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STORMWATER MANAGEMENT PLAN

MS4 GENERAL PERMIT COMPLIANCE

JUNE 2019
UPDATED JUNE 2023

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 4, 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. The 2016 MS4 Permit expired on June 30, 2022, and has been administratively continued for covered permittees until a new permit is issued.

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
- 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 of Engineering	Engineering Department
Joseph Flanagan	Director of Public Works	Department of Public Works
Jeremy Rosenberger	Town Planner	Planning & Zoning Department
Kylee Sullivan	Health Director	Health Department
Patrick Hogan	Interim Conservation Agent	Conservation Department
Robert Stanley	Parks & Recreation Director	Parks & Recreation
Denise Moroney	Facilities 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, and 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 2018/2020 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)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature	18
Mother Brook (MA73-28) *(Class B Water)*	(Debris*), (Flow Regime Modifications*), Color, DDT in Fish Tissue, Dissolved Oxygen, E.coli, Fecal Coliform, Mercury in Fish Tissue, Odor, PCB in Fish Tissue, Total Phosphorus, Trash	38
Rock Meadow Brook (MA72-21)	Algae, Benthic Macroinvertebrates, Dissolved Oxygen, Nutrient/Eutrophication Biological Indicators, Organic Enrichment (Sewage) Biological Indicators, Total Phosphorus	The Town does not have any outfalls or interconnections that discharge directly to Rock Meadow Brook.
Neponset River (MA73-02)	(Debris*), (Fish Passage Barrier*), DDT in Fish Tissue, Dissolved Oxygen, E.coli, Fecal Coliform, Flocculant Masses, Metals, Oil and Grease, PCBs in Fish Tissue, Scum/Foam, Trash, Turbidity, Unspecified Metals in Sediment	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)	-	5
Lowder Brook (Tributary to Charles River)	-	16

Table 1.2 RECEIVING WATERS AND IMPAIRMENTS		
Waterbody	Impairment	Number of Outfalls Discharging to Receiving Water
MIT Endicott Brook (Tributary to Charles River)	-	1
Peanut Butter Brook (Tributary to Neponset River)	-	5
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 30 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)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient

Table 1.3 INTERCONNECTIONS			
Interconnection and/or Drainage Area ID	Connecting Municipality	Receiving Water	Impairment
			Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC002	Interconnection with State Drainage	Charles River (MA72-07) *(Class B Water)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC003	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC004	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC005	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient

Table 1.3 INTERCONNECTIONS			
Interconnection and/or Drainage Area ID	Connecting Municipality	Receiving Water	Impairment
			Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC006	Interconnection to State Drainage	Charles River (MA72-07) *(Class B Water)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC007	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Debris*), (Flow Regime Modifications*), Color, DDT in Fish Tissue, Dissolved Oxygen, E.coli, Fecal Coliform, Mercury in Fish Tissue, Odor, PCB in Fish Tissue, Total Phosphorus, Trash
ITC008	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Debris*), (Flow Regime Modifications*), Color, DDT in Fish Tissue, Dissolved Oxygen, E.coli, Fecal Coliform, Mercury in Fish Tissue, Odor, PCB in Fish Tissue, Total Phosphorus, Trash
ITC009	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Debris*), (Flow Regime Modifications*), Color, DDT in Fish Tissue, Dissolved Oxygen, E.coli, Fecal Coliform, Mercury in Fish Tissue, Odor, PCB in Fish Tissue, Total Phosphorus, Trash
ITC010	Interconnection with BWSC Storm Drain	Mother Brook (MA73-28) *(Class B Water)*	(Debris*), (Flow Regime Modifications*), Color, DDT in Fish Tissue, Dissolved Oxygen, E.coli, Fecal Coliform, Mercury in Fish Tissue, Odor, PCB in Fish Tissue, Total Phosphorus, Trash
ITC011	Town Drainage to Private Storm Drain	Little Wigwam Stream	
ITC012	Interconnection with State Drainage	Unknown	

Table 1.3 INTERCONNECTIONS			
Interconnection and/or Drainage Area ID	Connecting Municipality	Receiving Water	Impairment
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)*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes

Table 1.3 INTERCONNECTIONS			
Interconnection and/or Drainage Area ID	Connecting Municipality	Receiving Water	Impairment
			Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC026	Town Discharges to Private Storm Drainage	Charles River (MA72-07) *(Class B Water*	(Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature
ITC027	Interconnection with State Drainage	Wigwam Brook	
ITC028	Interconnection with State Drainage	Little Wigwam Brook	
ITC029	Interconnection with MBTA Drainage	Little Wigwam Stream	
ITC030	Interconnection with State Drainage	Little Wigwam Brook	
ITC031	Interconnection with State Drainage	Charles River (MA72-07)	Curly-leaf Pondweed*), (Eurasian Water Milfoil, Myriophyllum spicatum*), (Fish-Passage Barrier*), (Flow Regime Modification*), (Water Chestnut*), Benthic Macroinvertebrates, DDT in Fish Tissue, E.Coli, Fishes Bioassessments, Nutrient Eutrophication/Biological Indicators, PCB in Fish Tissue, Total Phosphorus, Temperature

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, 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 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.

Regulatory Requirement:

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

Existing Town Practices:

Since the 2003 MS4 Permit became effective, the Town of 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 Conservation 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: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: Completed during Permit Year 4 (FY2022). The Town mailed out a flyer targeting residents with information on stormwater management and best practices to be done at home. The flyer was sent to every house in Dedham in July 2021. Throughout the rest of Year 4, messages related to stormwater management were sent out through social media targeting residents. These messages included topics of general stormwater management, leaf litter and fall clean up best practices, and proper disposal of pet waste. The messages were sent out via Facebook Ads, the DPW Facebook page, the Engineering Department Twitter page, the DWP Twitter page, the Town website, email notifications to Town website subscribers, and to the Dedham Schools System.

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: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: Completed during Permit Year 4 (FY2022). The Town mailed out a flyer targeting businesses, institutions and commercial facilities with information on stormwater management and best practices. The flyer was sent to the target audiences in July 2021. Throughout the rest of Permit Year 4, messages related to stormwater management were sent out through social media targeting residents and businesses. These messages included topics of general stormwater management, leaf litter and fall clean up best practices, and proper disposal of pet waste. The messages were sent out via Facebook Ads, the DPW Facebook page, the Engineering Department Twitter page, the DWP Twitter page, the Town website, email notifications to Town website subscribers, and to the Dedham Schools System.

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Developers (construction)
Responsible Department/Parties: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: Completed during Permit Year 4 (FY2022). Two public education flyers were created targeting developers. One flyer focused on reducing stormwater runoff during construction, and a second flyer focused specifically on sediment and erosion control for developers. Both flyers were distributed to developers by the Conservation Department, Planning Department, Building Department and Engineering Department when they submitted applications and permits.

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Industrial Facilities
Responsible Department/Parties: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading
Implementation Timeframe: Completed during Permit Year 4 (FY2022). A stormwater pollution prevention guide flyer, which focused on stormwater management related to industrial facilities, was mailed to 57 industrial facilities in Dedham during Permit Year 4.

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: Completed during Permit Year 5 (FY2023). The Town mailed out a flyer targeting residents with information on stormwater management best practices that could be implemented at home. The flyer was sent to every house in Dedham in May 2023. Throughout the remainder of Permit Year 5, messages related to stormwater management were sent out through social media targeting residents. These messages included topics on general stormwater management, leaf litter and fall clean up best practices, and proper disposal of pet waste. The messages were sent out via Facebook Ads, the DPW Facebook page, the Engineering Department Twitter page, the DWP Twitter page, the Town website, email notifications to Town website subscribers, and to the Dedham School System.

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: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: Completed during Permit Year 5 (FY2023). The Town mailed out a flyer targeting businesses, institutions and commercial facilities with information on stormwater management and best practices. The flyer was sent to the target audiences in May 2023. Throughout the remainder of Permit Year 5, messages related to stormwater management were sent out through social media targeting residents and businesses. These messages included topics on general stormwater management, leaf litter and fall clean up best practices, and proper disposal of pet waste. The messages were sent out via Facebook Ads, the DPW Facebook page, the Engineering Department Twitter page, the DWP Twitter page, the Town website, email notifications to Town website subscribers, and to the Dedham School System.

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Developers (construction)
Responsible Department/Parties: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: Completed during Permit Year 5 (FY2023). Two public education flyers were created targeting developers. One flyer focused on reducing stormwater runoff during construction, and a second flyer focused specifically on sediment and erosion control for developers. Both flyers were distributed to developers by the Conservation Department, Planning Department, Building Department and Engineering Department when they submitted applications and permits. Approximately 50 flyers were distributed to developers.

BMP: Outreach Message
Description: Mailing, website, event, school program, press coverage and/or other means.
Targeted Audiences: Industrial Facilities
Responsible Department/Parties: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: Completed during Permit Year 5 (FY2023). A stormwater pollution prevention guide flyer, which focused on stormwater management related to industrial facilities, was mailed to 90 industrial facilities in Dedham during Permit Year 5.

BMP: Educational Presentation
Description: Providing two visits to 5th grade classrooms across Dedham Public Schools with one visit covering stormwater-related topics and the other visit focusing on water conservation.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering Department
Measurable Goals: Raise awareness and modify behaviors to reduce pollutant loading.
Implementation Timeframe: Completed during Permit Year 5 (FY2023). Three 5th grade classrooms at Avery Middle School were visited on March 21, 2023 and March 22, 2023. Three 5th grade classrooms at Greenlodge Middle School were visited on March 1, 2023 and March 8, 2023. Three 5th grade classrooms were visited at Riverdale Middle School on March 18, 2023 and March 19, 2023. Three classrooms at Oakdale Middle School were visited on May 25, 2023 and May 30, 2023.

Public education materials utilized in the implementation of the Town's SWMP through Permit Year 5 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 a Conservation Department that is comprised of two staff members. The Conservation Department works alongside the Sustainability 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 Sustainability 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 Department of Public Works and the Conservation Department support 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. Dedham has 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. During Permit Year 4, on October 2, 2021 and April 30, 2022, Dedham held a Hazardous Waste Collection Day. On April 2, 2022 the Town held their Recycling Day and every third Saturday from January to June in 2022 the Town held their Cardboard Recycling Day. During Permit Year 5, on November 5, 2022, Dedham held a Household Hazardous Waste Collection Day. On every third Saturday from January to December in 2023, the Town held their Cardboard Recycling Day. The Town held their "Just 1 Bag" annual community clean-up event from April 16-30 at various parks and open spaces around Dedham. On May 5, 2023 the Rotary Club of Dedham held a recycling cleanup.

During Permit Year 5, the Town also pushed forward with the adoption of a stormwater utility. The Director of Engineering presented to the Select Board on the Stormwater Utility on July 13, 2022 and November 17, 2022. The Town of Dedham also held two additional public meetings in Permit Year 5 to discuss the Stormwater Utility Fee. On January 26, 2023, the Stormwater Utility Fee was introduced and on April 26, 2023 a public hearing was held.

During Permit Year 5, the Town was also a recipient of a Municipal Vulnerability Preparedness (MVP) Action Grant from the Executive Office of Energy and Environmental Affairs (EEA) as part of a Regional Project which focused on the development of a watershed-wide flood model for the Neponset River. The project also included a focus on developing a higher resolution flood model for the subwatershed that includes Dedham's Manor Neighborhood, as well as modeling potential flood mitigation strategies. In Permit Year 5, two public meetings were held specifically with residents of Dedham's Manor Neighborhood on April 12, 2023 and on May 25, 2023 where information was presented on the use of green infrastructure practices to mitigate flooding, while also providing water quality benefits.

In addition to continuing the above practices, the Town will allow for public review of this stormwater management plan by posting it 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, 3, and 4, 5, 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: Conservation Department, Health Department, DPW
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, 3, and 4, 5 and to be implemented annually thereafter.

BMP: Public Engagement
Description: Development and Implementation of a Stormwater Utility Fee Program
Responsible Departments/Parties: Engineering Department, DPW
Measurable Goals: Funds generated through the Stormwater Utility Fee Allocated to MS4 Permit Compliance
Beginning Year of BMP Implementation: The Stormwater Utility Fee Program was established in Permit Year 5 to provide funding to meet the requirements of the Town's 2016 MS4 Permit and to address impairments caused by untreated stormwater discharging to receiving waters. All property owners contribute to stormwater runoff, so a utility fee will be issued to all residential and non-residential property owners within Dedham with more than 500 square feet of impervious surface (such as driveways, parking lots, buildings, etc.). The funds generated through the Stormwater Utility Fee will be used for:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination (IDDE)
- Management of Construction Site Runoff
- Management of Post Construction Site Runoff
- Good Housekeeping and Municipal Operations
- Compliance with impaired-waters requirements of the 2016 MS4 Permit including implementation of the Town's Phosphorus Control Plan to meet the Charles River Phosphorus TMDL and implementation of the Phosphorus Source Identification Report

The Director of Engineering presented to the Select Board on the Stormwater Utility on July 13, 2022 and November 17, 2022. The Town of Dedham held two public meetings in Permit Year 5 to discuss the Stormwater Utility Fee. On January 26, 2023, the Stormwater Utility Fee was introduced and on April 26, 2023 a public hearing was held.

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 403 miles of sewer main, performed 7,946 manhole inspections, installed 206,200 linear feet (39 miles) of cured-in-place liners, installed 3,491 feet of short liners, installed 220 lateral liners, installed 35 top hat lateral liners, cementitious lined 11,710 vertical feet of manholes, chemically root treated 335,993 linear feet (64 miles) of sewer main, and performed 47,569 linear feet (9 miles) of testing and sealing of joints. The Engineering Department has conservatively

removed 6.3 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, 3, and 4, 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 5 to include updates to existing drainage infrastructure and the addition of new drainage infrastructure, as needed. The Town also previously completed catchment delineations for Town-owned BMPs which has been incorporated into the drainage mapping.

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 and continued investigations during Permit Years 4 and 5.

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 Permit Years 1, 2, 3, 4, and 5 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 and continued during Permit Year 4. No wet weather screening was conducted during Permit Year 5. 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, Engineering 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, Engineering Department
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, Engineering 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 May 31, 2021. 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.

During Permit Year 4, the Town developed two post construction stormwater management reports assessing regulatory mechanisms related to stormwater management.

The Town assessed current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. Regulatory mechanisms were reviewed to determine if changes to existing design standards can be made to support low impact design options and, where appropriate, propose recommendations to incorporate policies and standards to minimize impervious cover in parking areas and street designs.

The Town also assessed existing local regulatory mechanisms to determine the feasibility of making the following practices allowable when appropriate site conditions exist:

- Green roofs
- Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and nature-based stormwater management practices

- Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses
- Open space preservation or cluster development practices

The following regulatory mechanisms were reviewed during these exercises:

- Town of Dedham Zoning Bylaw
- Rules and Regulations Governing the Subdivision of Land in Dedham
- Stormwater Management Rules & Regulations
- Town of Dedham Drainage & Stormwater Management Design Standards
- Stormwater Management Bylaw
- Wetlands Protection Bylaw
- Dedham's Open Space and Recreation Plan (2019)
- Town of Dedham Design & Construction Standards – DPW & Engineering

Two reports summarizing the findings of each analysis and recommended changes to the relevant regulatory mechanisms were developed during Permit Year 4.

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, Engineering Department
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: Completed during Permit Year 4 (FY2022), and retrofits identified in the future will be reported annually to maintain at least 5 retrofits for the duration of the permit. The Town developed an inventory of five BMP retrofit projects that can be implemented in future permit years as opportunities present themselves, as part of capital improvements to storm and sanitary sewer infrastructure or as part of road reconstruction projects. As BMP retrofit projects are completed, the Town will continue to identify potential sites for BMP retrofit opportunities to maintain a backlog of projects.

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: DPW, Planning Department, Engineering Department
Measurable Goals: Complete assessment and implement recommendations of the report, where feasible.
Implementation Timeframe: Completed during Permit Year 4 (FY2022). During Permit Year 5, the Engineering Department presented to the Planning Board on January 25, 2023 and to the Conservation Commission on February 2, 2023 to discuss the recommendations included in the Green Infrastructure Report.

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, Engineering Department, DPW
Measurable Goals: Complete assessment and implement recommendations of the report, where feasible.
Implementation Timeframe: Completed during Permit Year 4 (FY2022). During Permit Year 5, the Engineering Department presented to the Planning Board on January 25, 2023 and to the Conservation Commission on February 2, 2023 to discuss the recommendations included in the Street Design and Parking Lot Report.

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, Engineering 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, Conservation Department, Engineering 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: Conservation Department, Engineering, DPW
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). Based on recommendations of the SWPP, a design for stormwater improvements and other updates to the DPW Facility are ongoing.

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 an 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).
During Permit Year 4, the Town continued 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, 3, 4 and 5.

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 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.

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 the 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 Permit 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;
- 153 Dedham-owned outfalls;
- 184 non-Dedham owned outfalls; and
- 30 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 183 outfalls 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. During Permit Year 4, 22 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 the 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. During Permit Year 4, catchment investigations were conducted in 7 high priority catchments. During Permit Year 5, catchment investigations were conducted in 53 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. All Town owned catch basins were cleaned in 2022 , and additional cleaning is also currently planned for Permit Year 5. With the new cleaning data collected, the Town will further development and refinement of their catch basin cleaning optimization plan during the beginning of Permit Year 6.

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, 3, 4 and 5, 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* $\boldsymbol{P_{exp} \leq P_{allow} + (P_{RR} \times 0.8)}$*. The Town's Phase 1 PCP, which was developed during Permit Year 5, included non-structural controls.*	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. The Town's Phase 1 PCP, which was developed during Permit Year 5, included structural controls.*	5 years after the effective permit date - FY2023

PCP Phase 1 Component	Completion Date
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 manufacturer specification and the responsible party for carrying out the plan. The Town's Phase 1 PCP, which was developed during Permit Year 5, included an operation and maintenance program.*	5 years after the effective permit date - FY2023
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. The Town's Phase 1 PCP, which was developed during Permit Year 5, included schedule for implementation of non-structural and structural BMPs.*	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. The Town's Phase 1 PCP included an estimated cost for implementation.*	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. The Town's written Phase 1 PCP was developed in Permit Year 5.*	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*	10 years after the effective permit date - FY2028

PCP Phase 1 Component	Completion Date
described above. All performance evaluations for each BMP will be included as an appendix to this report.	

The Town's Phase 1 PCP, which was developed in Permit Year 5, and includes the elements noted in the table above, is available under separate cover for review.

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*	10 years after the effective permit date – FY2028

PCP Phase 2 Component	Completion Date
be implemented no later than 15 years after the effective date of the permit.	
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
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

PCP Phase 3 Components	Completion Date
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
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 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

The Town developed a Phosphorus Source Identification Report for Mother Brook during Permit Year 4 and identified candidates for BMP retrofit within the Mother Brook Watershed as part of the report.

The Town developed a Phase II Phosphorus Source Identification Report for Mother Brook during Permit Year 5. In this report, the Town further evaluated the potential BMP retrofit opportunities identified in the Phosphorus Source Identification Report for Mother Brook developed during Permit Year 4. The Phase II Phosphorus Source Identification Report has been appended to this SWMP in Appendix L.

The Stormwater Utility Fee Program was developed in Permit Year 5 to provide funding to meet the requirements of the Town's MS4 Permit and to specifically address funding needs for implementation of the Town's Phosphorus Control Plan for the portion of Dedham within the Charles River Watershed, and to fund the potential BMP retrofit opportunities identified in the Phosphorus Source Identification Report for Mother Brook.

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, which will be completed during Permit Year 6.

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.