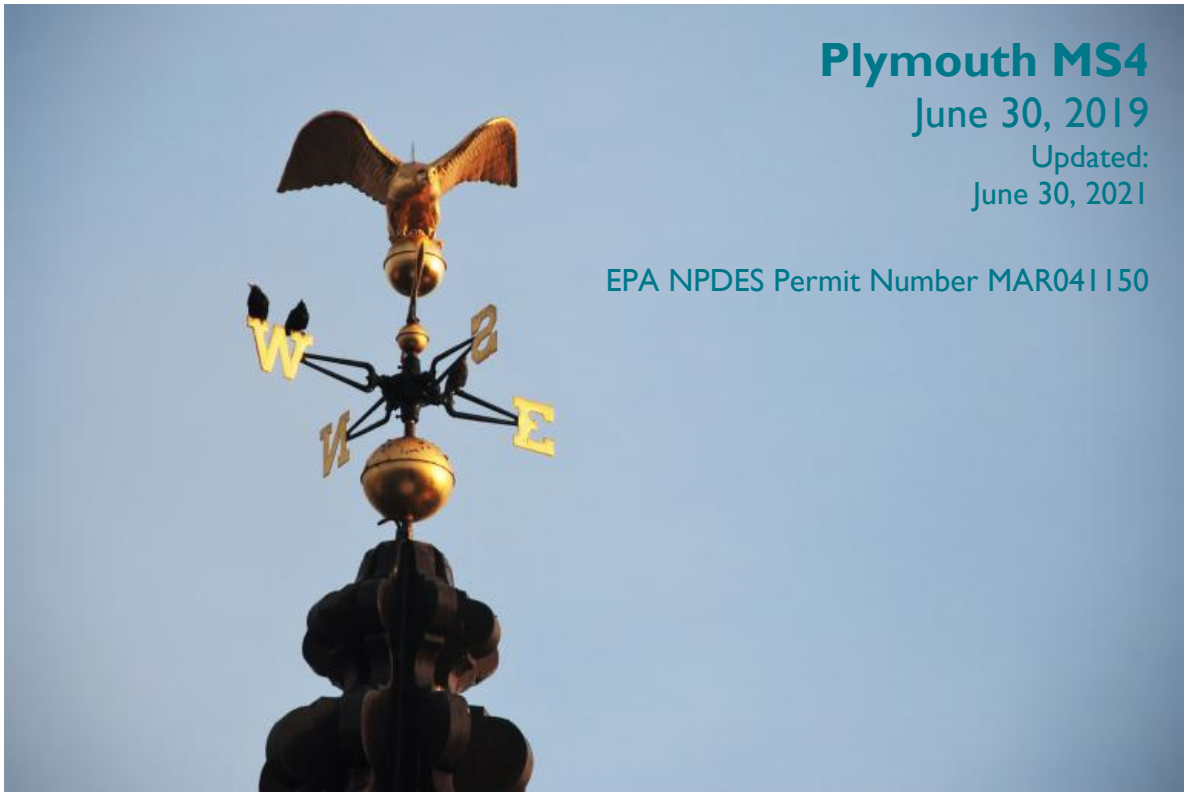
STORMWATER MANAGEMENT PLAN



Plymouth MS4

June 30, 2019

Updated:
June 30, 2021

EPA NPDES Permit Number MAR041150

Prepared for:
Town of Plymouth
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Plymouth, MA 02360

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LIST OF ACRONYMS

BMP	Best Management Practice
CGP	Construction General Permit
DPW	Plymouth Department of Public Works
EPA	U.S. Environmental Protection Agency
IDDE	Illicit Discharge Determination and Elimination
LPCP	Lake Phosphorus Control Plan
LID	Low Impact Development
MADEP	Massachusetts Department of Environmental Protection
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer Systems
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PSAs	Public Service Announcements
SOP	Standard Operating Procedure
SSO	Sanitary Sewer Overflow
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
USFWS	U.S. Department of Fish and Wildlife

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1.0 CERTIFICATION

In accordance with Appendix B, Subsection 11.A of the Permit, the following statement is incorporated and signed in this document.

"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:	Jonathan Beder, Director Department of Public Works	Date

2.0 BACKGROUND

2.1 Stormwater Regulation

The 1999 Stormwater Phase II Final Rule followed the 1987 Phase I Rule in EPA's effort to preserve, protect, and improve the Nation's water resources from polluted stormwater runoff. The Phase II program expands the Phase I program by requiring additional operators of Small Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas and operators of small construction sites to implement programs and practices to control polluted stormwater runoff. Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting controls on the unregulated sources of stormwater discharges that have the greatest likelihood of causing continued environmental degradation. Under the Phase II rule all MS4s with stormwater discharges from Census designated Urbanized Area are required to seek National Pollutant Discharge Elimination System (NPDES) permit coverage for those stormwater discharges.

2.2 Permit Program Background

On May 1, 2003, EPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 small MS4 permit) consistent with the Phase II rule. The 2003 small MS4 permit covered "traditional" (i.e., cities and towns) and "non-traditional" (i.e., Federal and state agencies) MS4 Operators located in the states of Massachusetts and New Hampshire. This permit expired on May 1, 2008 but remained in effect until operators were authorized under the 2016 MS4 general permit, which became effective on July 1, 2018.

2.3 Stormwater Management Program (SWMP)

The SWMP describes and details the activities and measures that will be implemented to meet the terms and conditions of the permit. The SWMP accurately describes the permittees plans and activities. The document should be updated and/or modified during the permit term as the permittee's activities are modified, changed or updated to meet permit conditions during the permit term. The main elements of the stormwater management program are:

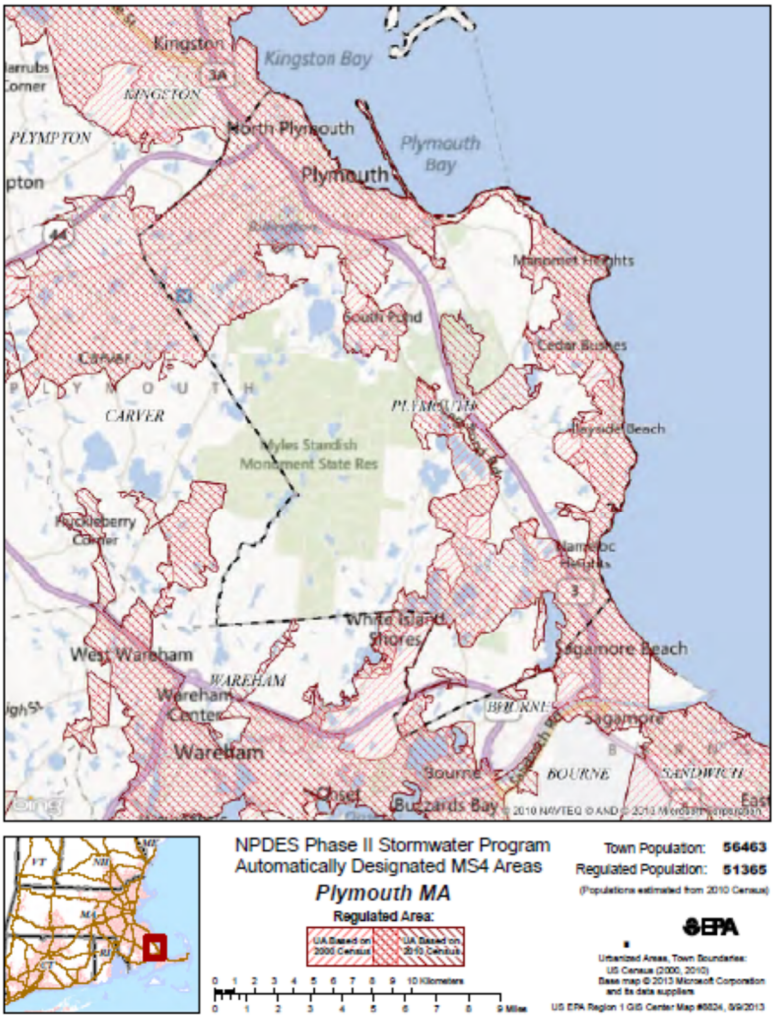
(1) a public education program in order to affect public behavior causing stormwater pollution,
(2) opportunity for the public to participate and provide comments on the stormwater program,
(3) a program to effectively find and eliminate illicit discharges within the MS4,
(4) a program to effectively control construction site stormwater discharges to the MS4,
(5) a program to ensure that stormwater from development projects entering the MS4 is adequately controlled by the construction of stormwater controls, and
(6) a good housekeeping program to ensure that stormwater pollution sources on municipal properties and from municipal operations are minimized.

2.4 Plymouth

Plymouth is a suburban urban community and municipality within the Plymouth County. The population, according to the 2010 U.S. Census is 56,463 people. The Plymouth stormwater system consists of local municipal drainage pipes, open channels, or natural channels. Waterways in Plymouth include Town Brook, Eel River, South Meadow Brook, Taunton River and Red Brook. Plymouth is part of the South Coastal, Buzzards Bay and Taunton River watersheds.

This SWMP was developed to comply with the permit, and is designed to reduce, to the maximum extent practicable (MEP), the discharge of pollutants from the municipal storm drain system. The SWMP includes stormwater management practices, control techniques, system design and engineering methods, an education component, and other provisions appropriate for the control of pollutants. The development, implementation, and enforcement of the SWMP are to fulfill requirements under the permit, in accordance with Section 402(p)(3)(B) of the Federal Clean Water Act. The Town's regulated areas, based on the 2000 and 2012 urbanized areas (UAs), are shown in **Figure 2-1**. The SWMP will be implemented within the Town's UA.

FIGURE 2-1 PLYMOUTH MS4 REGULATED AREAS



https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/plymouth-auth.pdf

2.5 Small MS4 Authorization

The MS4 Permit Notice of Intent NOI was submitted on September 18, 2018. The NOI can be found at the following web address: https://www.plymouth-ma.gov

The EPA Authorization to Discharge was granted February 14, 2019. The Authorization Letter will be found at the following web address:
https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/plymouth-auth.pdf

2.6 MS4 Team

Plymouth, under the direction of its Town Engineer, is responsible for the overall implementation of the SWMP. Other Town departments assist in this implementation as appropriate and provided in the flow chart in Figure 2-2. Specific responsibilities are provided within each chapter. The responsible parties are as follows:

SWMP Team

SWMP Team Coordinator

Name: Sheila Sgarzi
Town of Plymouth
126 Court Street
Plymouth, MA 02360
Email: SSgarzi@plymouth-ma.gov
Phone: (508) 747-1620 ext. 10200
Role: Overall project management, financial management and contract management.

SWMP Team

Name: Rick Bosse, P.E.
Town of Plymouth
126 Court Street
Plymouth, MA 02360
Email: RBosse@plymouth-ma.gov
Phone: (508) 747-1620 ext. 10123
Role: Assisting Project Manager

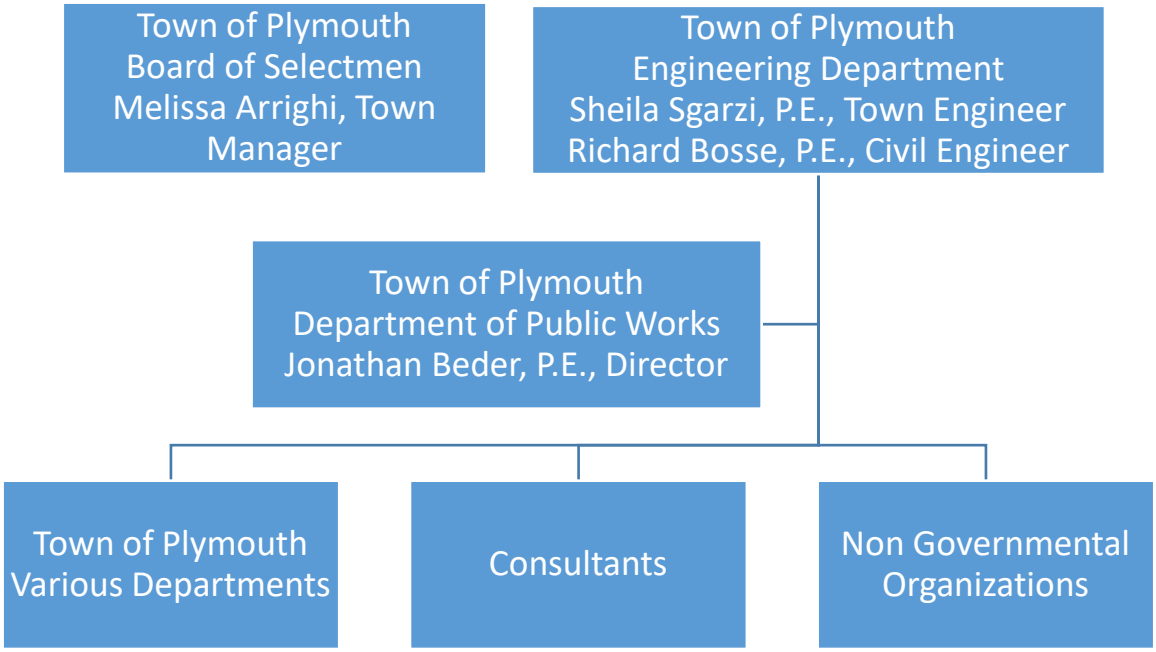
2.7 Purpose

This SWMP identifies tasks for development and implementation through the current permit cycle (set to expire on Sept 4, 2018). This SWMP will be updated as required per the renewed permit. These tasks are designed to address the six minimum control measures (MCMs) for the Town and are listed below:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Long-term Stormwater Management in New Development and Redevelopment
- Pollution Prevention and Good Housekeeping for Municipal Operations

Other permit requirements that incorporate all these MCMs include record keeping and reporting.

FIGURE 2-2 MS4 ORGANIZATIONAL FLOW CHART



3.0 SPECIAL CONDITIONS

The 2016 MS4 Permit requires the SWMP address potential impacts to impaired water bodies, threatened and endangered species, and historic properties with regards to the discharge of stormwater. This section provides a discussion of these issues.

3.1 Receiving Waters.

As required by the 2016 MS4 Permit, the SWMP is required to identify all waters that receive stormwater in the Town. The **Table 3-1** lists all receiving waters, impairments and number of outfalls discharging to each waterbody segment.

TABLE 3-1
RECEIVING WATERS

Waterbody segment that receives flow from the MS4	No. of outfalls to water body	Chloride	Chlorophyll-a	Dissolved Oxygen	Nitrogen	Oil, Grease, PAH	Phosphorus	Solids/TSS/Turbidity	E.coli	Enterococcus	Other pollutants causing impairments
Plymouth Harbor and Tributaries	247	☐	☐	☐	☐	☐	☐	☐	☐	☐	Nitrogen, Fecal Coliform, non-native aquatics (Smelt Pond)
Cape Cod Bay and Tributaries	174	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ellisville Harbor and Duxbury Bay – Fecal Coliform
Eel River and Tributaries	145	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Beaver Dam Brook and Tributaries.	112	☐	☐	☐	☐	☐	☐	☐	☐	☐	Non-native aquatics Brigs Reservoir & Long Island Pond
Taunton River and Tributaries	18	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Great Herring Pond & tributaries	124	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Billington Sea and Tributaries	74	☐	☐	☐	☐	☐	☐	☐	☐	☐	Billington Sea - Turbidity
Buttermilk Bay	18	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Red Brook and Tributaries	142	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Halfway Pond and Tributaries	53	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Besse Bog and Tributaries	13	☐	☐	☐	☐	☐	☐	☐	☐	☐	
So. Meadow Brook & Tributaries	149	☐	☐	☐	☐	☐	☐	☐	☐	☐	

3.2 Threatened and Endangered Species

The results of the US Fish and Wildlife Service (USFWS) endangered species screening determination are included in **Appendix B**. These lists are subject to change, therefore the most recent information should be obtained prior to initiating new stormwater projects. Plymouth will coordinate with the appropriate federal offices when new stormwater projects are planned and the potential impact to these species will be evaluated. The USFWS will be contacted during the planning stages.

Under what criterion did permittee determine eligibility for ESA? **Criterion B**

3.3 Historic Properties

Following the screening process of the National Historic Preservation Act Eligibility Determination, it was determined that the Town meets **Criterion A**, as the discharges do not have the potential to cause effects on historic properties.

4.0 MCM1: PUBLIC OUTREACH AND EDUCATION

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

BMP 1-1: Web Page for Businesses, Institutions and Commercial Facilities

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Web page posting of downloadable brochures, flyers and fact sheets posted on Town website may include materials available from the MADEP Stormwater Outreach Materials website (e.g., Stormwater Management for Small Businesses) and the Think Blue Massachusetts website.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: DMEA, DPW, Citizen Stormwater Committee, IT Division

Measurable Goal(s): Inform and assist targeted audience to improve stormwater management for their facilities. Town webmaster will track # of people who view materials and # of people that download materials. Goal: 100 brochures/flyers/fact sheets will be downloaded by web page visitors annually.

Message Date(s): Materials to be posted starting 2019 with more materials made available in subsequent years.

BMP 1-2: Cable TV for Businesses, Institutions and Commercial Facilities

Document Name and/or Web Address: http://www.pactv.org/services
Description: Broadcast public service announcements and videos about stormwater management on the Plymouth Cable Television channel, which are available from the Cable Television programs, the YouTube website, and the Think Blue Massachusetts website.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: DMEA, Plymouth Cable Advisory Committee

Measurable Goal(s): Inform and assist targeted audience to improve stormwater management for their facilities. Cable TV will track # of PSAs and videos broadcast annually. Estimate # viewers based on Cable Television statistics. Goal: 1000 people will view Public Service Announcements (PSAs) and videos annually. Survey Monkey will measure effectiveness of Cable TV messages.

Message Date(s): PSAs and videos broadcasts to begin in 2023.

BMP 1-3: Stormwater Management Email for Developers

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Email developers and home builders a brochure/fact sheet about construction stormwater management, which is available from the MADEP Stormwater Outreach Materials website and the Think Blue Massachusetts website.

Targeted Audience: Developers (construction)

Responsible Department/Parties: Building Dept., Conservation Commission, DPW

Measurable Goal(s): Inform and assist builders and developers to protect the Town's water resources. Email messages will include response form to measure the effectiveness of brochure/fact sheet. Track # and date of emails sent and responses received from targeted audience.

Message Date(s): Email developers and home builders in 2021.

BMP 1-4: Low Impact Development (LID) Email for Developers

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

***Description*:** Email developers and home builders the brochure "Builders Guide to Low Impact Development", which is available from the MADEP Stormwater Outreach Materials website and the National Association of Home Builders research center website.

Targeted Audience: Developers (construction)

Responsible Department/Parties: Building Dept., Conservation Commission, DPW

Measurable Goal(s): Inform and assist builders and developers to utilize LID site planning and design concepts to better manage stormwater and reduce the need for structural BMPs. Email messages will include response form to measure the effectiveness of brochure/fact sheet. Track the # and date of emails sent and responses received from targeted audience.

Message Date(s): Email developers and home builders in 2022.

BMP 1-5: Stormwater Management Email for Industrial Facilities

Document Name and/or Web Address:

https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Email industrial facilities a brochure/fact sheet about Industrial Stormwater Best Management Practices, which is available from the MADEP Stormwater Outreach Materials website and the Think Blue Massachusetts website.

Targeted Audience: Industrial Facilities

Responsible Department/Parties: Planning and Development

Measurable Goal(s): Inform and assist industrial facilities to utilize practices to better manage stormwater and protect local water resources. Email messages will include response form to measure the effectiveness of brochure/fact sheet. Track # and date of emails sent and responses received from targeted audience.

Message Date(s): Email industrial facilities in 2020.

BMP 1-6: Fleet Management Email for Industrial Facilities

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Email industrial facilities a brochure/fact sheet about Industrial Fleet Management practices, which is available from the MADEP Stormwater Outreach Materials website and the Think Blue Massachusetts website.

Targeted Audience: Industrial Facilities

Responsible Department/Parties: Planning and Development

Measurable Goal(s): Inform and assist industrial facilities to utilize fleet management practices to prevent polluted runoff and protect local water resources. Email message will include response form to measure the effectiveness of brochure/fact sheet. Track # and date of emails sent and responses received from targeted audience.

Message Date(s): Email industrial facilities in 2022.

BMP 1-7: Stormwater Flyer for Residents

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Website posting of a Stormwater Pollution Prevention Guide for Homeowners, using information available from the MADEP Stormwater Outreach Materials website, the Think Blue Massachusetts website and other sources.

Targeted Audience: Residents

Responsible Department/Parties: DMEA, Town Engineer, Citizen Stormwater Committee

Measurable Goal(s): Inform and assist residents to utilize simple household practices to prevent polluted runoff and protect local water resources. Town webmaster will track # of people who view materials and # of people that download materials. Goal: 200 fact sheets will be downloaded by web page visitors annually, and Survey Monkey will measure effectiveness of messaging.

Message Date(s): Post fact sheet to website in 2020.

BMP 1-8: Billing Insert for Residents

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Mail an insert with Town bills such as the Stormwater-What You Can Do As a Citizen, which is available from MADEP Stormwater Outreach website, the Think Blue Massachusetts website and other websites.

Targeted Audience: Residents

Responsible Department/Parties: DMEA, Town Clerk

Measurable Goal(s): Inform and assist residents to utilize simple household practices to reduce stormwater pollution. Track # and date of brochures mailed, and responses received from targeted audience. Goal: 500 households will receive brochure in mail and Survey Monkey will measure effectiveness of messaging.

Message Date(s): Arrange mailing to residents in 2022.

5.0 MCM 2: PUBLIC INVOLVEMENT AND PARTICIPATION

The SWMP addresses the importance of public involvement with respect to control of stormwater. Community participation provides for broader public support, shorter implementation schedules, a broader base of expertise and the development of important relationships with other community and government programs. The BMPs described in this section include opportunities for the public to play an active role in the Town's stormwater program.

5.1 Summary of Tasks

This MCM complements the Public Education and Outreach Program, providing for public input into the stormwater program as well as some active community programs. The following BMPs describe tasks to be completed by Plymouth for Public Involvement and Participation. Progress towards the measurable goals will be documented in the Annual Report.

BMP 2-1: BMP: Public Review of Stormwater Management Program

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater
Responsible Department/Parties: Town Engineer, IT Division

Description: Provide opportunity for public to review and comment on the SWMP and other regulatory mechanisms for SWMP implementation. The proposed Plymouth SWMP will be posted on Plymouth's website in June 2019 and available for public comment. Comments will be reviewed and incorporated as appropriate.

Measurable Goal(s): Stormwater Management Plan is publicly available.

BMP 2-2: Public Participation in Stormwater Management Program Development

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Public meeting will be arranged annually to present the Stormwater Management Plan and provide opportunity to participate in the review and implementation of the SWMP.

Responsible Department/Parties: Town Engineer, DMEA

Measurable Goal(s): Annual public input provided.

BMP 2-3: Community Stormwater Survey

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Survey Monkey designed to assess public attitudes, interests and foster community participation in the Town's SWMP. The survey was posted on the Town website in 2020 and survey responses will be tracked.

Responsible Department/Parties: DMEA, Town Engineer, Citizen Stormwater Committee

Measurable Goal(s): Survey Monkey will be updated in 2022 and posted again on Town website and the Town Facebook page. Survey responses in 2020 and 2022 will be correlated to measure the effectiveness of messaging. Goal: 500 people will participate in these Town surveys.

6.0 MCM 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM

The Illicit Discharge Detection and Elimination (IDDE) Program addresses non-stormwater flows that are discharged to receiving waters via stormwater conveyance systems. This program includes implementation of BMPs to assist in the identification of illicit discharges and removal of these discharges. This program will also focus on prevention of new illicit discharges to the stormwater system by means of education, regulations, and through spill prevention and response.

BMP 3-1: IDDE Legal Authority

Document Name: General By-Law §159: Stormwater Pollution

Location: Plymouth General By-Law

Responsible Department/Parties: Department of Public Works

BMP 3-2: Sanitary Sewer Overflow (SSO) Inventory

Document Name and/or Web Address: Appendix D

Description: There have been a few SSO to surface water or into the MS4 during the past 5 years. This initial SSO inventory will be documented as an appendix of the SWMP.

Responsible Department/Parties: DPW

Measurable Goal(s): In the event a SSO occurs, the town will track and report the following SSO information: the location; a clear statement of whether the discharge entered a surface water directly or entered the MS4; date(s) and time(s) of each known SSO occurrence; estimated volume(s) of the occurrence; description of the occurrence indicating known or suspected cause(s); mitigation and corrective measures completed with dates implemented; and mitigation and corrective measures planned with implementation schedules. Update inventory as needed.

SSO Reporting: In the event of an overflow or bypass, a notification must be reported within 24 hours by phone to MDEP, EPA, and other relevant parties. Follow up the verbal notification with a written report following MDEP's Sanitary Sewer Overflow (SSO)/Bypass notification form within 5 calendar days of the time you become aware of the overflow, bypass, or backup.

The MassDEP contacts are: Southeast Region (508) 946-2750, 20 Riverside Dr., Lakeville, MA 02347 24 - Hour Emergency Line 1-888-304-1133.

The EPA contacts are: EPA New England 5 Post Office Square, Boston, MA 02109; (617) 918-1510.

BMP 3-3: Map of Storm Sewer System

Document Location and/or Web Address: http://gis.townhall.plymouth.ma.us/watershed.html

Description: Work in progress to complete Phase II storm sewer system mapping per MS4 Permit criteria, as described in the IDDE Plan. Phase I will be completed by 2020; Phase II by 2028. Outfalls and catch basins are shown online. The storm sewer system mapping which provides pipe networks is located on an internal system.

Responsible Department/Parties: Engineering Department, IT Division

Measurable Goal(s): Map 100% of outfalls and receiving waters, open channel conveyances, interconnections with other MS4s and other storm sewer systems, municipally-owned stormwater treatment structures, water bodies identified by name and indication of all use impairments, and initial catchment delineations within 2 years of the permit's effective date. Map 100% of outfall spatial locations, pipes, manholes, catch basins, refined catchment delineations, municipal sanitary sewer system, and municipal combined sewer system (if applicable) within 10 years of the permit's effective date.

BMP 3-4: IDDE Program

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: IDDE Plan, which includes initial outfall inventory & ranking; outfall screening procedure; catchment investigation procedure; illicit discharge removal procedure; follow up ranking of outfalls and interconnections procedure. To be completed by 6/30/19. These IDDE Plan procedures will be posted as appendix of this Stormwater Management Program.

Responsible Department/Parties: Engineering Department

Measurable Goal(s): Conduct 100% of outfall screening on High and Low Priority Outfalls within 3 years of the permit's effective date. Complete catchment investigations for 100% of the Problem Outfalls within 7 years of the permit's effective date. Complete 100% of all catchment investigations within 10 years of the permit's effective date.

BMP 3-5: Employee Training

Description: Annual IDDE training of DPW personnel as required by MS4 Permit 2.3.4.11

Responsible Department/Parties: DPW

Measurable Goal(s): Annual training will be completed by June 30 each year.

BMP 3-6: Outfall Ranking for Impaired Waters and TMDL Requirements

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Rank outfalls to receiving waters with nitrogen, bacteria/pathogens, and phosphorous impairment as high priority for IDDE implementation. Per by MS4 Permit Appendices F & H.

Responsible Department/Parties: DPW

Measurable Goal(s): Conduct 100% of outfall screening on High and Low Priority Outfalls within 3 years of the permit's effective date (June 2021).

7.0 MCM 4: CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

The Construction Site Stormwater Runoff Control Program section of the SWMP addresses water quality concerns for construction sites greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development. Polluted stormwater runoff from construction sites often flows to storm drains and into receiving waters. This runoff can contribute more sediment to receiving waters than would otherwise naturally infiltrate into the ground, and can cause physical, chemical and biological harm to receiving waters. The BMPs described in this section of the SWMP includes a construction site program designed to reduce pollutants in stormwater runoff from construction site activities.

BMP 4-1: Sediment and Erosion Control Bylaw

Bylaw Reference: Town Zoning §205-18 H; and Guide for the Design of Storm Drainage Facilities

Department Responsible for Enforcement: Planning & Development, Building Department, Conservation Commission

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BMP 4-2: Site Plan Review Procedures

Document Name and Web Address: Guide for the Design of Storm Drainage Facilities; https://www.plymouth-ma.gov/planning-board

Description: Describe current site plan review procedures in Guide for the Design of Storm Drainage Facilities; which also encourages use of low impact design, infiltration and impervious surface reduction to prevent sediment transport to MS4 system.

Department Responsible for Enforcement: Planning & Development, Building Department, Conservation Commission

Measurable Goal(s): Conduct site plan review of 100% of projects according to the procedures outlined above. These existing site plan review procedures will be posted as an appendix of this Stormwater Management Program.

BMP 4-3: Site Inspections and Enforcement of Sediment and Erosion Control Measures Procedures

Document Name and Web Address: Guide for the Design of Storm Drainage Facilities; https://www.plymouth-ma.gov/planning-board

Description: Compile erosion & sediment inspection and enforcement procedures, which will be included in the Guide for the Design of Storm Drainage Facilities by 2020.

Responsible Department/Parties: Planning & Development, Building Department, Conservation Commission

Measurable Goal(s): Inspect 100% of construction sites as outlined in the above document and take enforcement actions as needed. When completed, the site inspection and enforcement procedures will be posted as an appendix of this Stormwater Management Program.

BMP 4-4: Construction Site Waste Control

Bylaw Reference: General By-Law §159: Stormwater Pollution
& Guide for the Design of Storm Drainage Facilities

Description: Compile written requirements by 6/30/19, which prohibit illicit discharge of debris, truck wash-out, litter and control sanitary waste on constructions sites**.**

Responsible Department/Parties: Planning & Development, Building Department, Conservation Commission

Measurable Goal(s): Inspect 100% of construction sites as outlined in the above document and take enforcement actions as needed.

8.0 MCM5: STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT PROGRAM (Post Construction Stormwater Management)

The Stormwater Management in New Development and Redevelopment Program (Post Construction Stormwater Management) addresses the importance of stormwater runoff management following the completion of construction activities. This program applies to areas with land disturbances of greater than or equal to one acre and projects less than one acre that are part of a larger common plan of development or sale or areas known to have sensitive soils and watershed issues. Post-construction stormwater management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly impact receiving waterbodies. There are two forms of impacts associated with post-construction runoff; one is caused by an increase of pollutants in stormwater runoff; the second type occurs by the increase in the quantity of stormwater. Prior planning and design for the minimization of pollutants in post-construction stormwater discharges is an effective approach to stormwater quality management. The BMPs described in this section include the development of structural and non-structural stormwater runoff strategies and the development of programs that consider water quality impacts of new development and redevelopment projects.

BMP 5-1: Post-Construction Bylaw

Bylaw Reference: Zoning Bylaw and Guide for the Design of Storm Drainage Facilities

***Department Responsible for Enforcement*:** Planning and Development, Town Engineer, DMEA

BMP 5-2: Street Design and Parking Lot Guidelines Report

Document Name and/or Web Address: Not applicable until June 2022

Description: Prepare report assessing requirements that affect the creation of impervious cover. This assessment will determine if design standards for streets and parking lots can be modified to support low impact design options. When completed, the report will be part of this Stormwater Management Plan.

Responsible Department/Parties: Planning and Development, DPW

Measurable Goal(s): The report will be completed by June 2022 and shall include recommendations to incorporate policies and standards into Town documents and procedures, which can lessen impervious cover created by parking areas and streets. The report will include a proposed implementation schedule for recommendations with progress reported annually.

BMP 5-3: Green Infrastructure Report

Document Name and Web Address: Guide for the Design of Storm Drainage Facilities

Description: Apply BMPs Selection Matrix in existing Guide for Design of Storm Drainage Facilities, which describes the feasibility of making green infrastructure - such as green roofs, infiltration practices and water harvesting devices - allowable when appropriate site conditions exist.

Responsible Department/Parties: Planning and Development, DPW, DMEA

Measurable Goal(s): Conduct site plan review of projects according to the BMPs Selection Matrix described above. This Guide for the Design of Storm Drainage Facilities is an attached appendix of this Stormwater Management Program.

BMP 5-4: List of Municipal Retrofit Opportunities

Document Name and/or Web Address: Not applicable until June 2022

Description: Identify minimum of five town properties that can be retrofitted to reduce pollutant loads of discharges into and from MS4 infrastructure (including street right-of-ways, conventional conveyances, outfalls and controls). Evaluate and rank retrofits for control of stormwater discharges to first or second order streams, public swimming beaches, water supply sources, water quality limited waters and other critical areas.

Responsible Department/Parties: DPW, DMEA, Planning and Development

Measurable Goal(s): The priority ranking for BMP retrofits will be completed by June 2022 and consider factors including site conditions and timetables for planned capital improvements to storm sewer infrastructure and paving projects. The list of retrofits will estimate the reductions of pollutant loads by BMP recommendations that will implemented according to the schedule contained in this inventory with progress reported annually.

BMP 5-5: Stormwater Bylaw Performance Standards

Document Name and Web Address: Guide for the Design of Storm Drainage Facilities; https://www.plymouth-ma.gov/planning-board

Description: Modify the Guide for the Design of Storm Water Facilities per MS4 Permit provisions for new development and redevelopment BMPs. Procedures for submission of as-built plans and O&M Plans will be part of updated Design Guide, which will be posted on Town website as an appendix for this Stormwater Management Program.

Responsible Department/Parties: DPW, DMEA, Planning and Development

Measurable Goal(s): Revise standards for runoff volume and pollutant removal by June 2021. Also require BMPs to be optimized for nitrogen removal including infiltration practices where feasible.

9.0 MCM6: POLLUTION PREVENTION & GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

The Pollution Prevention & Good Housekeeping Program of the Stormwater Management Plan addresses routine activities in the operation and maintenance of drainage systems, roadways, and other municipal operations to help ensure a reduction in pollutants entering the storm drain system.

BMP 6-1: Parks and Open Spaces Operations and Maintenance Procedures

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare written procedures (electronic and hard copy) for the operations and maintenance of town-owned parks and open space. When completed, the O&M procedures will be part of this Stormwater Management Program.

Responsible Department/Parties: DPW, Recreation Department, DMEA

Measurable Goal(s): Approve draft document and post to Town website by December 2021.

Properties List: Recreation Department and DPW will compile list of town-owned parks and open spaces.

BMP 6-2: Buildings and Facilities Operations and Maintenance Procedures

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare written procedures for the operations and maintenance of town-owned buildings and facilities (town offices, parking, etc.). When completed, the O&M procedures will be part of this Stormwater Management Program.

Responsible Department/Parties: DPW, Schools, DMEA, Police, Fire and Recreation Departments

Measurable Goal(s): Approve draft document and post to Town website by December 2021.

Properties List: DPW and Town Departments will compile list of town-owned buildings and facilities.

BMP 6-3: Vehicles and Equipment Operations and Maintenance Procedures

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare written procedures for the operations and maintenance (O&M) of town-owned vehicles and equipment. When completed, the O&M procedures will be part of this Stormwater Management Program.

Responsible Department/Parties: DPW, Schools, DMEA, Police, Fire and Recreation Departments

Measurable Goal(s): Approve draft document and post to Town website by December 2021.

Properties List: DPW and Town Departments will compile list of town-owned vehicles and equipment.

INFRASTRUCTURE

BMP 6-4: Infrastructure Operations and Maintenance Procedures

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare written program of procedures to maintain MS4 infrastructure in a timely manner. When completed, the O&M procedures described in the IDDE Plan posted to the Town website will be part of this Stormwater Management Program.

Responsible Department/Parties: DPW

Measurable Goal(s): Create electronic document by June 2020 for O&M procedures that prevent polluted runoff and implement the procedures for 100% of town owned MS4 infrastructure. The electronic document will utilize the Municipal Stormwater Infrastructure Operation and Maintenance Plan template that is available from Central MA Regional Stormwater Coalition website.

BMP 6-5: Catch Basin Cleaning Program

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare written program to optimize routine inspections, cleaning and maintenance of town-owned catch basins. When completed, the catch basin program schedule will be part of this Stormwater Management Program.

Responsible Department/Parties: DPW

Measurable Goal(s): Approve draft document and post to Town website by December 2021.

BMP 6-6: Street Sweeping Program

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Develop and implement sweeping procedures for Town-owned streets and parking lots in accordance with Permit conditions and maintain a town log of street and parking sweeping activities.

Responsible Department/Parties: DPW

Measurable Goal(s): All town-owned parking lots and streets, except rural uncurbed roads, will be swept twice per year: in the spring after winter sanding and in autumn after leaf fall. Sweeping procedures and log records will be in accordance with the Municipal O&M Plan. Written procedure will be completed by June 2019.

BMP 6-7: Winter Road Maintenance Program

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare written program for winter road maintenance including procedures for the use and storage of sand and salt; and for Town snow disposal activities.

Responsible Department/Parties: DPW

Measurable Goal(s): Winter road maintenance program will reduce application of salt and evaluate at least one salt/chloride alternative for use in the Town. Procedures for the use and storage of sand and salt will be in accordance with the Municipal O&M Plan. Written procedure will be completed by June 2019.

BMP 6-8: Stormwater Treatment Structures Inspection and Maintenance Procedures

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare and implement procedures for the annual inspection and maintenance of town-owned stormwater treatment structures including water quality swales, retention/detention basins, infiltration structures and proprietary devices.

Responsible Department/Parties: DPW

Measurable Goal(s): Inspect and maintain 100% of town-owned stormwater treatment structures to ensure proper function. The procedures for annual inspection and maintenance will be in accordance with the Municipal O&M Plan. Written procedures will be completed by June 2019.

BMP 6-9: Stormwater Pollution Prevention Plan

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare a SWPPP for each Town operated public works yard and other waste handling facilities that are exposed to stormwater. When completed, the SWPPPs will be separate and different documents from this SWMP.

Responsible Department/Parties: DPW, Town Engineer

Measurable Goal(s): Develop and implement SWPPPs for 100% of Town operated facilities. Written records of all required activities will be retained by the Town for a period of at least five years. Written SWPPPs will be completed by June 2020.

BMP 6-10: Nitrogen Source Identification Report

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Prepare a Nitrogen Source Identification Report per requirements in Part I of Appendix H for the MS4 Permit. This report will include MS4 catchment delineations, outfall screening and monitoring results, impervious area for target catchments, and prioritize potential catchments with high phosphorus loading.

Responsible Department/Parties: DPW, DMEA, Town Engineer, BOH

Measurable Goal(s): The report will identify retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment, including the removal of impervious area. The nitrogen source identification report shall be submitted to EPA as part of the Permit Year 4 annual report.

BMP 6-11: Nitrogen Source Structural BMPs Listing

Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Description: Evaluate town-owned properties identified by Nitrogen Source Identification Report for retrofit opportunities per requirements in Part I of Appendix H for the MS4 Permit. This evaluation will consider planned road paving or redevelopment activity; the estimated cost of redevelopment or retrofit BMPs; and engineering/regulatory feasibility of redevelopment or retrofit BMPs.

Responsible Department/Parties: DPW, DMEA, Town Engineer, BOH

Measurable Goal(s): Evaluation will provide a listing of planned structural BMPs and a plan/schedule for implementation. At least one structural BMP will be identified as a demonstration project for a catchment with high nitrogen load potential. The listing and schedule of planned structural BMPs shall be submitted to EPA as part of Permit Year 5 annual report.

10.0 Annual Evaluation

Year 1 Annual Report
Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Year 2 Annual Report
Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater
Year 3 Annual Report
Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Year 4 Annual Report (when available)
Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Year 5 Annual Report (when available)
Document Name and/or Web Address:
https://www.plymouth-ma.gov/engineering/pages/stormwater

Additional Annual Reports to be listed.

11.0 WATER QUALITY LIMITED WATERS

PHOSPHORUS: APPLICABLE WATERBODIES

- MA95166, MA95173, White Island Pond
- Massachusetts' 2016 §303d (d) list stated that restoration activities for White Island Pond have been effective and total phosphorus was delisted as a cause of impairment.

BACTERIA/PATHOGENS: APPLICABLE WATERBODIES

Final South Coastal Watershed (Control Number: CN02555.0)

- MA 94-15, Duxbury Bay, Fecal Coliform
- MA 94-34, Ellisville Harbor, Fecal Coliform
- MA 94-16, Plymouth Harbor, Fecal Coliform

Annual Requirements Beginning Year 1

(1) ***MCM 1 Public Education and Outreach-*** Appendix F, Part A III, 1(a) i. Public Education: The permittee shall supplement its Residential program with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee or its agents shall disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance.

The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens.

All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.IV, A.V, B.I, B.II and B.III where appropriate.

(2) ***MCM 3 IDDE Program -*** Rank outfalls to these receiving waters as problem catchments or high priority for IDDE implementation in the initial outfall ranking. The relevant BMP number(s) listed above in the Stormwater Management Program OR the description of implementation actions and document location(s) are:

TABLE 11-2 WATER QUALITY LIMITED WATERS			
Applicable Waterbodies	**303d Category**	**Pollutants**	**Notes**
Plymouth Harbor	5	Nitrogen	Appendix H Part I
Billington Sea	5	Turbidity (Solids)	Appendix H Part V
Duxbury Bay	5	Fecal Coliform	Appendix H Part III
Ellisville Harbor	5	Fecal Coliform	Appendix H Part III
Plymouth Harbor	5	Fecal Coliform	Appendix H Part III

Appendix H Part I: Nitrogen Impaired Waters Requirements

Annual Requirements Beginning Year 1

MCM 1 Public Education and Outreach
MS4 General Permit excerpts: 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. The program shall identify steps and/or activities that the public can take to reduce the pollutants in stormwater runoff and their impacts to the environment.

Appendix H, §II.1.a.i.1 Seasonal Messages: The permittee shall supplement its Residential and Business/ Commercial/Institution program with annual timed messages on specific topics. Annual timed messages to be delivered by one or more of following options: Town Facebook page; **Town website**; insert with Town bills; press release; signs placed on major roads in Town center.

Description:
Website posting of fact sheet in the **spring** (April/May), which will promote the proper use and disposal of grass clippings and encourage the proper use of slow-release and phosphorus-free fertilizers.

Measurable Goal:
Enable Town residents, businesses, institutions and commercial facilities to learn effective practices that reduce phosphorus in stormwater runoff and protect local water resources. Town webmaster will track # of people who view materials and # of people that download materials. Goal: 100 fact sheets will be downloaded by website visitors annually, and Survey Monkey will measure effectiveness of messaging.

Description:
Annual website posting of fact sheet in **summer** (June/July), which promote the proper management of pet waste and cite Town regulations including § 204-1 Stormwater management.

Measurable Goal:
Enable Town residents, businesses, institutions and commercial facilities to reduce nitrogen and bacteria in stormwater runoff and protect local water resources. Town

webmaster will track # of people who view materials and # of people that download materials. Goal: 100 fact sheets will be downloaded by website visitors annually, and Survey Monkey will measure effectiveness of messaging.

Description:
Annual website posting of fact sheet in the **fall** (September/October), which will promote the proper management of leaf litter and yard waste.

Measurable Goal:
Enable Town residents, businesses, institutions and commercial facilities to learn yard waste practices that prevent clogging of stormwater drainage and reduce nitrogen released to local water resources. Town webmaster will track # of people who view materials and # of people that download materials. Goal: 100 fact sheets will be downloaded by website visitors annually, and Survey Monkey will measure effectiveness of messaging.

MCM 6 Good Housekeeping and Pollution Prevention for Permittee Owned Operations
Increase street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall).
The relevant BMP number is BMP 6-6.

Establish procedures to properly manage fertilizer use, grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces
The relevant BMP number is BMP 6-2.

Any structural BMPs listed in Attachment 1 to Appendix H already existing or installed in the regulated area by the permittee or its agents shall be tracked and the permittee shall estimate the nitrogen removal by the BMP consistent with Attachment 1 to Appendix H. The BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP is an attachment to this Stormwater Management Plan and will be updated yearly at a minimum.

Requirements Due by Year 2
MCM 5 Stormwater Management in New Development and Redevelopment
The requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal.
The relevant BMP number is BMP 5-5.

Requirements Due by Year 4
MCM 5 Stormwater Management in New Development and Redevelopment
Retrofit inventory and priority ranking under 2.3.6.1.b. shall include consideration of BMPs that infiltrate stormwater where feasible.
The relevant BMP number is BMP 5-4

MCM 6 Good Housekeeping and Pollution Prevention for Permittee Owned Operations
Complete a Nitrogen Source Identification Report.
The relevant BMP number is BMP 6-10.

Requirements Due by Year 5
MCM 6 Good Housekeeping and Pollution Prevention for Permittee Owned Operations
Evaluate all permittee-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under Permit part 2.3.6.d.ii or identified in the Nitrogen Source Identification Report that are within the drainage area of the impaired water or its tributaries. Install at least one structural demonstration BMP by 6/30/24 for catchment with high nitrogen load potential.

Complete a listing of planned structural BMPs and a plan and schedule for implementation. The relevant BMP number is 6-11.

Appendix H Part V: Solids, Oil and Grease (Hydrocarbons) Requirements

Annual Requirements Beginning Year 1

MCM 6 Good Housekeeping and Pollution Prevention for Permittee Owned Operations
Increase street sweeping frequency of all municipal owned streets and parking lots in commercial areas and high-density residential areas, or drainage areas with a large amount of impervious area.

The relevant BMP number is BMP 6-6.

Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
The relevant BMP number is BMP 6-5.

Requirements Due by Year 2

MCM 5 Stormwater Management in New Development and Redevelopment
Stormwater management systems designed on commercial and industrial land use area draining to the water quality limited water body shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event.

The relevant BMP number is BMP 5-5.

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Small MS4 NOI Information Requested - Town of Plymouth

To:	Jonathan Beder	jbeder@townhall.plymouth.ma.us
MS4 Operator:	Town of Plymouth	
NPDES ID:	MAR041150	

Please provide corrected or additional information for the following:

Note: you do not need to resubmit your entire NOI form; please respond to the email you received from the EPA review team member with the requested information below.

2003 Information:	
ESA eligibility:	Please provide the output from your IPaC assessment for endangered species present
NHPA eligibility:	
Receiving waters:	Please provide the waterbody names and assessment unit IDs (where applicable) for all receiving waterbodies along with the number of outfalls discharging to each waterbody and any impairments. You have listed watersheds on your NOI instead of receiving waters
Public Education MCM:	
Public Participation MCM:	
IDDE MCM:	
Construction MCM:	
Post-construction MCM:	
Good Housekeeping MCM:	
TMDLs:	Please indicate the correct sections of Appendix F applicable to you. Part A.III is for in state bacteria/pathogen TMDLs. Please note, there are no requirements for the Towns MS4 for the White Island Pond TMDL
Impairments:	
Certification Information:	Please mail the original signed hard copy signature page from the NOI to EPA at the address provided on the NOI

Notice of Intent (NOI) for covera nder Small MS4 General Permit

Part II: Summary of Receiving Waters

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

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

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

Waterbody segment that receives flow from the MS4	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Plymouth Harbor and Tributaries	247	☐	☐	☐	☐	☐	☐	☐	☐	☐	Non-Native aquatics: Smelt Pond
Cape Cod Bay and Tributaries	174	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ellisville Harbor: Fecal Coliform
Eel River and Tributaries	145	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Beaver Dam Brook and Tributaries	112	☐	☐	☐	☐	☐	☐	☐	☐	☐	Non- Native Aquatics: Brigs Resevior, Long Island Pond,
Taunton River and Tributaries	18	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Town Brook and Tributaties	34	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Great Herring Pond and its Tributaries	124	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Billington Sea and its Tributaries	75	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Buttermilk Bay	18	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Red Brook and Tributaries	142	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Halfway Pond and Tributaries	53	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Besse Bog Resiviour and Tributaries	13	☐	☐	☐	☐	☐	☐	☐	☐	☐	
South Meadow Brook and Tributaries	149	☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
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Brochures/Pamphle	Pet Wast F/H	Residents	Town Engineer /DMEA	"	2023
Brochures/Pamphlets	Leaf Litter F/H	Residents / Business / Institutions	Town Engineer /DMEA	"	2018
Brochures/Pamphlets	Leaf Litter F/H	Residents / Business / Institutions	Town Engineer /DMEA	"	2023
Brochures/Pamphlets	Pet Waste Guide F/H	Residents	Town Engineer /Town Clerk	"	2019
Brochures/Pamphlets	Pet Waste Guide F/H	Residents	Town Engineer /Town Clerk	"	2023
Brochures/Pamphlets	Septic System F/H	Septic System Owners	Town Engineer /DMEA	"	2019
Brochures/Pamphlets	Septic System F/H	Septic System Owners	Town Engineer /DMEA	"	2023

Ensure any sto er controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and all applicable requirements of the Massachusetts Stormwater Handbook	Adoption, amendment, or modification of a regulatory mechanism to meet permit requirements	Planning/zoning Department	Complete 2 years after effective date of permit	2017
Nitrogen BMP	Install BMP	DPW / DMEA / Planning and Development /Conservation		2022
Inventory of Town owned properties for BMP retrofit	Update Annually	DPW / DMEA / Planning and Development /Conservation		2023

Inspections and maintenance of stormwater treatment structures	Establish and implement inspection and maintenance procedures and frequencies	DPW	Inspect and maintain treatment structures at least annually	2020
Phosphorus Source Identification Report: Appendix H	Delineate catchments & opportunities for BMP retrofits	DPW / DMEA / Town Engineer /BOH	Delineate catchments & opportunities for BMP retrofits	2022

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

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Requirements Related to Water Quality Limited Waters

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

Pollutant	Waterbody ID(s)	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Phosphorus	MA95166 , MA95173	Adhere to requirements in part II of Appendix H	DMEA / DPW / Planning and Development / Town Engineer
Nitrogen	MA94-16	Adhere to requirements in part I of Appendix H	DMEA / DPW / Planning and Development / Town Engineer
Turbidity	MA94007	Adhere to requirements in part V of Appendix H	DMEA / DPW / Planning and Development / Town Engineer
E. Coli	MA94-15, MA94-34, MA94-16	Adhere to requirements in part III of Appendix H	DMEA / DPW / Planning and Development / Town Engineer

Part V: Certification

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

Name: Melissa Arrighi

Title: Town Manager

Signature:

Date:

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

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

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

September 24, 2018

To whom it may concern:

The U.S. Fish and Wildlife Service (USFWS) reviewed the stormwater discharge activities associated with the 2016 National Pollutant Discharge and Elimination System (NPDES) Massachusetts (MA) Small Municipal Separate Storm Sewer System (MS4) general permit (MA MS4 General Permit) issued by the Environmental Protection Agency (EPA). We determined those activities may affect, but are not likely to adversely affect, certain species listed under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) when specific conditions are met. When these conditions are met, we do not need to review individual projects. These comments are provided in accordance with section 7 of the ESA and complement existing 2016 MA MS4 General Permit Appendix C Guidance. We understand the applicant is acting as a non-Federal representative of the EPA for the purpose of consultation under section 7. **This letter provides additional guidance for meeting Criterion B and should be submitted as part of your application package to the EPA.**

If the USFWS Information for Planning and Consultation website (https://ecos.fws.gov/ipac/) indicates your MA MS4 General Permit project action area may contain one or more of the following federally listed endangered species: roseate tern (*Sterna dougallii*), northern red-bellied cooter (*Pseudemys rubriventris*), dwarf wedgemussel (*Alasmidonta heterodon*), rusty patched bumble bee (*Bombus affinis*), northeastern bulrush (*Scirpus ancistrochaetus*), or American chaffseed (*Schwalbea americana*); threatened species: piping plover (*Charadrius melodus*), bog turtle (*Glyptemys muhlenbergii*), Puritan tiger beetle (*Cicindela puritana*), northeastern beach tiger beetle (*Cicindela dorsalis*), or red knot (*Calidris canutus rufa*); or their federally designated critical habitat; and the specific conditions listed below are met, you may submit this letter to complete the **MA MS4 General Permit Appendix C: Step 4** in place of a concurrence letter for informal consultation as documentation of ESA eligibility for **USFWS Criterion B.**

In addition, this letter also satisfies the requirement in the **MA MS4 General Permit Appendix C: Step 2 (3)** to contact the USFWS and obtain a concurrence letter, if you have not yet done so. If your project action area includes one or more of the above-listed species *and* one or more of the

species listed under **Criterion C,**[1] you may still use this letter to certify under **Criterion B**. All existing guidance regarding requirements for certifying eligibility according to the USFWS Criterion A, B, or C for coverage by the 2016 MS4 Permit (see MA MS4 General Permit Appendix C – Endangered Species Guidance) remains unchanged.

We have determined that proposed stormwater discharge activities covered under the 2016 MS4 Permit *may affect, but are not likely to adversely affect*, the above-listed species and the species' critical habitat when the following are true:

1. all stormwater discharges are pre-existing or previously permitted by EPA;
2. any planned operations and maintenance work covered by this permit will only affect previously disturbed areas where stormwater controls are already installed. In these situations the chance of encountering any of the subject species is discountable;
3. the project implements EPA MS4 Best Management Practices (BMPs) and meets Clean Water Act and Massachusetts Water Quality Standards. Although permitted discharges may reach the environment used by these species, BMPs reduce pollutants to the extent that discharges are not known to have measurable impacts on these species or their habitat;
4. no new construction or structural BMPs are proposed under this permit at this time; and
5. you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the Notice of Intent (NOI), you will re-initiate consultation with the USFWS as necessary (see **MA MS4 General Permit Appendix C: Step 2 (5)**).

If the above criteria are met, further consultation with the USFWS under section 7 of the ESA is not required at this time; however, if the proposed action changes in any way such that it may affect a listed species in a manner not previously analyzed or if new information reveals the presence of additional listed species that may be affected by the project, the applicant or the EPA should contact us immediately and suspend activities that may affect those species until the appropriate level of consultation is completed with our office. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you have questions or need further assistance.

Sincerely yours,

Thomas R Chapman
Supervisor
New England Field Office

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[1] Criterion C includes guidance for project action areas that may contain species for which EPA has already made a determination. These species include the northern long-eared bat (*Myotis septentrionalis*), sandplain gerardia (*Agalinis acuta*), small whorled pogonia (*Isotria medeoloides*), and/or American burying beetle (*Nicrophorus americanus*) (MA MS4 General Permit Appendix C: Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C).

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

VIA EMAIL

February 14, 2019

Melissa Arrighi
Town Manager

And;

Jonathan Beder
DPW Director
Town of Plymouth
26 Court St
Plymouth, MA. 02360
jbeder@townhall.plymouth.ma.us

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041150, Town of Plymouth

Dear Jonathan Beder:

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

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

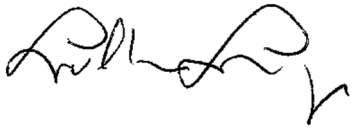
As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

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

Sincerely,

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

and;



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

Massachusetts Department of Environmental Protection
Bureau of Water Protection – Wastewater Management Program

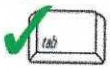
Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

A. Reporting Facility

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.




1. Facility Information

Plymouth Wastewater Treatment Plant
Reporting Sewer Authority

GW 1-677 & NPDES MA 0100587

2. Authorized Representative Transmitting Form:

Eileen
First Name

McNeil
Last Name

508-830-4159 x207
Telephone No.

Project Manager
Title

emcneil@woodardcurran.com
E-mail Address

B. Phone Notifications:

See DEP Regional Office telephone and fax numbers at the end of this form.

1. **MassDEP staff** contacted: David (first name) Burns (last name)
   Date/Time contacted: 02/09/2021 (Date) 4:00 (Time) ☐ am ☒ pm
2. **EPA staff** contacted: David (first name) Turin (last name)
   Date/Time EPA contacted: 02/09/2021 (Date) 4:30 (Time) ☐ am ☒ pm
3. Board of Health contacted: Karen (First Name) Keane (Last Name)
   Date/Time contacted: 02/10/2021 (Date) 08:53 (Time) ☒ am ☐ pm
4. Others notified (select all that apply); ☐ Conservation Commission

☐ Harbormaster ☐ Shellfish Warden ☐ Division of Marine Fisheries

☐ Downstream Drinking Water Supplier ☐ Watershed Association

☐ Beach Resource Manager ☐ Other: _____ (specify)

C. SSO Information

1. SSO Discovered: 02/09/2021 (Date) 1:09 (Time) ☐ am ☒ pm
   By: Jonathan Dries
2. SSO Stopped: 02/09/2021 (Date) 2:09 (Time) ☐ am ☒ pm
3. SSO Discharge from: ☒ Sanitary Sewer Manhole ☐ Pump Station

☒ Backup into Property ☐ Other: _____ (specify)

4. SSO Discharge to: ☒ Ground Surface (no release to surface water)

☐ Direct to Receiving Water _____ (surface water)

☐ Catch basin to Receiving Water _____ (surface water)

☐ Backup into Property Basement

Massachusetts Department of Environmental Protection
Bureau of Water Protection – Wastewater Management Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

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Tax Identification Number

C. SSO Information (cont.)

Location: 1 Sawyer Place, Plymouth MA 02360
(Description of discharge site or closest address)

5. Estimated SSO Volume at time of this Report: 5.61 Gallons

Method of Estimating Volume: Estimated cu-ft & converted to gallons

6. Cause of SSO Event:

☐ Rain Event ☐ Pump Station Failure ☐ Insufficient Capacity in System

☐ Treatment Unit failure

☒ Sewer System Blockage: ☐ Pipe Collapse ☐ Root Intrusion ☐ Grease Blockage

☐ Other: _____
(Specify)

7. Corrective Actions Taken:

As soon as Woodard & Curran was notified we dispatched Neal Doyon along with Jonathan Dries to assess the situation. together they vacored out the blockeage and confirmed flow was good and closed the cover. They took pictures of the site and reported findings to me, the project manager for Woodard & Curran. The spill went onto grass.

Impact Area cleaned and/or disinfected: ☐ Yes ☒ No

Corrective Actions Completed: ☒ Yes ☐ No

Yes, the clog was found and removed using a vactor truck. Flow was verified and site was secured; manhole closed.

D. Comments/Attachments/Follow-up

I wish to provide (select all that apply):

☒ Attachment ☐ Additional comments below: ☐ No additional comments or attachments

Additional comments and planned actions:

Massachusetts Department of Environmental Protection
Bureau of Water Protection – Wastewater Management Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

E. Certification Statement

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

Signature of Authorized Representative

02/10/2021
Date Signed

Please keep a copy of this report for your records. When submitting additional information, include the MassDEP Incident Number from this report.

MassDEP Regional Office and EPA Telephone and Fax Numbers:

Northeast Region	Phone: 978-694-3215	Fax: 978-694-3499
Southeast Region	Phone: 508-946-2750	Fax: 508-947-6557
Central Region	Phone: 508-792-7650	Fax: 508-792-7621
Western Region	Phone: 413-784-1100	Fax: 413-784-1149
EPA	Phone: 617-918-1510	
EPA for Southeast Region, David Turin	Phone: 617-918-1598	Fax: 617-918-0598
EPA for Northeast, Central and Western Regions, Douglas Koopman	Phone: 617-918-1747	Fax: 617-918-0747
DEP 24-hour emergency	Phone: 888-304-1133	

Massachusetts Department of Environmental Protection
Bureau of Water Protection – Wastewater Management Program

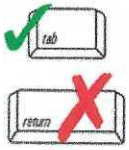
Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

A. Reporting Facility

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Facility Information

Plymouth WWTP 131 Camelot Road, Plymouth MA 02630 — Reporting Sewer Authority
MA0100587 — Permit #

2. Authorized Representative Transmitting Form:

Eileen L. — First Name
McNeil — Last Name
5088304159x207 — Telephone No.
Project Manager — Title
emcneil@woodardcurran — E-mail Address

B. Phone Notifications:

See DEP Regional Office telephone and fax numbers at the end of this form.

1. **MassDEP staff** contacted: David (first name) Burns (last name)
   Date/Time contacted: 03/11/2021 (Date) 16:43 (Time) ☐ am ☒ pm
2. **EPA staff** contacted: David (first name) Turin (last name)
   Date/Time EPA contacted: 03/11/2021 (Date) 16:40 (Time) ☐ am ☒ pm
3. Board of Health contacted: Karen (First Name) Keane (Last Name)
   Date/Time contacted: 03/12/2021 (Date) 07:02 (Time) ☒ am ☐ pm
4. Others notified (select all that apply);
   ☐ Conservation Commission
   ☐ Harbormaster ☐ Shellfish Warden ☐ Division of Marine Fisheries
   ☐ Downstream Drinking Water Supplier ☐ Watershed Association
   ☐ Beach Resource Manager ☒ Other: Woodard & Curran Area Manager (specify)

C. SSO Information

1. SSO Discovered: 03/11/2021 (Date) 16:00 (Time) ☐ am ☒ pm
   By: David Doyon-Neal Doyon
2. SSO Stopped: 03/11/2021 (Date) 17:30 (Time) ☐ am ☒ pm
3. SSO Discharge from: ☒ Sanitary Sewer Manhole ☐ Pump Station
   ☐ Backup into Property ☐ Other: Only flowed into pot hole in street next to manhole.
4. SSO Discharge to: ☐ Ground Surface (no release to surface water)
   ☐ Direct to Receiving Water (surface water)
   ☐ Catch basin to Receiving Water (surface water)
   ☐ Backup into Property Basement

Massachusetts Department of Environmental Protection
Bureau of Water Protection – Wastewater Management Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

C. SSO Information (cont.)

Location: 17 Oak Ridge Road, Plymouth MA 02360
(Description of discharge site or closest address)

5. Estimated SSO Volume at time of this Report: 5.61 Gallons

   Method of Estimating Volume: 3 ft X 3 ft X 0.0833 ft =0.7497 cu-ft x 7.48 gals/cu-ft=5.61

6. Cause of SSO Event:

   ☐ Rain Event ☐ Pump Station Failure ☐ Insufficient Capacity in System

   ☐ Treatment Unit failure

   ☒ Sewer System Blockage: ☐ Pipe Collapse ☐ Root Intrusion ☒ Grease Blockage

   ☒ Other: disposable diapers; "flushable" wipes, grease and septic sludge in line.
   (Specify)

7. Corrective Actions Taken:

Woodard-Curran personnel started vacking up the spill near the manhole; then surcharged manhole was vacked out. Woodard-Curran personne then jetted the sewer line down-stream from manhole where the SSO was; approx. 300 feet. Vaccumed out the blockage with Vactor truck. Vacked out the line until free flow was going.

Impact Area cleaned and/or disinfected: ☒ Yes ☐ No

Yes the spill was vacked up and cleaned.

Corrective Actions Completed: ☒ Yes ☐ No

19:00 pm there was free flow verified in the sewer line

D. Comments/Attachments/Follow-up

I wish to provide (select all that apply):

☒ Attachment ☐ Additional comments below: ☐ No additional comments or attachments

Additional comments and planned actions:

Pictures attached.

Massachusetts Department of Environmental Protection
Bureau of Water Protection – Wastewater Management Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

E. Certification Statement

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

Signature of Authorized Representative

03/12/2021
Date Signed

Please keep a copy of this report for your records. When submitting additional information, include the MassDEP Incident Number from this report.

MassDEP Regional Office and EPA Telephone and Fax Numbers:

Northeast Region	Phone: 978-694-3215	Fax: 978-694-3499
Southeast Region	Phone: 508-946-2750	Fax: 508-947-6557
Central Region	Phone: 508-792-7650	Fax: 508-792-7621
Western Region	Phone: 413-784-1100	Fax: 413-784-1149
EPA	Phone: 617-918-1510	
EPA for Southeast Region, David Turin	Phone: 617-918-1598	Fax: 617-918-0598
EPA for Northeast, Central and Western Regions, Douglas Koopman	Phone: 617-918-1747	Fax: 617-918-0747
DEP 24-hour emergency	Phone: 888-304-1133	

Incident Report

Plymouth_MA_Collections

Selection

15 July 2020

Incident Summary

Number of Incidents: 1

Incident ID	Incident Type	Node ID	Pipe ID	Property ID
SMH-2600.1	Pollution incident	-	SMH-2600.SMH-1119.1	143 COURT STREET

Incident ID	SMH-2600.1		
Incident Type	Pollution incident	*Property ID*	143 COURT STREET
Location	COURT STREET		
X Coord (ft)	881023.44	*Y Coord (ft)*	2812268.71
Node ID	-	*Pipe ID*	SMH-2600.SMH-1119.1

Status	RESOLVED	*Priority*	HIGH
Date Reported	09:55 29 Dec 2019	*Report Taken By*	CALL (535 Emergency Call)
Date Inspected	29 Dec 2019	*Inspected By*	FRADE (Mike Frade)
Date Resolved	17:00 29 Dec 2019	*Resolved By*	FRADE (Mike Frade)
Cause	MHSSO (SSO from MH)	*Estimated Cost ($)*	120.00
Effect	STORM (Sewage in Storm Sewer)	*Actual Cost ($)*	1087.50
Action	REG (Notify Regulatory Agency)		

User text 1	-	*Amount Discharged (gals)*	-
User text 2	-	*User number 2*	-
User text 3	-	*User number 3*	-
User text 4	-	*User number 4*	-
User text 5	-	*User number 5*	-
User text 6	-	*User number 6*	-
User text 7	-	*User number 7*	-
Discharge Date	-	*User number 8*	-
Discharge Start Time	-	*User number 9*	-
Discharge End Time	-	*User number 10*	-

Notes	GARY FRIZZELL CALLED THE 535 EMERGENCY LINE AND REPORTED A SURCHARGED MANHOLE ON COURT STREET AT LOTHROP INTERSECTION THAT HAD BEEN REPORTED BY THE POLICE. AFTER A FEW MINUTES HE ALSO CALLED MIKE FRADE TO REPORT THE SITUATION DAVE BIDANSET WAS THE ON-CALL AND HE HAD RETRIEVED THE 535 EMERGENCY CALL AND HAD BEGUN CALLING STAFF TO GET SOMEONE TO RESPOND. MIKE FRADE HAD ALSO BEGUN CALLING STAFF TO GET SOMEONE IN ASAP. NEAL WAS THE QUICKEST TO RESPOND AND WAS DISPATCHED TO GET THE VACTOR TRUCK AND WE REQUESTED DAVE BIDANSET TO ASSIST. CREW ARRIVED ONSITE AND FOUND SMH-2600 OVERFLOWING OUT OF THE HOOK HOLES - CALLED

	FOR A POLICE DETAIL TO HELP DIVERT TRAFFIC, WAITED 15 MINUTES WITH NO RESPONSE SO IT WAS DECIDED TO JET WASH FROM SMH -1119 TO SMH-2600, SOME 475 FEET. THIS DID NOT CLEAR ANY BLOCKAGE, CALLED MIKE FRADE FOR INSTRUCTIONS AND WAS ADVISED TO TRY SOME DIFFERENT NOZZLES/TIPS AND WITH THE SLED, BUT NO SUCCESS EVEN WITH 3 DIFFERENT TIPS AND SLED SETUPS., RETURNED TO THE ORIGINAL SMALLL PENETRATOR NOZZLE AND ATTEMPTED AGAIN TO JET WASH AND THIS TIME IT WOULDN'T GO PAST 40 FEET, PULLED OUT AND TRIED AGAIN BUT COULDN'T GET PAST 12 FEET. HAD TO PULL THE HOSE OUT AS THE TRUCK HAD RUN OUT OF WATER. PETER MURPHY HAD ALSO ARRIVED TO OFFER ASSISTANCE, WENT TO WATER STREET STATION TO REFILL WATER TANKS, SENT DAVE BIDANSET BACK TO THE PLANT TO GET THE CAMERA EQUIPMENT. AT 13:16 THE POLICE CALLED NEAL TO INFORM HIM THAT NO DETAIL REQUESTS COULD BE FILLED. CALLED MIKE FRADE FOR ASSISTANCE/DIRECTION. MIKE DIRECTED NEAL TO BRING THE TANKER (PUMP TRUCK) AND USE THE VACUUM TO COLLECT AS MUCH OF THE SURCHARGE AS POSSIBLE. MIKE FRADE REACHED OUT TO CHAD WHITING TO VERIFY THAT PARTS OF THIS PIPE WERE NEW AND IF HE HAD ANY KNOWLEDGE OF ISSUES IN THE PIPE. MIKE ALSO REQUESTED JONATHAN DRIES IF POSSIBLE AS HE HAS PRIOR EXPERIENCE JETTING THIS PIPE. MIKE FRADE AND JONATHAN DRIES BEGAN DRIVING INTO TOWN WHILE THE CREW TRANSPORTED THE PUMPER TRUCK AND SETUP HOSES. NEAL BROUGHT THE VACTOR TRUCK BACK FROM WATER STREET JUST AS MIKE AND JONATHAN ARRIVED ONSITE. JONATHAN WAS ABLE TO SECURE A DETAIL AND WE BEGAN SETTING UP SO ONCE THE DETAIL ARRIVED TO CONTROL TRAFFIC WE PULLED THE MANHOLE COVER AND REVERSE JETTED FROM MANHOLE SMH-534 TO SMH-2600, THE NOZZLE TRAVELED SOME 65 FEET AND WE WERE ABLE TO BREAK UP A BLOCKAGE AND FLOW WAS RE-ESTABLISHED AT APPROX. 4 PM. WE THEN REPOSITIONED THE VACTOR TO VACUUM OUT THE SAND CATCH BASIN IN FRONT OF 143 COURT STREET AND THE CREW APPLIED SOME 10 TO 12 GALLONS OF A BLEACH AND WATER 50/50 SOLUTION. WE USED BROOMS TO RUB IT IN AND THEN USED THE PUMPER TRUCK AND VACTOR TO VACUUM CLEAN THE STREET WHERE EVER IT WAS PUDDLED OR WET.

Photo -	*Sketch* INFONET OVERHEAD VIEW 

Incident Report

Plymouth_MA_Collections

Selection

15 July 2020

Incident Summary

Number of Incidents: 1

Incident ID	Incident Type	Node ID	Pipe ID	Property ID
SMH-648.1	Pollution incident	SMH-648	SMH-648.SMH-647.1	CHAPEL HILL - WESTERLY ROAD

Incident ID	SMH-648.1		
Incident Type	Pollution incident	*Property ID*	CHAPEL HILL - WESTERLY ROAD
Location	WESTERLY ROAD		
X Coord (ft)	880242.37	*Y Coord (ft)*	2806426.48
Node ID	SMH-648	*Pipe ID*	SMH-648.SMH-647.1

Status	RESOLVED	*Priority*	HIGH
Date Reported	13:11 07 Jun 2020	*Report Taken By*	OPS (WWTP Operations)
Date Inspected	13:11 07 Jun 2020	*Inspected By*	NEWELL (Mark Newell)
Date Resolved	09:45 08 Jun 2020	*Resolved By*	NEWELL (Mark Newell)
Cause	MHSSO (SSO from MH)	*Estimated Cost ($)*	-
Effect	STORM (Sewage in Storm Sewer)	*Actual Cost ($)*	40.00
Action	DPW (Notify DPW)		

User text 1	-	*Amount Discharged (gals)*	40.000
User text 2	-	*User number 2*	35.000
User text 3	-	*User number 3*	-
User text 4	-	*User number 4*	-
User text 5	Yes	*User number 5*	-
User text 6	-	*User number 6*	-
User text 7	-	*User number 7*	-
Discharge Date	-	*User number 8*	-
Discharge Start Time	-	*User number 9*	-
Discharge End Time	-	*User number 10*	-

Notes	6-7-20, 13:30, ON DUTY OPERATOR KYLE TRACEY, RECEIVED A CALL FROM JANICE WILLIAMS (508) 277-2371, SAYING THERE WAS SEWERAGE BUBBLING OUT OF A MANHOLE COVER AT THE BOTTOM OF CHAPEL HILL STREET @ THE INTERSECTION WITH WESTERLY ROAD. KYLE CALLED ON RICHARD COHOLAN TO INVESTIGATE. RICHARD CALLED JANICE WILLIAMS WHO DESCRIBED WHAT SHE WAS SEEING AND THEY STATED THAT HER DAUGHTER HAD SEEN SOME WATER ON SATURDAY 6-6-20. RICHARD CALLED IN MARK NEWELL FOR ASSISTANCE. CREW HAD TO BREAK THROUGH ASPHALT TO EXPOSE

	THE BURIED MANHOLE COVER @ SMH-648, HAD TO JET WASH FROM SMH-656 TO SMH-648 THEN TO SMH-647. AT SOME 502 FEET HIT AN OBSTRUCTION AND BROKE THROUGH, WASHED OUT TO 525 FEET THEN REVERSE JETTED THE PIPE BACK TO THE TRUCK AND REMOVED 3/4" ROCK , PIECES OF ASPHALT AND A LOT OF GREASE. REFILLED THE TRUCK WITH WATER THEN WASHED THE SAME PIPES AGAIN. CREW ASO WASHED FROM SMH-656 TO SMH-657 AND THEN LATERAL TO 21 CHAPEL HILL. USING THE VACTOR CREW CLEANED THE STREET OF RUNOFF.CREW ALSO USED HYPOCHLORIDE TO DISINFECT. 6/8/2020 -ND-RC-MN WENT BACK TO WESTERLEY RD AND JETTED 421 FT FROM SMH 657 TO SMH 648. SEWAGE FROM THE BUBBLING SMH-648 TRAVELED TO CATCH BASIN # 11866 ESTIMATE COULD BE 20 TO 40 GALLONS, WASN'T A HIGH FLOWRATE AND SOMETIMES IT STOPPED. CREW TO RETURN ON MONDAY AND WASH THE PIPES FURTHER DOWNSTREAM TO FIND ANY OTHER ROCK OR DEBRIS THAT MAY HAVE BEEN LOOSENED.

	
Photo -	*Sketch -*

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Watershed Permitting Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

A. Reporting Facility

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

See DEP Regional Office telephone and fax numbers at the end of this form.

1. Facility Information

Town of Plymouth, MA (Reporting Sewer Authority) — MA100587 (Permit #)

2. Authorized Representative Transmitting Form:

Michael (First Name) | Frade (Last Name) | 774-292-1299 (Telephone No.)

Assistant Project Manager (Title) | michael.frade@veolia.com (E-mail Address)

B. Phone Notifications:

1. **MassDEP staff** contacted: David (first name) | Burns (last name)

   Date/Time contacted: 6/8/20 (Date) | 9:58 (Time) ☒ am ☐ pm

2. **EPA staff** contacted: David (first name) | Turin (last name)

   Date/Time EPA contacted: 6/8/20 (Date) | 9:54 (Time) ☒ am ☐ pm

3. Board of Health contacted: Karen (First Name) | Keller (Last Name)

   Date/Time contacted: 6/8/20 (Date) | 10:14 (Time) ☒ am ☐ pm

4. Others notified (select all that apply);

☐ Conservation Commission
☒ Harbormaster ☐ Shellfish Warden ☒ Division of Marine Fisheries
☐ Downstream Drinking Water Supplier ☐ Watershed Association
☐ Beach Resource Manager ☐ Other: _____ (specify)

C. SSO Information

1. SSO Discovered: 6-7-20 (Date) | 13:10 (Time) ☐ am ☒ pm

   By: Janice Williams

2. SSO Stopped: 6-7-20 (Date) | 15:00 (Time) ☐ am ☒ pm

3. SSO Discharge from: ☒ Sanitary Sewer Manhole ☐ Pump Station
   ☐ Backup into Property ☐ Other: SMH-648 (specify)

4. SSO Discharge to: ☒ Ground Surface (no release to surface water)
   ☐ Direct to Receiving Water _____ (surface water)
   ☐ Catch basin to Receiving Water _____ (surface water)
   ☐ Backup into Property Basement

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.

Signature of Authorized Representative

6-8-20
Date Signed

Please keep a copy of this report for your records. When submitting additional information, include the MassDEP Incident Number from this report.

MassDEP Regional Office and EPA Telephone and Fax Numbers:

Northeast Region	Phone: 978-694-3215	Fax: 978-694-3499
Southeast Region	Phone: 508-946-2750	Fax: 508-947-6557
Central Region	Phone: 508-792-7650	Fax: 508-792-7621
Western Region	Phone: 413-784-1100	Fax: 413-784-1149
EPA Contact	Phone: 617-918-1870	Fax: 617-918-0870
DEP 24-hour emergency	Phone: 888-304-1133	

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SOP 1: Dry Weather Outfall Inspection

Introduction

Outfalls from an engineered storm drain system can be in the form of pipes or ditches. Under current and pending regulations, it is important to inspect and document water quality from these outfalls under both dry weather and wet weather conditions. SOP 2, "Wet Weather Outfall Inspection", covers the objectives of that type of inspection. This SOP discusses the dry weather inspection objectives, and how they differ from wet weather inspection objectives.

During a dry weather period, it is anticipated that minimal flow from stormwater outfalls will be observed. Therefore, dry weather inspections aim to characterize any/all flow observed during a dry weather period and identify potential source(s) of an illicit discharge through qualitative testing; further described in SOP 13, "Water Quality Screening in the Field".

Objectives of Dry Weather Inspections

A dry weather period is a time interval during which less than 0.1 inch of rain is observed across a minimum of 72 hours. Unlike wet weather sampling, dry weather inspections are not intended to capture a "first flush" of stormwater discharge, rather they are intended to identify any/all discharges from a stormwater outfall during a period without recorded rainfall. The objective of inspections during a dry weather period is to characterize observed discharges and facilitate detection of illicit discharges.

Visual Condition Assessment

The attached Dry Weather Outfall Inspection Survey is a tool to assist in documenting observations related to the both quantitative and qualitative characteristics of any/all flows conveyed by the structure during a dry period.

For any visual observation discharge from a stormwater outfall, an investigation into the pollution source should occur, but the following are often true:

1. Foam: indicator of upstream vehicle washing activities, or an illicit discharge.
2. Oil sheen: result of a leak or spill.
3. Cloudiness: indicator of suspended solids such as dust, ash, powdered chemicals and ground up materials.
4. Color or odor: Indicator of raw materials, chemicals, or sewage.
5. Excessive sediment: indicator of disturbed earth of other unpaved areas lacking adequate erosion control measures.
6. Sanitary waste and optical enhancers (fluorescent dyes added to laundry detergent): indicators of illicit discharge.
7. Orange staining: indicator of high mineral concentrations.

Both bacteria and petroleum can create a sheen on the water surface. The source of the sheen can be differentiated by disturbing it, such as with a pole. A sheen caused by oil will remain intact and move in a swirl pattern; a sheen caused by bacteria will separate and appear "blocky". Bacterial or naturally occurring sheens are usually silver or relatively dull in color and will break up into a number of small patches of sheen. The cause may be presence of iron, decomposition of organic material or presence of certain bacteria. Bacterial sheen is not a pollutant but should be noted.

Many of these observations are indicators of an illicit discharge. Examples of illicit discharges include: cross-connections of sewer services to engineered storm drain systems; leaking septic systems; intentional discharge of pollutants to catch basins; combined sewer overflows; connected floor drains; and sump pumps connected to the system (under some circumstances). Additional guidelines for illicit discharge investigations are included in SOP 10, "Locating Illicit Discharges". If dry weather flow is present at the outfall, and the flow does not appear to be an obvious illicit discharge (e.g. flow is clear, odorless, etc.) attempt to identify the source of flow (e.g. intermittent stream, wetlands drainage, etc.) and document the discharge for future comparison.

Although many of the observations are indicators of illicit discharge it should be noted that several of these indicators may also occur naturally. Orange staining may be the result of naturally occurring iron, and thus unrelated to pollution. Foam can be formed when the physical characteristics of water are altered by the presence of organic materials. Foam is typically found in waters with high organic content such as bog lakes, streams that originate from bog lakes, productive lakes, wetlands, or woody areas. To determine the difference between natural foam and foam cause by pollution, consider the following:

1. Wind direction or turbulence: natural foam occurrences on the beach coincide with onshore winds. Often, foam can be found along a shoreline and/or on open waters during windy days. Natural occurrences in rivers can be found downstream of a turbulent site.
2. Proximity to a potential pollution source: some entities including the textile industry, paper production facilities, oil industries, and fire fighting activities work with materials that cause foaming in water. If these materials are released to a water body in large quantities, they can cause foaming. Also, the presence of silt in water, such as from a construction site can cause foam.
3. Feeling: natural foam is typically persistent, light, not slimy to the touch.
4. Presence of decomposing plants or organic material in the water.

Optical enhancers, fluorescent dyes added to laundry detergent, are typically detected through the use of clean, white cotton pads placed within the discharge for several days, dried then viewed under a UV light. If the cotton pad displays fluorescent patches, optical enhancers are present. Optical enhancers are occasionally visible as a bluish-purple haze on the water surface; however the testing method should be used to confirm the presence of optical enhancers.

The Dry Weather Outfall Inspection Survey includes fields where these and other specific observations can be noted. The inspector shall indicate the presence of a specific water quality indicator or parameter by marking "Yes". If "Yes" is marked, provide additional details in the comments section. If the indictor in question is not present, mark "No".

Within the comments section, provide additional information with regard to recorded precipitation totals, or more detailed descriptions of observations made during the inspection and corrective actions taken.

Measuring Water Quality

Based on the results of the Visual Condition Assessment, it may be necessary to collect additional data about water quality. Water quality samples can be in the form of screening using field test kits and instrumentation, or by discrete analytical samples processed by a laboratory.

Information on selecting and using field test kits and instrumentation is included in SOP 13, "Water Quality Screening in the Field." The Inspection Survey also provides values for what can be considered an appropriate benchmark for a variety of parameters that can be evaluated in the field.

If the results of screening using field test kits indicate that the outfall's water quality exceeds the benchmarks provided, collection of discrete analytical samples should be considered.

Analytical Sample Collection

Sample collection methods may vary based on specific outfall limitations, but shall follow test procedures outlined in 40 CFR 136. A discrete manual or grab sample can classify water at a distinct point in time. These samples are easily collected and used primarily when the water quality of the discharge is expected to be homogeneous, or unchanging, in nature. A flow-weighted composite sample will classify water quality over a measured period of time. These samples are used when the water quality of the discharge is expected to be heterogeneous, or fluctuating, in nature. Grab samples are more common for dry weather outfall inspections due to the time-sensitive nature of the process.

Protocols for collecting a grab sample shall include the following:

1. Do not eat, drink or smoke during sample collection and processing.
2. Do not collect or process samples near a running vehicle.
3. Do not park vehicles in the immediate sample collection area, including both running and non-running vehicles.
4. Always wear clean, powder-free nitrile gloves when handling sample containers and lids.
5. Never touch the inside surface of a sample container or lid, even with gloved hands.

6. Never allow the inner surface of a sample container or lid to be contacted by any material other than the sample water.
7. Collect samples while facing upstream and so as not to disturb water or sediments in the outfall pipe or ditch.
8. Do not overfill sample containers, and do not dump out any liquid in them. Liquids are often added to sample containers intentionally by the analytical laboratory as a preservative or for pH adjustment.
9. Slowly lower the bottle into the water to avoid bottom disturbance and stirring up sediment.
10. Do not allow any object or material to fall into or contact the collected water sample.
11. Do not allow rainwater to drip from rain gear or other surfaces into sample containers.
12. Replace and tighten sample container lids immediately after sample collection.
13. Accurately label the sample with the time and location.
14. Document on the Wet Weather Outfall Inspection Survey that analytical samples were collected, specify parameters, and note the sample time on the Inspection Survey. This creates a reference point for samples.

Analytical Sample Quality Control and Assurance

Upon completion of successful sample collection, the samples must be sent or delivered to a MassDEP-approved laboratory for analytical testing. Quality control and assurance are important to ensuring accurate analytical test results.

Sample preservation is required to prevent contaminate degradation between sampling and analysis, and should be completed in accordance with 40 CFR 136.3.

Maximum acceptable holding times are also specified for each analytical method in 40 CFR 136.3. Holding time is defined as the period of time between sample collection and extraction for analysis of the sample at the laboratory. Holding time is important because prompt laboratory analysis allows the laboratory to review the data and if analytical problems are found, re-analyze the affected samples within the holding times.

Chain of custody forms are designed to provide sample submittal information and document transfers of sample custody. The forms are typically provided by the laboratory and must be completed by the field sampling personnel for each sample submitted to the lab for analysis. The document must be signed by both the person releasing the sample and the person receiving the sample every time the sample changes hands. The sampling personnel shall keep one copy of the form and send the remaining copies to the laboratory with the samples. Custody seals, which are dated, signed and affixed to the sample container, may be used if the samples are shipped in a cooler via courier or commercial overnight shipping.

Attachments

1. Dry Weather Outfall Inspection Survey

Related Standard Operating Procedures

1. SOP 2 - Wet Weather Outfall Inspection
2. SOP 10 - Locating Illicit Discharges
3. SOP 13 - Water Quality Screening in the Field

Outfall ID: _____ **Town:** _____

Inspector: _____ **Date:** _____

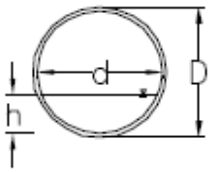
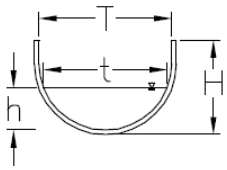
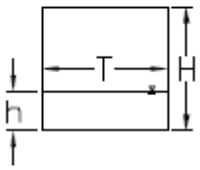
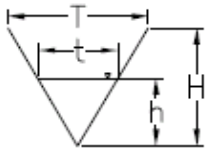
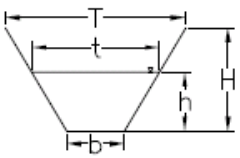
Street Name _____

Last rainfall event _____

DRY WEATHER OUTFALL INSPECTION SURVEY

Type of Outfall (check one):		**Pipe Outfall** ☐	**Open Swale Outfall** ☐
Outfall Label:	**Stencil** ☐ **Ground Inset** ☐ **Sign** ☐ **None** ☐ **Other**_____		
Pipe Material:	Concrete ☐ Corrugated metal ☐ Clay Tile ☐ Plastic ☐ Other: _____ ☐	**Pipe Condition:**	Good ☐ Poor ☐ Fair ☐ Crumbling ☐
Swale Material:	Paved (asphalt) ☐ Concrete ☐ Earthen ☐ Stone ☐ Other: _____ ☐	**Swale Condition:**	Good ☐ Poor ☐ Fair ☐ Crumbling ☐

Shape of Pipe/Swale (check one)

 ☐	 ☐	 ☐	 ☐	 ☐
Rounded Pipe/Swale		**Rectangular Pipe/Swale**	**Triangular Swale**	**Trapezoidal Swale**

Pipe Measurements:	**Swale Measurements:**	**Is there a headwall?**	**Location Sketch**
Inner Dia. (in): d= _____	Swale Width (in): T= _____	Yes ☐ No ☐	
Outer Dia. (in): D= _____	Flow Width (in): t = _____	**Condition:**	
Pipe Width (in): T= _____	Swale Height (in): H= _____	Good ☐ Poor ☐ Fair ☐ Crumbling ☐	
Pipe Height (in): H= _____	Flow Height (in): h= _____*		
Flow Width (in): h= _____*	Bottom Width (in): b=_____		

Description of Flow: Heavy ☐ Moderate ☐ Trickling ☐ Dry ☐

If the outlet is submerged check yes and indicate approximate height of water above the outlet invert. h above invert (in):

Circle All Materials Present:

Odor:	Yes ☐	No ☐	Rip rap / Sheen: Bacterial
Optical enhancers suspected?	Yes ☐	No ☐	Excessive sediment / Sheen: Petroleum
Has channelization occurred?	Yes ☐	No ☐	Foam / Floatables
Has scouring occurred below the outlet?	Yes ☐	No ☐	Sanitary Waste / Algae
			Orange Staining / Excessive Vegetation

Required Maintenance: Tree Work ☐ Remove Trash/Debris ☐ Ditch Work ☐ Blocked Pipe ☐ Structural Corrosion ☐ Erosion at Structure ☐ N/A ☐ Other ☐

Comments:

SOP 2: Wet Weather Outfall Inspection

Introduction

Outfalls from an engineered storm drain system can be in the form of pipes or ditches. Under current and pending regulations, it is important to inspect and document water quality from these outfalls under both dry weather and wet weather conditions. SOP 1, "Dry Weather Outfall Inspection", covers the objectives of that type of inspection. This SOP discusses wet weather inspection objectives and how they differ from dry weather inspection objectives. The primary difference is that wet weather inspection aims to describe and evaluate the first flush of stormwater discharged from an outfall during a storm, representing the maximum pollutant load managed by receiving water.

Definition of Wet Weather

A storm is considered a representative wet weather event if greater than 0.1 inch of rain falls and occurs at least 72 hours after the previously measurable (greater than 0.1 inch of rainfall) storm event. In some watersheds, based on the amount of impervious surface present, increased discharge from an outfall may not result from 0.1 inch of rain. An understanding of how outfalls respond to different events will develop as the inspection process proceeds over several months, allowing the inspectors to refine an approach for inspections.

Ideally, the evaluation and any samples collected should occur within the first 30 minutes of discharge to reflect the first flush or maximum pollutant load.

Typical practice is to prepare for a wet weather inspection event when weather forecasts show a 40% chance of rain or greater. If the inspector intends to collect analytical samples, coordination with the laboratory for bottleware and for sample drop-off needs to occur in advance.

Visual Condition Assessment

The attached Wet Weather Outfall Inspection Survey should be used to document observations related to the quality of stormwater conveyed by the structure. Observations such as the following can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash and debris

For any visual observation of pollution in a stormwater outfall discharge, an investigation into the pollution source should occur, but the following are often true:

1. Foam: indicator of upstream vehicle washing activities, or an illicit discharge.
2. Oil sheen: result of a leak or spill.
3. Cloudiness: indicator of suspended solids such as dust, ash, powdered chemicals and ground up materials.

4. Color or odor: Indicator of raw materials, chemicals, or sewage.
5. Excessive sediment: indicator or disturbed earth of other unpaved areas lacking adequate erosion control measures.
6. Sanitary waste and optical enhancers (fluorescent dyes added to laundry detergent): indicators of illicit discharge.
7. Orange staining: indicator of high mineral concentrations.

Many of these observations are indicators of an illicit discharge. Examples of illicit discharges include: cross-connections of sewer services to engineered storm drain systems; leaking septic systems; intentional discharge of pollutants to catch basins; combined sewer overflows; connected floor drains; and sump pumps connected to the system (under some circumstances). Additional guidelines for illicit discharge investigations are included in SOP 10, "Locating Illicit Discharges".

Although many of the observations are indicators of illicit discharge it should be noted that several of these indicators may also occur naturally. Orange staining may be the result of naturally occurring iron, and thus unrelated to pollution. Foam can be formed when the physical characteristics of water are altered by the presence of organic materials. Foam is typically found in waters with high organic content such as bog lakes, streams that originate from bog lakes, productive lakes, wetlands, or woody areas. To determine the difference between natural foam and foam cause by pollution, consider the following:

1. Wind direction or turbulence: natural foam occurrences on the beach coincide with onshore winds. Often, foam can be found along a shoreline and/or on open waters during windy days. Natural occurrences in rivers can be found downstream of a turbulent site.
2. Proximity to a potential pollution source: some entities including the textile industry, paper production facilities, oil industries, and fire fighting activities work with materials that cause foaming in water. If these materials are released to a water body in large quantities, they can cause foaming. Also, the presence of silt in water, such as from a construction site can cause foam.
3. Feeling: natural foam is typically persistent, light, not slimy to the touch.
4. Presence of decomposing plants or organic material in the water.

Both bacteria and petroleum can create a sheen on the water surface. The source of the sheen can be differentiated by disturbing it, such as with a pole. A sheen caused by oil will remain intact and move in a swirl pattern; a sheen caused by bacteria will separate and appear "blocky". Bacterial or naturally occurring sheens are usually silver or relatively dull in color and will break up into a number of small patches of sheen. The cause may be presence of iron, decomposition of organic material or presence of certain bacteria. Bacterial sheen is not a pollutant but should be noted.

Optical enhancers, fluorescent dyes added to laundry detergent, are typically detected through the use of clean, white cotton pads placed within the discharge for several days, dried then viewed

under a UV light. If the cotton pad displays fluorescent patches, optical enhancers are present. Optical enhancers are occasionally visible as a bluish-purple haze on the water surface; however the testing method should be used to confirm the presence of optical enhancers.
The Wet Weather Outfall Inspection Survey includes fields where these and other specific observations can be noted. The inspector shall indicate the presence of a specific water quality indicator or parameter by marking "Yes". If "Yes" is marked, provide additional details in the comments section. If the indictor in question is not present mark "No".

Within the comments section, provide additional information with regard to recorded precipitation totals, or more detailed descriptions of observations made during the inspection and corrective actions taken.

Measuring Water Quality
Based on the results of the Visual Condition Assessment, it may be necessary to collect additional data about water quality. Water quality samples can be in the form of screening using field test kits or by discrete analytical samples processed by a laboratory.

Information on how to use field test kits is included in SOP 13, "Water Quality Screening with Field Test Kits", and the Wet Weather Outfall Inspection Survey includes fields to document the results of such screening. The Inspection Survey also provides values for what can be considered an appropriate benchmark for a variety of parameters that can be evaluated with field test kits.

If the results of screening using field test kits indicate that the outfall's water quality exceeds the benchmarks provided, collection of discrete analytical samples should be considered.

Analytical Sample Collection
Sample collection methods may vary based on specific outfall limitations but shall follow test procedures outlined in 40 CFR 136. A discrete manual or grab sample can classify water at a distinct point in time. These samples are easily collected and used primarily when the water quality of the discharge is expected to be homogeneous, or unchanging, in nature. A flow-weighted composite sample will classify water quality over a measured period of time. These samples are used when the water quality of the discharge is expected to be heterogeneous, or fluctuating, in nature. Grab samples are more common for wet weather outfall inspections due to the time-sensitive nature of the process.

Protocols for collecting a grab sample shall include the following:

1. Do not eat, drink or smoke during sample collection and processing.
2. Do not collect or process samples near a running vehicle.
3. Do not park vehicles in the immediate sample collection area, including both running and non-running vehicles.

4. Always wear clean, powder-free nitrile gloves when handling sample containers and lids.
5. Never touch the inside surface of a sample container or lid, even with gloved hands.
6. Never allow the inner surface of a sample container or lid to be contacted by any material other than the sample water.
7. Collect samples while facing upstream and so as not to disturb water or sediments in the outfall pipe or ditch.
8. Do not overfill sample containers, and do not dump out any liquid in them. Liquids are often added to sample containers intentionally by the analytical laboratory as a preservative or for pH adjustment.
9. Slowly lower the bottle into the water to avoid bottom disturbance and stirring up sediment.
10. Do not allow any object or material to fall into or contact the collected water sample.
11. Do not allow rainwater to drip from rain gear or other surfaces into sample containers.
12. Replace and tighten sample container lids immediately after sample collection.
13. Accurately label the sample with the time and location.
14. Document on the Wet Weather Outfall Inspection Survey that analytical samples were collected, specify parameters, and note the sample time on the Inspection Survey. This creates a reference point for samples.

Analytical Sample Quality Control and Assurance

Upon completion of successful sample collection, the samples must be sent or delivered to a MassDEP-approved laboratory for analytical testing. Quality control and assurance are important to ensuring accurate analytical test results.

Sample preservation is required to prevent contaminant degradation between sampling and analysis and should be completed in accordance with 40 CFR 136.3.

Maximum acceptable holding times are also specified for each analytical method in 40 CFR 136.3. Holding time is defined as the period of time between sample collection and extraction for analysis of the sample at the laboratory. Holding time is important because prompt laboratory analysis allows the laboratory to review the data and if analytical problems are found, re-analyze the affected samples within the holding times.

Chain of custody forms are designed to provide sample submittal information and document transfers of sample custody. The forms are typically provided by the laboratory and must be completed by the field sampling personnel for each sample submitted to the lab for analysis. The document must be signed by both the person releasing the sample and the person receiving the sample every time the sample changes hands. The sampling personnel shall keep one copy of the form and send the remaining copies to the laboratory with the samples. Custody seals, which are dated, signed and affixed to the sample container, may be used if the samples are shipped in a cooler via courier or commercial overnight shipping.

Attachments

1. Wet Weather Outfall Inspection Survey

Related Standard Operating Procedures

1. SOP 1 - Dry Weather Outfall Inspection
2. SOP 10 - Locating Illicit Discharges
3. SOP 13 - Water Quality Screening in the Field

Outfall I.D.: _____ **Date:** _____

Inspector: _____

Time of Inspection: _____

Street Name _____

Last rainfall event _____

WET WEATHER OUTFALL INSPECTION SURVEY

Visual Inspection:	**Yes**	**No**	**Comments (Include probable source of observed contamination):**
Color	☐	☐	
Odor	☐	☐	
Turbidity	☐	☐	
Excessive Sediment	☐	☐	
Sanitary Waste	☐	☐	
Pet Waste	☐	☐	
Floatable Solids	☐	☐	
Oil Sheen	☐	☐	
Bacterial Sheen	☐	☐	
Foam	☐	☐	
Algae	☐	☐	
Orange Staining	☐	☐	
Excessive Vegetation	☐	☐	
Optical Enhancers	☐	☐	
Other _____			

Sample Parameters	**Analytical Test Method**	**Benchmark***	**Field Screening Result**	**Full Analytical?**
Ammonia[1]	EPA 350.2/SM4500-NH3C	>50.0 mg/L		☐ Yes ☐ No
Specific Conductance[1]	SM 2510B	>2,000		☐ Yes ☐ No
Detergents & Surfactants[2]	EPA 425.1/SM5540C	> 0.25 mg/L		☐ Yes ☐ No
Fluoride[2]	EPA 300.0	>0.25 mg/L		☐ Yes ☐ No
pH[1]	EPA 150.1/SM 4500H	<5		☐ Yes ☐ No
Potassium[1]	EPA 200.7	>20 mg/L		☐ Yes ☐ No
Comments:				

[1] – *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection and Robert Pitt of University of Alabama, 2004, p. 134, Table 45.

[2] – *Appendix I – Field Measurements, Benchmarks and Instrumentation*, Draft Massachusetts North Coastal Small MS4 General Permit, 2009.

Catch Basin Inspection and Cleaning

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a sump below the invert of the outlet pipe (older catch basins may not have a sump). Catch basin cleaning reduces foul odors, prevents clogs in the storm drain system, and reduces the loading of trash, suspended solids, nutrients, bacteria, and other pollutants to receiving waters. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on catch basin inspection and cleaning to reduce the discharge of pollutants from the MS4. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

This SOP can also be used for inspection of catch basins or manholes for the purpose of conducting catchment investigations as part of the municipality's Illicit Discharge Detection and Elimination program.

The Highway Division performs routine inspections, cleaning, and maintenance of the approximately 5,200 catch basins that are located within the MS4 regulated area. The Town of Plymouth will include an optimization plan for catch basin cleaning and inspection in its annual report.

The Town of Plymouth will implement the following catch basin inspection and cleaning procedures to reduce the discharge of pollutants from the MS4:

Procedures

Inspection and Cleaning Frequency

- Each catch basin should be cleaned and inspected at least annually.
- Catch basins near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) or high-use areas should be inspected and cleaned more frequently if inspection finds excessive sediments or debris loadings.
- Catch basins should be cleaned to ensure that they are no more than 50 percent full[1] at any time. Establish inspection and maintenance frequencies needed to meet this "50 percent" goal. If a catch basin sump is more than 50 percent full during two consecutive inspections, document the findings, investigate the contributing drainage area for sources of excessive sediment loading, and, if possible, address the contributing sources. If no contributing sources are found, increase the inspection and cleaning frequencies of the sump.
- Street sweeping performed on an appropriate schedule will reduce the amount of sediment, debris, and organic matter entering the catch basins, which will in turn reduce the frequency with which they need to be cleaned. Reference SOP 16: Streets and Parking Lots for information on appropriate street sweeping frequencies. Street sweeping schedules should also be adjusted based on catch basin inspection findings, with more frequent sweepings for areas with higher catch basin loads.

Inspection and Cleaning Procedures

Catch basin inspection and cleaning procedures should address both the grate opening and the catch basin structure, including the sump and any inlet and outlet pipes. Document any and all observations about the condition of the catch basin structure and water quality (an inspection form and log of catch basins cleaned or inspected are included in the attachments). Collect data on the condition of the physical basin structure, its frame, and the grate, as well as on the quality of stormwater conveyed by the structure. Observations like those below can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash and debris

Both oil and bacteria can create a sheen on the water's surface. The source of a sheen can be differentiating by disturbing it (e.g., with a pole). A sheen caused by oil will remain intact and move in a swirl pattern, while a sheen caused by bacteria will separate and appear "blocky." The bacteria that cause this sheen are naturally occurring iron bacteria – they are not considered a pollutant but should be noted. Other types of bacteria, such as fecal bacteria, are considered pollutants and their discovery should be recorded.

Observations like those below can indicate a potential connection of a sanitary sewer to the storm drain system, which is an illicit discharge:

- Indications of sanitary sewage, including fecal matter or sewage odors
- Foaming, such as from detergent
- Optical enhancers, fluorescent dye added to laundry detergent

In general, adhere to the following procedures when inspecting and cleaning catch basins. Record the findings in the log in the attachments:

1. Implement appropriate traffic safety procedures (e.g., traffic cones) prior to and during the catch basin inspection and cleaning process.
2. Work upstream to downstream in a given drainage network.
3. Clean sediment and trash off of the grate.
4. Visually inspect the outside of the grate.
5. Remove the grate and visually inspect the inside of the catch basin to determine cleaning needs.
6. Inspect the catch basin for structural integrity.
7. Determine the most appropriate equipment and method for cleaning the basin:
    a. Manually use a shovel to remove accumulated sediments.
    b. Use a bucket loader to remove accumulated sediments.
    c. Use a high pressure washer to clean any remaining material out of the catch basin while capturing the slurry with a vacuum.
    d. If necessary, after the catch basin is cleaned, use the rodder of the vacuum truck to clean the downstream pipe and pull back sediment that might have entered it.

8. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the Massachusetts Department of Environmental Protection (MassDEP) Hazardous Waste Regulations, 310 CMR 30.000 (https://www.mass.gov/files/documents/2016/08/xl/310cmr30_7883_54357.pdf). The chemical analysis required will depend on suspected contaminants. Note the identification number of the catch basin on the sample label and note sample collection on the Catch Basin Inspection Form.

1 A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin

Handling and Disposal of Catch Basin Cleanings

- Properly dispose of collected sediments and catch basin cleanings (solid material, such as leaves, sand, and twigs removed from stormwater collection systems during cleaning operations).
- Cleanings from stormwater-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.
- Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the screenings are managed properly to prevent pollution.
- Catch basin cleanings must be handled and disposed in accordance with compliance with the applicable MassDEP regulations, policies, and guidance (https://www.mass.gov/files/documents/2018/03/09/catch-basins.pdf).

Documentation and Reporting

The following information should be documented and included in the municipality's annual report – use the catch basin inspection log provided in the attachments to document the information to include in the report (alternatively, obtain records of volume of debris removed to include in the report):

- Metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4 (include in the SWMP and first annual report)
- Any action taken in response to excessive sediment or debris loadings
- Total number of catch basins
- Number of catch basins inspected
- Number of catch basins cleaned
- Total volume or mass of material removed from catch basins.

Employee Training

- Employees who perform catch basin cleaning and inspection are trained ##NUMBER times per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Catch Basin Inspection Form and Log
2. Catch Basin Inventory

Related Standard Operating Procedures

1. SOP 16 - Streets and Parking

Job No.: _____ **Town:** _____

Inspector: _____ **Date:** _____

CATCH BASIN INSPECTION FORM

Catch Basin I.D.	_____	**Final Discharge from Structure?** Yes ☐ No ☐ **If Yes, Discharge to Outfall No:**_____	
Catch Basin Label:	**Stencil** ☐ **Ground Inset** ☐ **Sign** ☐ **None** ☐ **Other**_____		
Basin Material:	Concrete ☐ Corrugated metal ☐ Stone ☐ Brick ☐ Other: _____ ☐	**Catch Basin Condition:**	Good ☐ Poor ☐ Fair ☐ Crumbling ☐
Pipe Material:	Concrete ☐ HDPE ☐ PVC ☐ Clay Tile ☐ Other:_____	**Pipe Measurements:**	Inlet Dia. (in): d= ____ Outlet Dia. (in): D= ____

Required Maintenance/ Problems (check all that apply):

- ☐ Tree Work Required
- ☐ New Grate is Required
- ☐ Pipe is Blocked
- ☐ Frame Maintenance is Required
- ☐ Remove Accumulated Sediment
- ☐ Pipe Maintenance is Required
- ☐ Basin Undermined or Bypassed
- ☐ Cannot Remove Cover
- ☐ Ditch Work
- ☐ Corrosion at Structure
- ☐ Erosion Around Structure
- ☐ Remove Trash & Debris
- ☐ Need Cement Around Grate

Other: _____

Catch Basin Grate Type :	**Sediment Buildup Depth :**	**Description of Flow:**	**Street Name/ Structure Location:**
Bar: ☐ Cascade: ☐ Other:_____ Properly Aligned: Yes ☐ No ☐	0-6 (in): _____ 6-12(in): _____ 12-18 (in): _____ 18-24 (in): _____ 24 + (in): _____	Heavy ☐ Moderate ☐ Slight ☐ Trickling ☐	

***If the outlet is submerged check yes and indicate approximate height of water above the outlet invert.** h above invert (in):___ Yes ☐ No ☐

☐ **Flow**
☐ **Standing Water**
(check one or both)

Observations:

Color:
Odor:

Weather Conditions : Dry > 24 hours ☐ Wet ☐

Sample of Screenings Collected for Analysis? Yes ☐ No ☐

Comments:

Circle those present:

Foam	Oil Sheen
Sanitary Waste	Bacterial Sheen
Orange Staining	Floatables
Excessive sediment	Pet Waste
Other:_____	Optical Enhancers

SOP 9: Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

Introduction

Best Management Practices (BMPs) are policies, procedures and structures designed to reduce stormwater pollution, prevent contaminant discharges to natural water bodies, and reduce stormwater facility maintenance costs. Structural BMPs are permanent site features designed to treat stormwater before infiltrating it to the subsurface or discharging it to a surface water body. Regular inspection and maintenance of structural stormwater BMPs is critical for these engineered systems to function as designed (e.g., provide benefits to water quality, groundwater recharge, and peak flow attenuation).

This Standard Operating Procedure (SOP) provides general inspection and maintenance frequencies and procedures for eight common structural stormwater BMPs, including:

1. Bioretention Areas and Rain Gardens
2. Constructed Stormwater Wetlands
3. Extended Dry Detention Basins
4. Proprietary Media Filters
5. Sand and Organic Filters
6. Wet Basins
7. Dry Wells
8. Infiltration Basins

This SOP is based on the Massachusetts Stormwater Handbook and is not intended to replace the stormwater BMP Operation and Maintenance guidance contained in the Handbook. This SOP is also not intended to replace the Stormwater BMP Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act, Order of Conditions.

Procedures

Bioretention Areas and Rain Gardens

Bioretention areas and rain gardens are shallow depressions filled with sandy soil, topped with a thick layer of mulch, and planted with dense native vegetation. There are two types of bioretention cells:

1. Filtering bioretention area: Areas that are designed solely as an organic filter.
2. Exfiltration bioretention area: Areas that are configured to recharge groundwater in addition to acting as a filter.

<u>Inspection and Maintenance</u>

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

Maintenance Schedule: Bioretention Areas and Rain Gardens

Activity	Time of Year	Frequency
Inspect for soil erosion and repair	Year round	Monthly
Inspect for invasive species and remove if	Year round	Monthly
Remove trash	Year round	Monthly
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and spring	Bi-annually
Replace dead vegetation	Spring	Annually
Prune	Spring or fall	Annually
Replace all media and vegetation	Late spring/early	As needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation, and mulch the surface.

Never store snow within a bioretention area or rain garden. This would prevent the recharge and water quality treatment of ground water.

Constructed Stormwater Wetlands

Constructed stormwater wetlands maximize pollutant removal from stormwater through the use of wetland vegetation uptake, retention, and settling. Constructed storm water wetlands must be used in conjunction with other BMPs, such as sediment forebays.

Inspection and Maintenance

Regular inspection and maintenance are important for the health of constructed stormwater wetlands. They help identify the need for replacement of vegetation and media, detect potentially harmful invasive species, and ensure the overall health of the wetland.

Maintenance Schedule, Constructed Stormwater Wetlands: Years 0-3

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Record and Map:	Year round	Annually
Types and distribution of dominant wetland plants	Year round	Bi-annually
Presence and distribution of planted wetland species	Spring	Annually
Presence and distribution of invasive species	Fall and spring	Bi-annually
Indications other species are replacing planted wetland species	Spring	Annually
Percent of standing water that is not vegetated	Spring or fall	Annually
Replace all media and vegetation	Late spring/early summer	As needed
Stability of original depth zones and micro-topographic features		
Accumulation of sediment in the forebay and micropool and survival rate of plants		

Maintenance Schedule, Constructed Stormwater Wetlands: Years 4-Lifetime

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Clean forebays	Year round	Annually
Clean sediment in basin/wetland system	Year round	Once every 10 years
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and spring	Bi-annually
Replace dead vegetation	Spring	Annually
Prune	Spring or fall	Annually
Replace all media and vegetation	Late spring/early Summer	As needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Never store snow within a constructed stormwater wetland. This would prevent required water quality treatment and the recharge of groundwater.

Extended Dry Detention Basins

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and reducing local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

Inspection and Maintenance

Annual inspection of extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include: erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway, and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately.

Maintenance Schedule: Extended Dry Detention Basins

Activity	Time of Year	Frequency
Inspect basins	Spring and fall	Bi-annually and during and after major storms
Examine outlet structure for clogging or high outflow release velocities	Spring and fall	Bi-annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through fall	Bi-annually
Remove trash and debris	Spring	Bi-annually
Remove sediment from basin	Year round	At least once every 5 years

Proprietary Media Filters

Media Filters are designed to reduce total suspended solids and other target pollutants, such as organics, heavy metals, or nutrients – these materials are sorbed onto the filter media, which is contained in a concrete structure. The substrate used as filter media depends on the target pollutants, and may consist of leaf compost, pleated fabric, activated charcoal, perlite, amended sand in combination with perlite, and zeolite. Two types of Media Filters are manufactured: Dry media filters, which are designed to dewater within 72 hours, and wet media filters, which maintain a permanent pool of water as part of the treatment system.

Inspection and Maintenance

Maintenance in accordance with the manufacturer's requirements is necessary to ensure stormwater treatment. Inspection or maintenance of the concrete structure may require OSHA confined space training. Dry media filters are required to dewater in 72 hours, thus preventing mosquito and other insect breeding. Proper maintenance is essential to prevent clogging. Wet media filters require tight fitting seals to keep mosquitoes and other insects from entering and breeding in the permanent pools. Required maintenance includes routine inspection and treatment.

Maintenance Schedule: Proprietary Media Filters

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging	Per manufacturer's schedule	Bi-annually (minimum)
Remove trash and debris	N/A	Each inspection
Examine to determine if system drains in 72	Spring, after large storm	Annually
Inspect filtering media for clogging	Per manufacturer's schedule	Per manufacturer's schedule

Sand and Organic Filters

Sand and organic filters, also known as filtration basins, are intended for stormwater quality control rather than quantity control. These filters improve water quality by removing pollutants through a filtering media and settling pollutants on top of the sand bed and/or in a pretreatment basin. Pretreatment is required to prevent filter media from clogging. Runoff from the filters is typically discharged to another BMP for additional treatment.

Inspection and Maintenance

If properly maintained, sand and organic filters have a long life. Maintenance requirements of the filters include raking the sand and removing sediment, trash, and debris from the surface of the BMP. Over time, fine sediments will penetrate deep into the sand requiring replacement of several inches or the entire sand layer. Discolored sand is an indicator of the presence of fine sediments, suggesting that the sand should be replaced.

Maintenance Schedule: Sand and Organic Filters

Activity	Frequency
Inspect filters and remove debris	After every major storm for the first 3 months after construction completion. Every 6 months

Wet Basins

Wet basins are intended to treat stormwater quality through the removal of sediments and soluble pollutants. A permanent pool of water allows sediments to settle and removes the soluble pollutants, including some metals and nutrients. Additional dry storage is required to control peak discharges during large storm events. If properly designed and maintained, wet basins can add fire protection, wildlife habitats, and aesthetic values to a property.

Inspection and Maintenance

To ensure proper operation, wet basin outfalls should be inspected for evidence of clogging or excessive outfall releases. Potential problems to investigate include erosion within the basin and banks, damage to the emergency spillway, tree growth on the embankment, sediment accumulation around the outlet, and the emergence of invasive species. Should any of these problems be encountered, perform repairs immediately. An on-site sediment disposal area will reduce sediment removal costs.

Maintenance Schedule: Wet Basins

Activity	Time of Year	Frequency
Inspect wet basins	Spring and/or fall	Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through fall	Bi-annually (Minimum)
Remove sediment, trash and debris	Spring through fall	Bi-annually (Minimum)
Remove sediment from basin	Year round	As required, but at least once every 10 years

Dry Wells

Dry wells are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. Dry wells provide groundwater recharge and can reduce the size and cost required of downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

Inspection and Maintenance

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24 and 48 hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop in water level (inches) by the time elapsed (hours).

Maintenance Schedule: Dry Wells

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Annually

Infiltration Basins

Infiltration basins are designed to contain stormwater and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site. High failure rates, however, often occur due to improper siting, inadequate pretreatment, poor design, and lack of maintenance.

Inspection and Maintenance

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction, or low spots. Inspections should include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, riprap condition, sediment accumulation, and turf health.

Maintenance Schedule: Infiltration Basins

Activity	Time of Year	Frequency
Preventative maintenance	Spring and fall	Bi-annually
Inspection	Spring and fall	After every major storm for the first 3 months after construction completion. Bi-annually thereafter and discharges through the high outlet orifice.
Mow/rake buffer area, side slopes and basin bottom	Spring and fall	Bi-annually
Remove trash, debris and organic matter	Spring and fall	Bi-annually

Inventory of Structural Stormwater Best Management Practices (BMPs)
Plymouth, Massachusetts

BMP ID or Description	Location	BMP Type	Inspection Frequency	Date of Last Inspection	Additional Notes

INSPECTION OF BIORETENTION AREAS / RAIN GARDENS|

General Information

BMP Description	Bioretention Area / Rain Garden		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for soil erosion and repair	Monthly	Yes ☐ No ☐	
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Remove trash	Monthly	Yes ☐ No ☐	
Mulch void areas	Annually	Yes ☐ No ☐	
Remove dead vegetation	Bi-Annually	Yes ☐ No ☐	
Replace dead vegetation	Annually	Yes ☐ No ☐	
Prune	Annually	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Years 0-3 of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

In addition, the following information should be recorded and mapped at least once per year:

- Types and distribution of dominant wetland plants
- Presence and distribution of planted wetland species
- Presence and distribution of invasive species
- Indications other species are replacing planted wetland species
- Percent of standing water that is not vegetated
- Replace all media and vegetation
- Stability of original depth zones and micro-topographic features
- Accumulation of sediment in the forebay and micropool and survival rate of plants

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Year 4 - Lifetime of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Clean forebays	Annually	Yes ☐ No ☐	
Clean sediment in basin/wetland system	Once every 10 years	Yes ☐ No ☐	
Mulch void areas	Annually	Yes ☐ No ☐	
Remove dead vegetation	Bi-Annually	Yes ☐ No ☐	
Replace dead vegetation	Annually	Yes ☐ No ☐	
Prune	Annually	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

INSPECTION OF EXTENDED DRY DETENTION BASINS

Inspections should be conducted bi-annually, and during and after major storm events.

General Information

BMP Description	Extended Dry Detention Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Examine outlet structure for clogging or high outflow release velocities	Bi-Annually	Yes ☐ No ☐	
Mow upper stage, side slopes, embankment and emergency spillway	Bi-Annually	Yes ☐ No ☐	
Remove trash and debris	Bi-Annually	Yes ☐ No ☐	
Remove sediment from basin	At least once every 5 years	Yes ☐ No ☐	

INSPECTION OF PROPRIETARY MEDIA FILTERS

General Information

BMP Description	Media Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for standing water, trash, sediment and clogging	Bi-Annually (minimum)	Yes ☐ No ☐	
Remove trash and debris	Each Inspection	Yes ☐ No ☐	
Examine to determine if system drains in 72 hours	Annually	Yes ☐ No ☐	
Inspect filtering media for clogging	Per manufacturer's schedule	Yes ☐ No ☐	

INSPECTION OF SAND AND ORGANIC FILTERS

Inspections should be conducted after every major storm event for the first 3 months following completion, then every 6 months thereafter.

General Information

BMP Description	Sand/Organic Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Remove sediment, trash, and debris	Every 6 months	Yes ☐ No ☐	
Rake sand	Every 6 months	Yes ☐ No ☐	

INSPECTION OF DRY WELLS

Regular inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.

General Information

BMP Description	Dry Well		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe condition of dry well at time of inspection			

After a major storm event, the water depth in the observation well should be measured at 24 and 48 hour intervals and the clearance rate calculated.

INSPECTION OF WET BASINS

Inspections should be conducted after every major storm event for the first 3 months following completion, then biannually thereafter.

General Information

BMP Description	Wet Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe condition of wet basin at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Preventative maintenance	Bi-Annually	Yes ☐ No ☐	
Mow/rake buffer area, side slopes and basin bottom	Bi-Annually	Yes ☐ No ☐	
Remove trash, debris and organic matter	Bi-Annually	Yes ☐ No ☐	
Inspect and clean pretreatment devices	Every other month and after every major storm event	Yes ☐ No ☐	

INSPECTION OF OTHER BMP

General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	

SOP 11: Oil/Water Separator (OWS) Maintenance

Oil/water separators (OWS), also known as gas/oil separators, are structural devices intended to provide pretreatment of floor drain water from industrial and garage facilities. An OWS allows oils (and substances lighter than water) to be intercepted and be removed for disposal before entering the sanitary sewer system. Substances heavier than water settle into sludge at the bottom of the unit. The remaining water passes through the unit into the sanitary sewer system.

OWS units are generally required where petroleum-based products, wastes containing petroleum, or oily and/or flammable materials are used, produced, or stored. OWS units should not be used to manage stormwater or flow from vehicle washing facilities. High flow rates through an OWS will reduce the structure's ability to separate materials. Detergents and solvents can emulsify oil and grease, allowing the particles to enter the sewer, so these should not be disposed of in drains entering the OWS.

General OWS Maintenance Requirements

1. Each OWS at a facility may receive different materials in different quantities, so the cleanout schedule may not be the same for every OWS at a facility.
2. Employees performing inspections of an OWS must be properly trained and be familiar with the maintenance of that specific structure, since function can vary based on design. Third-party firms may be utilized to perform quarterly inspections.
3. Do not drain petroleum, oil, or lubricants directly to an OWS. The structures are designed to manage these materials at low and medium concentrations in sanitary sewage, not as slug loads.
4. Do not drain antifreeze, degreasers, detergents, fuels, alcohols, solvents, coolant, or paint to the OWS.
5. Separator compartment covers should be tightly sealed to ensure floor drainage only enters the first compartment of the OWS.
6. Drains should be kept free of debris and sediment to the maximum extent practicable.
7. Spill cleanup materials should be maintained in the area served by the OWS. For more information on spill cleanup and response materials, refer to SOP 4, "Spill Response and Cleanup Procedures".

OWS Inspection Procedures

Daily inspection of an OWS should include a visual examination of the area served by the OWS for evidence of spills or leaks.

Weekly inspections of an OWS should include the following:

1. Visually examine the area served by the OWS for evidence of spills or leaks.
2. Inspect the point of discharge (i.e., sewer manhole) for evidence of petroleum bypassing the OWS.
3. Inspect drains for any signs of unauthorized substances entering the OWS.
4. Examine the OWS for signs of leaks or any malfunction.

Quarterly inspections of an OWS should include the following:

1. Complete tasks noted as appropriate for daily and weekly inspection.
2. Complete the Quarterly OWS Inspection Checklist, attached, during the inspection.
3. Take the following measurements to benchmark function of the OWS:
    a. Distance from rim of access cover to bottom of structure
    b. Distance from rim of access cover to top of sludge layer
    c. Depth of sludge layer (C = A – B)
    d. Distance from rim of access cover to the oil/water interface
    e. Distance from rim of access cover to the top of the liquid surface
    f. Depth of oil layer (F = D – E)

OWS Cleaning Procedures

Cleaning of the OWS is required when there has been a spill to the OWS that exceeds ten gallons of oil, one gallon of detergent or solvent, or any material prohibited by the owner of the sanitary sewer. Cleaning is also required when the levels of accumulated sludge and/or oil meet the manufacturer's recommended levels for cleaning. This will vary based on the manufacturer of the OWS. If the manufacturer's recommendations are unknown, the following guidelines are appropriate for determining when to clean:

1. When sludge accumulates to 25% of the wetted height of the separator compartment; or
2. When oil accumulates to 5% of the wetted height of the separator compartment; or
3. When 75% of the retention capacity of the OWS is filled.

Cleaning should be performed a minimum of once per year. When cleaning is required, it shall be performed by licensed OWS maintenance companies. Materials removed from the OWS must be disposed of in accordance with Massachusetts Hazardous Waste Regulations, 310 CMR 30.00.

Documentation of Cleaning and Service

The operator of the premises where the OWS is located shall maintain a log describing the date and type of all inspections, service and maintenance performed in connection with the Separator. Documentation shall include the identity of the inspector (or the identity of the person or entity that performed the service and/or maintenance). Records shall also document the amount of residue removed from the OWS each time it was cleaned, and how removed materials were disposed. This documentation shall be maintained for a minimum of six years.

Attachments

1. Quarterly OWS Inspection Checklist

Related Standard Operating Procedures

1. SOP 4 - Spill Response and Cleanup Procedures

OIL/WATER SEPARATOR (OWS)
QUARTERLY INSPECTION CHECKLIST

Facility: _____

OWS Location: _____

Inspected By: _____

Date: _____

Visual Inspection	Are there any signs of spills or leaks in the general area?	**Yes** ☐ **No** ☐
	Is there any evidence of petroleum bypassing the OWS?	**Yes** ☐ **No** ☐
	Are there any unauthorized substances entering the OWS?	**Yes** ☐ **No** ☐
	Does the OWS exhibit any signs of leaks or malfunctions?	**Yes** ☐ **No** ☐

If you answered “Yes” to any of the above questions, further inspection, repair, and/or cleaning may be necessary.

Measurements	A	Distance from rim of access cover to bottom of structure	
	B	Distance from rim of access cover to top of sludge layer	
	C = A - B	Depth of sludge layer	
	D	Distance from rim of access cover to the oil/water interface	
	E	Distance from rim of access cover to the top of the liquid surface	
	F = D - E	Depth of oil layer	

If the values for “C” and/or “F” are greater than those in the manufacturer’s recommendations, the OWS must be cleaned by a licensed OWS maintenance company.

SOP 13: Water Quality Screening in the Field

Introduction

Outfalls from an engineered storm drain system can be in the form of pipes or ditches. Under current and pending regulations, it is important to inspect and document water quality within the MS4 system under both dry weather and wet weather conditions. SOP 1, "Dry Weather Outfall Inspection" and SOP 2, "Wet Weather Outfall Inspection", cover the objectives of these activities and how water quality parameters can be collected during both types of inspections. SOP 3, "Catch Basin Inspection and Cleaning", describes how this operations and maintenance activity can serve as an additional opportunity to collect water quality data.

SOP 2 included detailed information on how to collect discrete analytical samples to be processed by a laboratory. In contrast, this SOP addresses screening-level measurements than can be collected at outfalls, catch basins, receiving waters, or other water bodies. The measurements can be collected with field test kits or with portable meters.

Water quality screening data collected in this manner can feed into an illicit discharge detection and elimination investigation, like the process described in SOP 10, "Locating Illicit Discharges".

Visual Condition Assessment

SOP 1, SOP 2, and SOP 3 describe a Visual Condition Assessment to collect observations related to the quality of stormwater conveyed by an engineered storm drain system. These observations may include such visual evidence and/or potential pollutants as:

- Foaming (detergents)
- Discoloration
- Evidence of sanitary waste
- Optical enhancers (fluorescent dyes added to laundry detergent); and
- Turbidity

If a Visual Condition Assessment indicates the presence of these pollutants, it may be necessary to quantify the extent of each, and gather data on other parameters that cannot be visually observed but can be measured using field kits or meters. These parameters include:

- Ammonia
- Chloride (present in treated drinking water but not groundwater)
- Conductivity
- Fluoride
- Hardness
- pH
- Potassium

Field Kits and Sampling Methods Available

In recent drafts of new MS4 Permits, U.S. EPA Region 1 has identified several test kits that are acceptable for use in the field, and other regulatory agencies have also completed similar reviews. The following table shows field test kits and portable meters that can be used for screening parameters.

Table SOP 13-1
Field Measurements, Test Kits, and Instrumentation

Analyte or Parameter	Instrumentation (Portable meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips
Bacteria	Bacteria field test kits require 24-hour window	
Boron	N/A	Hanna™ HI 38074 Taylor™ K-1541
Chloride	CHEMetrics™ V-2000 Colorimeter Hach™ Pocket Colorimeter™ II LaMotte™ DC1200 Colorimeter	CHEMetrics™ K-2002 through K-2070 Hach™ CDS-DT Hach™ Chloride QuanTab® Test Strips
Color		Hach™ ColorDisc
Conductivity	CHEMetrics™ I-1200	N/A
Detergents (Surfactants)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Fluoride	CHEMetrics™ V-2000 Colorimeter Hach™ Pocket Colorimeter™ II	N/A
Hardness	N/A	CHEMetrics™ K-1705 and K-1710 CHEMetrics™ K-4502 through K-4530 Hach™ HA-DT Hach™ Hardness Test Strips
Optical enhancers	Field tests still under development	
pH	CHEMetrics™ I-1000	Hach™ 17J through 17N Hach™ pH Test Strips
Potassium	Horiba™ Cardy C-131	LaMotte™ 3138 KIW
Turbidity	CHEMetrics™ I-1300	N/A

Each field test kit will include instructions specific to that test kit, and most kits are available in configurations that detect different ranges of the parameter. For example, the CHEMetrics™ detergents kit K-9400 shown above detects concentrations of 0 to 3 milligrams per liter (mg/L) while the K-9404 kit detects concentrations of 0 to 1,400 mg/L.

The table below shows values identified by the U.S. EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table SOP 13-2
Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>50.0 mg/L
Conductivity	>2,000
Detergents (Surfactants)	> 0.25 mg/L
Fluoride	>0.25 mg/L
pH	<5
Potassium	>20 mg/L

If and when water quality screening samples, whether using field test kits or portable meters, exceed these benchmark concentrations, the inspector should consider collecting analytical samples for laboratory analysis.

Advantages and Disadvantages of Field Testing

Field test kits can be convenient for use as a screening tool, initial purchase costs are low (typically $0.50 to $5.00 for the kits included in Table SOP 13-1), and the costs are far less than full analyses at a laboratory. However, some disadvantages of this screening method include:

- Limited shelf life
- Labor cost associated with inspector's time
- Generation of wastes, including glass vials and used reagent
- Steps and processes for each kit can vary widely, resulting in errors
- Trained staff are required in order to effectively utilize kits
- Not all kits are accepted by all regulatory agencies
- Limited useful detection range

Portable instrumentation such as the colorimeters shown in Table SOP 13-1 have the benefit of providing accurate readings, measure to low detection limits, and can be purchased pre-programmed to measure concentrations of most parameters required. Disadvantages of portable instrumentation include:

- High initial purchase cost
- Requirement for ongoing calibration and maintenance
- Individual probes require periodic replacement
- Specific storage requirements to maintain calibration
- Trained staff are required in order to effectively utilize meters

Related Standard Operating Procedures

1. SOP 1 - Dry Weather Outfall Inspection
2. SOP 2 - Wet Weather Outfall Inspection
3. SOP 3 - Catch Basin Cleaning and Inspection
4. SOP 10 - Locating Illicit Discharges

WATER QUALITY SCREENING FORM

Outfall I.D.			
Outfall Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Most Recent Storm Event			

FIELD WATER QUALITY SCREENING RESULTS

Sample Parameter	Field Test Kit or Portable Instrument Meter	Benchmark	Field Screening Result	Full Analytical Required?
Ammonia[1]		> 50.0 mg/L		☐ Yes ☐ No
Boron[1]		> 0.35 mg/L		☐ Yes ☐ No
Chloride[2]		230 mg/L		☐ Yes ☐ No
Color[1]		> 500 units		☐ Yes ☐ No
Specific Conductance[1]		> 2,000 µS/cm		☐ Yes ☐ No
Detergents & Surfactants[3]		> 0.25 mg/L		☐ Yes ☐ No
Fluoride[3]		> 0.25 mg/L		☐ Yes ☐ No
Hardness[1]		< 10 mg/L or > 2,000 mg/L		☐ Yes ☐ No
pH[1]		< 5		☐ Yes ☐ No
Potassium[1]		> 20 mg/L		☐ Yes ☐ No
Turbidity[1]		> 1,000 NTU		☐ Yes ☐ No

[1] – *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection and Robert Pitt of University of Alabama, 2004, p. 134, Table 45.

[2] –*Env-Ws 1703.21 Water Quality Criteria for Toxic Substances*, State of New Hampshire Department Surface Water Quality Regulations.

[3] – *Appendix I – Field Measurements, Benchmarks and Instrumentation*, Draft Massachusetts North Coastal Small MS4 General Permit, 2009.

FULL ANALYTICAL TESTING WATER QUALITY RESULTS

Sample Parameter	Analytical Test Method	Sample Collection (Time/Date)	Testing Lab	Analytical Testing Result
Ammonia	EPA 350.2/SM4500-NH3C			
Bacteria	E coli: 1103.1; 1603 Enterococcus: 1106.1; 1600			
Boron	EPA 212.3			
Chloride	EPA 9251			
Color	EPA 110.2			
Specific Conductance	SM 2510B			
Detergents & Surfactants	EPA 425.1/SM5540C			
Fluoride	EPA 300.0			
Hardness	EPA 130.1/SM 2340B			
Optical Enhancers	N/A*			
pH	EPA 150.1/SM 4500H			
Potassium	EPA 200.7			
Turbidity	SM 2130B			

*- There is presently no USEPA Standard Method for analysis of optical enhancers. Typically, sample pads are described as with “Present” or “Not Present” for fluorescing dye when exposed to UV light or a fluorometer.