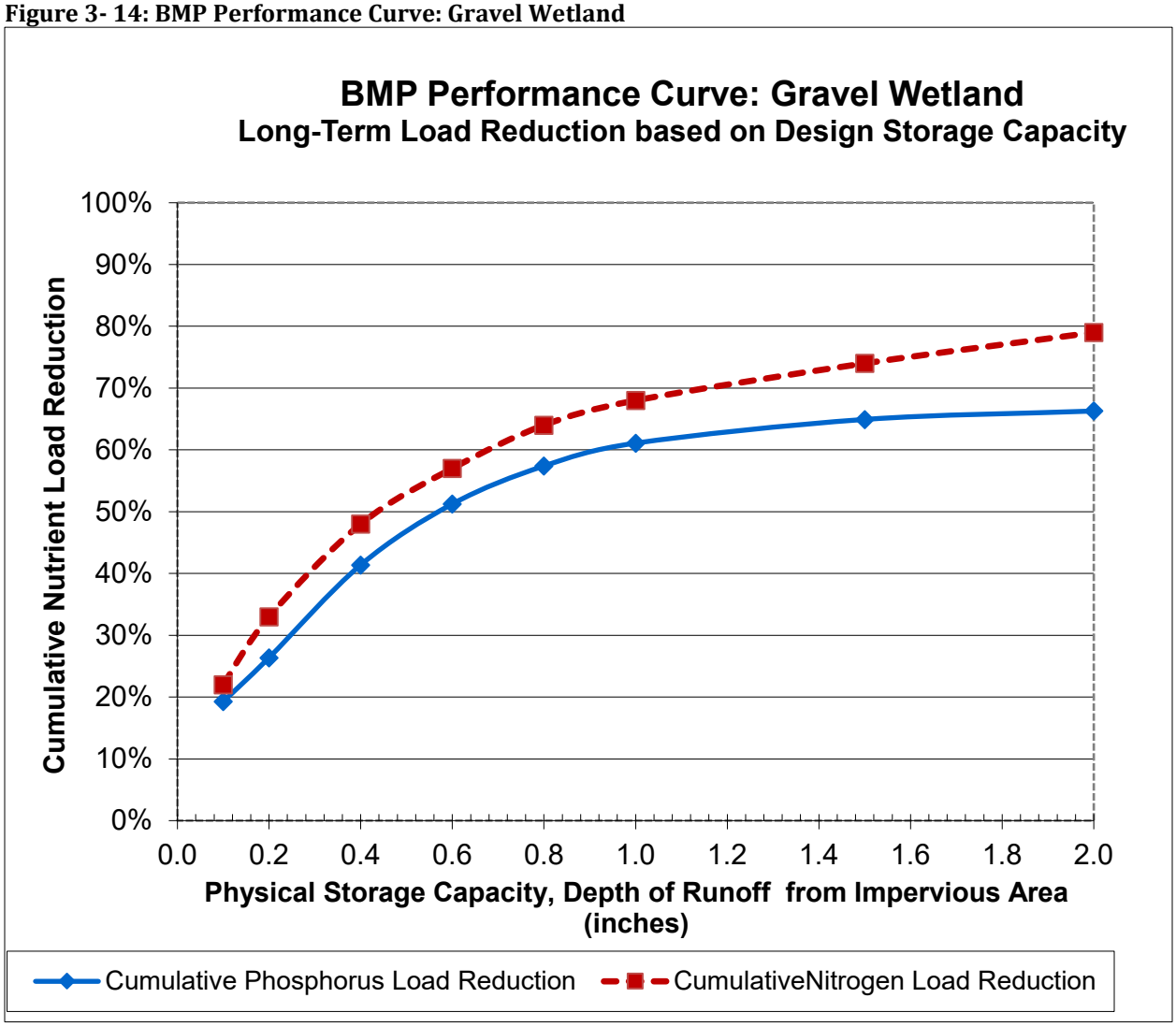


Table 3- 20: Enhanced Bio-filtration* with Internal Storage Reservoir (ISR) BMP Performance Table

Enhanced Bio-filtration* w/ ISR BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction

BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	32%	44%	58%	66%	71%	75%	82%	86%

***Filter media augmented with phosphorus sorbing materials to enhance phosphorus removal.**

Figure 3-15: BMP Performance Curve: Enhanced Bio-filtration with Internal Storage Reservoir (ISR) BMP Performance Table

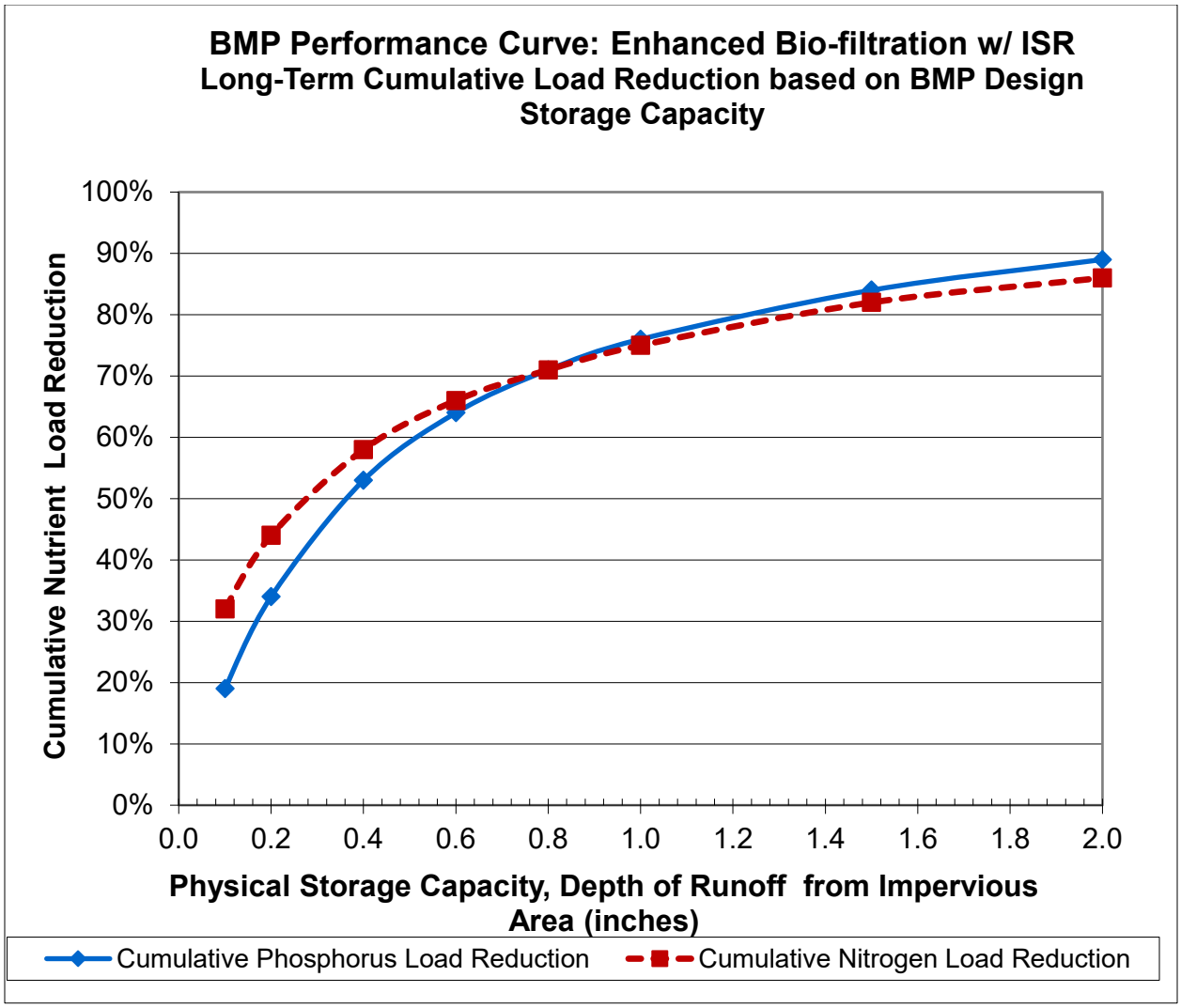


Table 3-21: Sand Filter BMP Performance Table

Sand Filter BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction

BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	9%	16%	23%	28%	31%	32%	37%	40%

Figure 3-16: BMP Performance Curve: Sand Filter

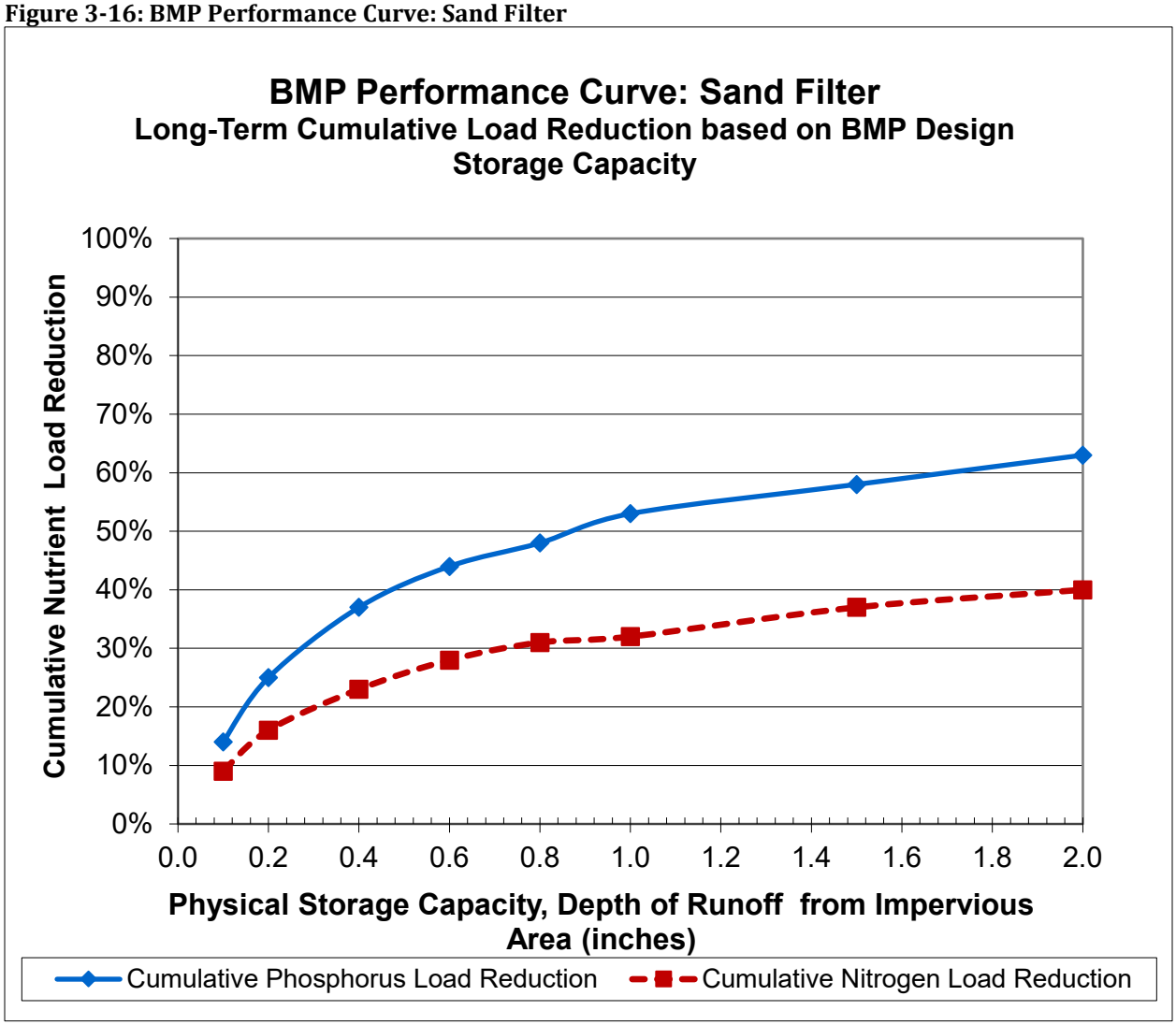


Table 3- 22 Porous Pavement BMP Performance Table

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%
Cumulative Nitrogen Load Reduction	76%	77%	77%	79%

Figure 3- 17: BMP Performance Curve: Porous Pavement

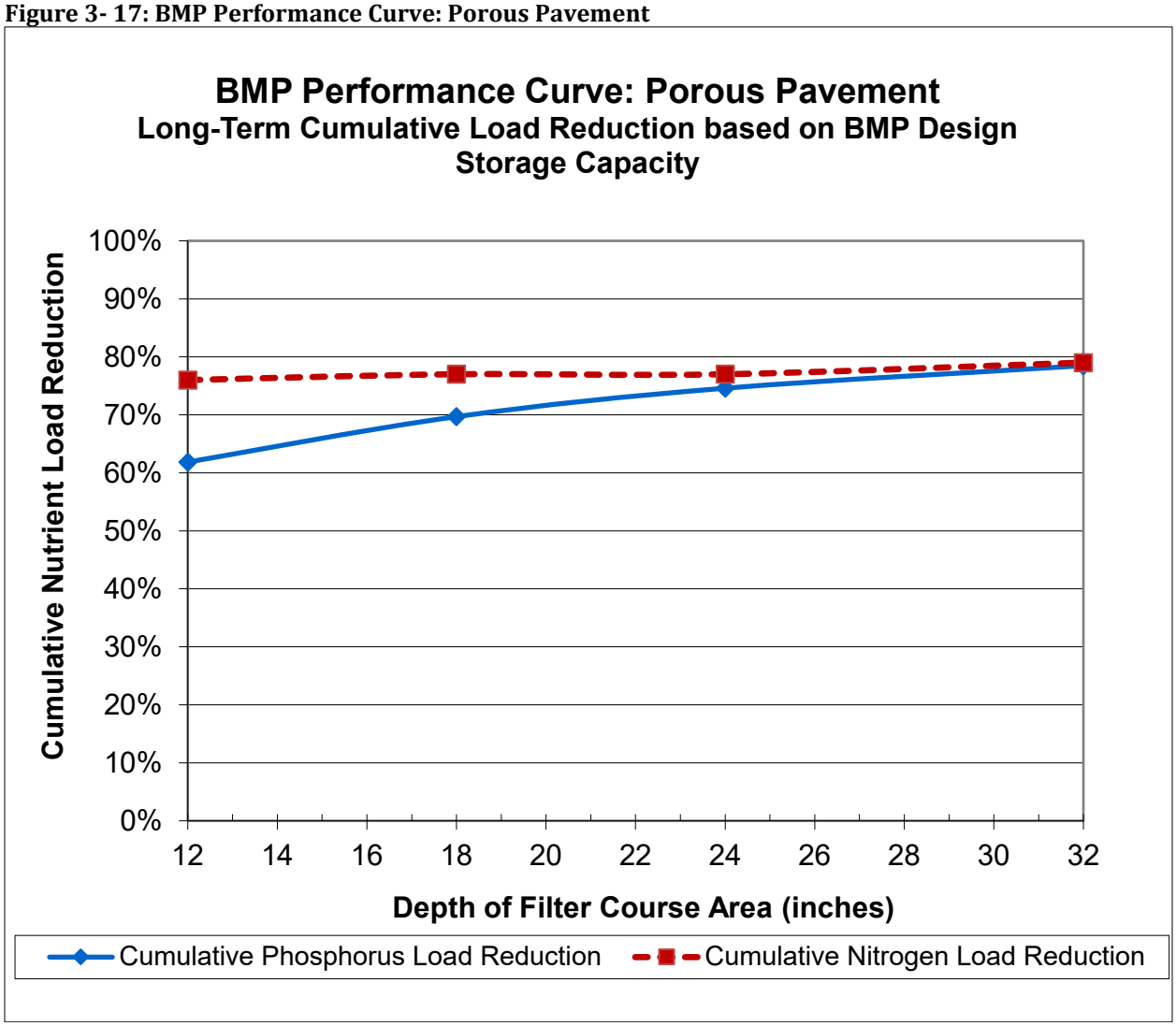


Table 3- 23: Wet Pond BMP Performance Table

Wet Pond BMP Performance Table: Long-Term Phosphorus Load Reduction

BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	9%	16%	23%	28%	31%	32%	37%	40%

Figure 3-18: BMP Performance Curve: Wet Pond

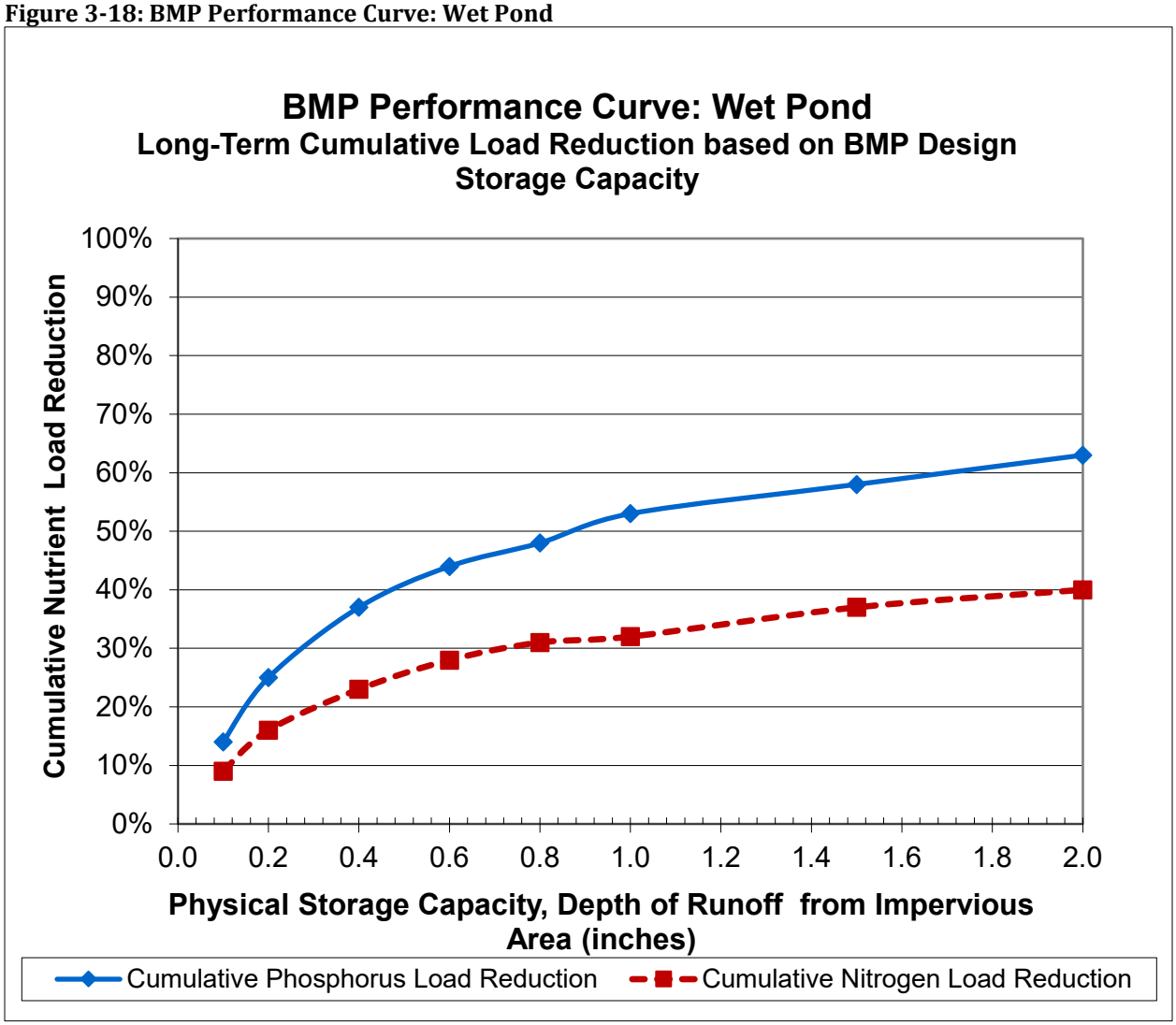


Table 3-24: Dry Pond BMP Performance Table

Extended Dry Pond BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction

BMP Capacity: Depth of Runoff 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%
Cumulative Nitrogen Load Reduction	1%	3%	6%	9%	11%	13%	19%	23%

Figure 3- 19: BMP Performance Curve: Dry Pond

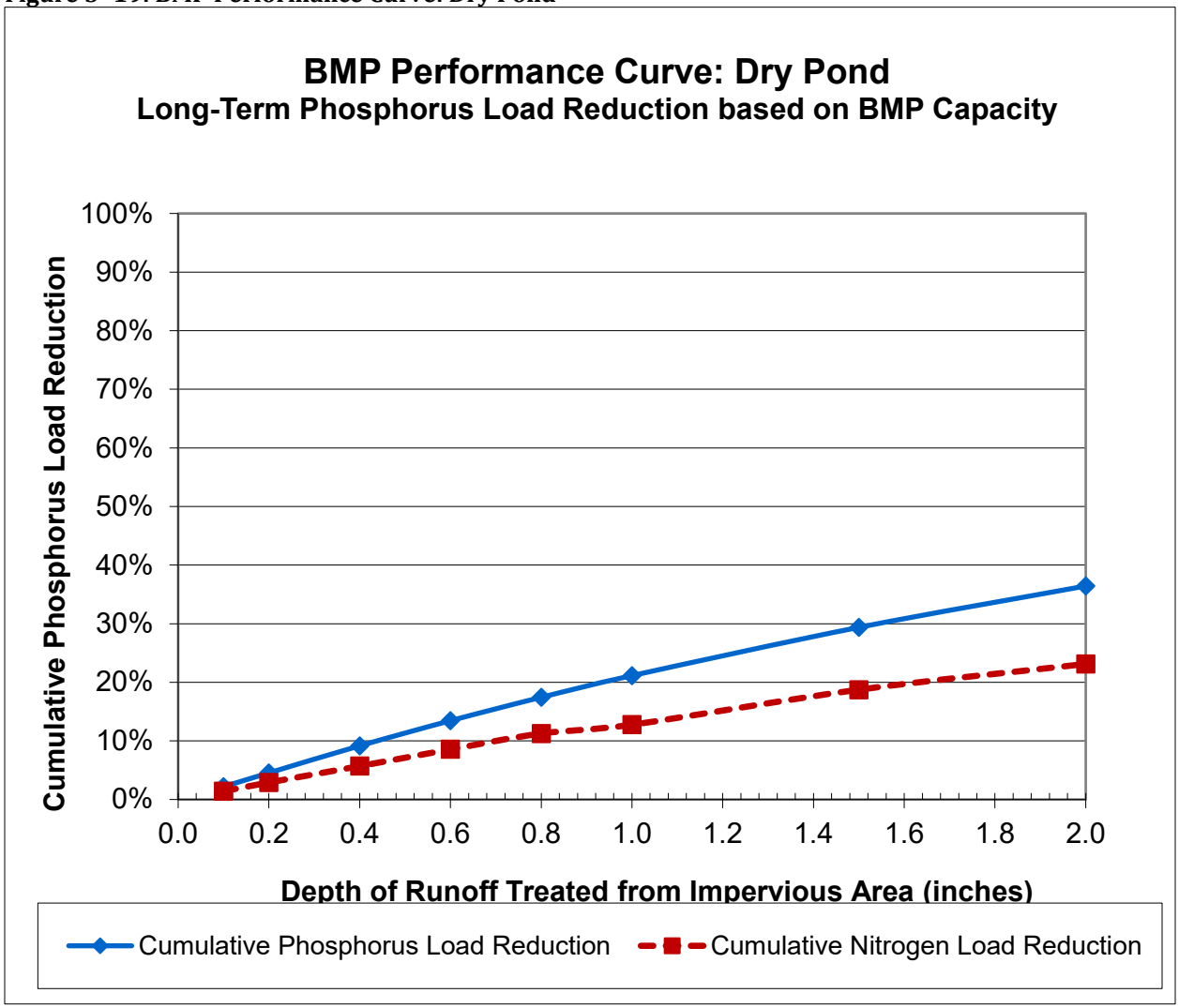


Table 3- 25: Water Quality Grass Swale with Detention BMP Performance Table

Water Quality Grass Swale with Detention Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction

BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Phosphorus Load Reduction	2%	5%	9%	13%	17%	21%	29%	36%
Nitrogen Load Reduction	1%	3%	6%	9%	11%	13%	19%	23%

Figure 3-20: BMP Performance Curve: Water Quality Grass Swale with Detention

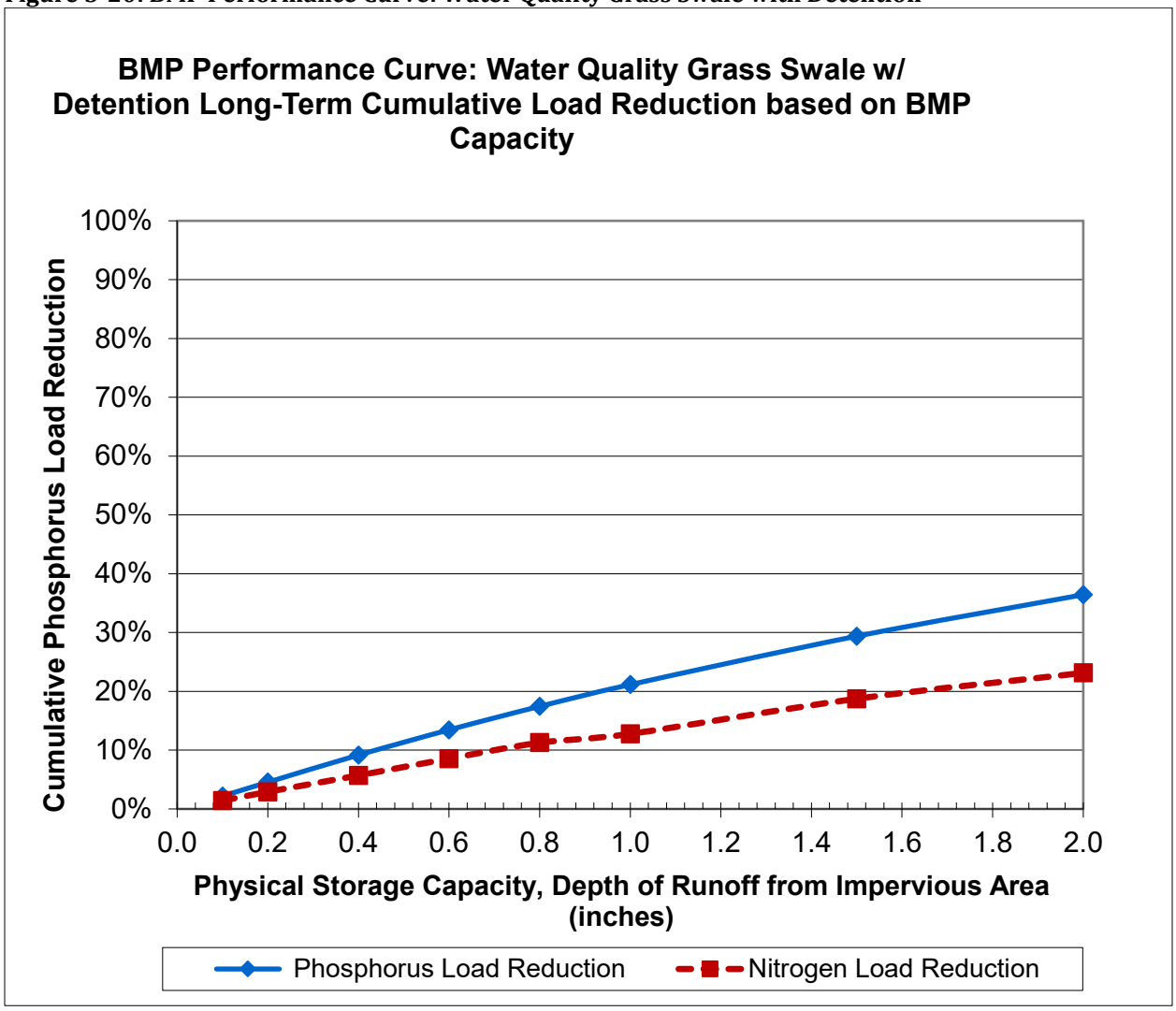


Table 3- 26: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1

Impervious Area Disconnection through Storage : Impervious Area to Pervious Area Ratio = 8:1	
	Total Runoff Volume (TP) Reduction Percentages

Storage volume to impervious area ratio	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- 21: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG A Soils

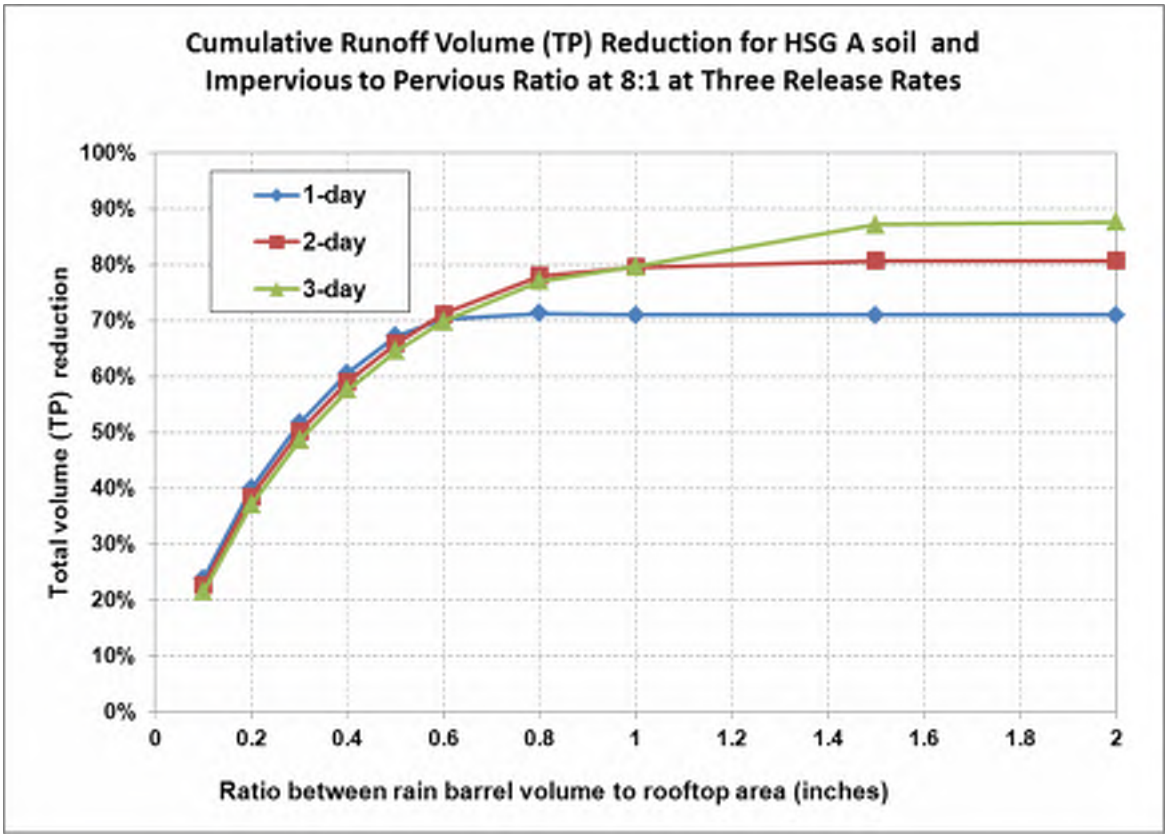


Figure 3- 22: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG B Soils

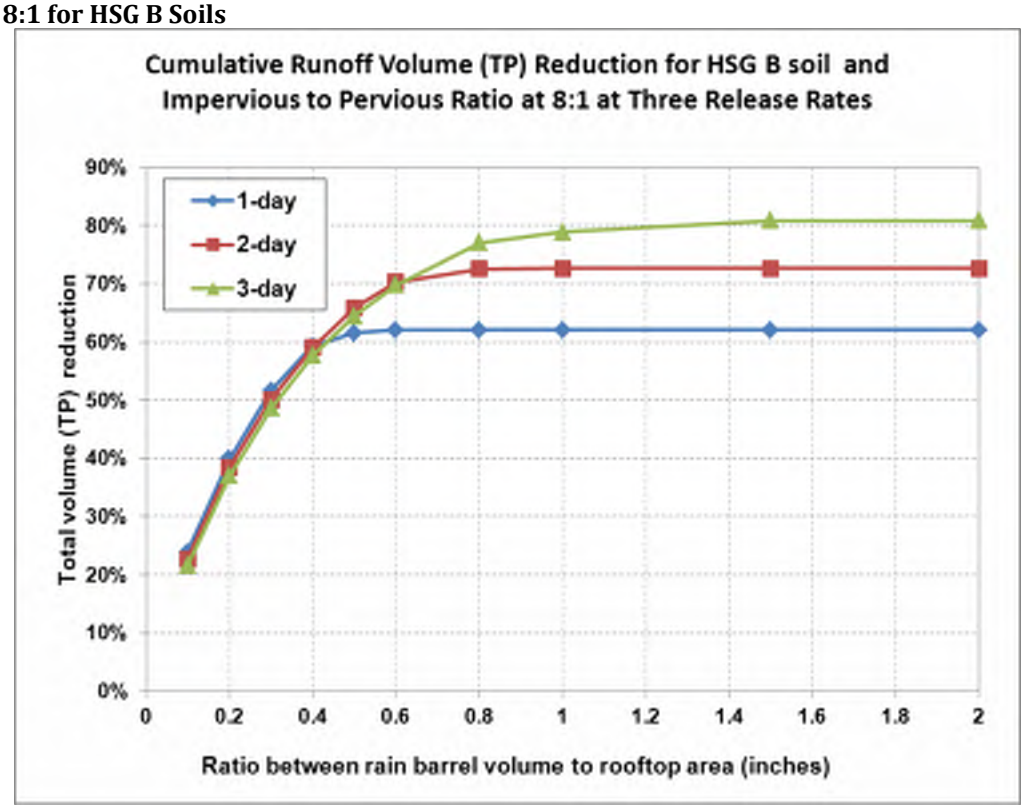


Figure 3- 23: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG C Soils

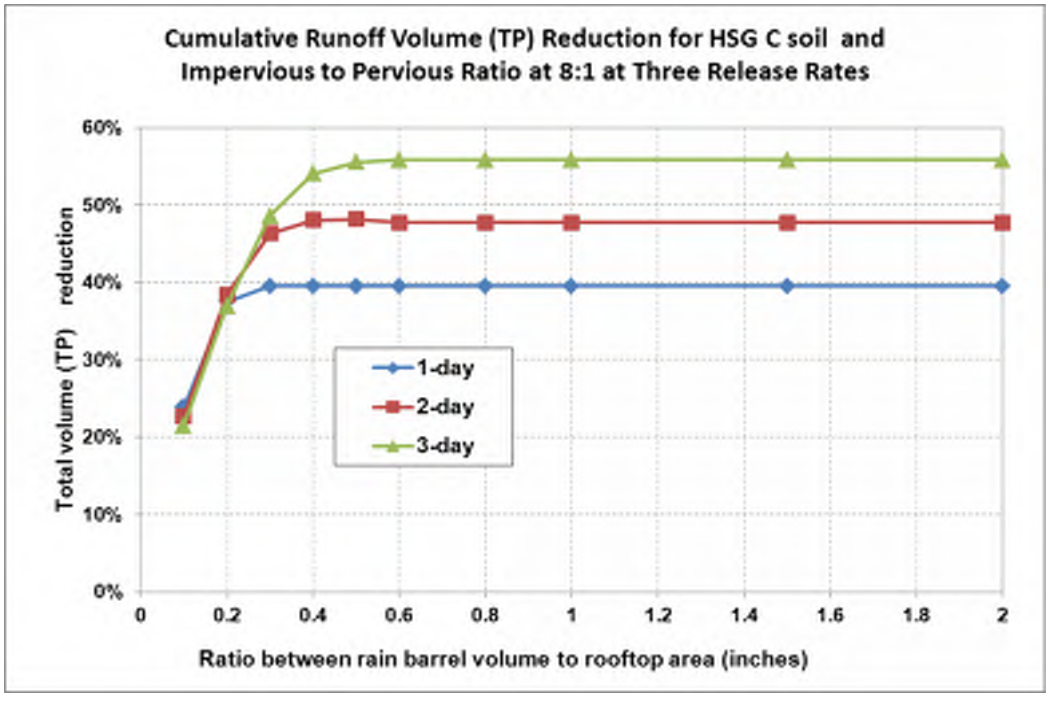


Figure 3- 24: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG D Soils

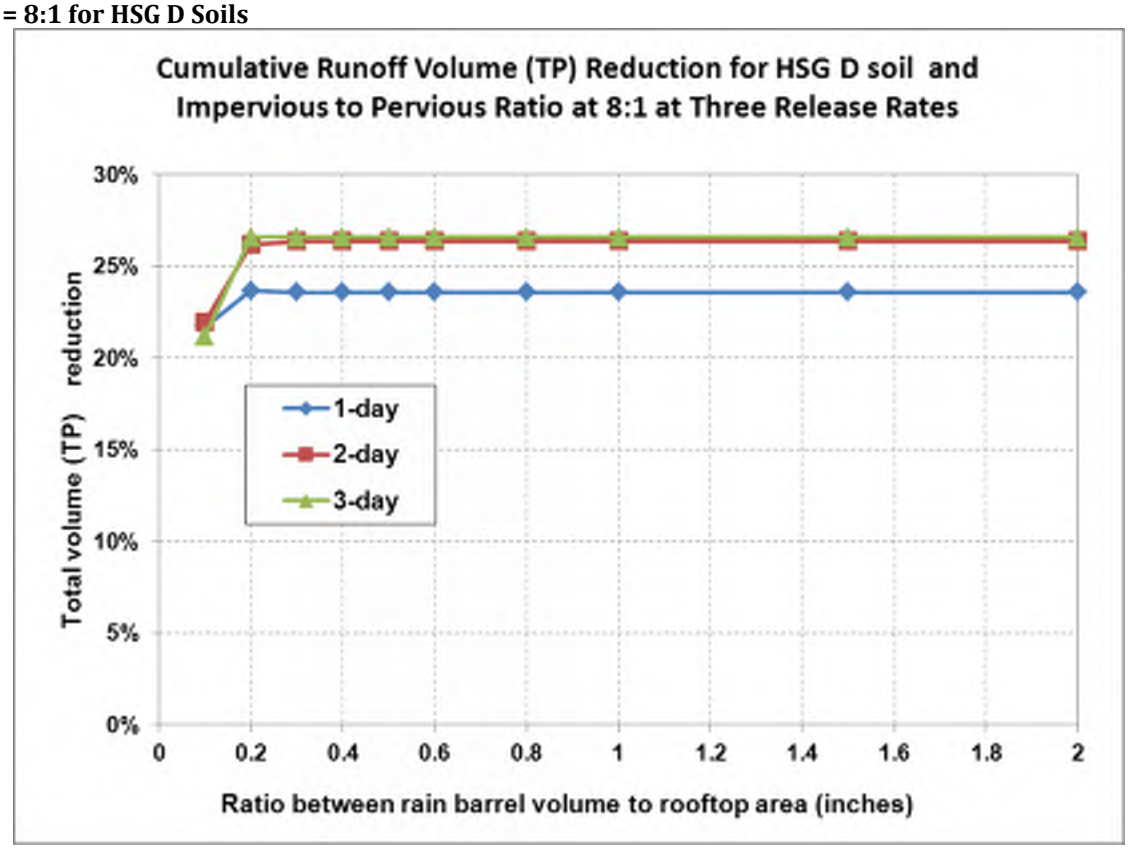


Table 3- 27: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1

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- 25: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG A Soils

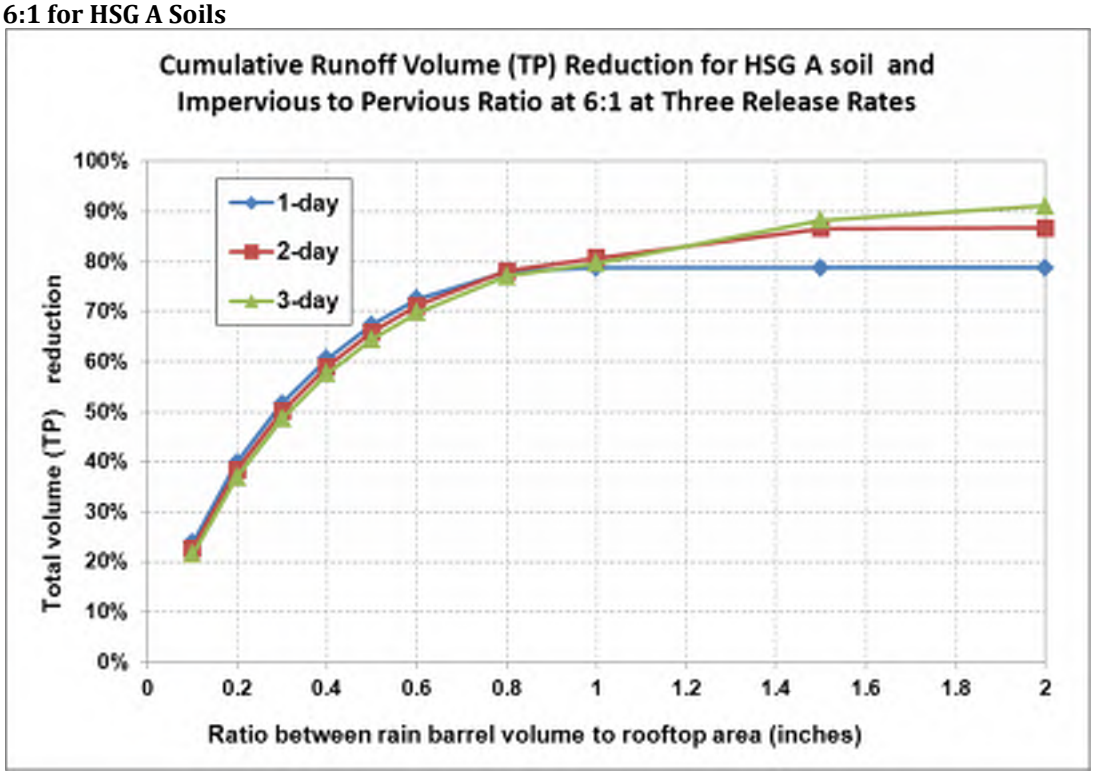


Figure 3- 26: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG B Soils

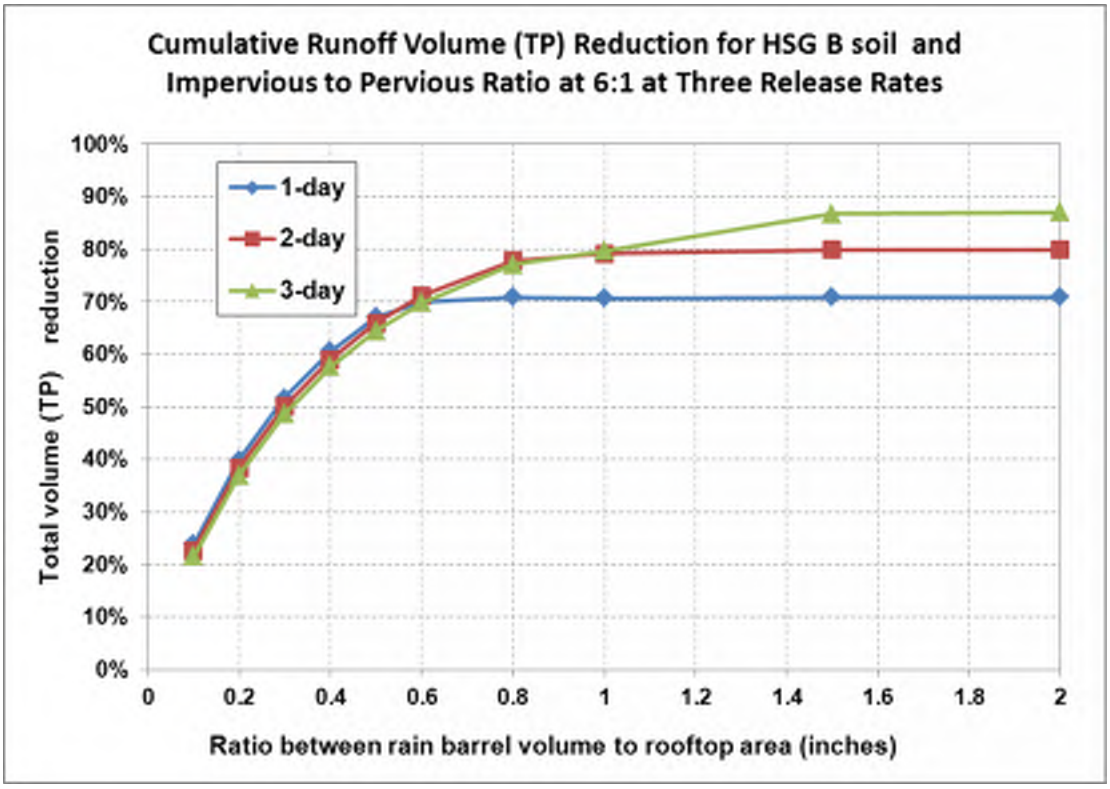


Figure 3- 27: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG C Soils

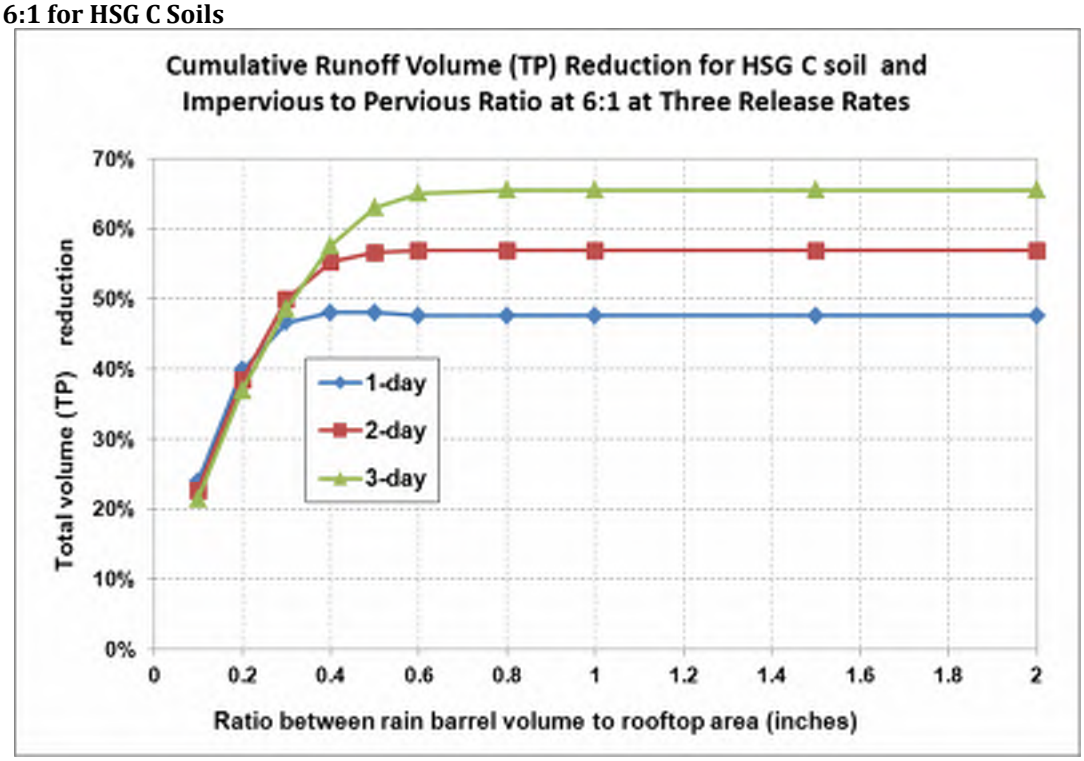


Figure 3- 28: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG D Soils

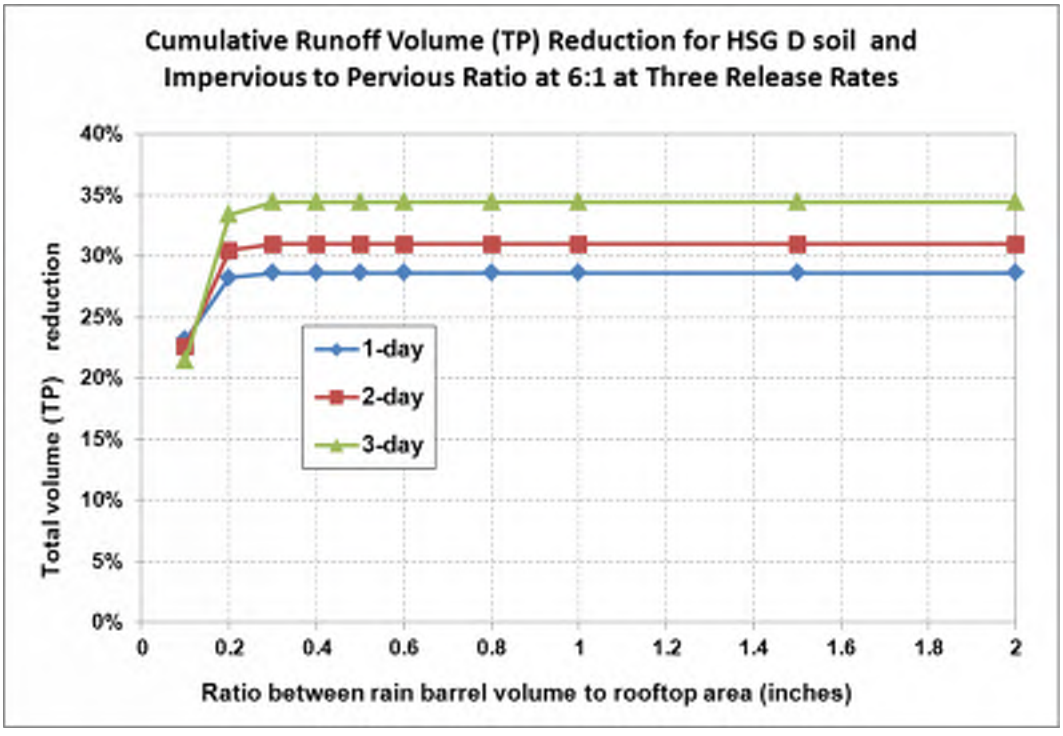


Table 3- 28: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1

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- 29: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG A Soils

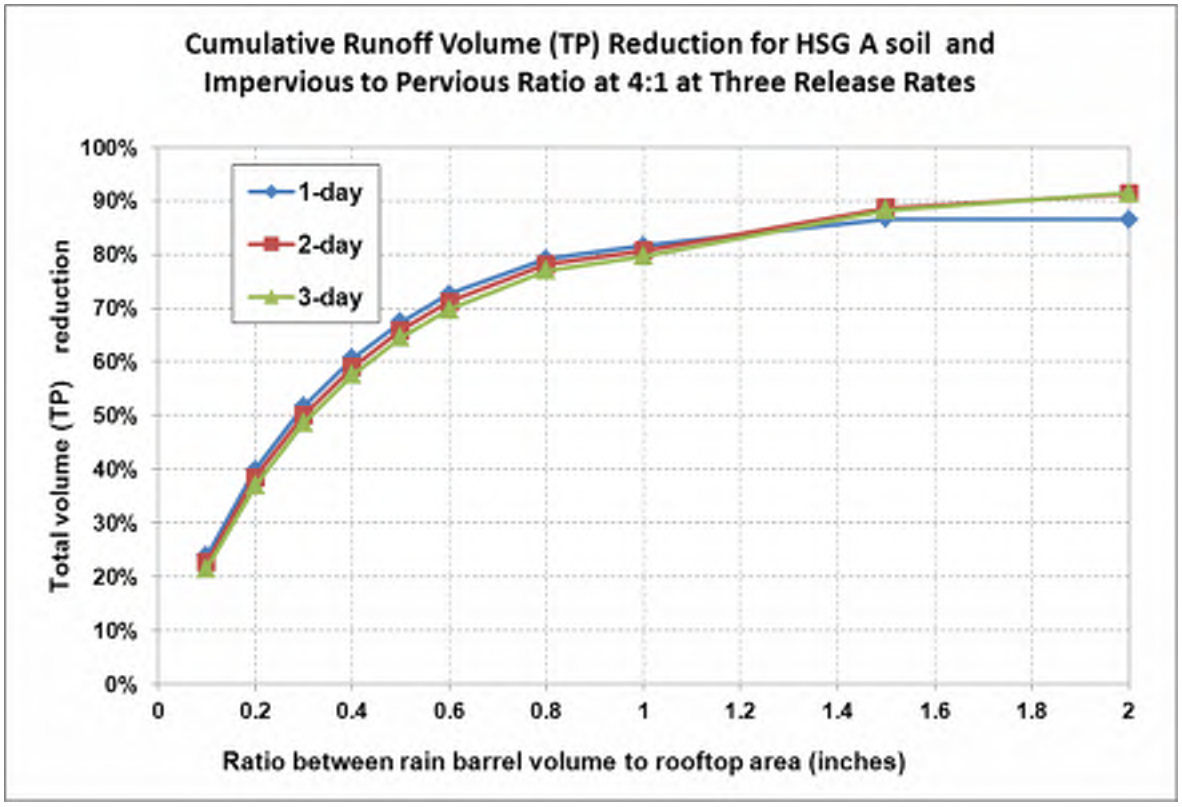


Figure 3- 30: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG B Soils

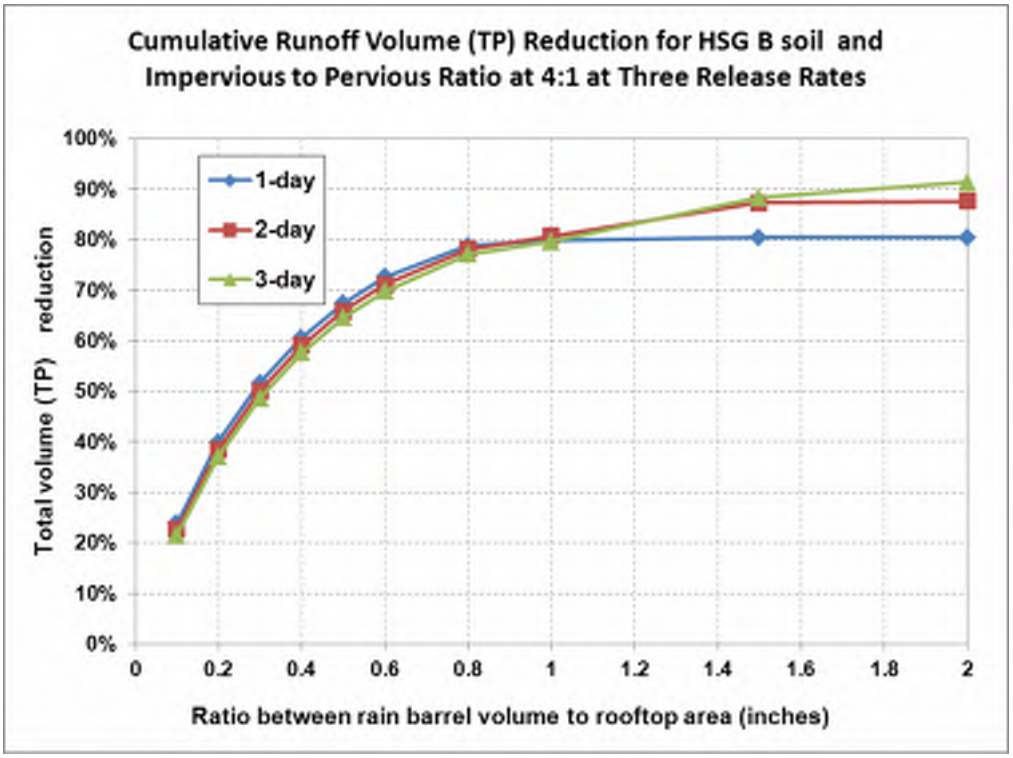


Figure 3- 31: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG C Soils

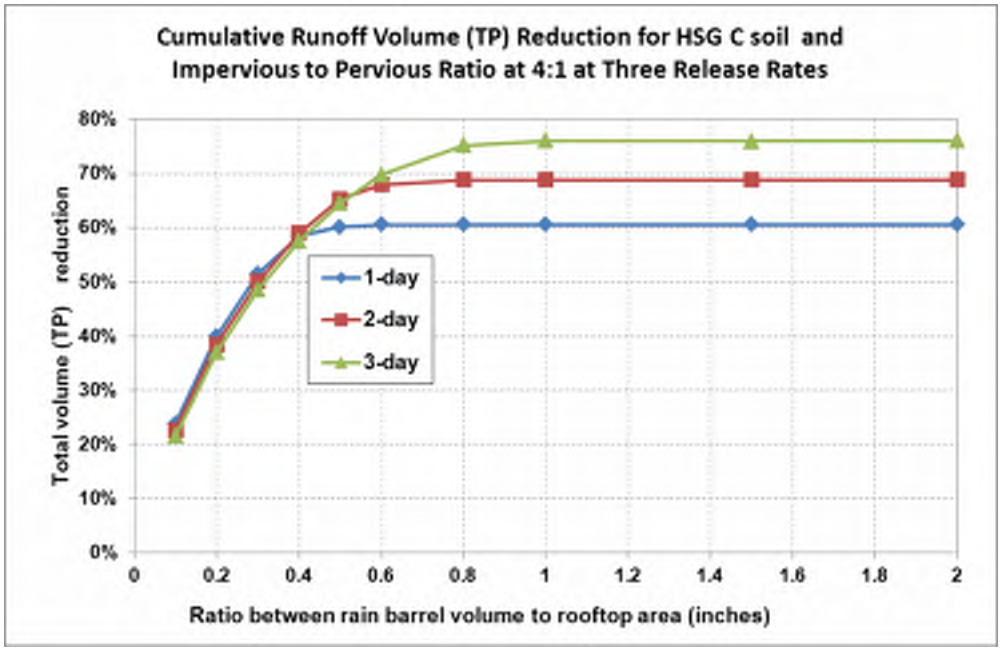


Figure 3- 32: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG D Soils

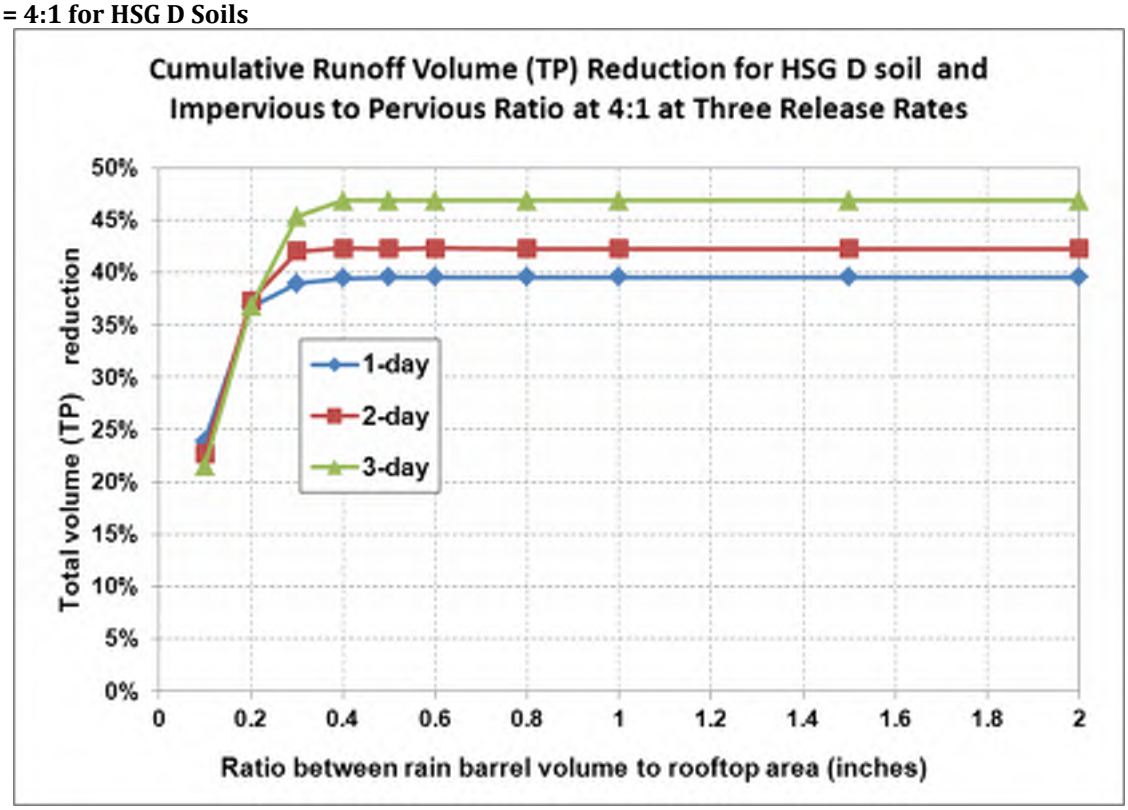


Table 3- 29: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 2:1

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- 33: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG A Soils

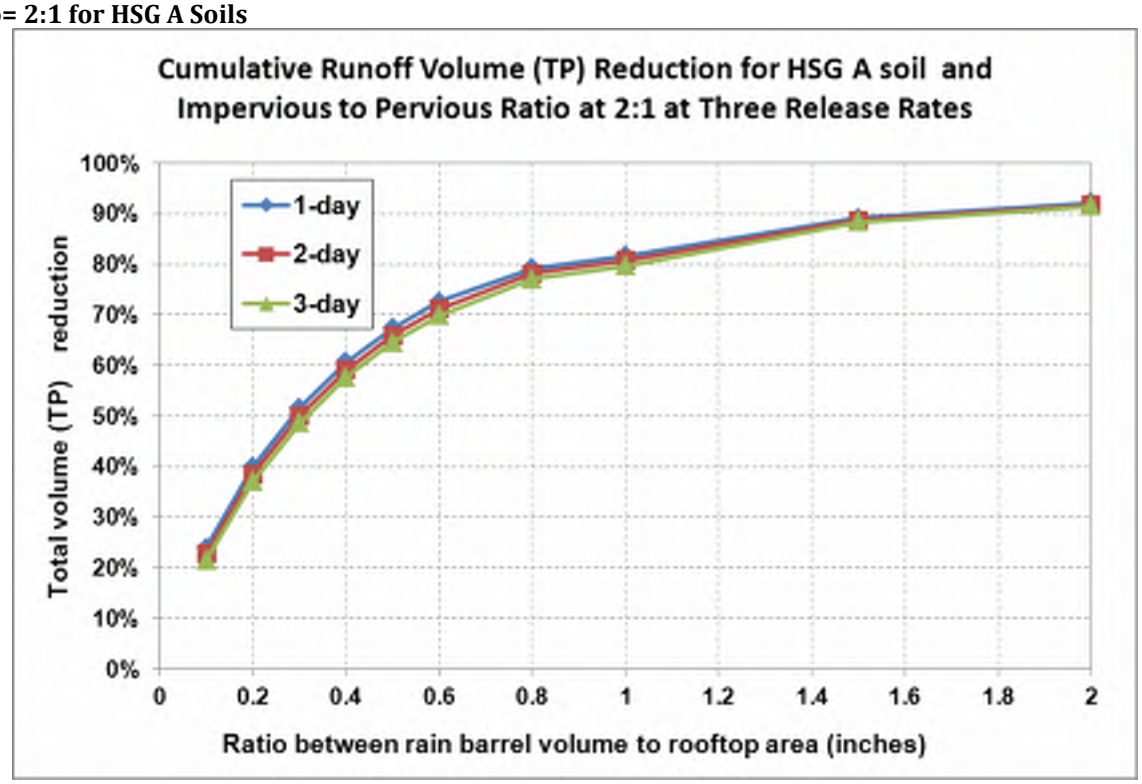


Figure 3- 34: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG B Soils

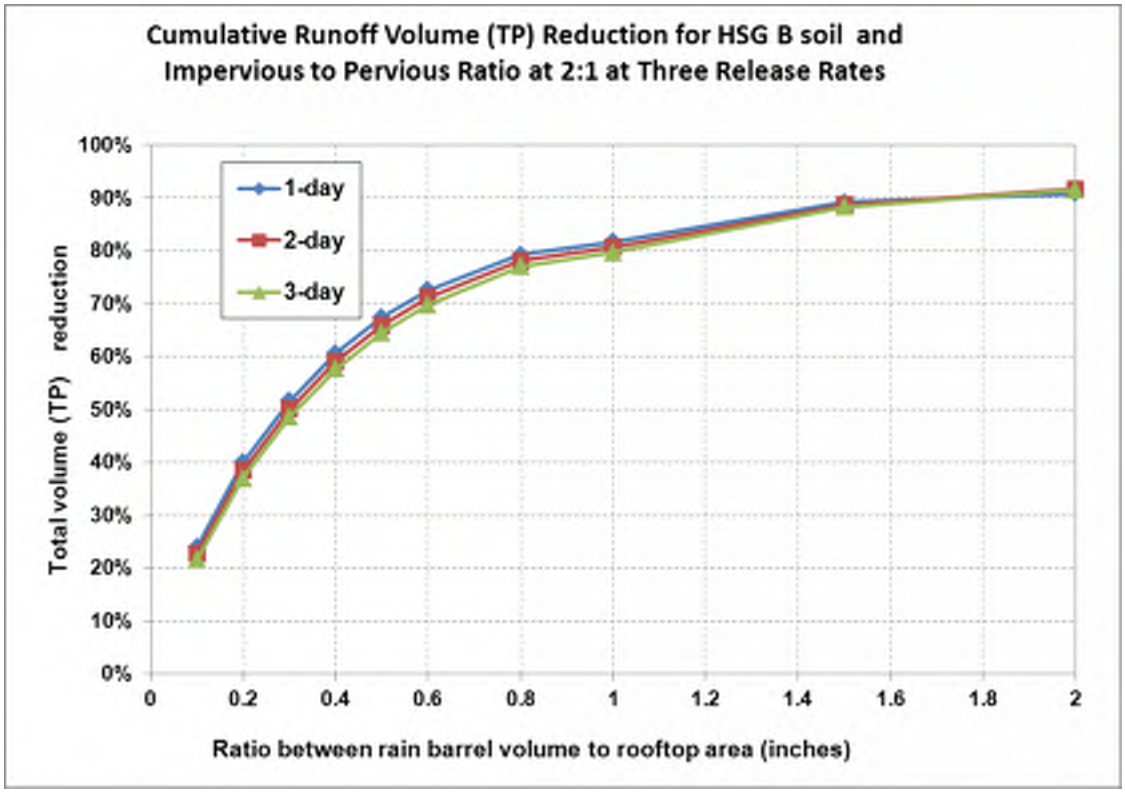


Figure 3- 35: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG C Soils

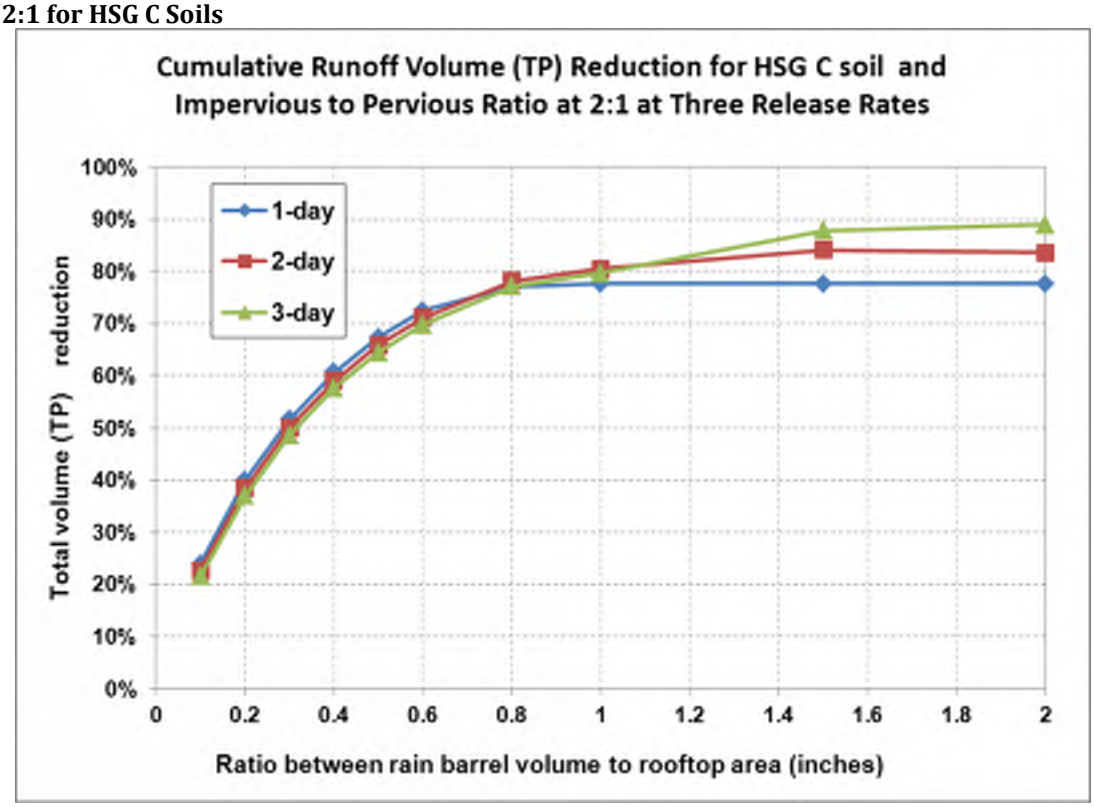


Figure 3- 36: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG D Soils

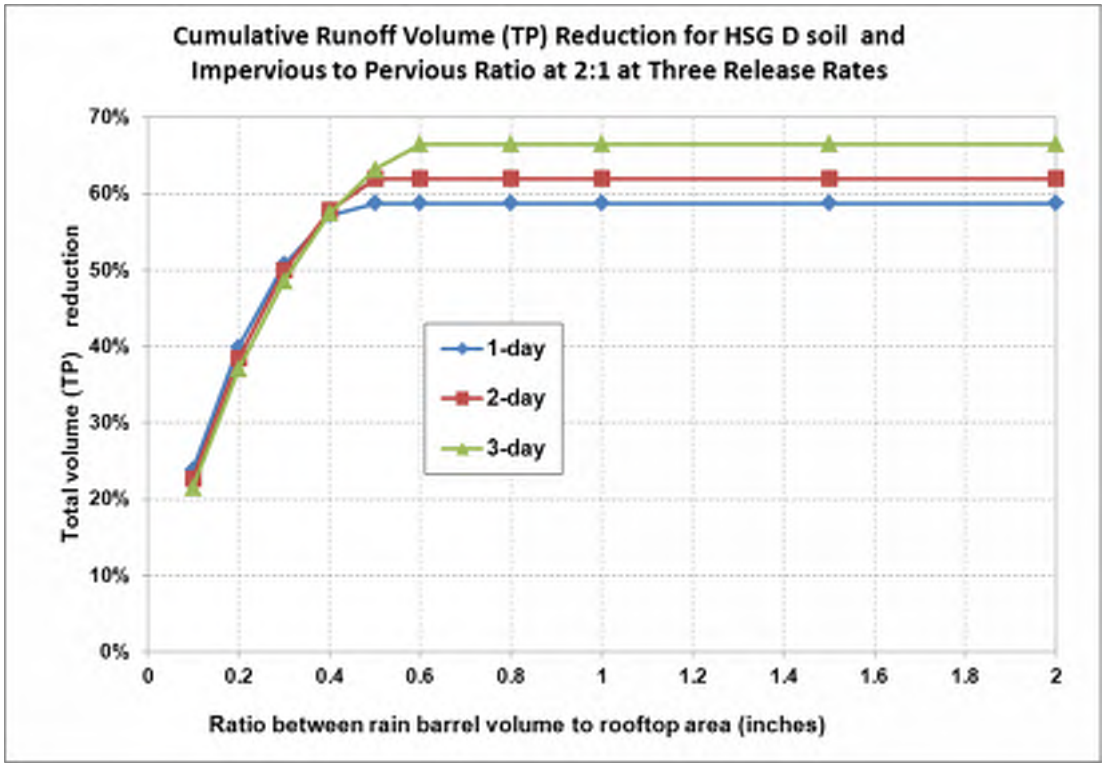


Table 3- 30: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1

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- 37: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG A Soils

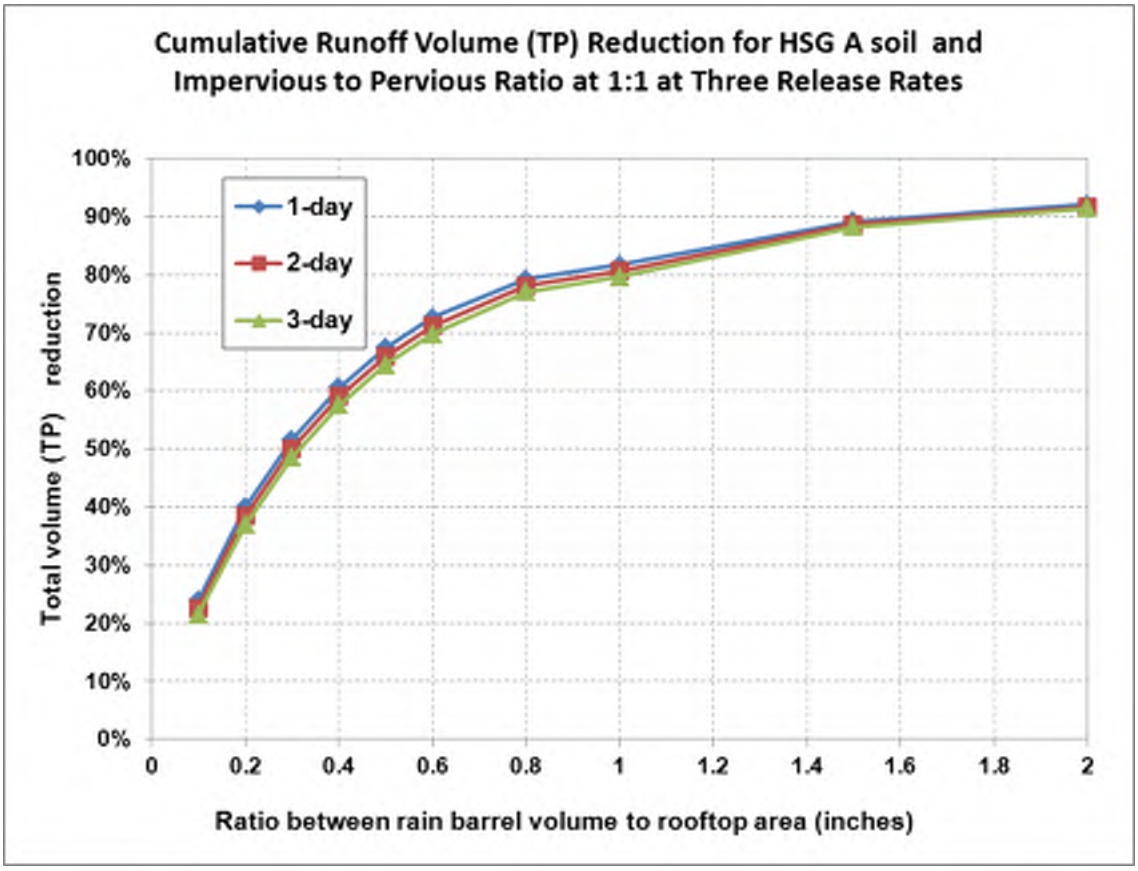


Figure 3- 38: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG B Soils

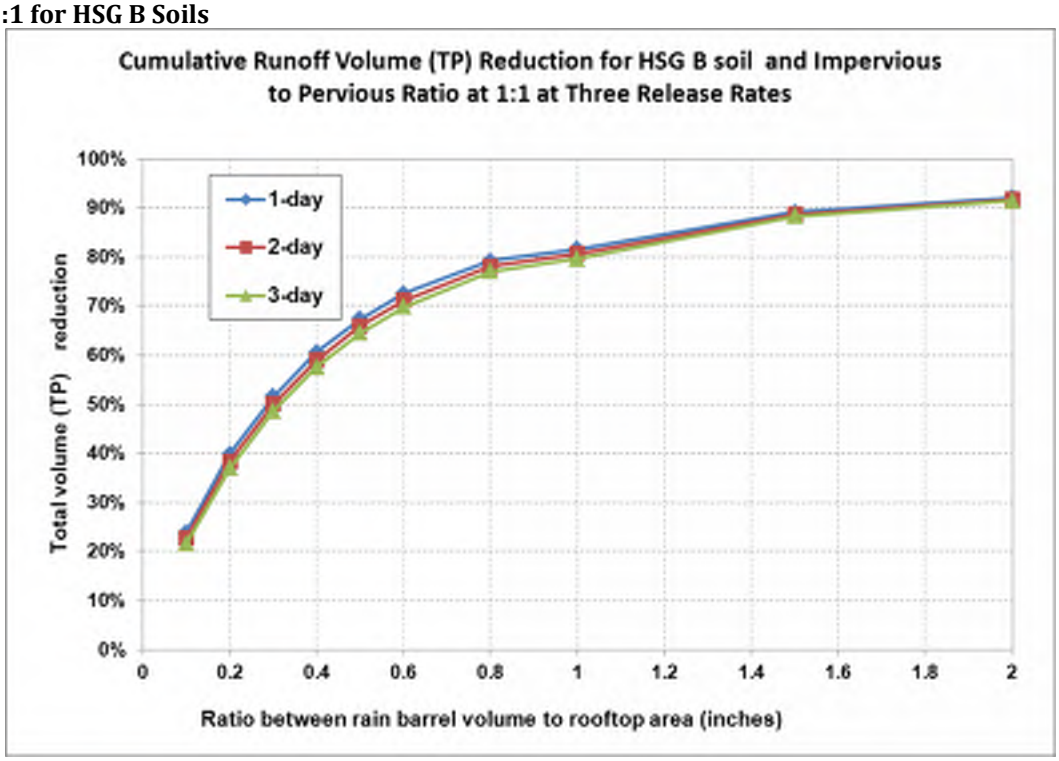


Figure 3- 39: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG C Soils

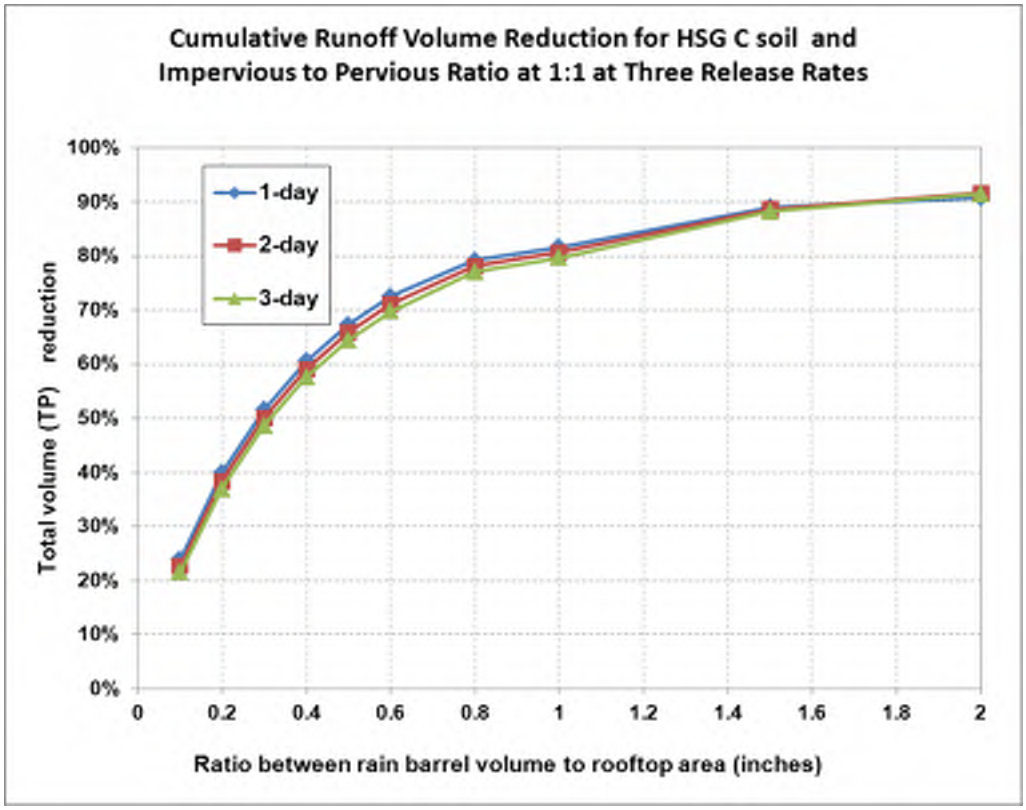


Figure 3- 40: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG D Soils

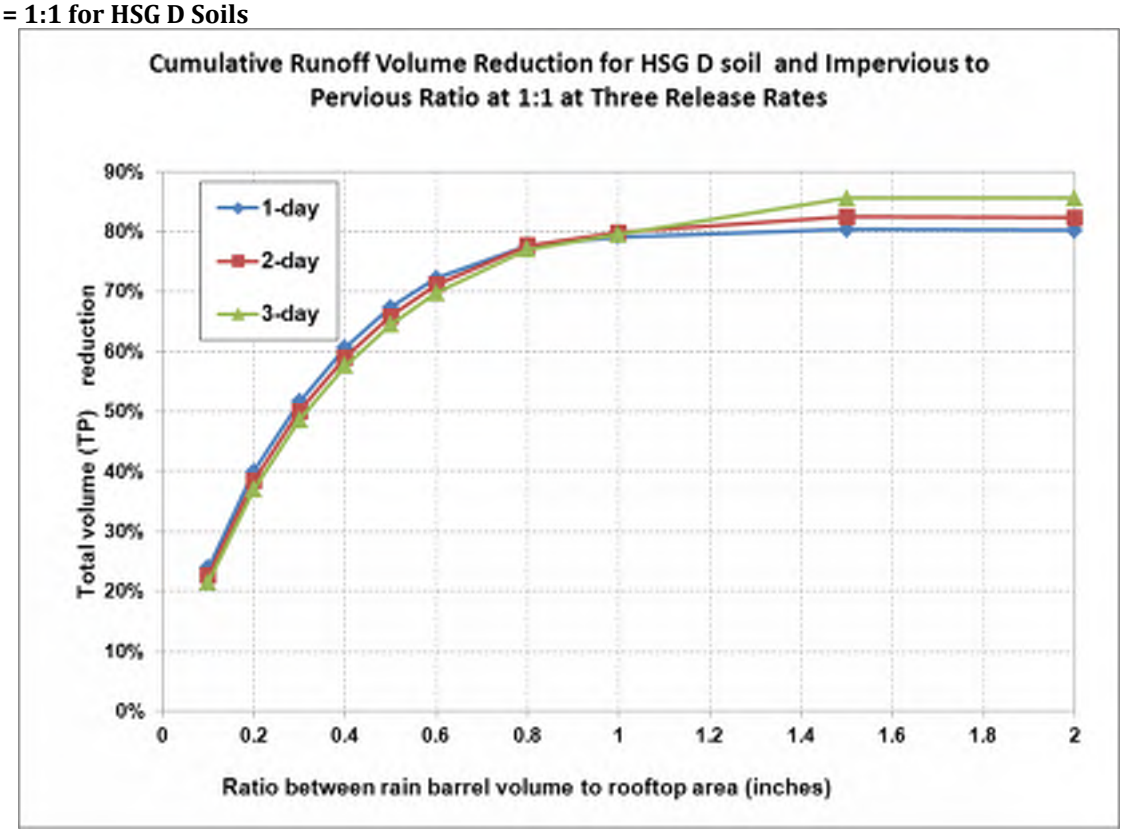


Table 3- 31: Impervious Area Disconnection Performance Table

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- 41: Impervious Area Disconnection Performance Curves

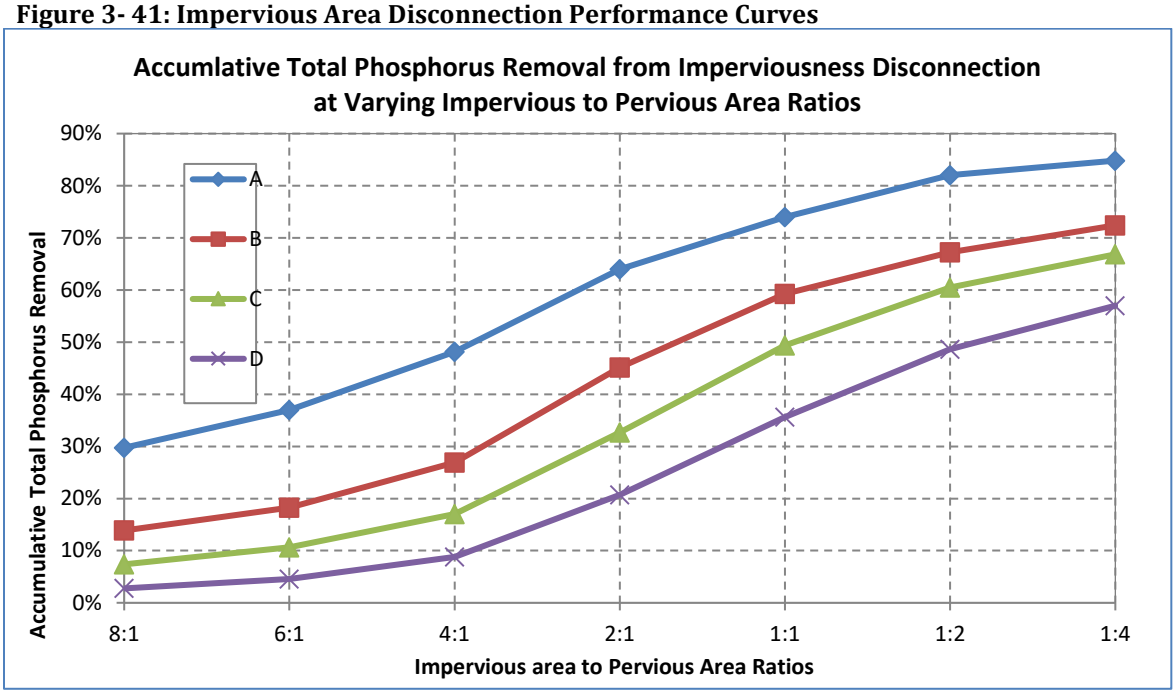


Table 3- 32: Performance Table for Conversion of Impervious Areas to Pervious Area based on Hydrological Soil Groups

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- 33: 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%

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

Table of Contents

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.d 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.b., 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. 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. Upon EPA or MassDEP notification that the permittee is discharging to a waterbody that is water quality limited due to nitrogen, the permittee shall update their SWMP within 90 days to incorporate the requirements of Appendix H part I.1 and document the date of SWMP update. When notification occurs beyond the effective date of the permit, deadlines in Appendix H part I.1 shall be extended based on the date of the required SWMP update rather than the permit effective date.

3. 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.d 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.b., 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. 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. Upon EPA or MassDEP notification that the permittee is discharging to a waterbody that is water quality limited due to phosphorus, the permittee shall update their SWMP within 90 days to incorporate the requirements of Appendix H part II.1 and document the date of SWMP update. When notification occurs beyond the effective date of the permit, deadlines in Appendix H part II.1 shall be extended based on the date of the required SWMP update rather than the permit effective date.

3. 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. Upon EPA or MassDEP notification that the permittee is discharging to a waterbody that is water quality limited due to bacteria or pathogens, the permittee shall update their SWMP within 90 days to incorporate the requirements of Appendix H part III.1 and document the date of SWMP update. When notification occurs beyond the effective date of the permit, deadlines in Appendix H part III.1 shall be extended based on the date of the required SWMP update rather than the permit effective date.

4. 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 meet applicable water quality standards[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 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 standards 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 standards, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications

[1] Applicable water quality standards are the state standards that have been federally approved or promulgated as of the issuance date of this permit and may be compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

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 meet applicable water quality standards[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 standards 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
iii. 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 standards , including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications

[2] Applicable water quality standards are the state standards that have been federally approved or promulgated as of the issuance date of this permit and may be 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. Upon EPA or MassDEP notification that the permittee is discharging to a waterbody that is water quality limited due to solids, metals, and/or oil and grease, the permittee shall update their SWMP within 90 days to incorporate the requirements of Appendix H part V.1 and document the date of SWMP update. When notification occurs beyond the effective date of the permit, deadlines in Appendix H part V.1 shall be extended based on the date of the required SWMP update rather than the permit effective date.

4. 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 meet applicable water quality standards 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 standards 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 standards, 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 standardsare the state standards that have been federally approved or promulgated as of the issuance date of this permit and may be compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

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: Town of Dedham | State: MA

EPA NPDES Permit Number (if applicable):

Primary MS4 Program Manager Contact Information

Name: Virginia LeClair | Title: Environmental Coordinator

Street Address Line 1: 26 Bryant Street

Street Address Line 2:

City: Dedham | State: MA | Zip Code: 02026

Email: vleclair@dedham-ma.gov | Phone Number: 781-751-9213

Fax Number:

Other Information

Stormwater Management Program (SWMP) Location: In Process for completion

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)*: 100%

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)

Map submitted as a separate PDF

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):

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):

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):

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

Part II: Summary of Receiving Waters

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

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

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

Waterbody segment that receives flow from the MS4	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
MA72-07 (Charles, Charles River)	26	☐	☐	☐	☐	☐	☒	☐	☒	☐	DDT, Eurasian Water Milfoil, Fish-Passage Barrier, Fishes Bioassessments, Non-Native Aquatic Plants, Nutrient/Eutrophication Biological Indicators, Other Flow Regime Alterations, PCB in Fish Tissue
MA73-28 (Boston Harbor: Neponset, Mother Brook)	43	☐	☐	☒	☐	☐	☒	☐	☒	☐	Low Flow Alterations, DDT, Fecal Coliform, Mercury in Fish Tissue, Taste & Odor
Arlington Stream (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
East Brook (Tributary to Charles Charles River)	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Great Ditch (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Greenlodge Stream (Tributary To Neponset River)	22	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Little Wigwam Stream (Tributary to Charles River)	8	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Lowder Brook (Tributary to Charles River)	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	
MIT Endicott Brook (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Peanut Butter Brook (Tributary to Neponset River)	6	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Rosemary Ditch (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Stoney Lea Brook (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Ursuline Stream (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Vine Rock Stream (Tributary to Charles River)	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Weld Stream (Tributary to Charles River)	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Westfield Brook (Tributary to Charles River)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wigwam Brook (Tributary to Charles River)	21	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unknown (Interconnections with MassDOT Stormwater systems	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Waterbody segment that receives flow from the MS4	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
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
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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**
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Residents	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'22
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Businesses, Institutions and Commercial Facilities	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'22
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Developers (construction)	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'22
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Industrial Facilities	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'22
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Residents	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'23

Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Businesses, Institutions and Commercial Facilities	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'23
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Developers (construction)	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'23
Outreach Message	Mailing, website, event, school program, press coverage and/or other means	Industrial Facilities	Neponset Stormwater Partnership	Raise awareness and modify behaviors to reduce pollutant loading	FY'23

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	SWMP Review	Environment Department	SWMP posted and public comments requested annually	FY'19
Public Participation	Annual event or activity such as hh haz waste day, water testing, catchb	Neponset Stormwater Partnership/Dedham Board of Health	Citizens will learn about and help implement MS4 program through a hands on activity annually	FY'19

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 SSO inventory in accordance of permit conditions	Engineering	Complete within 1 year of effective date of permit	FY'19
Storm sewer system map	Create map and update during IDDE program completion	Engineering	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit	FY'20
Written IDDE program	Create written IDDE program	Engineering	Complete within 1 year of the effective date of permit and update as required	FY'19
Implement IDDE program	Implement catchment investigations according to program and permit conditions	Engineering	Complete 7 to 10 years after effective date of permit. Begin problem catchments within 2 years.	FY'20
Employee training	Train employees on IDDE implementation	Engineering	Train annually	FY'19
Conduct dry weather screening	Conduct in accordance with outfall screening procedure and permit conditions	Engineering	Complete 3 years after effective date of permit	FY'21
Conduct wet weather screening	Conduct in accordance with outfall screening procedure	Engineering	Complete 7 to 10 years after effective date of permit	FY'22
Ongoing screening	Conduct dry weather and wet weather screening (as necessary)	Engineering	Complete ongoing outfall screening every five years upon completion of IDDE program	FY'30

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	Complete written procedures of site inspections and enforcement procedures	Conservation Commission	Complete within 1 year of the effective date of permit	FY'19
Site plan review	Complete written procedures of site plan review and begin implementation	Conservation Commission/Planning Board	Complete within 1 year of the effective date of permit	FY'19
Erosion and Sediment Control	Adoption of requirements for construction operators to implement a sediment and erosion control program	Conservation Commission	Complete within 1 year of the effective date of permit	FY'19
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	Conservation Commission/Building Department	Complete within 1 year of the effective date of permit	FY'19

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	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	Conservation Commission	Require submission of as-built plans for completed projects	FY'20
Target properties to reduce impervious areas	Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce impervious areas and update annually	Engineering Department	Complete 4 years after effective date of permit and report annually on retrofitted properties	FY'22
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	Neponset Stormwater Partnership	Complete 4 years after effective date of permit and implement recommendations of report	FY'22

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.	Neponset Stormwater Partnership	Complete 4 years after effective date of permit and implement recommendations of report	FY'22
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	Adoption, amendment, or modification of a regulatory mechanism to meet permit requirements	Conservation Commission	Complete 2 years after effective date of permit	FY'20

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	Parks& Recreation, Facilities Department, Environment Department, Fir	Complete and implement 2 years after effective date of permit	FY'20
Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment	Create inventory	Environment Department	Complete 2 years after effective date of permit and implement annually	FY'20
Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	DPW/Engineering	Complete 2 years after effective date of permit	FY'20
Stormwater Pollution Prevention Plan (SWPPP)	Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities	DPW/Environmental Department	Complete and implement 2 years after effective date of permit	FY'20
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	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually	FY'19
Street sweeping program	Sweep all streets and permitee-owned parking lots in accordance with permit conditions	DPW	Sweep all streets and permitee-owned parking lots once per year in the spring	FY'19

Road salt use optimization program	Establish and implement a program to minimize the use of road salt	DPW	Implement salt use optimization during deicing season	FY'19
Inspections and maitenance of stormwater treatment structures	Establish and implement inspection and maitenance procedures and frequencies	DPW/Engineering	Inspect and maintain treatment structures at least annually	FY'19

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)
Neponset River (Bactria/Pathogen)	Adhere to requirements in part A.III of Appendix F	Engineering
Charles River Watershed (Bactria/Pathogen)	Adhere to requirements in part A.III of Appendix F	Engineering
Upper/Middle Charles River (Phosphorus)	Adhere to requirements in part A.I of Appendix F	Engineering/Conservation

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. 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)
Phosphorus	MA73-28 (Mother Brook), MA72-07 (Charles River)	Adhere to requirements in part II of Appendix H	Engineering
Turbidity	MA73-02 (Neponset River)	Adhere to requirements in part V of Appendix H	Engineering
		Adhere to requirements in part II of Appendix H	
		Adhere to requirements in part V of Appendix H	

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.

1) Where a "beginning year" is requested, we have listed the applicable fiscal year. Fiscal years run from July 1 to June 30 and correspond to permit years (i.e. permit year 1 is FY'19)

2) Part II Summary of Receiving Waters: A number of waterways into which we discharge do not have a defined MassDEP waterbody segment as indicated in the MassGIS datalayer. In these cases, outfalls have been attributed to the first segment downstream.

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

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: Dennis Guiffre Title: Selectmen

Signature: Date: 9/26/18

(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

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 using the address below if you choose not to submit electronically. The 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

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Town of Dedham IPaC Report

LOCATION

Norfolk County, Massachusetts

Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Eastern Whip-poor-will Antrostomus vociferus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Snowy Owl Bubo scandiacus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence

across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

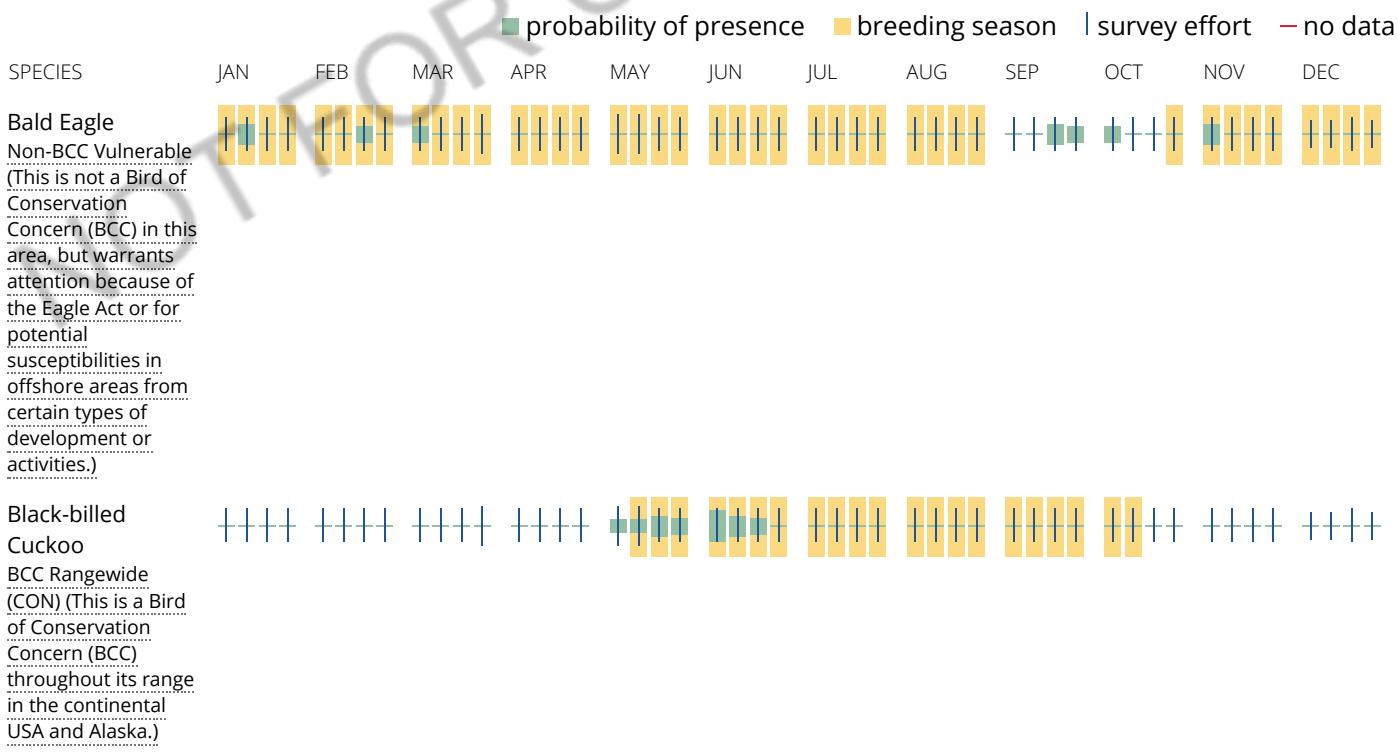
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

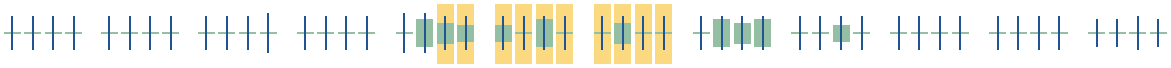
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

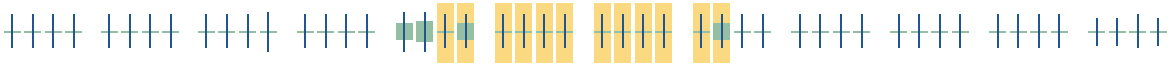
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bobolink
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



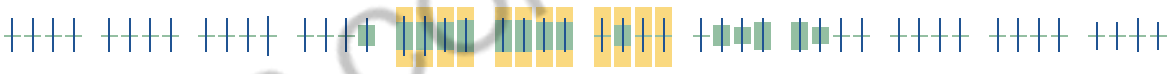
Canada Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



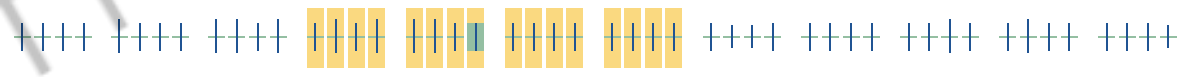
Eastern Whip-poor-will
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

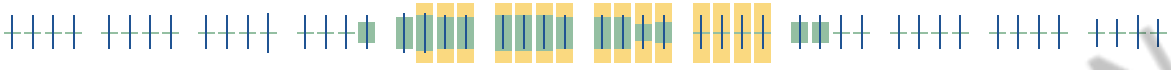


Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Snowy Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look

carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1/SS1Eh
- PEM1Eh
- PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1Ed
- PFO1Eh
- PFO4Eh
- PFO1E
- PFO4/1Eh
- PFO4/1E
- PFO1/4Eh
- PSS1Eh
- PSS1E

FRESHWATER POND

- PUBHx
- PUBHh
- PUB/EM1Fh

LAKE

- L1UBHh

RIVERINE

- R2UBHx
- R2UBH
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

TOWN OF DEDHAM

ENVIRONMENTAL DEPARTMENT

January 30, 2019

Michelle Vuto
Stormwater & Construction Permits
U.S. EPA Region 1
5 Post Office Square-OEP06-4
Boston, MA 02109-3912

Dear Michelle,

Per your request please find attached to this letter the IPaC report results. As this report indicates the only species present is the Northern Long Eared Bat which is a Category C species and we do not anticipate any impact to this species as a result of our MS4 program activities. The Town's planned discharge activities will not adversely affect the endangered species present.

Please feel free to contact me at 781-751-9213 or vleclair@dedham-ma.gov with any questions.

Thank you,

Virginia LeClair
Environmental Coordinator

cc: Jason Mammone, Director of Engineering
Elissa Brown, Conservation Agent
Joe Flanagan, DPW Director

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

VIA EMAIL

April 5, 2019

Dennis Guilfoyle
Selectmen

And;

Virginia LeClair
Environmental Coordinator
26 Bryant Street
Dedham, MA. 02026
vleclair@dedham-ma.gov

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041033, Town of Dedham

Dear Virginia LeClair:

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.

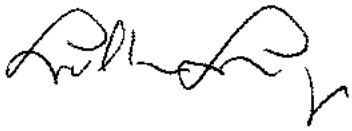
Information about the permit and available resources can be found on our website: https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit. Should you have

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

APPENDIX E

2003 MS4 Annual Reports Reference

2003 MS4 PERMIT ANNUAL REPORTS REFERENCE

Year 1 Annual Report (2003-2004)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2004/DedhamMA04.pdf

Year 2 Annual Report (2004-2005)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2005/Dedham05rpt.pdf

Year 3 Annual Report (2005-2006)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2006/Dedhamma06rpt.pdf

Year 4 Annual Report (2006-2007)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2007/Dedham07rpt.pdf

Year 5 Annual Report (2007-2008)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2008/Dedham08rpt.pdf

Year 6 Annual Report (2008-2009)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2009/Dedham09.pdf

Year 7 Annual Report (2009-2010)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2010/Dedham10.pdf

Year 8 Annual Report (2010-2011)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2011/Dedham11.pdf

Year 9 Annual Report (2011-2012)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2012/Dedham12.pdf

Year 10 Annual Report (2012-2013)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2013/Dedham13.pdf

Year 11 Annual Report (2013-2014)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2014/Dedham14.pdf

Year 12 Annual Report (2014-2015)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2015/Dedham15.pdf

Year 13 Annual Report (2015-2016)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2016/Dedham16.pdf

Year 14 Annual Report (2016-2017)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2017/Dedham17.pdf

Year 15 Annual Report (2017-2018)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2018/Dedham18.pdf

APPENDIX F

MS4 Checklists by Permit Year

Checklist for Year 1 MS4 Permit Requirements – Dedham, MA

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	1.7.2 & Appendix E	Yes
6/30/2019	Stormwater Management Plan (SWMP)	Develop written SWMP	1.10	Yes
6/30/2019	Charles River Pathogens TMDL	Implement public education initiatives; Rank tributary catchments as high for IDDE Investigation	F.A.III.1.a.i.1	Yes
6/30/2019	Phosphorus Impaired Water Bodies	Implement public education initiatives; Sweep streets and municipal parking lots a minimum of two times per year in catchments tributary to phosphorus impaired water bodies	H.II.1.a.i.1; H.II.1.a.i.3	Yes
6/30/2019	Turbidity Impaired Water Bodies	Increase frequency of sweeping of public streets and municipal parking lots to a schedule determined by the Town to target areas with potential for high pollutant loads and large amounts of impervious area; Prioritize inspection and maintenance of catch basins to ensure that no sump is more than 50% full, and cleaning of catch basins more frequently if inspection and maintenance activities indicate excessive sediment and debris loadings.	H.V.2.a.ii	Yes
6/30/2019	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.2	Yes
6/30/2019	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.3	Yes
6/30/2019	Sanitary Sewer Overflow (SSO) Inventory	Document all SSOs that have occurred in the last 5 years	2.3.4.4.b	Yes

6/30/2019	Illicit Discharge Detection and Elimination (IDDE) Plan	Develop written IDDE plan to satisfy permit requirements.	2.3.4.6	Yes
6/30/2019	Catchment Delineation	Delineate outfall & interconnection catchment areas.	2.3.4.5	Yes
6/30/2019	Catchment Prioritization & Ranking	Assess and rank the potential for all catchments to have illicit discharges.	2.3.4.7	Yes
6/30/2019	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2019	Construction Site Runoff Control Regulatory Updates/SOPs	Create written procedures for inspection of construction sites for proper sediment & erosion controls, and conducting site plan reviews. Incorporate requirements for waste control. Reference Stormwater Manual for Sediment & Erosion Control BMPs.	2.3.5.c	Yes
6/30/2019	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2019	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Yes
6/30/2019	Winter Road Maintenance SOP	Develop and implement winter road maintenance procedures including use and storage of sand/salt, and snow storage practices.	2.3.7.a.iii.5	Yes
6/30/2019	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	No

Checklist for Year 2 MS4 Permit Requirements – Dedham, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2020	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2020	Charles River Phosphorus TMDL	Perform legal analysis to ensure authority to implement Phosphorus Control Plan	F.A.I Table F-1 Item 1-1	Yes
6/30/2020	Charles River Pathogens TMDL	Implement public education initiatives	F.A.III.1.a.i.1	Yes
6/30/2020	Phosphorus Impaired Water Bodies	Implement public education initiatives; Modify stormwater regulations to require that new development and redevelopment BMPs are optimized for phosphorus removal; Development of a program to manage grass clippings and leaf litter on permittee-owned property; Sweep streets and municipal parking lots a minimum of two times per year in catchments tributary to phosphorus impaired water bodies	H.II.1.a.i.1; H.II.1.a.i.2; H.II.1.a.i.3	Yes
6/30/2020	Turbidity Impaired Water Bodies	Modify stormwater regulations to require that stormwater management systems designed on commercial and industrial land use area draining to the impaired water body incorporate designs that allow for shutdown and containment; Increase frequency of sweeping of public streets and municipal parking lots to target areas with potential for high pollutant loads and large amounts of impervious area; Prioritize inspection and maintenance of catch basins to ensure that no sump is more than 50% full, and clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment and debris loadings.	H.V.2.a.i; H.V.2.a.ii	Yes
6/30/2020	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.2	Yes

6/30/2020	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.3	Yes
6/30/2020	Update Drainage Map	Update town-wide MS4 mapping to include impaired waters, BMPs, interconnections, and open channel conveyances.	2.3.4.5	Yes
6/30/2020	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2025	IDDE Investigation of Problem Catchments	Begin investigation of problem catchments	2.3.4.8.a	N/A
6/30/2020	Post-Construction Stormwater Runoff Control Regulatory Updates	Update existing stormwater regulations as needed to include compliance with the Stormwater Management Standards, to meet retention and treatment requirements, to meet as-built requirements and provide for long term operation & maintenance of BMPs.	2.3.6.a.ii	Yes
6/30/2020	Inventory of Municipal Facilities	Develop an inventory of all permittee-owned facilities.	2.3.7.a.ii	Yes
6/30/2020	Operation and Maintenance Procedures	Develop a written set of O&M procedures for municipal facilities, activities and MS4 infrastructure	2.3.7.a.i & 2.3.7.a.iii	Yes
6/30/2020	Stormwater Pollution Prevention Plans (SWPPP)	Develop written SWPPPs for municipal waste handling facilities.	2.3.7.b	Yes
6/30/2020	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2020	Catch Basin Cleaning Optimization	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	Ongoing/ Yes
6/30/2020	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	Ongoing/Yes

Checklist for Year 3 MS4 Permit Requirements – Dedham, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2021	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2021	Charles River Phosphorus TMDL	Perform Funding Assessment to provide for implementation of Phosphorus Control Plan	F.A.I Table F-1 Item 1-2	Yes
6/30/2021	Charles River Pathogens TMDL	Implement public education initiatives	F.A.III.1.a.i.1	Yes
6/30/2021	Phosphorus Impaired Water Bodies	Implement public education initiatives; Sweep streets and municipal parking lots a minimum of two times per year in catchments tributary to phosphorus impaired water bodies	H.II.1.a.i.1; H.II.1.a.i.3	Yes
6/30/2021	Turbidity Impaired Water Bodies	Increase frequency of sweeping of public streets and municipal parking lots to a schedule determined by the Town to target areas with potential for high pollutant loads and large amounts of impervious area; Prioritize inspection and maintenance of catch basins to ensure that no sump is more than 50% full, and cleaning of catch basins more frequently if inspection and maintenance activities indicate excessive sediment and debris loadings.	H.V.2.a.ii	Yes
6/30/2021	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.2	Yes
6/30/2021	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.3	Yes
6/30/2021	Update Drainage Map	Update town-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	Yes
6/30/2021	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes

6/30/2021	Dry Weather Outfall Screening and Sampling	Sample all outfalls and interconnections (excluding problem outfalls and excluded outfalls) for dry weather flow and sample flow if present.	2.3.4.7.b	Ongoing
6/30/2021	Update Catchment Ranking	Update catchment ranking and prioritization based on dry weather outfall sampling data.	2.3.4.7.b.iii.c.iii	Ongoing
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	N/A
6/30/2028	Begin IDDE Investigation of High and Low Priority Catchments	Begin investigation of high and low priority catchments	2.3.4.8.a	Yes
6/30/2021	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2021	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Ongoing/Yes
6/30/2021	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	Ongoing/Yes

Checklist for Year 4 MS4 Permit Requirements – Dedham, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2022	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	
6/30/2022	Charles River Phosphorus TMDL	Define scope of Phosphorus Control Plan	F.A.I Table F-1 Item 1-3	
6/30/2022	Charles River Pathogens TMDL	Implement public education initiatives	F.A.III.1.a.i.1	
6/30/2022	Phosphorus Impaired Water Bodies	Implement public education initiatives; Inventory and priority ranking of permittee-owned property and infrastructure that can be retrofitted with BMPs to include consideration of BMPs that infiltrate stormwater Sweep streets and municipal parking lots a minimum of two times per year in catchments tributary to phosphorus impaired water bodies; Develop Phosphorus Source Identification Report;	H.II.1.a.i.1; H.II.1.a.i.2; H.II.1.a.i.3; H.II.1.b	
6/30/2022	Turbidity Impaired Water Bodies	Increase frequency of sweeping of public streets and municipal parking lots to a schedule determined by the Town to target areas with potential for high pollutant loads and large amounts of impervious area; Prioritize inspection and maintenance of catch basins to ensure that no sump is more than 50% full, and cleaning of catch basins more frequently if inspection and maintenance activities indicate excessive sediment and debris loadings.	H.V.2.a.ii	
6/30/2022	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.2	
6/30/2022	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.3	
6/30/2022	Update Drainage Map	Update town-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	

6/30/2022	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	
6/30/2028	Continue IDDE Investigation of High and Low Priority Catchments	Continue investigation of high and low priority catchments	2.3.4.8.a	
6/30/2028	Begin Wet Weather Outfall Screening and Sampling	Begin sampling outfalls and interconnections with System Vulnerability Factors during wet weather	2.3.4.8.c	
6/30/2022	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.	2.3.6.b	
6/30/2022	Green Infrastructure Practices	Develop a report assessing the barriers and incentives for Green Infrastructure/LID techniques.	2.3.6.c	
6/30/2022	BMP Retrofit Identification	Identify 5 permittee-owned properties that could be retrofitted with stormwater BMPs.	2.3.6.d	
6/30/2022	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	
6/30/2022	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	
6/30/2022	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	

Checklist for Year 5 MS4 Permit Requirements – Dedham, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2023	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	
6/30/2023	Charles River Phosphorus TMDL	Define written Phase I of Phosphorus Control Plan including Structural and Non-Structural Controls, O&M Plan, Implementation Plan & Cost Estimate	F.A.I Table F-1 Items 1-4 through 1-8	
6/30/2023	Charles River Pathogens TMDL	Implement public education initiatives	F.A.III.1.a.i.1	
6/30/2023	Phosphorus Impaired Water Bodies	Implement public education initiatives; Sweep streets and municipal parking lots a minimum of two times per year in catchments tributary to phosphorus impaired water bodies; Evaluate all permittee-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation or identified in the Phosphorus Source Identification Report & Develop implementation plan and schedule	H.II.1.a.i.1; H.II.1.a.i.3; H.II.1.c	
6/30/2023	Turbidity Impaired Water Bodies	Increase frequency of sweeping of public streets and municipal parking lots to a schedule determined by the Town to target areas with potential for high pollutant loads and large amounts of impervious area; Prioritize inspection and maintenance of catch basins to ensure that no sump is more than 50% full, and cleaning of catch basins more frequently if inspection and maintenance activities indicate excessive sediment and debris loadings.	H.V.2.a.ii	
6/30/2023	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.2	

6/30/2023	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.3	
6/30/2023	Update Drainage Map	Update town-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	
6/30/2023	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	
6/30/2028	Continue IDDE Investigation of High and Low Priority Catchments	Continue investigation of high and low priority catchments	2.3.4.8.a	
6/30/2028	Continue Wet Weather Outfall Screening and Sampling	Begin sampling outfalls and interconnections with System Vulnerability Factors during wet weather	2.3.4.8.c	
6/30/2023	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	
6/30/2023	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	
6/30/2023	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	

APPENDIX G

Public Education Materials

There's no such thing as the poop fairy.

It's up to YOU to pick up after your dog.

When dog poop is left on the ground, rain and snow melt wash the bacteria and parasites from the waste into storm drains, which empty directly into local streams, ponds, and lakes.

Bacteria and parasites from dog waste cause water quality problems for drinking water resources, recreation, and wildlife.

Every time you walk your dog, please:

- carry a bag to pick up pet waste,
- dispose of waste in a trash can,
- and never toss anything down a storm drain!

Your Department of Public Works thanks you for helping to keep local waterways clean.

Not only is dog waste gross to look at, it can cause significant health issues, including:

- ***Campylobacteriosis**: A bacterial infection that causes diarrhea in humans.*
- ***Giardiasis**: A protozoan infection of the small intestine that can cause diarrhea, cramping, fatigue, and weight loss.*
- ***Salmonellosis**: Symptoms include fever, muscle aches, headache, vomiting & diarrhea.*
- ***Toxocariasis**: An animal to human infection that is caused by roundworms found in the intestines of dogs. The parasite can cause vision loss, rash, fever or cough, and is a particular threat to children exposed to parasite eggs in sand and soil.*

An easy way to avoid these health issues is to just pick up after your dog. It's a simple thing to do and it makes a big difference for all of us!

nsp
neponset
stormwater
partnership

Learn how we're improving water quality in your community.

YourCleanWater.org

Your city or town is part of the Neponset Stormwater Partnership, which aims to help communities reduce water pollution, and save money while doing so.

Please contact the Neponset River Watershed Association for more information.
stormwater@neponset.org (781) 575-0354 x304

Properly Dispose of Yard Waste in Dedham

Guidelines for Curbside Pickup of Yard Waste

- Place leaves, grass, and brush in unlined trash cans, paper bags, or special "earth bags."
- Containers must be smaller than 35 gallons or 60 pounds.
- Brush must be smaller than 3 inches in diameter and 3 feet in length.
- Set the containers at the curb on your recycling collection day.
- This service is available from April 20 - December 13, 2020.

For more details about the curbside yard waste program, download the 2020 Waste and Recycling Schedule from the Town of Dedham's DPW website: **https://www.dedham-ma.gov/departments/public-works-dpw/recycling-trash** or call the DPW at **781-751-9350**.

Working Together to Prevent Stormwater Pollution

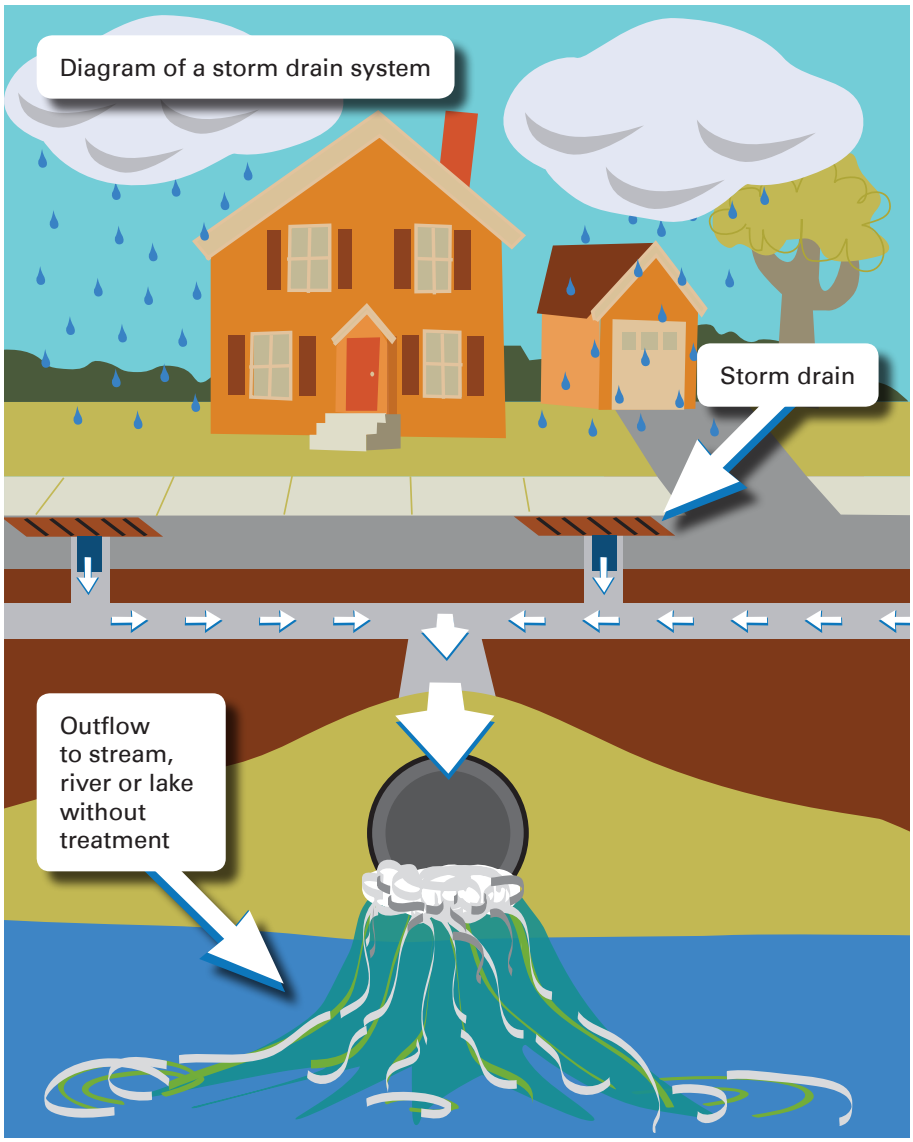
When rain hits pavement and concrete, it washes pollutants like pet waste, bacteria, oil, litter, fertilizer, and grass clippings into storm drains, which lead directly to local streams and ponds.

Water that flows into storm drains, or "stormwater," is NOT treated—and the pollutants affect drinking water supplies, recreation, and wildlife.

Dedham is working towards cleaner waterways by participating in the Neponset Stormwater Partnership (NSP), which offers resources to help eliminate water pollution that comes from paved surfaces.

Call the NSP Stormwater Hotline **781-575-0354 x300** or the Dedham DPW **781-751-9350** with stormwater questions, or to report dumping.

For more information on stormwater prevention, go to **YourCleanWater.org**



Help Keep Dedham's Water Clean This Fall

Leaves and grass clippings that are dumped or stored near waterways or paved areas add to water pollution.

Fallen leaves and grass clippings are loaded with phosphorus.

When streams, rivers, and ponds receive too much phosphorus, harmful algae and cyanobacteria blooms can occur. These blooms are unsightly and can be toxic to people, pets, and wildlife.

Keep our local waterways clean and healthy with a few simple steps.

- Place leaves, grass clippings, and brush in acceptable containers to be collected at the curb (see reverse side for guidelines).
- Consider composting yard waste.
- Keep paved areas and storm drains clear of leaves.
- Keep bagged, piled and mulched leaves on natural soil, a few feet back from paved areas.
- Ensure that your lawn service is properly disposing of yard waste.
- Reduce excessive lawn chemical use and always follow manufacturer's directions.

Learn more at www.YourCleanWater.org

neponset stormwater partnership

The Neponset Stormwater Partnership (NSP) is a program managed by the Neponset River Watershed Association on behalf of eleven member communities. NSP aims to increase the effectiveness of municipal stormwater management programs through regional cooperation and resource sharing.

We Work Together for Clean Water

Your community is a leader in the effort to end water pollution and ensure that you and your family—and generations to come—can enjoy clean water.

As a member of the Neponset Stormwater Partnership (NSP), they have made a strong commitment toward a healthy future.

NSP aims to help towns and cities reduce water pollution, comply with federal pollution reduction requirements, and save money through regional cooperation.

Learn more at **YourCleanWater.org**

neponset stormwater partnership

Avon • Canton • Dedham • Foxborough • Medfield • Milton
Norwood • Quincy • Randolph • Sharon • Stoughton • Westwood
with the Neponset River Watershed Association
and the Metropolitan Area Planning Council

Neponset River Watershed Association
on behalf of your water department
2173 Washington Street
Canton, MA 02021

Non-Profit Org.
U.S. Postage
PAID
Boston, MA
Permit No. 54080

Local Postal Customer

Let's keep water clean for future generations

Contaminated runoff pollutes the Neponset, Charles, and Taunton Rivers—and our oceans.

You can help solve the problem.

Reduce Fertilizer Use

Fertilizers (nitrogen and phosphorus) are good for plants but bad for water pollution.

When fertilizer runoff gets into ponds, streams, and rivers, it causes toxic aquatic habitat and fish kills.

Take steps to protect waterways:

- Never fertilize before a rainstorm. Rain will carry the fertilizer away, wasting your money and polluting waterways.
- Leave grass clippings on the lawn with a mulching mower. Clippings are a free natural fertilizer.
- Keep clippings, leaves and yard waste off of pavement and away from storm drains and wetlands.
- Use slow-release fertilizers instead of fast-release fertilizers.
- Test your soil to determine the exact needs of your lawn and avoid over-fertilizing.
- Check to see if your business or lawn service complies with the MA turf fertilizer law.

Get Your Lawn Tested

Half of all lawn owners fertilize their lawn, but only 10—20% get regular soil tests. (Center for Watershed Protection, 1999). An inexpensive soil test can reduce unnecessary fertilizer use and save you money on lawn care fees.

Visit **YourCleanWater.org/lawn** for step-by-step instructions to get a detailed soil report with targeted fertilizer recommendations for your exact lawn.

Pick Up After Your Dog

When dog poop is left on the ground, rain and snow wash it into storm drains that empty directly into local streams, ponds, beaches, and drinking water sources.

Not only is dog waste gross to step in, it can cause significant health issues, including Giardiasis, Salmonellosis, and Toxocariasis.

Every time you walk your dog, please:

- Carry a bag or scooper to pick up pet waste,
- Dispose of the bag or waste in a trash can,
- Never toss anything down a storm drain!

In many communities, dog owners can be fined for failing to scoop the poop.

Don't Litter

Trash that blows, washes, or is dumped into wetlands, waterways, and storm drains ends up in our rivers and flows to the ocean—and runoff is the main source of plastic pollution in our oceans.

Always remember...

- Storm drains are not trash cans! Never throw or pour anything in a storm drain. It's illegal!
- Litter left on the street will wash into the nearest storm drain.
- Yard waste is trash too, never dump it in or near a storm drain, stream or wetland.
- Keep dumpsters and trash cans closed and ensure container drainage ports are plugged at all times. Open dumpsters and cans fill with rain, which leaks out as highly polluted "dumpster juice" and attracts rats.

Do Your Part!

Your local waterways and groundwater are an important source of drinking water, recreation, and wildlife habitats.

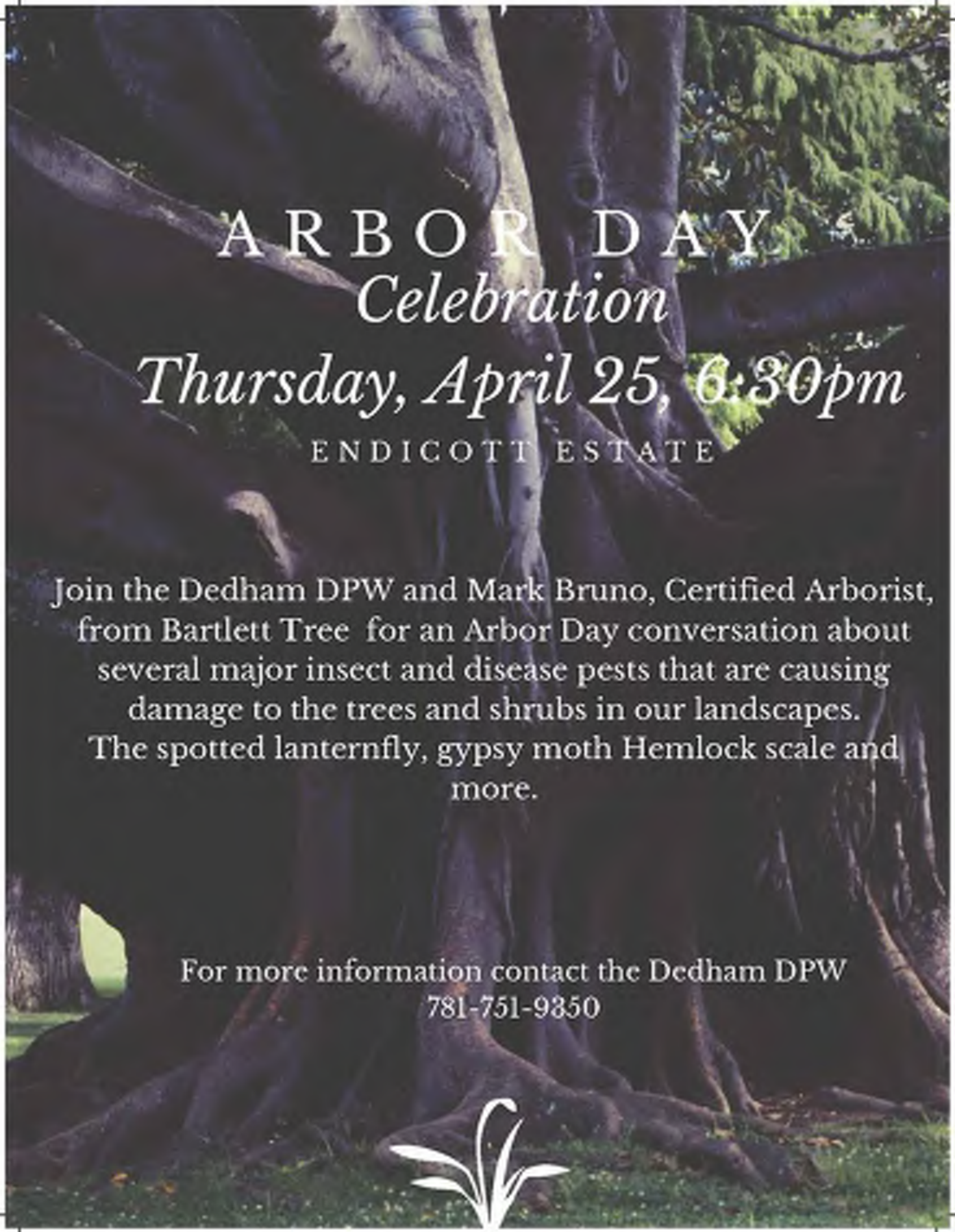
Follow the steps in this brochure to reduce pollutants at your home or business and to protect local waterways.

Visit **YourCleanWater.org** to learn more about stormwater.

Report Water Pollution

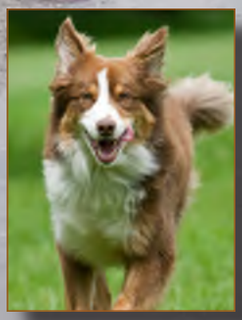
If you see any signs of pollution affecting a storm drain or a waterway report it to the Stormwater Pollution Hotline:

781-575-0354 x300
YourCleanWater.org/report


ARBOR DAY
Celebration
Thursday, April 25, 6:30pm
ENDICOTT ESTATE
Join the Dedham DPW and Mark Bruno, Certified Arborist, from Bartlett Tree for an Arbor Day conversation about several major insect and disease pests that are causing damage to the trees and shrubs in our landscapes. The spotted lanternfly, gypsy moth Hemlock scale and more.
For more information contact the Dedham DPW
781-751-9350

Don't be a poop!

Keep Pet Waste Off of Our Streets and Out of Our Water!



Dogs might be cute, but dog poop is gross. It's not just messy; it's loaded with **E. coli bacteria** and other pathogens that make us really sick.

When dog poop gets left on streets, sidewalks or lawns, it gets washed into stormdrains and dumped right into our rivers, streams and ponds.

When bacteria and pathogens get into our waterways, they become unsightly—and unsafe for kids, pets, fishing, boating and wildlife.

Your actions help keep our water healthy. Always carry a bag when you walk your dog, and **dispose of poop in a trash can—never in a stormdrain!**

Thanks for doing your part!

Federal rules now require Dedham to greatly reduce stormwater pollution. Help protect our water and reduce the amount of tax payer money needed to clean up polluted runoff, by keeping pollution off our streets and out of our water!

Learn more:
www.cleanstreetscleanwater.org
www.neponset.org

neponset river
WATERSHED ASSOCIATION

clean streets clean water

Funded in part by the Mass Environmental Trust

Pick up After Your Dog to Keep Our Water Clean!

Dog waste that is not disposed of properly is a **major source of pollution** for water quality and human health.

*Dog waste is not just unpleasant, it carries high levels of harmful **E. coli bacteria** and other pathogens, such as the following:*

- **Campylobacteriosis:** A bacterial infection that causes diarrhea in humans.
- **Giardiasis:** A protozoan infection of the small intestine that can cause diarrhea, cramping, fatigue, and weight loss.
- **Salmonellosis:** Symptoms include fever, muscle aches, headache, vomiting, and diarrhea.
- **Toxocariasis:** An animal to human infection that is caused by roundworms found in the intestines of dogs. The parasite can cause vision loss, rash, fever or cough, and is a particular threat to children exposed to parasite eggs in sand and soil.

Be sure to carry a **plastic bag** with you when you walk your dog, so that you can pick up the waste and dispose of it in a **trash can.**

*Deliberately leaving pet waste on the ground is not only unpleasant and unhealthy, it is often **punishable by fines.***

Let's work together to keep Dedham's waterways clean!
www.neponsetstormwater.org

neponset stormwater partnership

*Water gets polluted from the bacteria (including dog waste), chemicals, metals, nutrients and other contaminants that wash over land and pavement, then down stormdrains and into our waterways—affecting the cleanliness and health of the water that we rely on for drinking and recreation. This polluted cocktail of contaminants is called **stormwater runoff.***

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LAWN

Are you a Lawn Hero?

Everybody knows a friend with a beautifully green lawn. What less people know, is that fertilizers, pesticides, and herbicides don't always stay on your lawn. Stormwater runoff washes away these chemicals and pours them back into local streams, rivers, and ponds. Excess fertilizers and pesticides that are applied to lawns and gardens can wash off in a rainstorm and pollute waterways. In addition, yard clippings and leaves can wash into stormdrains and contribute nutrients and organic matter to streams.

Protect local waterways!

Follow the tips below to become a Lawn Hero!

First of all, it's time to get tested.

Half of all lawn owners fertilizer their lawn, however, only 10 - 20 % have soil tests done (Center for Watershed Protection, 1999). Take soil tests on your lawn to determine your lawn's exact fertilizer application ratio to avoid excessive fertilization. Did you know that the soil in your yard may already have plenty of valuable nutrients for making the grass green? You could be overspending on fertilizer! Get tested and be a Lawn Hero by:

- Getting an inexpensive soil test done through through UMass Amherst's Soil Testing Lab.
- Use the detailed soil results to modify your normal fertilizer application routine.

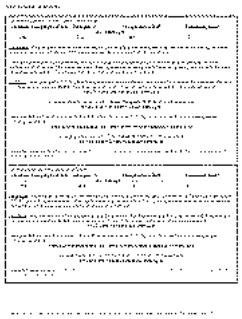
Fertilizers are made up a ratio of nutrients, such as nitrogen (N), phosphorus (P), and potassium (K). This is expressed on bags of fertilizer as the N-P-K ratio. When it rains, these nutrients are carried by stormwater into the nearest stream, river, or other water body. Too many nutrients on your lawn will end up in local waterways and can cause algae to grow, which can deplete oxygen and hurt aquatic wildlife - and make boating, fishing and swimming unpleasant.

Follow the form instructions below to collect soil samples, order a soil test, and interpret your soil test results to become a lawn hero today!

Step 1. Click the image above to download a Umass Soil Testing Lab Order Form.

Step 2. Click the image above to download a Step-By-Step Guide to Sample the Soil in your Lawn.

Step 3. Click the image above to download instructions on interpreting your soil report, as well as viewing an example soil test report!



Step 4. Click the image above to download instructions to properly fertilize your lawn based on your soil test results.

Understand the chemicals you put on your lawn.

- Never fertilizer before a forecasted rainstorm.
- Use pesticides and fertilizers sparingly. Always follow directions and never add more than the directions call for.
- Consider switching to slow release and natural organic fertilizers instead of typical chemical fertilizers
- Make sure to use fertilizer with no or low phosphorus, as phosphorus causes algae growth.

Your UMass Amherst Soil Test Results will help you understand the correct ratio of fertilizer needed for your unique lawn and soil. If you are currently using excessive fertilizer, the grass in your lawn can't use all the fertilizer you applied, and so it waits, unused, until rain rinses it all away. Once the runoff flows into the local water systems, it becomes a pollutant that can badly damage local aquatic habitat and cause harmful algal blooms.

Be a good steward of yard waste.

- Don't leave yard waste in the street or sweep it into storm drains or streams. Either bag it up for town pickup, take it to your local landfill, or re-use it as compost or mulch.
- Create a **compost pile** with your yard waste and use the nutrient rich humus in your gardens or potted plants.
- Use grass clippings or shredded leaves as **mulch** around shrubs and trees. Mulch helps to suppress weeds and retain moisture. Mulch also contributes nutrients to the soil by gradually breaking down over time.
- **Cover piles of dirt or mulch** being used in landscaping projects to avoid runoff.

Be smart about irrigation.

- Hire a WaterSense Certified Landscape Irrigation Professional to review your system at the beginning of each irrigation season. This will help reduce your water consumption, save money, and **maximize the efficiency of your system.**
- Avoid over-watering to prevent **excess runoff.** A lawn needs just **1" of water per week** to be green. Be sure to check weather reports.
- Upgrade to a moisture sensor to ensure irrigating only when needed, and **avoid using old-fashioned irrigation timers.**
- Don't irrigate in the **middle of the day** or when it's **windy,** in order to prevent evaporation and runoff.
- Make sure that sprinkler heads are **pointed at the lawn and not the pavement** - adjust and fix heads as necessary.

Think about hardscapes - walkways, patios, and driveways.

Traditional asphalt and concrete contribute to stormwater runoff by preventing water from soaking into the ground. Rain water flows over these **impervious surfaces**, collects pollutants along the way, and flows into storm drains and streams.

- Use **permeable materials** such as pavers, bricks, crushed stone, and mulch when building walkways, patios, and driveways. Permeable materials allow rain and snow melt to soak through them, thereby decreasing stormwater runoff.

Know where your runoff is going.

- Place a **rain barrel** under your downspout to easily capture rain for use around your property. A one inch rainfall on a 1,000 square foot roof yields approximately **600 gallons of water.**
- **Redirect downspouts** so that water flows into grass or shrubs instead of onto a driveway or sidewalk.
- Install a **dry well** in your yard to capture excess runoff.

Build a rain garden.

- **Rain gardens and grassy swales** are specially designed areas planted with **native plants** that provide a place for runoff from parking areas, driveways, walkways and roofs to **collect and slowly filter into the soil,** rather than flow directly into storm drains, ponds or lakes.
- **Vegetated filter strips** are areas of native grass or plants created **along roadways or streams.** They trap the pollutants stormwater picks up as it flows across driveways and streets.

Click here for more information on building a rain garden.

FOR IMMEDIATE RELEASE

MEDIA CONTACT

Virginia LeClair
Environmental Coordinator, Town of Dedham
vleclair@dedham-ma.gov
781-751-9213

You Can Help Keep Our Waterways Clean

Don't "Leaf" Dedham's water to chance this fall! The Town of Dedham is asking local businesses to help keep our water clean this fall by disposing of fall leaves properly. Leaves contain natural fertilizer that can cause water pollution when improperly disposed. They can also cause flooding when they block storm drains. This fall, make sure your employees and landscape contractors follow these simple steps:

- Never dump or store leaves within 100 feet of wetlands or waterways, it's illegal
- Have leaves and landscape waste disposed of properly at a commercial waste facility, or compost it on site in an area away from wetlands and storm drains
- Keep paved areas and storm drains clear of leaves
- Confirm that your landscape contractor is properly disposing of all your waste

Learn more at YourCleanWater.org/leaves or get free technical assistance on stormwater issues by calling the Neponset Stormwater Partnership hotline at 781-575-0354 x 300 or the Dedham Conservation Commission 781-751-9210

Thank you for helping to keep Dedham's waterways clean for all!

You're not just fertilizing the lawn.

Image courtesy of Washington State Department of Ecology

neponset stormwater partnership

YourCleanWater.org

Fertilizers—nitrogen and phosphorus—are good for plants but not for water quality. In ponds, streams and rivers, fertilizers are pollutants that harm fish and wildlife, can cause smelly algae blooms, and can even affect drinking water.

Be a Lawn Hero: Protect Your Local Waterways!

- Recycle grass clippings with a mulching mower. Clippings are a free, natural fertilizer—and all that most lawns need.
- Sweep or blow grass clippings and fertilizers off of pavement, and away from storm drains and wetlands.
- Never fertilize before a heavy rainstorm (light rain is ok).
- Don't apply fertilizer with phosphorous to an existing lawn. It's illegal in MA unless a soil test says you need it.
- Choose fertilizers with 75-100% "slow-release" or "water insoluble" nitrogen.

Learn More About Soil Testing

Of those who fertilize, a mere 10-20% get a soil test to understand their exact lawn needs. (CWP 1999).

Save hundreds on wasted fertilizer with an inexpensive soil test from the UMass Soil Test Lab. It gives you scientific fertilizer recommendations for your unique lawn.

For step-by-step instructions, visit **YourCleanWater.org/lawn**
Questions? Email stormwater@neponset.org or call 781-575-0354 x304.

Lawn fertilizers (and other pollutants such as pesticides, gasoline, oil, antifreeze and dog waste) mix with rain and irrigation runoff, and then wash into storm drains on the street, and empty into local waterways, with no filtration or treatment.

Image courtesy of Washington State Department of Ecology

You're not just fertilizing the lawn.

nsp neponset stormwater partnership

YourCleanWater.org

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Become a Lawn Hero and Protect Local Waterways!

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More About Soil Testing

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Questions? Email stormwater@neponset.org
or call 781-575-0354 x304.

neponset stormwater partnership

Your town is part of the Neponset Stormwater Partnership, which aims to help communities to reduce water pollution, and save money while doing so.

YourCleanWater.org

Spring Fertilizer Campaign 2019: Suggested messages to add to posts

You're not just fertilizing the lawn!

While fertilizers are good for plants, they're not so good for water quality. In ponds, streams, and rivers, fertilizers are pollutants that harm fish and wildlife, can cause smelly algae blooms, and can even affect drinking water.

Learn more about fertilizer and the simple steps that you can take to protect our waterways at www.YourCleanWater.org/lawnBe a lawn hero this spring! Use fertilizer sparingly to protect local waterways. For more info go to www.YourCleanWater.org/lawn

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Get tested! Send a soil sample to UMass before fertilizing. For more info go to www.YourCleanWater.org/lawn

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Save money, save water! Don't fertilize unless necessary. For more info go to www.YourCleanWater.org/lawn

Skip the chemicals and welcome birds, bees & bare feet to your lawn this summer. For more info go to www.YourCleanWater.org/lawn

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Suggested hashtags

#neponsetriver
#cleanwater
#protectwater
#chemicalfreelawn

Be sure to include url
www.YourCleanWater.org/lawns

See social media images below

YourCleanWater.org

Facebook

YourCleanWater.org

Twitter

YourCleanWater.org

Instagram

APPENDIX H

Regulatory Mechanisms

Town of Dedham, MA
Wednesday, March 20, 2019

Chapter 242. Storm Drains

[HISTORY: Adopted by the Town Meeting of the Town of Dedham as indicated in article histories. Amendments noted where applicable.]

GENERAL REFERENCES
Sewers — See Ch. **229**.
Stormwater management — See Ch. **246**.

Article I. Illicit Discharges and Connections

[Adopted 11-13-2007 STM by Art. 11; amended 11-18-2013 STM by Art. 16]

§ 242-1. Purpose.

A. Increased volumes of stormwater and contaminated stormwater runoff are major causes of: (1) impairment of water quality and flow in lakes, ponds, streams, rivers, wetlands and groundwater; (2) contamination of drinking water supplies; (3) alteration or destruction of aquatic and wildlife habitat; and (4) flooding. The United States Environmental Protection Agency has identified land disturbance and polluted stormwater as major sources of water pollution. Regulation of illicit connections and discharges to the municipal storm drain system is necessary for the protection of the Town of Dedham's water bodies and groundwater, and to safeguard the public health, safety, welfare and the natural resources of the Town.

B. The objectives of this by-law are:

(1) To prevent pollutants from entering the Town of Dedham's municipal storm drain system;

(2) To prohibit illicit connections and unauthorized discharges to the Town;

(3) To require the removal of all such illicit connections;

(4) To comply with state and federal statutes and regulations relating to stormwater discharges; and

(5) To establish the legal authority to ensure compliance with the provisions of this by-law through inspection, monitoring, and enforcement;

§ 242-2. Definitions.

For the purposes of this by-law, the following shall mean:

CLEAN WATER ACT

The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as hereafter amended.

DISCHARGE OF POLLUTANTS

The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or Commonwealth from any source.

GROUNDWATER

Water beneath the surface of the ground.

ILLICIT CONNECTION

A surface or subsurface drain or conveyance, which allows an illicit discharge into the municipal storm drain system, including without limitation sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this by-law.

ILLICIT DISCHARGE

Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in § **242-8**. The term does not include a discharge in compliance with an NPDES Stormwater Discharge Permit or a Surface Water Discharge Permit, or resulting from fire fighting activities exempted pursuant to § **242-8A(1)** of this by-law.

IMPERVIOUS SURFACE

Any material or structure on or above the ground that prevents water infiltrating the underlying soil. Impervious surface includes without limitation roads, paved parking lots, sidewalks, and rooftops.

MUNICIPAL STORM DRAIN SYSTEM OR MUNICIPAL SEPARATE STORM SEWER SYSTEM

The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Dedham.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT

A permit issued by United States Environmental Protection Agency or jointly with the State that authorizes the discharge of pollutants to waters of the United States.

NON-STORMWATER DISCHARGE

Discharge to the municipal storm drain system not composed entirely of stormwater.

PERSON

An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

POLLUTANT

Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or non-point source, that is or may be introduced into any sewage treatment works or waters of the Commonwealth. Pollutants shall include without limitation:

A. Paints, varnishes, and solvents;

B. Oil and other automotive fluids;

C. Non-hazardous liquid and solid wastes and yard wastes;

D. Refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;

E. Pesticides, herbicides, and fertilizers;

F. Hazardous materials and wastes; sewage, fecal coliform and pathogens;

G. Dissolved and particulate metals;

H. Animal wastes;

I. Rock, sand, salt, soils;

J. Construction wastes and residues; and

K. And noxious or offensive matter of any kind.

PROCESS WASTEWATER

Water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

RECHARGE

The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

STORMWATER

Runoff from precipitation or snow melt.

SURFACE WATER DISCHARGE PERMIT

A permit issued by the Department of Environmental Protection (DEP) pursuant to 314 CMR 3.00 that authorizes the discharge of pollutants to waters of the Commonwealth of Massachusetts.

TOXIC OR HAZARDOUS MATERIAL OR WASTE

Any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as Toxic or Hazardous under G.L. Ch.21C and Ch.21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.0000.

WASTEWATER

Any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct or waste product.

WATERCOURSE

A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

WATERS OF THE COMMONWEALTH

All waters within the jurisdiction of the Commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, costal waters, and groundwater.

§ 242-3. Applicability.

This by-law shall apply to flows entering the municipal storm drainage system.

§ 242-4. Authority.

This by-law is adopted under the authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Procedures Act, and pursuant to the regulations of the Federal Clean Water Act found at 40 CFR 122.34, and the Phase II ruling from the Environmental Protection Agency found in the December 8, 1999 Federal Register.

§ 242-5. Responsibility for administration.

The Department of Public Works shall administer, implement and enforce this by-law. Any powers granted to or duties imposed upon the Department of Public Works may be delegated in writing by the Department of Public Works to its employees or agents.

§ 242-6. Regulations.

The Department of Public Works may promulgate rules and regulations to effectuate the purposes of this by-Law. Failure by the Department of Public Works to promulgate such rules and regulations shall not have the effect of suspending or invalidating this by-law.

§ 242-7. Prohibited activities.

Prohibited activities are as follows:

A. Illicit discharges. No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the municipal storm drain system, into a watercourse, or into the waters of the Commonwealth.

B. Illicit connections. No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

C. Obstruction of municipal storm drain system. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior written approval from the Department of Public Works.

§ 242-8. Exemptions.

A. Exemptions from the by-law are as follows:

(1) Discharge or flow resulting from fire fighting activities.

(2) Discharge or flow that results from conditions that require immediate action and occurs during a state of emergency declared by any agency of the Federal or State Government, or by the Dedham Town Manager, Board or Selectmen or Board of Health.
[Amended 11-17-2014 ATM by Art. 18]

B. The following non-stormwater discharges or flows are exempt from the prohibition of non-stormwater provided that the source is not a significant contributor of a pollutant to the municipal storm drain system:

(1) Waterline flushing;

(2) Flow from potable water sources;

(3) Springs;

(4) Natural flow from riparian habitats and wetlands;

(5) Diverted stream flow;

(6) Rising groundwater;

(7) Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater;

(8) Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air conditioning condensation;

(9) Discharge from landscape irrigation or lawn watering;

(10) Water from individual residential car washing;

(11) Discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided test data is submitted to the Town substantiating that the water meets the one ppm standard and the pool is drained in such a way as not to cause a nuisance or public safety issue, and complies with all applicable Town by-laws;

(12) Discharge from street sweeping;

(13) Dye testing;

(14)

Non-stormwater discharge permitted under an NPDES permit or a Surface Water Discharge Permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency or the Department of Environmental Protection, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations; and

(15) Discharge for which advanced written approval is received from the Conservation Commission and the Department of Public Works as necessary to protect public health, safety, welfare or the environment.

§ 242-9. Emergency suspension of storm drainage system access.

The Department of Public Works may suspend municipal storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened discharge of pollutants that presents imminent risk of harm to the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the Department of Public Works may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.

§ 242-10. Notification of spills.

Notwithstanding other requirements of local, state or federal law, as soon as a person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of or suspects a release of materials at that facility or operation resulting in or which may result in discharge of pollutants to the municipal drainage system or waters of the Commonwealth, the person shall take all necessary steps to ensure containment, and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the municipal Fire and Police Departments, the Conservation Commission and the Department of Public Works. In the event of a release of non-hazardous material, the reporting person shall notify the Conservation Commission and the Department of Public Works no later than the next business day. The reporting person shall provide to the Conservation Commission and the Department of Public Works written confirmation of all telephone, facsimile or in-person notifications within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on-site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

§ 242-11. Enforcement.

A. Authorized agents. The Department of Public Works, or an authorized agent of the Department of Public Works, shall enforce this by-law, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

B. Civil relief. If a person violates the provisions of this by-law, regulations, permit, notice, or order issued thereunder, the Department of Public Works may seek injunctive relief in

a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

C. Orders. The Department of Public Works, or an authorized agent of the Department of Public Works, may issue a written order to enforce the provisions of this by-law or the regulations thereunder, which may include: (a) elimination of illicit connections or discharges to the municipal separate storm sewer system; (b) performance of monitoring, analyses, and reporting; (c) that unlawful discharges, practices, or operations shall cease and desist; and (d) remediation of contamination in connection therewith.

D. If the enforcing person determines that abatement or remediation of contamination is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town of Dedham may, at its option, undertake such work, and expenses thereof shall be charged to the violator.

E. Within 30 days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Department of Public Works within 30 days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within 30 days following a decision of the Department of Public Works affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. Ch. 59, S. 57 after the 31st day at which the costs first become due.

F. Enforcement. The penalty for violations of any provision of this by-law, regulation, order or permit issued thereunder, shall be $300.

G. Entry to perform duties under this by-law. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Department of Public Works, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this by-law and regulations and may make or cause to be made such examinations, surveys or sampling as the Department of Public Works deems reasonably necessary.

H. Appeals. The decisions or orders of the Department of Public Works shall be final. Further relief shall be to a court of competent jurisdiction.

I. Remedies not exclusive. The remedies listed in this by-law are not exclusive of any other remedies available under any applicable federal, state or local law.

§ 242-12. Severability.

The provisions of this by-law are hereby declared to be severable. If any provision, paragraph, sentence, or clause, of this by-law or the application thereof to any person,

establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this by-law.

Town of Dedham, MA
Wednesday, March 20, 2019

Chapter 246. Stormwater Management

[HISTORY: Adopted by the Town Meeting of the Town of Dedham as Ch. 36 of the 1996 By-laws; amended in its entirety 11-16-2015 ATM by Art. 14. Subsequent amendments noted where applicable.]

GENERAL REFERENCES
Storm drains — See Ch. **242**.
Wetlands protection — See Ch. **271**.

§ 246-1. Purpose.

A. The purpose of this by-law is to protect, maintain and enhance the public health, safety, environment and general welfare of the Town by establishing minimum requirements and procedures to control the adverse effects of soil erosion and sedimentation, construction site runoff, increased post-development stormwater runoff and nonpoint source pollution associated with new development and redevelopment. It has been determined that proper management of stormwater runoff will minimize damage to public and private property and infrastructure, safeguard the public health, safety, environment and general welfare of the public, protect water and aquatic resources, protect and enhance wildlife habitat, and promote groundwater recharge to protect surface and groundwater drinking supplies. This by-law seeks to meet that purpose through the following objectives:

(1) Establish a mechanism by which the Town can monitor and ensure compliance with requirements of its National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) and other applicable State and Federal mandates.

(2) Establish decision-making processes surrounding land development activities to reduce and eliminate impairments of the Charles and Neponset Rivers and to preserve the health of the Town's groundwater resources.

(3) Establish minimum construction and post-construction stormwater management standards and design criteria for the regulation and control of stormwater runoff quantity and quality.

(4) Encourage the use of nonstructural stormwater management, better site design practices or "low-impact development practices", such as reducing impervious cover, increasing site-wide infiltration, and preserving open space and other natural areas, to the maximum extent practicable.

(5) Promote water conservation through the re-use of stormwater.

(6)

Establish provisions for the long-term responsibility for and maintenance of structural stormwater control facilities and nonstructural stormwater management practices to ensure that they continue to function as designed, are maintained, and pose no threat to public safety or the environment.

(7) Establish provisions to ensure there is an adequate funding mechanism, including surety, for the proper review, inspection and long-term maintenance of stormwater facilities implemented as part of this By-law.

(8) Establish the Town of Dedham's legal authority and capacity to ensure compliance with the provisions of this By-law through funding, permitting, inspection, monitoring, and enforcement.

B. Nothing in this By-law is intended to replace the requirements of the Dedham Flood Plain Zoning By-law, the Dedham General Wetlands Protection By-law, or any other By-law that may be adopted by the Town of Dedham, or any Rules and Regulations adopted thereunder. Any activity subject to the provisions of the above-cited By-laws or Rules and Regulations must comply with the specifications of each. In case of conflict, the more stringent provisions shall apply.

§ 246-2. Definitions.

The following definitions shall apply in the interpretation and implementation of this By-law. Additional definitions may be adopted by separate regulation:

ALTER

Any activity that will measurably change the ability of a ground surface area to absorb water, will change existing surface drainage patterns, or will increase or decrease the rate or volume of flow from a site.

BEST MANAGEMENT PRACTICE (BMP)

Structural, non-structural and managerial techniques that are recognized to be the most effective and practical means to prevent and/or reduce increases in stormwater volumes and flows, reduce point source and nonpoint source pollution, and promote stormwater quality and protection of the environment. "Structural" BMPs are devices that are engineered and constructed to provide temporary storage and treatment of stormwater runoff. "Nonstructural" BMPs use natural measures to reduce pollution levels, do not require extensive construction efforts, and/or promote pollutant reduction by eliminating the pollutant source.

BETTER SITE DESIGN

Site design approaches and techniques, including low-impact development (LID) that can reduce a site's impact on the watershed through the use of nonstructural stormwater management practices. Better site design includes conserving and protecting natural areas and green space, reducing impervious cover, and using natural features for stormwater management, and providing site-wide infiltration.

DEVELOPMENT

Any construction that disturbs or alters a parcel of land as defined in the Massachusetts Stormwater Standards.

DISTURBANCE

Any activity that causes a change in the position or location of soil, sand, rock, gravel, or similar earth material; results in an increased amount of runoff or pollutants; measurably changes the ability of a ground surface to absorb waters; removes trees; clears or grades land; or results in an alteration of drainage characteristics.

EXISTING LAWN

Grass area which has been maintained and mowed in the previous two years.

IMPERVIOUS

Any material or structure on, above or below the ground that prevents water from infiltrating through the underlying soil. Impervious surface is defined to include, without limitation: paved surfaces (parking lots, sidewalks, and driveways), concrete, brick, stone, and rooftops.

INFILTRATION

The act of conveying surface water into the ground to promote groundwater recharge and the reduction of stormwater runoff from a project site.

LOW IMPACT DEVELOPMENT (LID)

An ecosystem-based approach to land development and stormwater management that ensures that each development site is designed to protect, or restore, the natural hydrology of the site.

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS

The Department of Environmental Protection's requirements to manage stormwater located in the Wetlands Protection Act Regulations at 310 CMR 10.05(6)(k) and the accompanying Stormwater Handbook issued by the Department of Environmental Protection.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OR MUNICIPAL STORM DRAIN SYSTEM

The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Dedham.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT

A permit issued by United States Environmental Protection Agency or the Commonwealth of Massachusetts that authorizes the discharge of pollutants to waters of the United States.

NONPOINT SOURCE POLLUTION

Pollution from many diffuse sources caused by rainfall, snowmelt, or other method of pollutant transport moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into water resource areas.

NORMAL MAINTENANCE

Activities that are regularly scheduled to maintain the health and condition of a landscaped area. Examples include removal of weeds or invasive species, pruning, mowing, raking, and other activities that are done at regular intervals within the course of a year.

OPERATION AND MAINTENANCE PLAN

A plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to ensure that it continues to function as designed.

POST-DEVELOPMENT

The conditions that reasonably may be expected or anticipated to exist after completion of the land development activity in accordance with approved plans on a specific site or tract of land. Post-development refers to the phase of a new development or redevelopment project after completion, and does not refer to the construction phase of a project.

PRE-DEVELOPMENT

The conditions that exist prior to the proposed disturbance activity. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the existing conditions at the time prior to the first plan submission shall establish pre-development conditions.

RECHARGE

The replenishment of underground water reserves.

RECONSTRUCTION

Any action causing complete removal and replacement of paved surfaces, such as driveways, parking areas and roads.

REDEVELOPMENT

Any construction, alteration, improvement, repaving, or resurfacing on a previously-developed site as defined in the Massachusetts Stormwater Standards.

RUNOFF

Rainfall or snowmelt water flowing over the ground surface.

SITE

The entire parcel of land being developed.

STOCKPILING

The storage of unsecured material for future use, excluding the storage of materials 10 cubic yards or less when secured utilizing erosion controls that prevent erosion of the material.

STORMWATER

Runoff from precipitation or snowmelt and surface water runoff and drainage.

STORMWATER MANAGEMENT

The use of structural or non-structural practices that are designed to control or treat stormwater runoff pollutant loads, discharge volumes, and/or peakflow discharge rates. Stormwater Management includes the use of Low-Impact Development (LID) management practices.

STORMWATER MANAGEMENT PERMIT (SMP)

A permit issued by the Conservation Commission or its designated agent, after review of an application, plans, calculations, and other supporting documents, which is designed to protect the environment of the Town from the deleterious effects of uncontrolled and untreated stormwater runoff.

STORMWATER OFFICER

The Conservation Agent or other person(s) designated by the Conservation Commission to review Stormwater Management Permit applications and advise the Dedham Conservation Commission on Stormwater Management Permit applications as outlined in this By-law.

§ 246-3. Authority.

This By-law is adopted under authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule statutes, and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122.34, and as authorized by the residents of the Town of Dedham at Town Meeting dated November 16, 2015.

§ 246-4. Administration.

A. The permitting provisions of this By-law shall be overseen and administered by the Conservation Commission or its designated Stormwater Officer.

B. Stormwater Management Regulations ("Regulations"). The Conservation Commission may adopt, and periodically amend, rules and regulations relating to the terms, conditions, definitions, enforcement, fees (including application, inspection, and/or consultant fees), delegation of authority, procedures and administration of this By-law after conducting a public hearing to receive comments on the proposed rules and regulations or any proposed revisions. Such hearing dates shall be advertised in a newspaper of general local circulation at least seven days prior to the hearing date. Failure of the Conservation Commission to promulgate such rules and regulations or a legal declaration of their invalidity by a court shall not act to suspend or invalidate the effect of this By-law.

§ 246-5. Applicability.

A. This By-law shall be applicable to any alteration, disturbance, development or redevelopment of 500 square feet or more, including any activities that require a permit issued by the Planning Board, the Zoning Board of Appeals or the Building Department.

B. This By-law shall apply to land or parcels of land that are held in common ownership (including ownership by related or jointly-controlled persons or entities) as of the effective date of this By-law, if the total land-disturbing activities on said land or parcels, considered as a whole, would presently or ultimately exceed the minimum thresholds in § **246-5C** and are not exempted by § **246-6**, and no such activity shall commence until a permit under this By-law has been issued. A development shall not be segmented or phased in a manner to avoid compliance with this By-law.

C. Storm Water Management Permit Thresholds. A Storm Water Management Permit shall be required for any of the following, except for an activity exempt per § **246-6**:

(1) Minor Stormwater Permit.

(a) Any residential alteration, disturbance, development or redevelopment of 500 square feet to 2,000 square feet, except for construction of a new dwelling.

(b) Any commercial, industrial, institutional, or municipal alteration, disturbance, development or redevelopment of 500 square feet to 1,000 square feet (except for such activities within the Aquifer Protection Overlay District, which shall require a Major Stormwater Permit).

(2) Major Stormwater Permit.

(a) Construction of any new dwelling or new dwelling replacing an existing dwelling;

(b) Any alteration, disturbance, development or redevelopment exceeding the thresholds listed in § **246-5C(1)** above.

§ 246-6. Exemptions.

No person shall alter, disturb, develop or redevelop within the Town of Dedham without having obtained a Minor or Major Stormwater Permit with the following exceptions:

A. Any activity which will disturb or alter land areas below the thresholds stipulated in § **246-5** above.

B. Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act regulation 310 CMR 10.04 and G.L.c. 40A, § 3.

C. Any work or projects for which all necessary approvals and permits, including building permits, have been issued before the effective date of this By-law.

D. Normal maintenance of existing lawn, landscaping, or gardens areas.

E. Construction of any fence that will not alter existing terrain or drainage patterns.

F. Construction of utilities (gas, water, sanitary sewer, electric, telephone, cable television, etc.) other than drainage which will not alter terrain, ground cover, or drainage patterns, provided that appropriate BMPs are used to prevent erosion, sedimentation and release of pollutants.

G. Emergency repairs to any existing utilities (gas, water, sanitary sewer, electric, telephone, cable television, etc.) or emergency repairs to any stormwater management facility that poses a threat to public health or safety, as determined by the Conservation Commission. Where such activity is subject to the jurisdiction of the Conservation Commission, the work shall not proceed without the issuance of an Emergency Certification by the Commission.

H. The maintenance or resurfacing (not including reconstruction) of any public or private way.

I. The construction or expansion of a residential driveway with a total paved area (including any existing pavement) of less than 1,000 square feet.

§ 246-7. Procedures.

Permit Procedures, Permit Requirements and Performance Standards shall be established and included as Stormwater Management Regulations promulgated under § **246-4** of this By-law to meet the following purposes:

A. Ensure the Town's compliance with requirements of its National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) and other applicable State and Federal mandates.

B. Reduce and eliminate impairments of the Charles and Neponset Rivers and to preserve the health of the Town's groundwater resources.

C. Regulate and control stormwater runoff quantity and quality.

D. Encourage the use of nonstructural stormwater management, better site design practices or "low-impact development practices", such as reducing impervious cover, increasing site-wide infiltration, and preserving open space and other natural areas, to the maximum extent practicable.

E. Promote water conservation through the re-use of stormwater.

F. Establish provisions for the long-term responsibility for and maintenance of structural stormwater control facilities and nonstructural stormwater management practices to ensure that they continue to function as designed, are maintained, and pose no threat to public safety or the environment.

G. Establish provisions to ensure there is an adequate funding mechanism, including surety, for the proper review, inspection and long-term maintenance of stormwater facilities implemented as part of this By-law.

§ 246-8. Enforcement.

The Conservation Commission, or an authorized agent of the Conservation Commission, shall enforce this By-law, Regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

A. Civil relief. If a person violates the provisions of this by-law, or any associated regulations, permit, notice, or order issued thereunder, the Conservation Commission may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

B. Orders. If the Conservation Commission determines that a person's failure to follow the requirements of this By-law, any Regulatory provision issued hereunder, or any authorization issued pursuant to this By-law or Regulations is creating an adverse impact to a water resource, then the Commission may issue a written order to the person to remediate the adverse impact, which may include requirements to:

   (1) Cease and desist from land-disturbing activity until there is compliance with the By-law or provisions of an approved Stormwater Management Permit;

   (2) Maintain, install or perform additional erosion and sediment control measures;

(3) Perform monitoring, analyses, and reporting;

(4) Remediate erosion and sedimentation resulting directly or indirectly from land-disturbing activity;

(5) Comply with requirements in the Stormwater Management Permit for operation and maintenance of stormwater management systems;

(6) Remediate adverse impacts resulting directly or indirectly from malfunction of the stormwater management systems; and/or

(7) Eliminate discharges, directly or indirectly, into a watercourse or into the waters of the Commonwealth.

C. If the Conservation Commission determines that abatement or remediation of pollutants is required, the order shall set forth a deadline for completion of the abatement or remediation. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town may, at its option, undertake such work, and expenses thereof shall be charged to the violator or property owner. Within 30 days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Conservation Commission within 30 days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within 30 days following a decision of the Conservation Commission affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the cost shall become a special assessment against the property owner of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. c.59, § 57 after the 30th day at which the costs first become due.

D. Criminal and Civil Penalties. Any person who violates any provision of this by-law, valid regulation, or the terms or conditions in any permit or order prescribed or issued there under, shall be subject to a fine not to exceed $300 for each day such violation occurs or continues or subject to a civil penalty, which may be assessed in an action brought on behalf of the Town in any court of competent jurisdiction.

E. Noncriminal disposition. As an alternative to criminal prosecution or civil action, the Town may elect to utilize the noncriminal disposition procedure set forth in G.L. c.40, § 21D and § **1-6B** of the Town of Dedham General By-laws, in which case any police officer of the Town of Dedham, the Conservation Agent, and such other persons as are authorized by the Conservation Commission shall be the enforcing person. The penalty for the first violation shall be a warning. The penalty for the second violation shall be $100. The penalty for the third and subsequent violations shall be $300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

F. Entry to perform duties under this by-law. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Commission, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this by-law and regulations and may make or cause to be made such examinations, surveys or sampling as the Commission deems reasonably necessary.

G.

Appeals. The decisions or orders of the Conservation Commission shall be final. Further relief shall be to a court of competent jurisdiction.

H. Remedies Not Exclusive. The remedies listed in this by-law are not exclusive of any other remedies available under any applicable federal, state or local law.

§ 246-9. Burden of proof.

The applicant for a permit shall have the burden of proving by a preponderance of the credible evidence that the work proposed in the application will not have unacceptable adverse or cumulative effect on the resource areas protected by this by-law. Failure to provide adequate evidence to show the effect the proposed project may have on the surface waters or ground waters of the Commonwealth, and/or the storm drainage system of the Town of Dedham shall be sufficient cause for the Commission to deny a permit or grant a permit with conditions.

§ 246-10. Stormwater management compliance certificate.

A. Because a SMP runs with the title of a property, a person shall request the Dedham Conservation Commission to issue a Stormwater Management Compliance Certificate (SMCC) upon completion of all work authorized under a Stormwater Management Permit (SMP).

B. The following procedure shall be followed in the application for a SMCC:

(1) A person who has been issued a SMP or their legal representative shall submit a letter or appropriate form with the Dedham Conservation Commission to request an issuance of a SMCC.

(2) Any as-built plans or other documentation required under the SMP shall accompany the SMCC request.

(3) The Dedham Conservation Commission shall vote on a SMCC request at a public hearing. Such requests shall be advertised on the Dedham Conservation Commission meeting agendas that are posted at Dedham Town Hall and Dedham Public Library.

(4) The Dedham Conservation Commission may refer a SMCC request to the Stormwater Officer for review and comment prior to taking any action.

C. The SMCC shall be recorded at the Norfolk County Registry of Deeds and shall run with the title of the property. Proof of recording, including Registry Book and Page or Land Court Instrument Number shall be provided to the Conservation Commission for its records.

§ 246-11. Fee schedule.

A. Rules.

(1) Permit and application fees are payable at the time of application and are non-refundable.

(2) Permit fees shall be calculated by the Conservation Commission in accordance with the fee schedule below.

(3) Town, County, State and Federal projects are exempt from fees.

(4) Failure to comply with the by-law after official notification shall result in fees twice those normally assessed.

B. Fees.

(1) A non-refundable application fee of the larger of $30 or $0.0030 per square foot of the parcel to which the permit will be issued shall be due and payable to the Town of Dedham at the time an application is filed.

(2) Application fees for permits issued under Minor Stormwater Management Permits (mSMP)s under § 246-4C of this by-law shall be waived when such permits are issued for projects associated with existing single-family dwellings.
[Amended 5-15-2017 ATM by Art. 29]

(3) Consultant fees shall be determined at the time of project review based on a specific scope of work. Consultant fees shall be outlined in Stormwater Management Rules and Regulations promulgated under this by-law.

(4) For a direct connection to the Town of Dedham Storm Drainage System, a non-refundable fee of $500 is due at the time an application is filed.

(5) A copy of the Stormwater Management Rules and Regulations shall be available for a fee of $5.

(6) A complete printed set of the Town of Dedham Construction Standards and Specifications including standard construction details for Stormwater Management Projects shall be available for a fee of $25.

(7) The only method of payment, which will be accepted, is US Currency (cash) or a check made payable to the Town of Dedham.

C. These fees are in addition to any other local or state fees that may be charged under any other law, by-law, or applicable regulation.

D. The above fee schedule may be reduced by the Conservation Commission. Any such change shall be made at a posted public hearing of the Commission not less than 30 days prior to the date upon which the change is to be effective.

§ 246-12. Severability.

The invalidity of any section, provision, paragraph, sentence, or clause of this By-law shall not invalidate any section, provision, paragraph, sentence, or clause thereof, nor shall it invalidate any permit or determination that previously has been issued.

STORMWATER MANAGEMENT RULES & REGULATIONS
ADOPTED BY THE DEDHAM CONSERVATION COMMISSION May 23, 2002
First Revision May 15, 2003
Second Revision October 2, 2008
Third Revision November 15, 2018
Fourth Revision August 6, 2020

SECTION 1: AUTHORITY

A. The Rules and Regulations contained herein have been adopted by the Dedham Conservation Commission in accordance with Section 246-4 of the Town of Dedham Stormwater Management By-Law.

B. Nothing in these Rules and Regulations is intended to replace or be in derogation of the requirements of the Town of Dedham General Wetlands Protection By-Law, the Town of Dedham Floodplain Zoning By-Law, or any other By-Law adopted by the Town of Dedham or any Rules and Regulations adopted thereunder. Any project or activity subject to the provisions of the above-cited By-Laws or Rules and Regulations must comply with the specifications of each. In case of conflict, the more stringent provisions shall apply.

C. These Rules and Regulations may be periodically amended by the Conservation Commission in accordance with the procedures outlined in accordance with Section 246-4 of the Town of Dedham Stormwater Management By-Law.

D. The Conservation Commission may make revisions to the fee schedule periodically as it sees fit, by vote of the Commission after public notice and opportunity for comment.

E. Waivers. The Conservation Commission may waive strict compliance with any of the requirements of the Town of Dedham Stormwater Management By-Law or the Rules and Regulations promulgated hereunder, if it finds that:

1. Strict application of some of the requirements is unnecessary or impracticable because of the size or character of the development project or because of the natural conditions at the site;

2. The Project is consistent with the purposes and intent of the Town of Dedham Stormwater Management By-Law, and;

3. The Project provides substantially the same level of protection to the public health, safety, environment and general welfare of the Town as required by the Town of Dedham Stormwater Management By-Law without strict application of the Rules and Regulations.

Any Applicant requiring a waiver must submit a written request for such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request.

All waiver requests shall be discussed and voted on at the Public Hearing for the project.

If, in the Conservation Commission's opinion, additional time or information is required for review of a waiver request, the Conservation Commission may request to continue a hearing to a date announced at the meeting. In the event the Applicant objects to a continuance or postponement, or fails to provide requested information, the waiver request shall be denied.

SECTION 2: PURPOSE

A. The purpose of these regulations is to protect, maintain and enhance the public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse effects of soil erosion and sedimentation, construction and post-development stormwater runoff, decreased groundwater recharge, and nonpoint source pollution associated with new development, redevelopment and other land alterations, as more specifically addressed in the Town of Dedham Stormwater Management By-Law.

SECTION 3: DEFINITIONS

A. The definitions contained herein apply to the Town of Dedham Stormwater Management By-Law and the Rules and Regulations adopted thereunder. Terms not defined in this section shall be construed according to their customary and usual meaning unless the context indicates a special or technical meaning.

B. All definitions are provided in the Town of Dedham Stormwater Management By-Law or Appendix A of the Town of Dedham Stormwater Management Rules and Regulations.

SECTION 4: APPLICABILITY

These Rules and Regulations apply to all projects or activities subject to the Applicability Section of the Town of Dedham Stormwater Management By-Law. Projects and/or activities within the jurisdiction of the Town of Dedham Stormwater Management By-Law must obtain a Stormwater Management Permit (SMP) from the Conservation Commission or its designee in accordance with the permit procedures and requirements defined in Sections 5 through 9 and Appendix B of these Rules and Regulations.

No work on a project within the jurisdiction of the Town of Dedham Stormwater Management By-Law may commence without written approval of the Conservation Commission or its designee, confirming that the project or activity is in compliance with the Design Standards of these Regulations. If work commences without approval, enforcement action and/or fines may be pursued.

A. No Permit Required

1. Notwithstanding Section 4.B, no permit shall be required by the Conservation Commission or its designee for:

    a) Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act regulation 310 CMR 10.04 and G.L.C. 40A, § 3.

    b) Any work or projects for which all necessary approvals and permits, including building permits, have been issued before the effective date of the Town of Dedham Stormwater Management By-Law.

    c) Projects disturbing less than 500 square feet of ground surface, except for driveways.

    d) Repair, repaving, replacement or expansion of a residential driveway with a total paved area (including any existing pavement) of less than 1,000 square feet.

    e) Repair or replacement of an existing roof.

f) Normal maintenance of existing lawn, landscaping, or garden areas.

g) Construction of any fence that will not alter existing terrain or drainage patterns.

h) Construction of utilities (gas, water, sanitary sewer, electric, telephone, cable television, etc.) other than drainage that will not alter the site.

i) The maintenance or resurfacing (excluding reconstruction) of any public or private way.

j) Emergency repairs to any existing utilities (gas, water, sanitary sewer, electric, telephone, cable television, etc.) or emergency repairs to any stormwater management facility that poses a threat to public health or safety, as determined by the Conservation Commission. Where such project or activity is subject to the jurisdiction of the Conservation Commission, the work shall not proceed without the issuance of an Emergency Stormwater Permit (ESP) by the Conservation Commission.

k) Such other projects as the Conservation Commission or its designee may find, in its discretion, to have less impact on the interests protected by the Stormwater Management By-Law, as defined in Section 246-1 of the Stormwater Management By-Law, than those projects eligible for a Minor Stormwater Management Permit, provided that erosion control measures such as those listed in the most recent versions of the Massachusetts Stormwater Standards and accompanying Stormwater Management Handbook (Handbook)[1] and the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas[2] are used and the project or activity will not result in an increased amount of stormwater runoff or pollutants flowing from a parcel of land and entering a traveled way or adjacent properties.

B. All projects or activities not falling under an exception listed in Section 4.A shall require a Stormwater Management Permit in accordance with Section 5 of the Stormwater Management By-Law.

C. Projects or activities eligible for a Minor Stormwater Management Permit:

1. Any residential alteration, disturbance, development or redevelopment of 500 square feet to 2,000 square feet, except for construction of a new dwelling.

2. The repair, repaving, replacement, or expansion of a residential driveway with a total paved area (including any existing pavement) of 1,000 to 2,000 square feet.

3. Any commercial, industrial, institutional, or municipal alteration, disturbance, development or redevelopment of 500 square feet to 1,000 square feet (except for such activities within the Aquifer Protection Overlay District, which shall require a Major Stormwater Management Permit).

D. Any project or activity effectuating an alteration, disturbance, development or redevelopment of land and ineligible for a Minor Stormwater Management Permit requires a Major Stormwater Management Permit.

E. An Emergency Stormwater Permit (ESP) may be issued in cases where a delay or failure to perform work poses an imminent danger to public health or safety. The Stormwater Officer or any member of the Conservation Commission may, in such individual's discretion, issue an ESP. Any person to whom an ESP is issued shall, prior to the next scheduled meeting of the Conservation Commission (or, in the Stormwater Officer's discretion, as soon as reasonably practical thereafter), submit the materials described in Sections 5 through 9 and Appendix B of these Rules and Regulations with

[1] Massachusetts Stormwater Handbook, as most recently updated.
http://www.mass.gov/eea/agencies/massdep/water/regulations/massachusetts-stormwater-handbook.html

respect to any work permitted by such ESP. Each ESP shall be presented to the Conservation Commission for ratification.

SECTION 5: DESIGN STANDARDS

A. Major Stormwater Management Permits (MSMPs)

1. At a minimum all projects subject to a Major Stormwater Management Permit shall comply with the performance standards of the most recent version of Massachusetts Stormwater Standards and accompanying Stormwater Management Handbook (Handbook)[2], and the Town of Dedham Drainage and Stormwater Design Standards, with the following differences from the Handbook:

    a) The Stormwater Management Standards shall apply to single family houses, as well as housing development and redevelopment projects comprised of detached single-family dwellings on four or fewer lots and multi-family housing development and redevelopment projects with four or fewer units, including condominiums, cooperatives, apartment buildings and townhouses.

2. Drainage Design: Drainage calculations shall be performed for existing site conditions (pre-development) and proposed site conditions (post-development) based on proposed site plans. Storms of 2, 10, 25, and 100 year frequency events shall be analyzed. The rainfall amounts used shall be based on the 1998 Cornell University Study, NOAA Atlas 14 Volume 10 Point Precipitation Frequency Estimates for Dedham, or other studies approved by the Massachusetts Department of Environmental Protection.

3. For purposes of choosing a Runoff Curve Number, all pervious lands in the Site shall be assumed prior to development to be in "good" hydrologic condition regardless of conditions existing at the time of computation.

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

    a) Retain the volume of runoff equivalent to, or greater than, two (2) inches multiplied by the total post-construction impervious surface area on the site; and

    b) Remove 90% of the average annual load of Total Suspended Solids generated from the total post-construction impervious area on the site; and

    c) Remove 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site; and

    d) Optimize phosphorus removal[3]. Infiltration BMPs, bioretention areas, constructed stormwater wetlands, and filter systems are recommended tools for reducing the concentration of nutrients in stormwater discharges.

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[2] Massachusetts Stormwater Handbook, as most recently updated. http://www.mass.gov/eea/agencies/massdep/water/regulations/massachusetts-stormwater-handbook.html

[3] The required removal percentages are not required for each storm, it is the average removal over a year that is required. 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

5. Stormwater management systems on redevelopment sites shall be designed to:

    a) Retain the volume of runoff equivalent to, or greater than, two (2) inches multiplied by the total post-construction impervious surface area on the site; and

    b) Remove 80% of the average annual load of Total Suspended Solids generated from the total post-construction impervious area on the site; and

    c) Remove 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site; and

    d) Optimize phosphorus removal[4]. Infiltration BMPs, bioretention areas, constructed stormwater wetlands, and filter systems are recommended tools for reducing the concentration of nutrients in stormwater discharges.

6. To support compliance with the Town's MS4 Permit, all new development and redevelopment stormwater management BMPs located on commercial or industrial land must incorporate designs that allow for shutdown and containment to isolate the drainage system in the event of an emergency spill or other unexpected event.

    On redevelopment sites, stormwater management systems may utilize offsite mitigation within the same USGS HUC12 as the redevelopment site to meet the equivalent retention or pollutant removal requirements indicated in part 3 above. Stormwater management systems on redevelopment sites shall also improve existing conditions.

7. All projects must consider and, unless impracticable, propose and implement Low Impact Development (LID) Best Management Practices (BMPs, See Appendix C). If impracticable, Applicants shall demonstrate reasons why LID BMPs are impracticable and demonstrative compliance with design standards through generally accepted methods.

B. Minor Stormwater Management Permits (mSMPs)

1. At a minimum all projects subject to a Minor Stormwater Management Permit shall be designed to the following standards:

    a) Stormwater management systems on new development and redevelopment sites shall be designed to retain the volume of runoff equivalent to, or greater than, two (2) inches multiplied by the new post-construction impervious surface area on the site.

2. All projects must consider and, unless impracticable, propose and implement Low Impact Development (LID) BMPs. Applicants shall demonstrate compliance with design standards for LID BMPs through generally accepted methods.

approved BMP design guidance or performance standards (*e.g.* State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

[4] The required removal percentages are not required for each storm, it is the average removal over a year that is required. 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.

SECTION 6: ADMINISTRATION

A. Administration of Rules and Regulations

1. The Conservation Commission shall administer, implement and enforce these Rules and Regulations. The Conservation Commission may designate in writing any authorized Town employee, board or agent for the purposes of reviewing stormwater submittals and issuing stormwater management permits. Any Town employee, board or agent so designated by the Conservation Commission shall be defined as the "Stormwater Officer." The Conservation Commission may always exercise any authority delegated to a Stormwater Officer under these regulations.

2. The Applicant shall submit all Stormwater Management Permit Application submittals in compliance with these Rules and Regulations to a Stormwater Officer. The Conservation Commission may designate a Stormwater Officer in both the Building Department and the Conservation Department. Stormwater Management Permit Applications shall be submitted as follows:

    a) Minor Stormwater Management Permit Applications also subject to Building Department review (*e.g.*, additions, sheds, etc.) shall be submitted to the Building Department.

    b) Minor Stormwater Management Permit Applications not associated with a Building Permit (*e.g.*, driveways and re-grading without construction) shall be submitted to the Conservation Department.

    c) Major Stormwater Management Permit Applications shall be submitted to the Conservation Commission.

3. The Stormwater Officer will review the submittal for administrative completeness and compliance with the requirements and standards of Sections 5 through 9 and Appendix B of these Rules and Regulations. If the proposed project is administratively complete and complies with these Rules and Regulations, the Stormwater Officer may grant a Minor Stormwater Management Permit, in addition to any other approval or permit. The Conservation Commission, its designees, and the Stormwater Officer shall have authority to enforce the Stormwater Management By-Law and these Rules and Regulations. The Stormwater Officer may reject an Application if it is not administratively complete.

4. Minor Stormwater Management Permits require review and approval by the Stormwater Officer, as follows:

    a) Minor Stormwater Management Permits also requiring Building Permits may be issued by the Building Department.

    b) Minor Stormwater Management Permits not associated with a Building Permit (*e.g.*, clearing and grubbing of vegetation and/or re-grading without construction of more than ten (10) percent of the total area of the parcel; and driveways) shall be issued by the Conservation Department.

5. Major Stormwater Management Permits require review and approval by the Conservation Commission after Public Hearing.

B. Abutter Notification

1. Concurrent with the filing of the Major Stormwater Management Permit and for Minor Stormwater Management Permit Applications where Design Standards cannot be met, the Applicant shall

provide notification to all abutters to the property or properties on which work is planned by Certified Mail, Return Receipt Requested or Certificate of Mailing. The notification shall state where within the municipality copies of the Stormwater Management Permit may be examined or obtained and where information on the date, time, and location of the Public Hearing may be obtained. The Applicant shall provide notification at the mailing addresses shown on the most recent applicable tax list from the municipal assessor. Mailing at least seven days prior to the Public Hearing shall constitute timely notice. The Applicant shall submit the return receipts from the Certified Letters or Certificates of Mailing to the Conservation Commission as proof of notification.

2. The Conservation Commission will place a legal notification of the Public Hearing in the local newspaper of general circulation. The Applicant shall be billed directly for the cost of the legal notice.

3. Re-notification of abutters and re-advertisement in the newspaper will not be required for cases where a Public Hearing is opened and continued to a later meeting date. Re-notification will also not be required in cases where a meeting is postponed due to a lack of a voting quorum or inclement weather.

C. Entry. Filing an Application for a permit grants the Conservation Commission, its Stormwater Officer, or designee as specified in these Rules and Regulations, permission to enter the site until a Stormwater Certificate of Compliance is issued to verify the information in the Application and to inspect for compliance with the resulting permit.

D. Minor Stormwater Management Permit Approval Process

1. Action by Stormwater Officer

a) Determination of Completeness: The Stormwater Officer shall review the Stormwater Management Permit Application for completeness within ten (10) business days of receipt.

b) Incomplete Applications: If the Stormwater Officer determines the Application is incomplete, including insufficient information to describe the site, the work, or the effect of the work on water quality and volume, the Stormwater Officer may require the submission of additional information and/or disapprove the Application and deny the Permit.

c) Complete Applications. Each Application for a Minor Stormwater Management Permit Application that is determined to be a complete shall be reviewed by the Stormwater Officer. The Application shall be acted upon within ten (10) business days of the date that the Stormwater Officer determines that the Application is complete, unless such Application has been withdrawn from consideration. The Stormwater Officer may:

(1) Approve the Permit Application upon finding that the proposed plan will protect water resources and meets the objectives and requirements of the Stormwater Management By-Law;

(2) Approve the Permit Application with conditions, modifications and/or restrictions that are required to ensure that the project will protect water resources and meets the objectives and requirements of the Stormwater Management By-Law;

(3) Deny the Permit Application due to non-compliance with Design Standards or insufficient information to make a determination; or.

(4) Determine that a Minor Stormwater Management Permit is inappropriate and require the submission of a Major Stormwater Management Permit.

d) Applications not in compliance with Design Standards.

(1) For Minor Stormwater Management Permit Applications for which the Stormwater Officer has determined that the Design Standards are not met, the Applicant may appeal the determination and request a Public Hearing with the Conservation Commission to consider the Application or resubmit the Application demonstrating compliance.

(2) For Minor Stormwater Management Permit Applications for which Applications Design Standards cannot be met due to site conditions or the Applicant wishes to propose an alternative design not consistent with the Design Standards, the Applicant may request a Public Hearing with the Conservation Commission.

E. Major Stormwater Management Permit Approval Process

1. Action by Conservation Commission

a) Determination of Completeness: The Conservation Commission or its designee shall review the Application submission within fifteen (15) business days of receipt.

b) Incomplete Applications: If the Conservation Commission or its designee determines the Application is incomplete, including insufficient information to describe the site, the work, or the effect of the work on water quality and runoff volume, within fifteen (15) business days of receipt of the Application, the Conservation Commission shall state the Application is incomplete and may request the submission of additional information and/or disapprove the Application and deny the Permit.

c) Complete Applications. Each Application for a Major Stormwater Management Permit Application that is determined to be a complete Application shall be reviewed by the Conservation Commission. The Application shall be acted upon within thirty (30) business days of the date that the Conservation Commission has determined that the filing is complete, unless such Application has been withdrawn from consideration or continued to a future meeting date with the consent of the Applicant.[5] The Conservation Commission may:

(1) Approve the Permit Application upon finding that the proposed project will protect water resources and meets the objectives and requirements of the Stormwater Management By-Law;

(2) Approve the Permit Application with conditions (See Standard Conditions, Appendix D), modifications or restrictions that are required to ensure that the project will protect water resources and meets the objectives and requirements of the Stormwater Management By-Law; or

(3) Deny the Permit Application due to non-compliance with Design Standards.

F. Public Hearing Process

1. A Public Hearing is required for Major Stormwater Management Permit Applications and for Minor Stormwater Management Permit Applications where Design Standards cannot be met. Minor Permit Applications that meet design standards shall not require a Public Hearing.

2. Applicants requesting a Public Hearing shall submit a written request for a Public Hearing with the Conservation Commission. Applications for a Public Hearing shall include the materials as

[5] See Town of Dedham Conservation Commission "Continuance of Public Meetings and Hearings Policy," Adopted by the Commission on October 5, 2016.

specified in Sections 5 through 9 and Appendix B of these Rules and Regulations. The Applicant shall file with the Conservation Commission one (1) original executed Stormwater Management Permit (SMP) Application, two (2) full size plan sets, eight (8) copies of the Application with 11-inch by 17-inch copies of the plans, and one (1) electronic copy of the Application package in PDF format emailed to conservation@dedham-ma.gov.

3. Notice of Public Hearings shall be published in a newspaper of general circulation. The first publication date shall be published not less than five (5) days before the day of the hearing. A copy of the hearing notice shall be posted in the Office of the Town Clerk for a period of not less than forty-eight (48) hours before the date of the hearing.

4. During the Public Hearing, the Conservation Commission may request additional information to be submitted by the Applicant. This may include, but is not limited to:

   a) Landscaping plans;

   b) Snow storage and removal plans;

   c) Spot grades confirming existing drainage patterns; and

   d) Additional information concerning operations and maintenance.

G. Deadline for Action

1. Failure of the Conservation Commission, Stormwater Officer, or its designee to take final action upon a Stormwater Management Permit within thirty (30) business days of receipt of a complete Major Stormwater Management Application and within ten (10) business days of receipt of a complete Minor Stormwater Management Application shall be deemed to be approval of said Application, unless extension of the deadline date is mutually agreed upon, in person at a Public Hearing or in writing, by the Conservation Commission (in the case of a Major Stormwater Management Permit) or Stormwater Officer (in the case of a Minor Stormwater Management Permit) and the Applicant:

2. For Minor Stormwater Management Permit Applications that have been denied and all Major Stormwater Management Permit Applications, a Public Hearing shall be held within forty-five (45) calendar days of the date of submission of the Stormwater Management Permit Application. The Conservation Commission shall issue a decision within sixty (60) calendar days of the Public Hearing, unless a continuance has been mutually agreed upon, in person at a Public Hearing or in writing, by the Applicant and the Conservation Commission.

3. Upon certification by the Town Clerk that the allowed time has passed without Conservation Commission or Stormwater Officer action, the Conservation Commission or Stormwater Officer must issue a Stormwater Management Permit.

H. Plan Changes. The Applicant or their legal designee must notify the Stormwater Officer for a Minor Stormwater Management Permit or the Conservation Commission for a Major Stormwater Management Permit, in writing, of any drainage change or alteration in the system authorized in a Stormwater Management Permit before any change or alteration is made. If the Stormwater Officer or Conservation Commission determines that the change or alteration is significant, based on the Design Standards in Section 5 of these Rules and Regulations and accepted construction practices, the Stormwater Officer or Conservation Commission may require that an amended Application be filed.

I. Appeals of Actions of the Conservation Commission. A decision of the Conservation Commission to grant or deny a permit shall be final. A final decision by the Conservation Commission made under

these Rules and Regulations shall be reviewable in a court of competent jurisdiction by an action filed within sixty (60) days thereof, in accordance with M.G.L. Ch. 249. § 4. An appeal of an action by a board, commission or department that has concurrent regulatory authority for a project and/or activity shall be conducted under the applicable appeal provisions of said board, commission and/or department of the Town of Dedham. An appeal shall result in suspension of any Permit so appealed as described in these Regulations, until such time as the appeal process of the applicable board, commission and/or department has been resolved.

J. Project Delay

1. Should a land-disturbing project or activity associated with an approved plan in accordance with this Section not begin within eighteen (18) months following permit issuance, the permit shall lapse and should the Applicant wish to continue with the previously approved plan, the Applicant must re-apply for a new permit.

2. If the project associated with an approved Stormwater Management Permit granted under the By-Law has not been substantially completed within three (3) years of permit issuance, a new permit or a permit extension will be required by the Conservation Commission (in the case of a Major Stormwater Management Permit) or the Stormwater Officer (in the case of a Minor Stormwater Management Permit). The Conservation Commission (in the case of a Major Stormwater Management Permit) or the Stormwater Officer (in the case of a Minor Stormwater Management Permit) may require updates to the project to comply with current regulations and standards as a condition of the permit extension.

K. Project Completion. A Stormwater Management Certificate of Compliance (SMCC) is required for completion of all Major Stormwater Management Permits and for Minor Stormwater Management Permits if required as a permit condition. The Applicant or their legal designee must submit a written request for a Stormwater Management Compliance Certificate from the Conservation Commission at the completion of the project. The Conservation Commission will issue a Stormwater Management Certificate of Compliance upon review and approval of the final inspection reports and/or upon otherwise determining that all work of the permit has been satisfactorily completed in conformance with the Stormwater Management By-Law.

SECTION 7: INSPECTIONS

A. Construction Commencement

1. Pre-Construction Meeting: The Conservation Commission or Stormwater Officer may require a pre-construction meeting prior to starting clearing, excavation, construction or land-disturbing activity by the Applicant. The Applicant's technical representative, the general contractor or any other person with authority to make changes to the project, shall meet with the Conservation Commission or its representative to review construction sequencing and the permitted plans and their implementation.

2. Notice of Construction Commencement: The Applicant must notify the Conservation Commission or Stormwater Officer two (2) days prior to the commencement of construction. In addition, the Applicant must notify the Stormwater Officer two (2) days prior to construction of critical components of any stormwater management structural Best Management Practices (BMPs).

3. A copy of the approved and signed plans and permits shall be kept on the construction site at all times.

B. Construction Inspections

1. Upon issuance of any Stormwater Management Permit, and until issuance of a SMCC, the Conservation Commission and Stormwater Officer shall be granted the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.

2. The Conservation Commission or Stormwater Officer may inspect the project site at the following stages, at a minimum:

   a) Initial Site Inspection: An inspection may be made of erosion and sedimentation controls and signage prior to any land-disturbance to assess overall effectiveness and functioning to protect resources

   b) Stormwater Management System Excavation Inspection: An inspection may be made of the excavation for the stormwater management system to ensure adequate separation of the stormwater system from ground water and presence of approved soil type.

   c) Stormwater Management System Inspection: An inspection may be made of the completed stormwater management system, prior to backfilling of any underground drainage or stormwater conveyance structures.

   d) The Conservation Commission or Stormwater Officer may require the submission of periodic inspections and reporting by the Applicant as dictated by site conditions. Inspections must be completed by qualified persons as approved by either the Conservation Commission or Stormwater Officer.

   e) Final Inspection: After the stormwater management system has been constructed, all Applicants are required to submit actual “as built” plans for any stormwater management facilities or practices. The Conservation Commission or Stormwater Officer shall inspect the system to confirm its "as-built" features and other permit conditions, including final site stabilization.

C. Notes indicating the required inspections are to be added to the Site Plan(s).

SECTION 8: RECORDKEEPING AND REPORTING REQUIREMENTS

A. Where required by any Permit issued under these regulations, the owner of the property shall maintain a log of all operation and maintenance activities, including without limitation, site reviews, inspections, repairs, replacement, disposal (for disposal, the log shall indicate the type of material and the disposal location), and enforcement actions. This log shall be made available to the Massachusetts Department of Environmental Protection and the Conservation Commission upon request.

B. When annual inspection reports are required by the Conservation Commission, stormwater management systems inspection reports shall be submitted to the Conservation Commission by January 15th of the following year. Inspection reports for stormwater management systems shall include:

1. The date of inspection.

2. Name of inspector.

3. The condition of each BMP, including components such as:

a) Pretreatment devices.

b) Vegetation or filter media.

c) Spillways, valves, or other control structures.

d) Embankments and slopes.

e) Inlet and outlet channels and structures.

f) Underground drainage.

g) Sediment and debris accumulation in storage and forebay areas (including catch basins).

h) Any nonstructural practices.

i) Any other item that could affect the proper function of the stormwater management system.

4. Description of the need for maintenance.

5. Observations of any physical changes to system in comparison with the approved as-built plan.

C. The owner(s) of the stormwater management systems, except for those associated with single family dwellings, shall notify the Conservation Commission of changes in ownership or assignment of financial responsibility.

SECTION 9. ENGINEERING AND CONSULTANT REVIEW FEES

A. In addition to the filing fee, the Conservation Commission is authorized to require an Applicant to pay reasonable costs and expenses borne by the Conservation Commission for specific expert engineering and consultant services deemed necessary by the Commission to review a Stormwater Management Permit Application. Payment may be required at any point in the deliberations prior to a final decision.

B. Any Application filed with the Conservation Commission must be accompanied by a completed Engineering Consultant Fee Acknowledgement form. This is to acknowledge that the Applicant is aware that the Application may be subject to Engineering and Consultant Review including, but not limited to wetland survey and delineation, hydrologic and drainage analysis, wildlife evaluation, stormwater quality analysis, and analysis of legal issues. This fee shall be calculated at a rate of $125.00 per hour (or at such other rate as the Conservation Commission may determine based on reasonable and actual rates for professional reviewers).

C. Subject to applicable law, any unused portion of Engineering and Consultant Review Fees collected will be returned by the Conservation Commission to the Applicant within forty-five (45) calendar days of a final invoice by the third party reviewer.

D. The Engineering and Consultant Review fees collected under this Section will be deposited in the revolving account authorized under Chapter 398 of the Acts of 1996.

SECTION 10: STORMWATER MANAGEMENT CERTIFICATE OF COMPLIANCE (SMCC)

A. No SMCC is required for work approved under a Minor Stormwater Management Permit.

B. After the stormwater management system has been constructed and before a Major SMCC is issued, the permittee shall submit as-built plans detailing the actual stormwater management systems, structures and devices as installed. With the exception of single family dwellings, as-built plans shall be stamped by a Registered Professional Engineer indicating that the constructed facility(s) have been constructed in accordance with, and meet the requirements of, the Stormwater Management Permit, including compliance with performance standards and Best Management Practices (BMPs).

C. After receipt of the as-built plans and prior to the issuance of a Major Stormwater Management Compliance Certificate, the Stormwater Officer or other designee of the Conservation Commission shall inspect the stormwater management system to confirm its "as-built" features. A system will be deemed inadequate if errors in the infiltrative capability, the maximum groundwater elevation, failure to properly define or construct flow paths, or erosive discharges are found. If the system is found to be inadequate by virtue of physical evidence of operational failure, even though it was built as called for in the Stormwater Management Permit, the Conservation Commission shall have the right to require corrections or improvements to the "as-built" system before issuing a Stormwater Management Compliance Certificate.

D. It is the responsibility of the permittee to request, in writing, the issuance of a Stormwater Management Compliance Certificate from the Conservation Commission upon completion of the work approved under a Major Stormwater Management Permit.

E. The Conservation Commission shall issue a Stormwater Management Compliance Certificate upon written request of the permittee and upon finding that the permit has been complied with permit conditions.

SECTION 11: SECURITY

A. As part of any Minor or Major Stormwater Management Permit issued, in addition to any security required by another municipal or state board, agency or official, the Conservation Commission may require that the performance and observance of the conditions imposed hereunder be secured wholly or in part by a proper bond or deposit of money or negotiable securities or the undertaking of financial responsibility sufficient in the opinion of the Conservation Commission, to be released in whole or in part upon issuance of a SMCC for work performed pursuant to the Permit.

SECTION 12: ENFORCEMENT

The Conservation Commission, Stormwater Officer or its designee may enforce the Stormwater Management By-Law, Rules and Regulations, orders, permits, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

A. Civil relief. If a person violates the provisions of the Stormwater Management By-Law, these Rules and Regulations or any associated rules and regulations, permit, notice, or order issued thereunder, the Conservation Commission may seek injunctive relief in a court of competent jurisdiction restraining the person.

B. Orders. If the Conservation Commission determines that a person has failed to follow the requirements of the Stormwater Management By-law, these Rules or Regulations or any other

regulatory provision issued hereunder, or any authorization issued pursuant to the By-Law or Rules and Regulations then the Conservation Commission may issue a written order to the person to remediate the adverse impact, which may include requirements to:

1. Cease and desist from land-disturbing activity until there is compliance with the By-Law or provisions of an approved Stormwater Management Permit;

2. Maintain, install or perform additional erosion and sedimentation control measures;

3. Perform monitoring, analyses, and reporting;

4. Remediate erosion and sedimentation resulting directly or indirectly from land-disturbing activity;

5. Comply with requirements of the Stormwater Management Permit for operation and maintenance of stormwater management systems;

6. Remediate adverse impacts resulting directly or indirectly from malfunction of the stormwater management systems; and/or

7. Eliminate discharges, directly or indirectly, into a watercourse or into the waters of the Commonwealth.

C. If the Conservation Commission determines that abatement or remediation of pollutants is required, it may issue an order shall setting forth a deadline for completion of the abatement or remediation. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town may, at its option, undertake such work, and expenses thereof shall be charged to the violator or property owner. Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Conservation Commission within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty (30) days following a decision of the Conservation Commission affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the cost shall become a special assessment against the property owner of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. c.59, § 57 after the 30th day at which the costs first become due.

D. Criminal and Civil Penalties. Any person who violates any provision of the Stormwater Management By-Law, these Rules and Regulations, or the terms or conditions in any permit or order prescribed or issued there under, may be subject to a fine not to exceed $300 for each day such violation occurs or continues or subject to a civil penalty, which may be assessed in an action brought on behalf of the Town in any court of competent jurisdiction.

E. Noncriminal Disposition. As an alternative to criminal prosecution or civil action, the Town may elect to utilize the noncriminal disposition procedure set forth in M.G.L. c.40, § 21D and § 1-6B of the Town of Dedham General By-Laws, in which case any police officer of the Town of Dedham, the Conservation Agent, and such other persons as are authorized by the Conservation Commission shall be the enforcing person. The penalty for the first violation shall be a warning. The penalty for the second violation shall be $100. The penalty for the third and subsequent violations shall be $300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

F. Entry To Perform Duties Under This By-Law. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Conservation Commission, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under the Stormwater Management By-Law and these Rules and Regulations and may make or

cause to be made such examinations, surveys or sampling as the Commission deems reasonably necessary.

G. Appeals. The decisions or orders of the Conservation Commission shall be final. Further relief shall be available only in a court of competent jurisdiction.

H. Remedies Not Exclusive: The remedies listed in the Stormwater Management By-Law and these Rules and Regulations are not exclusive of any other remedies available under any applicable federal, state, or local law.

SECTION 13: SEVERABILITY

The invalidity of any section, provision, paragraph, sentence, or clause of these Rules and Regulations shall not invalidate any other section, provision, paragraph, sentence, or clause thereof, nor shall it invalidate any permit or determination that previously has been issued.

END OF DEDHAM STORMWATER MANAGEMENT BY-LAW RULES AND REGULATIONS

APPENDIX A: DEFINITIONS

The following definitions supplement those included in the Town of Dedham Stormwater Management By-Law (Chapter 246).

1. ABUTTER
   For the purpose of the Dedham Stormwater Management By-Law and these Rules and Regulations, an abutter is any property owner whose property directly abuts the property upon which work is being proposed.

2. APPLICANT

   A property owner or agent of a property owner who has filed an Application for a Stormwater Management Permit.

3. CONVEYANCE

   A. Any structure or device, including pipes, drains, culverts, curb breaks, paved swales or man-made swales of all types designed or utilized to move or direct stormwater runoff or existing water flow.

   B. Any impervious surface, including pavement, where surface/sheet flow is utilized to remove rainfall.

4. DEDHAM DRAINAGE AND STORMWATER DESIGN STANDARDS

   The Drainage and Stormwater Design Standards promulgated by the Department of Public Works of the Town of Dedham.

5. EMERGENCY STORMWATER PERMIT (ESP)

   An Emergency Stormwater Permit issued in cases where a delay or failure to perform work poses an imminent danger to public health or safety.

6. EROSION CONTROL

   The prevention or reduction of the movement of soil particles or rock fragments.

7. EROSION CONTROL PLAN

   A plan that shows the location and construction detail(s) of the erosion and sediment reduction controls to be utilized for a construction site.

8. EXISTING LAWN
   Grass area which has been maintained and mowed in the previous two years.

9. FILL
   The placement or deposit of any material that raises, either temporarily or permanently, the elevation of any area subject to the By-Law.

10. FLOODING

    A local and temporary inundation or a rise in the surface of a body of water, such that it covers land not usually under water.

11. GRADING

    Changing the level or shape of the ground surface.

12. GROUNDWATER

    All water beneath any land surface including water in the soil and bedrock beneath water bodies.

13. HOODED CATCH BASIN

    A catch basin that is fitted with an inverted elbow over its outlet pipe or similar structure that is designed to retain oils and other floatables within the catch basin sump and prevent them from flowing into the drainage system.

14. IMPERVIOUS SURFACE

    Any material or structure on, above or below the ground that prevents water from infiltrating through the underlying soil. Impervious surface is defined to include, without limitation: paved surfaces (parking lots, sidewalks, driveways), roof tops, swimming pool decks, patios, and paved, gravel and compacted dirt surfaced roads.

15. NEW DEVELOPMENT

    Any construction or disturbance of land that is currently in a natural vegetated state. New development also includes any disturbance beyond existing impervious and disturbed areas that is contiguous to redevelopment projects.

16. OWNER

    A person with a legal or equitable interest in a property.

17. PERSON

    Any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the Commonwealth or political subdivision thereof to the extent subject to Town Bylaws, administrative agency, public or quasi-public corporation or body, the Town of Dedham, and any other legal entity, its legal representatives, agents, or assigns.

18. PERVIOUS MATERIAL

    Soil Types that are listed as Class I, II and III soils as defined in 310 CMR 15.243 and 15.244 based upon the general soil classification used by the U.S. Department of Agriculture and depicted in the Soil Textural Triangle

19. POINT SOURCE

    Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, or container from which pollutants are or may be discharged.

20. REDEVELOPMENT

Any construction, land alteration, or improvement of impervious surfaces that does not meet the definition of new development, above. The following activities are excluded from this definition:

1. Maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders, and correcting substandard intersections and drainage, and repaving.

2. Development, rehabilitation, expansion, and phased projects on previously developed sites, provided the redevelopment results in no net increase in impervious area.

21. RESOURCE AREA

Any area protected under including without limitation: the Massachusetts Wetlands Protection Act, Massachusetts Rivers Act, or Town of Dedham General Wetlands Protection By-Law.

22. SEDIMENTATION

A process of depositing material that has been suspended and transported in water.

23. SLOPE

The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance (*e.g.* a 4:1 slope). It can also be expressed as a percentage of the vertical rise divided by the horizontal distance (*e.g.* a twenty-five (25) percent slope).

24. STORMWATER MANAGEMENT CERTIFICATE OF COMPLIANCE (SMCC)

A document issued by the Conservation Commission after all construction activities have been completed which states that all conditions of an issued Stormwater Management Permit (SMP) have been met and that a project has been completed in compliance with the conditions set forth in a SMP.

APPENDIX B: APPLICATION PROCEDURES FOR STORMWATER MANAGEMENT PERMITS

Applications for a Stormwater Management Permit (SMP) shall include the materials as specified in this section.

A. Fees: The Conservation Commission, Stormwater Officer or its designee shall obtain with each submission an Application fee to be collected at the time of Application according to the Fee Schedule as approved by the Board of Selectmen. After-the-fact Applications shall submit fees at triple the rate set in the Fee Schedule.

B. Signature: The Applicant must sign the Application.

C. Minor Permit Submission Requirements

1. One (1) completed Minor Stormwater Management Permit Application Form with the following:

    a) Name, contact information, and original signatures of owner(s), Applicant(s), and, if applicable, representative.

    b) Address of property as well as assessor map and parcel ID.

    c) Registry of Deeds recording information (book and page) or Land Court Certificate number for parcel(s) on which work is to be conducted.

    d) Project description.

    e) Type of Minor Stormwater Management Permit being requested.

    f) Site plan reference(s).

2. Payment of the Application and review fees.

3. A Stormwater Management Site Plan that may be prepared by drafting or hand sketching. Required elements, depending on site-specific conditions, might at the discretion of the Stormwater Officer, include:

    a) General Information

        (1) Title.

        (2) Date.

        (3) Name and address of record owner and if applicable the name, address, and telephone number of the engineer or surveyor.

        (4) When prepared by a professional, plans shall be stamped by a Registered Professional Engineer, Professional Land Surveyor, or other recognized professional acceptable to the Conservation Commission.

    b) Existing Conditions

        (1) The site's existing topography with approximate contours at 2 foot intervals for the work area.

        (2) Locations of bodies of water, including wetlands, streams, ponds, etc.

(3) Location of existing septic systems and private wells, if present.

(4) Locations of existing buildings, driveways, walls, etc.

(5) Existing trees in the work area over 6 inches in diameter at breast height (dbh) with each designated to remain or to be removed

(6) Locations of soil tests including test pits, borings, groundwater determinations, and percolation tests with the soil logs and percolation testing results, and/or other soil testing procedures, when available

c) Proposed Conditions

(1) Proposed grading plan for work area.

(2) Proposed improvements including location of buildings or other structures, impervious surfaces, utilities, and easements, if applicable. For projects related to single family homes this shall include, at a minimum, house footprint, decks, garages, sheds, sewage disposal systems, roof drainage and storm drainage structures, as applicable, and all areas of existing and proposed impervious areas including tennis courts, swimming pool decks, patios, and driveways, etc. in the work area.

(3) Locations of all erosion and sedimentation control measures and BMPs.

(4) Construction details for all erosion and sedimentation controls proposed to be utilized.

(5) For engineered systems designed to provide drainage or stormwater management including, but not limited to, culverts, drainage outfalls, catch basins and pervious pavement provide an appropriate plan detail, along with an Operation and Maintenance plan required to maintain the design element.

4. Any other information requested by the Stormwater Officer.

The original Minor Stormwater Management Permit Application, including Stormwater Management Site Plan at a legible scale and Operations and Maintenance (O&M) Plan, shall be submitted to the Building Department if being submitted in conjunction with other building permits or Conservation Department if not associated with any other building permits (*e.g.*, driveways, grading only). One (1) electronic copy (pdf) of all Minor Stormwater Management Permits, including Stormwater Management Site Plan and O&M Plan submitted to the Conservation Department shall also be sent to conservation@dedham-ma.gov.

D. Major Permit Submission Requirements

1. One (1) completed Major Stormwater Management Permit Application Form with the following:

a) Name and contact information, of owner(s), Applicant(s), and, if applicable, representative.

b) Address of property as well as assessor map and parcel ID.

c) Registry of Deeds recording information (book and page) or Land Court Certificate number.

d) A brief project description.

e) Type of Major Stormwater Management Permit being requested.

f) Site plan reference(s).

g) Fee information including payer name on check, Applicant name, check number, check amount, and check date.

h) Signature of Applicant, property owner (if different), and representative, if applicable.

i) An Engineering Consultant Fee Acknowledgement signed by the Applicant.

j) A Site Inspection Authorization signed by the property owner.

k) A locus map.

2. Payment of the Application and review fees.

3. A Project Narrative that includes a description of the proposed project and a description of how and where stormwater will be controlled and erosion and sedimentation controls implemented, and an explanation of why the Applicant believes the plans

   a) Meet the Design Standards enumerated in Section 5;

   b) Employ, to the maximum extent practicable, environmentally sensitive site design as outlined in the Massachusetts Stormwater Handbook[6]; \

   c) Attempt to reproduce natural hydrologic conditions with respect to groundwater and surface water.[7]

   d) Include square footage summaries indicating square footage of work area as well as existing, proposed and net changes in impervious surface areas.

4. A Stormwater Management Site Plan prepared as follows:

   a) General Information:

      (1) Sheet size: Sheets shall have a maximum dimension of 24” x 36”. Large plans should be rolled rather than folded. If more than one sheet is needed to describe the proposed work, a key sheet is required showing a general composite of all work proposed.

      (2) Scale: Not more than 1” = 50' (the Conservation Commission routinely accepts plans at 1”=20' or 1”=40'). If project sites are large, an overall site plan at 1” = 100' is acceptable, but detail detailed plans must be at or less than 1” = 50'. Include graphical scales on all plans. Coordinate system shall be 1983 North American Datum, Massachusetts State Plane, feet, and North American Vertical Datum (NAVD) of 1988.

      (3) Title Block: A title block shall be included on all plans, located at the lower right hand corner, oriented to be read from the bottom when bound at the left margin. Include:

         (a) Plan title.

[6] Massachusetts Stormwater Handbook, as most recently updated. http://www.mass.gov/eea/agencies/massdep/water/regulations/massachusetts-stormwater-handbook.html

[7] Guidance on these practices is provided in Appendix C of these Regulations and the MA Stormwater Management Handbook.

(b) Original date plus additional space to reference the title and dates of all plan revisions.
(c) Name and address of record owner and engineer and/or surveyor.
(d) Address of property, Assessor Map and Parcel ID.

(4) Legend: Include legend identifying line types and symbols used in plan set

(5) Locus Map.

b) An Existing Conditions Plan containing the following:

(1) Property lines.

(2) The existing zoning, and land use at the site and abutting properties.

(3) The location(s) of existing easements.

(4) The location of existing utilities.

(5) Existing contours at 2-foot minimum vertical increments. Spot grades for proposed conditions are required when 2-foot contour intervals do not provide sufficient detail to show stormwater flow path and /or more specific detail is needed to demonstrate stormwater flow path.

(6) Existing landscaping and vegetation including all existing trees within 25 feet of the work area that are over 6 inches in diameter breast height (dbh) and major vegetative cover types, including wooded areas defined by tree line drip line, shrub communities, limits of lawn, and edge of tree canopy.

(7) Locations of existing structures, pipes, swales and detention ponds.

(8) Locations of bodies of water, including wetlands.

(9) A delineation of FEMA Special Flood Hazard areas and calculation of FEMA flood elevation, if applicable. Floodplain elevation data shall be based on 1988 NAVD (North American Vertical Datum) and reference the appropriate National Flood Insurance Rate Map and/or Flood Study.

(10) Location of existing septic systems and private wells, if present.

(11) The location(s) of soil tests and description of soil from test pits performed at the location of proposed stormwater management facilities, including but not limited to soil description, depth to seasonal high groundwater, depth to bedrock, and percolation rates. Soils information shall be based on site test pits logged by a Massachusetts Registered Soil Evaluator.

(12) The existing vegetation and ground surfaces with runoff coefficients for each.

(13) Stamp and signature of a Professional Engineer (PE) licensed in the Commonwealth of Massachusetts or Professional Land Surveyor (PLS).

c) A Proposed Conditions Plan containing the following:

(1) Property lines, building envelope restrictions and/or easement areas, including areas affected by conservation restrictions, if applicable.

(2) Proposed improvements including location of buildings or other structures, utilities, easements, etc., if applicable, and impervious surfaces. For single family homes plans shall show, at a minimum, house footprint, decks, garages, sheds, sewage disposal systems, , roof drainage and stormwater drainage structures, as applicable), and all areas of existing and proposed impervious areas including tennis courts, , patios, and driveways, etc.

(3) FEMA Special Flood Hazard areas, if applicable.

(4) Limit of work.

(5) Proposed grading for work area. Proposed contours at 2-foot minimum vertical increments. Spot grades for proposed conditions are required when 2-foot contour intervals do not provide sufficient detail to show stormwater flow path and /or more specific detail is needed to demonstrate stormwater flow path.

(6) Locations for storage of materials, equipment, soil, snow and other potential pollutants.

(7) Location(s) and description of existing stormwater conveyances, impoundments, wetlands, drinking water resource areas, or other critical environmental resource areas on or adjacent to the site or into which stormwater flows.

(8) Proposed drainage facilities (plan view and details) including drawings of all components of the proposed stormwater management system including:

1. Locations, cross sections, and profiles of all brooks, streams, drainage swales and their method of stabilization.

2. All measures for the detention, retention or infiltration of water.

3. All measures for the protection of water quality.

4. For engineered systems designed to provide drainage or stormwater management including, but not limited to, culverts, drainage outfalls, catch basins and pervious pavement ‘systems’; provide an appropriate plan detail with notes on drawings specifying materials to be used, and construction specifications.

5. Notes indicating the required inspections for the site and the stormwater drainage facilities during construction.

(9) Proposed landscaping, vegetation, and ground surfaces with runoff coefficients for each. When proposing mitigation areas, a table on the plan shall indicate plant types and quantities. At least 2:1 tree planting of (minimum 1-inch caliper) native trees shall be required for mitigation of each of the trees removed greater than 6 inches dbh. If it is not feasible to plant at least twice the number of trees removed, with the approval of the Conservation Commission, an applicant may substitute at least a 4:1 shrub replacement for trees removed.

(10) Locations where stormwater discharges to surface water (include all roads, drains and other structures that could carry stormwater to a wetland or other water body, on or offsite).

(11) A general construction note that states the Conservation Commission shall be notified prior to work in accordance with project permits.

(12) Stamp and signature of a Professional Engineer (PE) licensed in the Commonwealth of Massachusetts to certify that the Stormwater Management Plan is in accordance with the criteria established in the Stormwater Regulations; a stamp and signature of a Professional Land Surveyor (PLS) is acceptable if no drainage facilities are proposed and they have the experience and capability to prepare the required Site Plan and to provide the required existing and proposed grading and erosion control provisions.

5. An Erosion and Sediment Control Plan showing the following:
   c) Proposed erosion controls and materials to be used (i.e. straw bales, silt fence and straw wattles, compost filter mitts, etc.) must be indicated on the plan. In projects anticipated to encounter or manage groundwater, provide dewatering contingency plans, details, and location(s). Hay bales may not be used as these have been found to introduce invasive species.

6. A Stormwater Management Plan Report shall be prepared in conformance with the Design Standards contained in Section 5 and contain the following elements:

   c) The existing site hydrology.

   d) A drainage area map showing pre- and post-construction watershed boundaries, drainage area and stormwater time of concentration (Tc) flow paths, including 42drainage system flows.

   e) Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in this Regulation. Such calculations shall include:

      (10) Description of the design storm frequency, intensity and duration.

      (11) Time of concentration.

      (12) Soil Runoff Curve Number (CN) based on land use and soil hydrologic group.

      (13) Peak runoff rates and total runoff volumes for each watershed area.

      (14) Information on construction measures used to maintain the infiltration capacity of the soil where any kind of infiltration is proposed.

      (15) Infiltration rates, where applicable.

      (16) Culvert capacities.

      (17) Flow velocities.

      (18) Data on the increase in rate and volume of runoff for the specified design storms.

      (19) Documentation of sources for all computation methods and field test results.

   f) If a project requires a Stormwater Pollution Prevention Plan (SWPPP) per the NPDES General Permit for Storm Water Discharges from Construction Activities (applicable to construction sites that disturb one or more acres of land), then the Applicant is required to submit a complete copy of the SWPPP (including the signed Notice of Intent and approval letter) as part of its Application for a SMP.

7. An Erosion and Sedimentation Control Report shall be prepared in accordance with Section 14 of the Town of Dedham Drainage & Design Standards and contain the following elements:

c) Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas.

d) All pollution control measures (structural and non-structural BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. Appropriate control measures must be identified for each major construction activity and the operator responsible for the implementation of each control measure must also be identified.

e) The intended sequence and timing of activities that disturb soils at the site and the general sequence during the construction process in which the erosion and sediment control measures will be implemented.

f) Structural practices to divert flows form exposed soils, retain/detain flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains must be avoided to the degree practicable.

g) Interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided.

h) Construction and waste materials expected to be stored on-site with updates as appropriate, including descriptions of controls, and storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.

i) Measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust.

j) Measures to prevent the discharge of solid materials, including building materials, to water of the United States, except as authorized by a permit issued under Section 404 of the CWA.

k) Pollutant sources from areas other than construction and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

l) Proposed dewatering operations including proposed locations of discharge.

m) An Operation and Maintenance Schedule for structural and non-structural measures, interim grading, and material stockpiling areas.

8. Post Construction Operation and Maintenance Plan (O&M)

c) The Post-Construction O&M Plan shall be included that shall be designed to ensure compliance with the Permit, the Stormwater Management By-Law and these Rules and Regulations and that the Massachusetts Surface Water Quality Standards, 314, CMR 4.00 are met in all seasons and throughout the life of the system. The O&M Plan shall be a stand-alone document, and shall remain on file with the Conservation Commission and shall be an ongoing requirement. The O&M Plan shall apply to the entire project site, not just the disturbance area.

d) The Post-Construction O&M Plan shall include, at a minimum:

(10) The name(s) of the owner(s) for all components of the system and emergency contact information.

(11) The signature(s) of the owner(s).

(12) The names and addresses of the person(s) currently responsible for O&M. If O&M responsibility is contracted to a third party; a copy of the maintenance agreement(s) must be provided. If the responsible party is not the owner of the property where the BMP is located then a copy of the legal instrument that establishes the terms of and legal responsibility for the O&M of the project site BMPs as well as a plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions must be included.

(13) An Inspection and Maintenance Schedule for all stormwater management facilities including routine and non-routine maintenance tasks to be performed.

(14) A reduced size plan or map clearly showing the location of the systems and facilities including easements, catch basins, manholes/access lids, main, and stormwater devices.

(15) If applicable, a list of easements necessary for the construction and O&M of the stormwater system, with the purpose and location of each. Easements shall be recorded with the Norfolk County Registry of Deeds prior to issuance of a Stormwater Management Certificate of Compliance by the Conservation Commission.

(16) Estimated annual O&M budget.

(17) O&M inspection schedule and log form.

(18) The final O&M Plan shall be signed by the property owner and recorded at the Norfolk County Registry of Deeds to provide assurance that the transfer of responsibilities is understood by future owners.

(19) Provisions for the Conservation Commission, Stormwater Officer or its designee to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.

9. In addition to the original, the Applicant shall provide the following copies:

c) One (1) copy of the complete Major Stormwater Management Permit Application package with full size plans.

d) Eight (8) copies of the Major Stormwater Management Permit Application Form with copies of the Existing Conditions Plan (reduced to 11” x 17”), Proposed Conditions Plan (reduced to 11” x 17”), Erosion and Sedimentation Controls Plan (reduced to 11” x 17”), Post-Construction O&M Plan shall be submitted.

e) An electronic (pdf) version of the complete Major Stormwater Management Permit Application package sent to conservation@dedham-ma.gov.

f) Additional copies may be requested by the Conservation Commission.

APPENDIX C: LOW IMPACT DEVELOPMENT PRACTICES

Low Impact Development (LID) strategies use careful site design and decentralized stormwater management to reduce the environmental footprint of new growth and redevelopment. This approach improves water quality, minimizes the need for expensive pipe and pond stormwater systems, and creates more attractive developments. The following are LID strategies and various benefits of implementation.

1. Bioretention cells, commonly known as rain gardens, are relatively small-scale, landscaped depressions containing plants and a soil mixture that absorbs and filters runoff.

   Management Objectives:
   - Provide quality treatment.
   - Remove suspended solids, metals, nutrients.
   - Increase groundwater recharge through infiltration.
   - Reduce peak discharge rates and total runoff volume.

2. Permeable and porous pavements allow water to soak through the paved surface into the ground beneath. Permeable pavement encompasses a variety of mediums including: porous concrete and asphalt, plastic grid systems and interlocking paving bricks.

   Management Objectives:
   - Reduce stormwater runoff volume from paved surfaces.
   - Reduce peak discharge through infiltration.
   - Reduce pollutant transport through direct infiltration.
   - Improve site landscaping benefits (grass pavers).

3. Grass swales are broad, open channels sown with erosion resistant and flood tolerant grasses.

   Management Objectives:
   - Provide water quality treatment; remove suspended solids; heavy metals, trash.
   - Reduce peak discharge rate and total runoff volume.
   - Infiltrate water into the ground.
   - Provide a location for snow storage.

4. Infiltration Trenches and Dry Wells These are standard stormwater management structures that store water in the void space between crushed stone or gravel; the water slowly percolates downward into the subsoil.

   Management Objectives:
   - Remove suspended solids, heavy metals trash, oil, and grease.
   - Reduce peak discharge rate and total runoff volume.
   - Provide modest infiltration and recharge.
   - Provide snow storage areas.

5. Grass Filter Strips are low-angle vegetated slopes designed to treat sheet flow runoff from adjacent impervious areas.

   Management Objectives:
   - Remove suspended solids, heavy metals, trash, oil and grease.

- Reduce peak discharge rate and total runoff volume.
- Provide modest infiltration and recharge.
- Provide snow storage areas.

6. Roadway and Parking Lot Design:

   Management Objectives:
   - Reduce total impervious surface.
   - Reduce road/parking construction costs.
   - Provide save access and adequate parking.
   - Minimize disturbance to natural site hydrology.
   - Create opportunities for stormwater treatment and infiltration.
   - Improve site appearance.

7. Cisterns and rain barrels harvest and store rainwater collected from roofs [Note: not to be used as part of measures to meet minimum recharge volumes]

   Management Objectives:
   - Storing and diverting runoff.
   - Reduce flooding and erosion caused by stormwater runoff.
   - They contain no salts or sediment which provides "soft" chemical-free water for garden or lawn irrigation, reducing water bills and conserving municipal water supplies.

8. Other LID Implementations

   - Shared Driveways.
   - Green Roofs.
   - Eliminating curbs and gutters, or minimizing in new construction.
   - Roughening surfaces.
   - Creating long flow paths over landscaped areas.
   .
   - Creating terraces and check dams.
   - Pervious pavers.
   - Infiltration, Filtration
     - ° Rain gardens.
     - ° Disconnected downspouts (not on hills).
     - ° Filter Mitts.

9. Maintenance of Paved Surfaces

   - No coal-tar pavement sealants.
   - No sodium deicers.

10. Low Impact Landscaping

    - Native, drought tolerant species.
    - Turf area conversion (shrubs, etc.).
    - Encouraging longer grass length.
    - Planting wildflower meadows rather than turf along medians.

Conservation Development

Like LID, Conservation Development tries to mitigate the effects of urbanization, but it places additional emphasis on protecting aquatic habitat and other natural resources. Conservation Development subdivisions are characterized by compact clustered lots surrounding a common open space. Conservation Development's goal is to disturb as little land area as possible while simultaneously allowing for the maximum number of residences permitted under zoning laws.

Prior to new construction, conservation developers evaluate natural topography, natural drainage patterns, soils and vegetation. They deploy stormwater Best Management Practices to help prevent flooding and protect natural hydrology. By maintaining natural hydrological processes, Conservation Development creates conditions that slow, absorb, and filter stormwater runoff onsite.

Because future development threatens valuable natural features, Conservation Development provides specific provisions for long-term and permanent resource protection. Conservation easements, transfer of development rights, and other "in perpetuity" mechanisms ensure that protective measures are more than just temporary.

Better Site Design

The goals of Better Site Design are to reduce impervious cover, preserve natural lands, and capture stormwater onsite. To meet these goals, designers employ a variety of methods. To reduce impervious cover, they narrow streets and sidewalks, minimize cul-de-sacs, tighten parking spaces, and reduce the size of driveways and housing lots.

To reduce stormwater runoff, designers preserve natural lands, using them as buffer zones along streams, wetlands and steep slopes. They employ landscaping techniques that flatten slopes and preserve native vegetation and clusters of trees. They create bio-retention areas - open channels, filter strips and vegetated swales - to increase stormwater infiltration, helping to protect streams, lakes, and wetlands.

Water Reuse/Water Conservation

In order to conserve potable water supplies and maximize recharge, it may be appropriate on some sites to store and reuse clean runoff (*e.g.* from roofs) for reuse on the site for irrigation or other greywater purposes. This can be accomplished through the use of cisterns and rain barrels. Where appropriate, a water budget may be required to be prepared to determine applicability.

APPENDIX D: STANDARD CONDITIONS FOR STORMWATER MANAGEMENT PERMITS

Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Permit.

1. This Permit does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.

2. This Permit does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, by-laws, or regulations.

3. The work authorized hereunder shall be completed within three years from the date of this Permit unless the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance and both that date and the special circumstances warranting the extended time period are set forth in this Permit.

4. This Permit may be extended by the issuing authority for one or more periods of up to three years each upon Application to the issuing authority at least 30 days prior to the expiration date of the Order.

5. Prior to commencement of any work on-site, this Permit and a copy of the Post-Development Operations and Maintenance Plan, signed by the property owner(s), shall be recorded against the deed of the property, and evidence of recording of both shall be provided to the Dedham Conservation Commission.

6. A copy of the Registry recorded Permit shall be kept on-site at all times during construction. All contractors and subcontractors engaged during construction shall be provided with a copy of this Permit and all supporting documents before commencing work.

7. Prior to the Pre-Construction Meeting and commencement of any activity on this site, the Applicant shall provide surety to the Town of Dedham in an amount and form satisfactory to the Conservation Commission, pursuant to Section 11 of the Dedham Stormwater Management Rules and Regulations, providing for the completion of the work authorized under this Permit in accordance with the submitted Application/plans, this Permit, and all applicable regulations, including the Stormwater Management By-Law and the Conservation Commission's Stormwater Management Rules and Regulations. Provision shall be made as necessary for performance of any conditions which are of a continuing nature. The Applicant may propose a bond or deposit release schedule.[8]

8. The Applicant shall provide the Conservation Commission a forty-eight (48) hour notice, in writing, before starting any work authorized or required by this Permit.

9. Prior to the start of work, the Applicant shall provide a sign, which shall be posted on the premises at a location visible from the street. The sign shall be not less than two square feet and nor more than three square feet in size bearing the words,

   Dedham Stormwater Management Permit
   MSMP [**Permit #**]

10. Prior to the start of work, the Applicant shall install erosion and sedimentation controls in accordance with approved design.

11. After installation of erosion and sedimentation controls and installation of the sign required by Standard Conditions 9, but prior to the conduct of any other site work authorized or required by this Permit, a pre-construction meeting must be held with the Conservation Commission's Agent, the Applicant, and the person and/or contractor engaged to install the stormwater management system.

[8] This requirement may be waived for owner occupied single family dwelling development.

This is to ensure that all aspects of the Permit are fully understood, particularly the necessity to install the system in accordance with the approved design details.

12. The Applicant shall provide, at its own expense, on-site construction supervisor(s), and shall notify the Dedham Conservation Commission in writing of the identity and 24 hour phone numbers(s) and email address(es) of the on-site construction supervisor(s) whose responsibility shall be to ensure compliance with the Conditions of this Permit. The Dedham Conservation Commission shall be notified should the construction supervisor(s) or hi/her/their contact information change at any point during this project.

13. Accepted engineering and construction industry standards of workmanship, materials, and procedures shall be followed to the completion of the project in a proper, substantial, and workman-like manner. Engineering and construction shall be provided in a manner consistent with the level of care and skill ordinarily exercised by those providing services under similar circumstances, and all work must abide by all current Federal, State, and Local regulations and codes regarding engineering and construction.

14. In the event of any spill of hazardous materials (including gasoline, fuel oils, lubricants and hydraulic fluids), the Dedham Fire Department (781-326-2212), the DEP's Spill Response Unit (617-556-1133), the Dedham Board of Health (781-752-9220), the Dedham Conservation Commission Office (781-751-9210), and the Dedham-Westwood Water District (781-329 or 781-326-1250) shall be contacted immediately.

15. The Contractor shall clean up at least daily, all refuse, rubbish, concrete washout from trucks, scrap and surplus materials, debris, and unneeded construction equipment resulting from the construction operations. The site of the work and the adjacent areas shall be kept in a neat and orderly condition. Sediments that might be deposited on streets adjacent to the site shall be swept up daily.

16. A portable sanitary facility shall be located on site during construction.

17. Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.

18. All loam to be used in the landscaped areas of the site shall be from sources certified to be free from weed seeds, especially those of invasive species.

19. All excavated earth material not used during this project and all construction waste and debris shall be removed from the site and disposed of in accordance with applicable regulations.

20. The Applicant shall immediately control any erosion problems that occur on-site and shall notify the Conservation Commission of said problems. If any erosion problems occur it may become necessary to install additional erosion and sedimentation controls in association with this project.

21. Following completion of work, the Applicant shall request, in writing, that a Stormwater Management Certificate of Compliance be issued. The request shall state that stormwater management system has been satisfactorily installed and the site has been adequately stabilized.

22. After completion of construction, fertilizers utilized for landscaping and/or lawn care shall be organic in nature and of the low phosphorus content variety. Fertilizers shall be used in moderation. The use of fertilizers containing ammonium nitrate or ammonium phosphate is prohibited.

23. The owners of the project and their successors in title, in the event they proceed to alter areas subject to the Conservation Commission's jurisdiction under this Permit, agree that the Town of Dedham shall have no responsibility to maintain the proposed drainage system and that said Town shall not be liable for any damages in the event of failure. By acceptance of this Permit, the owners indemnify and hold harmless the Town of Dedham and its residents for any damages attributable to alterations

undertaken on this property pursuant to this Permit. Issuance of this Permit does not in any way imply or certify that the site or downstream areas will not be subject to flooding, storm damage, or any other form of water damage.

24. The work shall also conform to the attached Special Conditions:

CONSTRUCTION SITE INSPECTION REPORT

General Information

Project Name			
Project Location			
Inspector's Name			
Site Operator			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Subject to USEPA Construction General Permit? Yes ☐ No ☐ If yes, has NOI been approved? Yes ☐ No ☐ If yes, attach approved NOI to this report. **If no, contact contractor immediately to determine status of NOI.**			
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe the current phase of construction			

Site-Specific BMPs

Customize the following BMPs to be consistent with the SWPPP for the site being inspected.

	BMP Description	Installed and Operating Properly?	Corrective Action Needed
1		Yes ☐ No ☐	
2		Yes ☐ No ☐	
3		Yes ☐ No ☐	
4		Yes ☐ No ☐	
5		Yes ☐ No ☐	
6		Yes ☐ No ☐	
7		Yes ☐ No ☐	
8		Yes ☐ No ☐	
9		Yes ☐ No ☐	
10		Yes ☐ No ☐	
11		Yes ☐ No ☐	
12		Yes ☐ No ☐	
13		Yes ☐ No ☐	
14		Yes ☐ No ☐	
15		Yes ☐ No ☐	
16		Yes ☐ No ☐	
17		Yes ☐ No ☐	
18		Yes ☐ No ☐	
19		Yes ☐ No ☐	
20		Yes ☐ No ☐	

Erosion and Sediment Control (ESC) on Construction Sites

Document any of the following issues found on the construction site, and the corrective action(s) required for each.

Issue	Status	Corrective Action Needed
Have all ESC features been constructed before initiating other construction activities?	Yes ☐ No ☐	
Is the contractor inspecting and maintaining ESC devices regularly?	Yes ☐ No ☐	
Is existing vegetation maintained on the site as long as possible?	Yes ☐ No ☐	
Is construction staged so as to minimize exposed soil and disturbed areas?	Yes ☐ No ☐	
Are disturbed areas restored as soon as possible after work is completed?	Yes ☐ No ☐	
Is clean water being diverted away from the construction site?	Yes ☐ No ☐	
Are sediment traps and sediment barriers cleaned regularly?	Yes ☐ No ☐	
Are vegetated and wooded buffers protected and left undisturbed?	Yes ☐ No ☐	
Are soils stabilized by mulching and/or seeding when they are exposed for a long time?	Yes ☐ No ☐	
Has vegetation been allowed to establish itself before flows are introduced to channels?	Yes ☐ No ☐	
Is regular, light watering used for dust control?	Yes ☐ No ☐	
Is excessive soil compaction with heavy machinery avoided, to the extent possible?	Yes ☐ No ☐	

(continued)

Issue	Status	Corrective Action Needed
Are erosion control blankets used when seeding slopes?	Yes ☐ No ☐	
Are trees and vegetation that are to be retained during construction adequately protected?	Yes ☐ No ☐	
Are areas designated as off-limits to construction equipment flagged or easily distinguishable?	Yes ☐ No ☐	
If excavated topsoil has been salvaged and stockpiled for later use on the project, are stockpiles adequately protected?	Yes ☐ No ☐	
Are temporary slope drains or chutes used to transport water down steep slopes?	Yes ☐ No ☐	
Do all entrances to the storm sewer system have adequate protection?	Yes ☐ No ☐	

Overall Site Conditions

Document any of the following issues found on the construction site, and the corrective action(s) required for each.

Issue	Status	Corrective Action Needed
Are slopes and disturbed areas not being actively worked properly stabilized?	Yes ☐ No ☐	
Are material stockpiles covered or protected when not in use?	Yes ☐ No ☐	
Are natural resource areas protected with sediment barriers or other BMPs?	Yes ☐ No ☐	
Are perimeter controls and sediment barriers installed and maintained?	Yes ☐ No ☐	

(continued)

Issue	Status	Corrective Action Needed
Are discharge points and receiving waters free of sediment deposits and turbidity?	Yes ☐ No ☐	
Are storm drain inlets properly protected?	Yes ☐ No ☐	
Is there evidence of sediment being tracked into streets?	Yes ☐ No ☐	
Is trash/litter from the construction site collected and placed in dumpsters?	Yes ☐ No ☐	
Are vehicle/equipment fueling and maintenance areas free of spills and leaks?	Yes ☐ No ☐	
Are potential stormwater contaminants protected inside or under cover?	Yes ☐ No ☐	
Is dewatering from site properly controlled?	Yes ☐ No ☐	
Are portable restroom facilities properly sited and maintained?	Yes ☐ No ☐	
Are all hazardous materials and wastes stored in accordance with local regulations?	Yes ☐ No ☐	

Non-Compliance Actions

The municipality shall provide the site operator with a copy of this report, and notice of the corrective action(s) to be taken. The site operator shall have thirty days from the receipt of the notice to commence curative action of the violation.

SOP #X: CONSTRUCTION SITE INSPECTION SOP

Erosion and sedimentation from land-disturbing human activities can be a significant source of stormwater pollution to nearby bodies of water. This Standard Operating Procedure describes the major components of a Stormwater Construction Inspection Plan, procedures for evaluating compliance of stormwater controls at construction sites, and methods for reducing or eliminating pollutant loading from land disturbing activities.

Controlling Erosion and Sediment through Design and Planning

Prevention of erosion and sedimentation is preferable to installing treatment devices. Consistent application and implementation of the following guidelines during the design and review phases can prevent erosion and sedimentation:

1. Avoid sensitive areas, steep slopes, and highly erodible soils to the maximum extent possible when developing site plans.
2. Identify potential problem areas before the site plan is finalized and approved.
3. Plan to use sediment barriers along contour lines, with a focus on areas where short-circuiting (i.e., flow around the barrier) may occur.
4. Use berms at the top of a steep slopes to divert runoff away from the slope's edge.
5. Design trapezoidal or parabolic vegetated drainage channels, not triangular.
6. Use vegetated channels with rip rap check dams, instead of impervious pavement or concrete, to reduce the water velocity of the conveyance system.
7. Design a check dam or sediment forebay with level spreader at the exit of outfalls to reduce water velocity of the discharge and collect sediment.
8. Use turf reinforcement matting to stabilize vegetated channels, encourage vegetation establishment, and withstand flow velocities without scouring the base of the channel.
9. Plan open channels to follow land contours so natural drainage is not disrupted.
10. Use organic matting for temporary slope stabilization and synthetic matting for permanent stabilization.
11. Provide a stable channel, flume, or slope drain where it is necessary to carry water down slopes.

Stormwater Construction Inspection Plan

The Town has developed this Stormwater Construction Site Inspection program to track, inspect, and enforce local stormwater requirements at construction sites.

A Stormwater Construction Site Inspection program should include or address the following:

1. Construction Site Inventory
    - Have a tracking system to inventory projects and identify sites for inspection.

- Track the results of inspection and prioritize sites based on factors such as proximity to waterways, size, slope, and history of past violations.

2. Construction Requirements and BMPs
   - Provide guidance to contractors on the appropriate selection and design of stormwater BMPs.
3. Plan Review Procedures
   - Ensure submitted plans address local requirements and protect water quality.
4. Public Input
   - Per the Massachusetts MS4 Permit, allow the public to provide comment on inspection procedures and consider information provided by the public.
5. Construction Site Inspections
   - Identify an inspection frequency for each site.
   - See more detailed information below under Erosion and Sediment Control Inspections on Construction Sites.
6. Enforcement Procedures
   - Present a written progressive enforcement policy for the inspection program.
   - Utilize sanctions, both monetary and non-monetary, to ensure compliance with the program
7. Training and Education
   - Provide training to municipal staff conducting inspections on regulatory requirements, BMPs, inspections, and enforcement.

Erosion and Sediment Control Inspections on Construction Sites

During the construction phase, it is important to inspect active sites regularly to ensure that practices are consistent with approved site plans and the site's Stormwater Pollution Prevention Plan (SWPPP) and the Town's stormwater regulations. The role of the construction inspector is to ensure that all precautions are taken to prevent pollutants and sediment from the construction site from impacting local waterways.

The attached Erosion and Sedimentation Control Inspection Report shall be used by the inspector during site visits. Construction site inspectors should abide by the following guidelines:

1. Inspections to monitor stormwater compliance should be performed at least once per month at each active construction site, with priority placed on sites that require coverage under the USEPA Construction General Permit (i.e., that disturb one or more acres), and sites that are located in the watershed of any 303(d) water bodies.
2. The inspection shall begin at a low point and work uphill, observing all discharge points and any off-site support activities.
3. Written and photographic records shall be maintained for each site visit.
4. During the inspection, the inspector should ask questions of the contractor. Understanding the selection, implementation, and maintenance of BMPs is an important goal of the inspection process, and requires site-specific input.

5. The inspector should not recommend or endorse solutions or products. The inspector may offer appropriate advice, but all decisions must be made by the contractor.
6. The inspector shall always wear personal protective equipment appropriate for the site.
7. The inspector shall abide by the contractor's site-specific safety requirements.
8. The inspector has legal authority to enter the site. However, if denied permission to enter the site, the inspector should never force entry.
9. Erosion and sediment control features should be constructed before initiating activities that remove vegetated cover or otherwise disturb the site. These shall be installed consistent with the approved site plans and with manufacturer's instructions.
10. Erosion and sediment control devices shall be inspected by the contractor regularly, and maintained as needed to ensure function.
11. In the SWPPP or other document, the contractor shall clearly identify the party responsible for maintaining erosion and sediment control devices.
12. Existing vegetation should be maintained on site as long as possible.
13. Construction should proceed progressively on the site in order to minimize exposed soil, and disturbed areas should be restored as soon as possible after work has been completed.
14. Stockpiles shall be stabilized by seeding or mulching if they are to remain for more than two weeks.
15. Disturbed areas shall be protected from stormwater runoff by using protective Best Management Practices (BMPs).
16. Clean water shall be diverted away from disturbed areas on construction sites to prevent erosion and sedimentation.
17. Sediment traps and sediment barriers should be cleaned out regularly to reduce clogging and maintain design function.
18. Vegetated and wooded buffers shall be protected.
19. Soils shall be stabilized by mulching and/or seeding when they would be exposed for more than one week during the dry season, or more than two days during the rainy season.
20. Vegetation shall be allowed to establish before introducing flows to channels.
21. Regular light watering shall be used for dust control, as this is more effective than infrequent heavy watering.
22. Excessive soil compaction with heavy machinery shall be avoided, to the extent possible.
23. Construction activities during months with higher runoff rates shall be limited, to the extent possible.

Prior to planning a site visit, the inspector shall determine if the project is subject to the USEPA Construction General Permit, which is true if the project disturbs one or more acres in total.

If the site requires this coverage, the inspector shall visit the USEPA Region 1 eNOI website (http://cfpub.epa.gov/npdes/stormwater/cgpenoi.cfm or http://cfpub.epa.gov/npdes/stormwater/noi/noisearch.cfm) to determine if the contractor filed for coverage under the Construction General Permit. Print a copy of the project's NOI.

If the project disturbs one or more acres and is under construction, but does not show up in an existing database, the project is in violation of the Construction General Permit. Call the contractor to determine if the NOI process has been started. If not, notify the contractor verbally of this requirement and the violation. Work cannot proceed on the site until a Notice of Intent (NOI) for coverage under the Construction General Permit has been approved by USEPA. The inspector may choose to print instructions on how to file an NOI and meet with the contractor to review these. Issue a written Stop Work Order until the NOI has been approved by USEPA.

Once it has been determined that the site is in compliance with the requirements of the most recent Construction General Permit, the site inspection process can continue. The Construction Site Inspection process shall include the following:

1. Plan the inspection before visiting the construction site
    a. Obtain and review permits, site plans, previous inspection reports, and any other applicable information.
    b. Print the approved NOI from the USEPA Construction General Permit NOI website, listed previously.
    c. Inform the contractor of the planned site visit.
2. Meet with the contractor
    a. Review the Construction SWPPP (if the site includes over one acre of disturbance) or other document, as required by the municipality's legal authority. Compare BMPs in the approved site plans with those shown in the SWPPP.
    b. Review the project's approved NOI and confirm that information shown continues to be accurate.
    c. Get a general overview of the project from the contractor.
    d. Review inspections done by the contractor.
    e. Review the status of any issues or corrective actions noted in previous inspection reports.
    f. Discuss any complaints or incidents since the last meeting.
3. Inspect perimeter controls
    a. Examine perimeter controls to determine if they are adequate, properly installed, and properly maintained.
    b. For each structural BMP, check structural integrity to determine if any portion of the BMP needs to be replaced or requires maintenance.
4. Inspect slopes and temporary stockpiles
    a. Determine if sediment and erosion controls are effective.
    b. Look for slumps, rills, and tracking of stockpiled materials around the site.
5. Compare BMPs in the site plan with the construction site conditions
    a. Determine whether BMPs are in place as specified in the site plan, and if the BMPs have been adequately installed and maintained.
    b. Note any areas where additional BMPs may be needed which are not specified in the site plans.
6. Inspect site entrances/exits

   a. Determine if there has been excessive tracking of sediment from the site.
   b. Look for evidence of additional entrances/exits which are not on the site plan and are not properly stabilized.
7. Inspect sediment basins
   a. Look for signs that sediment has accumulated beyond 50% of the original capacity of the basin.
8. Inspect pollution prevention and good housekeeping practices
   a. Inspect trash areas and material storage/staging areas to ensure that materials are properly maintained and that pollutant sources are not exposed to rainfall or runoff.
   b. Inspect vehicle/equipment fueling and maintenance areas for the presence of spill control measures and for evidence of leaks or spills.
9. Inspect discharge points and downstream, off-site areas
   a. Walk down the street and/or in other directions off-site to determine if erosion and sedimentation control measures are effective in preventing off-site impacts.
   b. Inspect down-slope catch basins to determine if they are protected and identify whether sediment buildup has occurred.
10. Meet with the contactor again prior to leaving
   a. Discuss the effectiveness of current controls and whether modifications are needed.
   b. Discuss possible violations or concerns noted during the site inspection, including discrepancies between approved site plans, the SWPPP, and/or the implementation of stormwater controls.
   c. Agree on a schedule for addressing all discrepancies and schedule a follow-up inspection.
11. Provide a written copy of the inspection report to the contractor.
12. Follow up, as determined, and provide copy of subsequent inspection to the contractor.
13. Use Stop Work orders, as needed, until compliance with the Construction General Permit and/or other document, as required by the municipality's legal authority, can be achieved.

Controlling Erosion and Sediment by Proper Maintenance of Permanent BMPs

Many construction phase BMPs can be integrated into the final site design, but ongoing inspection and maintenance are required to ensure long-term function of any permanent BMP. The following guidelines summarize the requirements for long-term maintenance of permanent BMPs.

1. Responsibility for maintaining erosion and sediment control devices shall be clearly identified.
2. Erosion and sediment control devices shall be inspected following heavy rainfall events to ensure they are working properly.
3. Erosion control blankets shall be utilized when seeding slopes.
4. Vegetated and wooded buffers shall be protected, and left undisturbed to the extent possible.
5. Runoff shall not be diverted into a sensitive area unless this has been specifically approved.
6. Sedimentation basins shall be cleaned out once sediment reaches 50% of the basin's design capacity.
7. Snow shall not be plowed into, or stored within, retention basins, rain gardens, or other BMPs.

8. Easements and service routes shall be maintained, to enable maintenance equipment to access BMPs for regular cleaning.

Attachments

1. Construction Site Stormwater Inspection Report

JASON L. MAMMONE, P.E.
DIRECTOR OF ENGINEERING

NATHAN S. BUTTERMORE, P.E.
INFRASTRUCTURE ENGINEER

RONALD I. LAWRENCE
PROJECT ENGINEER

EMAN SAYEGH
GIS MANAGER

TOWN OF DEDHAM

Commonwealth of Massachusetts

55 RIVER STREET
DEDHAM, MA 02026-2935

(781) 751-9350
FAX (781) 751-9359

www.dedham-ma.gov

PROJECT NAME:_____
APPLICANT:_____
PLAN DATE:_____ **REV DATE:**_____
REVIEWED BY:_____
DATE REVIEWED:_____

Y	N	?	MAJOR STORMWATER MANGEMENT PERMIT CHECKLIST
			PART 1 – STORMWATER MANAGEMENT SITE PLAN SET REQUIREMENTS
			GENERAL
			Includes description of proposed project and description of how and where stormwater will be controlled and erosion and sediment controls to be implemented?
			Plan Set at a scale not less 1" = 30'?
			Plan set tied horizontally to 1983 North American Datum, MA State Plane (feet)?
			Plan set tied vertically to 1988 North American Vertical Datum, MA State Plane (feet)?
			Includes name & address of record owner and the name and address of the engineer or surveyor on the plan set?
			Includes address of property, Assessor Map and Parcel ID on plan set?
			Includes a locus map?
			Is property located within the Aquifer Protection Overlay district?
			Includes stamp and signature of a PE licensed in MA; a stamp and signature of a PLS licensed in MA is acceptable if no drainage facilities are proposed and they have experience and capability to prepare the required Site Plan and to provide the required existing and proposed grading, and erosion control provisions.
			EXISTING CONDITIONS PLAN
			Includes property lines for the entire property?
			Includes existing zoning and land use at the site and abutting properties?
			Includes locations of existing easements?
			Includes locations of existing utilities?
			Includes existing topography of the property at 2 foot contours?
			Includes locations of bodies of water, including wetlands?
			Includes location of existing septic system and private wells, if present?
			PROPOSED CONDITIONS PLAN
			Includes proposed grading for the property?
			Includes proposed improvements including location of buildings or other structures, impervious surfaces, utilities, and easements, if applicable?
			Includes proposed drainage facilities in plan view with pertinent details, if applicable?
			Indicates areas of soil disturbance and areas that will not be disturbed?

Y	N	?	MAJOR STORMWATER MANGEMENT PERMIT CHECKLIST
			Includes locations of soil testing including test pits, groundwater determinations, and percolation tests with the soil logs and percolation testing results, and/or other soil testing procedures?
			Includes notes indicating the required inspection for the site and the stormwater drainage facilities?
			EROSION AND SEDIMENTATION CONTROL PLAN
			Includes locations of for storage of materials, waste, vehicles, equipment, soil, snow and other potential pollutants?
			Includes locations where stormwater discharges to surface water (includes all roads, drains and other structures that could carry stormwater to a wetland or other water body, on or off-site)?
			Includes erosion control notes applicable to the project?
			Includes a description & delineation of existing stormwater conveyances, impoundments, wetlands, drinking water resource area, swimming beaches or other critical environmental resource areas on or adjacent to the site or into which stormwater flows?
			Includes a delineation of FEMA Special Flood Hazard areas, if applicable?
			Includes estimated seasonal high groundwater elevations in areas to be used for stormwater retention, detention, or infiltration?
			Includes the existing and proposed vegetation and ground surfaces with runoff coefficients for each?
			Includes the locations, cross sections and profiles of all brooks, streams, drainage swales and their method of stabilization?
			Includes all measures for the detention, retention or infiltration of water?
			Includes all measures for the protection of water quality?
			Includes the structural details for all components of the proposed drainage systems and stormwater management facilities?
			Includes notes on the drawings specifying materials to be used and construction specifications?
			Includes soils information from test pits performed at the location of proposed stormwater management facilities, including but not limited to soil descriptions, depth to seasonal high groundwater, depth to bedrock and percolation rates. Soils information will be based on site test pits logged by a Massachusetts Registered Soil Evaluator?
			Includes post-construction landscaping plan describing the woody and herbaceous vegetative stabilization and management techniques?
			STORMWATER MANAGEMENT PLAN REPORT
			Includes pre-development conditions in narrative form and calculations?
			Inlcudes a post-development discussion regarding whether the proposed BMPs meet or exceed the performance standards?
			Includes a drainage map showing pre and post construction watershed boundaries, drainage area and stormwater time of concentration (Tc) flow paths, including municipal drainage system flows?
			Does the hydrologic and hydraulic design calculations for pre and post development include the following? • Design storm frequencies of 2, 10, 25 and 100 year, 24 hour rainfall (1988 Cornell) completed? • Includes time of concentration (Tc)? • Includes Soil Runoff Curve Number (CN) based on land use and soil hydrologic group? • Includes peak runoff rates and total runoff volumes for each watershed? • Includes infiltration rates, if applicable? • Includes culvert capacities, if applicable? • Includes flow velocities? • Includes data on the increase in rate and volume of runoff for each design storm? • Documentation of sources for all computation methods and field test results.

Y	N	?	MAJOR STORMWATER MANGEMENT PERMIT CHECKLIST
			Does the project meet the following DEP stromwater quality performance standards? • No new stormwater conveyances discharging untreated stromwater or causing erosion? • Post-development peak discharge rates do not exceed pre-development peak discharge rates for each storm event? • Is the annual recharge from post-development approximate to the annual recharge pre-development based on soil types? • For new developments, does the stormwater management system remove a minimum of 80% TSS? • Is there a stormwater discharge from an area with higher pollutant loads? If yes, specific BMPs shall be used and infiltration is not allowed without pretreatment. • Is there a stormwater discharge to a critical area (Table 14 Drainage & Stormwater Standards)? If yes, must use an approved BMP for that particular critical area. • Is this project a redevelopment? If yes, it must meet the Stormwater Management Standards to the MEP. If it is not practicable, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions. • Have erosion controls been implemented to prevent impacts during construction or land disturbance activities? • Does the stormwater management system have and O&M Plan? • Includes an Illicit Discharge Compliance Statement along with a map showing the sewer and drainage utilities being separate?
			Is there an infiltration system proposed for this project? • Were Title V percolation tests performed for all proposed infiltration systems? • Was the infiltration system designed with a minimum percolation rate of 10 min/in? • If the percolation rate is greater than 10 min/in, was the system designed using the Darcy Equation? • If the percolation rate is greater than 20 min/in, was only the bottom area used in sizing the infiltration system? • Was the infiltration system designed to have a storage capacity of 2” x the impervious area discharging to the system? • Was a deep observation hole performed in accordance with Title V to determine the annual high water table at the location of each proposed infiltration system? • Was the deep hole(s) and percolation test(s) supervised by a PE or Certified Soil Evaluator? • Was the infiltration system designed to be a minimum of 2’ above the annual high groundwater table? • Does the system fully infiltrate within 48 hours? • Was an annual groundwater recharge calculation done following MassDEP Stormwater Standard #3 (Vol. 1, Ch. 1)?
			Is there a detention pond proposed for this project? • Was the detention basin designed based on the 100 year storm? • Does the detention basin utilize staged outlets to achieve a Zero Runoff Rate for each of the storm events? • Does the detention basin have a 1 foot minimum freeboard during the 100 year storm? • If stormwater forebays are proposed, were their storage volumes counted as storage volume for the detention basin? • If stormwater forebay is proposed, was it designed to store the first 1” of stormwater runoff from all impervious surfaces, except for roof? • Was infiltration assumed in the design of the detention basin?

Y	N	?	MAJOR STORMWATER MANGEMENT PERMIT CHECKLIST
			OPERATION & MAINTENANCE PLAN
			Is the O&M Plan presented as a stand-alone document?
			Includes stormwater management system(s) owner(s) and emergency contact information?
			Includes owner(s) signatures?
			Includes the names and addresses of the person(s) responsible for operation and maintenance?
			Is this person(s) a contracted third party? If yes, Is a copy of the maintenance agreement provided?
			Includes types of maintenance tasks for all structures, BMPs, swales and ponds?
			Includes a detailed maintenance schedule for all structures, BMPs, swales and ponds?
			Includes logs for all operation and maintenance activities?
			Does the O&M Plan meet the Water Quality Standards?
			Includes a plan or map showing the location of the system and facilities including easements, catch basins, manhole/access lids, main and stormwater devices?
			Includes provisions for the Con Com, its Stormwater Officer or its designee to enter the property at reasonable times and in a reasonable manner for the purpose of inspections?
			EROSION & SEDIMENT CONTROL REPORT
			Includes estimates of the total area expected to be disturbed by excavation, grading, or other activities, including dedicated off-site borrow and fill areas?
			Includes all pollution control measures (structural and non-structural BMPs) that will be implemented as part of the construction activity to control pollutants in stormwater discharges?
			Includes the intended sequence an timing of activities that disturb soils at the site?
			Includes the general sequence/schedule during the construction process in which the erosion and sediment control measures will be implemented?
			Includes structural practices to divert flows from exposed soils?
			Includes structural practices to retain/detain flows or otherwise limit runoff and discharge pollutants from exposed areas of the site?
			Includes construction and waste materials expected to be stored on-site, including descriptions of controls, and storage practices to minimize exposure of the materials to stormwater and spill prevention and response practices?
			Includes measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust?
			Includes, if applicable, measures to prevent the discharge of solid materials, including building materials, to waters of the United States, except as authorized by a permit issued under Section 404 of the CWA?
			Includes proposed dewatering operations including proposed locations of discharge?
			Includes plan or map of material stockpiling areas?

APPENDIX I

Operation and Maintenance Plan



Weston & Sampson℠

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OPERATIONS & MAINTENANCE PLAN

MS4 GENERAL PERMIT COMPLIANCE

JUNE 2020

TOWN OF
Dedham
MASSACHUSETTS

O&M

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LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Requirement for Standard Operating Procedures

The 2016 Massachusetts Municipal Separate Storm Sewer System General Permit (MS4 Permit), which came into effect on July 1, 2018, regulates discharges from small MS4s to waters of the United States. The Permit requires MS4 operators to develop, implement, and enforce a stormwater management program (SWMP). The purpose of the SWMP is to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the applicable water quality requirements of the Clean Water Act. MS4 operators are required to implement various Best Management Practices (BMPs) for each of six minimum control measures identified in the MS4 Permit. These minimum control measures are as follows:

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management in New Development and Redevelopment
- Good Housekeeping and Pollution Prevention for Municipal Operations

As part of the minimum control measure for Good Housekeeping and Pollution Prevention for Municipal Operations, Section 2.3.7 of the 2016 MS4 Permit requires regulated communities to develop and implement a written Operations and Maintenance (O&M) program for municipal activities and facilities. The O&M program serves to prevent or reduce pollutant runoff and protect water quality, and is required to include the following components:

1. Written O&M procedures for the following activities/facilities:
    a. Parks and open space
    b. Buildings and facilities where pollutants are exposed to stormwater runoff
    c. Vehicles and equipment
2. An inventory of all permittee-owned facilities
3. A written program outlining the necessary actions the permittee will implement so that the MS4 is properly maintained to reduce the discharge of pollutants from the MS4, including:
    a. Optimization of routine inspections, cleaning and maintenance of catch basins
    b. Implementation of procedures for sweeping and/or cleaning streets and municipally 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.

To address these requirements, Standard Operating Procedures (SOPs) associated with these municipal activities and facilities were taken and/or adapted from templates developed by EPA and the Central Massachusetts Regional Stormwater Coalition (CMRSWC). These templates were developed for use by MS4 communities in complying with the permit requirements outlined above.

The Town can either implement the SOPs as written or modify the SOPs to reflect current Town practices, as long as they are consistent with the requirements of the MS4 permit.

1.2 Applicability

The operations and maintenance procedures outlined in this document and the accompanying SOPs apply to all the facilities, vehicles, and equipment denoted in the inventory included in Appendix A, as well as any activities associated with each facility, vehicle, or piece of equipment. They shall also apply to all drainage infrastructure owned or operated by the Town. The inventory will be updated annually to reflect any changes in property or equipment ownership.

2.0 PARKS AND OPEN SPACE

2.1 Overview

The Dedham Parks and Recreation Department is responsible for the operation and maintenance of parks and open space. Maintenance typically consists of mowing, irrigation, and solid waste management. Town personnel do not apply fertilizer, pesticides, or herbicides in parks or landscaped areas of other municipal facilities—that work is conducted by an outside contractor with the appropriate certifications. Stormwater pollutants that can be generated from these activities include nutrients, pesticides, organics, sediment, trash and bacteria.

These Operation and Maintenance Procedures apply to the following Town-owned parks and open space areas:

- Barnes Memorial Park
- Churchill Park
- Condon Park
- Dedham Common
- Dedham Town Forest*
- Dolan Recreation Center
- East Dedham Passive Park*
- Fairbanks Park
- Fowl Meadow*
- Gonzalez Field
- Hartnett Square
- Manor Fields
- Mill Pond Park
- Mucciaccio Pool, Practice Field, Tennis Courts
- Oakdale Common
- Paul Park
- Stoney Lead Road*
- Town Landfill*
- Triangle Park
- Wigwam Pond, Little Wigwam Pond

*Requires maintenance as needed, see Appendix B.

2.2 Operation and Maintenance Activities

The Dedham Parks and Recreation Department maintains all parks and open space areas which involves mowing, landscaping parks, turf management at playing fields, trail monitoring and maintenance, litter and debris cleanup, and repair of damaged equipment. All lawns are cut, and grass clippings are discharged from the side of the lawn mowers or mulched into the turf canopy.

The Town has hired an outside contractor to collect trash from the receptacles in each park on a weekly basis. During the summer months, trash is collected daily at each of the parks. Signs regarding the proper disposal of pet waste are also posted at most parks. Waterfowl management at three of the Town's parks is conducted by an outside contractor.

Appendix B provides Standard Operating Procedures that the Town should follow for all operations and maintenance activities in its parks and open space areas, including:

- B.1: Parks and Open Space Management

3.0 MUNICIPAL BUILDINGS AND FACILITIES

3.1 Overview

Municipal buildings and facilities that are owned and operated by the Town of Dedham where potential pollutants are exposed to stormwater runoff include:

- Avery Elementary School
- Brookdale Cemetery Building
- Capen School
- Dedham High School
- Dedham Middle School
- Dolan Center
- DPW Facility
- Early Childhood Education Center
- Endicott Estate
- Endicott Cottage
- Fire Station (Main)
- Fire Station (East)
- Greenlodge Elementary School
- Library (Main)
- Library (Endicott)
- Mucciaccio Pool
- Oakdale Elementary School
- Police Station
- Riverdale Elementary School
- Town Hall

A full inventory of Town-owned parcels, including their street address and use description can be found in the inventory in Appendix A. These Operations and Maintenance Procedures apply to all buildings and facilities listed above in Appendix A.

3.2 Use, Storage, and Disposal of Petroleum Products and Other Stormwater Pollutants

The Town does not currently have written procedures in place regarding the use, storage, and disposal of petroleum products or other stormwater pollutants to prevent the potential for polluted stormwater. However, the DPW facility does not store gasoline for fueling vehicles and keeps up with regular vehicle and equipment maintenance to reduce the risk of leaks or spills. The Department of Public Works performs maintenance of vehicles inside their maintenance building. This building has no floor drains, and when all bays are closed should effectively contain any potential stormwater pollutants. The waste oil tank is located outside of the DPW maintenance facility on a concrete pad.

The Town also has outdoor storage sheds at most of their schools for their smaller grounds equipment. Small quantities are fuel are kept in spill proof containers within these sheds, typically in flammable storage cabinets.

Appendix C provides Standard Operating Procedures that the Town should follow for the use, storage, and disposal of petroleum or other hazardous products utilized at municipal facilities, including:

- C.1: Fuel and Oil Handling
- C.2: Hazardous Materials Storage and Handling

3.3 Employee Training

The Town is currently developing an employee training program, which provides information regarding stormwater pollution prevention and good housekeeping practices for municipal

operations. Management practices included as part of the training program consist of: (1) minimizing and preventing exposure of vehicles and equipment to stormwater, (2) good housekeeping operations, (3) preventive maintenance, (4) spill prevention and response, (5) erosion and sediment control, (6) stormwater runoff management, (7) management of salt and piles containing salt and (8) maintenance of control measures. Training on the proper use, storage, and disposal of petroleum products is also included.

The Town will have a Stormwater Pollution Prevention Plan (SWPPP) in place for the Department of Public Works Facility by the end of the MS4 Permit Year 2 (June 30, 2020). Employees at the facility will complete annual training on the management practices outlined in the SWPPP.

3.4 Spill Prevention and Response

The Department of Public Works does not have an existing written spill prevention and response plan in place. However, employees are trained on how to handle a spill situation. Speedi-dri absorbent is available on site for emergency spills. Dedham practices good housekeeping measures to minimize the risk of spilled pollutants entering stormwater runoff. Hydraulic equipment is kept in good repair to prevent leaks. Equipment and vehicles are regularly inspected to avoid situations that may result in leaks, spills, and other releases of pollutants that could be conveyed with stormwater to the drainage system.

If there is a spill or hazardous waste removed from any of the school buildings, a private environmental clean up company is called to handle and remove the waste.

Appendix C provides written Standard Operating Procedures that the Town should follow for spill response at all facilities, including:

- C.3: Spill Response and Cleanup

3.5 Waste Management and Other Applicable Good Housekeeping Practices

The Town employs a private subcontractor to empty outside trash receptables at municipal buildings and facilities on a weekly basis. Trash receptacles are closed when not in use.

Building maintenance is conducted to minimize the potential for stormwater pollution. This includes practices such as regularly inspecting buildings for leaks and sweeping facility parking lots and driveways.

Appendix C also provides Standard Operating Procedures pertaining to waste management and facility housekeeping, including:

- C.4: Operations and Maintenance of Municipal Buildings and Facilities

There are other Standard Operating Procedures that are applicable to municipal buildings and facilities, but they are discussed and referenced exclusively in other sections. These include the following:

- SOPs for lawn maintenance and landscaping activities, which are included under Section 2.0, Parks and Open Space
- SOPs for vehicle and equipment storage, washing, and fueling, which are discussed in Section 4.0, Municipal Vehicles and Equipment

- SOPs for street sweeping, snow disposal, and the storage and application of deicing materials, which are discussed exclusively under Section 5.0, Infrastructure Operations and Maintenance.

4.0 MUNICIPAL VEHICLES AND EQUIPMENT

4.1 Overview

The Dedham Department of Public Works is responsible for operating and maintaining their vehicles and equipment. The Fire Department, Police Department, Schools Department, Council On Aging, Youth Commission, and Facility Department do not receive maintenance or repair at the DPW facility. These municipal vehicles have their maintenance and vehicles washing outsourced to various vendors and does not occur at a public facility. An inventory of all vehicles operated and maintained by the DPW is included in Appendix A.

4.2 Municipal Vehicle Storage, Maintenance, and Repair

Vehicle maintenance facilities have the potential for spills that could contaminate stormwater. Potential pollutants associated with municipal vehicle storage, maintenance, and repair activities include oil and grease, petroleum products, metals, organics and chlorides.

In Dedham, vehicle maintenance for Public Works vehicles is performed in the maintenance building at the Public Works facility. Maintenance includes all changing of fluids. Employees use spigots/funnels to minimize drips/leaks, use drip pans when changing fluids, and have absorbing compounds available for use in the event of a spill. The maintenance garage is not equipped with floor drains and there is no direct discharge to the drainage system.

In addition to the maintenance building, there is another large garage that is part of the DPW building. This garage is used for vehicle/equipment storage. Municipal vehicles and equipment are stored indoors to the maximum extent practicable at the DPW facility. The garage has two floor drains that discharge to an oil/water separator which discharges to the sanitary sewer system.

4.3 Municipal Vehicle and Equipment Fueling

There are no fueling stations at the DPW facility. All municipal vehicles are fueled off site. Therefore, the only risk of stormwater runoff contamination from fuel is from vehicles or equipment that has leaks. By properly maintaining and inspecting vehicles regularly, the risk of leaks is minimized.

4.4 Municipal Vehicle Washing

Potential stormwater pollutants associated with municipal vehicle washing include sediment, nutrients, chlorides, trash, metals, oil & grease, petroleum products and organics.

Vehicles operated primarily by the Department of Public Works are washed down inside the DPW garage over floor drains which discharge to the sanitary sewer via an oil/water separator. The Town should continue washing all DPW vehicles indoors at the garage. The Engineering Department vehicles are washed at a car wash off site.

4.5 Other Applicable Good Housekeeping/ Pollution Prevention Practices

Appendix D provides Standard Operating Procedures related to vehicle and equipment operation and maintenance, including:

- D.1: Operations and Maintenance of Municipal Vehicles and Equipment

There are other Standard Operating Procedures that are applicable to Municipal Vehicles and Equipment, but they are discussed and referenced exclusively in other sections. These include the following:

- SOPs for the use, storage, and disposal of petroleum products; SOPs for spill prevention and response, and SOPs for waste management, which are included under Section 3.0, Municipal Buildings and Facilities
- SOPs for street sweeping, which are discussed exclusively under Section 5.0, Infrastructure Operations and Maintenance

5.0 DRAINAGE INFRASTRUCTURE OPERATIONS AND MAINTENANCE

5.1 Drainage System Overview

Dedham has developed a comprehensive map of the Town's drainage system in GIS, which includes town-wide mapping of outfalls, culverts, drain manholes, catch basins, drainage pipes, swales, etc. The system consists of approximately:

- 48.7 miles of gravity pipe/culverts ranging in size from 4-inches to 72-inches in diameter constructed of asbestos cement, brick, cast iron, corrugated metal, ductile iron, HDPE, PVC, vitrified clay, concrete, and reinforced concrete;
- 1,961 catch basins;
- 1,106 storm drain manholes;
- 199 municipal outfalls;
- 181 non-municipal outfalls;
- 78 structural BMPs; and
- 25 interconnections with other MS4s.

5.2 Catch Basin Cleaning

Historically, the Town has cleaned approximately half of its 1,961 catch basins annually using in-house equipment and staff. The Town plans to begin hiring a private contractor to assist with catch basin cleaning going forward to meet the MS4 Permit requirements. Catch basins at the Department of Public Works facility are cleaned as needed.

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:

- Prioritization of the inspection and maintenance of catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or development). Catch basins in such areas must be cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loading.
- Establishment of a schedule 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 will document the finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources.
- The Town will maintain documentation, including metrics and other information, used to determine 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 will 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

All catch basin cleanings are temporarily stockpiled at the DPW Facility. The spoils are stockpiled away from catch basins and confined on three sides by jersey barriers. The Town should cover cleanings with an impervious surface, such as a tarp, to prevent exposure to stormwater. The Town hires an outside contractor to haul the spoils offsite and dispose of them properly.

Appendix E provides Standard Operating Procedures that the Town should follow, including:

- E.1: Catch Basin Inspection and Cleaning

5.3 Street Sweeping

The Town of Dedham maintains approximately 84 miles of roadway. Main roads are currently swept two to three times per week, and side roads are swept quarterly. Areas surrounding municipal facilities are kept clean to reduce the runoff of pollutants. The DPW facility is swept as necessary and following deicing operations.

The Town will continue their current street sweeping frequencies, exceeding the minimum permit requirements and satisfying additional requirements for impaired receiving waters. The Town will report the number of miles of roadway swept and/or the volume or mass of material removed to EPA annually.

All street sweepings are temporarily stockpiled at the DPW facility. The spoils are stockpiled away from catch basins and confined on three sides by jersey barriers. The Town should cover cleanings with an impervious surface, such as a tarp, to prevent exposure to stormwater. The Town hires an outside contractor to haul the spoils offsite and dispose of them properly.

Appendix F provides Standard Operating Procedures that the Town should follow, including:

- F.1: Street Sweeping

5.4 Inspection and Maintenance of Stormwater Treatment Structures

Dedham owns and maintains 78 structural stormwater treatment structures. The Town plans to complete annual inspection of stormwater treatment structures in-house during the spring as required by the MS4 Permit. The Town's structural BMPs include infiltration/leaching basins, oil/water separators, bioretention basins, stormceptors, and cisterns. When properly maintained, these structures reduce stormwater pollution and reduce stormwater facility maintenance costs. A complete inventory of existing stormwater treatment structures is included in Appendix A.

Appendix G provides Standard Operating Procedures for stormwater treatment structures, including:

- G.1: Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

Many stormwater treatment structures are proprietary systems for which the manufacturer provides Operation and Maintenance procedures. In the event that there are conflicting Operation and Maintenance Procedures for a stormwater treatment structure, any procedure provided by the manufacturer shall take precedent.

5.5 Winter Road Maintenance

Potential stormwater pollutants associated with winter road maintenance include chloride, sediment and various deicing materials. Pollution potential is reduced by properly storing salt and sand, minimizing the use of sodium chloride and other salts, evaluating opportunities for use of alternative materials, and ensuring that snow disposal activities do not result in disposal of snow into waters of the United States. When necessary, snow is disposed of at Memorial or Saint Mary's Park.

The Dedham Department of Public Works stores all salt, sand, and pre-treated chemicals in its salt shed, a 5,300 square foot covered structure located at the DPW facility. All vehicles used to spread salt are loaded with salt inside the shed and mixing of sand and salt also occurs within the structure. Loading areas and yards are swept routinely to prevent sand and salt build-up and runoff. Historically, about 50 cubic yards of sand and 6 to 7 thousand tons of salt are used annually for winter road maintenance practices.

Appendix H provides Standard Operating Procedures for winter road maintenance, including:

- H.1: Salt Use Optimization/ Winter Road Maintenance

There are other Standard Operating Procedures that are applicable to Winter Road Maintenance, which are discussed and referenced exclusively in other sections. These include the following:

- SOPs for the operation and maintenance of vehicles and equipment, which are discussed exclusively under Section 4.0, Municipal Vehicles and Equipment

APPENDIX A

Parks and Open Space Inventory

Municipal Buildings and Facilities Inventory

Municipal Vehicles and Equipment Inventory

Inventory of Town-Owned Stormwater Treatment Structures

Appendix A: Public Open Space Inventory

Town Conservation Land

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
155-61	Beech Street	98 Beech St	conservation	passive	yes	SRB	permanent	0.57
168-138	Beech Street	115 Beech St	conservation	passive	yes	SRB	permanent	0.34
168-139	Beech Street	107 Beech St	conservation	passive	yes	SRB	permanent	0.34
168-140	Beech Street	103 Beech St	conservation	passive	yes	SRB	permanent	0.34
							Subtotal	**1.60**
121-36	Court St.	203 Court St	conservation	passive	yes	SRB	permanent	5.80
							Subtotal	**5.80**
181-108	Fowl Meadow	235 Bonham Rd	conservation	passive	yes	SRB	permanent	0.17
181-15	Fowl Meadow	19 Findlay Rd	conservation	passive	yes	SRB	permanent	6.47
182-32A	Fowl Meadow	91 Goshen Rd	conservation	passive	yes	SRB	permanent	1.11
182-33	Fowl Meadow	73 Goshen Rd	conservation	passive	yes	SRB	permanent	0.36
182-33A	Fowl Meadow	83 Goshen Rd	conservation	passive	yes	SRB	permanent	0.35
182-55	Fowl Meadow	74 Goshen Rd	conservation	passive	yes	SRB	permanent	0.23
182-70	Fowl Meadow	41 Meridan Rd	conservation	passive	yes	SRB	permanent	0.62
182-72	Fowl Meadow	39 Lorain Rd	conservation	passive	yes	SRB	permanent	3.92
182-73	Fowl Meadow	86 Hastings Rd	conservation	passive	yes	SRB	permanent	0.46
182-75	Fowl Meadow	222 Greensboro Rd	conservation	passive	yes	SRB	permanent	1.89
182-77	Fowl Meadow	201 Greensboro Rd	conservation	passive	yes	SRB	permanent	0.69
182-78	Fowl Meadow	189 Greensboro Rd	conservation	passive	yes	SRB	permanent	8.59
182-82	Fowl Meadow	78 Hastings Rd	conservation	passive	yes	SRB	permanent	0.15
182-83	Fowl Meadow	85 Hastings Rd	conservation	passive	yes	SRB	permanent	1.50
182-84	Fowl Meadow	108 Hastings Rd	conservation	passive	yes	SRB	permanent	0.73
183-19	Fowl Meadow	2 Hastings Rd	conservation	passive	yes	GR	permanent	0.91
183-22	Fowl Meadow	11 Sterling Rd	conservation	passive	yes	GR	permanent	0.63
183-23	Fowl Meadow	16 Sterling Rd	conservation	passive	yes	GR	permanent	0.51
183-24	Fowl Meadow	102 Trenton Rd	conservation	passive	yes	GR	permanent	2.35

Town Conservation Land

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
183-3A	Fowl Meadow	17 Dallas Rd	conservation	passive	yes	SRB	permanent	0.21
183-3B	Fowl Meadow	22 Meridan Rd	conservation	passive	yes	SRB	permanent	0.29
183-4	Fowl Meadow	30 Meridan Rd	conservation	passive	yes	SRB	permanent	4.46
183-5	Fowl Meadow	6 Dallas Rd	conservation	passive	yes	GR	permanent	2.00
183-6	Fowl Meadow	16 Hastings Rd	conservation	passive	yes	GR	permanent	0.42
183-7	Fowl Meadow	17 Salina Rd	conservation	passive	yes	GR	permanent	1.33
184-2	Fowl Meadow	105 Sherman Rd	conservation	passive	yes	GR	permanent	0.34
184-2A	Fowl Meadow	113 Sherman Rd	conservation	passive	yes	GR	permanent	0.16
184-4A	Fowl Meadow	110 Sherman Rd	conservation	passive	yes	GR	permanent	0.31
190-53	Fowl Meadow	27 Calvin Rd	conservation	passive	yes	GR	permanent	5.60
190-76	Fowl Meadow	78 Carol Dr	conservation	passive	yes	SRB	permanent	0.36
196-1A	Fowl Meadow	507 Greenlodge St	conservation	passive	yes	SRB	permanent	0.14
196-11	Fowl Meadow	498 Greenlodge St	conservation	passive	yes	SRB	permanent	0.20
196-16	Fowl Meadow	99-105 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.22
196-17	Fowl Meadow	93 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.18
196-18	Fowl Meadow	85-89 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.18
196-19	Fowl Meadow	81 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.18
196-21	Fowl Meadow	59 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.18
196-21A	Fowl Meadow	53 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.17
196-21B	Fowl Meadow	47 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.17
196-36A	Fowl Meadow	60 Fillmore Rd	conservation	passive	yes	SRB	permanent	13.84
196-37	Fowl Meadow	80 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.27
196-37B	Fowl Meadow	67 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.17
196-37C	Fowl Meadow	88 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.23
196-37D	Fowl Meadow	94 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.22
196-38	Fowl Meadow	98 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.28
196-39	Fowl Meadow	106 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.31
196-40	Fowl Meadow	112 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.26

Town Conservation Land

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
196-41	Fowl Meadow	118 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.20
196-42	Fowl Meadow	124 Fillmore Rd	conservation	passive	yes	LRM	permanent	0.20
196-43	Fowl Meadow	153 Fillmore Rd	conservation	passive	yes	LRM	permanent	0.17
196-44	Fowl Meadow	149 Fillmore Rd	conservation	passive	yes	LRM	permanent	0.17
196-45	Fowl Meadow	137 Fillmore Rd	conservation	passive	yes	LRM	permanent	0.24
196-46	Fowl Meadow	131 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.17
196-47	Fowl Meadow	123 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.17
196-48	Fowl Meadow	119 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.17
196-55	Fowl Meadow	94 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.17
196-58	Fowl Meadow	112 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.24
196-59	Fowl Meadow	118 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.23
196-60A	Fowl Meadow	40 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.17
196-60B	Fowl Meadow	46 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.17
196-60C	Fowl Meadow	52 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.17
196-60D	Fowl Meadow	58 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.18
196-60E	Fowl Meadow	70 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.18
196-60F	Fowl Meadow	31 Truman Rd	conservation	passive	yes	SRB	permanent	0.18
196-60G	Fowl Meadow	32 Truman Rd	conservation	passive	yes	SRB	permanent	0.18
196-60H	Fowl Meadow	79 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.17
196-60I	Fowl Meadow	73 Fillmore Rd	conservation	passive	yes	SRB	permanent	0.17
196-9	Fowl Meadow	486 Greenlodge St	conservation	passive	yes	SRB	permanent	0.18
200-2	Fowl Meadow	124 Roosevelt Rd	conservation	passive	yes	SRB	permanent	0.23
200-3	Fowl Meadow	155 Fillmore Rd	conservation	passive	yes	LRM	permanent	0.23
200-7	Fowl Meadow	4 Circumferential Hwy	conservation	passive	yes	LRM	permanent	0.01
200-8	Fowl Meadow	2 Circumferential Hwy	conservation	passive	yes	LRM	permanent	0.01
							Subtotal	**68.68**
153-2A	Little Wigwam Pond	869 East St	conservation	passive	limited	LB	permanent	2.93

Town Conservation Land

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
164-2A	Little Wigwam Pond	292 Rustcraft Rd	conservation	passive	limited	RD	permanent	5.39
164-4	Little Wigwam Pond	67 Allied Dr	conservation	passive	limited	RD	permanent	0.76
165-1	Little Wigwam Pond	983 East St	conservation	passive	limited	RD	permanent	16.54
166-124	Little Wigwam Pond	975 East St	conservation	passive	limited	RD	permanent	2.62
177-2A	Little Wigwam Pond	9 Allied Dr	conservation	passive	limited	RD	permanent	4.24
178-98	Little Wigwam Pond	1039 East St Rear	conservation	passive	limited	RD	permanent	16.43
178-98B	Little Wigwam Pond	Little Wigwam Pond	conservation	passive	limited	RD	permanent	3.08
							Subtotal	**51.98**
95-79	Mother Brook	222 Colburn St	conservation	passive	limited	SRB	permanent	0.80
96-110	Mother Brook	191 Bussey St	conservation	passive	limited	GR	permanent	0.03
114-44	Mother Brook	2 Fleming St	conservation	passive	limited	GR	permanent	0.23
							Subtotal	**1.06**
119-7	Stoney Lea Road	235 Stoney Lea Rd	conservation	passive	limited	SRA	permanent	2.19
							Subtotal	**2.19**
117-1	Town Forest	402 Circumferential Hwy	conservation	passive	limited	SRA	permanent	71.07
133-6	Town Forest	200 Sandy Valley Rd	conservation	passive	limited	SRA	permanent	4.05
146-14	Town Forest	400 Circumferential Hwy	conservation	passive	limited	SRB	permanent	1.36
147-53	Town Forest	43 Manning Rd	conservation	passive	limited	SRB	permanent	0.02
							Subtotal	**76.49**
70-1	Westfield Street	166 Westfield St	conservation	passive	limited	SRA	permanent	6.00
							Subtotal	**6.00**
109-59	Wigwam Pond	119 Eastern Ave	conservation	passive	limited	HB	permanent	1.69
123-18	Wigwam Pond	3 Blue Hill Pkwy	conservation	passive	limited	SRB	permanent	3.73
123-19	Wigwam Pond	5 Blue Hill Pkwy	conservation	passive	limited	SRB	permanent	1.74
123-20	Wigwam Pond	7 Blue Hill Pkwy	conservation	passive	limited	SRB	permanent	2.83
124-22	Wigwam Pond	64 Jersey St	conservation	passive	limited	SRB	permanent	0.09
124-23	Wigwam Pond	50 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.48

Town Conservation Land

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
124-24	Wigwam Pond	66 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.31
124-25	Wigwam Pond	47 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.55
124-41	Wigwam Pond	20 Virginia St	conservation	passive	limited	SRB	permanent	0.07
124-42	Wigwam Pond	59 Jersey St	conservation	passive	limited	SRB	permanent	1.71
124-43	Wigwam Pond	15 Virginia St	conservation	passive	limited	SRB	permanent	0.12
124-59	Wigwam Pond	43 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.06
124-60	Wigwam Pond	46 Fairbanks Rd	conservation	passive	limited	SRB	permanent	2.80
124-64	Wigwam Pond	18 Virginia St	conservation	passive	limited	SRB	permanent	11.50
124-65	Wigwam Pond	66 Jersey St	conservation	passive	limited	SRB	permanent	0.78
124-66	Wigwam Pond	14 Virginia St	conservation	passive	limited	SRB	permanent	0.06
137-14	Wigwam Pond	47 Arrowhead Ln	conservation	passive	limited	SRB	permanent	0.21
137-15	Wigwam Pond	51 Arrowhead Ln	conservation	passive	limited	SRB	permanent	0.56
137-1A	Wigwam Pond	167 West Jersey St	conservation	passive	limited	SRB	permanent	0.31
137-32	Wigwam Pond	43 Arrowhead Ln	conservation	passive	limited	SRB	permanent	0.09
137-33	Wigwam Pond	2 Blue Hill Pkwy	conservation	passive	limited	SRB	permanent	2.60
137-34	Wigwam Pond	41 Gibson Ave	conservation	passive	limited	SRB	permanent	0.06
137-35	Wigwam Pond	165 Wentworth St	conservation	passive	limited	SRB	permanent	0.58
137-36	Wigwam Pond	86 Ice House Ln	conservation	passive	limited	SRB	permanent	0.86
137-36A	Wigwam Pond	87 Ice House Ln	conservation	passive	limited	SRB	permanent	0.44
137-38	Wigwam Pond	1 Blue Hill Pkwy	conservation	passive	limited	SRB	permanent	0.16
137-39	Wigwam Pond	42 Arrowhead Ln	conservation	passive	limited	SRB	permanent	0.58
137-40	Wigwam Pond	0 Wigwam Pond	conservation	passive	limited	SRB	permanent	4.60
138-118	Wigwam Pond	85 Wentworth St	conservation	passive	limited	SRB	permanent	0.13
138-122	Wigwam Pond	73 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.40
138-123	Wigwam Pond	74 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.54
138-125	Wigwam Pond	88 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.40
138-127	Wigwam Pond	98 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.16
138-128	Wigwam Pond	104 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.20

Town Conservation Land

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
138-129	Wigwam Pond	110 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.52
138-131	Wigwam Pond	73 Wentworth St Rear	conservation	passive	limited	SRB	permanent	1.35
138-131A	Wigwam Pond	77 Wentworth St	conservation	passive	limited	SRB	permanent	0.15
138-131B	Wigwam Pond	73 Wentworth St	conservation	passive	limited	SRB	permanent	0.20
138-138	Wigwam Pond	38 Fairbanks Rd	conservation	passive	limited	SRB	permanent	1.36
138-139	Wigwam Pond	123 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.17
138-141	Wigwam Pond	107 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.19
139-25	Wigwam Pond	17 Drayton Rd	conservation	passive	limited	SRB	permanent	4.78
139-50	Wigwam Pond	68 Endicott St	conservation	passive	limited	SRB	permanent	0.15
139-50A	Wigwam Pond	64 Endicott St	conservation	passive	limited	SRB	permanent	0.15
139-77	Wigwam Pond	72 Wentworth St	conservation	passive	limited	SRB	permanent	0.09
139-8	Wigwam Pond	186 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.28
150-10	Wigwam Pond	71 Oscars Way	conservation	passive	limited	SRB	permanent	0.07
150-11	Wigwam Pond	410 Wildwood Dr	conservation	passive	limited	SRB	permanent	0.07
150-3	Wigwam Pond	0 Blue Hill Pkwy	conservation	passive	limited	SRB	permanent	2.25
152-15	Wigwam Pond	243 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.11
152-22	Wigwam Pond	204 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.21
152-23	Wigwam Pond	214 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.15
152-26	Wigwam Pond	236 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.21
152-27	Wigwam Pond	246 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.09
152-28	Wigwam Pond	250 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.11
152-29	Wigwam Pond	258 Fairbanks Rd	conservation	passive	limited	SRB	permanent	0.18
152-73	Wigwam Pond	46 Iverson Way	conservation	passive	limited	SRB	permanent	3.35
							Subtotal	**57.59**
							TOTAL	**271.38**

Town Parks and Recreation Property

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
109-58	Barnes Memorial Park	150 Eastern Ave	Recreation	Active	Yes	GR	Permanent	14.51
109-61	Barnes Memorial Park	152 Eastern Ave	recreation	active	Yes	GR	Permanent	0.38
							Subtotal	**14.88**
93-115	Gonzalez Field	520 High St	recreation	active	Yes	LB		0.20
109-2	Gonzalez Field	50 Eastern Ave	recreation	active	Yes	GR	None	3.77
109-25	Gonzalez Field	351 East St	recreation	active	Yes	SRA	Permanent	2.33
							Subtotal	**6.30**
112-152	Hartnett Square	21 Milton St	park	passive	Yes	SRA	Permanent	0.09
							Subtotal	**0.09**
113-24A	Mother Brook Park	34 Milton St	park	passive	Yes	SRB	Permanent	1.32
								1.32
127-143	Oakdale Common	231 River St	park	passive	Yes	SRB	Permanent	0.46
							Subtotal	0.46
151-53	Fairbanks Park	169 Rustcraft Rd	recreation	active	Yes	SRB	Permanent	14.10
							Subtotal	**14.10**
155-134	Paul Park	330 Cedar St	recreation	active	Yes	LB	Permanent	2.93
							Subtotal	**2.93**
157-8	Manor Fields	450 Sprague St	vacant	active/passive	Limited	GR	Partial	21.66
170-196	Manor Fields	408 Sprague St	vacant	active/passive	Limited	LM	Partial	4.06
							Subtotal	**25.72**
52-12	Dolan Recreation Center	269 Common St	recreation	active	Yes	GR	Permanent	11.40
							Subtotal	11.40
58-5A	Former Landfill	17 Lower East St	vacant	passive	No	GR	None	6.71
58-7A	Former Landfill	15 Lower East St	vacant	passive	No	GR	None	0.97
							Subtotal	**7.68**
80-119	Triangle Park	87 Hyde Park St	park	passive	Yes	GR	Permanent	0.41
80-120	Triangle Park	90 Whitehall St	park	passive	Yes	LM	Permanent	0.12
80-121	Triangle Park	93 Whitehall St	park	passive	Yes	GR	Permanent	0.19
80-122	Triangle Park	108 Whitehall St	park	passive	Yes	SRB	Permanent	0.19

Town Parks and Recreation Property

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
							Subtotal	0.91
89-56	Dedham Common	639 Bridge St	park	passive	Yes	SRB	Permanent	0.83
90-59	Dedham Common	642 Bridge St	park	passive	Yes	SRB	Permanent	1.21
							Subtotal	2.03
94-55A	Churchill Park	45 Allen Ln	recreation	active	Yes	SRB	Permanent	0.92
							Subtotal	0.92
96-108	Condon Park	180 Bussey St	recreation	active	Yes	SRB	Permanent	7.37
							Subtotal	**7.37**
							TOTAL	**96.11**

Town Public School Property

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Zoning	Public Access	Protection Status	Acres
110-114	Dedham High School	140 Whiting Ave	school/rec	active	GR	yes	partial	11.39
							Subtotal	**11.39**
110-113	Dedham Middle School	70 Whiting Ave	school/rec	active	GR	yes	partial	8.18
110-115	Dedham Middle School	26 Barrows St	school/rec	active	GR	yes	partial	0.43
							Subtotal	**8.61**
111-64	Avery Elementary School	336 High St	school/rec	active	SRB	yes	partial	5.60
							Subtotal	**5.60**
180-53	Greenlodge Elementary School	191 Greenlodge St	school/rec	active	GR	yes	partial	16.74
							Subtotal	**16.74**
141-49A	Oakdale Elementary School	147 Cedar St	school/rec	active	SRB	yes	partial	6.90
							Subtotal	**6.90**
13-160	Riverdale Elementary School	143 Needham St	school/rec	active	LM	yes	partial	3.07
13-161	Riverdale Elementary School	26 Hillside Rd	school/rec	active	SRB	yes	partial	3.04
							Subtotal	**6.11**
103-18	Curran ECEC	1100 High St	school/rec	active	GR	yes	partial	29.20
							Subtotal	**29.20**

Town Public School Property

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Zoning	Public Access	Protection Status	Acres
156-155	Capen School	195 Tower St Rear	school/rec	active	SRA	yes	partial	1.23
169-114	Capen School	336 Sprague St	school/rec	active	SRB	yes	partial	0.05
169-120	Capen School	322 Sprague St	school/rec	active	SRB	yes	partial	4.00
							Subtotal	**5.28**
110-116	Mucciaccio Pool/Tennis Courts	22 Mt Vernon St	school/rec	active	LM	yes	partial	1.89
111-63	Mucciaccio Pool/Soccer Field	316 High St	school/rec	active	SRA	yes	partial	1.54
111-65	Mucciaccio Pool/Avery School	31 Pottery Ln	school/rec	active	SRB	yes	partial	1.12
							Subtotal	**4.55**
							TOTAL	**94.37**

Town Historic Property

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Public Access	Zoning	Protection Status	Acres
125-109	Endicott Estate	656 East St	Community	Passive	Yes	SRB	Permanent	11.63
126-95	Endicott Estate	231 Mt Vernon St	Community	Passive	Yes	SRB	Permanent	6.64
							TOTAL	**18.27**

Town Cemeteries

Parcel ID	Name	Street Address	Current Use	Recreation Potential	Zoning	Public Access	Protection Status	Acres
107-109	Old Village Cemetery	30 Village Ave	Cemetery	Passive	GR	Yes	Permanent	4.10
77-66	Brookdale Cemetery	86 Brookdale Ave	Cemetery	Passive	GR	Yes	Permanent	42.82
94-41A	Brookdale Cemetery	24 Demetra Ter	Cemetery	Passive	GR	Yes	Permanent	0.76
94-41B	Brookdale Cemetery	26 Demetra Ter	Cemetery	Passive	GR	Yes	Permanent	0.02
94-61	Brookdale Cemetery	94 Brookdale Ave	Cemetery	Passive	GR	Yes	Permanent	3.81
160-12	Chickering Home	38 Pond Farm Rd	Cemetery	None	SRB	Limited	Permanent	0.07
							Total	**51.58**

Unassigned Town Property

Parcel ID	Address	Description	Suggested Town Manager	Acres
6-1	215 Riverside Dr	Long stretch of sloped land along river behind residential.	CONS	5.78
14-55	10 Samoset Rd	Thin parcel of land between two residential buildings.	BOS	0.01
24-248	5 Violet Ave	Corner parcel of land at Commonwealth Avenue.	DPW/ENG/BOS	0.01
24-251	6 Violet Ave	Grassy area near corner of Commonwealth Avenue & Short Street.	DPW/ENG/BOS	0.01
39-135	29 Bow Ave	Vacant parcel between Pine Street and Bow Ave in the Riverdale area.	CONS	0.09
39-136	33 Bow Ave	Vacant parcel between Pine Street and Bow Ave in the Riverdale area.	CONS	0.13
39-137	37 Brookside Ave	Vacant parcel at corner with Moreland Avenue. Trees, vines & grass.	BOS	0.04
39-138	54 Brookside Ave	Tree & water area that runs behind residential.	CONS	0.77
42-5	17 Crosstown Ave	Vacant Lot. Divided by Boston City line. Adjacent to #15	BOS/CONS	0.03
42-6	15 Crosstown Ave	Vacant Lot. Divided by Boston City line. Adjacent to #17	BOS/CONS	0.08
42-7	7 Crosstown Ave	Vacant Lot. Adjacent to #3.	BOS/CONS	0.05
42-8	3 Crosstown Ave	Vacant Lot. Thinner strip of land. Adjacent to #7.	BOS/CONS	0.06
55-96A	32 Ames St	Small vacant parcel in front of residential building.	BOS	0.00
55-110A	14 Shaw Ln	Vacant parcel off Ames Street. Abuts Charles River.	CONS	6.58
56-63	56 Farrington Ave	Vacant lot at end of dead-end street.	CONS/PARKS	0.17
72-19	177 Common St	Vacant Lot. Abuts Motley Pond.	CONS	0.27
74-26	183 Ames St	Vacant lot adjacent to the Charles River at Ames Street Bridge.	CONS	0.05
77-69	146 Washington St	Intersection of East Street and Washington Street/Incinerator Road.	PARKS/DPW	0.10
78-143	51 Ridge Ave	Wooded area behind Columbia Terrace; slopes steeply.	CONS	0.26
78-155	121 Schiller Rd	Wooded area behind Columbia Terrace; slopes steeply.	CONS	0.18
79-164	11 Carrolton Ln	Inaccessible vacant lot off Clisby Avenue.	CONS	0.11
79-62A	57 Clisby Ave	Wooded parcel, accessible by paper streets off Clisby Ave.	BOS	0.15
79-62B	59 Clisby Ave	Wooded parcel, accessible by paper streets off Clisby Ave.	BOS	0.16
80-37B	36 Thomas St	Vacant parcel, wet lowland, SRB with small frontage.	CONS	0.33
80-117	63 Whitehall St	Isolated irregular shaped parcel at rear of residential buildings.	CONS	0.12
80-118	104 Greenhood St	small half-circle parcel at edge of private parcel.	BOS/PARKS/DPW	0.01

Unassigned Town Property

Parcel ID	Address	Description	Suggested Town Manager	Acres
93-124	11 Harris St	driveway of Paul's Hair Salon at 3 Harris Street	BOS	0.02
96-111	194 Colburn St	Vacant strip of land across Mother Brook from Condon Park.	CONS/PARKS	0.06
96-109	171 Bussey St	Vacant Lot. Contains large portion of Mother Brook across from Condon Park.	CONS	6.09
96-114	21 Sawmill Ln	Large vacant tract behind and beside East Dedham Plaza.	CONS	0.96
102-4	5 Slant Rock Rd	Small vacant lot located next to Rte. 109. Rte. 128 north exit ramp/inaccessible.	BOS/CONS	0.02
102-5	7 Slant Rock Rd	Small vacant lot located next to Rte. 109. Rte. 128 north exit ramp/inaccessible.	BOS/CONS	0.37
128-132	159 Milton St	Thin strip of land currently used as a residential driveway.	BOS	0.10
130-34	1 Paradise Ln	Triangular parcel containing portions of residential buildings.	BOS	0.06
141-156	80 Lincoln St	Small strip parcel between two residential buildings; contains fence at present.	BOS	0.04
171-13	25 Kensington Rd	Wooded parcel, accessible by Mosley St, Kensington Rd	CONS	0.17
171-14	15 Kensington Rd	Wooded parcel, accessible by Kensington Rd	CONS	0.19
171-15	11 Kensington Rd	Wooded parcel, accessible by Kensington Rd	CONS	0.14
171-17	45 Lancaster Rd	Wooded parcel, accessible by Lancaster Rd	CONS	0.27
171-100	73 Durham Rd	Small parcel between two residential buildings; contains portion of neighboring building at present.	BOS	0.05
171-101	16 Moseley Rd	Vacant Lot. Possible wetlands.	CONS	0.23
182-74	104 Hastings Rd	Vacant lot at end of street near Fowl Meadow.	CONS	0.92
188-29	151 Ledgewood Rd	Irregular shaped parcel behind several residential properties; inaccessible due to ledge at narrow frontage.	CONS	1.00
188-88A	138 Ledgewood Rd	Small parcel between two residential buildings. Contains landscaping at present.	BOS	0.02
196-1	483 Greenlodge St	Vacant lot along I-95 Northbound lane. Fowl Meadow.	CONS	1.15
			TOTAL	**31.79**

Town of Dedham, MA
Inventory of Municipal Buildings and Facilities - March 2020

Building Name	Address
Avery Elementary School	336 High Street
Avery Elementary School (Old)	123 High Street
Brookdale Cemetery Building	86 Brookdale Avenue
Capen School	322 Sprague Street
Dedham High School	140 Whiting Avenue
Dedham Middle School	70 Whiting Avenue
Dolan Center	269 Common Street
DPW Office Building	55 River Street
DPW Garage	55 River Street
Early Childhood Education Center (New)	1100 High Street
Endicott Estate	656 East Street
Endicott Cottage	231 Mount Vernon Street
Fire Station (Main)	436 Washington Street
Fire Station (East)	230 Bussey Street
Greenlodge Elementary School	191 Greenlodge Street
Library (Main)	43 Church Street
Library (Endicott)	257 Mount Vernon Street
Mucciaccio Pool	336 High Street
Oakdale Elementary School	147 Cedar Street
Police Station	600 High Street
Riverdale Elementary School	143 Needham Street
Town Hall (Old)	26 Bryant Street
Town Hall (New)	450 Washington Street

Town of Dedham, MA
Inventory of Municipal Vehicles and Equipment - March 2020

Vehicle Year	Vehicle Make	Vehicle Model	Department
2015	Dodge	Charger/Police	Police
2014	Dodge	Charger/Police	Police
2015	Dodge	Charger/Police	Police
2017	Ford	Interceptor Utility	Police
2016	Dodge	Ram 1500	Police
2017	Ford	Interceptor Utility	Police
1998	Trailer	Trailer	Police
2012	ATS-5	Trailer	Police
2010	Speed Trailer	Trailer	Police
2016	Dodge	Charger	Police
2014	Dodge	Charger/ Police	Police
2016	Dodge	Charger	Police
2013	Ford	Taurus/Police Interceptor	Police
2004	Ford	Van	Police
2017	Ford	Interceptor Utility	Police
2010	Ford	Taurus	Police
2017	Ford	Interceptor Utility	Police
2013	Ford	Taurus/Police Interceptor	Police
2010	Ford	Pick Up Truck (cruiser)	Police
2009	Harley Davidson	Motorcycle	Police
2008	Harley Davidson	Motorcycle	Police
2015	Harley Davidson	Motorcycle	Police
2017	Ford	Interceptor Utility	Police
2017	Ford	Interceptor Utility	Police
2014	Dodge	Charger/ Police	Police
2013	Ford	Interceptor SUV	Police
2013	FORD F150	pickup	Police
2014	Yamaha XT250	Motorcycle	Police
2005	Ford	Crown Vic	Aux. Police
2003	Ford	Crown Vic	Aux. Police
2007	Ford	Crown Vic	Aux. Police
2001	Ford F250	F250	Parks
1979	Ford		Parks
1999	Ford F350	F350	Parks
2016	Ford F350	F350	Parks
2013	Ford F250	F250	Parks
1999	Ford F350	F350	Parks
2005	Ford	F350	Parks
2008	Ford	F250	Endicott Estate
1998	Ford		School
2006	Ford	F250	School
2014	Ford	Escape	School
2014	Ford	Econovan	School

Town of Dedham, MA
Inventory of Municipal Vehicles and Equipment - March 2020

Vehicle Year	Vehicle Make	Vehicle Model	Department
2015	Ford	F350 Dump Truck	School
2015	Ford	Transit	School
2017	Ford	F350 Utility	School
2016	Ford	F350 Stake Body	School
2016	Ford	F350 Utility	School
2016	Chevy	4500 Bus	School
2013	Ford	150 Van	School
2013	Ford	150 Van	School
2010	Ford	F150	School
2010	Ford	E150	Youth Commission
2004	Ford	E350 Van	COA
2017	Dodge	Caravan	COA
2011	Ford	Cutvan	COA
2006	Ford	Freestar Van	COA
	Haulmark	Utility Trailer	BOH
2007	Ford	F250	DPW - HGWY
2001	Ford	F250	DPW - HGWY
2012	Ford	F150	DPW - HGWY
2001	Ford	F350	DPW - HGWY
2014	Ford	F550	DPW - HGWY
2010	International	International	DPW - HGWY
2001	Ford	Ford F450	DPW - HGWY
1978	Ford	Ford	DPW - HGWY
2007	Sterling	Sterling	DPW - HGWY
2008	Peterbuilt	Peterbuilt	DPW - HGWY
2013	International	International	DPW - HGWY
2012	International	International	DPW - HGWY
1993	Ford	L8000	DPW - HGWY
1994	Ford	L8000	DPW - HGWY
2001	Ford	F550	DPW - HGWY
2004	Ford	F550	DPW - HGWY
2004	Ford	F550	DPW - HGWY
2014	Ford	F-550	DPW - HGWY
1998	Ford	LN8000	DPW - Sewer
2000	Sterling	Sterling L7501	DPW - Sewer
1993	Asplundh	Asplundh	DPW - Parks
2012	Ford	F150	Cemetery
1996	Ford	F350	Cemetery
2011	Ford	F550	Cemetery
2014	Ford	F-150	DPW - Fleet Maint.
2001	Ford	F-450	DPW - Fleet Maint.
2001	Ford	F250	DPW - Fleet Maint.
1999	John Deere	John Deere 310E	DPW

Town of Dedham, MA
Inventory of Municipal Vehicles and Equipment - March 2020

Vehicle Year	Vehicle Make	Vehicle Model	Department
2002	Bombadier	Bombadier	DPW
1987	Bombadier	Bombadier	DPW
1997	1997 John Deere 955	John Deere 955	DPW
1992	John Deere	John Deere 624E	DPW
2001	John Deere	John Deere 624H	DPW
2013	Prinorth	Prinorth	DPW
1999	Elgin	Elgin	DPW
2008	Elgin	Elgin	DPW
2011	Eligin Pelican	Eligin Pelican	DPW
	Fork lift		DPW
1999	RD-11A Whacker	Whacker	DPW
1977	Sull-Air	Sull-Air	DPW
1999	Sull-Air	Sull-Air	DPW
1997	Cross Country	Cross Country	DPW
1998	Cam Trailer	Trailer	DPW
2003	Cross Country	Cross Country	DPW
2004	PJ	PJ	DPW
2012	Monster (trailer)	Trailer	DPW
2017	Chevy	Tahoe	Engineering
2013	Ford	Explorer	Engineering
2016	Ford	Explorer Xlt	Engineering
2009	Pierce	Pumper 3	Fire Department
1994	E-One	Pumper 5	Fire Department
2015	E-One	Pumper 4	Fire Department
1999	Amer. Lafrance	Reserve	Fire Department
2004	Amer. Lafrance	Pumper 2	Fire Department
1993	E-One	Ladder 2	Fire Department
2016	E-One	Ladder 1	Fire Department
1989	Seagrave	Ladder 2	Fire Department
1983	Gmc	Special Operations	Fire Department
1989	Ford	Bucket Truck	Fire Department
2015	Ford	Bucket Truck	Fire Department
2002	Ford	Brush Truck	Fire Department
2010	Ford	F150	Fire Department
2017	Ford	F250	Fire Department
2009	Ford	Expedition	Fire Department
2006	Load Utility	Trailer	Fire Department
1953	PIRSC	Fire Engine	Fire Department
2014	Ford	Explorer	Fire Department
2014	Ford	Expedition	Fire Department

Town of Dedham, MA

Inventory of Municipally Owned/Operated Stormwater Treatment Structures - March 2020

BMP ID or Description	Location	BMP Type	Install Date
BMP13	Central Avenue	Leaching Basin	
BMP14	Central Avenue	Leaching Basin	
BMP15	Bridge Street	Leaching Basin	
BMP16	Bridge Street	Leaching Basin	
BMP17	Endicott Estate	Water Quality Structure	
BMP18	Endicott Estate	Leaching Field	
BMP19	Endicott Estate	Leaching Field	
BMP20	Endicott Estate	Cistern	
BMP21	Endicott Estate	Leaching Field	
BMP23	Endicott Estate	Water Quality Inlet	
BMP24	County Street	Leaching Basin	9/9/2008
BMP27	Haven Street	Leaching Chamber	7/14/2009
BMP28	Haven Street	Leaching Chamber	7/14/2009
BMP29	Dedham Middle School	Underground Cistern	
BMP55	Warren Road Easement	Underground Basin	
BMP56	Warren Road Easement	Underground Basin	
BMP57	Warren Road Easement	Underground Basin	
BMP58	Warren Road Easement	Underground Basin	
BMP59	Condon Park	Water Quality Inlet	
BMP60	Condon Park	Leaching Basin	
BMP62	Warren Road Easement	Infiltration Pipe	
BMP108	Village Avenue	Leaching Chamber	5/4/2010
BMP109	Fuller Street	Leaching Chamber	4/21/2010
BMP110	Quincy Avenue	Leaching Chamber	7/22/2010
BMP111	Quincy Avenue	Leaching Chamber	7/23/2010
BMP112	Blossom Street	Leaching Chamber	7/27/2010
BMP113	Mt. Vernon Street	Leaching Chamber	9/8/2010
BMP114	Breede Terrace	Leaching Chamber	9/15/2010
BMP115	Fairbanks Park Parking Lot	Water Quality Structure	
BMP116	Fuller Street	Leaching Basin	12/1/2010
BMP117	Central Avenue	Leaching Chamber	4/1/2011
BMP118	Central Avenue	Leaching Chamber	4/1/2011
BMP119	Trimount Street	Leaching Basin	6/21/2011
BMP120	Colburn Street Easement	Leaching Basin	11/15/2011
BMP121	Ridge Avenue	Leaching Chamber	8/28/2013
BMP122	Highland Street	Leaching Basin	6/20/2013
BMP123	Washington Street	Leaching Basin	6/1/2010
BMP124	Lower East Street	Leaching Basin	6/1/2010
BMP125	Eastbrook Road	Leaching Basin	6/1/2010
BMP126	Dale Street	Leaching Basin	
BMP127	Trenton Road	Leaching Chamber	6/1/2014
BMP00132	Westchester Circle	Infiltration Pipe	6/10/2015
BMP00133	Highland Street	Infiltration Pipe	6/13/2013

Town of Dedham, MA

Inventory of Municipally Owned/Operated Stormwater Treatment Structures - March 2020

BMP ID or Description	Location	BMP Type	Install Date
BMP00134	Avery School	Water Quality Structure	
BMP00135	Avery School	Water Quality Structure	
BMP00136	Avery School	Outlet Control	
BMP137	Alba Lane	Water Quality Structure	3/30/2011
BMP138	Alba Lane	Underground Basin	3/30/2011
BMP139	Alba Lane	Underground Basin	3/30/2011
BMP00140	Colburn Street Easement	Outlet Control	8/1/2015
BMP147	Massachusetts Avenue	Leaching Chamber	9/1/2016
BMP149	Booth Road	Infiltration Pipe	9/1/2016
BMP150	Booth Road	Infiltration Pipe	9/1/2016
BMP156	Avery Street Easement	Stormceptor STC 450i	5/1/2017
BMP157	Avery Street Easement	Outlet Control	5/1/2017
BMP159	ECEC	Stormceptor STC 900	5/18/2017
BMP160	ECEC	Stormceptor STC 900	5/18/2017
BMP161	ECEC	Stormceptor STC 900	5/18/2017
BMP00167	Condon Park	Underground Basin	7/1/2008
BMP00168	Fairbank Field Parking Lot	Underground Basin	
BMP00170	Avery School	Underground Basin	
BMP00171	ECEC	Bioretention Basin	
BMP00172	ECEC	Bioretention Basin	
BMP00173	ECEC	Bioretention Basin	
BMP00174	ECEC	Bioretention Basin	
BMP00175	Colburn Street Easement	Bioretention Basin	
BMP00183	Emmett Avenue	Bioretention Basin	5/15/2017

APPENDIX B

Standard Operating Procedures – Parks and Open Space

B.1: Parks and Open Space Management

Standard Operating Procedures

Dedham, MA

Parks and Recreation Department

B.1: Parks and Open Space Management

Issue Date:

MAR. 2020

Approved by:

Robert Stanley_____
Director of Parks & Recreation

MA Small MS4 General Permit Requirement Summary:

Part 2.3.7.a.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 [Parks and open space]. These written procedures shall be included as part of the SWMP.

Part 2.3.7.a.ii.1.
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.

Municipal Parks and Open Space Inventory

The following is a list of properties covered by these procedures. This inventory shall be updated annually during SWMP review.

Park	Address/Location	Lawn Mowing	Landscaping	Fertilizing	Pesticide/Herbicide	Trash mgmt.	Pet waste mgmt.	Waterfowl mgmt.	Other maintenance:
Barnes Memorial Park	150 Eastern Avenue	X	X	X	X	X		X	
Churchill Park	45 Allen Lane	X	X	X	X	X			
Condon Park	180 Bussey Street	X	X	X	X	X		X	
Dedham Common	639, 642 Bridge Street	X	X						
Dolan Recreation Center	269 Common Street	X	X			X	X		
East Dedham Passive Park	34 Milton Street					X			
Fairbanks Park	169 Rustcraft Road	X	X	X	X	X		X	
Gonzalez Field	50 Eastern Avenue	X	X			X			

Hartnett Square	21 Milton Street	X	X			X			
Manor Fields	408, 450 Sprague Street								
Mill Pond Park	222 Colburn Street	X	X			X			
Mucciaccio Pool, Practice Field, Tennis Courts	316 High Street	X	X			X			
Oakdale Common	231 River Street	X	X			X			
Paul Park	330 Cedar Street	X	X			X			
Town Landfill	15, 17 Lower East Street								Maintenance as necessary
Triangle Park	87 Hyde Park Street	X	X			X			
Wigwam Pond, Little Wigwam Pond	Area divided by Providence Hwy, Elm St, Allied Dr, East St, Central Ave, Eastern Ave					X			
Dedham Town Forest	400, 402 Circumferential Highway								Maintenance as necessary
Fowl Meadow	Southeast Dedham, Greenlodge/Manor Neighborhood								Maintenance as necessary
Stoney Lea Road	235 Stoney Lea Road								Maintenance as necessary
Avery Elementary School	336 High Street	X	X			X			
Greenlodge Elementary School	191 Greenlodge Street	X	X			X			
Oakdale Elementary School	147 Cedar Street	X	X			X			
Riverdale Elementary School	143 Needham Street	X	X			X			
Dedham Middle School	70 Whiting Avenue	X	X			X			
Dedham High School	140 Whiting Avenue	X	X			X			
Thomas J. Curran Early Childhood Center	1100 High Street								
Capen School	322 Sprague Street	X	X			X			

Personnel

The following personnel are responsible for municipal parks and open space management. Employees performing the procedures in this SOP shall attend annual stormwater pollution prevention training.

Name	**Responsibility**
Robert Stanley, P&R Director	Oversees the implementation of this SOP
Debbie Anderson, P&R Assistant Director	Assists in the implementation of this SOP
Tracey White, P&R Administrative Assistant	Assists in the implementation of this SOP

Lawn Mowing

Occurs at the following parks:
Barnes Memorial Park, Churchill Park, Condon Park, Dedham Common, Dolan Recreation Center, Fairbanks Park, Gonzalez Field, Hartnett Square, Mill Pond Park, Mucciaccio Pool, Oakdale Common, Paul Park, Triangle Park, Avery Elementary School, Greenlodge Elementary School, Oakdale Elementary School, Riverdale Elementary School, Dedham Middle School, Dedham High School and Capen School.

On the following schedule:
Lawn mowing of parks and open spaces is done once every 1-2 weeks.

Responsible Personnel:
Department of Parks & Recreation Director and Assistant Director

Standard Operating Procedures:

→ Lawns shall be mowed to a height of 1.5" to 4" inches depending on lawn use.

→ Mowing pattern shall vary to prevent ruts and promote even growth.

→ Grass clippings shall side discharged or mulched into the turf canopy.

Pesticide, Herbicide, and Fertilizer Use

As of the issue date of this SOP, the Town does not apply or store pesticides, herbicides, or fertilizers at any of its facilities. These operations are conducted by an outside contractor, who follow their own SOP for use of these products. Should the Town begin using pesticides, herbicides, or fertilizers itself, this section will be updated accordingly.

Other Landscaping

Involves the following:

- Weeding
- Planting/reseeding
- Pruning
- Leaf litter removal

Occurs at the following parks:
Barnes Memorial Park, Churchill Park, Condon Park, Dedham Common, Dolan Recreation Center, Fairbanks Park, Gonzalez Field, Hartnett Square, Mill Pond Park, Mucciaccio Pool, Oakdale Common, Paul Park, Triangle Park, Avery Elementary School, Greenlodge Elementary School, Oakdale Elementary School, Riverdale Elementary School, Dedham Middle School, Dedham High School and Capen School.

On the following schedule:
Leaf litter removal is completed once a year at parks and open spaces. Weeding, planting/reseeding, pruning and other

landscaping activities is done as needed.

Responsible Personnel:
Department of Parks & Recreation Director and Assistant Director

Standard Operating Procedures:

- → Landscaping waste shall be disposed properly by the waste collection contractor to avoid entering the storm drain system.
- → Weeding shall be done manually where possible to reduce herbicide use.
- → Leaf litter shall be disposed properly by the waste collection contractor to avoid entering the storm drain system.

Trash Management

Trash cans and/or dumpsters are located in the following parks:
All parks mentioned above with the exception of conservation areas.

Emptying and replacing bags/inspecting for leaks shall take place on the following schedule:
Trash receptacles are emptied on a weekly basis by an outside contractor.

Responsible Personnel:
Waste Management, Inc.

Additional trash cans or other necessary equipment shall be ordered by the Department of Public Works' Facilities Manager based on the results of park inspections.

Parks shall be inspected and cleaned for litter once per year.

Additional pet waste receptacles, signage, bags, etc. shall be ordered by the Department of Public Works based on the results of park inspections.

Other Park Management

Procedures for addressing waterfowl congregation and waste at specific parks:
The DPW hires an outside contractor for waterfowl management at Barnes Memorial Park, Condon Park, and Fairbanks Park. The private company brings dogs in to manage waterfowl congregation, specifically geese.

Standard Operating Procedures *Dedham, MA* *Parks and Recreation Department* **B.1: Parks and Open Space Management**	**Issue Date:** MAR. 2020

Procedures for washing or cleaning park impervious surfaces:

- Parking lots in parks shall be swept at the frequency specified for municipally-owned parking lots in SOP F.1
- Impervious surfaces such as paths and walkways which are salted or treated in the winter shall be swept once per year following the conclusion of winter deicing operations.

Procedures for correcting areas experiencing erosion:

- Areas shall be temporarily stabilized with seeding
- Sediment and erosion shall be controlled with filter fabric or compost filter stock
- Grass or native plants shall be re-established as quickly as possible

APPENDIX C

Standard Operating Procedures – Municipal Buildings and Facilities

C.1 Fuel and Oil Handling

C.2 Hazardous Materials Storage and Handling

C.3 Spill Response

C.4 Operations and Maintenance of Buildings and Facilities

C.1: Fuel and Oil Handling

Introduction

Spills, leaks, and overfilling can occur during handling of fuels and petroleum-based materials, representing a potential source of stormwater pollution, even in small volumes. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on a variety of ways by which fuels and petroleum-based materials can be delivered, as well as steps to be taken when petroleum products (such as waste oil) are loaded onto vehicles for offsite disposal or recycling. Delivery, unloading, and loading of waste oils are hereafter referred to as "handling." Attached is a fuel delivery form checklist.

The Town of Dedham undertakes various procedures and precautions in handling fuel and oil, as described in Section 3.0 of the Town's Operation and Maintenance Plan.

Procedures

The Town of Dedham will implement the following fuel and oil handling procedures to help reduce the discharge of pollutants from the MS4:

General Guidelines

For all manners of fuel and oil handling described below, a member of the facility's Pollution Prevention Team (if the facility has a SWPPP) or another knowledgeable person familiar with the facility should be present during handling procedures. This person should ensure that the following are observed:

- There is no smoking while fuel handling is in process or underway.
- Sources of flame are kept away while fuel handling is being completed. This includes smoking, lighting matches, carrying any flame, or carrying a lighted cigar, pipe, or cigarette.
- The delivery vehicle's hand brake is set and wheels are chocked while the activity is being completed.
- Catch basins and drain manholes are adequately protected.
- No tools are to be used that could damage fuel or oil containers or the delivery vehicle.
- No flammable liquid should be unloaded from any motor vehicle while the engine is operating, unless the engine of the motor vehicle is required to be used for the operation of a pump.
- Ensure that local traffic does not interfere with fuel transfer operations. If it does, make appropriate accommodations.
- The attending persons should watch for any leaks or spills:
    - Any small leaks or spills should be immediately stopped, and spilled materials absorbed and disposed of properly. Follow the procedures in SOP C.3: Spill Response and Cleanup.
    - In the event of a large spill or one that discharges to surface waters or an engineered storm drain system, the facility representative should activate the facility's Stormwater Pollution Prevention Plan (SWPPP) and report the incident as specified in the document.

Delivery by Bulk (Tanker) Truck

Procedures for the delivery of bulk fuel should include the following:

- The truck driver should check in with the facility upon arrival.

- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP C.3: Spill Response and Cleanup for examples of spill cleanup and response materials.
- The facility representative should check to ensure that the amount of delivery does not exceed the available capacity of the tank.
    - A level gauge can be used to verify the level in the tank.
    - If a level gauge is not functioning or is not present on the tank, the tank should be stick tested prior to filling.
- The truck driver and the facility representative should both remain with the vehicle during the delivery process.
- The truck driver and the facility representative should inspect all visible lines, connections, and valves for leaks.
- When delivery is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- The delivery vehicle should be inspected prior to departure to ensure that the hose is disconnected from the tank.
- The facility representative should inspect the fuel tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned and disposed of properly.
- The facility representative should gauge tank levels to ensure that the proper amount of fuel is delivered, and collect a receipt from the truck driver.

Delivery of Drummed Materials

Drummed materials may include motor oil, hydraulic fluid, transmission fluid, or waste oil from another facility (as approved). Procedures for the delivery of drummed materials should include the following:

- The truck driver should check in with the facility upon arrival.
- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible Refer to SOP C.3: Spill Response and Cleanup for examples of spill cleanup and response materials. The facility representative should closely examine the shipment for damaged drums.
    - If damaged drums are found, they should be closely inspected for leaks or punctures.
    - Breached drums should be removed to a dry, well-ventilated area and the contents transferred to other suitable containers.
    - Drums should be disposed of in accordance with all applicable regulations.
- Drummed materials should not be unloaded outdoors during wet weather events.
- The truck driver and the facility representative should both remain with the vehicle during the delivery process.
- Drums should be handled and unloaded carefully to prevent damage.
- Upon completion of unloading, the facility representative should inspect the unloading point and the drums to verify that no leaks have occurred, that any leaked or spilled material has been cleaned up and disposed of properly, and that the unloaded drums are not leaking.
- The facility representative should check to ensure that the proper amount of fuel or other material is delivered, and collect a receipt from the truck driver.

Removal of Waste Oil from the Facility

When waste oil or similar oil products need to be removed from the premises, only haulers certified to transport waste oil should be utilized. Procedures should include the following:

- The disposal truck driver should check in with the facility upon arrival.
- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP C.3: Spill Response and Cleanup for examples of spill cleanup and response materials. The truck driver and the facility representative should both remain with the vehicle during the tank draining process.
- When draining is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- The facility representative should inspect the loading point and the tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned up and disposed of properly.
- The facility representative should collect a receipt from the truck driver.
- When draining bulk oil tanks:
    - The facility representative should verify that the volume of waste oil in the tank does not exceed the available capacity of the disposal hauler's vehicle.
    - The disposal hauler vehicle should be inspected prior to departure to ensure that the hose is disconnected from the tank.

Employee Training

- Employees who handle or deliver fuel and/or oil are trained once per year on proper procedures.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Related Standard Operating Procedures

- C.3: Spill Response and Cleanup

C.2: Hazardous Materials Storage and Handling

Introduction

A hazardous material is any biological, chemical, or physical material with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous materials can be released to the environment in a variety of ways. When hazardous materials come into contact with rain or snow, the pollutants are washed into the storm sewer system and to surface waterbodies and/or groundwater. Hazardous materials associated with municipal facilities and their operations include, but are not limited to, oil, gasoline, antifreeze, fertilizers, pesticides, and de-icing agents and additives.

Municipally owned or managed facilities where hazardous materials are commonly stores and handled include:

- Equipment storage and maintenance yards
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Composting facilities
- Materials storage yards
- Municipal buildings and facilities (e.g., schools, libraries, police and fire departments, town offices, municipal pools, and parking garages)
- Public works yards
- Solid waste handling and transfer facilities
- Vehicle storage and maintenance yards
- Water and wastewater facilities

Minimizing or eliminating contact of hazardous materials with stormwater can significantly reduce pollution of receiving waters. Proper hazardous material handling and storage also contributes to employee health, an organized workplace, and efficient operations. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to help prevent stormwater pollution resulting from the handling and storage of hazardous materials. If services are contracted, this SOP should be provided to the contractor. The contract should also specify that the contractor is responsible for compliance with all applicable laws.

The Town of Dedham undertakes various activities in regards to handling and storing hazardous materials. These activities are outlined in Section 3.2 of the Town's Operation and Maintenance Plan.

Procedures

The Town of Dedham will implement the following procedures for handling and storing hazardous materials to reduce the discharge of pollutants to the MS4:

Handling, Loading, and Unloading

- Avoid loading/unloading materials in the rain and/or provide cover.
- Retrace areas where materials have been transferred to identify spills. If spills are found, immediately

clean them up. Follow procedures in SOP C.3: Spill Response and Cleanup.

- Time delivery and handling of materials during favorable weather conditions whenever possible (e.g., avoid receiving loads of sand during windy weather).
- Inspect containers for material compatibility and structural integrity prior to loading/unloading any raw or waste materials.
- Use dry cleanup methods (e.g., squeegee and dust pan, sweeping, and absorbents as last step) rather than hosing down surfaces.

Material Storage

- Confine material storage indoors whenever possible. Plug or disconnect floor drains that lead to the stormwater system.
- Confine outdoor material storage to designated areas that are covered, on impervious surfaces, away from high traffic areas, and outside of drainage pathways.
- Store containers on pallets or equivalent structures to facilitate leak inspection and to prevent contact with wet floors that can cause corrosion. This technique also reduces incidences of container damage by insects and rodents.
- Store materials and waste in materially compatible containment units.
- Keep hazardous materials in their original containers.
- If materials are not in their original containers, clearly label all storage containers with the name of the chemical, the expiration date, and handling instructions.
- Maintain an inventory of all raw and waste materials to identify leakage. Order new materials only when needed.
- Provide secondary containment for storage tanks and drums with sufficient volume to store 110 percent of the volume of the material.
- Provide sufficient aisle space to allow for routine inspections and access for spill cleanup.
- Inspect storage areas for spills or leaks and containment units for corrosion or other failures.

Waste Treatment, Disposal, and Cleanup

- Adopt a regular schedule for the pick-up and disposal of waste materials.
- Recycle leftover materials whenever possible.
- Substitute nonhazardous or less-hazardous materials for hazardous materials whenever possible.
- Protect empty containers from exposure to stormwater and dispose of them regularly to avoid contamination from container residues.

Employee Training

- Employees who handle and use hazardous materials are trained once per year on these procedures.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

C.3: Spill Response and Cleanup

Introduction

Municipalities are responsible for any contaminant spill or release that occurs on property that they own or operate. Particular areas of concern include any facilities that use or store chemicals, fuel oil, or hazardous waste, including schools, garages, and landfills. Implementation of proper spill response and cleanup procedures can help to mitigate the effects of a contaminant release. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to help reduce the discharge of pollutants from the MS4 as a result of spills or releases.

The Town of Dedham undertakes various precautions with spill response and cleanup procedures, which are described in Section 3.4 of the Town's Operation and Maintenance Plan.

Procedures

The Town of Dedham will implement the following spill response and cleanup procedures to reduce the discharge of pollutants from the MS4:

Responding to a Spill

Employees should be trained in proper spill response specific to the materials used at their site and appropriate personal protective equipment (PPE). In the event of a spill, follow these spill response and cleanup procedures:

- If the facility has a Stormwater Pollution Prevention Plan (SWPPP), notify a member of the facility's Pollution Prevention Team, the facility supervisor, and/or the facility safety officer (fill out the attached spill response contact list). If not, continue to follow the procedures outlined below.
- Assess the contaminant release site for potential safety issues and for direction of flow.
- Complete the following:
    - Stop the contaminant release.
    - Contain the contaminant release through the use of spill containment berms or absorbents.
    - Protect all drains and/or catch basins with the use of absorbents, booms, berms or drain covers.
    - Clean up the spill.
    - Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
        i. Soil contaminated with petroleum should be handled and disposed of as described in MassDEP policy WCS-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils (https://www.mass.gov/files/documents/2016/08/mq/94-400.pdf).
        ii. Products saturated with petroleum products or other hazardous chemicals require special handling and disposal by licensed transporters. Licensed transporters will pick up spill contaminated materials for recycling or disposal. Save the shipping records for at least three years.
        iii. Waste oil contaminated industrial wipes and sorptive minerals:
            1. Perform the "one drop" test to ensure absorbents do not contain enough

oil to be considered hazardous, as described in the MassDEP Waste Oil Management Guide (https://www.mass.gov/files/documents/2018/12/18/oilwiper.pdf).

2. Wring absorbents through a paint filter. If doing so does not generate one drop of oil, the materials are not hazardous.
3. If absorbents pass the "one drop" test they may be discarded in the trash unless contaminated with another hazardous waste.
    a. It is acceptable to mix the following fluids and handle them as waste oil:
        i. Waste motor oil
        ii. Hydraulic fluid
        iii. Power steering fluid
        iv. Transmission fluid
        v. Brake fluid
        vi. Gear oil
    b. **Do not mix** the following materials with waste oil. Store each separately:
        i. Gasoline
        ii. Antifreeze
        iii. Brake and carburetor cleaners
        iv. Cleaning solvents
        v. Other hazardous wastes
4. If absorbents do not pass the "one drop" test they should be placed in separate metal containers with tight fitting lids, labeled "Oily Waste Absorbents Only."

- If you need assistance containing and/or cleaning up the spill, or preventing it from discharging to a surface water (or an engineered storm drain system), contact your local fire department using the number listed below. **In the case of an emergency call 911**.
    - Dedham Fire Department: (781)-751-9400
- Contact the MassDEP 24-hour spill reporting notification line, toll-free at **(888)-304-1133**;
    - The following scenarios **are exempt** from MassDEP reporting requirements (see the MassDEP factsheet on oil and hazardous materials handling for more information: https://www.mass.gov/files/documents/2016/08/xm/spillmgm.pdf).
        i. Spills that are less than 10 gallons of petroleum and do not impact a water body
        ii. Spills that are less than one pound of hazardous chemicals and do not present an imminent health or safety hazard
        iii. Fuel spills from passenger vehicle accidents
        iv. Spills within a vault or building with a watertight floor and walls that completely contain all released chemicals

Reporting a Spill

When contacting emergency response personnel or a regulatory agency, or when reporting the contaminant release, be prepared to provide the following information:

1. Your name and the phone number you are calling from.
2. The exact address and location of the contaminant release.

3. Specifics of release, including:
    a. What was released;
    b. How much was released, which may include:
        i. Pounds
        ii. Gallons
        iii. Number of containers
4. Where was the release sent/what was contaminated, addressing:
    a. Pavement
    b. Soil
    c. Drains
    d. Catch basins
    e. Water bodies
    f. Public streets
    g. Public sidewalks
5. The concentration of the released contaminant.
6. What/who caused the release.
7. Is the release being contained and/or cleaned up or is the response complete.
8. Type and amount of petroleum stored on site, if any.
9. Characteristics of contaminant container, including:
    a. Tanks
    b. Pipes
    c. Valves

Maintenance and Prevention Guidance

Prevention of spills is preferable to even the best response and cleanup. To mitigate the effects of a contaminant release, provide proper maintenance and inspection at each facility. To protect against contaminant release adhere to the following guidance:

- Ensure all employees are properly trained to respond in the case of a spill, understand the nature and properties of the contaminant, and understand the spill control materials and personnel safety equipment. Maintain training records of current personnel on site and retain training records of former personnel for at least three years from the date last worked at the facility.
- Provide yearly maintenance and inspection at all municipal facilities, paying particular attention to underground storage tanks. Maintain maintenance and inspection records on site.
- Implement good management practices where chemicals and hazardous wastes are stored:
    a. Ensure storage in closed containers inside a building and on an impervious surface wherever possible.
    b. If storage cannot be provided inside, ensure secondary containment for 110 percent of the maximum volume of the storage container.
    c. Locate storage areas near maintenance areas to decrease the distance required for transfer.
    d. Provide accurate labels, Material Safety Data Sheets (MSDS) information, and warnings for all stored materials.
    e. Regularly inspect storage areas for leaks.
    f. Ensure secure storage locations, preventing access by untrained or unauthorized persons.
    g. Maintain accurate records of stored materials.

- Replace traditional hazardous materials such as pesticides and cleansers with non-hazardous products such as bio-lubricants which can reduce response costs in the case of a spill.

Maintain appropriately stocked spill response kits at each facilities and locations where oil, chemicals, or other hazardous materials are handled and stored.

Employee Training

- Employees who perform work with potential stormwater pollutants are trained once per year on proper spill procedures.
- Employees are also trained on stormwater pollution prevention and illicit discharge detection and elimination (IDDE) procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Spill Response and Cleanup Contact List

Spill Response and Cleanup Contact List

Contact	Phone Number	Date and Time Contacted
Facility Supervisor: Joseph Flanagan	**(781)-751-9377**	
Fire Department: William Spillane, Fire Chief	**(781)-751-9400**	
MassDEP 24-Hour Spill Reporting	**(888)-304-1133**	
MassDEP Regional Offices:		
Northeast Regional Office	**(978) 694-3200**	
Southeast Regional Office	**(508) 946-2700**	
Central Regional Office	**(508) 792-7650**	
Western Regional Office	**(413) 784-1100**	
Hazardous Waste Compliance Assistance Line	**(617) 292-5898**	
Household Hazardous Products Hotline	**(800) 343-3420**	
Massachusetts Department of Fire Services	**(978) 567-3100 or (413) 587-3181**	
Licensed Site Professionals Association (Wakefield, MA) Licensed Site Professionals Board	**(781) 876-8915** **(617) 556-1091**	

C.4: Operations and Maintenance of Municipal Buildings and Facilities

Introduction

Municipal buildings and facilities (schools, municipal offices, police and fire stations, municipal pools, parking garages, etc.) often house various chemicals, such as petroleum products and hazardous materials. As a result, these buildings and facilities are potential sources of pollutant discharges to the storm drainage system. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on the use, storage, and disposal of chemicals and other stormwater pollutants to reduce the discharge of pollutants from the MS4. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

The Town of Dedham performs a variety of operations and maintenance activities at its municipally owned and operated buildings, as mentioned in the Operation and Maintenance Plan. An inventory of all municipal buildings and facilities is included in Appendix A of that Plan, and will be updated annually.

Procedures

The Town of Dedham will implement the following procedures for municipally owned or operated buildings and facilities to reduce the discharge of pollutants from the MS4:

Handling, Storage, Transfer, and Disposal of Trash and Recyclables

All liquid and solid waste must be disposed of properly. Some of the most common sources of pollution at municipal facilities are a result of littering, improper collection of debris, and improper disposal of solid or liquid waste.

- All waste and recycling receptacles must be leak-tight with tight-fitting lids or covers.
- Keep lids on dumpsters and containers closed at all times unless adding or removing material. If using an open-top roll-off dumpster, cover it and tie it down with a tarp unless adding materials.
- Place waste or recycling receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and install berms or curbs around the storage area to prevent run-on and run-off.
- Do not locate dumpsters over or adjacent to catch basins.
- Prior to transporting waste, trash, or recycling, ensure that containers are not leaking (double bag if needed) and properly secure containers to the vehicle.
- Clean and sweep up around outdoor waste containers regularly.

- Clean up any liquid leaks or spills with dry cleanup methods.
- Arrange for waste or recycling to be picked up regularly and disposed of at approved disposal facilities.
- Never place hazardous materials, liquids, or liquid-containing wastes in a dumpster or recycling or trash container (see SOP C.2: Hazardous Materials Storage and Handling).
- Do not wash trash or recycling containers outdoors or in parking lots.
- Conduct periodic inspections of solid and liquid waste storage areas to check for leaks and spills.
- Conduct periodic inspections of work areas to ensure that all wastes are being disposed of properly.
- In dumpster areas, regularly pick up surrounding trash and debris and regularly sweep the area.
- In compactor areas, regularly check the hydraulic fluid hoses and reservoir to ensure that there are no cracks or leaks. Regularly sweep the area.

Building Maintenance

- When power washing buildings and facilities, ensure that the wash water does not flow into the storm system. Containment or filtering systems should be provided.
- Paint and other chemicals should not be applied on the outside of buildings when it is raining or prior to expected rain.
- When sanding, painting, power washing, etc., ensure that sites are properly prepared (e.g., use tarps) and cleaned (e.g., use dry cleaning methods) especially if they are near storm drains. Protect catch basins when maintenance work is conducted upgradient of them.
- When painting, use a drop cloth and clean up any spills immediately.
- Do not leave open containers on the ground where they may accidentally tip over.
- Buildings should be routinely inspected for areas of potential leaks.
- Do not discharge chlorinated pool water into the stormwater system. Water must be properly dechlorinated and tested before it is discharged.
- Streets and parking lots surrounding municipal buildings and facilities should be swept and kept clean to reduce runoff of pollutants and debris to the stormwater system.
- Streets and parking lots around buildings and facilities will be swept in accordance with the procedures in SOP F.1: Streets and Parking Lots.

Storage of Petroleum Products and Potential Pollutants

- Floor drains in storage areas should be disconnected from the stormwater system.
- Routinely inspect buildings and facilities for areas of potential leaks.
- For storage and handling procedures of petroleum products and potential pollutants, refer to SOP C.2: Hazardous Materials Storage and Handling and SOP C.1: Fuel and Oil Handling Procedures.
- Should the Town begin to store and apply fertilizer, herbicides, or pesticides, a separate SOP shall be developed for all activities relevant to those potential pollutants.
- All municipal buildings and facilities should be periodically inspected to address potential pollutant sources (e.g., leaks).

Spill Prevention Plan

- Spill prevention plans such as Spill Prevention Control and Countermeaure (SPCC) Plans should be in place where applicable, based on inventories of material storage and potential pollutants. Coordinate with the local fire department if necessary.
- Spill SOPs are outlined in SOP C.3: Spill Response and Cleanup.

Employee Training

- Employees who perform maintenance or other applicable work at municipal buildings and facilities are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Related Standard Operating Procedures

1. C.1: Fuel and Oil Handling
2. C.2: Hazardous Material Storage and Handling
3. C.3: Spill Response and Cleanup
4. F.1: Street Sweeping

APPENDIX D

Standard Operating Procedures – Municipal Vehicles and Equipment

D.1: Operations and Maintenance of Municipal Vehicles and Equipment

D.1: Operations and Maintenance of Municipal Vehicles and Equipment

Introduction

Regular maintenance of both municipal and contracted vehicles and heavy equipment not only prolongs the life of municipal assets but also helps reduce the potential for leaking of fluids associated with normal wear and tear. Potential pollutants include fuels, oil, antifreeze, brake fluid, solvents, and battery acid. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to help reduce the discharge of pollutants from the MS4 as a result of leaks from vehicles and equipment. If services are contracted with respect to vehicles and equipment, this SOP should be provided to the contractor. The contract should also specify that the contractor is responsible for compliance with all applicable laws.

The Town of Dedham undertakes various procedures in regards to its municipal vehicles and equipment, which are explained in detail in section 4.0 of the Town's Operation and Maintenance Plan. An inventory of all municipal vehicles and equipment is included in Appendix A of that plan and updated annually.

Procedures

The Town of Dedham will implement the following procedures for municipally owned and operated vehicles and equipment to reduce the discharge of pollutants from the MS4:

Vehicle and Equipment Maintenance

Vehicle Storage

- Monitor vehicles and equipment for leaks and use drip pans as needed until repairs can be performed.
- When drip pans are used, avoid overtopping.
- Drain fluids from leaking or wrecked vehicles and parts as soon as possible. Dispose of fluids properly.
- Store and park vehicles on impervious surfaces and/or under cover or indoors whenever possible.

Vehicle Maintenance

- Conduct routine inspections of heavy equipment and vehicles to proactively identify maintenance needs or potential leaks.
- Perform routine preventive maintenance to ensure heavy equipment and vehicles are operating optimally.
- Recycle or dispose of waste properly and promptly.
- Sweep and pick up trash and debris as needed.

- Do not dump any liquids or other materials outside, especially near or in storm drains or ditches.

Body Repair and Painting

- Conduct all body repair and painting work indoors.
- Minimize waste from paints and thinners. Calculate paint needs based on surface area.
- Use dry cleanup methods (vacuum, sweep) to clean up metal filings and dust and paint chips from grinding, shaving and sanding. Sweep debris from wet sanding after allowing it to dry overnight on the shop floor. Dispose of waste properly; never dump waste into storm or sanitary sewers.
- Use sanding tools equipped with vacuum capability to pick up debris and dust.

Material Management

- Store materials and waste in labeled containers under cover and in secondary containment.
- Chemicals should not be combined in containers.
- Hazardous waste must be labeled and stored according to hazardous waste regulations. Follow the procedures in SOP C.2: Hazardous Materials Storage and Handling.
- Carefully transfer collected fluids from containers into designated storage areas as soon as possible.
- Store new and used batteries securely to avoid breakage. Store indoors or in secondary containment to contain potential acid leaks. Recycle used batteries.
- Conduct periodic inspections of storage areas to detect possible leaks.
- Do not wash or hose down storage areas unless there is prior approval to collect and discharge the water into the sanitary sewer. Use dry cleanup methods whenever possible.
- Keep lids on containers. Store them indoors or under cover to reduce exposure to rain.
- Inspect and maintain all pretreatment equipment, including interceptors, according to the manufacturer's maintenance schedule and at least once per year.
- Proper spill protocol should be followed to prevent chemicals from entering the stormwater system. Follow the procedures in SOP C.3: Spill Response and Cleanup.

Parts Cleaning

- Use designated areas for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors. If parts cleaning equipment is not available then capture parts cleaning fluids.
- Recycle cleaning solution. Never discharge waste to the sanitary sewer or storm sewer.
- Use steam cleaning or pressure washing of parts instead of solvent cleaning. Cleaning equipment must be connected to an oil/water interceptor prior entering the sanitary sewer.
- When using solvents for cleaning, drain parts over the solvent tank to avoid drips to the floor. Catch excess solutions and divert them back to tank. Allow parts to dry over the hot tank.

Vehicle and Equipment Washing

Vehicle washing can result in the discharge of nutrients, sediment, petroleum products, and other contaminants to a surface water body or to a stormwater system. The MS4 Permit does not authorize the discharge of municipal vehicle washing byproducts into the MS4.

Outdoor Vehicle Washing Procedures

Outdoor washing of municipal vehicles should be avoided unless wash water is contained in a tight tank or similar structure. Where no alternative wash system is available, and full containment of wash water cannot be achieved, adhere to the following procedures:

- Avoid discharge of any wash water directly to the storm drainage system or surface water (e.g., stream, pond, or drainage swale)
- Minimize the use of water to the extent practicable.
- Where the use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of a biodegradable, phosphate-free detergent is preferred.
- Do not use solvents except in dedicated solvent parts washer systems or in areas not connected to a sanitary sewer.
- Do not power wash, steam clean, or perform engine or undercarriage cleaning.
- Grassy and pervious (porous) surfaces may be used to promote direct infiltration of wash water, providing treatment before recharging groundwater and minimizing runoff to an adjacent stormwater system. Pervious surfaces or other infiltration-based systems should not be used within wellhead protection areas or within other protected resources.
- Impervious surfaces discharging to the storm drainage system should not discharge directly to a surface water unless treatment is provided. The treatment device should be positioned such that all drainage must flow through the device, preventing bypassing or short-circuiting.
- Periodic sweeping and/or cleaning should be completed to prevent accumulation from forming on the washing area.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Follow the procedures in SOP C.3: Spill Response and Cleanup.
- Heavily soiled vehicles or vehicles dirtied from salting or snow removal efforts should follow the SOPs in the "Heavy Equipment Washing Procedures" below.

Indoor Vehicle Washing Procedures

- Vehicles and equipment should be washed inside whenever possible to reduce runoff to the stormwater system.
- Where the use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of biodegradable, phosphate-free detergent is preferred.
- Detergents should not be used in areas where oil/water separators provide pre-treatment of drainage.
- Floor drains should be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface water bodies or engineered storm drain systems should be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- Designate separate areas for routine maintenance and vehicle cleaning. This helps prevent

contamination of wash water by motor oils, hydraulic lubricants, greases, or other chemicals.

- Dry cleanup methods are recommended within garage facilities. Do not wash down floors and work areas with water.
- Bring smaller vehicles to commercial washing stations.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Follow the procedures in SOP C.3: Spill Response and Cleanup.

Heavy Equipment Washing Procedures

- Mud and heavy debris removal should occur on impervious surfaces or within a retention area.
- Maintain these areas with frequent mechanical removal and proper disposal of waste.
- Impervious surfaces with engineered storm drain systems should not discharge directly to a surface water.
- Floor drains should be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface waterbodies or engineered storm drain systems should be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- Where the use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of biodegradable, phosphate-free detergent is preferred.
- Detergents should not be used in areas where oil/water separators provide pre-treatment of drainage.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Follow the procedures in SOP C.3: Spill Response and Cleanup.

Engine and Steam Washing Procedures

- Do not wash parts outdoors.
- Maintain drip pans and smaller containers to contain motor oils, hydraulic lubricants, greases, etc. and to capture and collect spills or noticeable leaks observed during washing activities, to the extent practicable. Follow the procedures in SOP C.3: Spill Response and Cleanup.
- Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of a biodegradable, phosphate-free detergent is preferred.
- Avoid cleaning with solvents except in dedicated solvent parts washer systems. Make use of pressure washing and steam cleaning.
- Recycle clean solutions and rinse water to the extent practicable.
- Wash water should discharge to a tight tank or a sanitary sewer via an oil/water separator. Detergents should not be used in areas where oil/water separators provide pre-treatment of drainage.

Employee Training

- Employees who perform work on/with municipal vehicles or equipment are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations

APPENDIX E

Standard Operating Procedures – Catch Basin Inspection and Cleaning

E.1: Catch Basin Inspection and Cleaning

E.1: Catch Basin Inspection and Cleaning

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a sump below the invert of the outlet pipe (older catch basins may not have a sump). Catch basin cleaning reduces foul odors, prevents clogs in the storm drain system, and reduces the loading of trash, suspended solids, nutrients, bacteria, and other pollutants to receiving waters. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on catch basin inspection and cleaning to reduce the discharge of pollutants from the MS4. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

This SOP can also be used for inspection of catch basins or manholes for the purpose of conducting catchment investigations as part of the municipality's Illicit Discharge Detection and Elimination program.

The Dedham Department of Public Works performs routine inspections, cleaning, and maintenance of the approximately 1,961 catch basins that are located within the MS4 regulated area. The Town of Dedham will include an optimization plan for catch basin cleaning and inspection in its annual report. A description of current Town practices for catch basin cleaning and inspection is included in Section 5.2 of the Operation and Maintenance Plan.

Dedham will implement the following catch basin inspection and cleaning procedures to reduce the discharge of pollutants from the MS4:

Procedures

Inspection and Cleaning Frequency

- Each catch basin should be cleaned and inspected at least annually.
- Catch basins near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) or high-use areas should be inspected and cleaned more frequently if inspection finds excessive sediments or debris loadings.

- Catch basins should be cleaned to ensure that they are no more than 50 percent full[1] at any time. Establish inspection and maintenance frequencies needed to meet this "50 percent" goal. If a catch basin sump is more than 50 percent full during two consecutive inspections, document the findings, investigate the contributing drainage area for sources of excessive sediment loading, and, if possible, address the contributing sources. If no contributing sources are found, increase the inspection and cleaning frequencies of the sump.
- Street sweeping performed on an appropriate schedule will reduce the amount of sediment, debris, and organic matter entering the catch basins, which will in turn reduce the frequency with which they need to be cleaned. Reference SOP 16: Streets and Parking Lots for information on appropriate street sweeping frequencies. Street sweeping schedules should also be adjusted based on catch basin inspection findings, with more frequent sweepings for areas with higher catch basin loads.
- In accordance with requirements associated with the requirements of impaired waterbodies, the Town of Dedham will prioritize catch basin cleaning and inspection in catchments with TMDLs/impairments when creating their optimization schedule to ensure that these catch basins are no more than 50% full and reduce stormwater pollution to the Charles River, Neponset River, Rock Meadow Brook and Mother Brook.

Inspection and Cleaning Procedures

Catch basin inspection and cleaning procedures should address both the grate opening and the catch basin structure, including the sump and any inlet and outlet pipes. Document any and all observations about the condition of the catch basin structure and water quality (an inspection form and log of catch basins cleaned or inspected are included in the attachments). Collect data on the condition of the physical basin structure, its frame, and the grate, as well as on the quality of stormwater conveyed by the structure. Observations like those below can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash and debris

Both oil and bacteria can create a sheen on the water's surface. The source of a sheen can be differentiating by disturbing it (e.g., with a pole). A sheen caused by oil will remain intact and move in a swirl pattern, while a sheen caused by bacteria will separate and appear "blocky." The bacteria that cause this sheen are naturally occurring iron bacteria – they are not considered a pollutant but should be noted. Other types of bacteria, such as fecal bacteria, are considered pollutants and their discovery should be recorded

Observations like those below can indicate a potential connection of a sanitary sewer to the storm drain system, which is an illicit discharge:

- Indications of sanitary sewage, including fecal matter or sewage odors
- Foaming, such as from detergent
- Optical enhancers, fluorescent dye added to laundry detergent

[1] . 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

In general, adhere to the following procedures when inspecting and cleaning catch basins. Record the findings in the log in the attachments:

1. Implement appropriate traffic safety procedures (e.g., traffic cones) prior to and during the catch basin inspection and cleaning process.
2. Work upstream to downstream in a given drainage network.
3. Clean sediment and trash off of the grate.
4. Visually inspect the outside of the grate.
5. Remove the grate and visually inspect the inside of the catch basin to determine cleaning needs.
6. Inspect the catch basin for structural integrity.
7. Determine the most appropriate equipment and method for cleaning the basin:
    a. Manually use a shovel to remove accumulated sediments.
    b. Use a bucket loader to remove accumulated sediments.
    c. Use a high pressure washer to clean any remaining material out of the catch basin while capturing the slurry with a vacuum.
    d. If necessary, after the catch basin is cleaned, use the rodder of the vacuum truck to clean the downstream pipe and pull back sediment that might have entered it.
8. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the Massachusetts Department of Environmental Protection (MassDEP) Hazardous Waste Regulations, 310 CMR 30.000 (https://www.mass.gov/files/documents/2016/08/xl/310cmr30_7883_54357.pdf). The chemical analysis required will depend on suspected contaminants. Note the identification number of the catch basin on the sample label and note sample collection on the Catch Basin Inspection Form.

Handling and Disposal of Catch Basin Cleanings

- Properly dispose of collected sediments and catch basin cleanings (solid material, such as leaves, sand, and twigs removed from stormwater collection systems during cleaning operations).
- Cleanings from stormwater-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.
- Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the screenings are managed properly to prevent pollution.
- Catch basin cleanings must be handled and disposed in accordance with compliance with the applicable MassDEP regulations, policies, and guidance (https://www.mass.gov/files/documents/2018/03/09/catch-basins.pdf).

Documentation and Reporting

The following information should be documented and included in the municipality's annual report – use the catch basin inspection log provided in the attachments to document the information to include in the report (alternatively, obtain records of volume of debris removed to include in the report):

- Metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4 (include in the SWMP and first annual report)
- Any action taken in response to excessive sediment or debris loadings

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

Employee Training

- Employees who perform catch basin cleaning and inspection are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Catch Basin Inspection Form

Related Standard Operating Procedures

1. SOP F.1: Street Sweeping

Town of Dedham Department of Public Works

CATCHBASIN CLEANING FORM

Catchbasin ID Number (from map)**: _____**

Map Number (if applicable)**: _____**

Date : / /

Weather Conditions (circle one):

Sunny Mostly Sunny Mostly Cloudy Cloudy Rain Snow

Company and Inspector's Name: _____

Location (Closest address, pole number, etc):

_____

_____

Overall Structure Condition (circle one): 1 is poor, 2 is fair, 3 is average, 4 is above average, 5 is new

1 2 3 4 5

Depth to top of sediment before cleaning (feet to rim)**:** _____feet

Depth to bottom of the basin after cleaning (feet to rim)**:** _____feet

Depth to invert of the outlet pipe (feet to rim)**:** _____feet

Any Pollutants Present ? (circle one or many)

None	Trash	Pet Waste
Sanitary Odor	Oil/Oil Sheen	Algae/Bacteria
Foam	Other:_____	

Additional Notes About Sediment:

_____

_____

Requires Follow-up by Engineering or Highway Department? (circle one) YES NO If yes explain:

APPENDIX F

Standard Operating Procedures – Street Sweeping

F.1: Street Sweeping

Standard Operating Procedures

Dedham, MA

Department of Public Works

F.1: Sweeping Streets and Parking Lots

Issue Date:

MAR. 2020

Approved by:

Joseph M. Flanagan_____
Public Works Director

Purpose of SOPs:

Procedures for the operation and maintenance of street sweepers, frequency of sweeping, disposal of debris, and recordkeeping to prevent pollution from entering the stormwater sewer systems.

MA Small MS4 General Permit Requirement Summary:

Part 2.3.7.a.iii.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 with two (2) years of the effective date of the permit, and submit such plan with its year one annual report.

Part 2.3.a.iii.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.

Equipment Inventory:

The following is a list of street sweeping equipment:

Equipment Number (License Plate No.)	Make	Description	Sweeper Speed (or other notes)
	Elgin Pelican Sweeper	Three-wheel mechanical sweeper	< 20 mph
	Elgin Pelican Sweeper	Three-wheel mechanical sweeper	< 20 mph
	Elgin Pelican Sweeper	Three-wheel mechanical sweeper	< 20 mph

Standard Operating Procedures *Dedham, MA* *Department of Public Works* **F.1: Sweeping Streets and Parking Lots**	**Issue Date:** MAR. 2020

Operations

1. Operate all sweepers and equipment according to the manufacturer's recommended settings, standards, and procedures.

2. While sweeping, drive between the optimal sweeping speed limit, as recorded in the equipment list above.

3. Sweeping will not take place during moderate to heavy rainfall or during periods of extreme cold (temperatures lower than 15 degrees Fahrenheit).

4. If spills occur or illegal discharges are seen, report to Joseph Flanagan, DPW Director, at jflanagan@dedham-ma.gov, or (781)-751-9377.

Maintenance

1. Sweepers will be checked for leaks after each use. Immediately contain and properly clean up any spills.

2. Regular preventative maintenance to prolong equipment use (such as greasing moving parts and minor adjustments) occur once per month.

3. Parts are replaced as needed. Brushes shall be replaced in accordance with manufacturer specifications.

4. Equipment is washed at the DPW facility located at 55 River Street to trap grease, oils and sediment.

5. The left-over debris is scraped out from the hopper after 25 debris dumps.

Schedule

1. Street sweeping will primarily take place between the months of March and October.

2. All streets with curbing and/or catch basins shall be swept a minimum of once per year in the spring (following winter activities such as sanding) and once in the fall. Streets are swept according to the street list and schedule located at the DPW Facility and attached to this SOP as Attachment 1.

3. Priority roads and parking lots are identified on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, impaired or TMDL waters or other relevant factors. The list of priority roads and parking lots will be reassessed once annually.

4. The sweeping schedule is assessed once per year and updated as necessary.

5. A map of town roads and parking lots is attached to this SOP as Attachment 2.

6. Large public events require street sweeping be performed before and after the event.

Standard Operating Procedures *Dedham, MA* *Department of Public Works* **F.1: Sweeping Streets and Parking Lots**	**Issue Date:** MAR. 2020

Storage and Disposal

1. Temporary storage of solid sweeping debris is on an impervious surface or in a truck/dumpster that is protected from runoff. The debris is temporarily stored at the DPW Facility at 55 River Street.

2. Solid sweeping debris is hauled offsite by an outside contractor and properly disposed of at their discretion.

3. Weighing process: The amount of solid sweeping debris will be weighed by the outside contractor prior to disposal at the receiving facility. This amount is recorded by the Town and included in the yearly Annual Report to EPA.

Training

1. Employees are trained once per year on this procedure and the proper operation of equipment. Employees are also trained on stormwater pollution prevention, spill and response, and illicit discharge detection and elimination procedures.

Record Keeping

1. Records are kept at the DPW facility at 55 River Street.

2. The number of miles swept are recorded after each sweeping. The amount of debris collected per round of sweeping is received from the outside contractor after debris are hauled to a disposal facility.

3. The number of curb miles swept per year is calculated annually and included in the Town's Annual Report to EPA.

4. A list of employees implementing the SOPs and the completion of their training(s) is included below.

Revising the SOPs

1. These procedures are reviewed once per year and updated as needed.

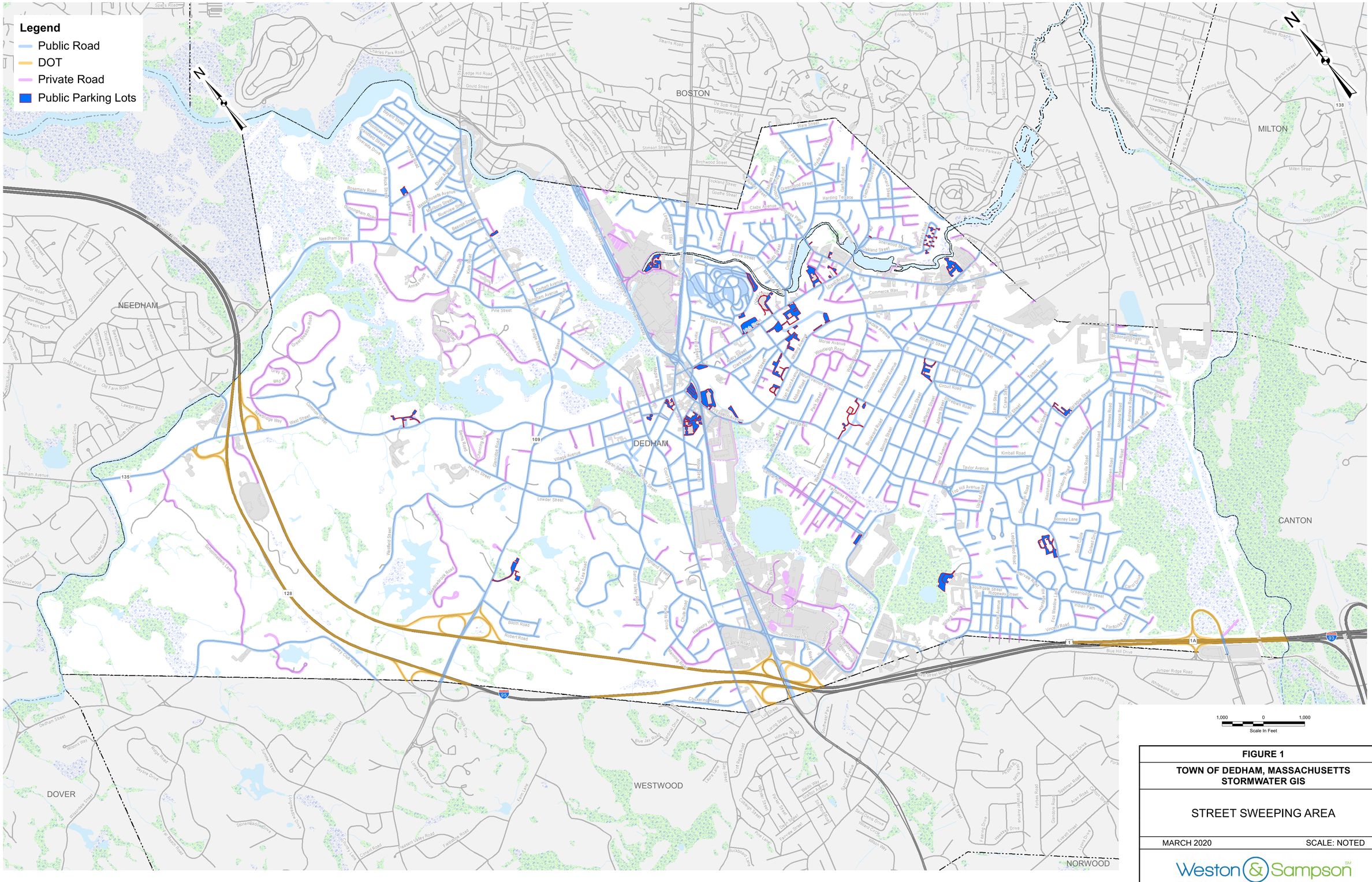

FIGURE 1

TOWN OF DEDHAM, MASSACHUSETTS
STORMWATER GIS

STREET SWEEPING AREA

MARCH 2020 SCALE: NOTED

Weston & Sampson℠

APPENDIX G

Standard Operating Procedures – Inspection and Maintenance of Stormwater Treatment Structures

G.1: Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

SOP: Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

Introduction

Best Management Practices (BMPs) are policies, procedures and structures designed to reduce stormwater pollution, prevent contaminant discharges to natural water bodies, and reduce stormwater facility maintenance costs. Structural BMPs are permanent site features designed to treat stormwater before infiltrating it to the subsurface or discharging it to a surface water body. Regular inspection and maintenance of structural stormwater BMPs is critical for these engineered systems to function as designed (e.g., provide benefits to water quality, groundwater recharge, and peak flow attenuation).

This Standard Operating Procedure (SOP) provides general inspection and maintenance frequencies and procedures for eight common structural stormwater BMPs, including:

1. Bioretention Areas and Rain Gardens
2. Constructed Stormwater Wetlands
3. Extended Dry Detention Basins
4. Proprietary Media Filters
5. Sand and Organic Filters
6. Wet Basins
7. Dry Wells, Leaching Chambers, Infiltration Pipes
8. Infiltration Basins
9. Water Quality Structures
10. Cisterns
11. Other Structural BMPs

This SOP is based on the Massachusetts Stormwater Handbook and is not intended to replace the stormwater BMP Operation and Maintenance guidance contained in the Handbook. This SOP is also not intended to replace the Stormwater BMP Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act, Order of Conditions.

The Dedham Department of Public Works is responsible for inspection and maintenance of municipally owned structural stormwater BMPs. A list of existing structural stormwater BMPs is included in the attachments, along with inspection and maintenance checklists for each type of BMP.

Structural stormwater BMPs will be inspected annually at a minimum. Inspection checklists for each type of structural BMP are provided in the attachments.

Procedures

Bioretention Areas and Rain Gardens

Bioretention areas and rain gardens are shallow depressions filled with sandy soil, topped with a thick layer of mulch, and planted with dense native vegetation. There are two types of bioretention cells:

1. Filtering bioretention area: Areas that are designed solely as an organic filter.

2. Exfiltration bioretention area: Areas that are configured to recharge groundwater in addition to acting as a filter.

Inspection and Maintenance

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

Maintenance Schedule: Bioretention Areas and Rain Gardens

Activity	Time of Year	Frequency
Inspect for soil erosion and repair	Spring through fall	Monthly
Inspect for invasive species and remove if present	Spring through fall	Monthly
Remove trash	Year round	Monthly
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and spring	Bi-annually
Replace dead vegetation	Spring	Annually
Prune	Spring or fall	Annually
Replace all media and vegetation	Late spring/early summer	As needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation, and mulch the surface.

Never store snow within a bioretention area or rain garden. This would prevent the recharge and water quality treatment of ground water.

Constructed Stormwater Wetlands

Constructed stormwater wetlands maximize pollutant removal from stormwater through the use of wetland vegetation uptake, retention, and settling. Constructed storm water wetlands must be used in conjunction with other BMPs, such as sediment forebays.

Dedham does not currently own or maintain any constructed stormwater wetlands. In the event that the Town installs a constructed stormwater wetland, the operation and maintenance procedures outlined in this section shall apply.

Inspection and Maintenance

Regular inspection and maintenance are important for the health of constructed stormwater wetlands. They help identify the need for replacement of vegetation and media, detect potentially harmful invasive species, and ensure the overall health of the wetland.

Maintenance Schedule, Constructed Stormwater Wetlands: Years 0-3

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Spring through fall	Monthly
Record and Map:	Year round	Annually
Types and distribution of dominant wetland plants	Year round	Bi-annually
Presence and distribution of planted wetland species	Spring	Annually
Presence and distribution of invasive species	Fall and spring	Bi-annually
Indications other species are replacing planted wetland species	Spring	Annually
Percent of standing water that is not vegetated	Spring or fall	Annually
Replace all media and vegetation	Late spring/early summer	As needed
Stability of original depth zones and micro-topographic features		
Accumulation of sediment in the forebay and micropool and survival rate of plants		

Maintenance Schedule, Constructed Stormwater Wetlands: Years 4-Lifetime

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Spring through fall	Monthly
Clean forebays	Year round	Annually
Clean sediment in basin/wetland system	Year round	Once every 10 years
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and spring	Bi-annually
Replace dead vegetation	Spring	Annually
Prune	Spring or fall	Annually
Replace all media and vegetation	Late spring/early Summer	As needed

Never store snow within a constructed stormwater wetland. This would prevent required water quality treatment and the recharge of groundwater.

Extended Dry Detention Basins

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and reducing local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

The Town does not own or maintain any extended dry detention basins. If installed in the future, they will be added to the Town's inventory included in Appendix A of Dedham's Operation and Maintenance Plan. This inventory is updated annually.

Inspection and Maintenance

Annual inspection of extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include: erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway, and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately. Inspection after storm events are not required of the MS4 Permit is good practice for maintaining extended dry detention basins.

Maintenance Schedule: Extended Dry Detention Basins

Activity	Time of Year	Frequency
Inspect basins	Spring and fall	Bi-annually and during and after major storms
Examine outlet structure for clogging or high outflow release velocities	Spring and fall	Bi-annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through fall	Bi-annually
Remove trash and debris	Spring	Bi-annually
Remove sediment from basin	Year round	At least once every 5 years

Proprietary Media Filters

Media Filters are designed to reduce total suspended solids and other target pollutants, such as organics, heavy metals, or nutrients – these materials are sorbed onto the filter media, which is contained in a concrete structure. The substrate used as filter media depends on the target pollutants, and may consist of leaf compost, pleated fabric, activated charcoal, perlite, amended sand in combination with perlite, and zeolite. Two types of Media Filters are manufactured: Dry media filters, which are designed to dewater within 72 hours, and wet media filters, which maintain a permanent pool of water as part of the treatment system.

Dedham does not currently own or maintain any proprietary media filters. In the event that the Town installs this type of BMP, the operation and maintenance procedures outlined in this section shall apply.

Inspection and Maintenance

Maintenance in accordance with the manufacturer's requirements is necessary to ensure stormwater treatment. Inspection or maintenance of the concrete structure may require OSHA confined space training. Dry media filters are required to dewater in 72 hours, thus preventing mosquito and other insect breeding. Proper maintenance is essential to prevent clogging. Wet media filters require tight fitting seals to keep mosquitoes and other insects from entering and breeding in the permanent pools. Required maintenance includes routine inspection and treatment.

Maintenance Schedule: Proprietary Media Filters

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging	Per manufacturer's schedule	Bi-annually (minimum)
Remove trash and debris	N/A	Each inspection
Examine to determine if system drains in 72 hours	Spring, after large storm	Annually
Inspect filtering media for clogging	Per manufacturer's schedule	Per manufacturer's schedule

Sand and Organic Filters

Sand and organic filters, also known as filtration basins, are intended for stormwater quality control rather than quantity control. These filters improve water quality by removing pollutants through a filtering media and settling pollutants on top of the sand bed and/or in a pretreatment basin. Pretreatment is required to prevent filter media from clogging. Runoff from the filters is typically discharged to another BMP for additional treatment.

Dedham does not currently own or maintain any sand or organic media filters. In the even that the Town installs this type of BMP, the operation and maintenance procedures outlined in this section shall apply.

Inspection and Maintenance

If properly maintained, sand and organic filters have a long life. Maintenance requirements of the filters include raking the sand and removing sediment, trash, and debris from the surface of the BMP. Over time, fine sediments will penetrate deep into the sand requiring replacement of several inches or the entire sand layer. Discolored sand is an indicator of the presence of fine sediments, suggesting that the sand should be replaced. Inspection after storm events are not required of the MS4 Permit is good practice for maintaining filters.

Maintenance Schedule: Sand and Organic Filters

Activity	Frequency
Inspect filters and remove debris	After every major storm for the first 3 months after construction completion. Every 6 months thereafter.

Wet Basins

Wet basins are intended to treat stormwater quality through the removal of sediments and soluble pollutants. A permanent pool of water allows sediments to settle and removes the soluble pollutants, including some metals and nutrients. Additional dry storage is required to control peak discharges during large storm events. If properly designed and maintained, wet basins can add fire protection, wildlife habitats, and aesthetic values to a property.

The Town does not own or maintain any wet basins. If installed in the future, they will be added to the Town's inventory included in Appendix A of Dedham's Operation and Maintenance Plan. This inventory is updated annually.

Inspection and Maintenance

To ensure proper operation, wet basin outfalls should be inspected for evidence of clogging or excessive outfall releases. Potential problems to investigate include erosion within the basin and banks, damage to the emergency spillway, tree growth on the embankment, sediment accumulation around the outlet, and the emergence of invasive species. Should any of these problems be encountered, perform repairs immediately. An on-site sediment disposal area will reduce sediment removal costs.

Maintenance Schedule: Wet Basins

Activity	Time of Year	Frequency
Inspect wet basins	Spring and/or fall	Annually (Minimum)
Mow upper stage, side slopes, embankment and emergency spillway	Spring through fall	Bi-annually (Minimum)
Remove sediment, trash and debris	Spring through fall	Bi-annually (Minimum)
Remove sediment from basin	Year round	As required, but at least once every 10 years

Dry Wells, Leaching Chambers, Infiltration Pipes

Dry wells, leaching chambers, leaching basins and infiltration pipes are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. These BMPs provide groundwater recharge and can reduce the size and cost required of downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

A list of Dry wells, leaching chambers, leaching basins and infiltration pipes owned and/or operated by the Town is included in Appendix A of Dedham's Operation and Maintenance Plan. This inventory is updated annually.

Inspection and Maintenance

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24 and 48 hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop in water level (inches) by the time elapsed (hours). Inspection after storm events are not required of the MS4 Permit is good practice for maintaining infiltration BMPs.

Maintenance Schedule: Dry Wells, Leaching Chambers, Infiltration Pipes

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Annually thereafter.

Infiltration Basins

Infiltration basins are designed to contain stormwater and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site. High failure rates, however, often occur due to improper siting, inadequate pretreatment, poor design, and lack of maintenance.

A list of Infiltration Basins owned and/or operated by the Town is included in Appendix A of Dedham's Operation and Maintenance Plan. This inventory is updated annually.

Inspection and Maintenance

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction, or low spots. Inspections should include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, riprap condition, sediment accumulation, and turf health. Inspection after storm events are not required of the MS4 Permit is good practice for maintaining infiltration basins.

Maintenance Schedule: Infiltration Basins

Activity	Time of Year	Frequency
Preventative maintenance	Spring and fall	Bi-annually
Inspection	Spring and fall	After every major storm for the first 3 months after construction completion. Bi-annually thereafter and discharges through the high outlet orifice.
Mow/rake buffer area, side slopes and basin bottom	Spring and fall	Bi-annually
Remove trash, debris and organic matter	Spring and fall	Bi-annually

Water Quality Structures

Water quality structures are designed to capture sediment, debris, and other floatables in stormwater. A series of chamber will take on stormwater runoff and capture solids in each of the chambers before discharging the flow. This will improve the quality of stormwater discharged through the MS4 system and to the outfall.

A list of Water Quality Structures owned and/or operated by the Town is included in Appendix A of Dedham's Operation and Maintenance Plan. This inventory is updated annually.

Inspection and Maintenance

Regular maintenance is required to prevent excess build up of sediment, which reduces the effectiveness of the structure. Inspections should include signs of sediment and debris accumulation and overall structure condition. The structure should be visually inspected annually. The accumulated sediment should be cleaned out from inlets at least annually. If certain water quality inlets are accumulating sediment and becoming ineffective prior to annual cleaning, they should be cleaned out twice per year or as necessary.

Maintenance Schedule: Water Quality Structures

Activity	Time of Year	Frequency
Clean out accumulated sediment and debris	Spring, summer or fall	Annually, or as necessary
Inspection	Spring, summer, or fall	Annually

Cisterns

Cisterns help reduce the overall quantity of stormwater runoff by collecting rainwater that has been redirected into a large barrel. Cisterns are commonly used from stormwater runoff from building roof tops. Rain water is directed to a gutter and gravity fed to the cistern.

A list of Cisterns owned and/or operated by the Town is included in Appendix A of Dedham's Operation and Maintenance Plan. This inventory is updated annually.

Inspection and Maintenance

Regular maintenance is required to prevent clogging of the cistern. Debris from the roof that discharges to the cistern should be removed as necessary to prevent debris from clogging the inlet or outlet of the cistern. The inside of the cistern should also be cleaned and all debris or sediment removed from the barrel as necessary. The cistern should be inspected annually for damage, leaks, and sediment or debris reducing the effectiveness.

Maintenance Schedule: Cisterns

Activity	Time of Year	Frequency
Clean out accumulated sediment and debris	Spring, summer or fall	Annually, or as necessary
Clean inside of cistern	Spring, summer or fall	Annually, or as necessary
Inspection	Spring, summer, or fall	Annually

Other Structural BMPs

Any structural BMPs not mentioned above should follow the maintenance schedule submitted with the design and construction of the structure. This includes water quality control structures, outlet control structures, and cisterns. If no written schedule exists, preventive maintenance should be performed at least annually, or as necessary to ensure proper performance. These maintenance tasks may include routine inspection, cleaning, landscaping or making repairs to the system. The Town will document any inspections or maintenance activities completed.

Employee Training

- Employees who perform inspection or maintenance on structural BMPs are trained once per year on proper procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Structural BMP Inspection and Maintenance Form

INSPECTION OF BIORETENTION AREAS / RAIN GARDENS|

General Information

BMP Description	Bioretention Area / Rain Garden		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for soil erosion and repair	Monthly	Yes ☐ No ☐	
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Remove trash	Monthly	Yes ☐ No ☐	
Mulch void areas	Annually	Yes ☐ No ☐	
Remove dead vegetation	Bi-Annually	Yes ☐ No ☐	
Replace dead vegetation	Annually	Yes ☐ No ☐	
Prune	Annually	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Years 0-3 of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

In addition, the following information should be recorded and mapped at least once per year:

- Types and distribution of dominant wetland plants
- Presence and distribution of planted wetland species
- Presence and distribution of invasive species
- Indications other species are replacing planted wetland species
- Percent of standing water that is not vegetated
- Replace all media and vegetation
- Stability of original depth zones and micro-topographic features
- Accumulation of sediment in the forebay and micropool and survival rate of plants

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Year 4 - Lifetime of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Clean forebays	Annually	Yes ☐ No ☐	
Clean sediment in basin/wetland system	Once every 10 years	Yes ☐ No ☐	
Mulch void areas	Annually	Yes ☐ No ☐	
Remove dead vegetation	Bi-Annually	Yes ☐ No ☐	
Replace dead vegetation	Annually	Yes ☐ No ☐	
Prune	Annually	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

INSPECTION OF EXTENDED DRY DETENTION BASINS

Inspections should be conducted bi-annually, and during and after major storm events.

General Information

BMP Description	Extended Dry Detention Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Examine outlet structure for clogging or high outflow release velocities	Bi-Annually	Yes ☐ No ☐	
Mow upper stage, side slopes, embankment and emergency spillway	Bi-Annually	Yes ☐ No ☐	
Remove trash and debris	Bi-Annually	Yes ☐ No ☐	
Remove sediment from basin	At least once every 5 years	Yes ☐ No ☐	

INSPECTION OF PROPRIETARY MEDIA FILTERS

General Information

BMP Description	Media Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for standing water, trash, sediment and clogging	Bi-Annually (minimum)	Yes ☐ No ☐	
Remove trash and debris	Each Inspection	Yes ☐ No ☐	
Examine to determine if system drains in 72 hours	Annually	Yes ☐ No ☐	
Inspect filtering media for clogging	Per manufacturer's schedule	Yes ☐ No ☐	

INSPECTION OF SAND AND ORGANIC FILTERS

Inspections should be conducted after every major storm event for the first 3 months following completion, then every 6 months thereafter.

General Information

BMP Description	Sand/Organic Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Remove sediment, trash, and debris	Every 6 months	Yes ☐ No ☐	
Rake sand	Every 6 months	Yes ☐ No ☐	

INSPECTION OF DRY WELLS AND INFILTRATION SYSTEMS

Regular inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.

General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe condition of BMP at time of inspection			

After a major storm event, the water depth in the observation well should be measured at 24 and 48 hour intervals and the clearance rate calculated.

INSPECTION OF WET BASINS

Inspections should be conducted after every major storm event for the first 3 months following completion, then biannually thereafter.

General Information

BMP Description	Wet Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe condition of wet basin at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Preventative maintenance	Bi-Annually	Yes ☐ No ☐	
Mow/rake buffer area, side slopes and basin bottom	Bi-Annually	Yes ☐ No ☐	
Remove trash, debris and organic matter	Bi-Annually	Yes ☐ No ☐	
Inspect and clean pretreatment devices	Every other month and after every major storm event	Yes ☐ No ☐	

INSPECTION OF WATER QUALITY STRUCTURE

General Information

BMP Description	Inlet or Outlet Water Quality Structure		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect condition of structure	Annually	Yes ☐ No ☐	
Properly remove and dispose of debris	Annually, or more frequent if needed	Yes ☐ No ☐	

INSPECTION OF CISTERN

General Information

BMP Description	Cistern		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect condition of cistern	Annually	Yes ☐ No ☐	
Remove any debris and clean cistern as needed	As necessary	Yes ☐ No ☐	

INSPECTION OF OTHER BMP

General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes No	
		Yes No	
		Yes No	
		Yes No	

APPENDIX H

Standard Operating Procedure – Salt Use Optimization/ Winter Road Maintenance

H.1: Salt Use Optimization/ Winter Road Maintenance

STANDARD OPERATING PROCEDURE **DEPARTMENT OF PUBLIC WORKS [OR OTHER]** **PROGRAM:** Snow Removal and De-Icing	**SOP NUMBER:** 1	**ISSUE DATE:** June 2019

APPROVED BY:

Joseph M. Flanagan_____
Public Works Director

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
Joseph Flanagan	Total Operation
John Wagner	Operation
James Capone	Fleet

Equipment

The municipality owns and maintains ice control and snow removal equipment listed in Table 2. Equipment maintenance shall be conducted consistent with the Vehicles and Equipment maintenance SOP found here: 55 River Street.

Plowing

When conditions warrant, plows are installed on the **6** larger trucks to move snow from the traveled roadway. Average time to install a plow is approximately **15** minutes. **7** smaller trucks are available for plowing of residential streets and clearing public lots.

Sand Spreaders

When conditions warrant, sand spreaders are installed on 5 large trucks and 6 small trucks to spread sand on the traveled roadway. Each sand spreader is calibrated prior to the deicing season and as needed. Sand spreaders are calibrated to dispense **250** cubic yards of sand per lane mile.

Salt Spreaders and Pre-Wetting Devices

When conditions warrant, salt spreaders are installed on 13 trucks to spread salt on the traveled roadway. Each salt spreader is calibrated prior to the deicing season and every **3 weeks** thereafter. Salt application shall be calibrated to dispense rates of **250** pounds per lane mile. 7 trucks are equipped with pre-wetting brine tanks which are calibrated prior to the deicing season and after every event. Pre-wetting application shall be calibrated to dispense rates **7** gallons of pre-wet liquid to 1 ton of salt.

Anti-Icing Dispensers

N/A

TABLE 2

Equipment Number	Make	Description	Additional Equipment	Primary Use
[00001]	*[XXXX]*	*[12-yard dump truck]*	*[4-yard salt spreader. 11' Side-cast plow]*	*[General Salting and Plowing]*
24	Ford 550	2 ton dump	3 yd sander	Plow Salt
26	2001 F450	1 ½ Ton dump	3 yd Sander	Plow
29	2016 F 550	2 Ton dump	3 yd sander	Plow Salt
30	2007 Sterling	10 wh 15 yd Body	Pre Wet 11' plow	Plow Salt
31	2008 Peterbuilt	10 Wh 15 yd Body	11' Plow	Plow Salt
32	2013 International	10 Wh 15 yd Body	Pre Wet 11' Plow	Plow Salt
33	2012 International	6 Wheel Hook Lift	Pre Wet 10' Plow	Plow Salt
34	2015 International	6 wheel Dump	Pre Wet 10' Plow	Plow Salt
35	1994 Ford	6 wheel dump	6 yd Sander 10' plow	Plow Salt
37	2004 Ford 550	2 Ton Hook Lift	3 yd sander Pre wet 9' Plow	Plow Salt
38	2016 International	2 Ton Hook Lift	3 yd sander Pre Wet 9' Plow	Plow Salt
39	2014 F 550	2 Ton Hook Lift	3 yd sander Pre Wet 9' Plow	Plow Salt
40	2018 F 550	2 Ton Hook Lift	3 yd sander Pre Wet 9' Plow	Plow Salt

Other Equipment available from other divisions:
[Fill in other equipment here]

STANDARD OPERATING PROCEDURE **DEPARTMENT OF PUBLIC WORKS [OR OTHER]** **PROGRAM:** Snow Removal and De-Icing	**SOP NUMBER:** 1	**ISSUE DATE:** June 2019

Materials

The major materials are used in snow and ice control are coarse sand, coarse salt, anti-icing agent, Pro melt Magnesium Chloride. These materials are stockpiled in advance of an event and are immediately available when needed and stocks are replenished between events.

Sand
Sand is used as an abrasive for traction on slick roadways. Approximately **50** cubic yards are anticipated to be used per year and are ordered from **local purveyor** prior to each deicing season. Sand is stored in the covered facility located at: **55 River Street**. Loading areas and yards are swept routinely to prevent sand build-up and run-off.

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 **6 7 thousand** tons of **salt** are anticipated to be used per year and are ordered from **Local Purveyor (Eastern Salt has won the bid)** prior to each deicing season. Salt is stored in the covered facility located at: **55 River Street.** Loading areas and yards are swept **routinely** to prevent salt build-up and run-off.

Anti-icing and Pre-Wetting Chemical
Dedham does not Anti – Ice.
1000 gallons of Pro Melt Mag – Magnesium Chloride Liquid Ice Melt is estimated to be needed for pre-wetting. These chemicals are stored at **55 River Street** in a 3000 gallon storage tank equipped with appropriate spill control.

Salt Alternatives
N/A

Record Keeping and Documentation

1. Maintain a master schedule of prioritized snow and sanding routes and the miles or roads plowed or sanded. **55 River Street**
2. Keep copies of manufacturer's recommendations for equipment calibration, plowing speed and salt/sand application rates. **55 River Street**
3. Keep records of the amounts of salt, sand, liquid deicer, and salt alternatives applied per season**. 55 River St**
4. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or computer file. 55 River St

APPENDIX J

2016 MS4 Annual Reports

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 Dedham

EPA NPDES Permit Number: MAR041033

Primary MS4 Program Manager Contact Information

Name: Jason Mammone Title: Director of Engineering

Street Address Line 1: 55 River Street

Street Address Line 2:

City: Dedham State: MA Zip Code: 02026

Email: jmammone@dedham-ma.gov Phone Number: (781) 751-9352

Fax Number:

Stormwater Management Program (SWMP) Information

SWMP Location (web address): http://www.dedham-ma.gov/departments/environmental/stormwater-management

Date SWMP was Last Updated: June 20, 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: http://www.dedham-ma.gov/departments/environmental/stormwater-management. However, the Town has not had any SSOs in the last five years.

☒ 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)*

Phosphorus (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Distribute an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorus-free fertilizers
- ☒ Distribute an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Distribute an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- ☒ Increase street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

Potential structural BMPs

- ☒ Any structural BMPs listed in 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 phosphorus removal by the BMP consistent with Attachment 1 to Appendix H. Document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated phosphorus removed in mass per year by the BMP in each each annual report

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule to target areas with potential for high pollutant loads

☐ 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

Charles River Watershed Phosphorus TMDL

☒ Begin Phase 1 Phosphorus Control Plan (PCP)

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:

There are no known locations where SSOs have discharged to the MS4 during the reporting period or in the 5 years prior to the start of the permit term.

The Town did not perform any catch basin cleaning during Permit Year 1 as it took longer to get a contractor on board and schedule the work than anticipated, and also secure a proper disposal location. While no log of catch basin cleanings was kept exclusively for Permit Year 1 since no cleaning was performed, the Town is keeping a log and tracking metrics for all catch basins being cleaned in Permit Year 2. More information is provided under MCM 6.

The Town does have an informal BMP inspection and maintenance program, which was implemented in Permit Year 1. As the Town continues to identify and map the location of BMPs during Permit Year 2, and develop operation & maintenances procedures/inspection forms as required in Permit Year 2, the Town will implement a more formal BMP inspection and maintenance program by the end of Permit Year 2.

The Board of Health did not distribute educational information directly to septic system owners. Information regarding septic system maintenance is available on the Town's website. The Board of Health will prioritize sending out targeted messages to homeowners during Permit Year 2. There are a very limited number of septic systems within Town. The Town estimates that less than 5% of properties are served by septic systems.

Estimated phosphorus removal associated with existing structural BMPs has been calculated for some developments in Town. However, the Town is still working to refine this information and expand this analysis. As the Town moves forward in developing their Phosphorus Control Plan, they will continue to track and estimate the phosphorus removed by each BMP including reporting on BMP type, total area treated, design storage volume, and the estimated phosphorus removed in mass per year. The Town will begin the legal analysis associated with Phase 1 of the Phosphorous Control Plan in Permit Year 2, as outlined in the SWMP and required by Appendix F of the Permit.

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:

In their NOI, the Town identified two (2) impaired receiving waters with direct discharges: the Charles River and Mother Brook. The NOI identified 26 outfalls discharging into the Charles River and 43 outfalls discharging into Mother Brook. During Permit Year 1, changes were made to outfalls and receiving waters as additional data has been collected regarding outfall ownership and outfall discharge location through field reconnaissance thereby impacting outfall regulatory status. The Town now has 18 outfalls discharging directly to the Charles River and 47 outfalls discharging directly to Mother Brook. All other outfalls discharge to various brooks and streams that are tributary to the Charles or Neponset Rivers. The Town has currently identified 159 outfalls and 25 interconnections, and these updates are reflected in the Town's Stormwater Management Plan.

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: 4

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: Mailing, website, event, school program, press coverage, and/or other means

Message Description and Distribution Method:

Dedham continues to provide stormwater-related educational information on the town website, including copies of the Town's Stormwater Rules and Regulations, a flyer of Best Management Practices compiled by the Town, information about the Town's storm drain stenciling program, and information regarding compliance with the MS4 Permit at: http://www.dedham-ma.gov/departments/environmental/stormwater-management An APWA flyer including Best Management Practices was also distributed to students in school. Dwayne the Storm Drain coloring books and flyers were also distributed at events such as the Farmer's Market, Dedham Trails Day, and Water in Dedham – Past, Present and Future.

Targeted Audience: Residents

Responsible Department/Parties: Environmental Department

Measurable Goal(s):

While the exact number of webpage views is not known, the online posting reached a large audience during the reporting period. The information is visible to those actively searching for it as well as those visiting the Town's website for other reasons, raising awareness more effectively than targeted mailings or postings might.

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 posted flyers about proper pet waste disposal around town, targeting neighborhoods of concern, and made brochures with the same information available in Town Hall. This information was also posted to social media, and distributed at events such as the Farmer's Market, Dedham Trails Day, Water in Dedham – Past, Present and Future. The information was shared with the Animal Rescue League of Boston's branch in Dedham, to be provided to pet adopters and visitors, and the Town Clerk's office to distribute at the time of dog license issuance or renewal.

Targeted Audience: Residents

Responsible Department/Parties: Environmental Department

Measurable Goal(s):

1,500 flyers were distributed by the Town Clerk. Even more were printed and distributed at events such as Dedham Trails Day, the Farmers Market and the Water in Dedham Symposium. They were distributed within Town Hall, the libraries, and hung at local businesses. The flyer was posted on the Town's website and shared through social media and the local newspaper. While the exact number of online messages is not known, the Town actively tried to reach as broad an audience as possible.

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: Website/Flyer/Brochure

Message Description and Distribution Method:

The Town shared a link on its website to information regarding proper disposal of yard clippings and encouraging the use of slow-release or phosphorus-free fertilizers: https://yourcleanwater.org/lawn/. This information was posted to the main slider of the Town's website and to social media. Postings were made to Green Dedham, the Dedham Trails Facebook page and Twitter account, the DPW Facebook page on April 23. A poster with the same information was put in Town Hall, the public library, and the DPW building. Copies were distributed at the Town's Public Participation events including the Farmer's Market, Dedham Trails Day, Water in Dedham – Past, Present and Future. Informational cards were also distributed on racks throughout the town.

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities

Responsible Department/Parties: Environmental Department

Measurable Goal(s):

The large distribution of these materials reached many members of the Dedham community, serving to increase awareness of the negative impacts yard clippings and phosphorus-heavy fertilizers can have on receiving water quality. The exact number of materials distributed is not known.

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: Press Release/PSA

Message Description and Distribution Method:

The Town distributed a press release about the importance of properly disposing of leaf litter. This release included a link to information on yard waste management provided by the Neponset Stormwater Partnership: https://yourcleanwater.org/yard-waste-disposal/ This information was also distributed on the main slider of the Town's website and also via social media. The information was shared on the Green Dedham, Dedham Trails, and DPW Facebook pages, and appeared in the Dedham Times newspaper on October 12, 2018. It was also distributed at events such as the Farmer's Market, Dedham Trails Day, Water in Dedham – Past, Present and Future.

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities

Responsible Department/Parties: Environmental Department

Measurable Goal(s):

This message was well distributed, reaching approximately 3,000 people on Facebook alone. This easily accessible information increased awareness of the impacts of mishandled leaf litter.

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:Website/Flyer/Brochure

Message Description and Distribution Method:

The Town posted information to their website regarding proper maintenance of septic systems.

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities

Responsible Department/Parties: Health Department

Measurable Goal(s):

The Town's goal is to reach all septic system owners. Less than 5% of the Town is currently served by septic systems. Septic system information was placed on the Town's website. A more targeted approach is planned for Permit Year 2, where mailings will be sent to property owners with septic systems directly.

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:

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 Town of Dedham posted the SWMP to their town website in June 2019, making it available for public comment through July 31, 2019. At the close of the comment period, zero comments had been received. Once submitted, this Annual Report will be appended to the SWMP and the online version 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:

Dedham provided multiple opportunities for public involvement and participation during this reporting period. On October 13, 2018 the Town held a Hazardous Waste Collection Day, collecting pesticides/herbicides, oil-based plants, acid, alkaline, oxidizers, aerosols, lithium batteries, fluorescent bulbs, CFLs, oils, pesticides, and mercury containing devices. The Town spent $14,393 to haul approximately 100 tons of hazardous waste to appropriate disposal facilities.

The DPW sponsored an Arbor Day Celebration on April 25, 2019, and the Dedham Environmental Department held a Water in Dedham symposium on May 4, 2019. This initiative highlighted the critical role water has played in the community, and took participants through its early use as a means for industry, and subsequent pollutant and cleanup efforts. The exhibits were placed in each neighborhood of the Town, showing historical pictures of the Charles River. The event was sold out, as was the guided tour of the Charles River in Dedham with L.L. Bean.

Over 90% of the Town's catch basins have been stenciled to date, but no stenciling was performed during Permit Year 1. All new catch basins are required to be installed with grates that state: "Do Not Dump, Drains To Waterways".

As part of Earth Day in April 2019, DPW provided assistance with clean-ups performed around water resource areas. Clean-ups were performed by various groups including Dedham Civic Group, Neponset River Watershed Association, Dedham Middle School, and Dedham High School. These activities provided the opportunity for residents to learn about and help implement the MS4 program.

Many Dedham residents volunteered to help the Neponset River Watershed Association (NepWRA) collect water quality data through the Citizen Water Monitoring Network (CWMN). Volunteers took samples from the CWMN station in Dedham located on Mother Brook at Washington Street once per month between May and October, and tested samples for E.coli, total phosphorus, pH, dissolved oxygen, temperature, ortho-

phosphate, total nitrogen, and ammonia. The sampling effort conducted during the reporting period is part of an initiative that has been in place for 23 years, and provides an active way for citizens to take responsibility for water quality in their town.

Twice per year, the Sustainability Advisory Committee hosts a recycling event for hard to recycle items such as styrofoam, textiles, mercury, packing peanuts, scrap metal and bikes. These events were held on Saturday, October 13th and Saturday, April 21st during the reporting period. At the April 21st event, 1,250lbs of paper, 800lbs of styrofoam, 1.78 tons of metal, 30 bikes, 6,883lbs of electronics, 112.5lbs of mercury lamps, and 340lbs of textiles were collected.

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: 0

Total number of SSOs removed: 0

MS4 System Mapping

Describe the status of your MS4 map, including any progress made during the reporting period:

Prior to the start of the permit term, Dedham had a comprehensive map of their drainage system. The map includes outfalls, pipes, manholes, catch basins, interconnections with other MS4s, and impaired water bodies. During this reporting period, defined catchment areas were delineated for each outfall and interconnection. The Town has also been working to identify open channel conveyances and determine outfall ownership and regulated status. The Town also continues to work on mapping of municipally owned stormwater treatment structures. The Town map, which is in accordance with the 2016 MS4 Permit's accuracy guidelines, is available at the following location: http://gis.dedham-ma.gov/infraviewer2.

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 GALLONS

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:

Materials were provided to municipal staff on Illicit Discharge Detection and Elimination during Permit Year 1. A more formal training on recognizing and eliminating illicit discharges, and on good housekeeping practices for municipal activities is planned for Permit Year 2.

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: 54

Number of inspections completed: 200

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:

Dedham has separate Rules and Regulations for Stormwater Management, as referenced in Chapter 246 of the Town's bylaws. These Rules and Regulations were most recently revised on November 15, 2018, and are included in Appendix H of the Stormwater Management Plan. Further minor revisions will be completed in Permit Year 2 to bring the Town into compliance with the 2016 MS4 Permit.

As-built Drawings

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites required to be complete in year 2 of the permit term:

For Major Stormwater Permits, Dedham's Stormwater Rules and Regulations require the submission of as-built plans, as well as a site inspection confirming the accuracy of as-built plans, prior to the issuance of a Stormwater Management Certificate of Compliance (SMCC). SMCCs are required to fully comply with the conditions of Major Stormwater Management Permits in Dedham. Under Dedham's Stormwater Management Rules & Regulations, Major Stormwater Management Permits must include a "Post Construction Operation and Maintenance Plan (O&M)." Required components of the plan include the names and contact information of responsible parties, an inspection and maintenance schedule, estimated annual O&M budget, and inspection forms. Additionally, the plan must be signed by the property owner and recorded with the Norfolk County Registry of Deeds.

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 develop the street design and parking lots assessment report during Permit Year 4.

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:

While the Town's Stormwater Management Rules and Regulations include provisions recommending the use of green infrastructure/low impact development in all new development projects, the Town will develop a specific green infrastructure assessment and report. This report will be completed during Permit Year 4.

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 is working to develop an inventory of its properties to be retrofitted with BMPs. This inventory will be completed within Permit Year 4.

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: 100

Number of catch basins cleaned: 100

Total volume or mass of material removed from all catch basins: 4,800 CF

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

Total number of catch basins: 1,961

If applicable:

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

Street Sweeping

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

The Town continued its existing schedule of sweeping arterial roads every three days and sweeping all other roads in town at least three times per year. The Town is working to develop a Standard Operating Procedure for street sweeping, which will be complete by the end of Permit Year 2.

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

- ◉ Number of miles cleaned: 250 miles
- ○ 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 twice 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 has developed Standard Operating Procedures for Snow Removal and De-icing, which can be found in Appendix I of the Stormwater Management Plan. This SOP includes written procedures for plowing, sanding, and salting roads, and designates appropriate covered storage areas for sand, salt, and pre-wetting chemicals that are used for road maintenance in the winter.

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 compile a complete inventory of their property, including vehicles and equipment. All vehicles and equipment used for Winter Road Maintenance have been inventoried and are included in the Snow Removal and De-Icing SOP in Appendix I of the SWMP.

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 develop written operation and maintenance procedures for parks and open spaces, buildings and facilities, and buildings and equipment. These SOPs will be included in Appedix I of the SWMP as completed.

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 is working to create a SWPPP for their DPW facility. This SWPPP will be complete by the end of Permit Year 2.

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 complete 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:

The Town was unable to clean any catch basins during the reporting period. The Town had planned to clean all of its catch basins in the summer of 2019 using an outside contractor, but there were a number delays outside of the Town's control mostly related to the limited options available for disposal of catch basin cleanings. The Contractor plans to start cleaning of call catch basins imminently. The Town recently developed an electronic catch basin cleaning and inspection form. This form runs on an iPad, and will standardize the way data is collected for each catch basin. The form includes fields for the depth to top of sediment, depth to bottom of basin after cleaning, depth to invert of outlet pipe, and evidence of pollutants. Once filled out, the information in the form will be automatically uploaded into a database, which will be used

to develop the Town's catch basin cleaning optimization plan.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 2 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete system mapping Phase I
- Begin investigations of catchments associated with Problem Outfalls
- Develop or modify an ordinance or other regulatory mechanism for post-construction stormwater runoff from new development and redevelopment
- Establish and implement written procedures to require the submission of as-built drawings no later than two years after the completion of construction projects
- Develop, if not already developed, written operations and maintenance procedures
- Develop an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; review annually and update as necessary
- Establish a written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner
- Develop and implement a written SWPPP for maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclose or cover storage piles of salt or piles containing salt used for deicing or other purposes
- Develop, if not already developed, written procedures for sweeping streets and municipal-owned lots
- Develop, if not already developed, written procedures for winter road maintenance including storage of salt and sand
- Develop, if not already developed, a schedule for catch basin cleaning
- Develop, if not already developed, a written procedure for stormwater treatment structure maintenance
- Develop a written catchment investigation procedure *(18 months)*

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually

Provide any additional details on activities planned for permit year 2 below:

Part V: Certification of Small MS4 Annual Report 2019

40 CFR 144.32(d) Certification

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

Name:	Jason Mammone	Title:	Director of Engineering
Signature:		Date:	

[Signatory may be a duly authorized representative]

Year 2 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019-June 30, 2020

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2019 and June 30, 2020 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: Town of Dedham

EPA NPDES Permit Number: MAR041033

Primary MS4 Program Manager Contact Information

Name: Jason Mammone Title: Director of Engineering

Street Address Line 1: 55 River Street

Street Address Line 2:

City: Dedham State: MA Zip Code: 02026

Email: jmammone@dedham-ma.gov Phone Number: (781) 751-9352

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.dedham-ma.gov/home/showdocument?id=13475

Date SWMP was Last Updated: June 2020

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☒ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

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 2 Requirements

- ☒ Completed Phase I of system mapping
- ☒ Developed a written catchment investigation procedure and added the procedure to the SWMP
- ☒ Developed written procedures to require the submission of as-built drawings and ensure the long term operation and maintenance of completed construction sites and added these procedures to the SWMP
- ☒ Enclosed or covered storage piles of salt or piles containing salt used for deicing or other purposes
- ☒ Developed written operations and maintenance procedures for parks and open space, buildings and facilities, and vehicles and equipment and added these procedures to the SWMP
- ☒ Developed an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment and added this inventory to the SWMP
- ☒ Completed a written program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☒ Developed written SWPPPs, included in the SWMP, for all of the following permittee owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Although referenced in the SWMP, the detailed written catchment investigation procedures were incorporated into the Town's IDDE Plan, not the actual SWMP. The IDDE Plan and the SWMP are currently two separate documents. A written SWPPP was developed for the Town's DPW Facility. However, this is a separate

standalone document and the complete document was not incorporated into the written SWMP, although again, they are referenced in this document. Both the IDDE Plan and the SWPPP for the Transfer Station are available on the Town's website.

Annual Requirements

- ☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☐ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ◉ This is not applicable because we did not find any new SSOs
  - ○ The updated SSO inventory is attached to the email submission
  - ○ The updated SSO inventory can be found at the following website:
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☒ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated outfall and interconnection inventory and priority ranking as needed

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☒ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Phosphorus (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

☒ Distributed an annual message in the spring (April/May) encouraging the proper use and disposal of grass clippings and encouraging the proper use of slow-release and phosphorus-free fertilizers

☒ Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

☒ Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

Potential structural BMPs

☐ Any structural BMPs already existing or installed in the regulated area by the permittee or its agents was tracked and the phosphorus removal by the BMP was estimated consistent with Attachment 3 to Appendix F. 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 were documented.

- ○ The BMP information is attached to the email submission
- ○ The BMP information can be found at the following website:

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Estimated phosphorus removal associated with existing structural BMPs has been calculated for some developments in Town. However, the Town is still working to refine this information and expand this analysis. As the Town moves forward in developing their Phosphorus Control Plan, they will track and estimate the phosphorus removed by each BMP including reporting on BMP type, total area treated, design storage volume, and the estimated phosphorus removed in mass per year.

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

☐ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Town has been collecting data during annual catch basin cleaning that will be utilized to develop a catch basin cleaning optimization plan. This plan will be developed and implemented once sufficient data has been collected. The plan will include provisions to prioritize areas that discharge to waterbodies impaired for solids, oil, grease, or metals.

Charles River Watershed Phosphorus TMDL

☒ Completed Legal Analysis

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

There are no known locations where SSOs have discharged to the MS4 during the reporting period or in the 5 years prior to the start of the reporting period.

The Town performed training on Illicit Discharge Detection and Elimination (IDDE) and Good Housekeeping and Pollution Prevention at the end of May 2020. Due to the COVID-19 pandemic, a formal, in-person training was not permissible, so PowerPoint Presentations were distributed to staff, and staff had to send confirmation to the Director of Engineering verifying that they completed the required training.

The Town was proactive in drafting the regulatory updates required under MCM5 during Permit Year 2, however the onset of COVID-19 and the change to a virtual public meeting format caused the adoption of those regulatory updates to be delayed until after the end of the reporting period. Dedham's Stormwater Management Rules and Regulations were officially updated to meet permit requirements at a Conservation Commission meeting held on August 8, 2020.

The Town inspected all 78 municipally owned stormwater treatment structures during the reporting period.

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:

The list of outfalls has been updated during mapping efforts during Permit Years 1 and 2. The list of receiving waters is now more detailed, accounting for smaller tributaries to larger waterbodies such as the Charles River and the Neponset River. These updates are included in the updated SWMP, dated June 2020, that is posted to the Town's website: https://www.dedham-ma.gov/departments/engineering/municipal-stormwater-ms4

The following changes have been made to the list of impaired waters in Dedham since the permit effective date: Mother Brook is no longer impaired for dissolved oxygen.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 6

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP: Dog Waste Flyers

Message Description and Distribution Method:

The Town distributed a flyer entitled "There's no such thing as the poop fairy" with dog license issuances and renewals during Permit Year 2. These flyers were distributed both in-person and via mail after the onset of COVID-19.

Targeted Audience: Residents

Responsible Department/Parties: Town Clerk/ Environmental Department

Measurable Goal(s):

The Town distributed 950 dog waste flyers with dog license issuances and renewals during the reporting period.

Message Date(s):

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Leaf Litter Messaging

Message Description and Distribution Method:

The Town posted information provided by the Neponset Stormwater Partnership regarding proper disposal of leaf litter to the home page of its website during the Fall of 2019. The leaf litter slider also served as a link to the Town's stormwater webpage, where more educational information is posted. As part of the fall campaign, the Town also shared this information to the "Sustainable Dedham" and "Dedham Trails" Facebook and Twitter pages.

Targeted Audience: Residents

Responsible Department/Parties: Environmental Department, Engineering Department

Measurable Goal(s):

By posting the leaf litter slider to the home page of the Town's website, Dedham ensured that it would be seen by as many residents as possible. Additionally, the post on the Dedham Trails Facebook and Twitter pages reached the accounts' 2,182 followers, and the post on the Sustainable Dedham pages reached its 1,324 followers at a minimum.

Message Date(s): Fall 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:

BMP:Septic System Messaging

Message Description and Distribution Method:

The Town posted a SepticSmart flyer developed by EPA and a SepticSmart homeowners guide to its website in the winter of 2020. The flyer was posted in both English and Spanish, and was also mailed to all the known addresses with septic systems in Town.

Targeted Audience: Residents

Responsible Department/Parties: Health Department, Engineering Department

Measurable Goal(s):

The flyer was mailed to the 257 properties in Dedham known to have septic systems.

Message Date(s): Spring 2020

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:Fertilizer Messaging

Message Description and Distribution Method:

The Town shared the "Fertilizer Calculator" developed by the Neponset Stormwater Partnership to the Sustainable Dedham and Dedham Trails Facebook and Twitter pages. These posts were part of a spring campaign to minimize phosphorus use and encourage the use of low phosphorus or phosphorus-free fertilizer.

Targeted Audience: Residents

Responsible Department/Parties: Environmental Department, Engineering Department

Measurable Goal(s):

This message reached the 2,182 followers of the "Dedham Trails" Facebook and Twitter pages and the 1,324 followers of the "Sustaintainable Dedham" Facebook and Twitter pages.

Message Date(s): Spring 2020

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:Town Hall Talks Newsletter

Message Description and Distribution Method:

The Environmental Department wrote an article on stormwater, stormwater pollution, and the Town's MS4 program for the May 2020 issue of the Town Hall Talk newsletter. The Conservation Department also included a piece on invasive species and the importance of reintroducing native plants back into the environment.

Targeted Audience: Residents

Responsible Department/Parties: Environmental Department, Conservation Department

Measurable Goal(s):

The Town Hall Talks newsletter was uploaded to the Town's website and emailed to the newletters' 340 subscribers. 58% of the subscribers, or 200 Dedham residents, opened the newsletter.

Message Date(s): May 2020

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:

The Town did not have any general public education BMPs scheduled for Year 2 in the NOI. This BMP was completed two years before the general public education BMPs which were scheduled for Year 4.

BMP: Regional Outreach Mailer

Message Description and Distribution Method:

The Neponset River Watershed Association distributed an informational flyer directly to Dedham residents in the summer of 2020. The flyer covered dog waste management, fertilizer use, and other topics related to stormwater management.

Targeted Audience: Residents

Responsible Department/Parties: Neponset Stormwater Partnership

Measurable Goal(s):

The flyer was distributed to 11,500 residents by the Neponset River Watershed Association.

Message Date(s): June 2020

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:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The Town posted the updated SWMP, dated June 2020, to its website at the end of Permit Year 2. The SWMP was made available for public comment. However, no comments were received. A final version of the updated SWMP has since been posted to the Town's website at the link included above.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The Board of Health held its annual Household Hazardous Waste Collection Day on October 5, 2019, providing the opportunity for residents to properly dispose of hazardous materials such as paints, pesticides, vehicle fluids, batteries, flammable materials, and other substances that may have otherwise been discharged into the MS4. While only one official collection day is held annually, DPW staff collect and properly dispose of hazardous materials year-round as needed. Over 2,800 gallons of hazardous waste was collected at the annual Household Hazardous Waste Collection Day during the reporting period.

In addition to providing bi-weekly curbside recycling pickup, the Town held a recycling collection event on November 2, 2019, to collect items that are not accepted during curbside pickup but are still recyclable.

While no in-person activities, such as river clean-ups, were conducted for Earth Day due to COVID-19, the Town increased its social media presence during the reporting period to encourage residents to continue to participate in the SWMP on their own. The Conservation Commission posted signs around Town and posted information online about pulling garlic mustard, an invasive species that spreads quickly in the area and

threatens native species. Throughout the spring, Dedham Trails encouraged residents to participate in the Just1Bag2020 initiative by collecting trash during their daily walks in lieu of an organized event.

The Town continued its Citizens Water Monitoring Network, an initiative organized through the Nepsonset River Watershed Association, during the reporting period. Resident volunteers collected monthly samples at the Mother Brook at Washington Street station, testing for E.coli, total phosphorus, pH, dissolved oxygen, temperature, ortho-phosphate, total nitrogen, and ammonia. This program allowed the Town to identify the Transfer Station as a source of stormwater pollution to Mother Brook and the Neponset River, and to take the actions necessary to mitigate its impact. Water quality in Mother Brook has improved since this program began in 1996.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 0

Number of SSOs removed: 0

MS4 System Mapping

Below, check all that apply.

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

☒ Outfalls and receiving waters

☒ Open channel conveyances

☒ Interconnections

☒ Municipally-owned stormwater treatment structures

☒ Waterbodies identified by name and indication of all use impairments

☒ Initial catchment delineations

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

Dedham has a comprehensive map of its drainage system, including all of the elements required to be mapped by the end of Permit Year 2. During the reporting period, the Town worked to identify all of its open channel conveyances, determine outfall ownership and regulated status, and map all municipally owned stormwater treatment structures. The most recent version of the MS4 map is included with the SWMP and available at the following location: http://gis.dedham-ma.gov/infraviewer2.

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:

N/A

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened: 0

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ The catchment investigation data is attached to the email submission
- ○ The catchment investigation data can be found at the following website:

N/A

*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:

Dedham did not have any problem catchments identified in its Catchment Prioritization and Ranking matrix. As information becomes available from dry-weather screening and sampling, the catchments will be reprioritized and catchment investigations 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:

N/A

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: 0

Total number of illicit discharges removed: 0

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

Employee Training

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

Individual employee training was conducted in May of the reporting period. As mentioned above, training could not be conducted in a formal group setting due to COVID-19, so instead PowerPoint presentations were sent to staff and the staff had to send email confirmation to the Director of Engineering that they had completed the training. The Town will continue annual employee training for the duration of the permit term.

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: 29

Number of inspections completed: 212

Number of enforcement actions taken: 3

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

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

Ordinance or Regulatory Mechanism

Below, select the option that describes your ordinance or regulatory mechanism progress.

- (●) Bylaw, ordinance, or regulations are updated and adopted consistent with permit requirements
- ( ) Bylaw, ordinance, or regulations are updated consistent with permit requirements but are not yet adopted
- ( ) Bylaw, ordinance, or regulations have not been updated or adopted

As-built Drawings

Describe 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:

There is language in the Dedham Stormwater Management Rules and Regulations that requires developers to submit as-built drawings at the completion of construction and before a Stormwater Management Compliance Certificate (SMCC) is issued. There is also language in the Stormwater Management Rules and Regulations requiring developers to submit a post-construction operation and maintenance plan for the stormwater management system on new development and redevelopment sites prior to project approval and the issuance of a Major Stormwater Management Permit.

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 is working to develop the street design and parking lots assessment. This assessment will be complete within four years of the permit effective date, or by June 2022.

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 is working to develop the green infrastructure report. The report will be complete within four years of the permit effective date, or by June 2022.

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 compiled an inventory of municipally-owned properties and is working to identify which of those properties could be modified or retrofitted with BMPs to mitigate its impact on the MS4. This retrofit inventory will be complete within four years of the permit effective date, or by June 2022.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 116

Number of catch basins cleaned: 98

Total volume or mass of material removed from all catch basins: 848.76 cubic feet

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

Total number of catch basins: 1,961

If applicable:

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

The Town is still working to collect the necessary data to develop their Catch Basin Cleaning Optimization Plan.

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- ◉ Number of miles cleaned: 330
- ○ Volume of material removed: [Select Units]
- ○ Weight of material removed: [Select Units]

O&M Procedures and Inventory of Permittee-Owned Properties

Below, check all that apply.

The following permittee-owned properties have been inventoried:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

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

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

Stormwater Pollution Prevention Plan (SWPPP)

Below, report on the number of site inspections for facilities that require a SWPPP completed ***during this reporting period****.*

Number of site inspections completed: 1

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

The SWPPP inspection mentioned above was conducted at the time the SWPPP was developed. This facility will be inspected quarterly going forward. The Town is working to address recommendations included in the SWPPP, but no corrective actions have been taken to date.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (●) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

COVID-19 Impacts

Optional: If any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Due to the impacts of COVID-19, the Town of Dedham had to institute a hiring freeze which prevented the Engineering Department from hiring their summer intern which was going to be focused on performing dry weather outfall inspections for our 186 Town-owned outfalls/interconnections.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 3 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Inspect all outfalls/ interconnections (excluding Problem and Excluded outfalls) for the presence of dry weather flow
- Complete follow-up ranking as dry weather screening becomes available

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary

Provide any additional details on activities planned for permit year 3 below:

Part V: Certification of Small MS4 Annual Report 2020

40 CFR 144.32(d) Certification

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

Name:	Jason Mammone	Title:	Director of Engineering
Signature:		Date:	

[Signatory may be a duly authorized representative]