ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PLAN

Town of Stoughton

September 2022

ENVIRONMENTAL PARTNERS
— An Apex Company —

Illicit Discharge Detection and Elimination (IDDE) Plan Revision History

MS4 Materials that supplement the 2019 IDDE Document

Revision #	Date	Comments
0	6/2019	IDDE Plan published for Town comments
1	9/2021	Updated ranking table (Appendix C)
2	9/2022	Updated text, Appendix A, Appendix B, Appendix C, and Appendix F; attached new sampling reports (Appendix E)

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

Printed Name

Signature _____ Date

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SECTION 1 INTRODUCTION

SECTION 1.1 MS4 PROGRAM

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed for The Town of Stoughton to address the requirements of the United States Environmental Protection Agency's (EPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit."

The 2016 Massachusetts MS4 Permit and 2020 Permit Modifications require that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

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

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement. Originally, the Town published this Plan in 2019, and since then, the Town has updated the Plan as needed.

SECTION 1.2 ILLICIT DISCHARGES

An "illicit discharge" is any discharge to a drainage system that is not composed entirely of stormwater, with the exception of discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire-fighting activities.

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage system through direct or indirect connections. Direct connections may be relatively obvious, such as cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect or address, such as failing septic systems that discharge untreated sewage to a ditch within the MS4, or a sump pump that discharges contaminated water on an intermittent basis.

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a resident or contractor illegally tapping a new sewer lateral into a storm drain pipe to avoid

the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.

Some illicit discharges are related to outdated building and construction practices. Examples of illicit discharges in this category include floor drains in old buildings that are connected to the storm drain system, as well as sanitary sewer overflows that enter the drainage system. Sump pumps legally connected to the storm drain system may be used inappropriately, such as for the disposal of floor washwater or old household products, in many cases due to a lack of understanding on the part of the homeowner.

Elimination of some discharges may require substantial costs and efforts, such as reconfiguring a sanitary sewer connection from a municipal storm to a sanitary sewer drain. Other beneficial strategies, such as reducing dog waste, can be accomplished through public outreach in conjunction with installing dog waste bins.

Regardless of the situation, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

SECTION 1.3 ALLOWABLE NON-STORMWATER DISCHARGES

The following categories of non-stormwater discharges are allowed under the MS4 Permit unless the permittee, EPA, or Massachusetts Department of Environmental Protection (MassDEP) identifies any category or individual discharge of non-stormwater discharge as a significant contributor of pollutants to the MS4:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

If these discharges are identified as significant contributors to the MS4, they must be considered an “illicit discharge” and addressed in the IDDE Plan (i.e., control these sources so they are no longer significant contributors of pollutants and/or eliminate the sources entirely).

SECTION 1.4 RECEIVING WATERS AND IMPAIRMENTS

Table 1-1 lists the "impaired waters" within the boundaries of Stoughton's MS4 regulated area. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s), such as recreation or aquatic habitat. The inventory is based on the Massachusetts 2018/2020 Integrated List of Waters published by MassDEP in February 2022 and updated every two years. The first draft of this IDDE Plan, published in 2019, and the Town's Notice of Intent (NOI), published in 2018, used the previous Massachusetts 2014 Integrated List of Waters. There are a few changes regarding Stoughton impaired waters classification between the 2014 and 2018/2022 Integrated Lists of Waters. In this period, MassDEP published Total Maximum Daily Load (TMDL) reports for Beaver Meadow Brook (MA73-20; Category 5 Water) and Steep Hill Brook (MA73-18; Category 5 Water), and both are now impaired for E. coli, Pinewood Pond is now impaired for aquatic plants (macrophytes), Ames Long Pond is now impaired for fanwort, Town Pond is no longer impaired for non-native aquatic plants but is now impaired for fanwort, and Unnamed Tributary MA73-32 is no longer impaired for low pH or phosphorus.

Table 1-1 Impaired Waters in the Town of Stoughton

Water Body Name	Segment ID	Category	Impairment(s)	Associated Approved TMDL
Farrington Pond	MA73040	4c	• Non-Native Aquatic Plants	
Glen Echo Pond	MA73022	4c	• Non-Native Aquatic Plants	
Pinewood Pond	MA73039	4c	• Non-Native Aquatic Plants • Aquatic Plants (Macrophytes)	
Town Pond	MA73056	4c	• Fanwort	
Woods Pond	MA73055	4c	• Non-Native Aquatic Plants	
Beaver Meadow Brook	MA73-20	5	• Oxygen, Dissolved • Escherichia coli	2592
Unnamed Tributary	MA73-32	5	• Benthic Macroinvertebrates • Escherichia coli	54860
Ames Long Pond	MA62001	5	• Non-Native Aquatic Plants • Aquatic Plants (Macrophytes) • Turbidity • Fanwort	
Steep Hill Brook	MA73-18	5	• Escherichia coli	

Category 4c Waters – impaired water bodies where the impairment is not caused by a pollutant. No TMDL required.
Category 5 Waters – impaired water bodies that require a TMDL.
"Approved TMDLs" are those that have been approved by EPA as of the date of issuance of the Massachusetts 2018/2020 List of Integrated Waters (February 2022).

These impairments require additional sampling in accordance with Appendix G of the MS4 Permit. The Town must sample for dissolved oxygen, temperature, BOD (Biological Oxygen Demand), total phosphorous, and E. coli at outfalls discharging to the Beaver Meadow Brook; E. coli at Unnamed Tributary (MA73-32); total suspended solids and turbidity at Ames Long Pond; and E. coli at Steep

Hill Brook. Due to the Boston Harbor Watershed (Neponset, Weymouth & Weir) and the Taunton Watershed's TMDL for pathogens, the Town must sample all outfalls for E. coli and fecal coliform.

In order to comply with the 2016 MS4 Permit, the Town of Stoughton must implement the illicit discharge program consistent with the requirements outlined in Appendix H. Catchments draining to Beaver Meadow Brook (MA73-20), Unnamed Tributary (MA73-32), Ames Long Pond (MA62001), and Steep Hill Brook (MA73-18) shall be designated as high priority for purposes of implementing the IDDE program.

SECTION 1.5 IDDE PROGRAM GOALS, FRAMEWORK, AND TIMELINE

The goals of the IDDE program are to find and eliminate illicit discharges to the Town's municipal separate storm sewer system and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition
- Storm system mapping
- Inventory and ranking of outfalls
- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training

The IDDE investigation procedure framework is shown in **Figure 1-1**. The required timeline for implementing the IDDE program is shown in **Table 1-2.**

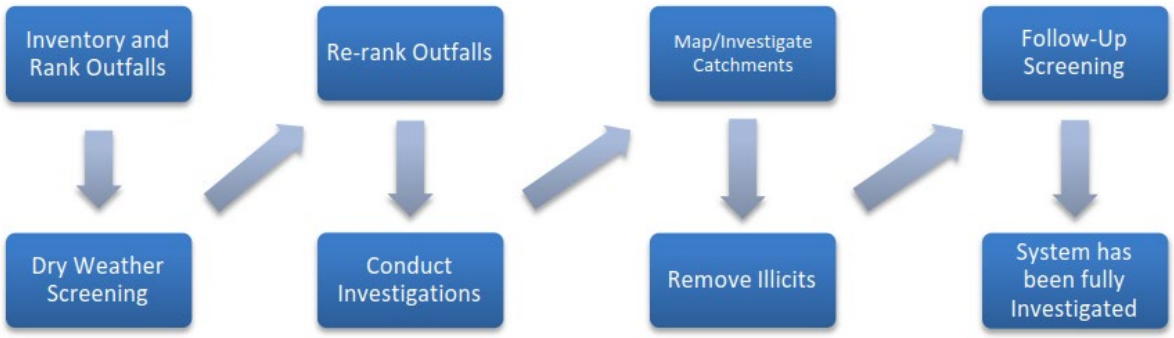

Figure 1-1 IDDE Investigation Procedure Framework

Table 1-2 IDDE Program Implementation Timeline

IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year (June 2019)	1.5 Years (Dec. 2019)	2 Years (June 2020)	3 Years (June 2021)	7 Years (June 2025)	10 Years (June 2028)
Written IDDE Program Plan	X					
Sanitary Sewer Overflow (SSO) Inventory	X					
Written Catchment Investigation Procedure		X				
Phase I Mapping			X			
Phase II Mapping						X
IDDE Regulatory Mechanism or By-law (if not already in place)				X		
Dry Weather Outfall Screening				X		
Follow-up Ranking of Outfalls and Interconnections				X		
Catchment Investigations – Problem Outfalls					X	
Catchment Investigations – all Problem, High and Low Priority Outfalls						X

SECTION 1.6 WORK COMPLETED UNDER THE 2003 MS4 PERMIT

The 2003 MS4 Permit required each MS4 community to develop a plan to detect illicit discharges using a combination of mapping of the storm system, adopting a regulatory mechanism to prohibit illicit discharges and enforce this prohibition, and identifying tools and methods to investigate suspected illicit discharges. Each MS4 community was also required to define how confirmed discharges would be eliminated and how their removal would be documented.

The Town of Stoughton has completed the following IDDE program activities consistent with the 2003 MS4 Permit requirements:

- Developed a map of outfalls and receiving waters
- Adopted an IDDE by-law or regulatory mechanism
- Developed procedures for locating illicit discharges (e.g., visual screening of outfalls for dry weather discharges, dye or smoke testing)
- Developed procedures for locating the source of the discharge
- Developed procedures for removal of the source of an illicit discharge
- Developed procedures for documenting actions and evaluating impacts on the storm sewer system subsequent to removal

In addition to the 2003 MS4 Permit requirements, the Town completed other IDDE-related activities prior to the 2016 MS4 Permit:

- Outfall sampling
- Additional storm system mapping, including the locations of catch basins, manholes and pipe connectivity

SECTION 2 AUTHORITY AND STATEMENT OF IDDE RESPONSIBILITIES

SECTION 2.1 LEGAL AUTHORITY

The Town of Stoughton has adopted Chapter 159: Stormwater Management Bylaw (adopted at 2021 Annual Town Meeting) and Rules and Regulations for Stormwater Management (approved by Select Board on October 19, 2021). Copies of the Stormwater Management Bylaw and Regulations for Stormwater Management are provided in **Appendix A**. The Stormwater Management Bylaw provides the Town of Stoughton with adequate legal authority to:

- Prohibit illicit discharges,
- Investigate suspected illicit discharges,
- Eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system, and
- Implement appropriate enforcement procedures and actions.

SECTION 2.2 STATEMENT OF RESPONSIBILITIES

The Stoughton Public Works Department is the lead municipal agency responsible for implementing the IDDE program pursuant to the provisions of the Illicit Discharges to Storm Drainage System. Other agencies or departments with responsibility for aspects of the program include:

- Public Works Department – Paul Giffune
- Sewer Department – Phil McNulty
- Water Department – Phil McNulty
- Building Department – Jack Erikson
- Engineering Department – Marc J. Tisdelle (interim)
- Board of Health – Lawrence Petty
- Conservation Agent – James B. Conlon
- Planning Board – Craig Horsfall (interim)
- Town Manager – Marc J. Tisdelle
- Facilities Director – Paul Giffune
- School Facilities – Joyce Husseini
- Plumbing Inspector – Scott Angelos

SECTION 3 STORMWATER SYSTEM MAPPING

The Town of Stoughton originally developed mapping of its stormwater system to meet the mapping requirements of the 2003 MS4 Permit. The 2016 MS4 Permit requires a more detailed storm system map than was required by the 2003 MS4 Permit. The revised mapping is intended to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit discharges.

The 2016 MS4 Permit requires the storm system map to be updated in two phases as outlined below. The Public Works Department is responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. The Town of Stoughton reports on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping are included in **Appendix B**.

SECTION 3.1 PHASE I MAPPING

Phase I mapping must be completed within two (2) years of the effective date of the permit (July 1, 2020) and include the following information:

- Outfalls and receiving waters (previously required by the MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally owned stormwater treatment structures
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report
- Initial catchment delineations. Topographic contours and drainage system information may be used to produce initial catchment delineations.

The Town of Stoughton has completed all of the Phase I mapping.

The following table contains information regarding the total number of drainage structures mapped within the MS4 Urbanized Area in Stoughton. It has been compiled using data collected by the Town. A complete stormwater system mapbook is included in the Stoughton Operations and Maintenance (O&M) Plan as Attachment 1. The O&M Plan is attached to the Storwmater Management Plan as an appendix.

Table 3-1 Summary of Mapped MS4 Structures

Structure Type	Number of Structures
Outfalls	147
Inlets	105
Uplands Outlet	364

Catch Basins	3,171
Drain Manholes	2,361
Stormwater BMPs	52
Drain Pipes	3,288
Swales	14

SECTION 3.2 PHASE II MAPPING

Phase II mapping must be completed within ten (10) years of the effective date of the permit (July 1, 2028) and include the following information:

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

The Town of Stoughton has completed the following updates to its stormwater mapping to meet the Phase II requirements:

- Outfall spatial location (complete)
- Pipes (mapping is ongoing)
- Manholes (mapping is ongoing)
- Catch basins (mapping is ongoing)
- Refined catchment delineations (completed as catchment investigations are completed)
- Municipal combined sewer system (none in Stoughton)
- Municipal sanitary sewer system (mapping is ongoing)

The Town of Stoughton will continue to update and improve its stormwater mapping throughtout the permit term.

SECTION 3.3 ADDITIONAL RECOMMENDED MAPPING ELEMENTS

Although not a requirement of the 2016 MS4 Permit, the Town of Stoughton will consider the following recommended elements in its storm system mapping:

- Storm sewer material, size (pipe diameter), age
- Sanitary sewer system material, size (pipe diameter), age (if/when applicable)
- Privately owned stormwater treatment structures

- Area where the permittee's MS4 has received or could receive flow from septic system discharges
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates

SECTION 4 SANITARY SEWER OVERFLOWS (SSOs)

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

The Town of Stoughton has completed an inventory of SSOs that have discharged to the MS4 since five (5) years prior to the effective date of the 2016 MS4 Permit, based on a review of available documentation pertaining to SSOs. The inventory includes all SSOs that occurred during wet or dry weather resulting from inadequate conveyance capacities or where interconnectivity of the storm and sanitary sewer infrastructure allows for transfer of flow between systems. **Table 4-1** is provided below as reference for future use, if necessary.

Upon detection of an SSO, the Town of Stoughton will eliminate it as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, the Town of Stoughton will provide oral notice to EPA within 24 hours and written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence.

The inventory in **Table 4-1** is updated by the Public Works Department when new SSOs are detected. The SSO inventory is included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

Table 4-1 SSO Inventory
Stoughton, Massachusetts
Revision Date: August 2022

SSO Location[1]	Discharge Statement[2]	Date[3]	Time Start[3]	Time End[3]	Estimated Volume[4]	Description[5]	Mitigation Completed[6]	Mitigation Planned[7]
None								

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

SECTION 5 ASSESSMENT AND PRIORITY RANKING OF OUTFALLS

The 2016 MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to contain illicit discharges and SSOs. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

SECTION 5.1 OUTFALL CATCHMENT DELINEATIONS

A catchment is the area that drains to an individual outfall or interconnection. The catchments for each of the MS4 outfalls have been delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. As described in Section 3, initial catchment delineations were completed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations.

SECTION 5.2 OUTFALL AND INTERCONNECTION INVENTORY AND INITIAL RANKING

The Public Works Department completed an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. The initial inventory and ranking was completed within one (1) year from the effective date of the permit. The inventory is updated annually to include data collected in connection with dry weather screening and other relevant inspections. An updated inventory and ranking is provided in each annual report.

The outfall and interconnection inventory identifies each outfall and interconnection discharging from the MS4, records the structure location and condition, and provides a framework for tracking inspections, screenings, and other IDDE program activities.

Outfalls and interconnections are classified into one of the following categories:

1. **Problem Outfalls**: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators are any of the following:

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

Dry weather screening and sampling, as described in **Section 6** of this IDDE Plan and Part 2.3.4.7.b of the MS4 Permit, is not required for Problem Outfalls.

Stoughton has no Problem Outfalls

2. **High Priority Outfalls**: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:

    - Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
    - Determined by the permittee as high priority based on the characteristics listed below or other available information

    Stoughton has 49 High Priority Outfalls

3. **Low Priority Outfalls**: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

    Stoughton has 98 Low Priority Outfalls

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

    Stoughton has no Excluded Outfalls

Outfalls are ranked into the above priority categories (except for excluded outfalls, which are excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in this IDDE Plan. The initial ranking was based upon response provided by the Town of Stoughton in May 2019, and the updated ranking was based on those results and additional information provided by the Town and observed in the field. These characteristics considered include:

- **Previous screening results** – Previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).
    - Four MS4 outfalls screened in 2016.
    - All remaining outfalls were screened in 2021 and 2022.
- **Past discharge complaints and reports**
    - No complaints provided.
- **Poor receiving water quality** – The following guidelines are recommended to identify waters as having a high illicit discharge potential:
    - Exceeding water quality standards for bacteria,

    - Ammonia levels above 0.5 mg/L, or
    - Surfactants levels greater than or equal to 0.25 mg/L.
- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
    - Gas stations, car washes, garden centers, car dealerships, and industrial areas were found within catchments: B, J, K, M, N, O, Q, R, S, T, U, V, X, Y, AB, AF, AO, AP.
- **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old may have a high illicit discharge potential. Developments 20 years or younger may have a low illicit discharge potential.
    - Built date from Assessor parcel mapping showed an even distribution that leaned more towards an age of 40+ years old.
- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have since been converted to sewer connections may have a high illicit discharge potential.
    - The Park Street/Turnpike Street area is being converted from septic to sewer.
- **Historic combined sewer systems** – Contributing areas that were once serviced by a combined sewer system, but have since been separated may have a high illicit discharge potential.
    - Stoughton has never had a combined sewer system.
- **Surrounding density of aging septic systems** – Septic systems 30 years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
    - Septic install database from Board of Health showed newer septic installs event distributed throughout the Town.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
    - No information provided directly from Town. Some culverted streams have been noted in the field during outfall screenings and now are incorporated into this ranking.
- **Water quality limited water bodies** – Impaired waters and/or waters with approved TMDL(s) that receive discharge from the MS4 have a high illicit discharge potential if the discharges could contain the pollutant identified as the cause of the water quality impairment.
    - Impaired water bodies are listed in **Table 1-1**.

The Town has updated the initial outfall priority ranking matrix based on screening and sampling completed since the initial ranking was developed. The screening and sampling and updates to the ranking table are discussed further in **Section 6.4** and **Section 6.5**. The updated outfall priority ranking matrix and catchment delineation mapping is included in **Appendix C**.

SECTION 6 DRY WEATHER OUTFALL SCREENING AND SAMPLING

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and Excluded Outfalls) to be inspected for the presence of dry weather flow. The Public Works Department, or hired representatives, are responsible for conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the previous section.

SECTION 6.1 WEATHER CONDITIONS

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, program staff can use precipitation data from the Stoughton Municipal Airport Weather Station (Station ID KGHG). If the Stoughton Municipal Airport Weather Station is not available or not reporting current weather data, then the Ocean Bluff Weather Station (Station ID KMAMARSH132) can be used as a back-up.

SECTION 6.2 DRY WEATHER SCREENING/SAMPLING PROCEDURE

Section 6.2.1 General Procedure

The dry weather outfall inspection and sampling procedure consists of the following general steps:

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking.
2. Acquire the necessary staff, mapping, and field equipment (see **Table 6-1** for list of potential field equipment).
3. Conduct the outfall inspection during dry weather:
    a. Mark and photograph the outfall.
    b. Record the inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device) (see form in **Appendix D**).
    c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper, or sanitary products). Also, observe outfalls for deposits and stains, vegetation, and damage to outfall structures.
4. If flow is observed, sample and test the flow following the procedures described in the following sections.
5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any

observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.

6. Input results from screening and sampling into spreadsheet/database. Include pertinent information in the outfall/interconnection inventory and priority ranking.
7. Include all screening data in the annual report.

Previous outfall screening/sampling conducted under the 2003 MS4 Permit may be used to satisfy the dry weather outfall/screening requirements of the 2016 MS4 Permit only if the previous screening and sampling was substantially equivalent to that required by the 2016 MS4 Permit, including the list of analytes outlined in Section 2.3.4.7.b.iii.4 of the 2016 permit.

Section 6.2.2 Field Equipment

Table 6-1 lists field equipment commonly used for dry weather outfall screening and sampling.

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

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and dry weather sampling should be available with extras
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp with Batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, safety glasses, and boots at a minimum
GPS Receiver	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter	Handheld meter, if available, for testing for various water quality parameters such as ammonia, surfactants, and chlorine
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean. Keep extra sample containers on hand at all times. Make sure there are proper sample containers for what is being sampled for (e.g., bacteria requires sterile containers)

Equipment	Use/Notes
Pry Bar or Pick	For opening catch basins and manholes when necessary
Sandbags	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes

Section 6.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample must be collected and analyzed for the required permit parameters listed in **Table 6-2**. The general procedure for collection of outfall samples is as follows:

1. Fill out all sample information on sample bottles and field sheets (see **Appendix D** for Field Sheets).
2. Put on protective gloves (nitrile/latex/other) before sampling.
3. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle. Be careful not to disturb sediments.
4. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled (not for bacteria sampling).
5. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (see **Table 6-2**).
6. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
7. Fill out chain-of-custody form for laboratory samples.
8. Deliver samples to Massachusetts state certified laboratory.
9. Dispose of used test strips and test kit ampules properly.
10. Decontaminate all testing personnel and equipment.

In the event that an outfall is submerged, either partially or completely, or inaccessible, field staff can proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. Field staff must continue to the next upstream structure until there is no longer an influence from the receiving water on the visual inspection or sampling.

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 6-2**

lists various field test kits and field instruments that can be used for outfall sampling associated with the 2016 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern.

Table 6-2 Field Screening Parameters and Analysis Methods

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
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	NA
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
Dissolved Oxygen	YSI Pro30 YSI EC300A Oakton 450	NA
Turbidity	Hach™ 2100Q Portable Turbidimeter Oakton CON 150	NA

[1] Where the stormwater discharges directly into a water quality limited water or a water subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136. Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. **Table 6-3** lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

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

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	**EPA**: 350.2 **SM**: 4500-NH3C	0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2,

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
				No preservative required if analyzed immediately
Surfactants	**SM**: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C
Chlorine	**SM**: 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	**SM**: 2550B	*NA*	Immediate	None Required
Specific Conductance	**EPA**: 120.1 **SM**: 2510B	0.2 µs/cm	28 days	Cool ≤6°C
Salinity	**SM**: 2520	-	28 days	Cool ≤6°C
Biochemical Oxygen Demand (BOD)	**EPA:** 360.1	**EPA:** 3 mg/L	48 hours	Cool ≤6°C
Dissolved Oxygen	**EPA:** 365.1	**EPA:** 1 mg/L	Immediate	Cool ≤6°C
Turbidity	**EPA:** 160.2	**EPA:** 1 NTU	48 hours	Cool ≤6°C
Indicator Bacteria: *E.coli* *Enterococcus* *Fecal Coliform*	*E.coli* **EPA**: 1603 **SM**: 9221B, 9221F , 9223 B **Other**: Colilert®, Colilert-18® *Enterococcus* **EPA**: 1600 **SM**: 9230 C **Other**: Enterolert® *Fecal Coliform* **EPA:** 1680	*E.coli* **EPA**: 1 cfu/100mL **SM**: 2 MPN/100mL **Other**: 1 MPN/100mL *Enterococcus* **EPA**: 1 cfu/100mL **SM**: 1 MPN/100mL **Other**: 1 MPN/100mL *Fecal Coliform* **EPA:** 1 ctu	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
Total Phosphorus	**EPA**: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 **SM**: 4500-P E-F	**EPA**: 0.01 mg/L **SM** : 0.01 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined	**EPA**: Cadmium reduction (automated)-353.2 Rev. 2.0, **SM**: 4500-NO_3 E-F	**EPA**: 0.05 mg/L **SM** : 0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
with Ammonia listed above.)				

40 CFR § 136: http://www.ecfr.gov/cgi-bin/text idx?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5
SM = Standard Methods

SECTION 6.3 INTERPRETING OUTFALL SAMPLING RESULTS

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. **Table 6-4** shows values identified by the EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table 6-4 Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria: *E.coli* *Enterococcus*	*E.coli*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 mL and no single sample taken during the bathing season shall exceed 235 colonies per 100 mL *Enterococcus:* the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 mL and no single sample taken during the bathing season shall exceed 61 colonies per 100 mL

SECTION 6.4 DRY WEATHER WORK COMPLETED TO DATE

The Town's outfall inventory contained 219 outfalls when the NOI was submitted in 2018. Town field staff, or hired representatives, screened many outfalls as part of the 2003 MS4 Permit, and since the start of the new 2016 MS4 Permit, the Town has completed dry weather screening of the remaining

outfalls. Screenings were completed over the course of six (6) days in May 2020, May 2021, and June 2021. Based on field observations, the Town removed 72 structures from the Town's outfall inventory because the structures were verified as culvert outlets/inlets, the drainage network changed since the original mapping was completed, or the structure is privately maintained.

In 2022, the Town further improved their outfall inventory. In this round of updates, 47 outfalls were removed from the inventory and 11 outfalls were added. Structures were removed based on roadway and drainage ownership, a comparison with the 2022 Massachusetts Department of Transportation GIS data and outfall inventory, and separate stormwater mapping updates including BMP identification. *The Town's current MS4 outfall inventory includes 147 outfalls*. All the outfalls have been screened, and the screening and sampling results are attached in **Appendix E**.

SECTION 6.5 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

The Town of Stoughton is responsible for updating the ranking of outfalls and interconnections. Outfalls/interconnections where relevant information is found indicating sewer input to the MS4 or sampling results indicating sewer input are highly likely to contain illicit discharges from sanitary sources. Such outfalls/interconnections are ranked at the top of the High Priority Outfalls category for investigation. Other outfalls and interconnections may be re-ranked based on any new information from the dry weather screening.

The Town updated and re-prioritized the initial outfall and interconnection rankings based on information gathered during dry weather. No outfall exhibited signs of likely sewer input based on the MS4 Permit definition (described in Section 5.2). Therefore, the Town still has no problem outfalls. The ranking was also revised based on changes to the Town's outfall inventory and the receiving water's impairments. The updated ranking table is attached as **Appendix C.**

SECTION 7 CATCHMENT INVESTIGATIONS

Once stormwater outfalls with evidence of illicit discharges have been identified, various methods can be used to trace the source of the potential discharge within the outfall catchment area. Catchment investigation techniques include, but are not limited to, review of maps, historic plans, and records; manhole observation; dry and wet weather sampling; video inspection; smoke testing; and dye testing. This section outlines a systematic procedure to investigate outfall catchments to trace the source of potential illicit discharges. All data collected as part of the catchment investigations is recorded and reported in each annual report.

SECTION 7.1 SYSTEM VULNERABILITY FACTORS

The Public Works Department has reviewed relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information has been reviewed:

- Plans related to the construction of the drainage network
- Plans related to the construction of the sewer network
- Prior work on storm drains or sewer lines
- Board of Health or other municipal data on septic systems
- Complaint records related to SSOs
- Septic system breakouts

Based on the review of this information, the presence of any of the following **System Vulnerability Factors (SVFs)** have been identified for each catchment and will continue to be evaluated. The following are required SVFs to be considered:

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

The following are optional SVFs the EPA recommends considering:

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

The Town has completed an SVF inventory for catchments visited during catchment investigations. The SVF inventory for these catchments is documented in **Appendix F** and will be updates as more SVFs are identified and more catchments investigated. The SVF inventory will be included in each annual report.

SECTION 7.2 DRY WEATHER MANHOLE INSPECTIONS

The Town of Stoughton has implemented a dry weather storm drain network investigation that involves systematically and progressively observing, sampling, and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs.

The Public Works Department is responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information is incorporated into the storm system map and catchment delineations are refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, where necessary.

Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit as follows:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
- **Key Junction Manholes** are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another

located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

For all catchments identified for investigation, during dry weather, field crews systematically inspect key junction manholes for evidence of illicit discharges. This program involves progressive inspection and sampling at manholes in the storm drain network to isolate and eliminate illicit discharges.

The manhole inspection methodology is conducted in one of two ways (or a combination of both):

- By working progressively up from the outfall and inspecting key junction manholes along the way, or
- By working progressively down from the upper parts of the catchment toward the outfall.

For most catchments, manhole inspections proceed from the outfall moving up into the system.

However, the decision to move up or down the system depends on the nature of the drainage system and the surrounding land use and the availability of information on the catchment and drainage system. Moving up the system can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. Moving down the system requires more advance preparation and reliable drainage system information on the upstream segments of the storm drain system, but may be more efficient if the sources of illicit discharges are believed to be located in the upstream portions of the catchment area. Once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

Inspection of key junction manholes proceeds as follows:

1. Manholes are opened and inspected for visual and olfactory evidence of illicit connections. A sample field inspection form is provided in **Appendix D**.
2. If flow is observed, a sample is collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis are in accordance with procedures outlined in **Section 6**. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).
3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole is flagged for further upstream manhole investigation and/or isolation and confirmation of sources.
4. Subsequent key junction manhole inspections proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.
5. If no evidence of an illicit discharge is found, catchment investigations are considered complete upon completion of key junction manhole sampling.

SECTION 7.3 WET WEATHER OUTFALL SAMPLING

Where a minimum of one (1) System Vulnerability Factor (SVF) is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. The Public Works Department is responsible for implementing the wet weather outfall sampling program and making updates as necessary. Wet weather sampling has begun in Stoughton and sampling results are located within **Appendix E**.

Outfalls are inspected and sampled under wet weather conditions, to the extent necessary, to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.

Wet weather outfall sampling proceeds as follows:

1. At least one wet weather sample is collected at the outfall for the same parameters required during dry weather screening.
2. Wet weather sampling occurs during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that triggers sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling occurs during the spring (March through June) when groundwater levels are relatively high.
3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling is performed, as warranted, or source isolation and confirmation procedures is followed as described in **Section 7.4**.
4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations are considered complete.

SECTION 7.4 SOURCE ISOLATION AND CONFIRMATION

Once the source of an illicit discharge is approximated between two manholes, more detailed investigation techniques are used to isolate and confirm the source of the illicit discharge. The following methods are used in isolating and confirming the source of illicit discharges:

- Sandbagging
- Smoke Testing
- Dye Testing
- CCTV/Video Inspections
- Optical Brightener Monitoring
- IDDE Canines

These methods are described in the sections below. Instructions for these and other IDDE methods are provided in **Appendix G**.

Public notification is an important aspect of a detailed source investigation program. Prior to smoke testing, dye testing, or TV inspections, the Public Works Department will notify property owners in the affected area. Smoke testing notification will include hanging notifications for single family homes and posting notifications in businesses and building lobbies of multi-family dwellings.

Section 7.4.1 Sandbagging

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours and should only be installed when dry weather is forecasted. If flow has collected behind the sandbags/barriers after 48 hours, it can be assessed using visual observations or by sampling. If no flow collects behind the sandbags/barriers, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

Section 7.4.2 Smoke Testing

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically, a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole, and air is then forced through the system. Test personnel are placed in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to area residents and business owners as well as local police and fire departments.

If the initial test of the storm drain system is unsuccessful, then a more thorough smoke test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

Section 7.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person is inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into a plumbing fixture (e.g., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

Section 7.4.4 CCTV/Video Inspection

Another method of source isolation involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. While this tool is both effective and usually definitive, it can be costly and time-consuming when compared to other source isolation techniques.

Section 7.4.5 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes that are used in detergents and paper products to enhance their appearance. The presence of optical brighteners in surface waters or dry weather discharges suggests there is a possible illicit discharge or insufficient removal through adsorption in nearby septic systems or wastewater treatment. Optical brightener monitoring can be done in two ways. The most common, and least expensive, methodology involves placing a cotton pad in a wire cage and securing it in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is retrieved at a later date and placed under UV light to determine the presence/absence of brighteners during the monitoring period. A second methodology uses handheld fluorometers to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorometer, while more quantitative, is typically more costly and is not as effective at isolating intermittent discharges as other source isolation techniques.

Section 7.4.6 IDDE Canines

Dogs specifically trained to smell human-related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is the canines' accuracy. The use of IDDE canines is not recommended as a standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods, such as dye testing, in order to fully verify sources of illicit discharges.

SECTION 7.5 ILLICIT DISCHARGE REMOVAL

When the specific source of an illicit discharge is identified, the Town of Stoughton will exercise its authority as necessary to require its removal. The annual report will include the status of IDDE investigation and removal activities including the following information for each confirmed source:

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

Section 7.5.1 Confirmatory Outfall Screening

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation.

SECTION 7.6 ONGOING SCREENING

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be re-prioritized for screening and scheduled for ongoing screening once every five (5) years. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in **Section 6** of this plan. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due to System Vulnerability Factors and will be conducted in accordance with the procedures described in **Section 7.3**. All sampling results will be reported in the annual report.

SECTION 8 TRAINING

Annual IDDE training is made available to all employees involved in the IDDE program. This training includes information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records are and will continue to be maintained. A training attendance log is included in **Appendix H**. The frequency and type of training is included in the annual report.

SECTION 9 PROGRESS REPORTING

The progress and success of the IDDE program is evaluated on an annual basis. The evaluation is documented in the annual report and includes the following indicators of program progress:

- Number of SSOs and illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/screenings
- Number of wet weather outfall inspections/sampling events
- Number of enforcement notices issued
- All dry weather and wet weather screening and sampling results
- Estimate of the volume of sewage removed, as applicable
- Number of employees trained annually

The success of the IDDE program is measured by the IDDE activities completed within the required permit timelines.

APPENDIX A

Legal Authority (IDDE By-law or Ordinance)

Chapter 159

STORMWATER MANAGEMENT

GENERAL REFERENCES

Groundwater protection -- See Ch. 107.

Hazardous waste -- See Ch. 113.

Streets and sidewalks -- See Ch. 162.

Water -- See Ch. 188.

Wetlands protection -- See Ch. 191.

Zoning -- See Ch. 191.

Conservation Commission -- See Ch. 287.

§ 159-1. Objectives.

A. Increased and contaminated stormwater runoff is a major cause of impairment of water quality and flow in lakes, ponds, streams, rivers, wetlands and groundwater; contamination of drinking water supplies; alteration or destruction of aquatic and wildlife habitat; and flooding.

B. Regulation of illicit connections and discharges to the municipal storm drain system is necessary for the protection of Stoughton's water bodies and groundwater, and to safeguard the public health, safety, welfare and the environment.

C. The harmful impacts of soil erosion and sedimentation are the impairment of water quality and flow in lakes, ponds, streams, rivers, wetlands and groundwater; contamination of drinking water supplies; alteration or destruction of aquatic and wildlife habitat; flooding; and overloading or clogging of municipal catch basins and storm drainage systems.

D. Increased and contaminated stormwater runoff associated with developed land uses and the accompanying increase in impervious surface are major causes of impairment of water quality and flow in lakes, ponds, streams, rivers, wetlands and groundwater.

E. The objectives of this bylaw are:

(1) To prevent pollutants from entering Stoughton's municipal separate storm sewer system (MS4);

(2) To prohibit illicit connections and unauthorized discharges to the MS4;

(3) To require the removal of all such illicit connections;

(4) To comply with state and federal statutes and regulations relating to stormwater discharges; and

(5) To establish the legal authority to ensure compliance with the provisions of this bylaw through inspection, monitoring, and enforcement;

(6) To require practices that eliminate soil erosion and sedimentation and control the volume and rate of stormwater runoff resulting from land disturbance activities;

(7) To promote infiltration and the recharge of groundwater;

(8) To ensure that soil erosion and sedimentation control measures and stormwater runoff control practices are incorporated into the site planning and design process and are implemented and maintained;

(9) To require practices to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

(10) To require practices to control the flow of stormwater from new and redeveloped sites into the Stoughton storm drainage system in order to prevent flooding and erosion;

(11) To protect groundwater and surface water from degradation;

(12) To ensure adequate long-term operation and maintenance of structural stormwater best management practices so that they work as designed.

§ 159-2. Definitions.

For the purposes of this bylaw, the following shall mean:

ABUTTER — The owner(s) of land abutting the activity.

AGRICULTURE — The normal maintenance or improvement of land in agricultural or aquacultural use, as defined by the Massachusetts Wetlands Protection Act and its implementing regulations.

ALTERATION OF DRAINAGE CHARACTERISTICS — Any activity on an area of land that changes the water quality, force, direction, timing or location of runoff flowing from the area. Such changes include: change from distributed runoff to confined, discrete discharge; change in the volume of runoff from the area; change in the peak rate of runoff from the area; and change in the recharge to groundwater on the area.

APPLICANT — Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision, of the commonwealth or the federal government to the extent permitted by law, requesting a soil erosion and sediment control permit for proposed land-disturbance activity.

AUTHORIZED ENFORCEMENT AGENCY — The Stoughton Board of Selectmen, acting as Drain Commissioners (hereafter the Board), its employees or agents designated to enforce this bylaw.

BEST MANAGEMENT PRACTICE (BMP) — An activity, procedure, restraint, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC) — A certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

CLEAN WATER ACT — The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as hereafter amended.

CLEARING — Any activity that removes the vegetative surface cover.

CONSTRUCTION AND WASTE MATERIALS — Excess or discarded building or site materials, including but not limited to concrete truck washout, chemicals, litter and sanitary waste, at a construction site that may adversely impact water quality.

DEVELOPMENT — The modification of land to accommodate a new use or expansion of use, usually involving construction.

DISCHARGE OF POLLUTANTS — The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or commonwealth from any source.

DISTURBANCE OF LAND — Any action that causes a change in the position, location, or arrangement of soil, sand, rock, gravel or similar earth material.

EROSION — The wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity, or vehicle traffic and the subsequent detachment and transportation of soil particles.

EROSION AND SEDIMENTATION CONTROL PLAN — A document containing narrative, drawings and details developed by a qualified professional engineer (PE) or a certified professional in erosion and sediment control (CPESC) which includes best management practices or equivalent measures designed to control surface runoff, erosion and sedimentation during preconstruction and construction-related land disturbance activities.

ESTIMATED HABITAT OF RARE WILDLIFE AND CERTIFIED VERNAL POOLS — Habitats delineated for state-protected rare wildlife and certified vernal pools for use with the Wetlands Protection Act Regulations (310 CMR 10.00) and the Forest Cutting Practices Act Regulations (304 CMR 11.00).

GROUNDWATER — Water beneath the surface of the ground.

ILLICIT CONNECTION — A surface or subsurface drain or conveyance which allows an illicit discharge into the municipal storm drain system,

including without limitation sewage, process wastewater, or wash water, and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this bylaw.

ILLICIT DISCHARGE — Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in § 157-7. The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit or a surface water discharge permit, or resulting from fire-fighting activities exempted pursuant to § 159-7D of this bylaw.

IMPERVIOUS SURFACE — Any material or structure on or above the ground that prevents water infiltrating the underlying soil. Impervious surface includes without limitation roads, paved parking lots, sidewalks, and rooftops.

LAND-DISTURBING ACTIVITY — Any activity that causes a change in the position or location of soil, sand, rock, gravel, or similar earth material.

MASSACHUSETTS ENDANGERED SPECIES ACT — MGL c. 131A and its implementing regulations at 321 CMR 10.00 which prohibit the taking of any rare plant or animal species listed as endangered, threatened, or of special concern.

MASSACHUSETTS STORMWATER MANAGEMENT POLICY — The policy issued by the Department of Environmental Protection, and as amended, that coordinates the requirements prescribed by state regulations promulgated under the authority of the Massachusetts Wetlands Protection Act MGL c. 131, § 40, and Massachusetts Clean Waters Act MGL c. 21, §§ 23 through 56. The policy addresses stormwater impacts through implementation of performance standards to reduce or prevent pollutants from reaching water bodies and control the quantity of runoff from a site.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OR MUNICIPAL STORM DRAIN SYSTEM — The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Stoughton.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER DISCHARGE PERMIT — A permit issued by United States Environmental Protection Agency or jointly with the state that authorizes the discharge of pollutants to waters of the United States.

NON-STORMWATER DISCHARGE — Discharge to the municipal storm drain system not composed entirely of stormwater.

OPERATION AND MAINTENANCE PLAN — A plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to insure that it continues to function as designed.

OUTFALL — The point at which stormwater flows out from a point source discernible, confined and discrete conveyance into waters of the commonwealth.

OUTSTANDING RESOURCE WATERS (ORWs) — Waters designated by the Massachusetts Department of Environmental Protection as ORWs. These waters have exceptional sociologic, recreational, ecological and/or aesthetic values and are subject to more stringent requirements under both the Massachusetts Water Quality Standards (314 CMR 4.00)[1] and the Massachusetts Stormwater Management Standards. ORWs include vernal pools certified by the Natural Heritage Program of the Massachusetts Department of Fisheries and Wildlife and Environmental Law Enforcement, all Class A designated public water supplies with their bordering vegetated wetlands, and other waters specifically designated.

OWNER — A person with a legal or equitable interest in property.

PERSON — An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

POINT SOURCE — Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, or container from which pollutants are or may be discharged.

POLLUTANT — Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter, whether originating at a point or nonpoint source, that is or may be introduced into any sewage treatment works or waters of the commonwealth. Pollutants shall include without limitation:

A. Paints, varnishes, and solvents;

B. Oil and other automotive fluids;

C. Nonhazardous liquid and solid wastes and yard wastes;

D. Refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;

E. Pesticides, herbicides, and fertilizers;

F. Hazardous materials and wastes; sewage, fecal coliform and pathogens;

G. Dissolved and particulate metals;

H. Animal wastes;

I. Rock, sand, salt, soils;

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1. Editor's Note: The Massachusetts Surface Water Quality Standards.

J. Construction wastes and residues; and

K. Any noxious or offensive matter of any kind.

PRECONSTRUCTION — All activity in preparation for construction.

PRIORITY HABITAT OF RARE SPECIES — Habitats delineated for rare plant and animal populations protected pursuant to the Massachusetts Endangered Species Act and its regulations.

PROCESS WASTEWATER — Water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

RECHARGE — The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

REDEVELOPMENT — Development, rehabilitation, expansion, demolition or phased projects that disturb the ground surface or increase the impervious area on previously developed sites.

RUNOFF — Rainfall, snowmelt, or irrigation water flowing over the ground surface.

SEDIMENT — Mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.

SEDIMENTATION — The process or act of deposition of sediment.

SLOPE — The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.

SOIL — Any earth, sand, rock, gravel, or similar material.

STABILIZATION — The use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or retard erosion.

STORMWATER — Stormwater runoff, snowmelt runoff, and surface water runoff and drainage.

STORMWATER MANAGEMENT PLAN — A plan required as part of the application for a Stormwater Management Permit. See § 159-9.

STRIP — Any activity which removes the vegetative ground surface cover, including tree removal, clearing, grubbing, and storage or removal of topsoil.

SURFACE WATER DISCHARGE PERMIT — A permit issued by the Department of Environmental Protection (DEP) pursuant to 314 CMR 3.00 that authorizes the discharge of pollutants to waters of the commonwealth of Massachusetts.

TOXIC OR HAZARDOUS MATERIAL OR WASTE — Any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately

or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as toxic or hazardous under MGL c. 21C and c. 21E and the regulations at 310 CMR 30.000 and 310 CMR 40.0000.

TSS — Total suspended solids.

VERNAL POOLS — Temporary bodies of freshwater which provide critical habitat for a number of vertebrate and invertebrate wildlife species.

WASTEWATER — Any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product or waste product.

WATERCOURSE — A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

WATERS OF THE COMMONWEALTH — All waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, appropriational waters, and groundwater.

WETLAND RESOURCE AREA — Areas specified in the Massachusetts Wetlands Protection Act MGL c. 131, § 40, and in the Town of Stoughton Wetlands Protection Bylaw.

WETLANDS — Tidal and nontidal areas characterized by saturated or nearly saturated soils most of the year that are located between terrestrial (land-based) and aquatic (water-based) environments, including freshwater marshes around ponds and channels (rivers and streams), brackish and salt marshes; common names include marshes, swamps and bogs.

§ 159-3. Authority.

This bylaw is adopted under the authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Procedures Act, and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122.34.

§ 159-4. Responsibility for administration.

The Board shall administer, implement and enforce this bylaw. Any powers granted to or duties imposed upon the Board may be delegated in writing by the Board to employees or agents of the Board.

§ 159-5. (Reserved)

§ 159-6. Regulations.

The Board may promulgate rules and regulations to effectuate the purposes of this bylaw. Failure by the Board to promulgate such rules and regulations shall not have the effect of suspending or invalidating this bylaw.

§ 159-7. Discharges to the municipal storm drain system.

A. Applicability. This bylaw shall apply to flows entering the municipally owned storm drainage system.

B. Prohibited activities.

(1) Illicit discharges. No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the municipal separate storm sewer system (MS4), into a watercourse, or into the waters of the commonwealth.

(2) Illicit connections. No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

(3) Obstruction of municipal storm drain system. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior written approval from the Board.

C. Exemptions.

(1) Discharge or flow resulting from fire-fighting activities.

(2) The following non-stormwater discharges or flows are exempt from the prohibition of non-stormwaters provided that the source is not a significant contributor of a pollutant to the municipal storm drain system:

(a) Waterline flushing;

(b) Flow from potable water sources;

(c) Springs;

(d) Natural flow from riparian habitats and wetlands;

(e) Diverted stream flow;

(f) Rising groundwater;

(g) Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater;

(h) Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air-conditioning condensation;

(i) Discharge from landscape irrigation or lawn watering;

(j) Water from individual residential car washing;

(k) Discharge from dechlorinated swimming pool water (less than one ppm chlorine), provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance;

(l) Discharge from street sweeping;

(m) Dye testing, provided verbal notification is given to the Board prior to the time of the test;

(n) Non-stormwater discharge permitted under an NPDES permit or a surface water discharge permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency or the Department of Environmental Protection, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations; and

(o) Discharge for which advanced written approval is received from the Board as necessary to protect public health, safety, welfare or the environment.

D. Emergency suspension of storm drainage system access. The Board may suspend municipal storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened discharge of pollutants that presents imminent risk of harm to the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the authorized enforcement agency may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.

E. Notification of spills. Notwithstanding other requirements of local, state or federal law, as soon as a person responsible for a facility or operation, or responsible for emergency response for a facility or operation, has information of or suspects a release of materials at that facility or operation resulting in or which may result in discharge of pollutants to the municipal drainage system or waters of the commonwealth, the person shall take all necessary steps to ensure containment and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the municipal Fire and Police Departments. In the event of a release of nonhazardous material, the reporting person shall notify the authorized

enforcement agency no later than the next business day. The reporting person shall provide to the authorized enforcement agency written confirmation of all telephone, facsimile or in-person notifications within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

F. Transitional provisions. Residential property owners shall have 30 days from the effective date of the bylaw to comply with its provisions, provided good cause is shown for the failure to comply with the bylaw during that period.

§ 159-8. Stormwater management and land disturbance.

A. Applicability.

(1) This bylaw shall apply to all activities that result in disturbance of one or more acres of land that drains to the municipal separate storm sewer system.

(2) Except as authorized by the Board in a land disturbance permit or as otherwise provided in this bylaw, no person shall perform any activity that results in disturbance of an acre or more of land. Normal maintenance and improvement of land in agricultural or aquacultural use, as defined by the Wetlands Protection Act regulation 310 CMR 10.4, are exempt. In addition, as authorized in the Phase II small MS4 general permit for Massachusetts, stormwater discharges resulting from the above activities that are subject to jurisdiction under the Wetlands Protection Act and demonstrate compliance with the Massachusetts Storm Water Management Policy as reflected in an order of conditions issued by the Conservation Commission are exempt from compliance with this bylaw.

B. Responsibility for administration.

(1) The Board shall administer, implement and enforce this bylaw. Any powers granted to or duties imposed upon the Board may be delegated in writing by the Board to its employees or agents.

(2) Waiver. The Board may waive strict compliance with any requirement of this bylaw or the rules and regulations promulgated hereunder, where:

(a) Such action is allowed by federal, state and local statutes and/or regulations;

(b) Is in the public interest; and

(c) Is not inconsistent with the purpose and intent of this bylaw.

(3) Rules and regulations. The Board may adopt and periodically amend rules and regulations to effectuate the purposes of this bylaw. Failure by the Board to promulgate such rules and regulations shall not have the effect of suspending or invalidating this bylaw.

C. Permits and procedures.

(1) Application. A completed application for a land disturbance permit shall be filed with the Board. A permit must be obtained prior to the commencement of land-disturbing activity that may result in the disturbance of an area of one acre or more. The land disturbance permit application package shall follow the procedures outlined in the Site Plan Review Bylaw (available at the Stoughton Engineering Department).

(2) Entry. Filing an application for a permit grants the Board or its agent permission to enter the site to verify the information in the application and to inspect for compliance with permit conditions.

(3) Other boards. The Board shall notify the Town Clerk of receipt of the application and shall give one copy of the application package to each of the other relevant boards. The submission of a site plan review application shall be considered as a valid submission under this bylaw.

(4) Public hearing. The public hearing required in the Site Plan Review Bylaw shall be considered sufficient satisfaction of this requirement. In the event the proposed project does not require site plan review, the Board shall hold a public hearing within 21 days of the receipt of a complete application and take final action within 21 days from the time of closure of the public hearing, unless such time is extended by agreement between the applicant and the Board. Notice of the public hearing shall be given by publication and by first-class mailing to abutters at least seven days prior to the hearing. The Board shall make the application available for inspection by the public during business hours at the Town Hall, 10 Pearl Street.

(5) Information requests. The applicant shall submit all additional information requested by the Board to issue a decision on the application.

(6) Action by the Board. The Board may:

(a) Approve the land disturbance permit application and issue a permit if it finds that the proposed plan will protect water resources and meets the objectives and requirements of this bylaw;

(b) Approve the land disturbance permit application and issue a permit with conditions, modifications or restrictions that

the Board determines are required to ensure that the project will protect water resources and meets the objectives and requirements of this bylaw;

(c) Disapprove the land disturbance permit application and deny the permit if it finds that the proposed plan will not protect water resources or fails to meet the objectives and requirements of this bylaw.

(7) Failure of the Board to take final action. Failure of the Board to take final action upon an application within the time specified above shall be deemed to be approval of said application. Upon certification by the Town Clerk that the allowed time has passed without the Board action, the land disturbance permit shall be issued by the Board.

(8) Fee structure. Each application must be accompanied by the appropriate application fee as established by the Board. Applicants shall pay review fees as determined by the Board sufficient to cover any expenses connected with the public hearing and review of the land disturbance permit application before the review process commences. The Board is authorized to retain a registered professional engineer or other professional consultant to advise the Board on any or all aspects of the application.

(9) Project changes. The permittee, or their agent, must notify the Board in writing of any change or alteration of a land-disturbing activity authorized in a land disturbance permit before any change or alteration occurs. If the Board determines that the change or alteration is significant, based on the design requirements listed in § 159-8C(10)(b) and accepted construction practices, the Board may require that an amended land disturbance permit application be filed and a public hearing held. If any change or alteration from the land disturbance permit occurs during any land-disturbing activities, the Board may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.

(10) Erosion and sediment control plan.

(a) The erosion and sediment control plan shall contain sufficient information to describe the nature and purpose of the proposed development, pertinent conditions of the site and the adjacent areas, and proposed erosion and sedimentation controls. The applicant shall submit such material as is necessary to show that the proposed development will comply with the design requirements listed in Subsection C(10)(b) below.

(b) The design requirements of the erosion and sediment control plan are:

[1] Minimize total area of disturbance;

[2] Sequence activities to minimize simultaneous areas of disturbance;

[3] Minimize peak rate of runoff in accordance with the Massachusetts Stormwater Policy;

[4] Minimize soil erosion and control sedimentation during construction, provided that prevention of erosion is preferred over sedimentation control;

[5] Divert uncontaminated water around disturbed areas;

[6] Maximize groundwater recharge;

[7] Install and maintain all erosion and sediment control measures in accordance with the manufacturer's specifications and good engineering practices;

[8] Prevent off-site transport of sediment;

[9] Protect and manage on- and off-site material storage areas (overburden and stockpiles of dirt, borrow areas, or other areas used solely by the permitted project are considered a part of the project); comply with applicable federal, state and local laws and regulations, including waste disposal, sanitary sewer or septic system regulations, and air quality requirements, including dust control;

[10] Prevent significant alteration of habitats mapped by the Massachusetts Natural Heritage and Endangered Species Program as endangered, threatened or of special concern, estimated habitats of rare wildlife and certified vernal pools, and priority habitats of rare species from the proposed activities;

[11] Institute interim and permanent stabilization measures, which shall be instituted on a disturbed area as soon as practicable but no more than 14 days after construction activity has temporarily or permanently ceased on that portion of the site;

[12] Properly manage on-site construction and waste materials; and

[13] Prevent off-site vehicle tracking of sediments.

(11) Erosion and sediment control plan content. The plan shall contain the information required by the Site Plan Review Bylaw.

(12) Inspection and site supervision.

(a) Preconstruction meeting. Prior to starting clearing, excavation, construction, or land-disturbing activity the applicant, the applicant's technical representative, the general contractor or any other person with authority to make changes to the project shall meet with the Board to review the permitted plans and their implementation.

(b) Board inspection. The Board or its designated agent shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the land disturbance permit as approved. The permit and associated plans for grading, stripping, excavating, and filling work, bearing the signature of approval of the Board, shall be maintained at the site during the progress of the work. In order to obtain inspections, the permittee shall notify the Board at least two working days before each of the following events:

[1] Erosion and sediment control measures are in place and stabilized;

[2] Site clearing has been substantially completed;

[3] Rough grading has been substantially completed;

[4] Final grading has been substantially completed;

[5] Close of the construction season; and

[6] Final landscaping (permanent stabilization) and project final completion.

(c) Permittee inspections. The permittee or his/her agent shall conduct and document inspections of all control measures no less than weekly, or as specified in the permit, and prior to and following anticipated storm events. The purpose of such inspections will be to determine the overall effectiveness of the control plan and the need for maintenance or additional control measures. The permittee or his/her agent shall submit monthly reports to the Board or designated agent in a format approved by the Board.

(d) Access permission. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Board, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this bylaw and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary to determine compliance with the permit.

(13) Surety. the Board may require the permittee to post, before the start of land disturbance activity, a surety bond, irrevocable letter of credit, cash, or other acceptable security. The form of the bond shall be approved by Town Counsel and be in an amount deemed sufficient by the Board to ensure that the work will be completed in accordance with the permit. If the project is phased, the Board may release part of the bond as each phase is completed in compliance with the permit, but the bond may not be fully released until the Board has received the final report as required by § 159-8C(14) and issued a certificate of completion.

(14) Final reports. Upon completion of the work, the permittee shall submit a report (including certified as-built construction plans) from a professional engineer (PE), surveyor, or certified professional in erosion and sediment control (CPESC), certifying that all erosion and sediment control devices, and approved changes and modifications, have been completed in accordance with the conditions of the approved permit. Any discrepancies should be noted in the cover letter.

(15) Certificate of completion. The issuing authority will issue a letter certifying completion upon receipt and approval of the final reports and/or upon otherwise determining that all work of the permit has been satisfactorily completed in conformance with this bylaw.

§ 159-9. Postconstruction stormwater management of new developments and redevelopments.

A. Applicability. No person may undertake a construction activity, including clearing, grading and excavation, that results in a land disturbance that will disturb equal to or greater than one acre of land or will disturb less than one acre of land but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one acre of land draining to the Stoughton municipal separate storm sewer system without a permit from the Board. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity or the original purpose of the site.

B. Exemptions.

(1) Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act regulation 310 CMR 10.4;

(2) Maintenance of existing landscaping, gardens or lawn areas associated with a single-family dwelling;

(3) The construction of fencing that will not substantially alter existing terrain or drainage patterns;

(4) Construction of utilities other than drainage (gas, water, electric, telephone, etc.) which will not alter terrain or drainage patterns;

(5) As authorized in the Phase II small MS4 general permit for Massachusetts, stormwater discharges resulting from the activities identified in § 159-8A that are wholly subject to jurisdiction under the Wetlands Protection Act and demonstrate compliance with the Massachusetts Storm Water Management Policy as reflected in an order of conditions issued by the Conservation Commission are exempt from compliance with this bylaw.

C. Permits and procedure.

(1) The application for a stormwater management permit shall consist of submittal of a stormwater management plan to the Board. This stormwater management plan shall contain sufficient information for the Board to evaluate the environmental impact, effectiveness, and acceptability of the measures proposed by the applicant for reducing adverse impacts from stormwater. The plan shall be designed to meet the Massachusetts Stormwater Management Standards as set forth in Subsection C(2) of this section and DEP Stormwater Management Handbook Volumes I and II. The stormwater management plan shall fully describe the project in drawings, and narrative. It shall represent as-built conditions on the site being permitted and shall contain the following information:

(a) A locus map;

(b) The existing zoning and land use at the site;

(c) The location(s) of existing easements;

(d) The location of existing utilities;

(e) The site's final topography with contours at two-foot intervals;

(f) The site hydrology;

(g) A description and delineation of existing stormwater conveyances, impoundments, and wetlands on and adjacent to the site or into which stormwater flows;

(h) A delineation of one-hundred-year floodplains, if applicable;

(i) The existing vegetation and ground surfaces with runoff coefficients;

(j) A drainage area map showing postconstruction watershed boundaries, drainage area and stormwater flow paths;

(k) A description and drawings of all components of the drainage system, including:

[1] Locations, cross sections, and profiles of all brooks, streams, drainage swales and their method of stabilization;

[2] All measures for the detention, retention or infiltration of water;

[3] All measures for the protection of water quality;

[4] The structural details for all components of the proposed drainage systems and stormwater management facilities;

[5] Notes on drawings specifying materials used, construction specifications, and typicals.

(l) Location of buildings or other structures, impervious surfaces, and drainage facilities, if applicable;

(m) A maintenance schedule for the on-site drainage facilities;

(n) Any other information requested by the Board.

(2) Standards.

(a) Projects shall meet the standards of the Massachusetts Stormwater Management Policy, which currently are as follows:

[1] No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the commonwealth.

[2] Stormwater management systems must be designed so that postdevelopment peak discharge rates do not exceed predevelopment peak discharge rates.

[3] Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the postdevelopment site should approximate the annual recharge rate from the predevelopment or existing site conditions, based on soil types.

[4] For new development, stormwater management systems must be designed to remove 80% of the average annual load (postdevelopment conditions) of total suspended solids (TSS). It is presumed that this standard is met when:

[a] Suitable nonstructural practices for source control and pollution prevention are implemented;

[b] Stormwater management best management practices (BMPs) are sized to capture the prescribed runoff volume; and

[c] Stormwater management BMPs are maintained as designed.

[5] Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs (see Stormwater Management Volume I: Stormwater Policy Handbook). The use of infiltration practices without pretreatment is prohibited.

[6] Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas (see Stormwater Management Volume I: Stormwater Policy Handbook). Critical areas are outstanding resource waters (ORWs), shellfish beds, swimming beaches, cold-water fisheries and recharge areas for public water supplies.

[7] Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

[8] Erosion and sediment controls must be implemented to prevent impacts during disturbance and construction activities.

[9] All stormwater management systems must have an operation and maintenance plan to ensure that systems function as designed.

(b) When one or more of the standards cannot be met, an applicant may demonstrate that an equivalent level of environmental protection will be provided.

D. Operation and maintenance plans. An operation and maintenance plan (O&M plan) is required at the time of application for all projects. The maintenance plan shall be designed to ensure compliance with the permit, this bylaw and that the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, are met in all seasons and throughout the life of the system. The Board shall make the final decision of what maintenance option is appropriate in a given situation. The Board will consider natural features, proximity of site to water bodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision. The operation and maintenance plan shall remain on file with the Board, attached to the stormwater management plan, and shall be an ongoing requirement. The O&M Plan shall include:

(1) The name(s) of the owner(s) for all components of the system.

(2) Maintenance agreements that specify:

(a) The names and addresses of the person(s) responsible for operation and maintenance.

(b) The person(s) responsible for financing maintenance and emergency repairs.

(c) A maintenance schedule for all drainage structures, including swales and ponds.

(d) A list of easements with the purpose and location of each.

(e) The signature(s) of the owner(s).

(3) Stormwater management easement(s).

(a) Stormwater management easements shall be provided by the property owner(s) as necessary for:

[1] Access for facility inspections and maintenance.

[2] Preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the one-hundred-year storm event.

[3] Direct maintenance access by heavy equipment to structures requiring regular cleanout.

(b) The purpose of each easement shall be specified in the maintenance agreement signed by the property owner.

(c) Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the Board.

(d) Easements shall be recorded with the Norfolk County Registry of Deeds prior to issuance of a certificate of completion by the Board.

E. Changes to operation and maintenance plans.

(1) The owner(s) of the stormwater management system must notify the Board of changes in ownership or assignment of financial responsibility.

(2) The maintenance schedule in the Maintenance Agreement may be amended to achieve the purposes of this bylaw by mutual agreement of the Board and the responsible parties. Amendments must be in writing and signed by all responsible parties. Responsible parties shall include owner(s), persons with financial responsibility, and persons with operational responsibility.

F. Surety. The Board may require the permittee to post, before the start of land disturbance or construction activity, a surety bond, irrevocable

letter of credit, cash, or other acceptable security. The form of the bond shall be approved by Town Counsel and be in an amount deemed sufficient by the Board to ensure that the work will be completed in accordance with the permit. If the project is phased, the Board may release part of the bond as each phase is completed in compliance with the permit, but the bond may not be fully released until the Board has received the final inspection report as required by § 159-8C(14) and issued a certificate of completion.

G. Inspections. The Board shall inspect the project site at the following stages:

(1) Initial site inspection: prior to approval of any plan.

(2) Erosion control inspection: to ensure erosion control practices are in accord with the filed plan.

(3) Bury inspection: prior to backfilling of any underground drainage or stormwater conveyance structures.

(4) Final inspection.

(a) After the stormwater management system has been constructed and before the surety has been released, the applicant must submit a record plan detailing the actual stormwater management system as installed. The Board shall inspect the system to confirm its as-built features. This inspector shall also evaluate the effectiveness of the system in an actual storm. If the inspector finds the system to be adequate he shall so report to the Board, which will issue a certificate of completion.

(b) If the system is found to be inadequate by virtue of physical evidence of operational failure, even though it was built as called for in the stormwater management plan, it shall be corrected by the permittee before the performance guarantee is released. If the permittee fails to act, the Town may use the surety bond to complete the work. Examples of inadequacy shall be limited to errors in the infiltrative capability, errors in the maximum groundwater elevation, failure to properly define or construct flow paths, or erosive discharges from basins.

H. Waivers.

(1) The Board may waive strict compliance with any requirement of this bylaw or the rules and regulations promulgated hereunder, where;

(a) Such action is allowed by federal, state and local statutes and/or regulations,

(b) Is in the public interest; and

(c) Is not inconsistent with the purpose and intent of this bylaw.

(2) Any applicant may submit a written request to be granted such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that strict application of the bylaw does not further the purposes or objectives of this bylaw.

(3) All waiver requests shall be discussed and voted on at the public hearing for the project.

(4) If, in the Board's opinion, additional time or information is required for review of a waiver request, the Board may continue a hearing to a date certain announced at the meeting. In the event the applicant objects to a continuance or fails to provide requested information, the waiver request shall be denied.

I. Certificate of completion. The Board will issue a letter certifying completion upon receipt and approval of the final inspection reports and/or upon otherwise determining that all work of the permit has been satisfactorily completed in conformance with this bylaw.

J. Town acceptance of drainage and stormwater structures and systems. When a developer requests the Town to accept a drainage system, stormwater management system, and/or a detention basin for a subdivision of three or more housing units, or for a commercial/ industrial land development of one acre or larger, the Town shall have the option to refuse or accept it. If the Town accepts the basin or system, a contribution to the Stormwater Management Revolving Fund shall be made which shall be equal to $1,000 for each drainage/ stormwater management system and $2,500 for every acre or portion thereof in the detention basins to compensate the Town for ongoing maintenance. The minimum contribution for any system or basin, regardless of size, shall be $5,000.

§ 159-10. Enforcement.

The Board or an authorized agent of the Board shall enforce this bylaw, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

A. Civil relief. If a person violates the provisions of this bylaw, regulations, permit, notice, or order issued thereunder, the Board may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

B. Orders.

(1) The Board or an authorized agent of the Board may issue a written order to enforce the provisions of this bylaw or the regulations thereunder, which may include:

(a) Elimination of illicit connections or discharges to the MS4;

(b) Performance of monitoring, analyses, and reporting;

(c) That unlawful discharges, practices, or operations shall cease and desist; and

(d) Remediation of contamination in connection therewith.

(2) If the enforcing person determines that abatement or remediation of contamination is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town may, at its option, undertake such work, and expenses thereof shall be charged to the violator.

(3) Within 30 days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the appropriations incurred by the Town, including administrative appropriations. The violator or property owner may file a written protest objecting to the amount or basis of appropriations with the Board within 30 days of receipt of the notification of the appropriations incurred. If the amount due is not received by the expiration of the time in which to file a protest or within 30 days following a decision of the Board affirming or reducing the appropriations, or from a final decision of a court of competent jurisdiction, the appropriations shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said appropriations. Interest shall begin to accrue on any unpaid appropriations at the statutory rate provided in MGL c. 59, § 57, after the 31st day at which the appropriations first become due.

C. Criminal penalty. Any person who violates any provision of this bylaw, regulation, order or permit issued thereunder shall be punished by a fine of not more than $100. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

D. Noncriminal disposition. As an alternative to criminal prosecution, the Town of Stoughton may elect to utilize the noncriminal disposition procedure set forth in MGL c. 40, § 21D. The Board, or its authorized agent, shall be the enforcing person. The penalty for the first violation shall be $100. The penalty for the second violation shall be $200. The penalty for the third and subsequent violations shall be $300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

E. Entry to perform duties under this bylaw. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Board, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this bylaw and regulations and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary.

F. Appeals. The decisions or orders of the Board shall be final. Further relief shall be to a court of competent jurisdiction.

G. Remedies not exclusive. The remedies listed in this bylaw are not exclusive of any other remedies available under any applicable federal, state or local law.

§ 159-11. Severability.

The provisions of this bylaw are hereby declared to be severable. If any provision, paragraph, sentence, or clause of this bylaw or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this bylaw.

RULES & REGULATIONS FOR STORMWATER MANAGEMENT

(Approved by Select Board on October 19, 2021)

UNDER THE GENERAL BYLAWS OF THE TOWN OF STOUGHTON, CHAPTER 159: STORMWATER MANAGEMENT BYLAW

(Stormwater Management Bylaw adopted at 2021 Annual Town Meeting)

1.0 PURPOSE

The purpose of these Regulations is to protect, maintain and enhance the public health, safety, environment and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased construction SITE and POST-DEVELOPMENT stormwater RUNOFF, decreased groundwater RECHARGE, and NONPOINT SOURCE pollution associated with NEW DEVELOPMENT and REDEVELOPMENT, as more specifically addressed in the Stormwater Management Bylaw of the Town of Stoughton.

2.0 DEFINITIONS

Terms defined herein and in the Bylaw are shown in all CAPITAL LETTERS. The definitions contained herein apply to issuance of a STORMWATER PERMIT established by the Town of Stoughton Stormwater Management Bylaw and implemented through these Regulations. Terms not defined in this section, in the Bylaw, or in the Massachusetts Wetlands Regulations shall be construed according to their customary and usual meaning.

The following terms are defined in the Massachusetts Wetlands Regulations (310 CMR 10.00): Cold-water fishery, Critical areas, environmentally sensitive SITE design, Flood control, ground water, Illicit discharge, Land uses with higher potential pollutant loads, LOW IMPACT DEVELOPMENT (LID) TECHNIQUES, Maintenance of a stormwater management system, REDEVELOPMENT, STORMWATER BEST MANAGEMENT PRACTICE, Stormwater management system, Surface waters, and Vernal pool habitat.

The following terms are *in addition to* the terms defined in Chapter 159 of the Stoughton General Bylaw.

FLOODING: A local and temporary inundation or a rise in the surface of a body of water, such that it covers land not usually under water.

IMPAIRED WATERS: According to EPA, Impaired Waters are waterbodies that do not meet one or more of its designated uses(s) in the applicable surface water quality standards. These waterbodies are listed in categories 4 and 5 of the most recent Massachusetts Integrated List of Waters. See the Massachusetts Department of Environmental Protection website for the most recent Integrated List of Waters.

IMPERVIOUS SURFACE or IMPERVIOUS COVER (IC) or IMPERVIOUS AREA (IA): Any material or structure on or above the ground that prevents water from infiltrating through the underlying soil. Impervious surface is defined to include, but is not limited to: paved surfaces (parking lots, sidewalks, driveways), roof tops, swimming pools, patios, and paved, gravel and compacted dirt surfaced roads.

INVASIVE SPECIES: Those plant species whose introduction does, or is likely to, cause economic or environmental harm or harm to human health. For the purpose of this bylaw, a plant species is considered “invasive" only when it occurs on the List of Federal Noxious Weeds (available on the U.S. Department of Agriculture Natural Resources Conservation Service website) or on the Massachusetts Prohibited Plant List (available on the Massachusetts Department of Agricultural Resources website).

INFILTRATION: The act of conveying surface water into the ground to permit groundwater RECHARGE and the reduction of stormwater RUNOFF from a project SITE.

MASSACHUSETTS STORMWATER HANDBOOK (HANDBOOK): The Stormwater Handbook, and as amended from time to time, that was produced by MassDEP to be used as guidance for controlling stormwater. Implementation of the STORMWATER MANAGEMENT STANDARDS shall be in accordance with the Stormwater Handbook.

NEW DEVELOPMENT: Any construction or LAND DISTURBANCE on a parcel of land that is currently in a natural vegetated state and does not contain alteration by man-made activities.

OWNER: An individual, firm, association, syndicate, partnership, or corporation having sufficient proprietary interest to seek development of land.

PERSON: Any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the Commonwealth or political subdivision thereof to the extent subject to Town Bylaws, codes, administrative agency, public or quasi-public corporation or body, the Town of Stoughton, and any other legal entity, its legal representatives, agents, or assigns.

PRE-DEVELOPMENT: The conditions that exist at the time that plans for the land development of a tract of land are submitted to the Engineering Department. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the existing conditions at the time prior to the first plan submission shall establish pre-development conditions.

POST-DEVELOPMENT: The conditions that reasonably may be expected or anticipated to exist after completion of the land development activity on a specific SITE or tract of land. Post-development refers to the phase of a NEW DEVELOPMENT or REDEVELOPMENT project after completion of construction, and does not refer to the construction phase of a project.

RECHARGE: The replenishment of underground water reserves.

RESOURCE AREA: Any area protected under, including without limitation: the Massachusetts Wetlands Protection Act, Massachusetts Rivers Act, or Town of Stoughton Wetlands Protection Bylaw.

RUNOFF: Rainfall or snowmelt flowing over the ground surface.

SEDIMENTATION: A process of depositing material that has been suspended and transported in water.

SITE: The parcel of land being developed, or a designated planning area in which the land development project is located.

STOP WORK ORDER: An order issued by the Planning Board or its designee which requires that all construction activity on a site be stopped.

SUBDIVISION: Defined in the Subdivision Control Law of Massachusetts (M.G.L. – Chapter 41, Section 81L Definitions).

TOTAL MAXIMUM DAILY LOAD (TMDL): The greatest amount of a pollutant that a water body can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. A TMDL is implemented by specifying how much of that pollutant can come from point, nonpoint, and natural sources. See section 303(d) of the Clean Water Act and 40 CFR §130.2 and §130.7.

WATER QUALITY VOLUME (WQ_v): The storage volume needed to capture a specified average annual stormwater RUNOFF volume. Numerically (WQv) will vary as a function of drainage area or IMPERVIOUS AREA.

3.0 AUTHORITY

A) The Rules and Regulations contained herein have been adopted by the Select Board in accordance with the Town of Stoughton Stormwater Management Bylaw.

B) Nothing in these Rules and Regulations is intended to replace or be in derogation of the requirements of the Town of Stoughton Zoning Bylaw, Subdivision Rules and Regulations, Wetlands Protection Bylaw, Board of Health Bylaws, or any Rules and Regulations adopted there under.

C) These Stormwater Regulations may be periodically amended by the Select Board in accordance with the procedures outlined in Section 159.5 (B) of the Town of Stoughton Stormwater Management Bylaw.

4.0 ADMINISTRATION

The Select Board is designated as the STORMWATER AUTHORITY under the Stormwater Management Bylaw. The Board shall administer, implement and enforce these Regulations. The Board may designate the Town Engineer or an outside consultant as its designee for the purposes of reviewing all stormwater submittals and conducting inspections described in Section 10.0.

5.0 APPLICABILITY

A) These Stormwater Management Regulations apply to all activities in accordance with the Scope and Applicability of Section 159.4 of the Stormwater Management Bylaw as described in this section. No Town Earth Removal Permit, Order of Conditions from the Conservation Commission, Site Plan approval from the Planning Board, Building Permit, Subdivision approval, Special Permit, variance or finding shall constitute compliance with this bylaw, unless issuance of such permit included review by the Engineering Department or Town Consultants on behalf of the Board of Selectmen relative to the Stormwater Management Bylaw.

Projects and/or activities not specifically under the currently regulated jurisdiction of any of the Town of Stoughton boards, commissions or departments but still within the jurisdiction of the Town of Stoughton Stormwater Management Bylaw must obtain a STORMWATER PERMIT from the Engineering Department in accordance with the permit procedures and requirements defined in Section 6.0 of these Regulations. Projects not requiring regulatory approval from other boards, departments, or commissions will undergo administrative review through the Town of Stoughton Engineering Department.

B) If a portion of a project or activity meets the Scope and Applicability of Section 159.4 of the Stormwater Management Bylaw and it is within the specific jurisdiction of another Town board, then the Select Board will remain the STORMWATER AUTHORITY, responsible for facilitating stormwater review and approval of the STORMWATER PERMIT. The specific application submission requirements, public notices, and fee requirements of the applicable board, commission, and/or department shall remain in effect in addition to the requirements of the Stormwater Management Bylaw. To the extent possible, the Select Board and other Town boards shall coordinate any necessary expert engineering and other consultant services. No SITE ALTERING activity may commence without a STORMWATER PERMIT issued by the Select Board (issued by the Stoughton Engineering Department).

6.0 PERMIT PROCEDURES AND REQUIREMENTS

A) Projects requiring a STORMWATER PERMIT per Section 159.4 of the Stormwater Management Bylaw shall be required to submit the materials as specified in this Section, and are required to meet the Performance Standards: Stormwater and LID Criteria as specified in Section 7.0 of these Regulations.

B) Filing Application

1. The applicant shall file with the approving Board, Commission, and Engineering Department, ten (10) copies and one (1) digital copy in Portable Document Format (PDF) of a completed application package for a STORMWATER PERMIT. While the applicant can be a representative, the permittee must be the OWNER of the SITE or holder of an easement. The Stormwater Management application package shall include:

    a) A completed Application Form with original signatures of all OWNERS;
    b) Stormwater Report to document compliance with the STORMWATER MANAGEMENT STANDARDS and all additional requirements specifically described in these Regulations;
    c) Payment of the application fee; and
    d) Draft Operation & Maintenance Agreement.
    e) Draft Stormwater Pollution Prevention Plan (SWPPP).

C) Filing Fees

1. General. A non-refundable application fee shall be due and payable to the Town of Stoughton at the time an application is filed. The application fee will be used for processing of the application, coordination of Town staff, posting hearings, inspections by Town staff and other expenses connected with the review of the application by Town staff.

2. Rules

    a) Stormwater Permit Application and Review Fees are non-refundable. All fees shall be calculated by the Engineering Department in accordance with the fee schedule in Table 1 below.
    b) These fees are in addition to any other local or state fees that may be charged under any other law, regulation, or local Bylaw.
    c) Federal, State, and Municipal projects shall be exempt from Application Fees associated with a STORMWATER PERMIT.
    d) The fee includes two follow-up reviews for plan and document revisions.
    e) The fees denoted below shall not be used to calculate review fees for outside consultants. Additional review fees may be charged to cover outside professional consultant review services for a project if the Town Engineer determines that such services are necessary due to the scope and complexity of the project.
    a) Filing Fees will be deposited into the Stormwater Revolving Fund.

Table 1: Filing Fee Schedule for Stormwater Permits

Application Type	Fee
Disturbance area is 1.0 to 2.0 acres	$1,000
Disturbance area is 2.0 to 5 acres	$1,500
Disturbance area is 5.0 to 10.0 acres	$2,000
Disturbance area of 10.0 acres or more	$2,500

3. Revision of Fee Schedules and Regulations Governing Fees

   a) The Select Board may review and revise its Regulations and fee schedules periodically at its discretion.

   b) Amendments to these Regulations shall be preceded by a posted public hearing of the Select Board not less than 15 days prior to the date upon which the change is to be effective.

   c) A copy of the written decision of revised Regulations and/or fee schedules will be filed with the Town Clerk within 12 business days after final action by the Board is taken.

4. Revolving Fund for consultant Services. The Select Board may, at its discretion, require deposit of funds into a revolving fund in accordance with Chapter 44 Section 53E ½ to pay for peer review of projects. Generally, such projects are more complicated and require extensive review; however, the Board may also consider such peer review upon the recommendation of the Town Engineer. The Select Board will strive to make such reviews concurrent with other permits being sought by the applicant, and not duplicate efforts of peer reviewers.

D) Public Hearings and Meetings

1. For projects or activities within the currently regulated jurisdiction of Town Boards and Commissions (including but not limited to projects requiring Site Plan Review through the Planning Board, Subdivision, Special Permit, or an Order of Conditions through the Conservation Commission), the Engineering Department shall review the STORMWATER PERMIT concurrently with other permits in order to streamline the review process for the applicant.

2. For projects that are not otherwise subject to review by Town Boards and Commissions, a STORMWATER PERMIT application shall be reviewed administratively by the Engineering Department within thirty (30) days of the receipt of a complete application. The Engineering Department may continue its consideration of the application to a further date, in order to receive additional information as deemed necessary. Failure of the Engineering Department to take final action within thirty (30) days shall not result in constructive approval of the application. The BOARD shall be notified of all STORMWATER PERMIT applications that have been received.

E) Plan Changes

The permittee must notify the Engineering Department or its designee in writing of any drainage change or alteration in the system authorized in a STORMWATER PERMIT before any change or alteration is made. If the Engineering Department or its designee determines in writing that the change or alteration is significant, based on the STORMWATER MANAGEMENT STANDARDS, Performance Standards in Section 7.0, and accepted construction practices, the Engineering Department may require that an amended application be filed. A change will be required when 25% of the land area of the previously approved project plans are revised, OR, any changes are made to the stormwater system including any stormwater BMPs.

F) Entry

To the extent permitted by state law, or if authorized by the OWNER or other party in control of the property, Board or its designee, officers, and employees may enter upon privately owned property for the purpose of performing their duties under the Stormwater Management Bylaw and these Regulations and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary to determine compliance with the permit.

G) Project Completion

At completion of construction of the project, the permittee shall submit as-built record drawings of all structural best management practices required in the STORMWATER PERMIT and an updated Maintenance Agreement noting any changes and new responsible parties. As-built Plans shall be full size plans at a scale approved by the Planning Board that reflect the "as built" conditions, including all final grades, as determined by a Registered Land Surveyor. Topographic information shall be collected for all of the surface stormwater management features including contours of stormwater basins, top of berm elevations, outlet control elevations, etc. All changes to project design shall be bubbled on plans to define changes made or otherwise noted as changes. All work deleted, corrections in elevations, and changes in materials, shall be shown on the as-built drawings. Deviations from the approved plans, if any, shall be certified in writing by a Registered Professional Engineer. As-built plans shall be submitted within two years of the completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage stormwater generated by the site. The applicant shall also submit as-built drainage calculations using the information collected by the as-built drawings to insure that the proposed stormwater BMP's have been constructed consistent with the approved design.

Surveyed latitude and longitude position of all structural STORMWATER BEST MANAGEMENT PRACTICES, including drainage structures, conveyances, outfalls, catch basins, curbing and headwalls compatible with Stoughton's Geographic Information System (GIS) shall be submitted digitally to the Engineering Department. Record drawings shall also include a calculation of IMPERVIOUS AREA (IA) and DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA) in square feet (ft^2) for pre-

and post-development conditions. Additional requirements for as- built plans are in the Stoughton Subdivision Rules and Regulations.

H) Permit Expiration

If work has not been completed within three (3) years, the Applicant shall notify the Engineering Department. The Board may re-evaluate the originally approved STORMWATER PERMIT to determine whether the plan still satisfies local program requirements. Permits may be extended by the Engineering Department. If the Engineering Department finds the previously filed Plan to be inadequate, a modified plan shall be submitted and approved prior to the commencement or continuation of land- disturbing activities per the procedure in Section 6.0 of these Regulations.

I) Stormwater Report Contents

1. The application for a STORMWATER PERMIT shall include the submittal of a Stormwater Report to the Applicable Board, Commission, or Engineering Department prepared in accordance with the MASSACHUSETTS STORMWATER HANDBOOK and the criteria established in these Regulations. This Stormwater Report shall document compliance with each of the STORMWATER MANAGEMENT STANDARDS as provided in the HANDBOOK as well as the performance standards as described in Section 7.0 and shall contain sufficient information for the Engineering Department to evaluate the environmental impact, effectiveness, and acceptability of the SITE planning process and the measures proposed by the applicant for reducing adverse impacts from stormwater RUNOFF. The Stormwater Report shall remain on file with the Engineering Department.

2. The Stormwater Report shall fully describe the project in drawings, narrative, and calculations. To demonstrate compliance with these Regulations to the Engineering Department, the applicant shall include the following in addition to the Stormwater Report requirements in the HANDBOOK:

   a) Locus Map;
   b) Existing Conditions SITE Plan. Stamped by a Registered Land Surveyor including existing topography, wetlands resources (if any), special flood zones or 100-year flood plain, topography at 1-foot contours, site detail, utilities;
   c) The existing zoning, and land use at the SITE and abutting properties;
   d) A proposed condition SITE Plan including the layout of the project, proposed buildings, parking areas, sidewalks, driveways, etc.;
   e) Description of proposed Low Impact Development and green infrastructure best management practices
   f) The location(s) of existing and proposed easements;
   g) The location of existing and proposed utilities;
   h) The SITE's existing & proposed topography with contours at 1-foot intervals;
   i) The existing SITE stormwater flow patterns including surface flows and any existing subsurface conveyance or RECHARGE facilities);
   j) Information regarding whether the site is located in a watershed that drains

to an impaired water.

k) A written description and delineation of existing stormwater conveyances, impoundments, wetlands, drinking water protection areas, swimming beaches, and other protected RESOURCE AREAs, on or adjacent to the SITE or into which stormwater flows;
l) A delineation of 100-year flood plains, if applicable;
m) The existing and proposed vegetation and ground surfaces with RUNOFF coefficients for each; (including all IMPERVIOUS COVER – parking, driveways, etc.)
n) A drainage area map showing pre- and post-construction watershed boundaries (as governed by topography, not the property line), drainage areas, time of concentration (tc) path, and stormwater flow paths, including MUNICIPAL STORM DRAIN SYSTEM flows;
o) A description and drawings of all components of the proposed Stormwater Management system including:
    i. All measures for the collection, detention, retention, treatment or INFILTRATION of water;
    ii. Description of non-structural BMPs;
    iii. All measures for the protection of water quality;
    iv. The structural details for all components of the proposed drainage systems and Stormwater Management facilities;
    v. Notes on drawings specifying materials to be used, construction specifications, and expected hydrology with supporting calculations;
    vi. Proposed SITE plan including location of buildings or other structures, impervious surfaces, and drainage facilities, if applicable;
    vii. Any other information requested by the Board.
p) Hydrologic and hydraulic design calculations for the PRE-DEVELOPMENT and POST-DEVELOPMENT conditions for the design storms specified in the MASSACHUSETTS STORMWATER HANDBOOK. Such calculations shall include:
    i. Description of the design storm frequency, intensity and duration as required by the most current version of the MASSACHUSETTS STORMWATER HANDBOOK;
    ii. Time of concentration;
    iii. Soil Runoff Curve Number (RCN) based on land use and soil hydrologic group;
    iv. Peak RUNOFF rates and total RUNOFF volumes for each watershed area;
    v. Provisions for protecting, during construction, the INFILTRATION capacity of the soil where INFILTRATION is proposed;
    vi. Culvert capacities;
    vii. Flow velocities;
    viii. Data on the change in stormwater rates and volume of RUNOFF for the specified design storms,
    ix. Documentation of sources for all computation methods and field test results.
    x. Sizing calculations for all stormwater Best Management Practices indicating required and proposed BMP sizing.
    xi. Soil test pits at locations consistent with the requirements of the

Standards. All test pits should include estimated seasonal high groundwater elevations as determined using soil mottles, Frimpter, or another suitable method, as well as soil INFILTRATION rates Stormwater Management checklist as described in the Standards

q) Landscaping Plan describing the woody and herbaceous vegetative stabilization and management techniques to be used within and adjacent to the stormwater practice.

r) An Erosion and Sedimentation Control Plan consistent with the requirements of the Massachusetts Standards including the following:
   i. Minimizing land disturbance
   ii. Site perimeter controls
   iii. Slope stabilization
   iv. Stabilized construction site entrances and exits to prevent off-site tracking of sediment
   v. Storm drain inlet protection
   vi. Temporary sedimentation basins
   vii. Locations of proposed waste control including discarded building materials, concrete truck wash out areas, chemicals, litter, and sanitary wastes. These areas are prohibited from discharging to the MS4.
   viii. Appropriate erosion and sedimentation control notes including notes that require that no land clearing is to be undertaken prior to installation of erosion and sedimentation control measures
   ix. Operations plan for the construction site
   x. Planned temporary Best Management Practices
   xi. Site stabilization following construction
   xii. Inspection of stormwater controls at regular intervals

3. If, in the applicant's opinion, one or more of the Stormwater Management Standards or other requirements cannot be reasonably met, the applicant shall provide a detailed explanation in the Stormwater Report. This narrative shall include reasons that the requirement or Standard could not be met and a description of potential consequences if no mitigating measures are provided.

J) Operations & Maintenance Agreement

The Maintenance Agreement shall include the signature(s) of the OWNER(s) and the party or parties responsible for operation and maintenance as specified in the STORMWATER PERMIT and party or parties responsible for perpetual inspections as specified under Section 12.B of these Regulations. The Maintenance Agreement shall include a map showing the "as-built" location of the systems and facilities including all structural and nonstructural stormwater best management practices (BMPs), low impact design best management practices, catch basins, manholes/access lids, pipes, and other stormwater devices. The Maintenance Agreement and plan showing such systems and facilities to be privately maintained, including associated easements shall be recorded, by the OWNER with the Norfolk County Registry of Deeds as conditioned in the STORMWATER PERMIT. Evidence of recording shall be presented to the Engineering Department prior to the issuance of the Town's final approval. The Operations & Maintenance agreement will require the annual submission of all

Operations and Maintenance Reports to the Town of Stoughton Engineering Department.

7.0 PERFORMANCE STANDARDS: STORMWATER AND LID CRITERIA

A) For compliance with Performance Standards of these Regulations, the applicant must meet all standards of the Massachusetts Department of Environmental Protection's STORMWATER MANAGEMENT STANDARDS and HANDBOOK using current Best Management Practices (BMPs) as well as the additional design criteria specified below.

B) Additional Design Criteria

1. Low Impact Design (LID) site planning and stormwater design strategies must be used to the maximum extent practicable. Specific strategies and BMPs to be considered include - but are not limited to – reducing or minimizing impervious surfaces, incorporating stormwater management facilities into landscape islands, bioretention basins, grass and surface swales, infiltrative basins and chambers, pervious pavers, etc. A decentralized approach to stormwater management, including installing different BMP's throughout the site, should be included. Traditional collect and convey systems should be minimized. In the event that LID site design strategies and BMPs are not proposed, the applicant should provide a narrative describing why these facilities cannot be incorporated into the site design.

2. Landscape Design

   SITE plans and landscape plans for all proposed projects must take appropriate steps to minimize water use for irrigation and to allow for natural RECHARGE of groundwater. Native species and habitat-creating species shall be used in all landscape plans to the maximum extent possible as SITE conditions allow. INVASIVE SPECIES shall not be planted in the Town of Stoughton under any circumstances.

   Low Impact Development surface BMP's should include a landscape plan that includes appropriate plantings. It is the intent of these Regulations that surface stormwater BMP's be incorporated into the landscape to the maximum extent practicable and not simply be shallow grassed depressions used to collect, infiltrate and/or store water.

3. Hydrologic Basis for Design

   For stormwater facility sizing criteria, refer to DEP Stormwater Management Regulations & Handbook and engineering practices. In addition to the requirements described in the DEP Stormwater Management Regulations & Handbook, the following performance standards apply to NEW developments:

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

b) Remove 90% of the annual Total Suspended Solids (TSS) generated from the total post-construction impervious area on site AND 60% of the average annual load of Total Phosphorus(TP) generated from the total post-construction impervious area on site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool.

4. For REDEVELOPMENT Projects, the following performance standards apply:

   a) Retain the volume of runoff equivalent to, or greater than, .80 inch multiplied by the total post-construction impervious surface areas on the site;
   b) Remove 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site and 50% of the annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool.
   c) Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems where feasible) are exempt from section 4a-c above. Roadway widening or improvements that increase the amount of impervious area on a redevelopment site are required to comply with the requirements described above.

5. Sensitive Areas – Additional Design Criteria

   Stormwater discharges to Critical Areas with sensitive resources as defined in the Massachusetts STORMWATER MANAGEMENT STANDARD No. 6 are subject to additional criteria, and may need to utilize or restrict certain STORMWATER MANAGEMENT practices at the discretion of the Board. The Board has also designated the following Sensitive Areas with specific design criteria. The Board may designate additional Sensitive Areas and specific criteria for these areas by amending these Regulations.

   1. Discharges to Water Quality Impaired Waters
      The applicant must determine whether stormwater discharges from the proposed SITE will contribute, either directly or indirectly, to an IMPAIRED WATER body. Structural and non-structural BMPs shall be selected that will control the discharge of the pollutants of concern and ensure that the discharges will not cause an instream exceedance of applicable water quality standards. Pollutants of concern refer to the pollutant identified as causing the impairment. For more information on impaired waters and the most recent Integrated List of Impaired Waterbodies, see MassDEP's TMDL website.
      a) Ames Long Pond – Turbidity
      b) Bolivar Pond – Turbidity
      c) Unnamed Tributary (MA73-32) – E.coli & Phosphorus
      d) Taunton River Watershed – Nitrogen
      e) Beaver Meadow Brook (MA73-20) – E.coli
      f) Steep Hill Brook (MA73-18)
   2. Projects that are located within a Sensitive Area or watershed that contributes

to a water body that is impaired for phosphorus shall include structural BMPs that are optimized for phosphorus removal. The applicant shall document the estimated phosphorus removal.

3. Projects that are located within a Sensitive Area or watershed that contributes to a water body that is impaired for nitrogen shall include structural BMPs that are optimized for nitrogen removal. The applicant shall document the estimated nitrogen removal.

8.0 WAIVERS

A) The Board may in its discretion and after due considerations decide to waive and exempt strict compliance with any requirement of the Stormwater Management Bylaw and these Regulations, where it makes a written finding that such action is:

1. Allowed by federal, state and local statutes and/or regulations;
2. In the public interest; and
3. Consistent with the purpose and intent of the Town of Stoughton Stormwater Management Bylaw and these Regulations.

B) An applicant may submit a written request to be granted such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that strict application of the Bylaw does not further the purposes or objectives of the Bylaw.

C) Waivers described herein shall not constitute an exemption from any applicable Federal or State permitting requirements.

9.0 CONSTRUCTION INSPECTIONS

A) NOTICE OF CONSTRUCTION COMMENCEMENT

The applicant must notify the Engineering Department or its designee not less than 14 days prior to the commencement of construction and schedule a pre-construction meeting. In addition, the applicant must notify the Engineering Department or its designee 48 hours in advance of construction of critical components of any stormwater management facility. At this time, the applicant should produce a copy of the final Stormwater Pollution Prevention Plan as well as evidence that the project has a filed a Notice of Intent with the United States Environmental Protection Agency under the National Pollutant Discharge Elimination System Construction General Permit.

B) At the discretion of the Engineering Department, periodic inspections of the stormwater management system construction shall be conducted by qualified personnel (a Town Officer, a professional engineer, or their designee who has been approved by the Engineering Department). All inspections shall be documented and written reports prepared that contain the following information:

1. The date and location of the inspection as well as weather conditions;
2. Names, titles, and qualifications of personnel making the inspection;
3. Whether construction is in compliance with the approved STORMWATER PERMIT;
4. Variations from the approved construction specifications; and
5. Any other variations or violations of the conditions of the approved STORMWATER PERMIT.

C) EROSION CONTROL INSPECTION

1. If a project is covered by the EPA NPDES General Permit for Stormwater Discharges from Construction Activities (Construction General Permit), the permittee is required to conduct inspections in accordance with requirements of the Construction General Permit, and must submit reports of all inspections required thereunder to the Engineering Department.
2. If a project is <u>not</u> covered by the Construction General Permit, to ensure EROSION CONTROL practices are in accordance with the STORMWATER PERMIT, EROSION CONTROL Inspections will be conducted by the OWNER or an authorized representative at least once every seven (7) calendar days from the start of construction until the SITE is permanently stabilized. Inspection frequency may be reduced to at least once a month if the SITE is determined by the Board or its designee to be temporarily stabilized, such as RUNOFF is unlikely due to winter conditions (e.g., SITE is covered with snow, ice, or the ground is frozen, site is covered with mulch, stone, etc.). The permittee is required to notify the Select Board or its designee of any change in inspection frequency, including termination of inspections due to SITE stabilization.

    a. The inspection form will include:
        i. Date of inspection
        ii. Name, title, qualifications, and signature of inspector;
        iii. Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
        iv. Weather information and a description of any discharges occurring at the time of the inspection
        v. Location(s) of discharges of sediment or other pollutants from the SITE;
        vi. Location(s) of BMPs that need to be maintained;
        vii. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
        viii. Location(s) where additional BMPs are needed that did not exist at prior inspection; and
        ix. Corrective action required including any changes to the STORMWATER

PERMIT necessary and implementation dates.

D) INSPECTION SCHEDULE

The Engineering Department or its designee shall inspect the project SITE at the following stages, at a minimum:

1. Initial SITE Inspection: prior to approval of any plan;

2. Inspection of site following installation of erosion and sedimentation control measures and prior to any clearing. All erosion and sedimentation control practices must be installed prior to any land clearing activities.

3. Inspection of the excavation for any infiltration facilities prior to the installation of any of the facility components (i.e. stone, pipe, chambers, etc.) to insure that adequate soil conditions exist consistent with the approved plans.

4. Stormwater Management System Inspection: An inspection will be made of the completed stormwater management system, prior to backfilling of any underground drainage or stormwater conveyance structures.

5. Final Inspection

   a) After the stormwater management system has been constructed and stabilized, all applicants are required to submit actual "as built" plans for any stormwater management facilities or practices after final construction is completed and must be certified by a Professional Engineer. As-built plans must be submitted within two years of completion of construction.
   b) The Engineering Department or its designee shall inspect the system to confirm its "as- built" features.
   c) A copy of the Construction General Permit Notice of Termination (NOT) (required by the EPA within 30 days after land disturbance has ceased and the site is stabilized; with seventy percent (70%) permanent vegetation coverage or 70% permanent erosion and sediment controls installed) shall be submitted with the As-built.
   d) An Illicit Discharge Compliance Statement shall be submitted by the permittee's Technical Representative and Registered Professional Engineer to verify that no illicit discharges exist on the site. For redevelopment projects, the Illicit Discharge Compliance Statement shall also document all actions taken to identify and remove illicit discharges, including, without limitation, visual screening, dye or smoke testing, and the removal of any sources of illicit discharges to the stormwater management system.
   e) The permittee's Technical Representative and Registered Professional Engineer shall evaluate the effectiveness of the stormwater best management practices (BMPs) during an actual storm and document the findings. The Final Report shall also include certification from the Applicant's Technical Representative as to the effectiveness of the installed system during storm

events.

E) INADEQUACY OF SYSTEM

1. If the system is found to be inadequate by virtue of physical evidence of operational failure, even though it was built in accordance with the STORMWATER PERMIT, it shall be corrected by the applicant at the applicant's cost.

2. If the Engineering Department or its designee determines that there is a failure to comply with the plan, the OWNER shall be notified in writing of the nature of the violation and the required corrective actions. The Engineering Department or its designee shall issue a STOP WORK ORDER until any violations are corrected and all work previously completed has received approval by the Engineering Department or its designee.

10.0 CONTINUING INSPECTION AND MAINTENANCE REQUIREMENTS

A) Maintenance Responsibility

The Town of Stoughton will not accept ownership of stormwater BMPs located outside of street rights of way, Town easements, or Town Parcels of land. The maintenance of such facilities shall remain the permanent responsibility of the applicant or his successors and/or assigns. The OWNER of the property on which work has been done pursuant to these Regulations for private stormwater management facilities, or any other PERSON or agent in control of such property, shall maintain in good condition and promptly repair and restore all grade surfaces, walls, drains, dams and structures, vegetation, erosion and SEDIMENTATION controls, and other protective devices. Such repairs or restoration and maintenance shall be in accordance with approved plans. When a project is a Definitive Subdivision, it is responsibility of the developer to maintain the stormwater system until the Subdivision is accepted by the Town. In the event a homeowner's association is created to maintain the subdivision, it will be the responsibility of the homeowner's association to maintain the stormwater management system.

B) Maintenance Inspections

1. Stormwater management facilities and practices included in the LAND DISTURBANCE PERMIT with a Maintenance Agreement in accordance with Section 6.K of these Regulations must undergo regular ongoing inspections to document maintenance, repair, replacement and disposal needs and ensure compliance with the requirements of the agreement, these Regulations, and the MASSACHUSETTS STORMWATER HANDBOOK.

2. A Maintenance Agreement as specified under Section 6.K of these Regulations between the OWNER and the Board shall be executed for privately-owned stormwater management systems that specify the PERSON for conducting long term inspections.

3. At a minimum, inspections shall occur consistent with the Operation and Maintenance requirements outlined in each project's STORMWATER PERMIT application. All BMPs require –at a minimum – annual maintenance. Some BMPs may require more frequent inspection, as specified in the STORMWATER PERMIT.

4. Inspection reports shall be submitted to the Engineering Department for all stormwater management systems. Inspection reports for stormwater management systems shall include at a minimum:

    a) The date of inspection;
    b) Weather conditions, including temperature and precipitation, if any;
    c) Name and signature of inspector;
    d) The condition of:
        i. Pretreatment devices
        ii. Vegetation or filter media
        iii. Fences or other safety devices
        iv. Spillways, valves, or other control structures
        v. Embankments, slopes, and safety benches
        vi. Reservoir or treatment areas
        vii. Inlet and outlet channels and structures
        viii. Underground drainage
        ix. Sediment and debris accumulation in storage and fore bay areas (including catch basins)
        x. Any nonstructural practices
        xi. Any other item that could affect the proper function of the stormwater management system
    e) Description of the need for maintenance.
    f) In the event that maintenance activities are performed by a private contractor, a copy of the contract or agreement to provide the maintenance.

C) Right-of-Entry for Inspection

The terms of the Maintenance Agreement as specified in Section 6.K of these Regulations shall provide for the Engineering Department or its designee to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.

D) Records of Inspections, Maintenance, Repair, Replacement and Operations
OWNERs are responsible for the operation and maintenance of a stormwater management facility shall prepare records of the installation and of all inspections, maintenance, repairs, replacement, and disposal activities, and shall retain the records for at least five years. These records shall be submitted to the Engineering Department annually, at a minimum, and upon request. For disposal, the record must indicate the type of material, quantity of material, and disposal location.

E) Failure to Maintain

1. If the OWNER fails or refuses to meet the requirements of the Maintenance

Agreement, the Engineering Department, after 30 days' written notice (except, that in the event the violation constitutes an immediate danger to public health or public safety, 24-hour notice shall be sufficient), may correct a violation of the design standards or maintenance requirements by performing the necessary work to place the facility or practice in proper working condition. The Engineering Department may assess the OWNER(s) of the facility for the cost of repair work, which shall be a lien on the property.

2. After notification is provided to the PERSON responsible for carrying out the maintenance plan of any deficiencies discovered from an inspection of a stormwater management system, the PERSON responsible for carrying out the maintenance plan shall have 30 days or other time frame mutually agreed to between the Engineering Department and the PERSON responsible for carrying out the maintenance plan to correct the deficiencies. The Engineering Department shall then conduct a subsequent inspection to ensure completion of repairs.

11.0 ILLICIT DISCHARGES

Any property owner or party, who illegally discharges non-stormwater pollutants, including sanitary sewer discharges, as described in the Stormwater Management Bylaw, Section 159, must eliminate discharges to the MS4 system within 60 days of identification.

12.0 ENFORCEMENT

A) Enforcement powers of the Select Board or its designee are granted in the Stormwater Management Bylaw, Section 159.9.

B) Notices and Orders

1. The Select Board or an authorized agent of the Select Board may issue a written notice of violation or enforcement order to enforce the provisions of the Stormwater Management Bylaw and these Regulations, which may include:

   a) Elimination of illicit connections or discharges to the MS4;
   b) That unlawful discharges, practices, or operations shall cease and desist;
   c) Remediation of contamination in connection therewith;
   d) Suspension or revoke of approval of any STORMWATER PERMIT;
   e) Cease and desist from all or a portion of construction or land disturbing activity until there is compliance with the Bylaw and the STORMWATER PERMIT;
   f) Repair, maintain, or replace the stormwater management system or portions thereof in accordance with the Maintenance Agreement;
   g) Perform monitoring, analyses, and reporting; and/or
   h) Fix adverse impact resulting directly or indirectly from malfunction of the stormwater management system.

2. The suspension or revocation of the STORMWATER PERMIT shall not relieve the Applicant of his obligation thereunder except at the discretion of the Board.

C) Any PERSON who purchases, inherits or otherwise acquires real estate upon which work has been done in violation of the provisions of the Stormwater Management Bylaw and these Regulations, or in violation of the approved Plans under this Section shall forthwith comply with any such Order, and restore such real estate to its condition prior to such violation, as the applicable Board, Commission, or Engineering Department deems necessary to remedy such violation.

D) Criminal Violation. Any PERSON who violates any provision of the Town of Stoughton Stormwater Management Bylaw, these Regulations, or order or permit issued thereunder, may be ordered to correct the violation and/or shall be punished by a fine of not more than $300.00, excluding the cost of damages. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

E) Non-Criminal Disposition. As an alternative to criminal prosecution or civil action, the Town of Stoughton may elect to utilize the non-criminal disposition procedure set forth in G.L. Ch. 40, §21D and the Town of Stoughton General Bylaws Chapter 1.2 A in which case the Board shall be the enforcing PERSON. The provisions of the General Bylaws Chapter 1.2 A as to the monetary penalties shall prevail. The penalty for the 1st violation shall be $100.00. The penalty for the 2nd and subsequent violations shall be $300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

F) Entry to Perform Duties Under these Regulations. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Board, its agents, officers and employees may enter upon privately owned property for the purpose of performing their duties under these Regulations and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary.

G) Appeals. The decisions or orders of the Board shall be final. Further relief shall be to a court of competent jurisdiction.

H) Remedies Not Exclusive. The remedies listed in these Regulations are not exclusive of any other remedies available under any applicable federal, state or local law.

13.0 SEVERABILITY

The invalidity of any section, provision, paragraph, sentence, or clause of these Regulations shall not invalidate any section, provision, paragraph, sentence, or clause thereof, nor shall it invalidate any permit or determination that previously has been issued.

APPENDIX A

SUMMARY OF STORMWATER PERMIT PROCESS

STORMWATER PERMIT PROCESS
Permit Authority
Stoughton Select Board
⇩
Applicability
Land Development Projects with greater than 1 acre of Land Disturbance (i.e. commercial site plans, subdivisions, etc.)
⇩
Permit Requirements
Application
Filing Fee
Site Plans
Description of Low Impact Design Measures
Stormwater Report demonstrating compliance with MA Stormwater Management Standards and Massachusetts MS4 performance standards)
Operation and Maintenance Plan
Erosion & Sediment Control Plan
Stormwater Pollution Prevention Plan (SWPPP)
⇩
Public Hearings and Meetings
Permit is reviewed by the Enginering Department during public hearings and/or meetings through the Planning Board and/or Conservation Commission
All projects reviewed by Stoughton Engineering Department
⇩
Stormwater Inspections
Erosion Controls installed prior to construction
Erosion Controls inspected weekly by Owner representative
Infiltration facilities bottom inspection prior to component install (Open Hole)
Stormwater Management System component inspection prior to backfill
Final Inspection and As-built Review
⇩
Final Approval
Illicit Discharge Compliance Statement submittal
Final Certification of Design Engineer
Final review and approval of Town Engineer

APPENDIX B

STORMWATER PERMIT APPLICATION

STOUGHTON
MASSACHUSETTS

Stormwater Management Permit Application

Permit Applicability

How much New Impervious Area (square feet) will result from the Project?	How much Disturbed Land Area will result from the Project?

Town Engineer's Approval as to Applicability: Y/N _____ Signature:

Property Owner Information:

Name		**Signature**	
Address		**City, State, Zip**	
Email		**Phone**	

Applicant Information:

Name		**Signature**	
Address		**City, State, Zip**	
Email		**Phone**	

Applicant Representative:

Name		**Signature**	
Address		**City, State, Zip**	
Email		**Phone**	

Project Information:

Address						
City			**State**		**Zip**	
Property Information	**Map**	**Block**	**Lot**	**Unit**	**Lot Area**	

Description of Project	
List Zoning Districts *Include all Districts including Overlay Districts*	
Surface Waters to which the Project Discharges	
Other Permits Requested/Received *Attach additional sheets if needed*	

Stormwater Management Permit Application (Continued)				
Project Specifics	**Yes**	**No**	**N/A**	**Description** *(Attach additional sheets as needed)*
Will the project result in the disturbance of one or more acres of land?	☐	☐	☐	
Will the project result in the discharge of stormwater to Critical Areas with Sensitive Resources as described by Massachusetts Stormwater Management Standard No. 6?	☐	☐	☐	
Will the project discharge stormwater to an impaired water body?	☐	☐	☐	
Will the project include the construction of Stormwater Management Facilities?	☐	☐	☐	
Will the construction activity be located within the Town's MS4 area?	☐	☐	☐	

Submission Checklist

- Completed Application form with original signatures and Fee
- Project Narrative describing existing conditions, proposed development and methods used to mitigate stormwater impacts. Narrative should include the evaluation and implementation of Low Impact Development Management Practices for stormwater management.
- Stormwater Management Plan stamped by a Registered Professional Engineer to include at a minimum the following:
  - Existing Conditions Plan with Property Information, existing grades taken from a topographic survey, existing utilities, drainage, tree line, wetland boundaries, flood zones, and soils classifications.
  - Proposed work shall include all site layout, grading, utilities, stormwater management systems, soil testing data, proposed tree line, and limit of work.
- Stormwater Report signed and stamped by Registered Professional Engineer that includes:
  - Completed MassDEP Stormwater Checklist
  - Pre & Post development hydrologic calculations
  - Hydraulic calculations for all pipes, swales, etc.
- Stormwater Pollution and Prevention Plan (SWPPP)
- Operations and Maintenance Plan in accordance with the Regulations

Filing Fees

1. General. A non-refundable application fee shall be due and payable to the Town of Stoughton at the time an application is filed. The application fee will be used for processing of the application, coordination of Town staff, inspections by Town staff and other expenses connected with the review of the application by Town staff.

2. Rules

   a) Stormwater Permit Application and Review Fees are non-refundable. All fees shall be calculated by the Engineering Department in accordance with the fee schedule in Table 1 below.
   b) These fees are in addition to any other local or state fees that may be charged under any other law, regulation, or local Bylaw.
   c) Federal, State, and Municipal projects shall be exempt from Application Fees associated with a STORMWATER PERMIT.
   d) The fee includes two follow-up reviews for plan and document revisions.
   e) The fees denoted below shall not be used to calculate review fees for outside consultants. Additional review fees may be charged to cover outside professional consultant review services for a project if the Town Engineer determines that such services are necessary due to the scope and complexity of the project.

Filing Fee Schedule for Stormwater Permits

Application Type	Fee
Disturbance area is 1.0 to 2.0 acres	$1,000
Disturbance area is 2.0 to 5 acres	$1,500
Disturbance area is 5.0 to 10.0 acres	$2,000
Disturbance area of 10.0 acres or more	$2,500

Signatures

I hereby certify under the penalties of perjury that the submitted plans, documents and supporting data are true, accurate and in compliance with the Town Stormwater Management By-law and Regulations.

_____ _____

Signature of applicant Date

_____ _____

Signature of Representative's Engineer Date

APPENDIX C

STORMWATER PERMIT VIOLATION FORM

STOUGHTON
MASSACHUSETTS

NOTICE OF VIOLATION

Town of Stoughton Rules & Regulations for Stormwater Management

DATE:	
TOWN INSPECTOR:	
PROPERTY ADDRESS:	
PROPERTY OWNER:	
PROPERTY OWNER CONTACT INFORMATION **PHONE:**	**EMAIL:**
NATURE OF VIOLATION:	
REGULATION SECTION CITED:	

WARNING ☐

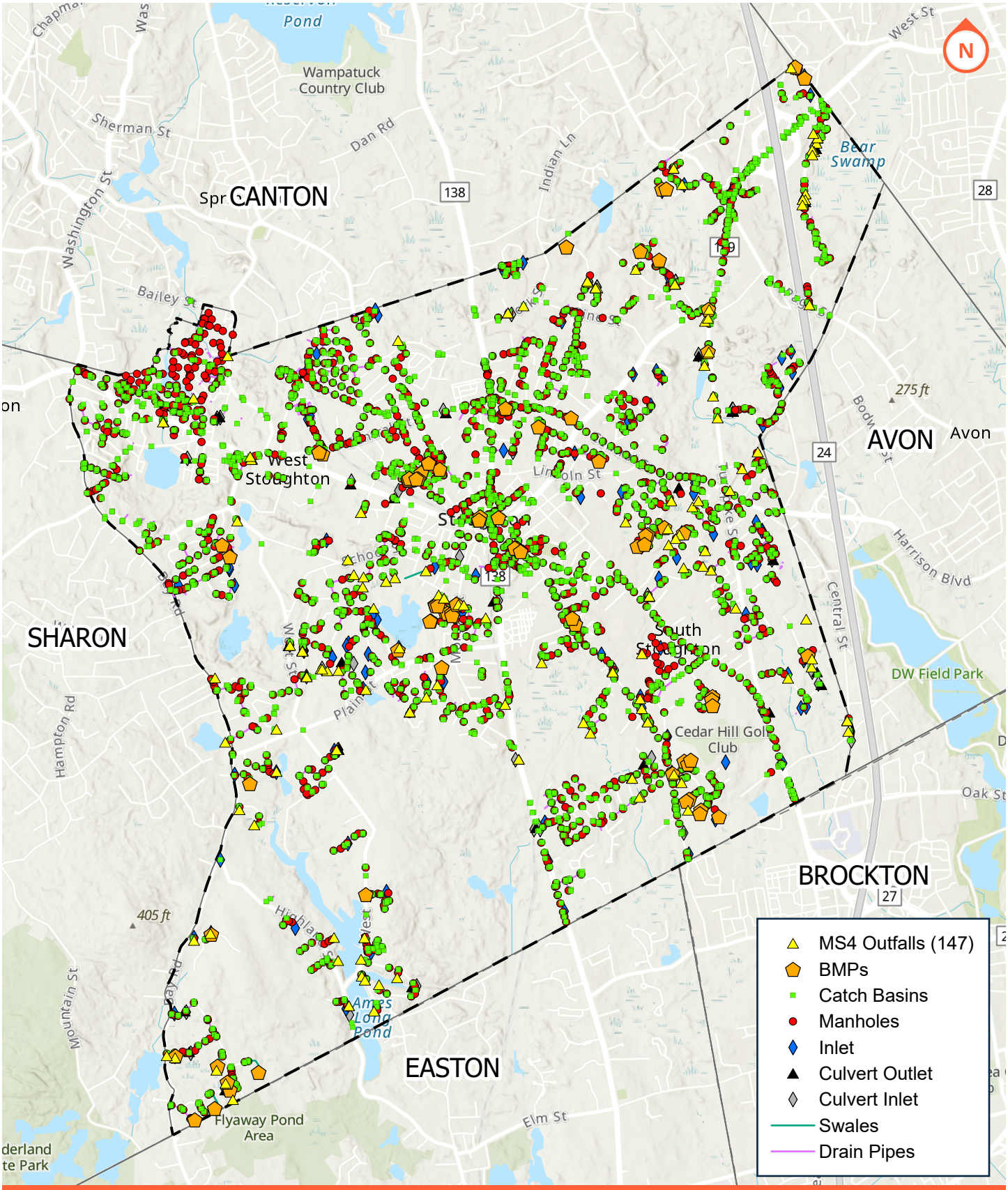
1st OFFENSE ☐

SUBSEQUENT OFFENSE ☐

FINE AMOUNT:		
ISSUED BY:	**SIGNED:**	**DATE:**

APPENDIX B

Stormwater System Mapping



ENVIRONMENTAL PARTNERS
An Apex Company

Appendix B
Stormwater System
Stoughton, Massachusetts
9/1/2022

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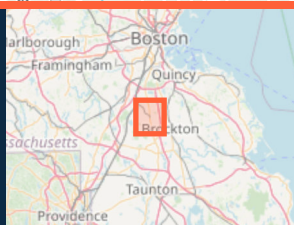
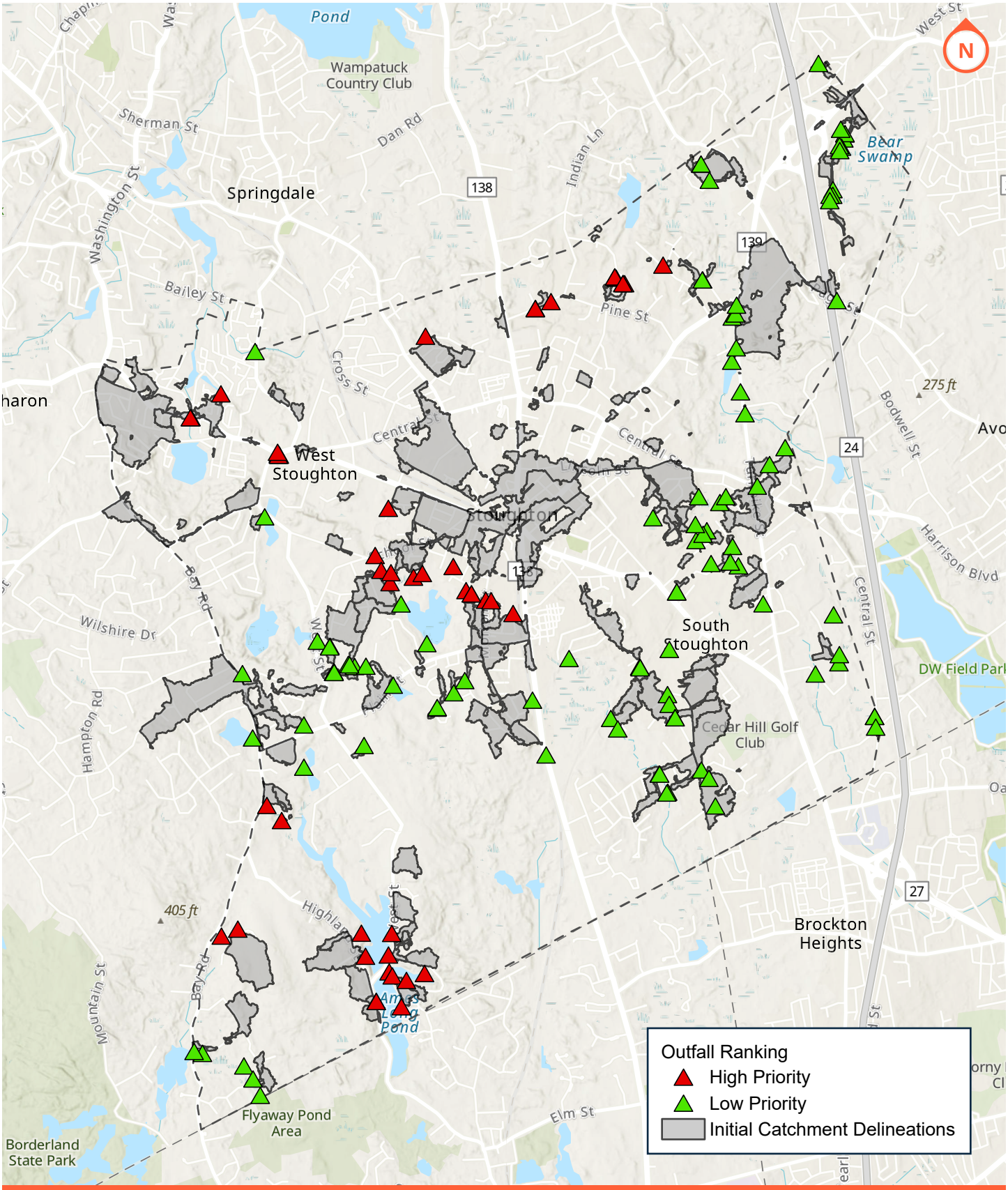
1:50,000



APPENDIX C

Catchment Delineation Mapping and Ranking Matrix



ENVIRONMENTAL PARTNERS
— An Apex Company —

Appendix C

Catchment Ranking

Stoughton, Massachusetts

9/16/2022

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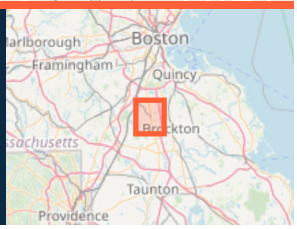

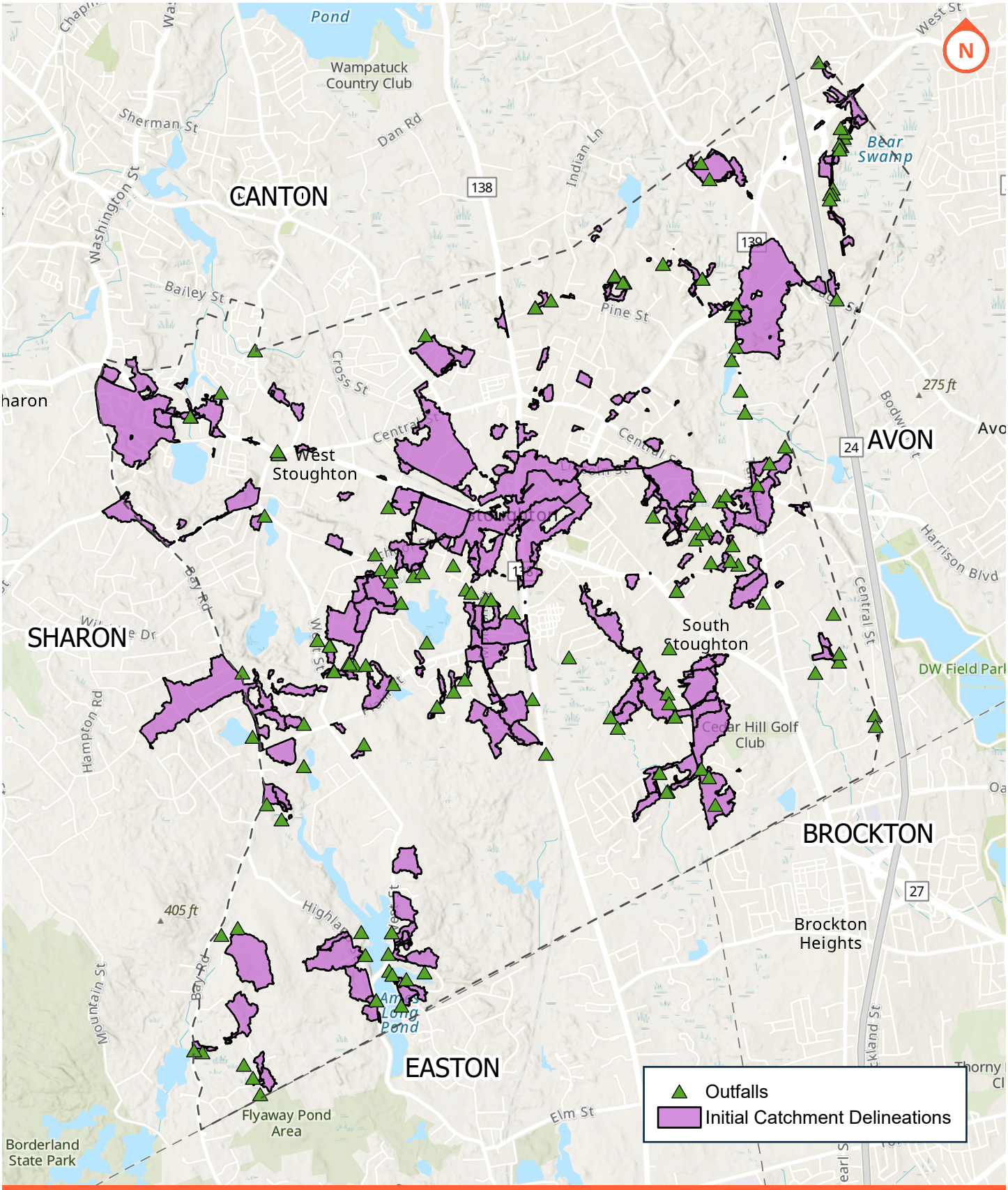

ENVIRONMENTAL PARTNERS
— An Apex Company —

Appendix C

Initial Catchment Delineations

Stoughton, Massachusetts

9/16/2022

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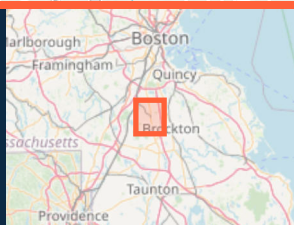

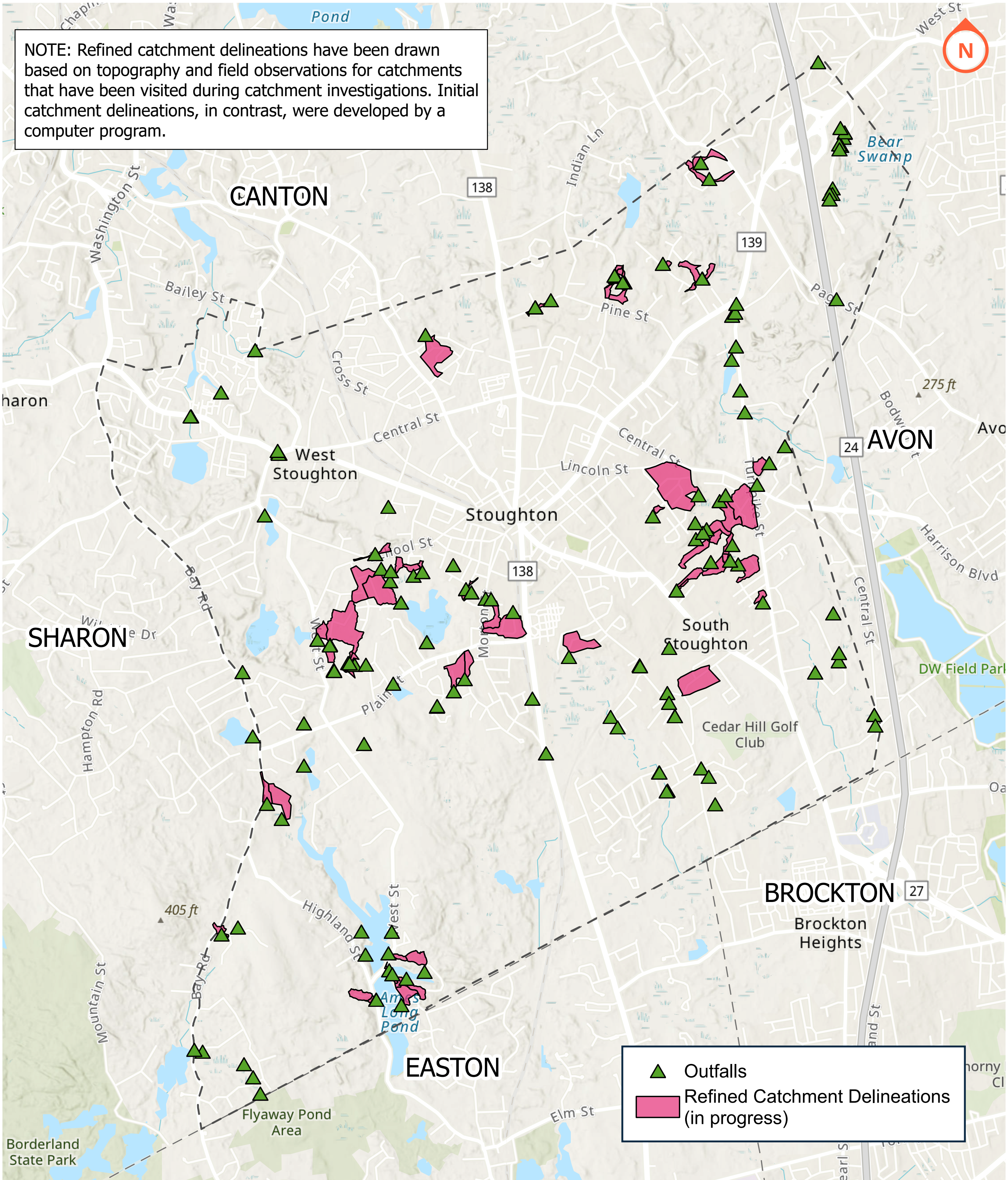

Appendix C
Refined Catchment Delineations
Stoughton, Massachusetts

9/16/2022

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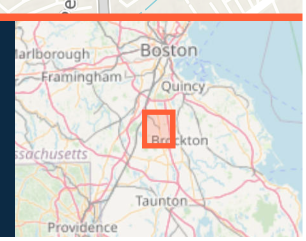
1:50,000



ENVIRONMENTAL PARTNERS — An Apex Company —

Stormwater Outfall Ranking Table
Stoughton, MA
September, 2022

Catchment ID	Receiving Water	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Converted Septic?	Aging Septic?	Receiving Water Quality	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Outfall Screening/Sampling Results		Outfall Score	Outfall Ranking *
	Information Source		Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Parcel Age	Impaired Waters List	GIS and Storm System Maps	GIS Maps, Town Input	Outfall inspections and sample results	Town Input	2003 MS4 Permit Sampling Results	2016 MS4 Permit Sampling Results		
	Scoring Criteria		High = 2 Medium = 1 Low = 0	Older = 2 Medium = 1 Newer = 0	Yes = 2 No Data = 1 No = 0	Older = 2 Medium = 1 Newer = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0				
AF	Unnamed Tributary to Steep Hill Brook	OF-150	0	0	0	0	1	2	1	0	0	2016 - Flow	2019 - Dry	4	High
AG	Unnamed Tributary to Steep Hill Brook	OF-151	0	0	0	0	1	2	1	0	0	2016 - Dry	2019 - Dry	4	High
EU	Ames Long Pond	OF-376	0	0	0	2	1	0	1	0	0		2019 - Dry	4	High
EV	Ames Long Pond	OF-378	0	0	0	2	1	0	1	0	0		2021 - Sampled	4	High
GB	Ames Long Pond	OF-547	0	0	0	2	1	0	1	0	0		2019 - Dry	4	High
HW	Ames Long Pond	OF-553	0	0	0	2	1	0	1	0	0		2019 - Dry	4	High
HX	Ames Long Pond	OF-554	0	0	0	2	1	0	1	0	0		2019 - Dry	4	High
IM	Unnamed Tributary to Steep Hill Brook	OF-580	0	0	0	0	1	2	1	0	0		2021 - Sampled	4	High
OJ	Unnamed Tributary to Unnamed Tributary (MA73-32)	OF-728	1	0	0	0	1	2	0	0	0		2022 - Sampled	4	High
OC	Unnamed Tributary to Steep Hill Brook	OF-793	1	0	0	0	1	2	0	0	0		2022 - Sampled	4	High
AK	Unnamed Tributary to Steep Hill Brook	OF-156	0	0	0	2	1	0	0	0	0		2019 - Dry	3	High
AN	Unnamed Tributary to Ames Long Pond	OF-159	0	0	0	2	1	0	0	0	0	2016 - Dry	2019 - Dry	3	High
BG	Ames Long Pond	OF-204	0	0	0	2	1	0	0	0	0		2021 - Dry	3	High
BJ	Ames Long Pond	OF-207	0	0	0	2	1	0	0	0	0		2021 - Sampled	3	High
BN	Ames Long Pond	OF-211	0	0	0	2	1	0	0	0	0		2021 - Sampled	3	High
CH	Unnamed Tributary to Ames Long Pond	OF-249	0	0	0	2	1	0	0	0	0		2019 - Dry	3	High
CI	Unnamed Tributary to Ames Long Pond	OF-251	0	0	0	2	1	0	0	0	0		2021 - Dry	3	High
ED	Unnamed Tributary to Ames Long Pond	OF-351	0	0	0	2	1	0	0	0	0		2021 - Dry	3	High
BE	Ames Long Pond	OF-202	0	0	0	0	1	0	1	0	0		2021 - Dry	2	High
KO	Unnamed Tributary to Steep Hill Brook	OF-545	1	0	0	0	1	0	0	0	0		2022 - Sampled	2	High
KC	Unnamed Tributary to Steep Hill Brook	OF-671	0	0	0	0	1	0	1	0	0		2019 - Dry	2	High
AC	Unnamed Tributary to Steep Hill Brook	OF-148	0	0	0	0	1	0	0	0	0	2016 - Dry	2019 - Sampled	1	High
AW	Beaver Meadow Brook	OF-193	0	0	0	0	1	0	0	0	0	2016 - Dry	2019 - Dry	1	High
AW	Beaver Meadow Brook	OF-194	0	0	0	0	1	0	0	0	0	2016 - Dry	2021 - Dry	1	High
AW	Beaver Meadow Brook	OF-195	0	0	0	0	1	0	0	0	0	2016 - Dry	2016 - Dry	1	High
BF	Ames Long Pond	OF-203	0	0	0	0	1	0	0	0	0		2021 - Dry	1	High
CV	Beaver Meadow Brook	OF-286	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
DI	Beaver Meadow Brook	OF-306	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
DO	Unnamed Tributary to Steep Hill Brook	OF-323	0	0	0	0	1	0	0	0	0		2019 - Sampled	1	High
DP	Unnamed Tributary to Steep Hill Brook	OF-324	0	0	0	0	1	0	0	0	0		2021 - Sampled	1	High
DU	Beaver Meadow Brook	OF-334	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
EC	Unnamed Tributary to Steep Hill Brook	OF-350	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
EW	Beaver Meadow Brook	OF-38	0	0	0	0	1	0	0	0	0	2016 - Dry	2019 - Dry	1	High
EZ	Beaver Meadow Brook	OF-39	0	0	0	0	1	0	0	0	0	2016 - Dry	2019 - Dry	1	High
FG	Unnamed Tributary to Beaver Meadow Brook	OF-42	0	0	0	0	1	0	0	0	0	2016 - Dry	2020 - Dry	1	High
FX	Unnamed Tributary to Steep Hill Brook	OF-450	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
FZ	Beaver Meadow Brook	OF-455	0	0	0	0	1	0	0	0	0		2021 - Dry	1	High
GA	Beaver Meadow Brook	OF-456	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
GH	Unnamed Tributary to Steep Hill Brook	OF-465	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
GK	Unnamed Tributary to Steep Hill Brook	OF-469	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
JF	Unnamed Tributary (MA73-32)	OF-612	0	0	0	0	1	0	0	0	0		2019 - Dry	1	High
JF	Unnamed Tributary to Steep Hill Brook	OF-64	0	0	0	0	1	0	0	0	0	2016 - Dry	2016 - Dry	1	High

Outfalls discharging to Category 4a, 4c, or 5 waterbodies are ranked High

ENVIRONMENTAL PARTNERS
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Stormwater Outfall Ranking Table
Stoughton, MA
September, 2022

Catchment ID	Receiving Water	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Converted Septic?	Aging Septic?	Receiving Water Quality	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Outfall Screening/Sampling Results		Outfall Score	Outfall Ranking *
	Information Source		Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Parcel Age	Impaired Waters List	GIS and Storm System Maps	GIS Maps, Town Input	Outfall inspections and sample results	Town Input	2003 MS4 Permit Sampling Results	2016 MS4 Permit Sampling Results		
	Scoring Criteria		High = 2 Medium = 1 Low = 0	Older = 2 Medium = 1 Newer = 0	Yes = 2 No Data = 1 No = 0	Older = 2 Medium = 1 Newer = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0				
JS	Unnamed Tributary (MA73-32)	OF-65	0	0	0	0	1	0	0	0	0	2016 - Dry	2019 - Dry	1	High
JF	Unnamed Tributary to Steep Hill Brook	OF-742	0	0	0	0	1	0	0	0	0	2016 - Dry	2016 - Dry	1	High
MJ	Steep Hill Brook	OF-747	0	0	0	0	1	0	0	0	0	2016 - Dry	2016 - Dry	1	High
MK	Steep Hill Brook	OF-748	0	0	0	0	1	0	0	0	0	2016 - Flow	2019 - Dry	1	High
JF	Unnamed Tributary to Steep Hill Brook	OF-757	0	0	0	0	1	0	0	0	0	2016 - Dry	2016 - Dry	1	High
MT	Beaver Meadow Brook	OF-759	0	0	0	0	1	0	0	0	0	2016 - Dry	2020 - Dry	1	High
NE	Ames Long Pond	OF-77	0	0	0	0	1	0	0	0	0	2016 - Dry	2021 - Sampled	1	High
CO	Unnamed Wetlands near Lovett Brook	OF-103	1	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	3	Low
MD	Unnamed Tributary to Brockton Reservoir	OF-104	1	0	0	2	0	0	0	0	0		2021 - Dry	3	Low
B	Lovett Brook	OF-105	1	0	0	2	0	0	0	0	0		2020 - Dry	3	Low
EF	Unnamed Wetlands to Three Swamp Brook	OF-355	1	0	0	2	0	0	0	0	0		2020 - Dry	3	Low
EI	Unnamed Wetlands to Three Swamp Brook	OF-358	1	0	0	2	0	0	0	0	0		2020 - Dry	3	Low
OE	Unnamed Wetlands near Lovett Brook	OF-98	1	0	0	2	0	0	0	0	0	2016 - Dry	2020 - Dry	3	Low
KF	Plain Street Pond	OF-300	0	0	0	2	0	0	0	0	0		2021 - Dry	2	Low
DS	Unnamed Wetlands to Three Swamp Brook	OF-330	0	0	0	2	0	0	0	0	0		2020 - Dry	2	Low
DJ	Unnamed Tributary to Town Pond	OF-342	0	0	0	2	0	0	0	0	0		2021 - Dry	2	Low
EE	Unnamed Wetlands to Three Swamp Brook	OF-354	0	0	0	2	0	0	0	0	0		2020 - Dry	2	Low
GJ	Briggs Pond	OF-399	0	0	0	2	0	0	0	0	0		2020 - Dry	2	Low
FV	Unnamed Tributary To Beaver Brook	OF-444	0	0	0	2	0	0	0	0	0		2020 - Dry	2	Low
GJ	Briggs Pond	OF-468	0	0	0	2	0	0	0	0	0		2021 - Dry	2	Low
GV	Unnamed Tributary To Beaver Brook	OF-492	0	0	0	2	0	0	0	0	0		2021 - Dry	2	Low
IS	Unnamed Wetlands to Beaver Brook	OF-588	0	0	0	2	0	0	0	0	0	2015 - Dry	2015 - Dry	2	Low
JH	Beaver Brook	OF-616	0	0	0	2	0	0	0	0	0		2021 - Dry	2	Low
KI	Plain Street Pond	OF-69	0	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	2	Low
LD	Unnamed Wetlands near Lovett Brook	OF-710	0	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	2	Low
MA	Unnamed Tributary to Bolivar Pond	OF-735	0	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	2	Low
ME	Unnamed Pond	OF-739	0	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	2	Low
MG	Unnamed Wetlands near Lovett Brook	OF-743	0	0	0	2	0	0	0	0	0	2016 - Flow	2021 - Sampled	2	Low
MG	Unnamed Wetlands near Lovett Brook	OF-744	0	0	0	2	0	0	0	0	0	2016 - Dry	2019 - Dry	2	Low
MO	Unnamed Tributary to Beaver Brook	OF-753	0	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	2	Low
MY	Dry Pond	OF-764	0	0	0	2	0	0	0	0	0	2016 - Dry	2016 - Dry	2	Low
ND	Town Pond	OF-769	0	0	0	2	0	0	0	0	0		2021 - Dry	2	Low
OD	Unnamed Tributary	OF-803	0	0	0	2	0	0	0	0	0		2022 - Dry	2	Low
OF	Unnamed Tributary	OF-804	0	0	0	2	0	0	0	0	0		2022 - Dry	2	Low
DT	Unnamed Wetlands to Three Swamp Brook	OF-331	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
EG	Unnamed Wetlands to Three Swamp Brook	OF-356	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
EH	Unnamed Wetlands to Three Swamp Brook	OF-357	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
EL	Unnamed Wetlands to Three Swamp Brook	OF-362	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
HI	Unnamed Tributary to Beaver Brook	OF-516	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
DS	Unnamed Wetlands to Three Swamp Brook	OF-634	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
MP	Unnamed Tributary To Beaver Brook	OF-754	1	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	1	Low
NS	Unnamed Wetlands	OF-792	1	0	0	0	0	0	0	0	0		2021 - Sampled	1	Low

Outfalls discharging to Category 4a, 4c, or 5 waterbodies are ranked High

ENVIRONMENTAL PARTNERS
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Stormwater Outfall Ranking Table
Stoughton, MA
September, 2022

Catchment ID	Receiving Water	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Converted Septic?	Aging Septic?	Receiving Water Quality	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Outfall Screening/Sampling Results		Outfall Score	Outfall Ranking *
	Information Source		Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Parcel Age	Impaired Waters List	GIS and Storm System Maps	GIS Maps, Town Input	Outfall inspections and sample results	Town Input	2003 MS4 Permit Sampling Results	2016 MS4 Permit Sampling Results		
	Scoring Criteria		High = 2 Medium = 1 Low = 0	Older = 2 Medium = 1 Newer = 0	Yes = 2 No Data = 1 No = 0	Older = 2 Medium = 1 Newer = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0				
HI	Unnamed Tributary to Beaver Brook	OF-801	1	0	0	0	0	0	0	0	0		2020 - Dry	1	Low
OK	Beaver Brook	OF-809	1	0	0	0	0	0	0	0	0		2022 - Dry	1	Low
E	Unnamed Tributary to Beaver Brook	OF-108	0	0	0	0	0	0	0	0	0	2016 - Dry	2020 - Dry	0	Low
F	Unnamed Wetlands to Beaver Brook	OF-109	0	0	0	0	0	0	0	0	0	2016 - Dry	2020 - Dry	0	Low
I	Unnamed Tributary near Dorchester Brook	OF-112	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
J	Dorchester Brook	OF-113	0	0	0	0	0	0	0	0	0	2016 - Dry	2021 - Dry	0	Low
Z	Unnamed Tributary near Woods Pond	OF-144	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
AH	Unnamed Tributary to Town Pond	OF-152	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
AH	Unnamed Tributary to Town Pond	OF-153	0	0	0	0	0	0	0	0	0	2016 - Dry	2020 - Dry	0	Low
AI	Unnamed Tributary to Town Pond	OF-154	0	0	0	0	0	0	0	0	0	2016 - Dry	2020 - Dry	0	Low
BK	Unnamed Tributary to Town Pond	OF-209	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
BR	Unnamed Tributary to Beaver Brook	OF-217	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
BU	Unnamed Tributary near Woods Pond	OF-226	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
BW	Unnamed Tributary to Dorchester Brook	OF-231	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
AA	Woods Pond	OF-242	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
CD	Unnamed Wetlands to Beaver Brook	OF-243	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
CE	Unnamed Wetlands to Beaver Brook	OF-244	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
CF	Unnamed Wetlands to Beaver Brook	OF-245	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
CG	Unnamed Tributary to Beaver Brook	OF-246	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
CR	Unnamed Tributary To Beaver Brook	OF-279	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
DG	Unnamed Tributary To Beaver Brook	OF-304	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
DN	Woods Pond	OF-322	0	0	0	0	0	0	0	0	0		2021 - Sampled	0	Low
EJ	Unnamed Wetlands to Three Swamp Brook	OF-359	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
EN	Unnamed Wetlands to Beaver Brook	OF-366	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
EO	Unnamed Wetlands to Beaver Brook	OF-367	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
EX	Unnamed Tributary to Dorchester Brook	OF-380	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
FF	Unnamed Tributary	OF-419	0	0	0	0	0	0	0	0	0		2022 - Dry	0	Low
FK	Unnamed Tributary to Beaver Brook	OF-426	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
FO	Unnamed Tributary to Beaver Brook	OF-431	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
FO	Unnamed Tributary to Beaver Brook	OF-432	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
AH	Unnamed Tributary to Town Pond	OF-440	0	0	0	0	0	0	0	0	0		2021 - Sampled	0	Low
FY	Unnamed Tributary to Town Pond	OF-453	0	0	0	0	0	0	0	0	0		2021 - Sampled	0	Low
GC	Unnamed Tributary to Beaver Brook	OF-458	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
GD	Unnamed Tributary to Beaver Brook	OF-459	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
GF	Unnamed Tributary to Dorchester Brook	OF-463	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
GG	Unnamed Tributary to Dorchester Brook	OF-464	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
GP	Town Pond	OF-478	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
HQ	Dorchester Brook	OF-54	0	0	0	0	0	0	0	0	0	2016 - Dry	2020 - Dry	0	Low
HU	Dorchester Brook	OF-55	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
IB	Dorchester Brook	OF-56	0	0	0	0	0	0	0	0	0	2016 - Flow	2019 - Dry	0	Low
IE	Unnamed Tributary to Dorchester Brook	OF-57	0	0	0	0	0	0	0	0	0		2019 - Dry	0	Low

Outfalls discharging to Category 4a, 4c, or 5 waterbodies are ranked High

Stormwater Outfall Ranking Table
Stoughton, MA
September, 2022

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Information Source			Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Parcel Age	Impaired Waters List	GIS and Storm System Maps	GIS Maps, Town Input	Outfall inspections and sample results	Town Input	2003 MS4 Permit Sampling Results	2016 MS4 Permit Sampling Results		
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IR	Unnamed Tributary to Beaver Brook	OF-587	0	0	0	0	0	0	0	0	0		2021 - Sampled	0	Low
IU	Unnamed Tributary near Woods Pond	OF-59	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
IY	Unnamed Tributary near Woods Pond	OF-60	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
JD	Unnamed Tributary to Beaver Brook	OF-610	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
JM	Unnamed Wetlands to Beaver Brook	OF-636	0	0	0	0	0	0	0	0	0		2020 - Dry	0	Low
JN	Unnamed Tributary to Town Pond	OF-641	0	0	0	0	0	0	0	0	0	2015 - Dry	2021 - Dry	0	Low
JU	Unnamed Tributary to Town Pond	OF-653	0	0	0	0	0	0	0	0	0	2015 - Dry	2015 - Dry	0	Low
JZ	Unnamed Tributary to Town Pond	OF-664	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
OU	Unnamed Tributary To Beaver Brook	OF-669	0	0	0	0	0	0	0	0	0		2021 - Dry	0	Low
KL	Unnamed Tributary To Beaver Brook	OF-694	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
JN	Unnamed Tributary to Town Pond	OF-70	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
LG	Unnamed Tributary near Dorchester Brook	OF-713	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
LO	Unnamed Pond near Woods Pond	OF-723	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
MH	Unnamed Tributary to Beaver Brook	OF-745	0	0	0	0	0	0	0	0	0	2016 - Flow	2019 - Dry	0	Low
MQ	Unnamed Tributary to Beaver Brook	OF-755	0	0	0	0	0	0	0	0	0	2016 - Flow	2019 - Dry	0	Low
MR	Unnamed Tributary to Beaver Brook	OF-756	0	0	0	0	0	0	0	0	0	2016 - Flow	2021 - Dry	0	Low
MX	Unnamed Tributary to Beaver Brook	OF-762	0	0	0	0	0	0	0	0	0	2016 - Dry	2016 - Dry	0	Low
NN	Beaver Brook	OF-788	0	0	0	0	0	0	0	0	0		2021 - Sampled	0	Low
OG	Unnamed Tributary	OF-805	0	0	0	0	0	0	0	0	0		2022 - Dry	0	Low
OH	Unnamed Tributary to Beaver Brook	OF-806	0	0	0	0	0	0	0	0	0		2022 - Sampled	0	Low
OI	Unnamed Tributary near Dorchester Brook	OF-807	0	0	0	0	0	0	0	0	0		2022 - Dry	0	Low
OL	Unnamed Tributary to Beaver Brook	OF-810	0	0	0	0	0	0	0	0	0		2022 - Dry	0	Low

* Note: All outfalls draining to Category 4a or Category 5 waterways are ranked as High Priority

Outfalls discharging to Category 4a, 4c, or 5 waterbodies are ranked High

APPENDIX D

Field Forms and Hyperlinks to Laboratories and Field Services Companies

Date: _____

Weather Observations: _____

Staff Onsite: _____

Photos: _____

Stoughton Storm Drain Mapping Form

Structure #:_____

Map #: _____

Street Name: _____

Nearest Structure: _____
(address, bldg, utility pole, etc)

Type of Structure: _____
(outfall, culvert, inlet, etc)

Headwall?: _____
(Y/N; concrete, stone, rip rap, none)

Material: _____
(concrete, concrete FES, corrugated metal, plastic, pvc, clay, cast iron, etc)

Size & Shape of Structure: _____
_____
(diameter, width/height)

Invert (top of headwall to bottom inside of pipe): _____
_____

Pipe Condition/headwall condition: _____
_____

Connectivity: _____
(from MH, CB, culvert, other)

Date: _____

Structure Number: _____

Is Crown (top inside of pipe) Above or Below Surface Water?: _____

Dry Weather Flow Conditions: _____
(weather, ground condition, flowing?)

Description of Visual Characteristics or Odors: _____

_____
(aesthetics, deposits/stains, erosion, vegetation)

<u>Field Screening Data:</u>

pH: _____
Temperature: _____
Sp. Conduct.: _____
Turbidity: _____

Flag as Future Sample Location? (Y/N): _____

Sample collected for lab analysis? ** (Y/N): _____

Lab Sample ID: _____
Analyses: _____
Sampling Date/Time: _____
**** (ensure SOP for stormwater grab sampling has been followed, see Appendix F of IDDE Plan)**

<u>Additional comments/Sketch:</u>

Appendix D – Links to Relevant Laboratories and Field Services Companies

Local Massachusetts State Certified Laboratories:

- ESS Laboratory; Cranston, RI http://www.esslaboratory.com/
- Alpha Analytical Labs; Westborough, MA https://alphalab.com/
- G&L Laboratories; Quincy, MA http://www.gllab.com/
- MassDEP Searchable Laboratory Certification Listing https://eeaonline.eea.state.ma.us/DEP/Labcert/Labcert.aspx

Local Field Equipment Suppliers

- U.S. Environmental; Waltham, MA https://usenvironmental.com/
- Pine Environmental; Woburn, MA http://www.pine-environmental.com/locations/?list
- Hach Company Analytical Instruments https://www.hach.com/

CCTV/Video Inspection Companies

- National Water Main Cleaning Co.; Canton, MA https://nwmcc.com/
- BMC Corp.; Billerica, MA https://pipejetter.com/cctv-inspection.html
- Inland Waters Inc.; Johnston, RI http://www.inlandwatersinc.com/

APPENDIX E

Outfall Sampling and Catchment Investigation Results

Stoughton Outfall Sampling Results
Stoughton, MA
September 2022

			Field Test Results							Analytical Results												
Outfall ID	Discharging Waterbody	Sample Date	Temp. (˚C)	Specific Conductance (µS/cm) *Threshold: 2000*	Salinity (ppt)	pH *Threshold: 6.5-8.0*	DO (mg/L)	Total Chlorine (mg/L) *Threshold: 0.1*	Oxygen Reduction Potential (mV)	Ammonia as Nitrogen (mg/L) *Threshold: 0.5*	Chlorine, TRC (mg/L) *Threshold: 0.1*	Chloride (mg/L)	Fecal Coliform, MF (col/100ml)	E. coli (MPN/100 mL) *Threshold: 236*	Phosphorus, Total (mg/L)	Surfactants, MBAS (mg/L) *Threshold: 0.25*	Biological Oxygen Demand, BOD (mg/L)	Nitrogen, Total (mg/L)	Nitrate as Nitrogen (mg/L)	Nitrite as Nitrogen (mg/L)	Turbidity (NTU)	Total Suspended Solids, TSS (mg/L)
OF-202	Ames Long Pond	5/15/2019	2.8	247.3	2.10	8.89	14.66	-	-	0.04	ND	-	-	1	-	0.011	-	1.08	0.603	ND	ND	ND
OF-203	Ames Long Pond	5/15/2019	3.7	272.1	0.16	7.21	18.95	-	-	ND	ND	-	-	2	-	0.027	-	1.45	0.276	ND	35.7	35.7
OF-207	Ames Long Pond	5/9/2019	4.3	510.4	0.25	6.60	20.03	-	-	ND	ND	-	-	<1.0	-	ND	-	0.84	0.292	ND	1.1	1.1
		5/21/2021	12.0	743	0.37	9.43	6.30	-	-	ND	-	220	33	410.58	-	ND	-	-	-	-	0.92	28
		7/15/2021	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-211	Ames Long Pond	5/9/2019	4.7	406.5	0.20	7.20	17.60	-	-	ND	ND	-	-	<1.0	-	ND	-	0.80	0.342	ND	ND	ND
		5/21/2021	12.7	325.6	0.16	7.45	6.60	-	-	ND	-	84	ND	<1	-	ND	-	-	-	-	0.42	ND
		7/15/2021	-	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-378	Ames Long Pond	5/9/2019	7.8	37.5	0.02	6.55	13.92	-	-	ND	ND	-	-	1	-	ND	-	0.58	ND	ND	ND	ND
		5/18/2021	14.7	34.3	0.01	6.61	7.48	-	-	0.087	-	-	ND	1*	-	ND	-	-	-	-	-	-
		6/24/2021	-	-	-	-	-	-	-	-	-	5.8	38	40.2	-	-	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-77	Ames Long Pond	5/9/2019	4.5	220.6	0.11	5.87	13.77	-	-	ND	1.87	-	-	2*	-	0.04	-	0.90	0.101	ND	ND	ND
		5/18/2021	11.9	304.8	0.15	5.79	7.12	-	-	ND	-	68	2*	<1*	-	ND	-	-	-	-	2.1	15
		7/15/2021	-	-	-	-	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-455	Beaver Meadow Brook	5/1/2019	10.7	463	0.62	6.24	9.30	-	-	ND	ND	-	-	2	ND	0.036	-	-	-	-	-	-
OF-113	Dorchester Brook	5/15/2019	8.8	332.1	2.70	6.84	12.04	-	-	ND	ND	-	-	10.9	-	0.023	-	2.57	2.110	ND	-	-
OF-756	Unnamed Tributary to Beaver Brook	5/15/2019	2.8	238.6	0.11	9.75	20.41	-	-	ND	ND	-	-	4.1	-	0.012	-	0.76	0.283	ND	-	-
OF-464	Unnamed Tributary to Dorchester Brook	5/1/2019	2.4	506.3	0.24	9.07	12.18	-	-	0.11	ND	-	-	36.4	-	ND	-	1.24	0.614	ND	-	-
OF-148	Unnamed Tributary to Steep Hill Brook	5/1/2019	12.2	215	0.41	6.10	9.32	-	-	ND	ND	-	-	<1.0	ND	0.026	-	-	-	-	-	-
OF-323	Unnamed Tributary to Steep Hill Brook	5/1/2019	12.8	221	0.56	6.60	17.75	-	-	ND	ND	-	-	<1.0	ND	0.026	-	-	-	-	-	-
OF-324	Unnamed Tributary to Steep Hill Brook	5/1/2019	12.7	387	0.21	6.56	12.20	-	-	0.17	ND	-	-	<1.0	ND	0.019	-	-	-	-	-	-
		5/21/2021	41.1	407.5	0.20	6.80	7.06	-	-	0.192	-	95	2	<1	-	0.07	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note:
* Indicates samples that were analyzed with the holding time exceeded for the laboratory method required
All sampling was conducted during dry weather
- : Not Tested
ND: Non-detect
Bold, red values exceed contaminant criteria.

Stoughton Outfall Sampling Results
Stoughton, MA
September 2022

			Field Test Results							Analytical Results												
Outfall ID	Discharging Waterbody	Sample Date	Temp. (˚C)	Specific Conductance (µS/cm) *Threshold: 2000*	Salinity (ppt)	pH *Threshold: 6.5-8.0*	DO (mg/L)	Total Chlorine (mg/L) *Threshold: 0.1*	Oxygen Reduction Potential (mV)	Ammonia as Nitrogen (mg/L) *Threshold: 0.5*	Chlorine, TRC (mg/L) *Threshold: 0.1*	Chloride (mg/L)	Fecal Coliform, MF (col/100ml)	E. coli (MPN/100 mL) *Threshold: 236*	Phosphorus, Total (mg/L)	Surfactants, MBAS (mg/L) *Threshold: 0.25*	Biological Oxygen Demand, BOD (mg/L)	Nitrogen, Total (mg/L)	Nitrate as Nitrogen (mg/L)	Nitrite as Nitrogen (mg/L)	Turbidity (NTU)	Total Suspended Solids, TSS (mg/L)
OF-580	Unnamed Tributary to Steep Hill Brook	5/1/2019	13.6	486	0.51	6.40	10.35	-	-	ND	ND	-	-	28.8	ND	0.025	-	-	-	-	-	-
		5/21/2021	12.6	1712	0.87	6.73	6.23	-	-	0.112	-	560	ND	<1	-	ND	-	-	-	-	-	-
OF-322	Woods Pond	5/1/2019	12.4	497	0.68	6.41	11.96	-	-	ND	ND	-	-	1	ND	0.023	-	-	-	-	-	-
		5/21/2021	15.0	499.1	0.24	7.15	6.96	-	-	ND	-	120	ND	<1	-	ND	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-194	Beaver Meadow Brook	5/1/2019	11.2	318	0.54	6.59	10.20	-	-	ND	ND	-	-	47.3	ND	0.023	ND	-	-	ND	-	-
OF-440	Unnamed Tributary to Town Pond	5/18/2021	15.5	329.2	0.16	4.93	7.22	-	-	ND	-	81	82*	63.14*	-	ND	-	-	-	-	2.2	ND
		6/24/2021	-	-	-	-	-	-	-	-	-	-	760	1,203.33	-	-	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-453	Unnamed Tributary to Town Pond	5/21/2021	17.7	153.3	0.07	5.46	6.90	-	-	0.105	-	34	ND	5.16	-	ND	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-788	Brockton Reservoir	5/21/2021	10.2	523	0.25	7.08	7.27	-	-	ND	-	140	ND	<1	-	ND	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-792	Cochato River	5/21/2021	15.5	3,408	1.80	4.81	7.16	-	-	0.109	-	1100	3	<1	-	ND	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-743	Unnamed Wetlands near Lovett Brook	5/18/2021	13.8	1,500	0.76	6.80	6.82	-	-	ND	-	480	ND	<1	-	ND	-	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-587	Unnamed Tributary to Beaver Brook	5/18/2021	14.9	152.4	0.07	5.22	6.17	-	-	ND	-	36	8	29.17	-	ND	2.9	-	-	-	-	-
		7/15/2021	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-545	Unnamed Tributary to Steep Hill Brook	4/13/2022	-	-	-	-	-	-	-	**1.92**	ND	-	70	36.41	0.16	ND	-	-	-	-	-	-
		6/29/2022	18.2	**2104**	1.08	7.01	5.09		-100	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-728	Unnamed Tributary to Steep Hill Brook	4/13/2022	-	-	-	-	-	-	-	0.165	ND	-	15	16.94	0.017	ND	-	-	-	-	-	-
		6/29/2022	18.6	794	0.39	7.44	7.80	-	-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-806	Unnamed Tributary to Beaver Brook	4/13/2022	-	-	-	-	-	-	-	ND	ND	-	ND	1	0.046	ND	-	-	-	-	-	-
		6/29/2022	24.5	649	0.08	7.31	4.76	-	-140	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-793	Unnamed Tributary to Steep Hill Brook	7/1/2022	18.5	1273	0.64	7.42	6.90	-	-84	0.12	ND	-	**1553.12**	**1986.29**	0.02	ND	-	-	-	-	-	-

Note:
* Indicates samples that were analyzed with the holding time exceeded for the laboratory method required
All sampling was conducted during dry weather
- : Not Tested
ND: Non-detect
Bold, red values exceed contaminant criteria.

CERTIFICATE OF ANALYSIS

Natalie Pommersheim
Environmental Partners Group
18 Commerce Way Ste 2000
Woburn, MA 01801

RE: FY19 MS4 Services - Stoughton (R282-1801)
ESS Laboratory Work Order Number: 1905038

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:42 pm, May 09, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

Analytical Balance - Middleboro, MA	Surfactants
BAL Laboratory - Cranston, RI	E Coli

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905038

SAMPLE RECEIPT

The following samples were received on May 01, 2019 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the Guidelines Establishing Test Procedures for the Analysis of Pollutants, 40 CFR Part 136, as amended.

Lab Number	Sample Name	Matrix	Analysis
1905038-01	OF-323	Storm Water	350.1, 365.1, 4500Cl G, SM9223B, SUB
1905038-02	OF-322	Storm Water	350.1, 365.1, 4500Cl G, SM9223B, SUB
1905038-03	OF-324	Storm Water	350.1, 365.1, 4500Cl G, SM9223B, SUB
1905038-04	OF-148	Storm Water	350.1, 365.1, 4500Cl G, SM9223B, SUB
1905038-05	OF-580	Storm Water	350.1, 365.1, 4500Cl G, SM9223B, SUB
1905038-06	OF-194	Storm Water	350.1, 365.1, 4500Cl G, 5210 B, SM9223B, SUB
1905038-07	OF-455	Storm Water	350.1, 4500Cl G, 5210 B, SM9223B, SUB

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton ESS Laboratory Work Order: 1905038

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905038

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-323
Date Sampled: 05/01/19 10:45
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-01
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/02/19 18:50	mg/L	CE90220
Total Phosphate as P	**0.12** (0.10)		365.1		1	EEM	05/02/19 16:24	mg/L	CE90214
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-323
Date Sampled: 05/01/19 10:45
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-01
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.011** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-323
Date Sampled: 05/01/19 10:45
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-01
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**< 1.0** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-322
Date Sampled: 05/01/19 11:15
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-02
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/02/19 18:51	mg/L	CE90220
Total Phosphate as P	ND (0.10)		365.1		1	EEM	05/02/19 16:25	mg/L	CE90214
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-322
Date Sampled: 05/01/19 11:15
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-02
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.023** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-322
Date Sampled: 05/01/19 11:15
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-02
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**1.0** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-324
Date Sampled: 05/01/19 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-03
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.17** (0.10)		350.1		1	JLK	05/02/19 18:52	mg/L	CE90220
Total Phosphate as P	ND (0.10)		365.1		1	EEM	05/02/19 16:27	mg/L	CE90214
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-324
Date Sampled: 05/01/19 11:40
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-03
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.019** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-324
Date Sampled: 05/01/19 11:40
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-03
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**< 1.0** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-148
Date Sampled: 05/01/19 13:05
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-04
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/02/19 18:52	mg/L	CE90220
Total Phosphate as P	ND (0.10)		365.1		1	EEM	05/02/19 16:28	mg/L	CE90214
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-148
Date Sampled: 05/01/19 13:05
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-04
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.026** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-148
Date Sampled: 05/01/19 13:05
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-04
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**< 1.0** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-580
Date Sampled: 05/01/19 13:40
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-05
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/02/19 18:53	mg/L	CE90220
Total Phosphate as P	ND (0.10)		365.1		1	EEM	05/02/19 16:29	mg/L	CE90214
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-580
Date Sampled: 05/01/19 13:40
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-05
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.025** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-580
Date Sampled: 05/01/19 13:40
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-05
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**28.8** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-194
Date Sampled: 05/01/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-06
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/02/19 18:54	mg/L	CE90220
Biochemical Oxygen Demand	ND (3)		5210 B		1	LAB	05/02/19 17:30	mg/L	CE90218
Total Phosphate as P	ND (0.10)		365.1		1	EEM	05/02/19 16:30	mg/L	CE90214
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-194
Date Sampled: 05/01/19 14:15
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-06
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.023** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-194
Date Sampled: 05/01/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-06
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**47.3** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-455
Date Sampled: 05/01/19 14:30
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-07
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/02/19 18:55	mg/L	CE90220
Biochemical Oxygen Demand	ND (3)		5210 B		1	LAB	05/02/19 17:30	mg/L	CE90218
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/01/19 20:30	mg/L	CE90131

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-455
Date Sampled: 05/01/19 14:30
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-07
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/3/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.036** (0.002)		SUB		1	SUB	05/03/19 0:00	mg/L	CE90925

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-455
Date Sampled: 05/01/19 14:30
Percent Solids: N/A

ESS Laboratory Work Order: 1905038
ESS Laboratory Sample ID: 1905038-07
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**2.0** (N/A)		SM9223B		RAS	05/02/19 9:00	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905038

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CE90131 - General Preparation										
Blank										
Total Residual Chlorine	ND	0.06	mg/L							
LCS										
Total Residual Chlorine	0.40		mg/L	0.3999		99	80-120			
Batch CE90214 - TPO4 Prep										
Blank										
Total Phosphate as P	ND	0.10	mg/L							
LCS										
Total Phosphate as P	0.51	0.10	mg/L	0.5000		102	90-110			
Batch CE90218 - BOD Prep										
LCS										
Biochemical Oxygen Demand	172		mg/L	200.0		86	84.6-115.4			
Batch CE90220 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.12	0.10	mg/L	0.09994		117	80-120			
LCS										
Ammonia as N	1.15	0.10	mg/L	0.9994		115	80-120			

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton ESS Laboratory Work Order: 1905038

Notes and Definitions

U	Analyte included in the analysis, but not detected
<	Less than the Method Detection Limit.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905038

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 10:45
LOCATION: 1905038
1

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935240-01**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.011**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 11:15
LOCATION: 1905038 2

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935240-02**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.023**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 11:40
LOCATION: 1905038 3

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935240-03**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.019**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 13:05
LOCATION: 1905038 4

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935240-04**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.026**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 13:40
LOCATION: 1905038 5

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935240-05**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.025**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 14:15
LOCATION: 1905038 6

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935240-06**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.023**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 14:30
LOCATION: 1905038 7

REPORTED: 05/07/2019
ORDER #: G1935240
SAMPLE DATE: 5/2/2019
DATE RECEIVED: 5/2/2019
SAMPLE ID: Grab
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#:** **1935240-07**	
Surfactants (MBAS)	Hach 8028	05/03/2019	mg/L	0.002	**0.036**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

NA = Not Applicable
ND = Not Detected
'<' = Less Than
'*' = Detection Limit

Amanda Cronin

Digitally signed by Amanda Cronin
CN=Amanda Cronin
O=Analytical Balance Corp.
E=amanda@h2otest.net
2.5.4.11=
Date: 2019.05.07 13:32:57

Approved By: _____
Lab Manager / Date

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

Analytical Balance

CHAIN OF CUSTODY

ESS Lab # 1905038

Turn Time X Standard Other________

Regulatory State: **MA** RI CT NH NJ NY ME Other______

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other________

Reporting Limits - ____________

Electonic Deliverables Excel Access PDF

Co. Name	ESS Laboratory	Project #		Project Name	1905038
Contact Person	Shawn Morrell	Proj. Location			
Address		City , State		Zip	PO # B02787
Tel.	ext 3083	email:	smorrell@thielsch.com		

Analysis: Surfactants

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container		Surfactants
	5/1/19	1045	G	SW *	1905038-01	1	1	AG	1L		X
	5/1/19	1115	G	SW *	1905038-02	1	1	AG	1L		X
	5/1/19	1140	G	SW *	1905038-03	1	1	AG	1L		X
	5/1/19	1305	G	SW *	1905038-04	1	1	AG	1L		X
	5/1/19	1340	G	SW *	1905038-05	1	1	AG	1L		X
	5/1/19	1415	G	SW *	1905038-06	1	1	AG	1L		X
	5/1/19	1430	G	SW *	1905038-07	1	1	AG	1L		X
					*Matrix = Stormwater (hdm 5/6/19)						

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ______Yes _____No

Seals Intact ____ Yes _____No NA:____

Cooler Temperature: __________

Internal Use Only
[ ] Pickup
[ ] Technician____

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **Please send Sample Confirmation after samples have been received to Heather Masse - hmasse@thielsch.com**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
R Carlson 5/2/19 14:38	Amanda Cruz 5/2 238		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

BAL

C905013

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # ~~1904038~~ 1905038

Turn Time: (5) Days

Reporting Limits: 05/02/19

Regulatory State

Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Electonic Deliverables: ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name	Project #	Project Name
Environmental Partners Group, Inc.	R982-1801	FY19 MS4 Services - Stoughton

Contact Person	Address
Natalie Pommersheim	1900 Crown Colony Drive

City	State	Zip Code	PO #
Quincy	MA	02169	

Telephone Number	FAX Number	Email Address
617-657-0257		nmp@environpartners.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis: Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chlorine (TRC)	BOD	NO2	NO3	E. coli	Surfactants	Fecal coliform	Turbidity
1	5/1/19	1045	G	SW	OF-323	X	P		X				X	X		
2	5/1/19	1115	G	SW	OF-322	X	P		X				X	X		
3	5/1/19	1140	G	SW	OF-324	X	P		X				X	X		
4	5/1/19	1305	G	SW	OF-148	X	P		X				X	X		
5	5/1/19	1340	G	SW	OF-580	X	P		X				X	X		
6	5/1/19	1415	G	SW	OF-194	X	X		X	X			X	X		
7	5/1/19	1430	G	SW	OF-455	X			X	P			X	X		

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial — P P P P P P P S AG S

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* — 6 6 6 6 6 6 6 1 6 1

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* — 3 3 3 1 1 1 1 1 1 1

Number of Containers per Sample: 1 1 1 1 1 1 1 1 1 1

Laboratory Use Only

Cooler Present: ✓ ○ Drop Off

Seals Intact: ○ ✓ Pickup

Cooler Temperature: 0.8+0.9 °C ICE 2C

Sampled by: Marissa Carvalho

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/1/19 1454	5/1/19 1454	5/1/19 1815	5/1/19 1957
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
050219 842	050219 842		

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 904038

Turn Time: 5 Days
Regulatory State
Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP
Reporting Limits
Electonic Deliverables: ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name: Environmental Partners Group, Inc.
Project #: P982-1801
Project Name: FY19 MS4 services - Stoughton
Contact Person: Natalie Pommersheim
Address: 1900 Crown Colony Drive
City: Quincy
State: MA
Zip Code: 02169
PO #:
Telephone Number: 617-657-0257
FAX Number:
Email Address: nmp@environpartners.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	TDHal Phosphorus	Total Nitrogen	Chlorine (TRC)	BOD	NO2	NO3	E. coli	Surfactants	Fecal coliform	Turbidity
1	5/1/19	1045	G	SW	OF-323	X	P		X				X	X		
2	5/1/19	1115	G	SW	OF-322	X	P		X				X	X		
3	5/1/19	1140	G	SW	OF-324	X	P		X				X	X		
4	5/1/19	1305	G	SW	OF-148	X	P		X				X	X		
5	5/1/19	1340	G	SW	OF-580	X	P		X				X	X		
6	5/1/19	1415	G	SW	OF-194	X	X		X	X			X	X		
7	5/1/19	1430	G	SW	OF-455	X			X	P			X	X		

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial — P P P P P P P S AG S
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* — 6 6 6 6 6 6 6 1 6 1
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* — 3 3 3 1 1 1 1 1 1 1
Number of Containers per Sample: 1 1 1 1 1 1 1 1 1 1

Laboratory Use Only
Cooler Present: ✓ ○ Drop Off
Seals Intact: ① Pickup
Cooler Temperature: 0.8+0.9 °C ICE 2C

Sampled by: Marissa Carvalho
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/1/19 1454	R Carlson 5/1/19 1454	R Carlson 5/1/19 1815	5/1/19 1957
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
05.02.19 842	05.02.19 842		

CERTIFICATE OF ANALYSIS

Natalie Pommersheim
Environmental Partners Group
18 Commerce Way Ste 2000
Woburn, MA 01801

RE: FY19 MS4 Services - Stoughton (R282-1801)
ESS Laboratory Work Order Number: 1905509

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:10 pm, May 29, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

Analytical Balance - Middleboro, MA	Surfactants
BAL Laboratory - Cranston, RI	E Coli

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905509

SAMPLE RECEIPT

The following samples were received on May 15, 2019 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the Guidelines Establishing Test Procedures for the Analysis of Pollutants, 40 CFR Part 136, as amended.

Lab Number	Sample Name	Matrix	Analysis
1905509-01	OF-113	Storm Water	350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905509-02	OF-756	Storm Water	350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905509-03	OF-203	Storm Water	180.1, 350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905509-04	OF-202	Storm Water	180.1, 350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton ESS Laboratory Work Order: 1905509

PROJECT NARRATIVE

Classical Chemistry

1905509-01	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905509-02	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905509-03	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905509-04	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905509

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-113
Date Sampled: 05/15/19 12:26
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-01
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/16/19 17:26	mg/L	CE91552
Nitrate as N	**2.11** (0.110)		353.2		5	JLK	05/15/19 21:50	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/15/19 20:05	mg/L	CE91546
Total Nitrogen	**2.57** (0.20)		4500N		5	JLK	05/17/19 16:49	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/15/19 17:25	mg/L	CE91558

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-113
Date Sampled: 05/15/19 12:26
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-01
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/17/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.023** (0.006)		SUB		1	SUB	05/17/19 0:00	mg/L	CE92234

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-113
Date Sampled: 05/15/19 12:26
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-01
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**10.9** (N/A)		SM9223B		CCC	05/15/19 16:30	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-756
Date Sampled: 05/15/19 12:45
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-02
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/16/19 17:27	mg/L	CE91552
Nitrate as N	**0.283** (0.030)		353.2		1	JLK	05/15/19 21:32	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/15/19 20:06	mg/L	CE91546
Total Nitrogen	**0.76** (0.20)		4500N		1	JLK	05/17/19 16:56	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/15/19 17:25	mg/L	CE91558

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-756
Date Sampled: 05/15/19 12:45
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-02
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/17/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.012** (0.006)		SUB		1	SUB	05/17/19 0:00	mg/L	CE92234

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-756
Date Sampled: 05/15/19 12:45
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-02
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**4.1** (N/A)		SM9223B		CCC	05/15/19 16:30	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-203
Date Sampled: 05/15/19 13:31
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-03
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/16/19 17:28	mg/L	CE91552
Nitrate as N	**0.276** (0.030)		353.2		1	JLK	05/15/19 21:33	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/15/19 20:07	mg/L	CE91546
Total Nitrogen	**1.45** (0.20)		4500N		1	JLK	05/17/19 16:56	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/15/19 17:25	mg/L	CE91558
Turbidity	**35.7** (1.0)		180.1		1	CCP	05/15/19 17:30	NTU	CE91543

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-203
Date Sampled: 05/15/19 13:31
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-03
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/17/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.027** (0.006)		SUB		1	SUB	05/17/19 0:00	mg/L	CE92234

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-203
Date Sampled: 05/15/19 13:31
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-03
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**2.0** (N/A)		SM9223B		CCC	05/15/19 16:30	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-202
Date Sampled: 05/15/19 13:55
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-04
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/16/19 17:29	mg/L	CE91552
Nitrate as N	**0.603** (0.030)		353.2		1	JLK	05/15/19 21:34	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/15/19 20:08	mg/L	CE91546
Total Nitrogen	**1.08** (0.20)		4500N		1	JLK	05/17/19 16:57	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/15/19 17:25	mg/L	CE91558
Turbidity	ND (1.0)		180.1		1	CCP	05/15/19 17:30	NTU	CE91543

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-202
Date Sampled: 05/15/19 13:55
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-04
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/17/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.011** (0.006)		SUB		1	SUB	05/17/19 0:00	mg/L	CE92234

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-202
Date Sampled: 05/15/19 13:55
Percent Solids: N/A

ESS Laboratory Work Order: 1905509
ESS Laboratory Sample ID: 1905509-04
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**1.0** (N/A)		SM9223B		CCC	05/15/19 16:30	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905509

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CE91543 - General Preparation										
Blank										
Turbidity	ND	1.0	NTU							
LCS										
Turbidity	4.0		NTU	4.000		100	90-110			
Batch CE91546 - General Preparation										
Blank										
Nitrite as N	ND	0.010	mg/L							
Nitrite as N	ND	0.010	mg/L							
LCS										
Nitrite as N	0.258		mg/L	0.2497		103	90-110			
Nitrite as N	0.258		mg/L	0.2497		103	90-110			
Batch CE91547 - General Preparation										
Blank										
Nitrate/Nitrite as N	ND	0.020	mg/L							
Nitrate/Nitrite as N	ND	0.020	mg/L							
LCS										
Nitrate/Nitrite as N	0.496		mg/L	0.5000		99	90-110			
Nitrate/Nitrite as N	0.496		mg/L	0.5000		99	90-110			
Batch CE91552 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.10	0.10	mg/L	0.09994		103	80-120			
LCS										
Ammonia as N	1.16	0.10	mg/L	0.9994		116	80-120			
Batch CE91558 - General Preparation										
Blank										
Total Residual Chlorine	ND	0.06	mg/L							
LCS										
Total Residual Chlorine	0.39		mg/L	0.3999		98	80-120			
Batch CE91724 - TKN Prep										
Blank										
Total Kjeldahl Nitrogen as N	ND	0.20	mg/L							
LCS										
Total Kjeldahl Nitrogen as N	3.97	0.20	mg/L	3.490		114	80-120			

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton ESS Laboratory Work Order: 1905509

Notes and Definitions

U	Analyte included in the analysis, but not detected
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905509

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Environmental Chemistry
Site Assessment
Quality Assurance Services

Environmental Services
Site Sampling
Data Auditing

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 12:26
LOCATION: 1905509-01

REPORTED: 05/21/2019
ORDER #: G1935703
SAMPLE DATE: 5/15/2019
DATE RECEIVED: 5/16/2019
SAMPLE ID: 1905509
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935703-01**	
Surfactants (MBAS)	Hach 8028	05/17/2019	mg/L	0.006	**0.023**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 12:45
LOCATION: 1905509-02

REPORTED: 05/21/2019
ORDER #: G1935703
SAMPLE DATE: 5/15/2019
DATE RECEIVED: 5/16/2019
SAMPLE ID: 1905509
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935703-02**	
Surfactants (MBAS)	Hach 8028	05/17/2019	mg/L	0.006	**0.012**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 13:31
LOCATION: 1905509-03

REPORTED: 05/21/2019
ORDER #: G1935703
SAMPLE DATE: 5/15/2019
DATE RECEIVED: 5/16/2019
SAMPLE ID: 1905509
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#:** **1935703-03**	
Surfactants (MBAS)	Hach 8028	05/17/2019	mg/L	0.006	**0.027**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

CERTIFICATE OF ANALYSIS

Shawn Morrell
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211

COLLECTED BY: Customer
TIME: 13:55
LOCATION: 1905509-04

REPORTED: 05/21/2019
ORDER #: G1935703
SAMPLE DATE: 5/15/2019
DATE RECEIVED: 5/16/2019
SAMPLE ID: 1905509
DESCRIPTION: WATER

RESULTS OF ANALYSIS

Parameter	Analytical Method	Date Analyzed	Units	Det. Limit*	Result
Test Parameters				**LAB-ID#: 1935703-04**	
Surfactants (MBAS)	Hach 8028	05/17/2019	mg/L	0.006	**0.011**

Unless otherwise noted, all analyses were conducted by Analytical Balance Corp. (M-MA022).

NA = Not Applicable
ND = Not Detected
'<' = Less Than
'*' = Detection Limit

Approved By: _____
Lab Manager / Date

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

Analytical Balance

CHAIN OF CUSTODY

ESS Lab # 1905509

Turn Time **X** Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name	Project #	Project Name
ESS Laboratory		1905509

Contact Person	Proj. Location
Shawn Morrell	

Address	City , State	Zip	PO #
			B02787

Tel.	email:
ext 3083	smorrell@thielsch.com

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis		Surfactants							
1	5/15/19	1226	g	Aq*	1905509-01							x							
2	5/15/19	1245	g	Aq*	1905509-02							x							
3	5/15/19	1331	g	Aq*	1905509-03							x							
4	5/15/19	1355	g	Aq*	1905509-04							x							

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No

Seals Intact ____ Yes _____No NA:____

Cooler Temperature: _____

Internal Use Only

[ ] Pickup

[ ] Technician____

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: ***Aq = Stormwater**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
R Carlson 5/16/19 1253	Erin McElwee 5/16/19 12:53		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

(1905161

CHAIN OF CUSTODY

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

ESS Lab # 1905509
Reporting Limits
Electonic Deliverables ☐ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Turn Time: 5 Days
Regulatory State
Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP

Company Name: Environmental Partners Group, Inc.
Project #: R282-1801
Project Name: FY19 - MS4 Services (Stoughton)
Contact Person: Natalie Pommersheim
Address: 1900 Crown Colony Dr.
City: Quincy
State: MA
Zip Code: 02169
PO #:
Telephone Number: 617-657-0257
FAX Number:
Email Address: nmp@envpartners.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chloride (TRC)	BOD	NO2	NO3	E.coli	Surfactants	Fecal Coliform	Turbidity
1	5/15/19	1226	G	Stormwater	OF-113	X		X	X		X	X	X	X		
2	5/15/19	1245	G	Stormwater	OF-756	X		X	X		X	X	X	X		
~~5/15/19~~	~~1310~~		~~G~~	~~Stormwater~~	~~OF-744~~	X		X	X		X	X	X	X		
3	5/15/19	1331	G	Stormwater	OF-203	X		X	X		X	X	X	X		X
4	5/15/19	1355	G	Stormwater	OF-202	X		X	X		X	X	X	X		X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*

P	P	P	P	P	P	P	P	S	AG	S	P					
6	6	6	6	6	6	6	1	6	1	6						
3	3	3	1	1	1	1	1	1	1	1						
1	1	1	1	1	1	1	1	1	1	1						

Number of Containers per Sample:

Laboratory Use Only
Cooler Present: _____ ○ Drop Off ☑ Pickup
Seals Intact: _____
Cooler Temperature: 1.2 °C ICE RC

Sampled by: Marissa Carvalho
Comments: * E.coli samples have a short hold time!
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/15/19 1413	5/15/19 1413	5/15/19 1548	5/15/19 16:04
5/15/19 1608	5/15/19 1612		

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1905509

Turn Time: 5 Days
Regulatory State
Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP
Reporting Limits
Electonic Deliverables: ☐ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name	Project #	Project Name
Environmental Partners Group, Inc.	R282-1801	FY19 - MS4 Services (Stoughton)
Contact Person	**Address**	
Natalie Pommersheim	1900 Crown Colony Dr.	
City	**State**	**Zip Code** / **PO #**
Quincy	MA	02169
Telephone Number	**FAX Number**	**Email Address**
617-657-0257		nmp@envpartners.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chlorine (TRC)	BOD	NO2	NO3	E.coli	Surfactants	Fecal Coliform	Turbidity
1	5/15/19	1226	G	Stormwater	OF-113	X		X	X		X	X	X	X		
2	5/15/19	1245	G	Stormwater	OF-756	X		X	X		X	X	X	X		
~~5/15/19~~	~~1310~~	~~G~~	~~Stormwater~~	~~OF-744~~	~~X~~		~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~		
3	5/15/19	1331	G	Stormwater	OF-203	X		X	X		X	X	X	X		X
4	5/15/19	1355	G	Stormwater	OF-202	X		X	X		X	X	X	X		X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial — P P P P P P P S AG S P
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* — 6 6 6 6 6 6 6 1 6 1 6
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* — 3 3 3 1 1 (1 1 1 1 1
Number of Containers per Sample: 1 1 1 1 1 1 1 1 1 1 1

Laboratory Use Only
Cooler Present: ____ ○ Drop Off
Seals Intact: ____ ☑ Pickup
Cooler Temperature: 1.2 °C ICE RC

Sampled by: Marissa Carvalho

Comments: Please specify "Other" preservative and containers types in this space
* E.coli samples have a short hold time!

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/15/19 1413	R Carlson 5/15/19 1413	R Carlson 5/15/19 1548	5/15/19 16:04
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Natalie Pommersheim
Environmental Partners Group
18 Commerce Way Ste 2000
Woburn, MA 01801

RE: FY19 MS4 Services - Stoughton (R282-1801)
ESS Laboratory Work Order Number: 1905342

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:33 pm, Jun 05, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

BAL Laboratory - Cranston, RI	E Coli
New England Testing Laboratory, Inc. - West Warwick, RI	Surfactants

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905342

SAMPLE RECEIPT

The following samples were received on May 09, 2019 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the Guidelines Establishing Test Procedures for the Analysis of Pollutants, 40 CFR Part 136, as amended.

Revision 1 June 5, 2019: This report has been revised to include Chlorine analysis for 1905342-07.

Lab Number	Sample Name	Matrix	Analysis
1905342-01	Island	Storm Water	350.1, 365.1, 4500Cl G, 5210 B, SM9223B, SUB
1905342-02	Bailey	Storm Water	350.1, 365.1, 4500Cl G, 5210 B, SM9223B, SUB
1905342-03	OF-77	Storm Water	180.1, 350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905342-04	OF-207	Storm Water	180.1, 350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905342-05	OF-378	Storm Water	180.1, 350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905342-06	OF-464	Storm Water	350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB
1905342-07	OF-211	Storm Water	180.1, 350.1, 353.2, 4500Cl G, 4500N, SM9223B, SUB

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton ESS Laboratory Work Order: 1905342

PROJECT NARRATIVE

Classical Chemistry

1905342-01	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905342-02	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905342-03	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905342-04	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905342-05	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905342-06	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1905342-07	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905342

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: Island
Date Sampled: 05/09/19 14:05
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-01
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/14/19 16:49	mg/L	CE91416
Biochemical Oxygen Demand	ND (3)		5210 B		1	LAB	05/10/19 16:54	mg/L	CE91019
Total Phosphate as P	**0.12** (0.10)		365.1		1	EEM	05/13/19 16:35	mg/L	CE91046
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/09/19 19:53	mg/L	CE90943

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: Island
Date Sampled: 05/09/19 14:05
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-01
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.050** (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: Island
Date Sampled: 05/09/19 14:05
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-01
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**14.6** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: Bailey
Date Sampled: 05/09/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-02
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/14/19 16:52	mg/L	CE91416
Biochemical Oxygen Demand	ND (3)		5210 B		1	LAB	05/10/19 16:54	mg/L	CE91019
Total Phosphate as P	**0.12** (0.10)		365.1		1	EEM	05/13/19 16:36	mg/L	CE91046
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/09/19 19:53	mg/L	CE90943

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: Bailey
Date Sampled: 05/09/19 14:15
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-02
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.100** (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: Bailey
Date Sampled: 05/09/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-02
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**27.5** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-77
Date Sampled: 05/09/19 13:25
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-03
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/14/19 16:53	mg/L	CE91416
Nitrate as N	**0.101** (0.030)		353.2		1	JLK	05/10/19 20:51	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/10/19 19:59	mg/L	CE91044
Total Nitrogen	**0.90** (0.20)		4500N		1	JLK	05/15/19 16:48	mg/L	[CALC]
Total Residual Chlorine	**1.87** (0.06)		4500Cl G		1	CCP	05/09/19 19:53	mg/L	CE90943
Turbidity	ND (1.0)		180.1		1	CCP	05/09/19 19:49	NTU	CE90970

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-77
Date Sampled: 05/09/19 13:25
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-03
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	**0.040** (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-77
Date Sampled: 05/09/19 13:25
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-03
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**2.0** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-207
Date Sampled: 05/09/19 10:40
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-04
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/14/19 16:54	mg/L	CE91416
Nitrate as N	**0.292** (0.030)		353.2		1	JLK	05/10/19 20:53	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/10/19 20:02	mg/L	CE91044
Total Nitrogen	**0.84** (0.20)		4500N		1	JLK	05/15/19 16:49	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/09/19 19:53	mg/L	CE90943
Turbidity	**1.1** (1.0)		180.1		1	CCP	05/09/19 19:49	NTU	CE90970

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-207
Date Sampled: 05/09/19 10:40
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-04
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	ND (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-207
Date Sampled: 05/09/19 10:40
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-04
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**< 1.0** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-378
Date Sampled: 05/09/19 12:50
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-05
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/14/19 16:55	mg/L	CE91416
Nitrate as N	ND (0.030)		353.2		1	JLK	05/10/19 20:54	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/10/19 20:03	mg/L	CE91044
Total Nitrogen	**0.58** (0.20)		4500N		1	JLK	05/15/19 16:55	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/09/19 19:53	mg/L	CE90943
Turbidity	ND (1.0)		180.1		1	CCP	05/09/19 19:49	NTU	CE90970

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-378
Date Sampled: 05/09/19 12:50
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-05
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	ND (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-378
Date Sampled: 05/09/19 12:50
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-05
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**1.0** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-464
Date Sampled: 05/09/19 11:09
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-06
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.11** (0.10)		350.1		1	JLK	05/14/19 16:55	mg/L	CE91416
Nitrate as N	**0.614** (0.030)		353.2		1	JLK	05/10/19 20:55	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/10/19 20:04	mg/L	CE91044
Total Nitrogen	**1.24** (0.20)		4500N		1	JLK	05/15/19 16:56	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	CCP	05/09/19 19:53	mg/L	CE90943

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-464
Date Sampled: 05/09/19 11:09
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-06
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	ND (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-464
Date Sampled: 05/09/19 11:09
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-06
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**36.4** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-211
Date Sampled: 05/09/19 11:20
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-07
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	05/14/19 16:56	mg/L	CE91416
Nitrate as N	**0.342** (0.030)		353.2		1	JLK	05/10/19 20:56	mg/L	[CALC]
Nitrite as N	ND (0.010)		353.2		1	JLK	05/10/19 20:05	mg/L	CE91044
Total Nitrogen	**0.80** (0.20)		4500N		1	JLK	05/15/19 16:57	mg/L	[CALC]
Total Residual Chlorine	ND (0.06)		4500Cl G		1	PMH	05/30/19 21:30	mg/L	CE93040
Turbidity	ND (1.0)		180.1		1	CCP	05/09/19 19:49	NTU	CE90970

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-211
Date Sampled: 05/09/19 11:20
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-07
Sample Matrix: Storm Water

Analyst: SUB
Prepared: 5/10/19 0:00

All methods used are in accordance with 40 CFR 136.

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Surfactants (MBAS)	ND (0.030)		SUB		1	SUB	05/10/19 0:00	mg/L	CE91727

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton
Client Sample ID: OF-211
Date Sampled: 05/09/19 11:20
Percent Solids: N/A

ESS Laboratory Work Order: 1905342
ESS Laboratory Sample ID: 1905342-07
Sample Matrix: Storm Water

All methods used are in accordance with 40 CFR 136.

Microbiology

Analyte	Results (MRL)	MDL	Method	Limit	Analyst	Analyzed	Units
E.coli	**< 1.0** (N/A)		SM9223B		GSG	05/09/19 16:45	MPN/100mL

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905342

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CE90943 - General Preparation										
Blank										
Total Residual Chlorine	ND	0.06	mg/L							
LCS										
Total Residual Chlorine	0.39		mg/L	0.3999		98	80-120			
Batch CE90970 - General Preparation										
Blank										
Turbidity	ND	1.0	NTU							
LCS										
Turbidity	3.9		NTU	4.000		97	90-110			
Batch CE91019 - BOD Prep										
LCS										
Biochemical Oxygen Demand	204		mg/L	200.0		102	84.6-115.4			
Batch CE91044 - General Preparation										
Blank										
Nitrite as N	ND	0.010	mg/L							
Nitrite as N	ND	0.010	mg/L							
LCS										
Nitrite as N	0.248		mg/L	0.2497		99	90-110			
Nitrite as N	0.248		mg/L	0.2497		99	90-110			
Batch CE91045 - General Preparation										
Blank										
Nitrate/Nitrite as N	ND	0.020	mg/L							
Nitrate/Nitrite as N	ND	0.020	mg/L							
LCS										
Nitrate/Nitrite as N	0.513		mg/L	0.5000		103	90-110			
Nitrate/Nitrite as N	0.513		mg/L	0.5000		103	90-110			
Batch CE91046 - General Preparation										
Blank										
Total Phosphate as P	ND	0.10	mg/L							
LCS										
Total Phosphate as P	0.51	0.10	mg/L	0.5000		102	90-110			
Batch CE91416 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.09	0.10	mg/L	0.09994		91	80-120			
LCS										
Ammonia as N	1.14	0.10	mg/L	0.9994		114	80-120			
Batch CE91446 - TKN Prep										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905342

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CE91446 - TKN Prep										
Total Kjeldahl Nitrogen as N	ND	0.20	mg/L							
LCS										
Total Kjeldahl Nitrogen as N	3.67	0.20	mg/L	3.490		105	80-120			
Batch CE93040 - General Preparation										
Blank										
Total Residual Chlorine	ND	0.06	mg/L							
LCS										
Total Residual Chlorine	0.38		mg/L	0.3999		94	80-120			

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton ESS Laboratory Work Order: 1905342

Notes and Definitions

U	Analyte included in the analysis, but not detected
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
<	Less than the Method Detection Limit.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group
Client Project ID: FY19 MS4 Services - Stoughton

ESS Laboratory Work Order: 1905342

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 9E10003
Client Project: General Project

Report Date: 16-May-2019

Prepared for:

ESS Lab
ESS Laboratory
185 Frances Avenue
Cranston, RI 02910

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted:

The samples listed below were submitted to New England Testing Laboratory on 05/10/19. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 9E10003. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled
9E10003-01	1905342-01	Water	05/09/2019
9E10003-02	1905342-02	Water	05/09/2019
9E10003-03	1905342-03	Water	05/09/2019
9E10003-04	1905342-04	Water	05/09/2019
9E10003-05	1905342-05	Water	05/09/2019
9E10003-06	1905342-06	Water	05/09/2019
9E10003-07	1905342-07	Water	05/09/2019

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1905342-01

Surfactants (MBAS)	SM5540-C

1905342-02

Surfactants (MBAS)	SM5540-C

1905342-03

Surfactants (MBAS)	SM5540-C

1905342-04

Surfactants (MBAS)	SM5540-C

1905342-05

Surfactants (MBAS)	SM5540-C

1905342-06

Surfactants (MBAS)	SM5540-C

1905342-07

Surfactants (MBAS)	SM5540-C

The analytical methods provided are documented in the following references:

Manual of Methods for Chemical Analysis of Water and Water Wastes, EPA-600/4-79-020 (Revised 1983), USEPA/EMSL.
Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, APHA, AWWA-WPCF.
40 CFR 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act*, Office of Federal Register National Archives and Records Administration.

Results:

Sample: 1905342-01
9E10003-01 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	**0.05**	0.03	mg/L	05/10/19

Sample: 1905342-02
9E10003-02 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	**0.10**	0.03	mg/L	05/10/19

Sample: 1905342-03
9E10003-03 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	**0.04**	0.03	mg/L	05/10/19

Sample: 1905342-04
9E10003-04 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	ND	0.03	mg/L	05/10/19

Sample: 1905342-05
9E10003-05 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	ND	0.03	mg/L	05/10/19

Sample: 1905342-06
9E10003-06 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	ND	0.03	mg/L	05/10/19

Sample: 1905342-07
9E10003-07 (Water)

General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
MBAS	ND	0.03	mg/L	05/10/19

Case Narrative

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

All samples were analyzed in accordance with 40 CFR 136 approved methodologies.

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B9E0483 - Surfactants										
Blank (B9E0483-BLK1)					Date Analyzed: 05/10/19					
MBAS	ND		0.03	mg/L						
LCS (B9E0483-BS1)					Date Analyzed: 05/10/19					
MBAS	1.29		0.03	mg/L	1.20		107	90-110		
LCS (B9E0483-BS2)					Date Analyzed: 05/10/19					
MBAS	1.22		0.03	mg/L	1.20		102	90-110		

9 E 1 0003 R

ESS Laboratory NET

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time X Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name: ESS Laboratory	Project #:	Project Name: 1905342	
Contact Person: Shawn Morrell	Proj. Location:		
Address:	City , State:	Zip:	PO #: B02787
Tel.: ext 3083	email: smorrell@thielsch.com		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis		Surfactants							
	5/9/19	1405	G	SW	1905342-01	1	1	AG	1L			X							
	5/9/19	1415	G	SW	1905342-02	1	1	AG	1L			X							
	5/9/19	1325	G	SW	1905342-03	1	1	AG	1L			X							
	5/9/19	1040	G	SW	1905342-04	1	1	AG	1L			X							
	5/9/19	1250	G	SW	1905342-05	1	1	AG	1L			X							
	5/9/19	1109	G	SW	1905342-06	1	1	AG	1L			X							
	5/9/19	1120	G	SW	1905342-07	1	1	AG	1L			X							

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No

Seals Intact ____ Yes _____No NA:____

Cooler Temperature: 4°

Internal Use Only

[ ] Pickup

[ ] Technician____

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **Please send Sample Confirmation after samples have been received to Heather Masse - hmasse@thielsch.com**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
5/10/19 900	5/10/19 900 am		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

AA

BNL

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1905342

Turn Time: 5 Days
Regulatory State:
Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP
Reporting Limits:
Electonic Deliverables: ☐ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name	Project #	Project Name
Environmental Partners Group, Inc.	P-282-1801	FY19 - MS4 Services (Stoughton)

Contact Person	Address
Natalie Pommersheim	1900 Crown Colony Dr.

City	State	Zip Code	PO #
Quincy	MA	02169	

Telephone Number	FAX Number	Email Address
617-657-0257		nmp@envpartner.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chlorine	BOD	NO2	NO3	E. coli	Surfactants	Fecal Coliform	Turbidity
	5/9/19	1405	G	Storm Water	[redacted] Island	X	X		X	X			X	X	X	
		1415			Bailey	X	X		X	X			X	X	X	
		1325			OF-77	X		X	X		X	X	X	X		X
		1040			OF-207	X		X	X		X	X	X	X		X
		1250			OF-378	X		X	X		X	X	X	X		X
		1109			OF-464	X		X	X		X	X	X	X		
		1120			OF-211	X		X			X	X	X	X		X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial	P	P	P	P	P	P	P	S	AG	S	P					
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*	6	6	6	6	6	6	6	1	6	1	6					
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*	3	3	3	1	1	1	1	1	1	1	1					
Number of Containers per Sample:	1	1	1	1	1	1	1	1	1	1	1					

Laboratory Use Only
Cooler Present: ____ ○ Drop Off
Seals Intact: ____ ⓟ Pickup
Cooler Temperature: 0.6+0.9 °C ICE RC

Sampled by: Marissa Carvalho

Comments: Please specify "Other" preservative and containers types in this space
E.coli samples - short hold time!

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/9/19 1449	R Carlos 5/9/19 1449	R Carlos 5/9/19 1632	5/9/19 1630
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
5/9/19 16:32	05/09/19 1632		

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1905342

Turn Time	5 Days
Regulatory State	
Is this project for any of the following?:	○ CT RCP ○ MA MCP ○ RGP
Reporting Limits	
Electonic Deliverables	☐ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name	Project #	Project Name
Environmental Partners Group, Inc.	P-282-1801	FY19-MS4 Services (Stoughton)
Contact Person	**Address**	
Natalie Pommersheim	1900 Crown Colony Dr.	
City	**State**	**Zip Code** / **PO #**
Quincy	MA	02169
Telephone Number	**FAX Number**	**Email Address**
617-657-0257		nmp@envpartners.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chlorine	BOD	NO2	NO3	E. coli	Surfactants	Fecal Coliform	Turbidity
1	5/9/19	1405	G	Storm Water	[redacted] Island	X	X		X	X			X	X	X	
2		1415			Bailey-	X	X		X	X			X	X	X	
3		1325			OF-77	X		X	X		X	X	X	X		X
4		1040			OF-207	X		X	X		X	X	X	X		X
5		1250			OF-378	X		X	X		X	X	X	X		X
6		1109			OF-464	X		X	X		X	X	X	X		
7		1120			OF-211	X		X	X		X	X	X	X		X

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	P	P	P	P	P	P	P	S	AG	S	P
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*	6	6	6	6	6	6	6	1	6	1	6
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*	3	3	3	1	1	1	1	1	1	1	1
											Number of Containers per Sample:	1	1	1	1	1	1	1	1	1	1	1

Laboratory Use Only

Cooler Present: _____ ○ Drop Off
Seals Intact: _____ ⊘ Pickup
Cooler Temperature: 0.6+0.9 °C ICE RC

Sampled by: Marissa Carvalho

Comments: Please specify "Other" preservative and containers types in this space

E.coli samples -short hold time! Chlorine added for sample -07 5/30/19 - PRB

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/9/19 1447	RCarlos 5/9/19 1449	RCarlos 5/9/19 1632	5/9/19 1630
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
	05 09 19 GJC		

Fecal canclled per client - ML 5/17/19

ESS Laboratory

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185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1905342

Turn Time	5 Days
Regulatory State	
Is this project for any of the following?:	○ CT RCP ○ MA MCP ○ RGP
Reporting Limits	
Electonic Deliverables	☐ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name	Project #	Project Name
Environmental Partners Group, Inc.	P-282-1801	FY19-MS4 Services (Stoughton)
Contact Person	**Address**	
Natalie Pommersheim	1900 Crown Colony Dr.	
City	**State**	**Zip Code** / **PO #**
Quincy	MA	02169
Telephone Number	**FAX Number**	**Email Address**
617-657-0257		nmp@envpartners.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chlorine	BOD	NO2	NO3	E. coli	Surfactants	Fecal Coliform	Turbidity					
1	5/9/19	1405	G	Storm Water	[redacted] Island	X	X		X	X			X	X	X						
2		1415			Bailey-	X	X		X	X			X	X	X						
3		1325			OF-77	X		X	X		X	X	X	X		X					
4		1040			OF-207	X		X	X		X	X	X	X		X					
5		1250			OF-378	X		X	X		X	X	X	X		X					
6		1109			OF-464	X		X	X		X	X	X	X							
7		1120			OF-211	X		X			X	X	X	X		X					

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial		P	P	P	P	P	P	P	S	AG	S	P					
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*		6	6	6	6	6	6	6	1	6	1	6					
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DI H2O	11-Other*		3	3	3	1	1	1	1	1	1	1	1					
											Number of Containers per Sample:		1	1	1	1	1	1	1	1	1	1	1					

Laboratory Use Only

Cooler Present: _____ ○ Drop Off
Seals Intact: _____ ⊘ Pickup
Cooler Temperature: 0.6+0.9 °C ICE RC

Sampled by: Marissa Carvalho

Comments: Please specify "Other" preservative and containers types in this space
E.coli samples - short hold time!

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/9/19 1447	R Carlos 5/9/19 1449	R Carlos 5/9/19 1632	5/9/19 1630
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
	05 09 19 GJC		

Fecal canclled per client - ML 5/17/19

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1905342

Turn Time: 5 Days
Regulatory State
Is this project for any of the following?: ○ CT RCP ○ MA MCP ○ RGP
Reporting Limits
Electonic Deliverables: ☐ Data Checker ☑ Excel ☑ Other (Please Specify →) PDF

Company Name: Environmental Partners Group, Inc.
Project #: P-282-1801
Project Name: FY19 - MS4 Services (Stoughton)
Contact Person: Natalie Pommersheim
Address: 1900 Crown Colony Dr.
City: Quincy
State: MA
Zip Code: 02169
PO #:
Telephone Number: 617-657-0257
FAX Number:
Email Address: nmp@envpartners.com

Analysis

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Ammonia Nitrogen	Total Phosphorus	Total Nitrogen	Chlorine	BOD	NO2	NO3	E. coli	Surfactants	Fecal Coliform	Turbidity
1	5/9/19	1405	G	Storm Water	[redacted] Island	X	X		X	X			X	X	X	
2		1415			Bailey-	X	X		X	X			X	X	X	
3		1325			OF-77	X		X	X		X	X	X	X		X
4		1040			OF-207	X		X	X		X	X	X	X		X
5		1250			OF-378	X		X	X		X	X	X	X		X
6		1109			OF-464	X		X	X		X	X	X	X		
7		1120			OF-211	X		X			X	X	X	X		X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial						P	P	P	P	P	P	P	S	AG	S	P
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*						6	6	6	6	6	6	6	1	6	1	6
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*						3	3	3	1	1	1	1	1	1	1	1
Number of Containers per Sample:						1	1	1	1	1	1	1	1	1	1	1

Laboratory Use Only
Cooler Present: _____ ○ Drop Off
Seals Intact: _____ ⓟ Pickup
Cooler Temperature: 0.6+0.9 °C ICE RC

Sampled by: Marissa Carvalho
Comments: Please specify "Other" preservative and containers types in this space
E.coli samples - short hold time!

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
M Carvalho 5/9/19 1447	R Carlos 5/9/19 1449	R Carlos 5/9/19 1632	5/9/19 1630
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
	05091900 GJC		

Environmental Partners GROUP

A partnership for engineering solutions

Technical Memorandum

Date 06/18/2019

To Craig Horsfall, P.E. – Assistant Town Engineer, Town of Stoughton

From Natalie Pommersheim – Senior Project Scientist, Environmental Partners

CC Marc Tisdelle, P.E. – Town Engineer, Town of Stoughton

Thomas Fitzgerald – Superintendent, Town of Stoughton

Marissa Carvalho – Environmental Scientist, Environmental Partners

File

Subject Illicit Discharge Detection & Elimination (IDDE) Investigations

FY19 Stormwater Services for the Engineering Department

This memorandum summarizes the 2019 Outfall Sampling Program, outlined in Task 2 of the General Services Agreement – Letter of Understanding Task Order No. 22 for FY19 Stormwater Services for the Engineering Department of the Town of Stoughton.

Under this task, Environmental Partners Group, Inc. (EP) conducted outfall sampling over the course of three (3) days in May 2019. A total of sixty-five (65) outfalls were screened, of which sixteen (16) were found flowing during dry weather. In addition, two (2) surface water samples were collected from the East branch of the Neponset River, upstream and downstream of the Greenbrook II Apartments.

OUTFALL SAMPLING

On May 1, 9 and 15, 2019, EP and Stoughton Public Works staff visited sixty-five (65) outfalls during dry weather, approximately 25% of the 219 total identified MS4 outfalls in the Town of Stoughton. These outfalls were selected based on proximity (less than 100 feet) of a Category 5 waterbody, or tributaries to a Category 5 waterbody, as identified in the 2014 List of Integrated Waters. The Category 5 waterbodies receiving MS4 outfall discharges include Ames Long Pond, two (2) Unnamed Tributaries to Ames Long Pond, Beaver Meadow Brook, two (2) Unnamed Tributaries to Beaver Meadow Brook, the East branch of the Neponset River, Unnamed Tributary MA73-32, an Unnamed Tributary to Unnamed Tributary MA73-32 and Steep Hill Brook. Although Dorchester Brook is not a Category 5 waterbody, the two (2) outfalls discharging to Dorchester Brook were screened due to evidence of E.coli contamination from past sampling events. The two (2) surface water locations on the East branch of the Neponset River were

selected upstream and downstream of private apartment complex Greenbrook II in order to confirm that the water quality in the river is being impacted by discharges from private property rather than Town owned property. The complete list of all sixty-seven (67) screening locations is attached as *Table 1: Outfalls and Surface Water Sampling Locations* and all locations are shown on *Figure 1: Stoughton Sampling Locations*.

Throughout the outfall screening process, EP staff made the following observations:

- OF-322 and OF-323 (both flowing) off Kotlik Street were sampled from upstream manholes for accessibility, and flow was observed from two separate incoming pipes in each of these manholes.
- Connectivity from OF-465 off Winslow Drive is unclear, potentially a buried manhole in the area.
- At Grove Road and Glen Echo Boulevard, EP visited OF-286 that was not flowing, but it should be noted that there was a strong sewer odor in the stream/culvert nearby, and there were suds/bubbles near the culvert outlet. See attached map.
- OF-545, previously sampled off Wheeler Circle (high E.coli concentrations), was just barely dripping and always has orange residue surrounding the outfall. This area is not maintained by the Town (according to DPW staff), but the ownership in GIS is listed as public.
- OF-200, previously sampled off Ethyl Drive, was flowing into Steep Hill Brook and has been sampled in the past (high E.coli concentrations). This area is not maintained by the Town (according to DPW staff), but the ownership in GIS is listed as public.
- OF-464 behind 45 Crockett Street (which discharges to Dorchester Brook) is very difficult to access and therefore it was not possible to perform a visual observation of the pipe end. This outfall was flowing, and a sample was collected using a sampling rod. EP recommends that DPW staff clear this area for follow-up sampling events.
- OF-40 behind the power line easements near 125 Charles Avenue was actually identified as an outlet to an overgrown BMP, and EP recommends that the Town clear this BMP area for follow-up investigations. An additional outlet structure was located that was covered in vegetation and bolted shut.
- EP recommends that the Town coordinate sampling efforts with the Town of Avon for OF-743 and OF-744. Both of these pipes were flowing, however connectivity was observed to be from the Avon drainage system, just along the Town line on Central Street.

RESULTS AND RECOMMENDATIONS

A total of eighteen (18) locations were sampled under this task. All outfalls and surface water locations were analyzed in the field for pH, temperature, specific conductance, salinity, dissolved oxygen. All samples were analyzed for ammonia, chlorine, E.coli and surfactants at certified laboratory, ESS Laboratory, in Cranston, Rhode Island. Additional sampling parameters were applied to outfalls discharging to waterbodies with TMDL requirements, such as nitrogen, turbidity, fecal coliform, BOD, and phosphorus. A summary of the field and analytical results is presented in *Table 2: Stormwater Field Screening and Analytical Results*. Additional sampling parameters are also shown in Table 2.

All outfall sampling results were below reporting limits, other than specific conductance and pH. EP recommends selecting another 25% of MS4 outfalls (55) for FY20 to continue with the sampling program and permit compliance.

In accordance with the General Services Agreement, EP also verified the outfall structure information including material, size, condition, flow connectivity, receiving waterbody, and headwall type. The updated survey data has been incorporated into the Town's existing GIS and an updated geodatabase will be submitted to the Town via Dropbox. An observation log of all structures screened and sampled under this Task is included in *Table 3: Outfall Observation Log.*

Attachments:

Table 1: Outfalls and Surface Water Sampling Locations

Table 2: Stormwater Field Screening and Analytical Results

Table 3: Outfall Observation Log

Figure 1: Sampling Locations

Table 1: Outfalls and Surface Water Sampling Locations

Sampled (Flowing) 2019

Screened (Not Flowing) 2019

Waterbody	OF ID	Previously Sampled?	E.coli Results	Map Grid #	Approx. Street Address	Additional Sampling Parameters	Sample Date/Time
Ames Long Pond	OF-77	No		12	1670 West St	*Nitrogen; Turbidity	5/9/2019 13:25
	OF-162	No		5	769 Highland St		
	OF-202	No		8	216 Palisades Circle		5/15/2019 13:55
	OF-203	No		8	1749 West St		5/15/2019 13:31
	OF-204	Apr-15	<10	8	22 Palisades Circle		
	OF-207	Apr-15	10	12	450 Highand Dr		5/9/2019 10:40
	OF-211	Apr-15	<10	8	536 Highand Dr		5/9/2019 11:20
	OF-376	No		8	751 Highland St		
	OF-378	No		8	751 Highland St		5/9/2019 12:50
	OF-547	No		8	145 Lake Dr		
	OF-553	No		8	55 Lake Dr		
	OF-554	No		8	55 Lake Dr		
Beaver Meadow Brook	OF-193	No		82	14 Meadowbrook Ln	**Bacteria (E.coli); Dissolved Oxygen (BOD)	
	OF-194	No		82	14 Meadowbrook Ln		5/1/2019 14:15
	OF-195	No		82	14 Meadowbrook Ln		
Upstream East Branch Neponset River	Surface Water Sample	No		79	275 Bailey St (Canton)	**Bacteria (E.coli); Dissolved Oxygen (BOD); Fecal Coliform	5/9/2019 14:15
Downstream East Branch Neponset River	Surface Water Sample	No		80	372 Island St	**Bacteria (E.coli); Dissolved Oxygen (BOD); Fecal Coliform	5/9/2019 14:05
Unnamed Tributary to Ames Long Pond (1)	OF-159	No		23	10 Walters Way	*Nitrogen	
	OF-351	No		17	115 Walters Way		
Unnamed Tributary to Beaver Meadow Brook (1)	OF-38	No		89	90 Towbridge Cir	**Bacteria (E.coli)	
	OF-39	No		89	102 Deady Ave		
	OF-286	No		89	213 Glen Echo Blvd		
	OF-306	No		89	90 Towbridge Cir		
	OF-334	No		89	102 Deady Ave		
	OF-455	No		89	102 Deady Ave		5/1/2019 14:30
	OF-456	No		89	90 Towbridge Cir		
Unnamed Tributary to Beaver Meadow Brook (2)	OF-395	No		83	25 Darling Way	**Bacteria (E.coli)	
	OF-486	No		83	47 Darling Way		
Unnamed Tributary to Ames Long Pond (2)	OF-249	No		10	Jordan Dr	*Nitrogen	
	OF-250	No		10	Jordan Dr		
	OF-251	No		10	Jordan Dr		
Unnamed Tributary to MA73-32	OF-148	No		49	153 Rogers Dr	**Bacteria (E.coli)	5/1/2019 13:05
	OF-150	No		49	78 Bradford St		
	OF-151	No		49	202 Morton St		
	OF-156	No		57	497 Schhol St		
	OF-322	No		48	176 Kotlik St		5/1/2016 11:15
	OF-323	No		48	98 Kotlik St		5/1/2019 10:45
	OF-324	No		48	70 Kotlik St		5/1/2019 11:40
	OF-350	No		49	14 Dino Dr		
	OF-450	No		48	75 Sheehan St		
	OF-465	No		48	132 Winslow Dr		
	OF-469	No		48	104 Winslow Dr		
	OF-578	No		49	989 Washington St		
	OF-580	No		49	78 Bradford St		5/1/2019 13:44
	OF-671	No		49	78 Bradford St		
Steep Hill Brook	OF-200	Apr-17	1290	71	73 Ethly Way	**Bacteria (E.coli)	
Dorchester Brook	OF-463	Apr-15	590	34	11 Crockett St	*Nitrogen	
	OF-464	No		34	45 Crockett St		5/9/2019 11:09
Unnamed Tributary (MA73-32)	OF-12	No		71	45 Wheeler Circle	**Bacteria (E.coli); Total Phosphorus	
	OF-64	No		64	1771 Central St		
	OF-65	No		64	1771 Central St		
	OF-136	No		71	75 Mill St		
	OF-545	May-19	2500	71	45 Wheeler Circle		
	OF-612	No		64	1771 Central St		
	OF-697	No		71	45 Wheeler Circle		
	OF-742	No		64	1771 Central St		
	OF-757	No		64	1771 Central St		

* = Taunton River Watershed Impairment

** = Boston Harbor: Neponset Watershed Impairment

All outfalls will be sampled for:
Ammonia, Chlorine, E. coli, Surfactants

pH, DO, specific conductivity, salinity, temperature

Additional Outfalls to Screen

Waterbody	OF ID	Previously Sampled?	E.coli Results	Map Grid #	Approx. Street Address	Additional Sampling Parameters
Wetlands near Beaver Meadow Brook	OF-40	No		83	125 Charles Ave	**Bacteria (E.coli)
Dorchester Brook	OF-55	No		27	110 Atkinson Ave	*Nitrogen
	OF-56	Apr-17	<1	27	54 Daly Drive Ext	*Nitrogen
	OF-113	No		27	Daly Drive	*Nitrogen
Unnamed Pond (1)	OF-57	No		26	1518 Washington St	*Nitrogen
Unnamed Wetlands	OF-743	Apr-17	<1	37	63 Central St (Avon)	*Nitrogen
	OF-744	Apr-17	4	37	63 Central St (Avon)	*Nitrogen
Unnamed Pond (2)	OF-765	No		86	Reebok Dr/Page St	***Pathogens (E.coli)
Steep Hill Brook	OF-748	No		71	2070 Central St	**Bacteria (E.coli)
Unnamed Tributary to Dorchester Brook	OF-755	No		35	632 Sumner St	*Nitrogen
	OF-756	No		35	632 Sumner St	*Nitrogen
	OF-745	No		35	1 Cedar St	*Nitrogen

Dorchester Brook

* = Taunton River Watershed Impairment

** = Boston Harbor: Neponset Watershed Impairment

***=Boston Harbor: Weymouth & Weir Watershed Impairment

Sampled (Flowing) 2019

Screened (Not Flowing) 2019

Table 2: Stormwater Field Screening and Analytical Results
Stoughton, MA
May 1, 9 and 15, 2019

									Surface Water									
Outfall Identification		OF-77	OF-202	OF-203	OF-207	OF-211	OF-378	OF-194	Upstream	Downstream	OF-455	OF-148	OF-322	OF-323	OF-324	OF-580	OF-464	OF-113	OF-756
Discharge Waterbody		Ames Long Pond						Beaver Meadow Brook	East Branch of the Neponset River		Unnamed Tributary to Beaver Meadow Brook	Unnamed Tributary to MA73-32					Dorchester Brook		Unnamed Tributary to Dorchester Brook
Date Sampled		5/9/2019	5/15/2019	5/15/20109	5/9/2019	5/9/2019	5/9/2019	5/1/2019	5/9/2019	5/9/2019	5/1/2019	5/1/2019	5/1/2019	5/1/2019	5/1/2019	5/1/2019	5/9/2019	5/15/2019	5/15/2019
Flow		Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Time		1:25 PM	1:55 PM	1:31 PM	10:40 AM	11:20 AM	12:50 PM	2:15 PM	2:15 PM	2:05 PM	2:30 PM	1:05 PM	11:15 AM	10:45 AM	11:40 AM	1:40 PM	11:09 AM	12:26 PM	12:45 PM
Field Test Results	**Threshold**																		
Temperature (˚C)	-	4.5	2.8	3.7	4.3	4.7	7.8	11.21	9.5	8.5	10.74	12.18	12.37	12.8	12.71	13.57	2.4	8.8	2.8
Specific Conductance (µS/cm)	2000 (µS/cm)	220.6	247.3	272.1	510.4	406.5	37.5	318	384.2	479	463	215	497	221	387	486	506.3	332.1	238.6
Salinity (ppt)	-	0.11	2.1	0.16	0.25	0.2	0.02	0.54	0.19	0.23	0.62	0.41	0.68	0.56	0.21	0.51	0.24	2.7	0.11
pH	6.5-8.0	**5.87**	**8.89**	7.21	6.60	7.20	6.55	6.59	7.01	6.54	**6.24**	**6.10**	**6.41**	6.60	6.56	**6.40**	**9.07**	6.84	**9.75**
DO (mg/L)	-	13.77	14.66	18.95	20.03	17.6	13.92	10.2	13.7	18.24	9.3	9.32	11.96	17.75	12.2	10.35	12.18	12.04	20.41
Analytical Results																			
Ammonia as Nitrogen (mg/L)	0.5 mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.17	ND	0.11	ND	ND
Biochemical Oxygen Demand (BOD) (mg/L)	-	-	-	-	-	-	-	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chlorine (TRC) (mg/L)	0.011/0.02 mg/L	1.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
E. coli (MPN/100 mL)	236 MPN/100 mL	2	1	2	<1.0	<1.0	1	47.3	27.5	14.6	2	<1.0	1	<1.0	<1.0	28.8	36.4	10.9	4.1
Phosphorus, Total (mg/L)	-	-	-	-	-	-	-	ND	0.12	0.12	ND	ND	ND	0.12	ND	ND	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	0.04	0.011	0.027	ND	ND	ND	0.023	0.1	0.05	0.036	0.026	0.023	0.011	0.019	0.025	ND	0.023	0.012
Nitrogen, Total (mg/L)	-	0.9	1.08	1.45	0.84	0.8	0.58	-	-	-	-	-	-	-	-	-	1.24	2.57	0.76
Nitrate as N	-	0.101	0.603	0.276	0.292	0.342	ND	-	-	-	-	-	-	-	-	-	0.614	2.11	0.283
Nitrite as N	-	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND
Turbidity	-	ND	ND	35.7	1.1	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-

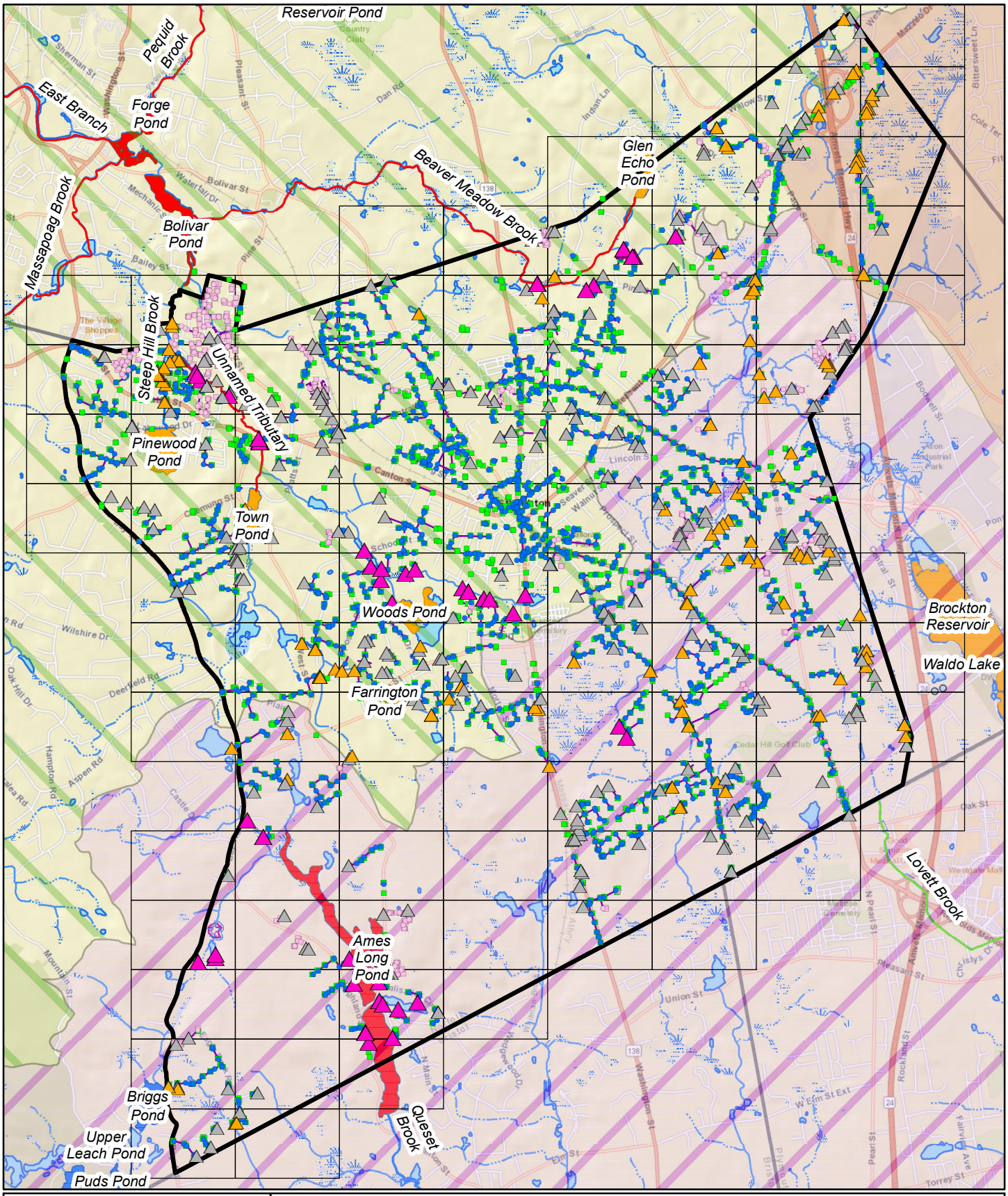
Notes:
- : Not Tested
ND: Non-detect
Bold Values exceed contaminant criteria.

Table 3: Outfall Observation Log
Stoughton, MA
May 1, 9 and 15, 2019

OF_ID	AdditNotes	Waterbody	InspNotes	2019Sample	date	time	address_fu
OF-697				Yes	5/1/2019		45 Wheeler Circle Stoughton Norfolk MA 02072 US
OF-395				Yes	5/1/2019		25 Darling Way Stoughton Norfolk MA 02072 US
OF-486				Yes	5/1/2019		47 Darling Way Stoughton Norfolk MA 02072 US
OF-136				Yes	5/1/2019		75 Mill Street Stoughton Norfolk MA 02072 US
OF-742		Unnamed Tributary		Yes	5/1/2019		1771 Central Street Stoughton Norfolk MA 02072 US
OF-757		Unnamed Tributary		Yes	5/1/2019		1771 Central Street Stoughton Norfolk MA 02072 US
OF-12		Unnamed Tributary		Yes	5/1/2019		45 Wheeler Circle Stoughton Norfolk MA 02072 US
OF-193	Slightly moved	Beaver Meadow Brook		Yes	5/1/2019		14 Meadowbrook Lane Stoughton Norfolk MA 02072 US
OF-195		Beaver Meadow Brook		Yes	5/1/2019		14 Meadowbrook Lane Stoughton Norfolk MA 02072 US
OF-200		Steep Hill Brook	FLOWING-ORANGE RESIDUE and bubbles	Yes	5/1/2019		73 Ethyl Way Stoughton Norfolk MA 02072 US
OF-38		Beaver Meadow Brook		Yes	5/1/2019		90 Trowbridge Circle Stoughton Norfolk MA 02072 US
OF-39		Beaver Meadow Brook		Yes	5/1/2019		102 Deady Ave Stoughton Norfolk MA 02072 US
OF-64		Unnamed Tributary	Comes from previously unmpaped catch basin in water works parking lot	Yes	5/1/2019		1771 Central Street Stoughton Norfolk MA 02072 US
OF-65		Unnamed Tributary	Comes from manhole	Yes	5/1/2019		1771 Central Street Stoughton Norfolk MA 02072 US
OF-156		Unnamed Tributary		Yes	5/1/2019		497 School Street Stoughton Norfolk MA 02072 US
OF-150		Unnamed Tributary	Outlet culvert, very overgrown	Yes	5/1/2019		72 Bradford Street Stoughton Norfolk MA 02072 US
OF-151	Inlet moved 218 feet	Unnamed Tributary	outfall, into culvert inlet	Yes	5/1/2019		202 Morton Street Stoughton Norfolk MA 02072 US
OF-545		Unnamed Tributary	Outfall - Goes to stream. Orange residue	Yes	5/1/2019		45 Wheeler Circle Stoughton Norfolk MA 02072 US
OF-612		Unnamed Tributary	Outfall - Goes to stream	Yes	5/1/2019		1771 Central Street Stoughton Norfolk MA 02072 US
OF-286		Beaver Meadow Brook	Outfall - Goes to wetlands	Yes	5/1/2019		213 Glen Echo Blvd Stoughton Norfolk MA 02072 US
OF-306		Beaver Meadow Brook	Outfall - Goes to stream	Yes	5/1/2019		90 Trowbridge Circle Stoughton Norfolk MA 02072 US
OF-334		Beaver Meadow Brook	Outfall - Goes to stream	Yes	5/1/2019		102 Deady Ave Stoughton Norfolk MA 02072 US
OF-350		Unnamed Tributary	Outfall - Goes to stream. May want to sample from MH	Yes	5/1/2019		14 Dino Dr Stoughton Norfolk MA 02072 US
OF-450		Unnamed Tributary	Outfall - Goes to pond	Yes	5/1/2019		75 Sheehan St Stoughton Norfolk MA 02072 US
OF-456		Beaver Meadow Brook	Outfall - Goes to stream	Yes	5/1/2019		90 Trowbridge Circle Stoughton Norfolk MA 02072 US
OF-465		Unnamed Tributary	Outfall - Goes to swamp. Entirely submerged	Yes	5/1/2019		132 Winslow Drive Stoughton Norfolk MA 02072 US
OF-469		Unnamed Tributary	Outfall - Goes to swamp	Yes	5/1/2019		104 Winslow Drive Stoughton Norfolk MA 02072 US
OF-671		Unnamed Tributary	Outfall - Goes to stream. Almost entirely submerged	Yes	5/1/2019		78 Bradford Street Stoughton Norfolk MA 02072 US
OF-578	State ownership			Yes	5/9/2019	9:03	989 Washington St Stoughton Norfolk MA 02072 US
OF-250				Yes	5/9/2019	9:40	68 Jordan Dr Stoughton Norfolk MA 02072 US
OF-77	Just barely flowing	Ames Long Pond	to woods and then to lake	Yes	5/9/2019	9:25	1561–1699 West St Stoughton Norfolk MA 02072 US
OF-159		Ames Long Pond		Yes	5/9/2019	10:03	15 Walters Way Stoughton Norfolk MA 02072 US
OF-162		Ames Long Pond		Yes	5/9/2019	13:11	1000 Highland St Stoughton Norfolk MA 02072 US
OF-553		Ames Long Pond	Outfall - Goes to pond	Yes	5/9/2019	13:41	1–63 Lake Dr Stoughton Norfolk MA 02072 US
OF-554		Ames Long Pond	Outfall - Goes to pond	Yes	5/9/2019	13:43	1000 Highland St Stoughton Norfolk MA 02072 US
OF-351	May have been flowing recently but no flow at time of observation	Ames Long Pond	Outfall - Goes to wetlands	Yes	5/9/2019	9:58	115 Walters Way Stoughton Norfolk MA 02072 US
OF-376		Ames Long Pond	Outfall - Goes to pond	Yes	5/9/2019	12:52	736–1198 Highland St Stoughton Norfolk MA 02072 US
OF-378		Ames Long Pond	Outfall - Goes to pond	Yes	5/9/2019	12:52	736–1198 Highland St Stoughton Norfolk MA 02072 US
OF-207	Steady flow	Ames Long Pond	Outfall - Goes to pond	Yes	5/9/2019	10:27	450 Highland St Stoughton Norfolk MA 02072 US
OF-211		Ames Long Pond	Outfall - Goes to pond	Yes	5/9/2019	11:07	536 Highland St Stoughton Norfolk MA 02072 US
OF-249	Half submerged	Ames Long Pond	Outfall. Vegetation in front	Yes	5/9/2019	9:35	25 Jordan Dr Stoughton Norfolk MA 02072 US
OF-251	To access, go down path along edge of bmp/pond	Ames Long Pond	Outfall from detention basin. Two pipes stacked. Outlet from OF 252	Yes	5/9/2019	9:44	68 Jordan Dr Stoughton Norfolk MA 02072 US
OF-463	Sheen	Coweeset Brook	Outfall - Goes to river - Pipe end broken from rest of pipe. Now it is pointing down at 135 degree angle	Yes	5/9/2019	7:54	11 Crockett St Stoughton Norfolk MA 02072 US
OF-464	Very difficult access, go in from white gate at house 45, lots of thorns, not able to actually see pipe end	Coweeset Brook	Outfall - Goes to stream	Yes	5/9/2019	8:00	45 Crockett St Stoughton Norfolk MA 02072 US
OF-743	Outfall to Stream. Flowing, possibly diverted stream. AVON DRAINAGE	Lovett Brook		Yes	5/15/2019	10:39	58–98 Central St Avon Norfolk MA 02322 US
OF-744	Outfall to stream, AVON drainage	Lovett Brook		Yes	5/15/2019	10:38	58–98 Central St Avon Norfolk MA 02322 US
OF-745	Outfall for stream from S-1120 28" or 30", smells. No flow in manhole but flow from culvert across street	Coweeset Brook		Yes	5/15/2019	9:20	1 Cedar St Stoughton Norfolk MA 02072 US
OF-748	Outfall to Stream	Steep Hill Brook		Yes	5/15/2019	11:30	2070 Central St Stoughton Norfolk MA 02072 US
OF-755	CULVERT OUTLET	Coweeset Brook		Yes	5/15/2019	9:27	8 Anderson Rd Stoughton Norfolk MA 02072 US
OF-756	Heavy flow from CB on Sumner	Coweeset Brook		Yes	5/15/2019	9:29	8 Anderson Rd Stoughton Norfolk MA 02072 US
OF-765	Outfall 70% submerged	Cochato River		Yes	5/15/2019	10:57	39–113 Page St Stoughton Norfolk MA 02072 US
OF-40	Pipe end completely submerged, can hear flowing water but unsure where it's coming from	Beaver Meadow Brook		Yes	5/15/2019	9:56	168 Washington St Stoughton Norfolk MA 02072 US
OF-55	On headwall with culvert, submerged, checked manhole	Coweeset Brook		Yes	5/15/2019	9:10	61 Farnham Rd Stoughton Norfolk MA 02072 US
OF-56	Submerged, does not seem to be flowing	Coweeset Brook		Yes	5/15/2019	9:03	12 Daly Drive Ext Stoughton Norfolk MA 02072 US
OF-57	CULVERT on on state rd	Longwater Pond	Picks up drainage from Morton St	Yes	5/15/2019	8:51	1518 Washington St Stoughton Norfolk MA 02072 US
OF-547		Ames Long Pond	Outfall - Goes to pond	Yes	5/15/2019	8:17	145 Lake Dr Stoughton Norfolk MA 02072 US
OF-202	Heavy flow, Bird Street conservation land drainage? Possibly stream outlet from there. Lower flow in PM	Ames Long Pond	Outfall - Goes to pond	Yes	5/15/2019	7:52	234 Palisades Cir Stoughton Norfolk MA 02072 US
OF-203	Very little flow	Ames Long Pond	Outfall - Goes to pond	Yes	5/15/2019	7:45	1725 West St Stoughton Norfolk MA 02072 US
OF-204		Ames Long Pond	Outfall - Goes to pond	Yes	5/15/2019	8:10	36 Palisades Cir Stoughton Norfolk MA 02072 US
OF-194		Beaver Meadow Brook		Yes	5/30/2019	16:11	14 Meadowbrook Ln Stoughton MA
OF-148	No OF data provided on plan.	Unnamed Tributary	if need to sample, ask DPW to clear out	Yes	5/30/2019	16:16	153 Rogers Dr Stoughton MA
OF-580		Unnamed Tributary	Outfall - Goes to stream	Yes	5/30/2019	16:24	78 Bradford St Stoughton MA
OF-322		Unnamed Tributary	Outfall - Goes to swampy stream that may attach to nearby pond	Yes	5/30/2019	16:18	176 Kotlik St Stoughton MA
OF-323		Unnamed Tributary	Outfall - need to access private property to inspect (residents were not home)	Yes	5/30/2019	16:21	98 Kotlik St Stoughton MA
OF-324		Unnamed Tributary	Outfall - Goes to pond. Nearly entirely submerged. Headwall falling apart	Yes	5/30/2019	16:22	70 Kotlik St Stoughton MA
OF-455		Beaver Meadow Brook	Outfall - Goes to stream	Yes	5/30/2019	16:15	102 Deady Ave Stoughton MA

Table 3: Outfall Observation Log
Stoughton, MA
May 1, 9 and 15, 2019

OF_ID	flow_pre_1	outfall__1	condition	diameter	material	headwall_1	headwall_2	headwall_3	temperatur	ph	dissolved_	specific_c	salinity_p	verify_con	verify_rec
OF-697	No	End of Pipe	Good	8	Concrete	Pipe	Good	Good						yes	yes
OF-395	No	End of Pipe	Good	15	Concrete	Headwall	Good	Concrete						yes	yes
OF-486	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-136	No	End of Pipe	Good	12	Concrete	Headwall	none	None						yes	yes
OF-742	No	End of Pipe	Good	0	Concrete	Pipe	Good	Concrete						yes	yes
OF-757	No	End of Pipe	Good	12	Concrete	Pipe	Good	Concrete						yes	yes
OF-12	No	End of Pipe	Good	24	Concrete	stone	fair	Masonry Stone						yes	yes
OF-193	No	End of Pipe	Good	12	Concrete	Headwall	Good	Masonry Block						yes	yes
OF-195	No	End of Pipe	Good	12	Concrete	concrete block	good	Masonry Block						yes	yes
OF-200	Yes	End of Pipe	Good	18	Concrete	stone	poor	Masonry Stone						yes	yes
OF-38	No	End of Pipe	Good	12	Concrete	concrete	fair	Concrete						yes	yes
OF-39	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-64	No	End of Pipe	Good	12	Concrete	none	none	None						yes	yes
OF-65	No	End of Pipe	Good	14	Concrete	none	none	None						yes	yes
OF-156	No	End of Pipe	Good	24x36	Concrete	Headwall	Good	Concrete						yes	yes
OF-150	Yes	End of Pipe	Good	unknown	Concrete	Headwall	Good	Concrete						yes	yes
OF-151	No	End of Pipe	Good	8	Concrete	Headwall	Good	None						yes	yes
OF-545	No	End of Pipe	Good	24	Concrete	Headwall	Good	Concrete						yes	yes
OF-612	No	End of Pipe	Good	8	Concrete	Headwall	Good	Stone						yes	yes
OF-286	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-306	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-334	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-350	No	End of Pipe	Good	24	Concrete	Headwall	Good	Stone						yes	yes
OF-450	No	End of Pipe	Good	12	Concrete	Pipe	Good	Concrete						yes	yes
OF-456	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-465	No	End of Pipe	Good		Concrete	Headwall	Good	Concrete						yes	yes
OF-469	No	End of Pipe	Good	12	Concrete	Headwall	Good	Concrete						yes	yes
OF-671	No	End of Pipe	Good	12?	Concrete	Headwall	Good	Concrete						yes	yes
OF-578	no	End of Pipe	Good	12”	Concrete	N/A								yes	yes
OF-250	no	End of Pipe	Clogged with debris	12	RCP	Headwall	Concrete	Good						yes	yes
OF-77	Yes	West Street (02)	Good	18	Concrete	Headwall	good	Concrete	4.5	5.87	13.77	220.6	0.11	yes	yes
OF-159	no	End of Pipe	Good	12	Concrete	Headwall	Concrete	good						yes	yes
OF-162	no	End of Pipe	Good	18	Concrete	Headwall	Concrete	Good						yes	yes
OF-553	no	End of Pipe	Good	12	RCP	FES								yes	yes
OF-554	no	End of Pipe	Good	12	RCP	FES								yes	yes
OF-351	no	End of Pipe	Good	18	RCP	Headwall	Concrete	Good						yes	yes
OF-376	no	End of Pipe	Good	24	RCP	Headwall	Concrete	Good						yes	yes
OF-378	yes	End of Pipe	Good	18	RCP	Headwall	Concrete	Good	7.8	6.55	13.92	37.5	0.02	yes	yes
OF-207	yes	End of Pipe	Good	15	RCP	Headwall	Other	Good	4.3	6.6	20.03	510.4	0.25	no	no
OF-211	yes	End of Pipe	Good	24	RCP	Headwall	Concrete	Good	4.7	7.2	17.6	406.5	0.2	yes	yes
OF-249	no	End of Pipe	Clogged with debris	12	RCP	Headwall	Concrete	Fair						yes	yes
OF-251	no	End of Pipe	Good	6	PVC	Headwall	Concrete	Good						yes	yes
OF-463	no	End of Pipe	Other	24	RCP	N/A								yes	yes
OF-464	yes	End of Pipe	Unknown	15	RCP	N/A			2.4	9.07	12.18	506.3	0.24	yes	yes
OF-743	yes	End of Pipe	Spalling (concrete)	15	RCP	Headwall	Concrete	Good						yes	yes
OF-744	yes	End of Pipe	Good	12	RCP	Headwall	Concrete	Good						yes	yes
OF-745	no	End of Pipe	Good	24”	RCP	Headwall	Concrete	Good						yes	yes
OF-748	no	End of Pipe	Good	12	RCP	Headwall	Concrete	Good						yes	yes
OF-755	yes	End of Pipe	Good	36	RCP	Headwall	Stone	Good						yes	yes
OF-756	yes	End of Pipe	Good	12	RCP	Headwall	Stone	Good	2.8	9.75	20.41	238.6	0.11	yes	yes
OF-765	no	End of Pipe	Fair	24?	Concrete	N/A								yes	yes
OF-40	no	End of Pipe	Good	12	Concrete	Headwall	Concrete	Fair						yes	yes
OF-55	no	End of Pipe	Good	18	Concrete	Headwall	Concrete	Good						yes	yes
OF-56	no	End of Pipe	Good	14	Concrete	N/A								yes	yes
OF-57	yes	Surface Drainage	Damaged	unknown, 36?	Concrete									no	no
OF-547	no	End of Pipe	Good	15	RCP	N/A								yes	yes
OF-202	yes	End of Pipe	Good	15	RCP	Headwall	Concrete	Good	2.8	8.89	14.66	247.3	2.1	yes	yes
OF-203	yes	End of Pipe	Good	12	RCP	Headwall	Concrete	Good	3.7	7.21	18.95	272.1	0.16	yes	yes
OF-204	no	End of Pipe	Good	15	RCP	Headwall	Concrete	Good						yes	yes
OF-194	yes	End of Pipe	Good	24	Concrete	Headwall	Masonry Block	good	11.21	6.59	10.2	318	0.54	yes	yes
OF-148	yes	End of Pipe	Good	24	Concrete	Headwall	Masonry Block	Good	12.18	6.1	9.32	215	0.41	yes	yes
OF-580	yes	End of Pipe	Good	24	RCP	Headwall	Concrete	Good	13.57	6.4	10.35	456	0.51	yes	yes
OF-322	yes	End of Pipe	Good	20	RCP	Headwall	Concrete	Good	12.37	6.41	11.96	497	0.68	yes	yes
OF-323	yes	End of Pipe	Good	12	RCP	Headwall	Concrete	Good	12.8	6.6	17.75	221	0.56	yes	yes
OF-324	yes	End of Pipe	Other	12	RCP	Headwall	Concrete	Poor	12.71	6.56	12.2	387	0.21	yes	yes
OF-455	yes	End of Pipe	Good	12	RCP	Headwall	Concrete	Good	10.74	6.24	9.3	463	0.62	yes	yes



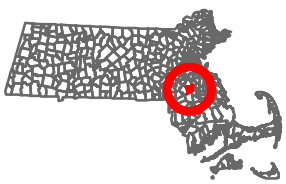


Figure 1: Sampling Locations
Stoughton, Massachusetts
May 2019

Environmental Partners

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ENVIRONMENTAL PARTNERS

TECHNICAL MEMORANDUM

Date: June 30, 2021

To Mark J. Tisdelle – Town Engineer, Town of Stoughton

From Scott Turner, P.E. – Director of Planning, Environmental Partners

CC Annie Tucker – Environmental Scientist, Environmental Partners

Subject Illicit Discharge Detection & Elimination (IDDE) Investigations
MS4 General permit Assistance for the DPW Engineering Division

This memorandum summarizes the FY21 Dry Weather Investigations, outlined in Task 2 of the Agreement for Professional Engineering Services – Municipal Separate Storm Sewer Systems (MS4) General Permit Assistance for the Department of Public Works (DPW) Engineering Division of the Town of Stoughton.

Under this task, Environmental Partners Group, Inc. (EP) conducted outfall screening and sampling over the course of four (4) days in May and June 2021. A total of 69 outfalls were screened, of which fourteen were found to be flowing during dry weather. This work completed the MS4 General Permit requirement to screen during dry weather all MS4 outfalls by the third year of the permit term (June 30, 2021).

Outfall Sampling

On May 11th and 18th, June 24th, and July 15th, 2021, EP staff attempted to visit 69 outfall locations during dry weather. Only field sampling of total chlorine was conducted in July, 2021. The 69 locations visited represent the remaining outfalls in the Town's MS4 outfall inventory not inspected during dry weather and outfalls EP previously found were flowing during dry weather and sampled. The locations of all 69 screened outfalls are shown on Figure 1: Dry Weather Outfall Sampling Locations.

During outfall screening, EP determined that 11 outfalls were not part of the Town's MS4 system, and the Town confirmed that those outfalls are either private, DOT-owned, do not exist, or another category of stormwater structure. The current MS4 Outfall inventory for Stoughton is **123 outfalls.**

Results and Recommendations

A total of 14 outfalls were sampled for field measurements and laboratory analysis: Outfalls OF-378, OF-77, OF-440, OF-207, OF-211, OF-453, OF-324, OF-322, OF-580, OF-788, OF-792, OF-743, OF-567, and OF-587. All samples were analyzed for ammonia, chloride, fecal coliform, E. coli, total phosphorous, and surfactants at a state certified laboratory, Alpha Analytical Inc. in Westborough, MA. Select outfalls required additional analysis due to water quality impairments. Outfalls OF-77, OF-440, OF-207, and OF-211 required analysis for Total Suspended Solids (TSS) and Turbidity, and outfall OF-587 required analysis for Biological Oxygen Demand (BOD).

Field parameters sampled for include: temperature, specific conductance, salinity, pH, total chlorine, and dissolved oxygen. A summary of the field and analytical results is presented in Table 1: Stormwater Field Screening and Analytical Results. All the outfalls screened are listed on Table 2: Outfall Sampling Locations.

Four (5) outfalls sampled resulted in parameters outside the regulated thresholds.

- At Outfall OF-207, pH was detected at 6.3, slightly below the threshold limit of 6.5. In addition, E. Coli was detected at 410.58 MPN/100 mL, which is above the threshold limit of 236 MPN/100 mL.
- At Outfall 440, E. Coli was detected at 1,203 MPN/100 mL, which is above the threshold limit of 236 MPN/100 mL.
- At Outfall OF-792, specific conductance was detected at 3408 µS/cm, which is above the threshold limit of 2000 µS/cm.
- At Outfall OF-567, pH was detected at 5.92, below the threshold limit of 6.5.
- At Outfall OF-587, pH was detected at 5.22, below the threshold limit of 6.5.

In addition to the five (5) outfalls with sampling results outside of regulated thresholds, 12 of the 14 outfalls sampled for total chlorine resulted in detectable levels of total chlorine. Three (3) outfalls had total chlorine concentrations greater than 0.10 mg/L. The highest concentration of total chlorine observed was 0.29 mg/L at Outfall OF-788 near 150 Larson Road. The MS4 General Permit considers any detectable level of chlorine to be a potential signal of an illicit discharge. EP tested total chlorine with a field test kit due to the small hold time of chlorine.

Moving forward, EP recommends the following:

- Perform additional investigation of the four (4) outfalls sampled that had elevated parameter levels (OF-207, OF-792, OF-567, and OF-587) to determine the likely source of the contaminants levels.
- Investigate potential reasons for the detectable chloride levels within most of the outfalls sampled.
- Begin IDDE catchment investigations, starting with the high priority outfalls/catchments.
- Continue performing wet weather outfall sampling at outfalls within catchments that have at least one (1) System Vulnerability Factor (SVF) identified.

Attachments

Table 1: Stormwater Field Screening and Analytical Results

Figure 1: Dry Weather Outfall Sampling Locations

Table 2: Outfall Sampling Locations

Laboratory Analytical Report

Stoughton MS4 Certification Page

TABLE 1: STORMWATER FIELD SCREENING AND ANALYTICAL RESULTS

Table 1: Stormwater Field Screening and Analytical

Results Stoughton, MA

June 2021

Outfall Identification		OF-378			OF-77	
Discharge Waterbody		Ames Long Pond			Ames Long Pond	
Date Sampled		5/18/2021	6/24/2021	7/15/2021	5/18/2021	7/15/2021
Sample Time		1:00 PM	1:35 PM	5:41 PM	12:35 PM	11:14 AM
Field Test Results	**Threshold**		-			
Temperature (˚C)	-	14.7	-	-	11.9	-
Specific Conductance (µS/cm)	2000 (µS/cm)	34.3	-	-	304.8	-
Salinity (ppt)	-	0.01	-	-	0.15	-
DO (mg/L)	-	6.61	-	-	5.79	-
pH	6.5-8.0	7.48	-	-	7.12	-
Total Chlorine	-	-	-	0.08	-	0.22
Analytical Results						
Turbidity	-	-	-	-	2.1	-
Solids, Total Suspended	-	-	-	-	15	-
Chloride	-	5.8	-	-	68	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.087	-	-	ND	-
BOD, 5 Day	-	-	-	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	-	-	ND	-
Coliform, Fecal (MF) col/100ml	-	ND	38	-	2*	-
E. coli (MPN/100 mL)	236 MPN/100 mL	1	40.2	-	<1*	-

Outfall Identification		1. OF-440			OF-207	
Discharge Waterbody		Unnamed Tributary to Town Pond			Ames Long Pond	
Date Sampled		5/18/2021	6/24/2021	7/15/2021	5/21/2021	7/15/2021
Sample Time		12:10 PM	1:20 PM	11:48 AM	12:00 PM	10:34 AM
Field Test Results	**Threshold**					
Temperature (˚C)	-	15.5	-	-	12	-
Specific Conductance (µS/cm)	2000 (µS/cm)	329.2	-	-	743	-
Salinity (ppt)	-	0.16	-	-	0.37	-
DO (mg/L)	-	4.93	-	-	9.43	-
pH	6.5-8.0	7.22	-	-	**6.3**	-
Total Chlorine	-	-	-	0.04	-	0
Analytical Results						
Turbidity	-	2.2	-	-	0.92	-
Solids, Total Suspended	-	ND	-	-	28	-
Chloride	-	81	-	-	220	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	ND	-	-	ND	-
BOD, 5 Day	-	-	-	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	-	-	ND	-
Coliform, Fecal (MF) col/100ml	-	82	760	-	33	-
E. coli (MPN/100 mL)	236 MPN/100 mL	63.14	**1203.33**	-	**410.58**	-

Notes:

- : Not Tested

ND: Non-detect

Bold Values exceed contaminant criteria.

* Indicates samples that were analyzed with the method required holding time exceeded.

Table 1: Stormwater Field Screening and Analytical

Results Stoughton, MA

June 2021

Outfall Identification		OF-211		OF-453	
Discharge Waterbody		Ames Long Pond		Unnamed Tributary to Town Pond	
Date Sampled		5/21/2021	7/15/2021	5/21/2021	7/15/2021
Sample Time		11:40 AM	10:45 AM	11:00 AM	4:43 PM
Field Test Results	**Threshold**				
Temperature (˚C)	-	12.7	-	17.7	-
Specific Conductance (µS/cm)	2000 (µS/cm)	325.6	-	153.3	-
Salinity (ppt)	-	0.16	-	0.07	-
DO (mg/L)	-	7.45	-	5.46	-
pH	6.5-8.0	6.6	-	6.9	-
Total Chlorine	-	-	0.04	-	0.04
Analytical Results					
Turbidity	-	0.42	-	-	-
Solids, Total Suspended	-	ND	-	-	-
Chloride	-	84	-	34	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	ND	-	0.105	-
BOD, 5 Day	-	-	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	-	ND	-
Coliform, Fecal (MF) col/100ml	-	ND	-	ND	-
E. coli (MPN/100 mL)	236 MPN/100 mL	<1	-	5.16	-

Outfall Identification		OF-324		OF-322	
Discharge Waterbody		Unnamed Tributary to Steep Hill Brook		Woods Pond	
Date Sampled		5/21/2021	7/15/2021	5/21/2021	7/15/2021
Sample Time		10:40 AM	4:28 PM	10:20 AM	4:44 PM
Field Test Results	**Threshold**				
Temperature (˚C)	-	41.1	-	15	-
Specific Conductance (µS/cm)	2000 (µS/cm)	407.5	-	499.1	-
Salinity (ppt)	-	0.2	-	0.24	-
DO (mg/L)	-	6.80	-	7.15	-
pH	6.5-8.0	7.06	-	6.96	-
Total Chlorine	-	-	0.13	-	0.03
Analytical Results					
Turbidity	-	-	-	-	-
Solids, Total Suspended	-	-	-	-	-
Chloride	-	95	-	120	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.192	-	ND	-
BOD, 5 Day	-	-	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	0.07	-	ND	-
Coliform, Fecal (MF) col/100ml	-	2	-	ND	-
E. coli (MPN/100 mL)	236 MPN/100 mL	<1	-	<1	-

Notes:

- : Not Tested

ND: Non-detect

Bold Values exceed contaminant criteria.

* Indicates samples that were analyzed with the method required holding time exceeded.

Table 1: Stormwater Field Screening and Analytical

Results Stoughton, MA

June 2021

Discharge Waterbody		Unnamed Tributary to Steep Hill Brook		Brockton Reservoir	
Date Sampled		5/21/2021	7/15/2021	5/21/2021	7/15/2021
Sample Time		9:30 AM	4:27 PM	8:45 AM	11:11 AM
Field Test Results	**Threshold**				
Temperature (˚C)	-	12.6	-	10.2	-
Specific Conductance (µS/cm)	2000 (µS/cm)	1712	-	523	-
Salinity (ppt)	-	0.87	-	0.25	-
DO (mg/L)	-	6.73	-	7.08	-
pH	6.5-8.0	**6.23**	-	7.27	-
Total Chlorine	-	-	-	-	0.29
Analytical Results					
Turbidity	-	-	-	-	-
Solids, Total Suspended	-	-	-	-	-
Chloride	-	560	-	140	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.112	-	ND	-
BOD, 5 Day	-	-	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	-	ND	-
Coliform, Fecal (MF) col/100ml	-	ND	-	ND	-
E. coli (MPN/100 mL)	236 MPN/100 mL	<1	-	<1	-

Outfall Identification		OF-792		OF-743	
Discharge Waterbody		Cochato River		Unnamed Wetlands near Lovett Brook 2	
Date Sampled		5/21/2021	7/15/2021	5/18/2021	7/15/2021
Sample Time		8:10 AM	8:44 AM	2:45 PM	12:01 PM
Field Test Results	**Threshold**				
Temperature (˚C)	-	15.5	-	13.8	-
Specific Conductance (µS/cm)	2000 (µS/cm)	**3408**	-	1500	-
Salinity (ppt)	-	1.8	-	0.76	-
DO (mg/L)	-	4.81	-	6.80	-
pH	6.5-8.0	7.16	-	6.82	-
Total Chlorine	-	-	0.07	-	0.01
Analytical Results					
Turbidity	-	-	-	-	-
Solids, Total Suspended	-	-	-	-	-
Chloride	-	1100	-	480	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.109	-	ND	-
BOD, 5 Day	-	-	-	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	-	ND	-
Coliform, Fecal (MF) col/100ml	-	3	-	ND	-
E. coli (MPN/100 mL)	236 MPN/100 mL	<1	-	<1	-

Notes:

- : Not Tested

ND: Non-detect

Bold Values exceed contaminant criteria.

* Indicates samples that were analyzed with the method required holding time exceeded.

Table 1: Stormwater Field Screening and Analytical

Results Stoughton, MA

June 2021

Outfall Identification		OF-567		OF-587	
Discharge Waterbody		Lovett Brook		Unnamed Tributary to Beaver Brook	
Date Sampled		5/18/2021	7/15/2021	5/18/2021	7/15/2021
Sample Time		2:30 PM	12:14 PM	2:00 PM	1:17 PM
Field Test Results	**Threshold**				
Temperature (˚C)	-	14.7	-	14.9	-
Specific Conductance (µS/cm)	2000 (µS/cm)	771	-	152.4	-
Salinity (ppt)	-	0.38	-	0.07	-
DO (mg/L)	-	5.92	-	5.22	-
pH	6.5-8.0	**6.26**	-	**6.17**	-
Total Chlorine	-	-	0.01	-	0.05
Analytical Results					
Turbidity	-	-	-	-	-
Solids, Total Suspended	-	-	-	-	-
Chloride	-	210	-	36	-
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.075	-	ND	-
BOD, 5 Day	-	-	-	2.9	-
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	-	ND	-
Coliform, Fecal (MF) col/100ml	-	30	-	8	-
E. coli (MPN/100 mL)	236 MPN/100 mL	14.64	-	29.17	-

Notes:

- : Not Tested

ND: Non-detect

Bold Values exceed contaminant criteria.

* Indicates samples that were analyzed with the method required holding time exceeded.

FIGURE 1: DRY WEATHER SCREENING LOCATIONS

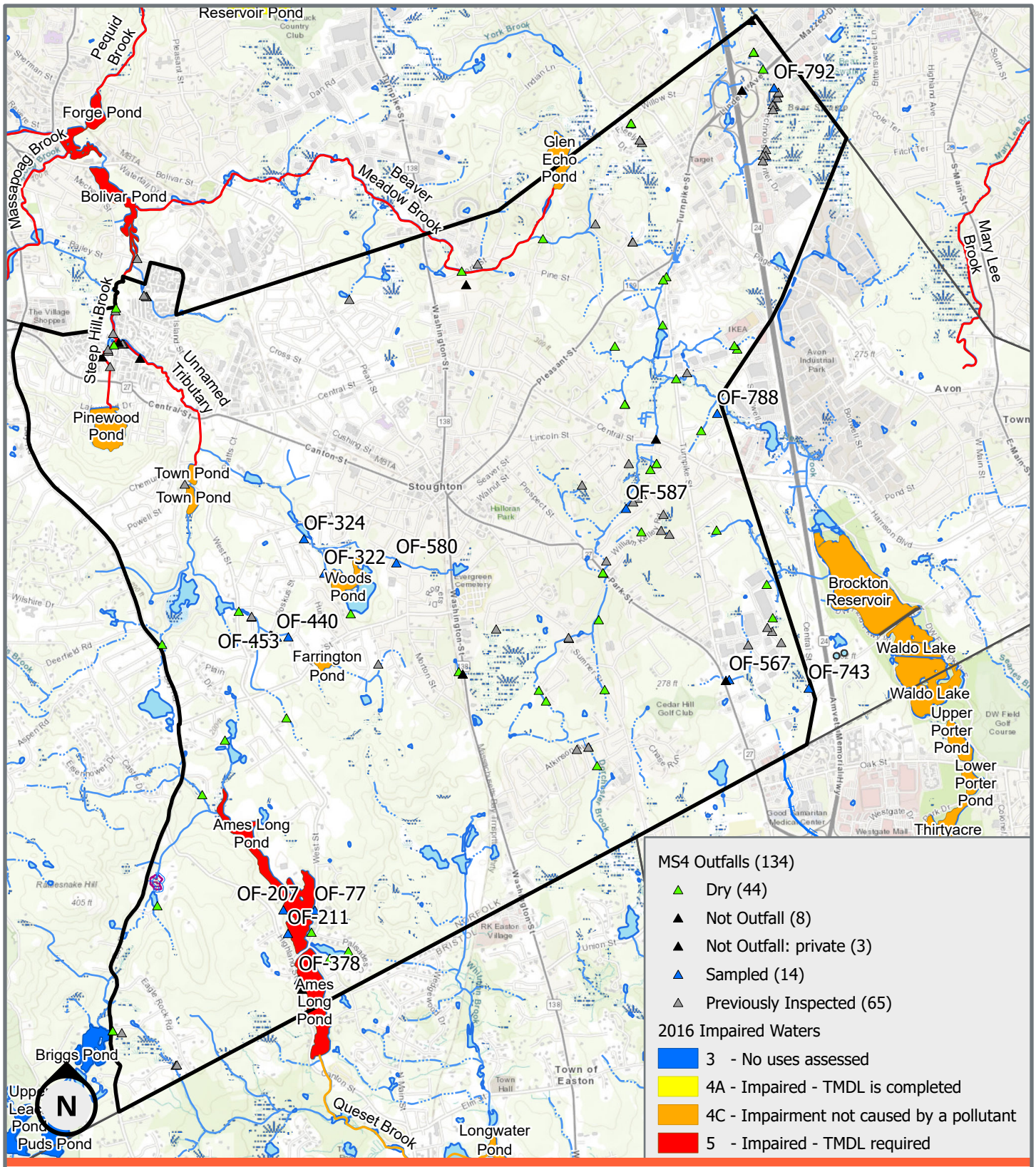

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Figure 1: Dry Weather Sampling Locations

Stoughton, Massachusetts

0 0.5 1 2 Miles

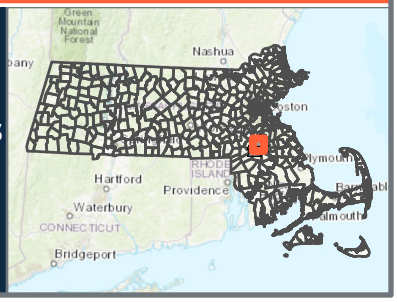


TABLE 2: DRY WEATHER SCREENING LOCATIONS

Table 2: Dry Weather Screening Locations
Stroughton, Massachusetts

Receiving Water Body	Outfall ID	Approximate Street Address	Screening Date	Status
Ames Long Pond	OF-378	216 Palisades Circle	2021-05-11	Sampled
	OF-77	22 Palisades Circle	2021-05-18	Sampled
	OF-207	1 Kay Way	2021-05-18	Sampled
	OF-211	1 Kay Way	2021-05-18	Sampled
	OF-203	445 Central St	2021-05-11	Dry
	OF-202	333 Central St	2021-05-11	Dry
	OF-204	445 Central Street	2021-05-18	Dry
	OF-162	200 Shuman Avenue	2021-05-18	Not Outfall
Beaver Brook	OF-616	672 West Street	2021-05-18	Dry
Beaver Meadow Brook	OF-194	1136 Turnpike St	2021-05-11	Dry
Briggs Pond	OF-468	36 Patricia Drive	2021-05-18	Dry
Brockton Reservoir	OF-788	73 Ethly Way	2021-05-18	Sampled
Cochato River	OF-792	65 Ethyl Way	2021-05-18	Sampled
	OF-791	170 William Kelley Rd	2021-05-18	Dry
	OF-790	6 Carson Drive	2021-05-18	Dry
Dorchester Brook	OF-113	Turnpike Street	2021-05-11	Dry
Lovett Brook	OF-567	Jordan Dr	2021-05-18	Sampled
	OF-647	557 Park Street	2021-05-18	Not Outfall
Plain Street Pond	OF-300	78 Bradford St	2021-05-18	Dry
Steep Hill Brook	OF-200	1670 West St	2021-05-18	Not Outfall: private
	OF-575	450 Highand Dr	2021-05-18	Not Outfall: private
	OF-8	100 Technology Center Drive	2021-05-18	Not Outfall
	OF-303	139 Shuman Avenue	2021-05-18	Dry
	OF-7	63 Central St (Avon)	2021-05-18	Dry
Town Pond	OF-769	25 Poskus Street	2021-05-18	Dry
Unnamed trib to Beaver Meadow Brook	OF-455	951 Pleasant St	2021-05-11	Dry
Unnamed Tributary	OF-702	33 Turnstone Terrace	2021-05-18	Not Outfall
	OF-419	176 Kotlik St	2021-05-18	Not Outfall
Unnamed Tributary to Ames Long Pond	OF-251	11 Crockett St	2021-05-18	Dry
	OF-351	70 Kotlik St	2021-05-18	Dry
Unnamed Tributary To Beaver Brook	OF-522	879 Turnpike Street	2021-05-18	Dry
	OF-327	8 Onset Lane	2021-05-18	Dry
	OF-535	116 Swanson Terrace	2021-05-18	Dry
	OF-492	33 Kwedar Avenue	2021-05-18	Dry
	OF-304	15 Oliver Lane	2021-05-18	Dry
	OF-669	103 York Street	2021-05-18	Dry
	OF-217	1749 West St	2021-06-24	Dry
	OF-587	115 Walters Way	2021-05-18	Sampled
	OF-586	951 Pleasant Street	2021-05-18	Dry
	OF-585	695 Park Street	2021-05-18	Dry
	OF-610	91 East Vanston Road	2021-05-18	Dry
	OF-459	28 Smyth Street	2021-05-18	Dry
	OF-458	1317 Washington St	2021-05-18	Dry
	OF-305	45 Crockett St	2021-05-18	Dry
	OF-383	45 Wheeler Circle	2021-05-18	Not Outfall
Unnamed Tributary to Beaver Brook 2	OF-629	632 Sumner St	2021-05-18	Dry
Unnamed Tributary to Brockton Reservoir	OF-104	14 Meadowbrook Ln	2021-05-18	Dry
	OF-494	172 Curtis Ave	2021-05-18	Dry
Unnamed Tributary to Dorchester Brook	OF-380	1154 Bay Road	2021-05-18	Dry
	OF-565	102 Deady Ave	2021-05-18	Not Outfall
	OF-464	70 Drinkwater Avenue	2021-05-18	Dry
	OF-756	Turnpike Street	2021-05-11	Dry
	OF-463	661 Pleasant St	2021-05-18	Dry
Unnamed Tributary to Steep Hill Brook	OF-545	751 Highland St	2021-05-18	Not Outfall: private
	OF-324	1096 Park Street	2021-05-18	Sampled
	OF-580	76 Grace Lane	2021-05-18	Sampled
Unnamed Tributary to Town Pond	OF-440	769 Highland St	2021-05-18	Sampled
	OF-453	Daly Drive	2021-05-18	Sampled
	OF-664	115 Erin Road	2021-05-18	Dry
	OF-641	53 Barnes Road	2021-05-18	Dry
Unnamed Tributary to Town Pond 2	OF-342	121 E Vanston Rd	2021-05-18	Dry
Unnamed Wetlands near Beaver Meadow Brook	OF-40	150 Larson Road	2021-05-18	Not Outfall
Unnamed Wetlands near Lovett Brook 1	OF-100	557 Park Street	2021-05-18	Dry
Unnamed Wetlands near Lovett Brook 2	OF-743	Technology Center Drive	2021-05-18	Sampled
Unnamed Wetlands to Beaver Brook	OF-245	536 Highand Dr	2021-06-24	Dry
	OF-367	15 Hunt Drive	2021-05-18	Dry
Unnamed Wetlands to Three Swamp Brook	OF-699	1 Kay Way	2021-05-18	Dry
Woods Pond	OF-322	1096 Park St	2021-05-18	Sampled
	OF-242	36 Jessica Dr	2021-05-18	Dry

LABORATORY RESULTS

ANALYTICAL REPORT

Lab Number:	L2126183
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Scott Turner
Phone:	(207) 939-3883
Project Name:	STOUGHTON F14 MS4
Project Number:	R282.2007
Report Date:	06/07/21

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126183
Report Date: 06/07/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2126183-01	OF-440	WATER	STOUGHTON, MA	05/18/21 12:10	05/18/21
L2126183-02	OF-77	WATER	STOUGHTON, MA	05/18/21 12:35	05/18/21
L2126183-03	OF-378	WATER	STOUGHTON, MA	05/18/21 13:00	05/18/21
L2126183-04	OF-587	WATER	STOUGHTON, MA	05/18/21 14:00	05/18/21
L2126183-05	OF-567	WATER	STOUGHTON, MA	05/18/21 14:30	05/18/21
L2126183-06	OF-743	WATER	STOUGHTON, MA	05/18/21 14:45	05/18/21

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126183
Project Number:	R282.2007	**Report Date:**	06/07/21

Case Narrative

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

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

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

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

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

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

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126183
Project Number:	R282.2007	**Report Date:**	06/07/21

Case Narrative (continued)

Sample Receipt

L2126183-04: The sample identified as "OF-587" on the chain of custody was identified as "OF-487" on the container label. At the client's request, the sample is reported as "OF-587".

Coliform, Fecal (MF)

L2126183-01 and -02 were analyzed with the method required holding time exceeded.

L2126183-03 and -06: The sample has an elevated detection limit due to the dilution required by the method.

E. Coli (MPN)

L2126183-01 thru -03 were analyzed with the method required holding time exceeded.

Nitrogen, Ammonia

L2126183-04: The sample has an elevated detection limit due to the dilution required by the sample matrix.

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

Authorized Signature: Jennifer L Clements

Title: Technical Director/Representative Date: 06/07/21

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007
Lab Number: L2126183
Report Date: 06/07/21

SAMPLE RESULTS

Lab ID: L2126183-01
Client ID: OF-440
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 05/18/21 12:10
Date Received: 05/18/21
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	82		col/100ml	2.0	NA	2	-	05/18/21 20:39	121,9222D	SH
E. Coli (MPN)	63.14		MPN/100ml	1	NA	1	-	05/18/21 21:33	121,9223B	SH
General Chemistry - Westborough Lab										
Turbidity	2.2		NTU	0.20	--	1	-	05/20/21 02:51	121,2130B	KA
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/24/21 17:20	121,2540D	DW
Chloride	81.		mg/l	1.0	--	1	-	05/27/21 23:39	121,4500CL-E	AT
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/03/21 18:00	06/06/21 07:37	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/19/21 01:00	05/19/21 06:54	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007
Lab Number: L2126183
Report Date: 06/07/21

SAMPLE RESULTS

Lab ID: L2126183-02
Client ID: OF-77
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 05/18/21 12:35
Date Received: 05/18/21
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	2.0		col/100ml	2.0	NA	2	-	05/18/21 20:39	121,9222D	SH
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/18/21 21:33	121,9223B	SH
General Chemistry - Westborough Lab										
Turbidity	2.1		NTU	0.20	--	1	-	05/20/21 02:51	121,2130B	KA
Solids, Total Suspended	15.		mg/l	5.0	NA	1	-	05/24/21 17:20	121,2540D	DW
Chloride	68.		mg/l	1.0	--	1	-	05/27/21 23:40	121,4500CL-E	AT
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/03/21 18:00	06/06/21 07:37	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/19/21 01:00	05/19/21 06:55	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126183
Report Date: 06/07/21

SAMPLE RESULTS

Lab ID: L2126183-03
Client ID: OF-378
Sample Location: STOUGHTON, MA

Date Collected: 05/18/21 13:00
Date Received: 05/18/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/18/21 20:39	121,9222D	SH
E. Coli (MPN)	1		MPN/100ml	1	NA	1	-	05/18/21 21:33	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	5.8		mg/l	1.0	--	1	-	05/27/21 23:41	121,4500CL-E	AT
Nitrogen, Ammonia	0.087		mg/l	0.075	--	1	06/03/21 18:00	06/06/21 07:38	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/19/21 01:00	05/19/21 06:56	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007
Lab Number: L2126183
Report Date: 06/07/21

SAMPLE RESULTS

Lab ID: L2126183-04
Client ID: OF-587
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 05/18/21 14:00
Date Received: 05/18/21
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	8.0		col/100ml	2.0	NA	2	-	05/18/21 20:39	121,9222D	SH
E. Coli (MPN)	29.17		MPN/100ml	1	NA	1	-	05/18/21 21:33	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	36.		mg/l	1.0	--	1	-	05/27/21 23:41	121,4500CL-E	AT
Nitrogen, Ammonia	ND		mg/l	0.150	--	2	06/03/21 18:00	06/06/21 07:39	121,4500NH3-BH	AT
BOD, 5 day	2.9		mg/l	2.0	NA	1	05/19/21 19:40	05/24/21 16:30	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/19/21 01:00	05/19/21 06:56	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007
Lab Number: L2126183
Report Date: 06/07/21

SAMPLE RESULTS

Lab ID: L2126183-05
Client ID: OF-567
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 05/18/21 14:30
Date Received: 05/18/21
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	30		col/100ml	2.0	NA	2	-	05/18/21 20:39	121,9222D	SH
E. Coli (MPN)	14.64		MPN/100ml	1	NA	1	-	05/18/21 21:33	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	210		mg/l	10	--	10	-	05/28/21 00:26	121,4500CL-E	AT
Nitrogen, Ammonia	0.075		mg/l	0.075	--	1	06/03/21 18:00	06/06/21 07:40	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/19/21 01:00	05/19/21 06:57	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007
Lab Number: L2126183
Report Date: 06/07/21

SAMPLE RESULTS

Lab ID: L2126183-06
Client ID: OF-743
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 05/18/21 14:45
Date Received: 05/18/21
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/18/21 20:39	121,9222D	SH
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/18/21 21:33	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	480		mg/l	10	--	10	-	05/28/21 00:28	121,4500CL-E	AT
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/03/21 18:00	06/06/21 07:41	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/19/21 01:00	05/19/21 06:57	121,5540C	AW

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126183
Project Number:	R282.2007	**Report Date:**	06/07/21

REFERENCES

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

LIMITATION OF LIABILITIES

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

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

Certification Information

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

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625/625.1: alpha-Terpineol
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

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

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

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

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 5/18/21

ALPHA Job #: L2126183

Client Information

Client: Environmental Partners
Address: 1900 Crown Colony Dr #402 Quincy MA
Phone: 207 939 3883
Email: aet@envpartners.com sdt@envpartners.com

Additional Project Information:
Mass NPDES MS4

Project Information

Project Name: Stoughton FY21 MS4
Project Location: Stoughton, MA
Project #: R282.2007
Project Manager: Scott Turner
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☒ Yes ☐ No NPDES RGP
☐ Other State /Fed Program ____ Criteria ____

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO
Filtration: ☐ Field ☒ Lab to do
Preservation: ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Fecal coliform, E. coli	Chloride	Surfactants	Ammonia	Turbidity	TSS	Sample Comments	Total # Bottles
26183-01	OF-440	5/18	12:10	water	AT	X	X	X	X	X	X		9
02	OF-77	↓	12:35	↓	↓	X	X	X	X	X	X		9
03	OF-378	↓	13:00	↓	↓	X	X	X	X				7
04	OF-587	↓	14:00	↓	↓	X	X	X	X			BOD also	7
05	OF-567	↓	14:30	↓	↓	X	X	X	X				7
06	OF-743	↓	14:45	↓	↓	X	X	X	X				7
Container Type						B	P	P	P	P	P	P	
Preservative						H	A	A	D	A	A	A	

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H = $Na_2S_2O_3$, I= Ascorbic Acid, J = NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Annie Tuck	5/18/21 3:35	Nemu Davis AAL	5-18-21 1535
[illegible] PADS AAL	5/18/21 17:15	[illegible]	5-18-21 1715

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L2126983
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Scott Turner
Phone:	(207) 939-3883
Project Name:	STOUGHTON F14 MS4
Project Number:	R282.2007
Report Date:	06/10/21

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2126983-01	OF-792	WATER	STOUGHTON, MA	05/21/21 08:10	05/21/21
L2126983-02	OF-788	WATER	STOUGHTON, MA	05/21/21 08:45	05/21/21
L2126983-03	OF-580	WATER	STOUGHTON, MA	05/21/21 09:30	05/21/21
L2126983-04	OF-322	WATER	STOUGHTON, MA	05/21/21 10:20	05/21/21
L2126983-05	OF-324	WATER	STOUGHTON, MA	05/21/21 10:40	05/21/21
L2126983-06	OF-453	WATER	STOUGHTON, MA	05/21/21 11:00	05/21/21
L2126983-07	OF-211	WATER	STOUGHTON, MA	05/21/21 11:40	05/21/21
L2126983-08	OF-207	WATER	STOUGHTON, MA	05/21/21 12:00	05/21/21

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126983
Project Number:	R282.2007	**Report Date:**	06/10/21

Case Narrative

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

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

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

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

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

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

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126983
Project Number:	R282.2007	**Report Date:**	06/10/21

Case Narrative (continued)

Sample Receipt

L2126983-06: The sample identified as "OF-453" on the chain of custody was identified as "OF-423" on the container label. At the client's request, the sample is reported as "OF-453".

Coliform, Fecal (MF)

L2126983-02 through -04, -06 and -07: The sample has an elevated detection limit due to the dilution required by the method.

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

Authorized Signature: Sebastian Corbin

Title: Technical Director/Representative Date: 06/10/21

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-01
Client ID: OF-792
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 08:10
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	3.0		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	1100		mg/l	100	--	100	-	06/09/21 00:51	121,4500CL-E	TL
Nitrogen, Ammonia	0.109		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:18	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 01:30	05/22/21 05:35	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-02
Client ID: OF-788
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 08:45
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	140		mg/l	10	--	10	-	06/09/21 00:54	121,4500CL-E	TL
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:19	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 01:30	05/22/21 05:36	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-03
Client ID: OF-580
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 09:30
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	560		mg/l	10	--	10	-	06/08/21 23:17	121,4500CL-E	TL
Nitrogen, Ammonia	0.112		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:20	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:37	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-04
Client ID: OF-322
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 10:20
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	120		mg/l	10	--	10	-	06/09/21 00:36	121,4500CL-E	TL
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:21	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:37	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-05
Client ID: OF-324
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 10:40
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	2.0		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	95.		mg/l	10	--	10	-	06/08/21 23:23	121,4500CL-E	TL
Nitrogen, Ammonia	0.192		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:22	121,4500NH3-BH	AT
Surfactants, MBAS	0.070		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:37	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-06
Client ID: OF-453
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 11:00
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	5.16		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	34.		mg/l	1.0	--	1	-	06/09/21 00:37	121,4500CL-E	TL
Nitrogen, Ammonia	0.105		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:23	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:38	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-07
Client ID: OF-211
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 11:40
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Turbidity	0.42		NTU	0.20	--	1	-	05/21/21 18:55	121,2130B	AS
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/27/21 11:10	121,2540D	AC
Chloride	84.		mg/l	1.0	--	1	-	06/09/21 00:38	121,4500CL-E	TL
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:27	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:39	121,5540C	AW

Project Name: STOUGHTON F14 MS4
Project Number: R282.2007

Lab Number: L2126983
Report Date: 06/10/21

SAMPLE RESULTS

Lab ID: L2126983-08
Client ID: OF-207
Sample Location: STOUGHTON, MA

Date Collected: 05/21/21 12:00
Date Received: 05/21/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	33		col/100ml	2.0	NA	2	-	05/21/21 16:05	121,9222D	JT
E. Coli (MPN)	410.58		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab										
Turbidity	0.92		NTU	0.20	--	1	-	05/21/21 18:55	121,2130B	AS
Solids, Total Suspended	28.		mg/l	5.0	NA	1	-	05/27/21 11:10	121,2540D	AC
Chloride	220		mg/l	10	--	10	-	06/08/21 23:29	121,4500CL-E	TL
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:28	121,4500NH3-BH	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:39	121,5540C	AW

Project Name: STOUGHTON F14 MS4 **Lab Number:** L2126983

Project Number: R282.2007 **Report Date:** 06/10/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-08 Batch: WG1502190-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	05/21/21 16:05	121,9222D	JT
Microbiological Analysis - Westborough Lab for sample(s): 01-08 Batch: WG1502191-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/21 16:05	121,9223B	JT
General Chemistry - Westborough Lab for sample(s): 07-08 Batch: WG1502268-1										
Turbidity	ND		NTU	0.20	--	1	-	05/21/21 18:55	121,2130B	AS
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1502328-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 01:30	05/22/21 05:25	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 03-08 Batch: WG1502329-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 06:30	05/22/21 09:35	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 07-08 Batch: WG1504459-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/27/21 11:10	121,2540D	AC
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG1508771-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/08/21 02:32	06/09/21 19:02	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG1509285-1										
Chloride	ND		mg/l	1.0	--	1	-	06/08/21 22:26	121,4500CL-E	TL

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126983
Project Number:	R282.2007	**Report Date:**	06/10/21

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126983
Project Number:	R282.2007	**Report Date:**	06/10/21

Footnotes

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

Terms

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

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

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

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

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

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

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

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

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

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126983
Project Number:	R282.2007	**Report Date:**	06/10/21

Data Qualifiers

the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Report Format: Data Usability Report

Project Name:	STOUGHTON F14 MS4	**Lab Number:**	L2126983
Project Number:	R282.2007	**Report Date:**	06/10/21

REFERENCES

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

LIMITATION OF LIABILITIES

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

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

Certification Information

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

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625/625.1: alpha-Terpineol
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

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

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

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

CHAIN OF CUSTODY

PAGE _____ OF _____

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 5/21/21

ALPHA Job #: L2126983

Client Information

Client: Environmental Partners
Address: 1900 Crown Colony Drive #402 Quincy, MA
Phone: 207 939 3883
Email: ael@env.partners.com
sd+@env.partners.com

Additional Project Information:
Mass NPDES MS4

Project Information

Project Name: Stoughton F421 MS4
Project Location: Stoughton, Ma
Project #: RZ82.2007
Project Manager: Scott Turner
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due:

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ANALYSIS

- VOC: ☐ 8260 ☐ 624 ☐ 524.2
- SVOC: ☐ ABN ☐ PAH
- METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
- METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
- EPH: ☐ Ranges & Targets ☐ Ranges Only
- VPH: ☐ Ranges & Targets ☐ Ranges Only
- ☐ PCB ☐ PEST
- TPH: ☐ Quant Only ☐ Fingerprint
- Fecal Coliform i.e. coli
- Chloride
- Surfactants
- Ammonia
- Turbidity
- TSS

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Fecal Coliform i.e. coli	Chloride	Surfactants	Ammonia	Turbidity	TSS	Total # Bottles
26983 01	OF-792	5/21	8:10	water	SB	X	X	X	X			
02	OF-788	5/21	8:45			X	X	X	X			
03	OF-580	5/21	9:30			X	X	X	X			
04	OF-322	5/21	10:20			X	X	X	X			
05	OF-324	5/21	10:40			X	X	X	X			
06	OF-453	5/21	11:00			X	X	X	X			
07	OF-211	5/21	11:40			X	X	X	X	X	X	
08	OF-207	5/21	12:00			X	X	X	X	X	X	

Container Type												
Preservative												

Container Type												B P P P P P P
Preservative												H A A D A A A

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Jaymie Bousquet	5/21/21	MCM MultiAA	5/24/21 1220
MCM	5/24/21 1315		05/21/21 1315

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Project Name: RE-SAMPLING
Project Number: R282.2007

Lab Number: L2134398
Report Date: 07/13/21

SAMPLE RESULTS

Lab ID: L2134398-01
Client ID: OF-440
Sample Location: WHITMAN STOUGHTON

Date Collected: 06/24/21 13:20
Date Received: 06/24/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	760		col/100ml	10	NA	10	-	06/24/21 19:05	121,9222D	JT
E. Coli (MPN)	1203.33		MPN/100ml	1	NA	1	-	06/24/21 20:50	121,9223B	JT

Project Name: RE-SAMPLING
Project Number: R282.2007

Lab Number: L2134398
Report Date: 07/13/21

SAMPLE RESULTS

Lab ID: L2134398-03
Client ID: OF-378
Sample Location: WHITMAN STOUGHTON

Date Collected: 06/24/21 13:35
Date Received: 06/24/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	38		col/100ml	2.0	NA	2	-	06/24/21 19:05	121,9222D	JT
E. Coli (MPN)	40.2		MPN/100ml	1	NA	1	-	06/24/21 20:50	121,9223B	JT

Serial_No:07132116:12

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 6/24/21

ALPHA Job #: L2134398

Client Information

Client: Environmental Partners

Address: 1900 Crown Colony Dr #402 Quincy MA

Phone: 207 939 3883

Email: aet@envpartners.com

Project Information

Project Name: Re-sampling

Project Location: Whitman Stoughton

Project #:

Project Manager: Nathalie Lewis

ALPHA Quote #: no charge - resampling

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods

☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)

☒ Yes ☐ No NPDES RGP

☐ Other State /Fed Program ______ Criteria ______

Additional Project Information:

MS4

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15 ☐ PP13; METALS: ☐ RCRA5 ☐ RCRA8; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint; ecoli; fecal coliform

SAMPLE INFO — Filtration: ☐ Field ☒ Lab to do; Preservation: ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ecoli	fecal coliform	Sample Comments	TOTAL # BOTTLES
34398-01	OF-440	6/24/21	1320	water	AT	X	X		2
-02	OF-56	↓	1235	↓	↓		X		2
-03	OF-378	↓	1335	↓	↓	X	X		2
Container Type						B	B		
Preservative						H	H		

Container Type	Preservative
P= Plastic	A= None
A= Amber glass	B= HCl
V= Vial	C= HNO_3
G= Glass	D= H_2SO_4
B= Bacteria cup	E= NaOH
C= Cube	F= MeOH
O= Other	G= $NaHSO_4$
E= Encore	H = $Na_2S_2O_3$
D= BOD Bottle	I= Ascorbic Acid
	J = NH_4Cl
	K= Zn Acetate
	O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Annie Tucker	6/24/21 14:55	Benjamin Swan ARL	6/24 14:53
Benjamin Swan ARL	6/24 18:00	[illegible]	6/24/21 1800

FORM NO: 01-01 (rev. 12-Mar-2012)

Certification

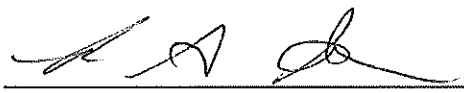
Authorized Representative (Optional): All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 11.A or by a duly authorized representative of that person in accordance with Appendix B, Subsection 11.B. If there is an authorized representative to sign MS4 reports, there must be a signed and dated written authorization.
The authorization letter is:

☐ Attached to this document (document name listed below)

☐ Publicly available at the website below

"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 | Robin A Grimm

Signature  Date | 9/22/21

ENVIRONMENTAL PARTNERS
— An Apex Company —

MEMORANDUM

Date: August 23, 2022

To Mark J. Tisdelle, P.E. – Town Engineer, Town of Stoughton

From Scott Turner, P.E. – Director of Planning, Environmental Partners

CC Laurence Langlois – GIS Manager/Stormwater Coordinator, Town of Stoughton
Paul Giffune – Acting Public Works Director, Town of Stoughton

Subject Year 4 Additional Dry Weather Illicit Discharge Detection & Elimination (IDDE) Outfall Screening Results - MS4 General Permit Assistance for the DPW Engineering Division

This memorandum documents dry weather screenings completed under the Agreement for Professional Engineering Services – Municipal Separate Storm Sewer Systems (MS4) General Permit Assistance for the Department of Public Works (DPW) Engineering Division of the Town of Stoughton.

Under this contract, Environmental Partners Group, LLC (EP) updated GIS mapping data and the MS4 outfall inventory. **The current MS4 outfall inventory includes 147 outfalls**. As part of this effort, nine (9) new outfalls were inventoried and screened in March, April, and July 2022. Four (4) outfalls were found to be flowing during dry weather and sampled. In total, 47 outfalls were removed from the inventory and 11 outfalls were added.

Outfall Inventory Updates

Prior to these updates, the Town's MS4 outfall inventory included 183 outfalls. That inventory had been improved last year in 2021 after field staff visited all outfall and recorded notes on ownership. This year, Environmental Partners continued that work and conducted an in-depth review of roadway and subdivision ownership to refine the outfall inventory further. A number of roads (listed below) are privately maintained and previously had an outfall that now is confirmed to be private. This list was verified by the Town's asset management "Roadway Acceptance Review" list, last updated February 2022, and during discussions with the Town's GIS Manager. The private roads include:

- Erin Road
- Ethyl Way
- Greenbrook Drive
- Ikea Way
- Jennifer Lane
- Jessica Drive
- Patricia Drive
- Onset Lane
- Reebok Drive
- Sunrise Terrace

Additionally, Environmental Partners confirmed five (5) outfalls to be owned and maintained by the Massachusetts Department of Transportation (MassDOT). MassDOT published stormwater GIS mapping for public use in March 2021, data that was unavailable or in draft form when the original outfall inventory was developed. Environmental Partners cross-referenced this inventory with the Town's outfall inventory as well as road ownership GIS to determine five (5) outfalls—located on Park Street and Route 139—should be removed from the municipal IDDE Program.

Other separate stormwater mapping improvements resulted in adjustments to the outfall inventory as well. Several new BMPs were inventoried this year, and all structures discharging into these BMPs now are considered outlets. The overflow structures that discharge stormwater from the BMPs to waterbodies were added as new MS4 outfalls. Additionally, newly mapped drainage ditches added two previously flagged upland outfalls (OF-793, OF-809) to the MS4 outfall inventory. These two outfalls drain a significant portion of the center of Town, including over 9.5 miles of drain pipe and over 10 municipal facilities.

Lastly, updates to the inventory were also made based on field observations during catchment investigation work. For example, field connectivity updates indicated that two structures were actually culvert outlets, which was verified with as-built site plans and Town input (OF-143 and OF-365).

Outfall Sampling Results

The four (4) outfalls found to be flowing during dry weather were analyzed for ammonia, chlorine, fecal coliform, E. coli, total phosphorous, and surfactants at a state certified laboratory, Alpha Analytical Inc. in Westborough, MA. Outfalls were field-screened for temperature, specific conductance, salinity, pH, and dissolved oxygen. A summary of the field and analytical results is presented in Table 2: Stormwater Field Screening and Analytical Results.

Sampling results from two (2) outfalls showed parameter concentrations above MS4 thresholds. At outfall OF-545 on Wheeler Circle, ammonia was detected at 1.92 mg/L, which exceeds the contaminant criteria of 0.5 mg/L. Specific conductance was detected at 2,104 µS/cm, which exceeds the contaminant criteria of 2,000 µS/cm. Additionally, at outfall OF-793 on Myrtle Street, fecal coliform and E. coli were detected at 1,553.12 col/100 mL and 1,986.29 MPN/100 mL, respectively. Fecal coliform does not have an applicable threshold, but E. coli has a threshold of 236 MPN/100 mL, which is lower than the sampling results at OF-793. These two outfalls should be prioritized for future catchment investigations.

Attachments

Table 1: Changes to Town of Stoughton MS4 Outfall Inventory

Table 2: Stormwater Field Screening and Analytical Results

Laboratory Analytical Report

MS4 Certification Page

Table 1: Changes to the Town of Stoughton MS4 Outfall Inventory

Outfall ID	Reason for Change	Add or Remove	Screening Status, if applicable	Screening Date, if applicable
OF-100	Outlet to BMP (not waterway)	Remove		
OF-136	Private	Remove		
OF-15	Private	Remove		
OF-236	Outlet to BMP (not waterway)	Remove		
OF-250	Outlet to BMP (not waterway)	Remove		
OF-303	Private	Remove		
OF-305	Private	Remove		
OF-327	Private	Remove		
OF-346	Private	Remove		
OF-365	Culvert outlet	Remove		
OF-395	Private	Remove		
OF-419	Outfall from BMP to waterway	Add	Dry	3/9/2022
OF-429	Outlet to BMP (not waterway)	Remove		
OF-46	Outlet to BMP (not waterway)	Remove		
OF-486	Private	Remove		
OF-494	Private	Remove		
OF-5	Private	Remove		
OF-50	Private	Remove		
OF-51	Private	Remove		
OF-52	Private	Remove		
OF-521	Private	Remove		
OF-522	Private	Remove		
OF-526	Private	Remove		
OF-535	Private	Remove		
OF-545	Not private	Add	Flowing, Sampled	4/13/2022
OF-546	Private	Remove		
OF-567	Private	Remove		
OF-578	Private	Remove		
OF-585	Private	Remove		
OF-586	Private	Remove		
OF-6	Private	Remove		
OF-617	Private	Remove		
OF-629	Private	Remove		
OF-697	Private	Remove		
OF-699	Private	Remove		
OF-7	Private	Remove		
OF-700	Private	Remove		

Table 1: Changes to the Town of Stoughton MS4 Outfall Inventory

Outfall ID	Reason for Change	Add or Remove	Screening Status, if applicable	Screening Date, if applicable
OF-703	Private	Remove		
OF-704	Private	Remove		
OF-728	Previously was greater than 100 feet from Waters of the U.S., but location was improved and now is within 100 feet of water	Add	Flowing, Sampled	4/13/2022
OF-732	Private	Remove		
OF-733	Private	Remove		
OF-765	Private	Remove		
OF-790	Private	Remove		
OF-791	Private	Remove		
OF-793	280 feet from Waters of the U.S., but newly mapped drainage ditch conveys water from outfall to waterbody	Add	Flowing, Sampled	7/1/2022
OF-800	Private	Remove		
OF-803	Inventoried, new ID, outfall from BMP	Add	Dry	3/14/2022
OF-804	Inventoried, new ID, outfall from BMP	Add	Dry	3/14/2022
OF-805	Inventoried, new ID, outfall from BMP	Add	Dry	3/14/2022
OF-806	Inventoried, new ID, outfall from BMP	Add	Flowing, Sampled	4/13/2022
OF-807	Inventoried, new ID, outfall from BMP	Add	Dry	3/9/2022
OF-809	Located greater than 100 feet from Waters of the U.S., but newly mapped drainage ditch conveys water from outfall to waterbody	Add	Dry	3/9/2022
OF-810	Identified during catchment investigations	Add	Dry	3/22/2022
OF-86	Outlet to BMP (not waterway)	Remove		
OF-87	Private	Remove		
OF-99	Outlet to BMP (not waterway)	Remove		
OF-143	Structure determined to be culvert outfall and receive no Town drainage	Remove		

Table 2: Stormwater Field Screening and Analytical Results

Outfall Identification		OF-545		OF-728		OF-806		OF-793
Discharge Waterbody		Unnamed Tributary to Steep Hill Brook		Unnamed Tributary to Steep Hill Brook		Unnamed Tributary to Beaver Brook		Unnamed Tributary to Steep Hill Brook
Address		153 Wheeler Circle		Memorial/Simpson		57 Tamarack Drive		70 Myrtle Street
Date Sampled		4/13/2022	6/29/2022	4/13/2022	6/29/2022	4/13/2022	6/29/2022	7/1/2022
Sample Time		9:55 AM	10:05 AM	10:35 AM	10:20 AM	11:35 AM	1:05 PM	11:15 AM
Field Test Results	Threshold							
Temperature (˚C)		-	18.2	-	18.6	-	24.5	18.5
Specific Conductance (µS/cm)	2000	-	**2104**	-	794	-	649	1273
Salinity (ppt)		-	1.08	-	0.39	-	0.08	0.64
DO (mg/L)		-	5.09	-	7.8	-	4.76	6.9
pH (unitless)	6.5-8.0	-	7.01	-	7.44	-	7.31	7.42
Oxygen Reduction Potential (mV)		-	-100	-	-1.9	-	-140	-84
Analytical Results								
Ammonia as Nitrogen (mg/L)	0.5	**1.92**	-	0.165	-	ND	-	0.12
Total Residual Chlorine (mg/L)		ND	-	ND	-	ND	-	ND
Phosphorus, Total (mg/L)		0.16	-	0.017	-	0.046	-	0.02
Surfactants, MBAS (mg/L)	0.25	ND	-	ND	-	ND	-	ND
Fecal Coliform, MF (col/100mL)		70	-	15	-	ND	-	**1553.12**
E. coli (MPN/100 mL)	236	36.41	-	16.94	-	1	-	**1986.29**

Notes
- : Not Tested
ND: Non-detect
Bold, red values exceed contaminant criteria.

ANALYTICAL REPORT

Lab Number:	L2219185
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	STOUGHTON FY22 OUTFALLS
Project Number:	295.2010
Report Date:	04/27/22

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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

Project Name: STOUGHTON FY22 OUTFALLS
Project Number: 295.2010

Lab Number: L2219185
Report Date: 04/27/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2219185-01	OF-545	WATER	STOUGHTON, MA	04/13/22 09:55	04/13/22
L2219185-02	OF-728	WATER	STOUGHTON, MA	04/13/22 10:35	04/13/22
L2219185-03	OF-806	WATER	STOUGHTON, MA	04/13/22 11:35	04/13/22

Project Name:	STOUGHTON FY22 OUTFALLS	**Lab Number:**	L2219185
Project Number:	295.2010	**Report Date:**	04/27/22

Case Narrative

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

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

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

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

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

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

Project Name:	STOUGHTON FY22 OUTFALLS	**Lab Number:**	L2219185
Project Number:	295.2010	**Report Date:**	04/27/22

Case Narrative (continued)

Surfactants, MBAS

L2219185-01: The sample has an elevated detection limit due to the dilution required by the sample matrix.

Coliform, Fecal (MF)

L2219185-03: The sample has an elevated detection limit due to the dilution required by the method.

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

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 04/27/22

INORGANICS
&
MISCELLANEOUS

Project Name: STOUGHTON FY22 OUTFALLS
Project Number: 295.2010
Lab Number: L2219185
Report Date: 04/27/22

SAMPLE RESULTS

Lab ID: L2219185-01
Client ID: OF-545
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 04/13/22 09:55
Date Received: 04/13/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	70		col/100ml	2.0	NA	2	-	04/13/22 16:59	121,9222D	JW
E. Coli (MPN)	36.41		MPN/100ml	1	NA	1	-	04/13/22 15:30	121,9223B	TL
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	04/13/22 23:44	121,4500CL-D	AS
Nitrogen, Ammonia	1.92		mg/l	0.075	--	1	04/15/22 13:00	04/15/22 21:51	121,4500NH3-BH	AT
Phosphorus, Total	0.160		mg/l	0.010	--	1	04/20/22 10:30	04/20/22 15:21	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.500	--	10	04/14/22 01:30	04/14/22 04:04	121,5540C	KA

Project Name: STOUGHTON FY22 OUTFALLS
Project Number: 295.2010
Lab Number: L2219185
Report Date: 04/27/22

SAMPLE RESULTS

Lab ID: L2219185-02
Client ID: OF-728
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 04/13/22 10:35
Date Received: 04/13/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	15		col/100ml	2.0	NA	2	-	04/13/22 16:59	121,9222D	JW
E. Coli (MPN)	16.94		MPN/100ml	1	NA	1	-	04/13/22 15:30	121,9223B	TL
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	04/13/22 23:44	121,4500CL-D	AS
Nitrogen, Ammonia	0.165		mg/l	0.075	--	1	04/15/22 13:00	04/15/22 21:52	121,4500NH3-BH	AT
Phosphorus, Total	0.017		mg/l	0.010	--	1	04/20/22 10:30	04/20/22 15:22	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/14/22 01:30	04/14/22 04:05	121,5540C	KA

Project Name: STOUGHTON FY22 OUTFALLS
Project Number: 295.2010
Lab Number: L2219185
Report Date: 04/27/22

SAMPLE RESULTS

Lab ID: L2219185-03
Client ID: OF-806
Sample Location: STOUGHTON, MA
Sample Depth:
Matrix: Water

Date Collected: 04/13/22 11:35
Date Received: 04/13/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	04/13/22 16:59	121,9222D	JW
E. Coli (MPN)	1		MPN/100ml	1	NA	1	-	04/13/22 15:30	121,9223B	TL
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	04/13/22 23:44	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/16/22 03:14	04/18/22 13:15	121,4500NH3-BH	KP
Phosphorus, Total	0.046		mg/l	0.010	--	1	04/20/22 10:30	04/20/22 15:23	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/14/22 01:30	04/14/22 04:05	121,5540C	KA

Project Name: STOUGHTON FY22 OUTFALLS **Lab Number:** L2219185

Project Number: 295.2010 **Report Date:** 04/27/22

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1626867-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	04/13/22 15:30	121,9223B	TL
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1626935-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	04/13/22 16:59	121,9222D	JW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1626963-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	04/13/22 23:44	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1626997-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/14/22 01:30	04/14/22 04:02	121,5540C	KA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1627569-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/15/22 13:00	04/15/22 21:37	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1627887-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/16/22 03:14	04/18/22 12:57	121,4500NH3-BH	KP
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1629047-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	04/20/22 10:30	04/20/22 14:54	121,4500P-E	SD

Project Name:	STOUGHTON FY22 OUTFALLS	**Lab Number:**	L2219185
Project Number:	295.2010	**Report Date:**	04/27/22

GLOSSARY

Acronyms

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

Report Format: Data Usability Report

Project Name:	STOUGHTON FY22 OUTFALLS	**Lab Number:**	L2219185
Project Number:	295.2010	**Report Date:**	04/27/22

Footnotes

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

Terms

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

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

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

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

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

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

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

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

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

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report

Project Name:	STOUGHTON FY22 OUTFALLS	**Lab Number:**	L2219185
Project Number:	295.2010	**Report Date:**	04/27/22

Data Qualifiers

the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name: STOUGHTON FY22 OUTFALLS **Lab Number:** L2219185

Project Number: 295.2010 **Report Date:** 04/27/22

REFERENCES

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

LIMITATION OF LIABILITIES

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

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

Certification Information

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

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625/625.1: alpha-Terpineol
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

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

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

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

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 4/13/22

ALPHA Job #: L2219185

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: Environmental Partners
Address: 1900 Crown Colony Dr #402 Quincy MA
Phone: 207 939 3883
Email: aet@envpartners.com

Project Information

Project Name: Stoughton FY22 Outfalls
Project Location: Stoughton, MA
Project #:
Project Manager:
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☒ Yes ☐ No NPDES RGP
☐ Other State /Fed Program ____ Criteria ____

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:

MS4

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint; E. Coli + Fecal Coliform; Surfactants; TRC; Ammonia; Total Phosphorus

SAMPLE INFO — Filtration: ☐ Field ☒ Lab to do; Preservation: ☒ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	METALS	EPH	VPH	PCB/PEST	TPH	E. Coli + Fecal Coliform	Surfactants	TRC	Ammonia	Total Phosphorus	Sample Comments	Total # Bottles
19185-01	OF-545	4/13/22	9:55	storm water	AET									X	X	X	X	X		
-02	OF-728	↓	10:35	↓	↓									X	X	X	X	X		
-03	OF-806	↓	11:35	↓	↓									X	X	X	X	X		

Container Type:
Preservative:

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H = $Na_2S_2O_3$, I= Ascorbic Acid, J = NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Annie Tietz	4/13/22 12:55	[signature] AAL	4/13/22 12:55
[signature] AAL	4/13/22 14:15	C Sebedu AAL	4/13/22 1415

FORM NO: 01-01 (rev. 12-Mar-2012)

Certification

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

Printed Name

Signature _____ Date

ANALYTICAL REPORT

Lab Number:	L2235345
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	Not Specified
Project Number:	295.2010
Report Date:	07/25/22

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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

Project Name: Not Specified
Project Number: 295.2010

Lab Number: L2235345
Report Date: 07/25/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2235345-01	OF-793	WATER	Not Specified	07/01/22 11:15	07/01/22

Project Name:	Not Specified	**Lab Number:**	L2235345
Project Number:	295.2010	**Report Date:**	07/25/22

Case Narrative

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

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

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

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

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

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

Project Name:	Not Specified	**Lab Number:**	L2235345
Project Number:	295.2010	**Report Date:**	07/25/22

Case Narrative (continued)

Chlorine, Total Residual

WG1658256: A Matrix Spike could not be performed due to insufficient sample volume available for analysis.

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

Authorized Signature: Tiffani Morrissey - Tiffani Morrissey

Title: Technical Director/Representative Date: 07/25/22

Project Name: Not Specified
Project Number: 295.2010

Lab Number: L2235345
Report Date: 07/25/22

SAMPLE RESULTS

Lab ID: L2235345-01
Client ID: OF-793
Sample Location: Not Specified

Date Collected: 07/01/22 11:15
Date Received: 07/01/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MPN)	1553.12		MPN/100ml	1	NA	1	-	07/01/22 14:32	121,9223B	TL
E. Coli (MPN)	1986.29		MPN/100ml	1	NA	1	-	07/01/22 15:06	121,9223B	JW
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/02/22 08:05	121,4500CL-D	MR
Nitrogen, Ammonia	0.120		mg/l	0.075	--	1	07/19/22 23:15	07/20/22 17:53	121,4500NH3-BH	AT
Nitrogen, Nitrate/Nitrite	2.2		mg/l	0.10	--	1	-	07/06/22 05:32	44,353.2	MR
Total Nitrogen	2.7		mg/l	0.30	--	1	-	07/25/22 18:08	107,-	JO
Nitrogen, Total Kjeldahl	0.536		mg/l	0.300	--	1	07/25/22 08:30	07/25/22 16:23	121,4500NH3-H	AT
Phosphorus, Total	0.020		mg/l	0.010	--	1	07/14/22 12:00	07/15/22 09:09	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/02/22 07:30	07/02/22 09:18	121,5540C	KA

Project Name:

Project Number: 295.2010

Lab Number: L2235345

Report Date: 07/25/22

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1658117-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	07/01/22 15:06	121,9223B	JW
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1658118-1										
Coliform, Fecal (MPN)	<1		MPN/100ml	1	NA	1	-	07/01/22 14:32	121,9223B	TL
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1658254-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/02/22 07:30	07/02/22 09:14	121,5540C	KA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1658256-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/02/22 08:05	121,4500CL-D	MR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1658678-1										
Nitrogen, Nitrate/Nitrite	ND		mg/l	0.10	--	1	-	07/06/22 03:23	44,353.2	MR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1662901-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	07/14/22 12:00	07/15/22 08:46	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1664910-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/19/22 23:15	07/20/22 17:37	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1666801-1										
Nitrogen, Total Kjeldahl	ND		mg/l	0.300	--	1	07/25/22 08:30	07/25/22 16:18	121,4500NH3-H	AT

Project Name:	Not Specified	**Lab Number:**	L2235345
Project Number:	295.2010	**Report Date:**	07/25/22

GLOSSARY

Acronyms

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

Report Format: Data Usability Report

Project Name:	Not Specified	**Lab Number:**	L2235345
Project Number:	295.2010	**Report Date:**	07/25/22

Footnotes

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

Terms

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

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

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

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

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

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

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

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

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

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	Not Specified	**Lab Number:**	L2235345
Project Number:	295.2010	**Report Date:**	07/25/22

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	Not Specified	**Lab Number:**	L2235345
Project Number:	295.2010	**Report Date:**	07/25/22

REFERENCES

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

107 Alpha Analytical - In-house calculation method.

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

LIMITATION OF LIABILITIES

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

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

Certification Information

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

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625/625.1: alpha-Terpineol
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

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

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

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

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
Eight Walkup Drive Westborough, MA 01581
TEL: 508-898-9220 FAX: 508-898-9193

Date Rec'd in Lab: 7/1/22

ALPHA Job #: L2235345

Client Information

Client: Environmental Partners
Address: 1900 Crown Colony Dr 402
Quincy MA
Phone: 207 939 3583
Fax:
Email: aet@envpartners.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name:
Project Location:
Project #:
Project Manager:
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #: R282-2109.02

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY - THESE QUESTIONS MUST BE ANSWERED

☐ Yes ☑ No Are MCP Analytical Methods Required?
☐ Yes ☑ No Are Drinking Water Samples Submitted?
☐ Yes ☑ No Have you met minimum field QC requirements?

Other Project Specific Requirements/Comments/Detection Limits:

NPDES / MS4

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	E coli	Fecal coliform	Surfactants	TRC	Total Phos.	Ammonia	Total N. Nitrogen	TOTAL # BOTTLES	Sample Specific Comments
35345-01	OF-793	7/1/22	11:15	Storm water	AT	X	X	X	X	X	X	X		

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☑ Lab to do
Preservation
☐ Lab to do
(Please specify below)

QUESTIONS ABOVE MUST BE ANSWERED FOR PRESUMPTIVE CERTAINTY

IS YOUR PROJECT MCP ? NO

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/1/22 11:44	MaM AT	7/1/22 1147
MaM	7/1/22 1238	[signature]	7/1/22 1238

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

ENVIRONMENTAL PARTNERS
— An Apex Company —

MEMORANDUM

Date: August 23, 2022

To Mark J. Tisdelle, P.E. –Town Engineer, Town of Stoughton

From Scott Turner, P.E. – Director of Planning, Environmental Partners

CC Laurence Langlois – GIS Manager/Stormwater Coordinator, Town of Stoughton
Paul Giffune – Acting Public Works Director, Town of Stoughton
Annie Tucker – Project Scientist, Environmental Partners

Subject: FY22 Illicit Discharge Detection & Elimination (IDDE) Catchment Investigations Findings and Recommendations

This memorandum summarizes the FY22 Illicit Discharge Detection & Elimination (IDDE) catchment investigations, outlined in Task 2A of the contract for Professional Engineering Services for the Municipal Separate Storm Sewer System (MS4) General Permit between the Town of Stoughton and Environmental Partners Group LLC (EP). In accordance with the 2016 Massachusetts MS4 General Permit, the Town of Stoughton must perform catchment investigations at each of the Town's catchments by the end of the Permit term (i.e., Year 10).

In March, April, and May 2022, EP personnel visited 62 catchments during dry weather conditions. The catchment investigations for 53 of the 62 catchments are considered complete. Catchments were selected based on the Town's outfall-catchment ranking table included in the Illicit Discharge Detection and Elimination Plan. EP visited all catchments identified as high priority that do not require the assistance of a police detail. Additionally, when EP staff investigated a high priority catchment next to a low priority catchment, that low priority location would also be investigated for efficiency. The locations of the catchments screened are shown in *Figure 1: FY22 Catchment Investigation Locations* and listed in *Table 1: FY22 Catchment Investigation Locations*. Any mapping updates identified within GIS are also noted within *Table 1*.

During these catchment investigations, EP followed the catchment investigation methodology detailed in the MS4 General Permit. This methodology can be summarized as follows:

- EP verified stormwater mapping,

- EP identified key junction manholes (KJMs) for each catchment and inspected them during dry weather, starting at the most downstream location,
- At each KJM, EP completed a field form noting the structure's condition, presence and source of any flow, and the invert, diameter, and material of the structure and all inlet and outlet pipes. In addition, pictures were taken of the inside and outside of the structure. The KJM field forms are attached to this memorandum,
- If flow was found in a KJM, EP used field test kits to screen for ammonia, total chlorine, and surfactants,
- If field sampling results or visual and olfactory inspection indicated potential illicit discharges, the upstream area was flagged for further investigation,
- EP continued inspecting and, if flowing, sampling all KJMs until the whole catchment was evaluated, and
- If no evidence of illicit connections were found, the dry weather IDDE investigation is considered complete, pending system vulnerability factor (SVF) inventory, refined catchment delineation, and any catchment mapping updates identified.

Following the field work, EP and the Town collaborated to identify the presence or absence of SVFs for each catchment visited. This evaluation is included in *Table 3: SVF Assessment.* Additionally, we also uses LiDAR and contour GIS data to delineate the catchments for each of the 62 outfalls visited. Refined catchment delineations are shown in *Figure 2*.

Catchment Investigation Findings

A summary of the field sampling results is presented in *Table 2: Field Test Kit Results*. There are some structures that need maintenance, and further mapping updates are required. These instances are summarized in *Table 1.* Also attached to this report is a map for each catchment visited that includes field notes, Town actions needed, and notes regarding GIS updates. Catch basin/manhole inspection forms are also attached.

Of the 62 catchments visited, five catchments had indicators of potential illicit discharges and require additional follow-up. None of these catchments qualify as "Problem Outfalls" based on the MS4 Permit definition. However, based on the field observations and sampling results, follow-up is needed before the catchment investigation can be considered complete.

- OF-154 – 31 Alpine Way
  - A garden hose was identified entering CB-670 from #102 Chrisholm Road. The Town should determine what the residents are discharging into the MS4. The property has a residential aboveground pool.
- OF-324 – 62 Kotlik Street
  - A significant number of dog waste bags were observed in CB-593 and at the outfall. The dog waste bags should be removed. Additionally, the Town should consider sending an educational message about dog waste to the neighborhood or consider another solution.

- OF-350 – 14 Dino Drive
    - On May 16, 2022, MH-496 was sampled at each of its three inlets. Total chlorine was detected at the inlet from the west at a concentration of greater than 3.4 mg/L, which exceeds the MS4 Permit threshold of detectable levels of chlorine. Ammonia was detected at 1.0 mg/L, above its threshold of 0.5 mg/L.
    - The upstream structures were observed to be dry. Therefore, the high-chlorine stormwater may be entering the drainage system via an unmapped pipe.
    - These results suggest there may be an illicit discharge entering the system between MH-496 and MH-495. The Town should consider videoing that length of pipe, conducting a smoke test, or another method to confirm the source of the illicit connection.
- OF-458 – Flynn Road
    - On March 30, 2022, MH-1969 was sampled and surfactants (also known as detergents) was detected at 3.0 mg/L, which exceeds its criteria threshold of 0.25 mg/L. Total chlorine was detected at a concentration of 0.6 mg/L, which also exceeds the MS4 Permit threshold of detectable chlorine.
    - On April 11, 2022, MH-688 was sampled and surfactants were detected at 1.5 mg/L, and total chorine was detected at a concentration of 0.7 mg/L. Since this catchment channels a culverted stream, the stream was observed and noted to have suds.
    - On June 29, 2022, MH-688 was re-sampled and surfactants were detected at 0.5 mg/L and total chorine was detected at a concentration of 1.1 mg/L. The stream was also sampled and surfactants were detected at 0.5 mg/L and total chorine at 0.1 mg/L.
    - These results suggest there may be an illicit discharge entering this catchment or the stream upstream of the catchment. Further investigation is needed to isolate and confirm the source of the illicit and determine appropriate removal actions.
- OF-459 – Fraser Road
    - On March 20, 2022, MH-681, MH-684, and MH-686 were sampled and surfactants were detected between a concentration of 0.5 mg/L and 2 mg/L. Additionally, total chlorine was detected at two of the three manholes sampled.
    - MH-684 was revisited on June 29, 2022, and it was dry.
    - These results suggest there may be an intermittent illicit discharge entering this catchment or the stream upstream of the catchment. Further investigation is needed to confirm the existence of an illicit discharge and, if present, remove the connection.

While investigating catchments, pipes entering the MS4 from unknown sources were noted. These pipes may be residential area drains or roof drains, an illicit connection, or something else. The Town should locate the sources of the following pipes and determine if the pipes contain allowable discharges or illicit discharges:

- OF-42 – 38 Valley Drive
    - Pipe entering system from around #54 Amherst Street
    - Pipe entering system from around #13 Ralph Mann Drive
- OF-444 – Rocky Knoll Drive
    - Pipe entering system from around #70 Connie Lane

- OF-636 – Carson Drive
    - Pipe entering system from between #23 and #29 Sander Lane
- OF-745 – 1 Cedar Street
    - Pipe entering from west of the Cedar Street culvert
    - Four dangling pipes on the South Elementary School property

Additionally, some catchments were visited but the investigations could not be completed. The reason for the incompleteness and Town actions needed are described below:

- OF-109 – D Street
    - MH-2032 and MH-2033 need to be located and opened. Additionally, MH-2033 should be located as well. Both are likely are buried in dirt.
- OF-204 – 36 Palisades Circle
    - MH-300 was unable to be opened. The Town should open this manhole.
- OF-217 – 42 Ash Park Drive
    - MH-760 was unable to be opened. The Town should open that manhole or another manhole closer to the outfall.
- OF-243 – 279 William Kelley Road
    - MH-746 or MH-1905 were unable to be opened. The Town should open these manholes.
- OF-251 – 52 Jordan Drive
    - MH-1906 was unable to be opened. The Town should open this manhole.
- OF-323 – 108 Kotlik Street
    - MH-324 was unable to be opened. The Town should open this manhole.
- OF-378 – Highland Street
    - CB-1679 needs to be cleaned.
- OF-553 – Lake Drive
    - MH-2198 was unable to be opened. The Town should open this manhole.

Lastly, OF-143 near 60 Whitten Ave was determined to be an outlet for a culvert and does not receive stormwater. This was confirmed by as-built drawings, field verification, and discussions with the Town. This catchment has been removed from the Town's MS4 inventory.

Recommendations

In conclusion, EP recommends the following:

1. **Complete follow-up on outfalls OF-154, OF-324, OF-350, OF-458, and OF-459, and document any actions taken. See the attached catchment figures for more details.**
2. **Complete the recommended actions for the 8 incomplete catchments. See the attached catchment figures for more details.**
3. Continue IDDE catchment investigations, investigating a portion of the remaining catchments each year for the next 5 years.
4. Continue performing wet weather sampling at outfalls within catchments that have at least one SVF identified.

Attachments

Certification Page
Table 1: FY22 Catchment Investigations Locations
Table 2: Stormwater Field Test Kit Results
Table 3: SVF Assessment
Figure 1: FY22 Catchment Investigation Locations
Figure 2: Refined Outfall-Catchment Delineations
Catchment Packages for Catchments that Require Town Follow-up
- Catchment of OF-154
- Catchment of OF-324
- Catchment of OF-350
- Catchment of OF-458
- Catchment of OF-459

Catchment Packages for Catchments that Require Town Action to Complete
- Catchment of OF-109
- Catchment of OF-204
- Catchment of OF-217
- Catchment of OF-243
- Catchment of OF-251
- Catchment of OF-323
- Catchment of OF-378
- Catchment of OF-553

Catchment Packages for Catchments that are Complete
- All Remaining Catchments

Certification

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

Printed Name

Signature _____ Date

Table 1: FY22 Catchment Investigation Locations

Outfall ID	Approximate Street Address	Receiving Water	Outfall-catchment Priority	Catchment Investigation Date	Mapping Notes	Flow Present	Catchment Investigation Status	Maintenance Needed
OF-38	101 Trowbridge Circle	Beaver Meadow Brook	High	2022-03-30		No	Complete	
OF-39	97 Deady Avenue	Beaver Meadow Brook	High	2022-03-23		No	Complete	
OF-42	38 Valley Drive	Unnamed Tributary to Beaver Meadow Brook	High	2022-03-30		No	Initial catchment investigation complete - Town to investigate pipes entering system from #54 Amherst St and #13 Ralph Mann Dr	Outfall pipe is being eroded and may need maintenance. See photo. Resident reported ponding at leaching catch basin CB-865
OF-108	83 Tanglewood Drive	Unnamed Tributary to Beaver Brook	High	2022-03-22		Yes	Complete	
OF-144	4 Robert Scott Way	Unnamed Tributary near Woods Pond	Low	2022-05-16	Two catch basins mapped	No	Complete	
OF-148	161 Rogers Drive	Unnamed Tributary to Steep Hill Brook	High	2022-03-23		Yes	Complete	
OF-150	4 Blackstone Street	Unnamed Tributary to Steep Hill Brook	High	2022-03-22		No	Complete	
OF-152	34 Poskus Street	Unnamed Tributary to Town Pond	Low	2022-05-16		No	Complete	
OF-153	34 Poskus Street	Unnamed Tributary to Town Pond	Low	2022-05-16		No	Complete	CB-588 rim started to come up when we lifted grate
OF-154	31 Alpine Way	Unnamed Tributary to Town Pond	Low	2022-05-16		No	Initial investigation complete - but hose from #102 Chrisholm Rd to CB-670 needs to be investigated	MH-369, MH-339, MH-341, MH-370, and MH-365 were stuck
OF-156	497 School Street	Unnamed Tributary to Steep Hill Brook	High	2022-03-22	CB-2844 is actually a scupper	No	Complete	
OF-159	15 Walters Way	Unnamed Tributary to Ames Long Pond	High	2022-04-13		No	Complete	
OF-193	94 York Street	Beaver Meadow Brook	High	2022-03-23		No	Complete	Headwall is in poor condition. Sedimentation at outlet suggests flooding is possible
OF-202	216 Palisades Circle	Ames Long Pond	High	2022-03-23		No	Complete	
OF-203	1725 West Street	Ames Long Pond	High	2022-03-23		No	Complete	
OF-209	31 Alpine Way	Unnamed Tributary to Town Pond	Low	2022-05-16		No	Complete	

Table 1: FY22 Catchment Investigation Locations

Outfall ID	Approximate Street Address	Receiving Water	Outfall-catchment Priority	Catchment Investigation Date	Mapping Notes	Flow Present	Catchment Investigation Status	Maintenance Needed
OF-226	10 Chipman Lane	Unnamed Tributary near Woods Pond	Low	2022-05-16	Inlet and CB mapped; drainage updates still needed at southern cul-de-sac	No	Complete	Outfall partially covered by debris perhaps due to residents dumping yard waste
OF-231	116 Shirley Rd	Unnamed Tributary to Dorchester Brook	Low	2022-05-16		No	Complete	Significant debris/sediment at outfall, suggesting ponding is likely
OF-242	9 Hunt Drive	Woods Pond	Low	2022-05-16		No	Complete	
OF-244	223 William Kelley Road	Unnamed Wetlands to Beaver Brook	High	2022-03-22		No	Complete	
OF-245	170 William Kelley Road	Unnamed Wetlands to Beaver Brook	High	2022-03-22		No	Complete	
OF-246	27 William Kelley Road	Dorchester Brook	High	2022-03-22		Yes	Complete	
OF-249	25 Jordan Drive	Unnamed Tributary to Ames Long Pond	High	2022-04-13		No	Complete	Outfall was 50% full of debris; oil film noted in MH-1605, potentially from residential inlet
OF-279	79 Rocky Knoll Drive	Unnamed Tributary To Beaver Brook	High	2022-03-23		No	Complete	
OF-286	Pondview Ln	Beaver Meadow Brook	High	2022-03-23	Catchment connectivity updated - see map	No	Complete	
OF-306	90 Trowbridge Circle	Beaver Meadow Brook	High	2022-03-30		No	Complete	
OF-324	62 Kotlik Street	Unnamed Tributary to Steep Hill Brook	High	2022-05-23		Yes	Initial investigation complete - Dog waste bags in CB-593 and at outfall need to be removed	Rim started coming up at MH-359
OF-334	102 Deady Avenue	Beaver Meadow Brook	High	2022-03-23		No	Complete	
OF-350	24 Dino Drive	Unnamed Tributary to Steep Hill Brook	High	2022-05-16	New outlet pipe from MH-2034 mapped - original outlet pipe may not exist	Yes	Signs of illicit discharges identified - follow up is needed	MH-495 was stuck
OF-351	103 Walters Way	Unnamed Tributary to Ames Long Pond	High	2022-04-13		No	Complete	
OF-366	Ledgebrook Ave	Unnamed Wetlands to Beaver Brook	High	2022-03-23	Connectivity updated - see map	No	Complete	Outfall has sediment buildup creating ponding
OF-367	Carson Dr	Unnamed Wetlands to Beaver Brook	High	2022-03-22		No	Complete	Manhole pipes partially filled with sediment
OF-376	Highland St	Ames Long Pond	High	2022-03-23		Yes	Complete	
OF-426	40 Ladyslipper Lane	Unnamed Tributary to Beaver Brook	High	2022-03-30		No	Complete	

Table 1: FY22 Catchment Investigation Locations

Outfall ID	Approximate Street Address	Receiving Water	Outfall-catchment Priority	Catchment Investigation Date	Mapping Notes	Flow Present	Catchment Investigation Status	Maintenance Needed
OF-431	230 Curtis Ave	Unnamed Tributary to Beaver Brook	High	2022-04-11		No	Complete	BMP-84 needs maintenance
OF-432	218 Curtis Ave	Unnamed Tributary to Beaver Brook	High	2022-03-30		No	Complete	
OF-444	Rocky Knoll Dr	Unnamed Tributary To Beaver Brook	High	2022-03-23	Connectivity of CB-1456 needs updating	No	Initial investigation Complete - but source of pipe entering system at #70 Connie Lane needs to be identified	Sediment has built-up at MH-869 outlet; inlet to nearby culvert is partially blocked due to concrete cave-in
OF-450	75 Sheehan Street	Unnamed Tributary to Steep Hill Brook	High	2022-04-11		No	Complete	Outfall partially covered by debris
OF-455	102 Deady Avenue	Beaver Meadow Brook	High	2022-03-23		No	Complete	
OF-456	90 Trowbridge Circle	Beaver Meadow Brook	High	2022-03-30		No	Complete	
OF-458	121 East Vanston Road	Unnamed Tributary to Beaver Brook	High	2022-03-30		Yes	Signs of illicit discharges identified - follow up is needed	MH-687 could not be located
OF-459	91 East Vanston Road	Unnamed Tributary to Beaver Brook	High	2022-03-30		Yes	Signs of illicit discharges identified - follow up is needed	
OF-465	132 Winslow Drive	Unnamed Tributary to Steep Hill Brook	High	2022-04-11		No	Complete	Outfall is buried under debris and there is evidence of localized flooding during rain events. Headwall is collapsing
OF-469	104 Winslow Drive	Unnamed Tributary to Steep Hill Brook	High	2022-04-11		No	Complete	Outfall is 80% full of debris
OF-547	131 Lake Drive	Ames Long Pond	High	2022-04-13		No	Complete	
OF-554	Lake Drive intersect w/ West St	Ames Long Pond	High	2022-04-11	MH inventoried; nearby culvert needs to be mapped	No	Complete	
OF-587	Bramblebush Rd	Unnamed Tributary to Beaver Brook	High	2022-03-22		Yes	Complete	
OF-588	189 Fifth Street	Unnamed Wetlands to Beaver Brook	High	2022-04-11		No	Complete	
OF-610	53 Barnes Road	Unnamed Tributary to Beaver Brook	High	2022-04-11		No	Complete	
OF-636	Carson Dr	Unnamed Wetlands to Beaver Brook	High	2022-03-23		Yes	Initial investigation complete - but source of pipe entering system between #29 and #23 Sander Lane needs to be identified	

Table 1: FY22 Catchment Investigation Locations

Outfall ID	Approximate Street Address	Receiving Water	Outfall-catchment Priority	Catchment Investigation Date	Mapping Notes	Flow Present	Catchment Investigation Status	Maintenance Needed
OF-664	672 West Street	Unnamed Tributary to Town Pond	Low	2022-04-11		No	Complete	
OF-745	1 Cedar Street	Unnamed Tributary to Beaver Brook	High	2022-05-23	Connectivity of CB-2983 updated; Pipe entering CB-2987 added; Pipe entering CB-2982 added	Yes	Initial investigation complete - but mapping needs to be Complete, including source of pipes entering system	CB-2983 and CB-3380 need to be cleaned. MH-2185 and CB-1290 were stuck and could not be opened
OF-810	27 William Kelley Road	Dorchester Brook	Low	2022-03-22		No	Complete	
OF-109	D St	Unnamed Wetlands to Beaver Brook	High	2022-03-22		No	Incomplete - Town to help open MH-2032 and 2033	CB-2609 was covered by leaves
OF-143	4 Robert Scott Way	Unnamed Tributary near Woods Pond	Low	2022-05-16	Not outfall	No	Location removed from MS4 Outfall inventory - catchment receives no stormwater	
OF-204	22 Palisades Circle	Ames Long Pond	High	2022-03-23		No	Incomplete - Town to help open MH-300	
OF-217	42 Ash Park Drive			2022-05-23		No	Incomplete - Town to help open MH-760	MH-1033 was rusted shut
OF-243	261 William Kelley Road	Unnamed Wetlands to Beaver Brook	High	2022-03-22		No	Incomplete - Town to help open MH-746 or MH-1905	
OF-251	52 Jordan Drive	Unnamed Tributary to Ames Long Pond	High	2022-04-13		No	Incomplete - Town to help open MH-1906	All inlets and outlets within BMP need maintenance
OF-323	108 Kotlik Street	Unnamed Tributary to Steep Hill Brook	High	2022-03-23	MH-2023 is actually a catch basin	Yes	Incomplete - Town help to open MH-324	
OF-378	Highland St	Ames Long Pond	High	2022-03-23		Yes	Incomplete - Town to clean CB-1679	CB-1679 needs cleaning
OF-553	Lake Drive intersect w/ West St	Ames Long Pond	High	2022-04-13		No	Incomplete - Town to help open MH-2198	

Table 2: Field Test Kit Results

Outfall ID	Structure ID	Discharging Waterbody	Date Sampled	Ammonia (mg/L) 0.5 mg/L Threshhold	Total Chlorine (mg/L) 0.1 mg/L Threshhold	Surfactants (mg/L) 0.25 mg/L Threshhold	Temp. (deg C)	pH	Specific Conductance (µs/cm)	Salinity (mg/L)	Dissolved Oxygen (mg/L)
OF-108	MH-951	Unnamed Tributary to Beaver Brook	2022-03-22	0.25	**0.40**	0.25	8.4	6.62	472.8	0.23	9.09
	MH-990		2022-03-22	0.25	**0.30**	**0.3**	8.8	6.94	680.8	0.33	13.1
	MH-721		2022-03-22	0.30	0.00	0.25	10.2	7.00	370.6	0.18	9.11
OF-148	MH-808	Unnamed Tributary to	2022-03-23	0.20	**0.40**	0.25	9.8	7.76	344	0.17	8.66
	MH-786		2022-03-23	0.20	**0.25**	0.25	7.4	7.40	754	0.37	8.83
OF-323	MH-360	Unnamed Tributary to	2022-03-23	ND	**0.30**	0.25	8.9	6.98	286.2	0.14	11.46
	MH-2023		2022-03-23	ND	**0.40**	0.25	9.0	6.66	23.1	0.13	7.75
OF-324	MH-321	Unnamed Tributary to	2022-05-23	ND	**0.50**	0.25	18.7	6.82	537.4	0.26	7.38
	OF-324		2022-05-23	ND	**0.50**	0.25	17.0	7.09	374	0.18	10.13
OF-350	MH-496 (pipe from MH-495)	Unnamed Tributary to Steep Hill Brook	2022-05-16	**1.00**	**3.40**	0.25	15.8	7.24	642		
	MH-496 (pipe from MH-2035)		2022-05-16	ND	**0.30**	0.25	12.4	6.64	512.3		
	MH-496 (pipe from MH-528)		2022-05-16	ND	**0.80**	0.25	15.1	6.60	516.5		
OF-376	MH-1603	Ames Long Pond	2022-03-23	ND	**0.50**	0.25	11.1	6.97	923	0.46	8.16
OF-458	MH-1969	Unnamed Tributary to	2022-03-30	ND	**0.60**	**3**	4.5	5.76	322.1	0.15	11.43
	MH-688		2022-03-30	ND	**0.70**	**1.5**	11.5	8.23	293.9	0.14	
OF-459	MH-684	Unnamed Tributary to Beaver Brook	2022-03-30	ND	**0.20**	**2**	8.2	6.51	685		7.21
	MH-681		2022-03-30	0.10	ND	**1.5**	8.4	5.79	577.7		8.23
	MH-686		2022-03-30	ND	**0.20**	**0.5**	7.6	5.66	662.1	0.32	6.27
OF-587	MH-748	Unnamed Tributary to Beaver Brook	2022-03-22	0.25	ND	0.25	6.7	7.99	198.5	0.09	9.56

Table 2: Field Test Kit Results

Outfall ID	Structure ID	Discharging Waterbody	Date Sampled	Ammonia (mg/L) 0.5 mg/L Threshhold	Total Chlorine (mg/L) 0.1 mg/L Threshhold	Surfactants (mg/L) 0.25 mg/L Threshhold	Temp. (deg C)	pH	Specific Conductance (µs/cm)	Salinity (mg/L)	Dissolved Oxygen (mg/L)
OF-636	MH-2	Unnamed Wetlands to Beaver Brook	2022-03-23	ND	**0.20**	0.25	9.3	7.21	817	0.4	7.02
OF-745	MH-1799	Unnamed Tributary to Beaver Brook	2022-05-23	ND	**0.50**	0.25	16.3	8.67	463.8	0.22	7.74
	MH-758		2022-05-23	ND	**0.20**	ND	15.7	7.93	217.8	0.1	7.48
	MH-770		2022-05-23	ND	**0.50**	ND	23.5	6.69	229.3	0.11	6.56

Bold values exceed contaminant criteria
ND is non-detect

Table 3: Outfall-Catchment System Vulnerability Factor (SVF) Inventory
Stoughton, Massachusetts

			Required Factors									Recommended Factors			
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OF-103	139 Shuman Avenue	Unnamed Wetlands near Lovett Brook						X	N/A						X
OF-104	200 Shuman Avenue	Unnamed Tributary to Brockton Reservoir						X	N/A						X
OF-105	75 Campanelli Parkway	Lovett Brook						X	N/A						
OF-108	83 Tanglewood Drive	Unnamed Tributary to Beaver Brook							N/A						
OF-109	D St	Unnamed Wetlands to Beaver Brook						X	N/A						X
OF-144	4 Robert Scott Way	Unnamed Tributary near Woods Pond							N/A						
OF-148	161 Rogers Drive	Unnamed Tributary to Steep Hill Brook							N/A						
OF-150	4 Blackstone Street	Unnamed Tributary to Steep Hill Brook							N/A						
OF-152	34 Poskus Street	Unnamed Tributary to Town Pond							N/A						
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OF-154	31 Alpine Way	Unnamed Tributary to Town Pond							N/A						
OF-156	497 School Street	Unnamed Tributary to Steep Hill Brook							N/A						
OF-159	15 Walters Way	Unnamed Tributary to Ames Long Pond							N/A					X	
OF-193	94 York Street	Beaver Meadow Brook							N/A						
OF-202	216 Palisades Circle	Ames Long Pond						X	N/A						X
OF-203	1725 West Street	Ames Long Pond						X	N/A						X
OF-204	22 Palisades Circle	Ames Long Pond						X	N/A						X
OF-207	426 Highland Street	Ames Long Pond						X	N/A						
OF-209	31 Alpine Way	Unnamed Tributary to Town Pond							N/A						

Table 3: Outfall-Catchment System Vulnerability Factor (SVF) Inventory
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OF-231	116 Shirley Rd	Unnamed Tributary to Dorchester Brook				X			N/A						
OF-242	9 Hunt Drive	Woods Pond							N/A						
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OF-244	223 William Kelley Road	Unnamed Wetlands to Beaver Brook							N/A						
OF-245	170 William Kelley Road	Unnamed Wetlands to Beaver Brook				X			N/A						
OF-246	27 William Kelley Road	Dorchester Brook							N/A						
OF-249	25 Jordan Drive	Unnamed Tributary to Ames Long Pond							N/A						
OF-251	52 Jordan Drive	Unnamed Tributary to Ames Long Pond							N/A						
OF-279	79 Rocky Knoll Drive	Unnamed Tributary To Beaver Brook							N/A						
OF-286	Pondview Ln	Beaver Meadow Brook							N/A						
OF-306	90 Trowbridge Circle	Beaver Meadow Brook							N/A						
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OF-376	Highland St	Ames Long Pond						X	N/A						X
OF-378	Highland St	Ames Long Pond						X	N/A						X

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OF-380	28 Smyth Street	Unnamed Tributary to Dorchester Brook						X	N/A						
OF-39	97 Deady Avenue	Beaver Meadow Brook							N/A						
OF-42	38 Valley Drive	Unnamed Tributary to Beaver Meadow Brook	X						N/A						
OF-426	40 Ladyslipper Lane	Unnamed Tributary to Beaver Brook							N/A						
OF-431	230 Curtis Ave	Unnamed Tributary to Beaver Brook							N/A						
OF-432	218 Curtis Ave	Unnamed Tributary to Beaver Brook							N/A						
OF-444	Rocky Knoll Dr	Unnamed Tributary To Beaver Brook							N/A						
OF-450	75 Sheehan Street	Unnamed Tributary to Steep Hill Brook							N/A						
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OF-469	104 Winslow Drive	Unnamed Tributary to Steep Hill Brook							N/A						
OF-547	131 Lake Drive	Ames Long Pond						X	N/A						X
OF-553	Lake Drive intersect w/ West St	Ames Long Pond						X	N/A						X
OF-554	Lake Drive intersect w/ West St	Ames Long Pond						X	N/A						X
OF-567	1096 Park Street	Lovett Brook	X					X	N/A						

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OF-588	189 Fifth Street	Unnamed Wetlands to Beaver Brook						X	N/A						X
OF-610	53 Barnes Road	Unnamed Tributary to Beaver Brook							N/A						
OF-636	Carson Dr	Unnamed Wetlands to Beaver Brook							N/A						
OF-664	672 West Street	Unnamed Tributary to Town Pond							N/A						
OF-694	951 Pleasant Street	Unnamed Tributary To Beaver Brook	X					X	N/A						
OF-745	1 Cedar Street	Unnamed Tributary to Beaver Brook							N/A						
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OF-98	139 Shuman Avenue	Unnamed Wetlands near Lovett Brook						X	N/A						X
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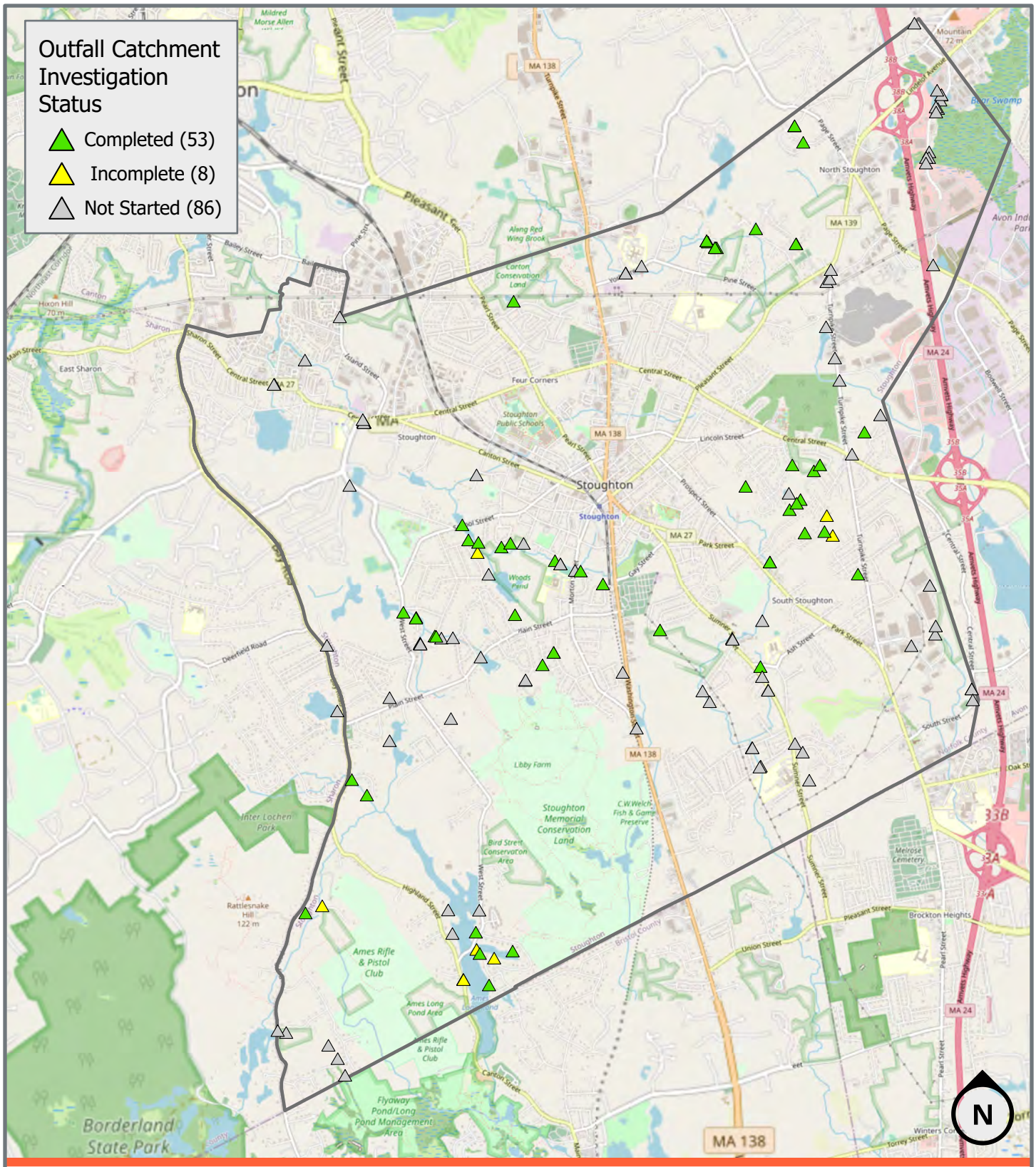

Figure 1: FY22 Catchment Investigation Locations

Stoughton, MA

0 0.5 1 Miles

ENVIRONMENTAL PARTNERS
— An Apex Company —

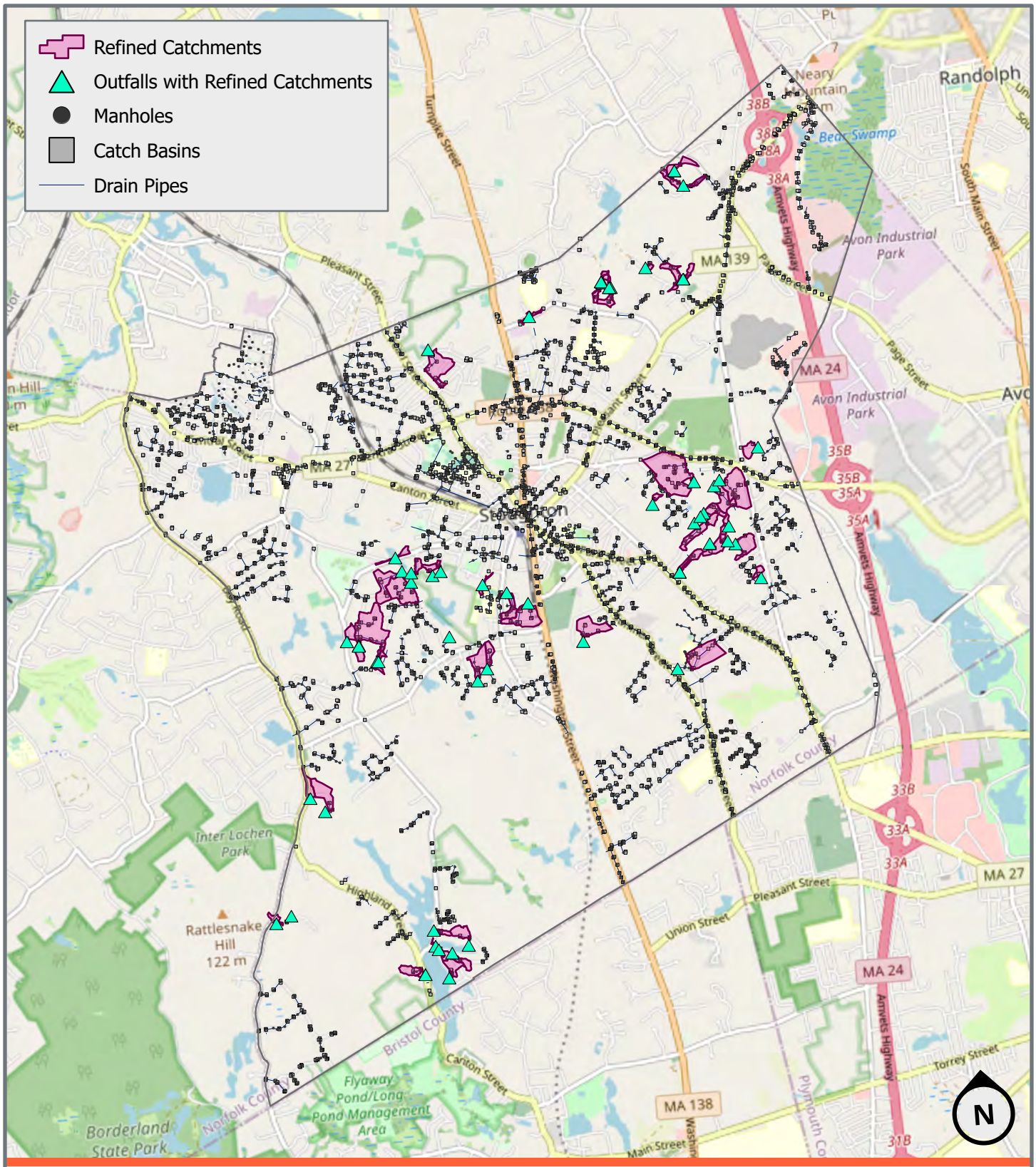

Figure 2: Refined Outfall-Catchment Delineations

Stoughton, MA

0 0.5 1 Miles

ENVIRONMENTAL PARTNERS
— An Apex Company —

APPENDIX F

System Vulnerability Factor (SVF) Inventory

Table 3: Outfall-Catchment System Vulnerability Factor (SVF) Inventory
Stoughton, Massachusetts

			Required Factors									Recommended Factors			
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OF-104	200 Shuman Avenue	Unnamed Tributary to Brockton Reservoir						X	N/A						X
OF-105	75 Campanelli Parkway	Lovett Brook						X	N/A						
OF-108	83 Tanglewood Drive	Unnamed Tributary to Beaver Brook							N/A						
OF-109	D St	Unnamed Wetlands to Beaver Brook						X	N/A						X
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APPENDIX G

New England Interstate Water Pollution Control Commission

IDDE Manual

ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL

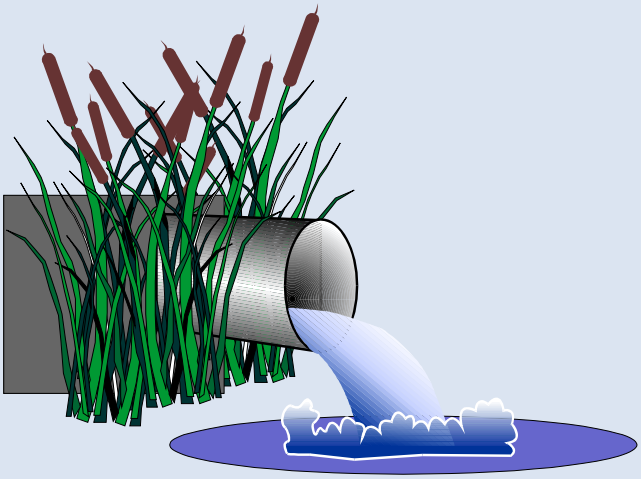
A Handbook for Municipalities

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

January 2003

ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL

A Handbook for Municipalities



Prepared by the

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

Boott Mills South

100 Foot of John Street

Lowell, Massachusetts 01852

Ronald F. Poltak, *Executive Director*

COMPACT MEMBER STATES

Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

Copies of this document may be downloaded from *www.neiwpcc.org.*

January 2003

ACKNOWLEDGEMENTS

This manual was developed by the New England Interstate Water Pollution Control Commission (NEIWPCC). NEIWPCC is a nonprofit interstate agency, established by an Act of Congress in 1947, that serves its member states (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) by providing coordination, public education, training, and leadership in the management and protection of water quality.

This project was initiated by NEIWPCC's Storm Water Workgroup, which is composed of state and federal environmental agency staff. The group perceived a need for resources to help municipalities in NEIWPCC-member states that are regulated under the U.S. Environmental Protection Agency's (EPA's) Phase II storm water program comply with regulatory requirements. This manual is intended to help municipalities develop illicit discharge detection and elimination programs—one of the six minimum control measures under Phase II.

This manual was made possible by a grant from the U.S. Environmental Protection Agency. The contents do not necessarily reflect the views and policies of EPA or NEIWPCC's member states, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

This manual was compiled and written by Rebekah Lacey, with assistance from Kim Starbuck and other NEIWPCC staff. Editing, graphic design, and layout were performed by Ellen Frye and Ricki Pappo of ENOSIS. Thelma Murphy served as the EPA Project Officer. NEIWPCC would like to thank Andrea Donlon, NHDES, for her many contributions to this document, which included providing information, comments, and photographs—most of the photographs in the manual were either provided by Andrea or taken by NEIWPCC staff while accompanying Andrea on field work.

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Andrea Donlon, NHDES
Tim Grover, City of Winooski, VT
Charlie Jewell, BWSC
Natalie Landry, NHDES
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Thomas Mahin, MADEP
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Ginny Scarlet, MADEP
Chris Stone, CTDEP

CONTENTS

ACRONYMS

BMP	Best Management Practice
BWSC	Boston Water and Sewer Commission
GIS	Geographic Information System
GPS	Global Positioning System
IDDE	Illicit Discharge Detection and Elimination
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NOV	Notice of Violation
SIC	Standard Industrial Classification

EPA	U.S. Environmental Protection Agency
CTDEP	Connecticut Department of Environmental Protection
MEDEP	Maine Department of Environmental Protection
MADEP	Massachusetts Department of Environmental Protection
NHDES	New Hampshire Department of Environmental Services
NYSDEC	New York State Department of Environmental Conservation
RIDEM	Rhode Island Department of Environmental Management
VTDEC	Vermont Department of Environmental Conservation

INTRODUCTION

Although the quality of the nation's waters has improved greatly since the passage of the Clean Water Act in 1972, many water bodies are still impaired by pollution. According to the U.S. Environmental Protection Agency's (EPA's) 2000 National Water Quality Inventory, 39 percent of assessed river and stream miles, 46 percent of assessed lake acres, and 51 percent of assessed estuarine square miles do not meet water quality standards. The top causes of impairment include siltation, nutrients, bacteria, metals (primarily mercury), and oxygen-depleting substances. Polluted storm water runoff, including runoff from urban/suburban areas and construction sites, is a leading source of this impairment. To address this problem, EPA has put into place a program that regulates certain storm water discharges.

Polluted storm water runoff, including runoff from urban/suburban areas and construction sites, is a leading source of water quality impairment. To address this problem, EPA has put into place a program that regulates certain storm water discharges.

In 1990, EPA promulgated Phase I of its storm water program under the National Pollutant Discharge Elimination System (NPDES) permit provisions of the Clean Water Act. Phase I addressed storm water runoff from "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater, construction activity that would disturb five or more acres of land, and 10 categories of industrial activity. To further reduce the adverse effects of storm water runoff, EPA instituted its Storm Water Phase II Final Rule on December 8, 1999.

WHO ADMINISTERS THE PHASE II STORM WATER PROGRAM?

The Phase II storm water program is part of EPA's NPDES program, which in many states is delegated to state authorities to administer. Connecticut, Maine, New York, Rhode Island, and Vermont are authorized to serve as NPDES permitting authorities. EPA Region 1 serves as the permitting authority for Massachusetts and New Hampshire. EPA is also the permitting authority for all federally recognized Indian Country lands and for federal facilities in Massachusetts, New Hampshire, and Vermont.

WHAT IS REGULATED UNDER PHASE II?

Phase II regulates discharges from small MS4s located in "urbanized areas" (as delineated by the Census Bureau in the most recent census) and from additional small MS4s designated by the permitting authority. Phase II also regulates construction activities that would disturb between one and five acres of land. In addition, the Phase II Final Rule ends the temporary exemption from Phase I requirements for some municipally operated industrial activities[1] and revises the "no exposure" provision for Phase I-regulated industrial activities.

MS4s are typically operated by municipalities, but the Phase II definition of "municipal separate storm sewer systems" includes storm sewer systems owned or operated by other public bodies (e.g., states, counties, Indian tribes, departments of transportation, universities). EPA also notes that an MS4 is not always just a system of underground pipes; it can include roads with drainage systems, gutters, and ditches.

[1] This temporary exemption was provided by the Intermodal Surface Transportation Act (ISTEA) of 1991.

The rules for determining which small MS4s are regulated under Phase II are somewhat complex; MS4 operators should consult the NPDES permitting authority for their state to determine whether their MS4s are regulated. Note also that requirements may be different if a municipality is located only partially within an urbanized area.

WHERE DOES IDDE FIT IN?

EPA's Phase II rule specifies that permitting authorities must issue general permits for "automatically designated" small MS4s by December 9, 2002. The rule requires that operators of these automatically designated small MS4s apply for NPDES permit coverage within 90 days of permit issuance, and no later than March 10, 2003[2]. To obtain this coverage, an MS4 operator must develop, implement, and enforce a storm water management program that is designed to reduce the discharge of pollutants to the maximum extent practicable, protect water quality, and satisfy the applicable water quality requirements of the Clean Water Act. EPA's Storm Water Phase II Final Rule states that this storm water management program must include the following six minimum control measures:

- Public education and outreach on storm water impacts
- Public involvement and participation
- ➤ **Illicit discharge detection and elimination (IDDE)**
- Construction site storm water runoff control
- Post-construction storm water management in new development and redevelopment
- Pollution prevention and good housekeeping for municipal operations

As part of their applications for permit coverage, MS4 operators must identify the best management practices they will use to comply with each of the six minimum control measures and the measurable goals they have set for each measure.

ABOUT THIS MANUAL

This manual is intended to help municipalities in the New England states and New York develop illicit discharge detection and elimination (IDDE) programs required by EPA's Phase II storm water program. EPA's Phase II storm water regulations provide guidelines that are used by permitting authorities in writing their permits. This manual provides general information based on EPA's Phase II storm water regulations; it is important to consult the permitting authority in your state (see Chapter 10) to find out about state-specific requirements.

EPA's Phase II storm water regulations provide guidelines that are used by permitting authorities in writing their permits. This manual provides general information based on EPA's Phase II storm water regulations; it is important to consult the permitting authority in your state to find out about state-specific requirements.

Chapter 1 explains the IDDE requirement of EPA's Phase II regulations. Chapters 2 through 8 describe the required elements of an IDDE program and provide information to help municipalities execute each of these elements. Chapter 9 provides information on best management practices and measurable goals for IDDEs. Chapter 10 lists additional resources and contacts that may be helpful in developing an IDDE program.

[2] There are some exceptions to this deadline; contact the permitting authority in your state for up-to-date official information.

1 GETTING STARTED WITH YOUR IDDE PROGRAM

As you set out to develop your illicit discharge detection and elimination (IDDE) program, you will need to start by making sure that you know the answers to two key questions: (1) What is an illicit discharge? and (2) What are the required elements of an IDDE program? In this chapter we'll review the answers to these questions; we'll provide supporting information and details in subsequent chapters.

WHAT IS AN ILLICIT DISCHARGE?

The term "illicit discharge" is defined in EPA's Phase II storm water regulations as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire-fighting activities."

Illicit discharges can be categorized as either direct or indirect.

- Examples of direct illicit discharges:
  - sanitary wastewater piping that is directly connected from a home to the storm sewer
  - materials (e.g., used motor oil) that have been dumped illegally into a storm drain catch basin
  - a shop floor drain that is connected to the storm sewer
  - a cross-connection between the municipal sewer and storm sewer systems
- Examples of indirect illicit discharges:
  - an old and damaged sanitary sewer line that is leaking fluids into a cracked storm sewer line
  - a failing septic system that is leaking into a cracked storm sewer line or causing surface discharge into the storm sewer

Illicit discharge

Any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire-fighting activities.

WHAT ARE THE ELEMENTS OF AN IDDE PROGRAM?

EPA's Phase II regulations state that an IDDE program must incorporate the following four elements.

- Develop (if not already completed) a storm sewer system map showing the location of all outfalls, and the names and location of all waters of the United States that receive discharges from those outfalls.

NON-STORM WATER DISCHARGES THAT YOUR IDDE PROGRAM MAY NOT NEED TO ADDRESS

According to EPA's Phase II storm water regulations, an illicit discharge detection and elimination program need only address the following categories of non-storm water discharges if the operator of a small MS4 identifies them as significant contributors of pollutants to the MS4:

- water line flushing
- landscape irrigation
- diverted stream flows
- rising ground waters
- uncontaminated ground water infiltration
- uncontaminated pumped ground water
- discharges from potable water sources
- foundation drains
- air conditioning condensation
- irrigation water
- springs
- water from crawl space pumps
- footing drains
- lawn watering
- individual residential car washing
- flows from riparian habitats and wetlands
- dechlorinated swimming pool discharges
- street wash water

- To the extent allowable under state, tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed.
- Develop and implement a plan to detect and address illicit discharges, including illegal dumping, to the system.
- Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

For each of these mandatory elements, EPA suggests a variety of approaches that can help in creating a successful IDDE program. The mandatory elements and the suggested approaches will be discussed further in the next seven chapters.

REFERENCES: CHAPTER 1

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. *http://www.epa.gov/npdes/regulations/phase2.pdf*

USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.5: *Illicit Discharge Detection and Elimination Minimum Control Measure.* EPA 833-F-00-007. January 2000. *http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm*

2 DEVELOPING A STORM SEWER MAP

The creation of a storm sewer map is the first mandatory element of an IDDE program. Phase II requires that the operator of a regulated MS4 develop a map of the MS4 that shows, at a minimum, the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls. While many municipalities in the Northeast already have detailed maps of their storm sewer systems, others, typically those in older or more rural areas, have the information scattered in different locations. These municipalities will have the most work to do to comply with this requirement. If you need to develop a map, begin by collecting any existing information on outfall locations (e.g., review city records, drainage maps, storm drain maps, state or federal storm water permit files, state transportation maintenance maps), and then conduct field surveys to verify the locations.

CONDUCTING A FIELD SURVEY

A field survey of outfall locations will often be necessary to create a map or verify and update an existing map. The References section at the end of the chapter provides a Web link for a sample guide for conducting a storm drain mapping survey (MA DFWELE, 2002). Field outfall surveys generally include the following basic steps:

- Survey receiving waters on foot or by boat to look for all outfalls (i.e., wade small receiving waters or use a boat for larger receiving waters).
- Note the locations of outfalls on a map. The map scale should be such that outfalls can be located accurately.
- Assign a code or label to each outfall. Adopt a logical, easy-to-understand system (e.g., distance along the stream).
- Fill out a survey sheet for each outfall, noting characteristics such as dry weather discharge and deposits or stains.

The goal of a mapping program should be functionality—find a way to map outfalls such that you (and the permitting authority) can locate any specific outfall to check on discharges.

MAPPING OPTIONS

For municipalities that do not already have a storm sewer map, it is important to determine the type of map (e.g., topographic, hand or computer drafted) that best fits your needs. Because there is no specific mapping standard in the Phase II rule, the goal of a mapping program should be functionality—find a way to map outfalls such that you

CAN A DITCH BE AN OUTFALL?

The paragraph below is an excerpt from EPA's Storm Water Phase II Final Rule (USEPA, 1999).

The term "outfall" is defined in 40 CFR 122.26(b)(9) as "a point source at the point where a municipal separate storm sewer discharges to waters of the United States." The term "municipal separate storm sewer" is defined at 40 CFR 122.26(b)(8) as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)." Following the logic of these definitions, a "ditch" may be part of the municipal separate storm sewer, and at the point where the ditch discharges to waters of the United States, it is an outfall. As with any determination about jurisdictional provisions of the CWA, however, final decisions require case-specific evaluations of fact.

(and the permitting authority) can locate any specific outfall to check on discharges. The most basic way to meet the mapping requirement is to use an existing map (e.g., a topographic map) that shows receiving waters. You can then mark outfall locations on the map by hand (using existing information augmented by a field survey). Make sure the names of receiving waters are shown on the map; for receiving waters that don't have names, it is helpful to indicate the nearest named water body downstream. The graphic at the beginning of this chapter shows an example of a marked-up United States Geological Survey map (markings do not represent actual outfalls). The next step up is a more sophisticated paper map (e.g., blueprint-style). Figure 1 presents an example of a simple paper map showing outfalls and other key features of the storm sewer system.

In many municipalities, a paper map may be completely adequate for carrying out an IDDE program. However, if your MS4 has the resources, or if your municipality has a complex storm sewer system, you may want to make use of available computer technology in making your map.

Global Positioning System (GPS) technology can be used to obtain the coordinates (longitude and latitude) for each outfall. A GPS unit, which uses data from the U.S. Department of Defense's constellation of GPS satellites to constantly update position, can be carried with you on your field survey. A particular position can be recorded and later downloaded into a Geographic Information System (GIS) database. Using GIS, the coordinates can be linked with other site-specific information, such as a picture and history of the outfall. GPS units can be purchased or rented.

There are various computerized mapping programs. A GIS program (e.g., ArcGIS) combines a georeferenced database with mapping capability, so that different geographical attributes (e.g., streets, outfalls, land use, monitoring data) can be mapped as

"layers" and displayed either separately or together. AutoCAD®, a design/drafting platform, is another program commonly used for storm sewer mapping.

If you plan to map via computer, decide if you want to make the mapping system compatible with other departments within your municipality and/or with other data sources (e.g., state agencies that provide GIS layers). Since storm sewer systems are often constructed in roadways, the use of the GIS road line data layer can be helpful in developing a map. If this layer is available, it is usually very accurate and frequently updated by state or regional agencies. Local or regional planning commissions may be able to provide assistance with GIS technology and map development. Once a particular software system has been chosen, it is helpful to require developers to submit compatible electronic updates for subsequent development to ensure that the map and data remain current after the initial mapping effort is finished.

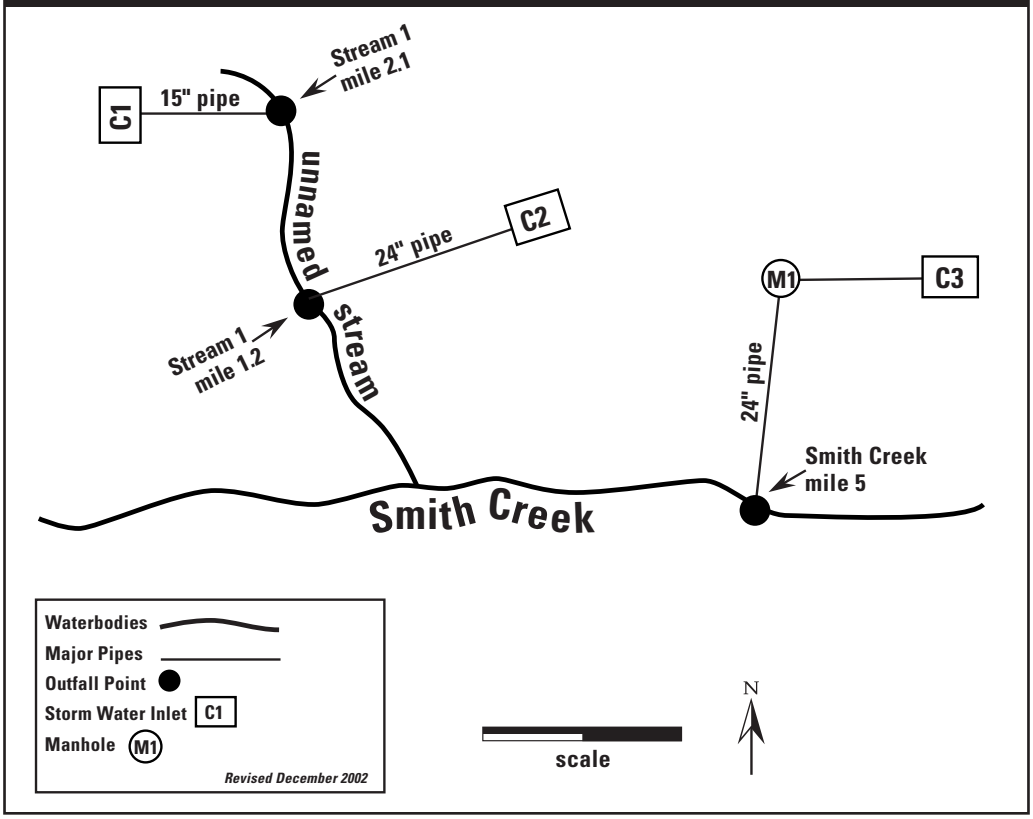
PRIORITIZING AREAS TO BE MAPPED

You may find that practical considerations will dictate the need to conduct mapping in phases. In this case, it is best to prioritize your mapping agenda. For example, older developed areas are more likely to have illicit discharges than newer areas for various reasons (e.g., many municipalities have imposed inspection requirements on new construction that help to prevent illegal connections). Therefore, if your community has limited resources, you would benefit from mapping the older areas first to ensure that priority areas are mapped.

You may find that practical considerations will dictate the need to conduct mapping in phases. In this case, it is best to prioritize your mapping agenda.

Other considerations in setting mapping priorities include land uses, reports of illicit discharges, and other information specific to each MS4. Although EPA's Phase II regulations require that only outfalls be mapped, once an illicit discharge is detected at an outfall, it may be necessary to map the portion of the storm sewer system leading to the outfall so that you are able to locate the source of the discharge. If possible, mapping the entire storm sewer system may prove very helpful to your IDDE program.

Figure 1 SAMPLE MAP



REFERENCES: CHAPTER 2

Colorado Department of Public Health and Environment, Water Quality Control Division. 2001. *Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal stormwater discharge permit.* *http://www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html*

Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. 2002. *Storm Drain Mapping Project Field Manual* (Draft). *http://www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf*

Oakland County, Michigan. 2002. *Illicit Discharge Elimination Program.* *http://www.co.oakland.mi.us/drain/program_service/illicit_disch.html*

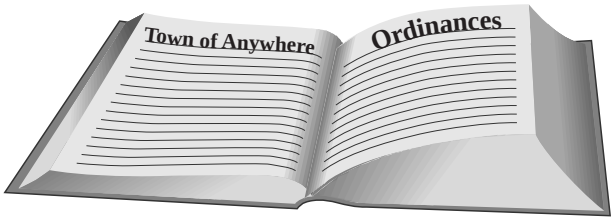
Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide.* USEPA Office of Research and Development. EPA/600/R-92/238. *http://www.epa.gov/clariton*

Rohrer, C.A., and Beckley, R.J. Undated. *Using GIS Tools to Implement an Illicit Discharge Elimination Program in Livonia, Michigan.* Rouge River Demonstration Project. *http://www.rougeriver.com/proddata*

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. *http://www.epa.gov/npdes/regulations/phase2.pdf*

3 PROHIBITING ILLICIT DISCHARGES

The second mandatory element of a Phase II IDDE program requires that MS4 operators "to the extent allowable under State, Tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed."



ILLICIT DISCHARGE ORDINANCES

As EPA's guidance specifies, a municipal ordinance created to comply with Phase II regulations must include a *prohibition* of illicit discharges and an *enforcement* mechanism. Note that it is also essential for the municipality to establish legal authority to inspect properties suspected of releasing contaminated discharges into the storm sewer system. Your municipality may already have a sewer use ordinance or similar bylaw that meets Phase II requirements, or that can be amended to meet the requirements. Consult with your town counsel and other municipal authorities to review your town's existing bylaws and regulations and determine what changes or additions are needed and what the procedure is for making those changes. If you need to make changes, you may want to review the model bylaws and other guidance discussed below.

EPA's nonpoint source pollution program Web site offers several examples of local ordinances for illicit discharges (USEPA, 2002). Appendix A of this manual presents EPA's general model ordinance, which synthesizes a number of existing municipal ordinances. In using any of these ordinances as a model, a community should take into account the legal authority granted to it under state law, the Phase II permit requirements in that state, the enforcement methods it deems appropriate, and any other locality-specific considerations.

A municipal ordinance created to comply with Phase II regulations must include a* prohibition *of illicit discharges and an* enforcement *mechanism.

A workgroup chaired by Massachusetts Department of Environmental Protection (MADEP) staff has been working on developing model bylaws that municipalities in the state can use to help them comply with Phase II regulations. The products of this group's work (model bylaws and associated guidance) are expected to be available on the MADEP Web site (see Chapter 10) by the time this manual is published. This group found that many of the available model ordinances did not fit well with the structure of Massachusetts government and, therefore, developed models that would work for towns in the state. The group also found that entry onto private property can be a tricky legal issue and should be treated carefully in any new or amended bylaws.

The Boston Water and Sewer Commission's (BWSC's) *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains* are available on the Web (*http://*www.bwsc.org; click on "Engineering" then "Regulations") and may serve as a useful local model. The regulations specify certain conditions under which BWSC

representatives must be granted access to property; denial of access may lead to termination of water service.

Note that illicit discharges to *storm* sewers should be addressed hand-in-hand with the issue of illegal connections of extraneous water to *sanitary* sewers (typically referred to as infiltration/inflow or I/I programs); bylaws or regulations should make clear which discharges belong in which system.

REFERENCES: CHAPTER 3

BWSC. 2002. *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains.* *http://www.bwsc.org*

Personal communication from Ginny Scarlet, MADEP, November 29, 2002.

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851.

USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges.* *http://www.epa.gov/owow/nps/ordinance/discharges.htm*

4 DEVELOPING AND IMPLEMENTING AN IDDE PLAN: LOCATING PRIORITY AREAS

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: locating priority areas; tracing the source of an illicit discharge; removing the source of an illicit discharge; and program evaluation and assessment. The first component, locating priority areas, is the subject of this chapter. Each of the other three components will be discussed in chapters five, six, and seven respectively.

THE IDDE PLAN

- ➤ **Locating priority areas**
- **Tracing the source of an illicit discharge**
- **Removing the source of an illicit discharge**
- **Program evaluation and assessment**

The process of identifying "priority areas" can be broken down into three steps:

- ➤ ***Use available information to identify potential hot spots***
- ➤ ***Conduct dry-weather field screening to look for non-storm water discharges***
- ➤ ***Conduct water quality tests to see if these non-storm water discharges seem to be illicit discharges***

The following sections focus on each of these approaches.

IDENTIFYING POSSIBLE HOT SPOTS

"Hot spots" are areas that are considered to be likely sources of illicit discharges, based on available information. The following list provides examples of potential hot spots.

Commercial/ industrial areas These areas have been found in some communities' IDDE programs to (a) have significant numbers of illicit connections and/or (b) have discharges with a high potential to affect water quality (Tuomari, 1999 and Pitt et al., 1993). Specific business sectors can be prioritized (e.g., businesses subject to waste water pretreatment rules, businesses falling under certain Standard Industrial Classification [SIC] codes, or business sectors with a record of enforcement actions).

Older areas of town Older development may predate more stringent construction codes regarding illegal connections and may have deteriorating sewer and/or storm sewer infrastructure that can lead to infiltration problems.

Hot spots
Areas that are considered to be likely sources of illicit discharges, based on available information.

Areas where there have been repeated complaints Areas where illegal dumping or apparently contaminated discharges have been reported are obvious priority targets. Geographic Information System (GIS) mapping can be useful for visualizing complaint locations. These maps can be overlain with other pertinent resource information (e.g., locations of facilities that have had compliance violations, water quality data for receiving waters).

Locations identified from ambient water quality sampling data The locations of high levels of particular contaminants (e.g., bacteria) can help to target priority outfalls. Good resources for this information are the periodic water quality assessment reports ("305(b) reports") and lists of impaired waters ("303(d) lists") that the Clean Water Act requires each state to prepare and submit to EPA. These reports are prepared by each state's environmental agency and are available to the public, often on the state's Web site. Also, local watershed groups monitor many water bodies, particularly those in more developed areas. In addition to providing sampling data, these groups can often serve as valuable resources for information about a particular water body and potential problem areas. Other possible sources of water quality data include local Boards of Health (in Massachusetts, they must test at beaches) and water districts or departments.

CONDUCTING DRY-WEATHER OUTFALL/MANHOLE SURVEYS

Once your general geographic priority areas have been determined, dry-weather surveys of outfalls and/or manholes can be undertaken to look for non-storm water flows.

EPA recommends that you make visual observations of outfalls during dry weather. Some operators have found that dry-weather manhole inspections can also be useful. The presence of flow in a storm sewer outfall or manhole during dry weather indicates a likely illicit discharge. (Other explanations for the presence of such flow include infiltrating ground water or the diversion of a surface stream into the storm sewer system.) Because illicit discharges are often intermittent, you should ideally check for discharges multiple times in a given location (particularly in a priority location). Please note that only those with confined-space training should enter a manhole or outfall. The observation and sampling strategies described below can typically be conducted without entering manholes or outfalls.

IMPORTANT NOTE:
Only those with confined-space training should enter a manhole or outfall.

In implementing your dry-weather survey, consider adopting the following strategies.

- Combine this survey with the outfall mapping field survey (see Chapter 2) and/or water quality sampling of the discharges (discussed in the next section of this chapter).
- Enlist a watershed association or other volunteer organization to help with the outfall survey.
- Notify the public that the survey will be taking place (e.g., send notices to property owners in the area). Note that while it is desirable to keep the public informed

about the presence of survey-takers to prevent undue alarm, notification may also tip off an illegal discharger to curtail discharges; use your judgment as to the most appropriate course of action. For example, you might just specify a very general time frame during which the survey will take place.

- Keep safety considerations at the forefront of survey procedures at all times. Likely hazards should be anticipated and discussed with the individuals carrying out the survey, and individuals should be instructed to use their judgment and err on the side of caution as they conduct the survey. The survey should be conducted in groups of two or more. If manholes are opened for inspection as part of the survey, staff should wear high-visibility safety vests and block off their work area with traffic cones; police presence can be helpful for safety and to allay public concerns that can be created by individuals opening manholes.

- Determine your criterion for "dry weather." The working definition of dry weather used for sampling programs can vary depending on location-specific factors. Pitt et al. (1993) suggest that storm-runoff drainage ends in most urban areas no more than 12 hours after a storm event, but many programs (e.g., Boston, NH DES, San Diego) use a longer time period, such as no rain or no more than 1/10 inch of rain in the last 48 or 72 hours.

- Observe dry-weather flows for odor, color, turbidity, and floatable matter. Observe outfalls for deposits and stains, vegetation, and damage to outfall structures. This information can help identify contaminants present in the discharge and/or the likely nature of the discharge (e.g., sanitary, industrial). Some of the resources listed in Chapter 10 provide examples of data and observation sheets to be filled out for each outfall.

- Look up some of the resources listed in the references for this chapter for more detailed instructions for conducting dry-weather field surveys (e.g., MA DFWELE, 2002).

CASE STUDY: BOSTON WATER AND SEWER COMMISSION

USING SANDBAGS TO DETECT ILLICIT DISCHARGES

The Boston Water and Sewer Commission has had success using sandbags to help detect illicit discharges. Sandbags are placed in storm drain outlets that empty into manholes and/or water bodies. The sandbags are small enough that they do not block the storm drain outlet. They must be placed in the outlet after 48 hours of dry weather (1/10 inch of rain or less). After the bag is placed in the outlet, another 48 hours of dry weather is needed (total of 96 hours of dry weather). The outlet is then observed, and any water buildup behind the sandbag is sampled. This method is very effective in narrowing down the manhole junctures that contain illicit discharges. Sandbags cost approximately $60 each and can be reused. The main difficulty in using this method is the need for 96-hour periods of dry weather.

Information from an interview with Paul Barden, Deputy Director of Engineering Services, and Charlie Jewell, Project Director, Boston Water and Sewer Commission, August 15, 2002.

CONDUCTING WATER QUALITY TESTS

When dry-weather flow is observed, visual or odor observations (e.g., observation of pieces of toilet paper, strongly colored or very muddy discharge, or the odor of sewage or chemicals) may provide enough information to determine that the discharge is illicit and to identify the likely source. If not, water quality sampling can be used to determine whether the flow is likely to have resulted from an illicit discharge.

Certain water quality parameters can serve as indicators of the likely presence or absence of a specific type of discharge. Some of these parameters can be measured in the field with probes or test kits; others must be analyzed for in the laboratory. A wide variety of water quality parameters can be measured in an IDDE program, and many references exist that describe these parameters. Some of the more commonly used and useful parameters are summarized in Table 1, which focuses on parameters suggested in Pitt et al. (1993) and the subset of those recommended in EPA's Phase II regulations.

CASE STUDY: WINOOSKI, VERMONT

USE OF OPTICAL BRIGHTENERS

The city of Winooski, Vermont has found that testing for optical brighteners is an efficient, cheap way to determine the presence of a non-storm water discharge in a particular outfall. Optical brighteners are used in laundry detergents and thus serve as a marker for household or commercial laundry discharges. These tests are extremely sensitive to the presence of detergents.

To perform an optical-brightener test, an untreated cotton pad ($9/100 pads) surrounded by a mesh bag or a suet cage is placed in a storm drain outlet, manhole, or catch basin that has been found to have dry-weather discharge and left for a certain period of time (i.e., 5-7 days). The cotton pad is then brought back to the lab and placed under a UV lamp (approximately $200) in a dark room. A blue color indicates the presence of detergents, signifying either illegal dumping, a direct illicit connection, a leaking sewer, or leakage from a failed septic system. If the test is positive for detergents, further tests need to be performed to determine the source.

Information from an interview with Tim Grover, Water Pollution Control Facility Superintendent, City of Winooski, August 9, 2002.

TABLE 1 WATER QUALITY TEST PARAMETERS AND USES

Water Quality Test	Use of Water Quality Test	Comments
Conductivity	Used as an indicator of dissolved solids	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Typically measured in the field with a probe
Ammonia	High levels can be an indicator of the presence of sanitary wastewater	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Used very often and equipment is readily available; Boston, MA uses a field test kit (see case example)
Surfactants	Indicate the presence of detergent (e.g., laundry, car washing)	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Boston, MA uses a field test kit (see case example)
pH	Extreme pH values (low or high) may indicate commercial or industrial flows; not useful in determining the presence of sanitary wastewater (which, like uncontaminated baseflows, tends to have a neutral pH, i.e., close to 7)	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Typically measured in the field or lab with a probe
Temperature	Sanitary wastewater and industrial cooling water can substantially influence outfall discharge temperatures. This measurement is most useful during cold weather.	- Pitt et al. 1993 suggested parameter - Measured in the field with a thermometer or probe
Hardness	Used to distinguish between natural and treated waters	- Pitt et al. 1993 suggested parameter
Total Chlorine	Used to indicate inflow from potable water sources; not a good indicator of sanitary wastewater because chlorine will not exist in a "free" state in water for long (it will combine with organic compounds)	- Pitt et al. 1993 suggested parameter
Fluoride	Used to indicate potable water sources in areas where water supplies are fluoridated	- Pitt et al. 1993 suggested parameter
Potassium	High levels may indicate the presence of sanitary wastewater	- Pitt et al. 1993 suggested parameter
Optical Brighteners (Fluorescence)	Used to indicate presence of laundry detergents (which often contain fabric whiteners, which cause substantial fluorescence)	-Pitt et al. 1993 suggested parameter -Used by City of Winooski, VT (see case example)
Bacteria (fecal coliform, *E. coli,* and/or *enterococci)*	Used to indicate the presence of sanitary wastewater	- Used by NHDES (see case example in chapter 5)

REFERENCES: CHAPTER 4

Clark County (WA) Public Works. 2000. *Illicit Discharge Screening Project: Annual Summary 2000.* *http://www.co.clark.wa.us/site/clean/download/2000rept.pdf*

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Donlon, A. 2001. *2000 Coastal Illicit Connection Remediation Grant Program: Final Report.* New Hampshire Department of Environmental Services and New Hampshire Estuaries Project. R-WD-01-10. *http://www.des.state.nh.us/wmb/was/nhep2000.pdf*

Interview with Paul Barden and Charlie Jewell, BWSC, August 15, 2002.

Interview with Andrea Donlon, NHDES, July 29, 2002.

Interview with Tim Grover, City of Winooski, VT, August 9, 2002.

Jewell, C. 2001. A Systematic Methodology for Identification and Remediation of Illegal Connections. Presented at the Water Environment Federation Specialty Conference *2001 A Collection Systems Odyssey: Combining Wet Weather and O&M Solutions.* *http://www.wef.org*

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North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination.* *http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html*

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Sargent, D. and W. Castonguay. 1998. *An Optical Brightener Handbook.* *http://www.mvpc.org/services_sec/mass_bays/optical_handbook.htm*

Tuomari, D. 1999. *Dos and Don'ts on Implementing a Successful Illicit Connection Program.* Rouge River Demonstration Project. *http://www.rougeriver.com/proddata*

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851.

USEPA. 2002. Storm Water Phase II Menu of BMPs - *Illicit Discharge Detection and Elimination: Identifying Illicit Connections.* *http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_2.cfm*

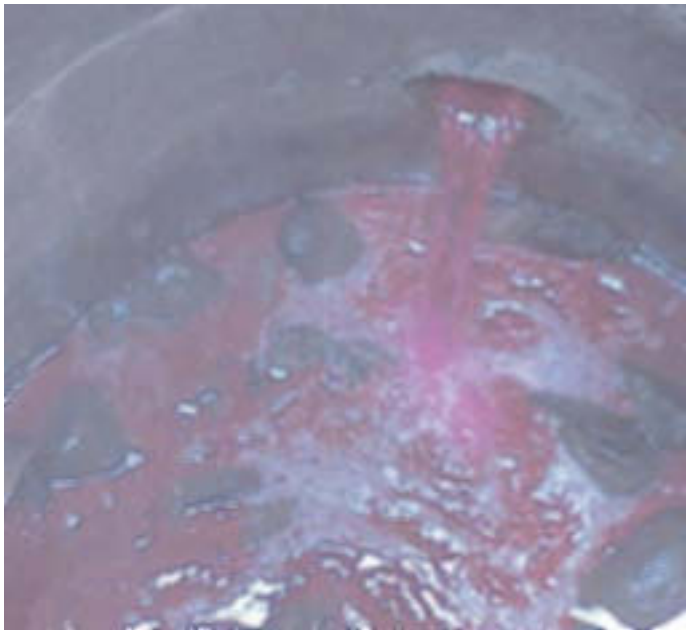
5 DEVELOPING AND IMPLEMENTING AN IDDE PLAN: TRACING THE SOURCE OF AN ILLICIT DISCHARGE

***D**eveloping and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The second component, tracing the source of an illicit discharge, is the subject of this chapter.*

THE IDDE PLAN

- Locating priority areas
- ➤ Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

Once storm drain outlets with evidence of illicit discharges have been located, various methods can be used to pinpoint the exact source of the discharge. These techniques, many of which are already used by municipal sewer departments, include manhole observation, video inspection, smoke testing, dye testing, aerial infrared and thermal photography, and tracking illegal dumping.



MANHOLE OBSERVATIONS

A key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source. This can be accomplished by taking the following steps:

- ➤ Consult the drainage system map.
- ➤ Check the next "upstream" manhole with a junction to see if there is evidence of discharge. You may wish to sample each manhole that has a discharge.
- ➤ Repeat these steps until a junction is found with no evidence of discharge; the discharge source is likely to be located between the junction with no evidence of discharge and the next downstream junction.
- ➤ Be aware of the surrounding areas and look for water in gutters and streets.

A key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source.

Note that the Boston Water and Sewer Commission has had success working in the opposite direction (i.e., upstream to downstream) (Jewell 2001). Manhole observations can be time-consuming, but they are generally a necessary step before conducting other tests.

VIDEO INSPECTION

Mobile video cameras can be guided remotely through storm sewer lines to observe possible illegal connections into storm sewer systems and record observations on a videocassette or DVD. Public works staff can observe the videos and note any visible illegal connections. This technique is time-consuming and expensive but thorough and usually definitive, and it does not require the intrusion on members of the public that some of the other methods do.

SMOKE TESTING

This technique involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines. The injection is accomplished by placing a smoke bomb in the storm sewer manhole below ground and forcing air in after it. Smoke-generating machines can also be used. Test personnel should be stationed at points of suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm sewer infrastructure). Prior to performing this test, it is necessary to inform building owners and occupants in the area in advance. It is also advisable to inform the police and fire departments.

Smoke testing involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines.

For a more thorough smoke-test program, the sanitary sewer lines can also be smoked. For houses that do not emit smoke during either the sanitary sewer or the storm sewer system tests, sewer gas may be venting inside, which is hazardous. Interviews with various IDDE program staff suggest that the smoke-test method is more effective in infiltration/inflow investigations of the sanitary sewer system than in detecting illegal connections to the storm sewer system.

Smoke may cause minor irritation of respiratory passages; residents with respiratory conditions should receive special attention to determine if it is safe for them to be present for the testing. Smoke testing is typically used to survey an area all at once, in contrast to dye testing, which tests one building at a time.

DYE TESTING

This technique involves flushing non-toxic dye into toilets and sinks and observing storm sewer and sanitary sewer manholes and storm sewer outfalls for the presence of the dye. Prior to performing this test, it is necessary to inform building owners and occupants in advance and gain permission for entry. Local public health and state water quality staff should also be notified so that they will be prepared to respond to citizens calling about any dye observed in surface waters.

To perform the test, you need a crew of two or more people (ideally, all with two-way radios). One person is inside the building; the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which

CASE STUDY: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

LOCATING AND TRACING ILLICIT DISCHARGES IN NEW HAMPSHIRE COASTAL COMMUNITIES

In 1996, the New Hampshire Department of Environmental Services (NHDES) began a program of investigating and eliminating illicit connections to storm drainage systems in coastal communities to reduce bacterial contamination in coastal waters. The following excerpt from the NHDES report on the first phase of the project describes the process used to detect and trace illicit discharges.

Beginning in the summer of 1996, the coastal shorelines were surveyed by foot or canoe at low tide for potential pollution sources. All pipes, seeps, streams, and swales with flow were sampled for bacteria. In addition, temperature was measured, and observations related to the condition of the pipe (stained or structurally damaged), odor, evidence of untreated wastewater (e.g., toilet paper), turbidity, color, debris, estimated flow, and any other observations were noted. Dry pipes were rechecked on several occasions for intermittent flow. Evidence indicating the presence of wastewater and/or elevated bacteria levels prompted further investigation of these locations.

Upstream catch basins and manholes associated with the outfall pipes that were identified by the screening process were surveyed for evidence of wastewater and sampled for bacteria. Smoke testing (using non-toxic smoke blown into catch basins) was then used to identify buildings connected to the storm drainage system by canvassing the neighborhood for vents emitting smoke. Final confirmation of an illicit connection from the buildings that emitted smoke was accomplished by dye testing indoor plumbing and observing the storm drainage and sewer systems for the presence or absence of the dye.

Feeder streams were surveyed for outfall pipes with dry-weather flow. Other potential bacteriological sources (e.g., pigeon roosting sites on bridges) were bracketed with water quality sampling stations. Where contaminated seeps and swales were suspected, the drainage area was surveyed for potential sources, such as broken sewer mains.

Landry, N. 1999. Elimination of Illicit Connections in Coastal New Hampshire Spurs Cooperation and Controversy: A Final Report to the New Hampshire Estuaries Project. New Hampshire Department of Environmental Services.

should be opened) and/or outfalls. The inside person drops dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The inside person then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test is relatively quick (about 30 minutes per test), effective (results are usually definitive), and cheap. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

AERIAL INFRARED AND THERMAL PHOTOGRAPHY

Aerial infrared and/or thermal photography can be used to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers. This technique requires knowledge of aerial photo interpretation. Using aerial infrared or thermal photographs, do the following:

- For outfalls
  - Note if discharge has a higher temperature than that of the stream
  - Note if algae growth is concentrated near an outfall
- For potentially failing septic systems
  - Note evidence of increased moisture in surrounding soil
  - Observe vegetation located close to the potentially failing septic system, and note any increase in vegetation compared to the surrounding area
  - Observe any increase in temperature readings at the septic system location

Aerial infrared and/or thermal photography can be used to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers.

This is still a developing technology and not commonly used for IDDE programs. You may still need further tests to determine specific houses/businesses with illegal connections. This technique has been used primarily for the detection of failing septic systems, which are only considered "illicit discharges" under the Phase II Storm Water program if they discharge into the storm sewer system.

TRACKING ILLEGAL DUMPING

Developing a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges. Suggestions for tracking illegal dumping include the following:

- Create a hotline that can be used to report any illegal-dumping behavior (i.e., who illegally dumped and where illegal dumping occurred).
- Observe the materials that have been illegally dumped and trace the potential sources of the materials.
- Note where dumping occurs most often, record patterns of time of day and day of the week, and note common responsible parties.

Developing a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges.

Challenges in addressing illegal dumping include the difficulty of catching dumpers in the act and the significant staff time needed to receive, respond to, and track complaints.

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6 DEVELOPING AND IMPLEMENTING AN IDDE PLAN: REMOVING THE SOURCE OF AN ILLICIT DISCHARGE

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The third component, removing the source of an illicit discharge, is the subject of this chapter.

THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- ➢ Removing the source of an illicit discharge
- Program evaluation and assessment

Because there are various sources of illicit discharges to the storm sewer system, there are different kinds of actions municipalities may have to take to remove those sources and prevent future illicit discharges. This section groups those actions into three categories: compliance assistance and enforcement for illegal connections to homes and businesses; proper construction and maintenance of MS4s; and responding to and preventing illegal dumping.

COMPLIANCE ASSISTANCE AND ENFORCEMENT FOR ILLEGAL CONNECTIONS TO HOMES AND BUSINESSES

There is a range of ways in which municipalities may wish to handle the removal of illegal connections between homes or businesses and the storm sewer system. Enforcement measures should be spelled out in the required IDDE ordinance (see Chapter 3), but the MS4 operator will normally be allowed to use judgment about what mix of compliance assistance and enforcement actions is appropriate in a given situation. Typically, a municipality responds to the discovery of an illegal connection in a graduated manner, beginning with efforts to obtain voluntary compliance and escalating to increasingly severe enforcement actions if compliance is not obtained.

Voluntary Compliance

Often, home or business owners are not aware of the existence of illegal connections between their buildings and the storm sewer systems. In these cases, providing the responsible party with information about the connection, its environmental consequences, the applicable regulations, and how to remedy it may be enough to secure vol-

untary compliance. The cost of removing the connection and reconnecting it to the sanitary sewer system can be an obstacle. Recognizing this, some localities (e.g., Boston and coastal New Hampshire) have chosen to provide assistance with these costs, using municipal public works funds or state or federal grants.

Typically, a municipality responds to the discovery of an illegal connection in a graduated manner, beginning with efforts to obtain voluntary compliance and escalating to increasingly severe enforcement actions if compliance is not obtained.

Enforcement

EPA's model illicit discharge ordinance (Appendix A) provides an example of the enforcement steps that might be specified in a typical local ordinance. These steps are summarized below.

- The authorized enforcement agency sends the property owner a Notice of Violation (NOV), which may require the violator to take steps such as monitoring, elimination of an illicit connection or discharge, or payment of a fine.
- The person receiving the NOV may appeal it.
- If the person receiving the NOV does not appeal or loses the appeal and fails to correct the violation, the enforcement agency may "take any and all measures necessary to abate the violation and/or restore the property." The agency then may require reimbursement from the violator for the cost of the abatement, including administrative costs.
- The authorized enforcement agency also has the ability to seek an injunction against the violator "restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation."

If the municipality has not yet obtained enforcement authority (e.g., because a local ordinance has not yet been passed), it may be possible for the municipality to seek enforcement action from state or federal authorities. Involvement of state or federal

CASE STUDY: WAYNE COUNTY, MICHIGAN

ENFORCEMENT PROCEDURE

Wayne County, Michigan, began its illicit discharge detection and elimination program by targeting certain industrial and commercial facilities for site inspections—starting at the other end of the pipe from the outfall survey approach. County personnel visited the facilities, dye tested a representative number of plumbing fixtures, and observed general "housekeeping" practices.

If no violations were found, a thank you letter was sent to the facility acknowledging staff participation and closing the file. If a facility was found to have an illicit connection, a violation letter was sent, giving the facility 30 to 90 days to correct it. If a facility failed to comply with the request, the municipal plumbing inspector or building department became involved. If the municipality was not able to gain compliance, the facility was referred to the Michigan Department of Environmental Quality. When an illicit connection was eliminated, the county provided confirmation. Once a correction was confirmed, a confirmation/thank you letter was sent to facility management, thanking them for their participation and closing the file.

Information from Tuomari, D. 1999. Dos and Don'ts on Implementing a Successful Illicit Connection Program. *Technical Report of the Rouge River Demonstration Project.* ***http://www.rougeriver.com/proddata***

CASE STUDY: ST. LOUIS, MISSOURI

ENFORCEMENT PROCEDURE

The Metropolitan St. Louis Sewer District has a comprehensive ordinance regulating users who discharge into the sanitary sewer and storm sewer systems. Upon discovery of a violation of this ordinance, the Sewer District notifies the user of the nature of the violation and directs that actions be taken to remedy the noncompliance. Within 30 days of receipt of the notice, the user must submit a plan for correction of the violation to the Sewer District. If a violation is found within the house or business that appears to present an immediate danger to human health or welfare, a verbal notification is given immediately by telephone or visit, directing the user to take immediate action to discontinue or reduce the discharge to safe levels. A written notice is sent within five days of the verbal notification.

The Sewer District has the power to issue the following Administrative Orders: Cease and Desist Order (directing the user to stop the violating action), Compliance Order (directing the user take action to correct violation), Show Cause Order (directing the user to show cause why a proposed enforcement action should not be taken), and Consent Order (establishing an agreement with a user to correct a violation).

If the violator does not take action within the time allotted, the Sewer District has the right to eliminate the illicit discharge at the expense of the violator. Legal actions can be taken against, and penalties imposed on, any violator that does not comply.

Information from Metropolitan St. Louis Sewer District Ordinance No. 8472, on EPA's nonpoint source pollution Web site at ***http://www.epa.gov/owow/nps/ordinance/discharges.htm***

authorities may also be necessary if the source of an illicit discharge is located outside of the municipality's boundaries. Examples of enforcement procedures implemented in Wayne County, Michigan, and St. Louis, Missouri, are included in this section.

PROPER CONSTRUCTION AND MAINTENANCE OF MS4s

Some illicit discharge problems may be the responsibility of the MS4 operator. These problems include cross-connections between the sanitary sewer and storm sewer systems and infiltration into damaged or deteriorating storm sewer pipes.

Cross-connections between a municipality's sanitary sewer and storm sewer systems may exist by mistake, because of deterioration over time, or as part of the design in an antiquated system. Complete and accurate maps of the sewer and storm sewer systems can help identify these cross-connections and prevent them during any new construction that takes place.

Contamination can infiltrate into a cracked or leaking MS4 from leaking sanitary sewer pipes, failing septic systems, or contaminated groundwater. To help prevent this, both MS4s and sanitary sewer systems should be inspected periodically and maintained properly to keep them in good repair.

PREVENTING AND RESPONDING TO ILLEGAL DUMPING

It is often difficult to identify and locate the individuals responsible for illegal dumping; therefore, a program to address illegal dumping should focus on prevention, backed up by enforcement to the extent possible.

EPA Region 5 has prepared an *Illegal Dumping Prevention Guidebook* that suggests the following key strategies that can be used to prevent illegal dumping.

- **Site maintenance and controls** Measures should be taken to clean up areas where illegal dumping has taken place, and controls such as signs or access restrictions should be used, as appropriate, to prevent further dumping.
- **Community outreach and involvement** Outreach is the linchpin of an illegal-dumping prevention program and can include the following components:
  - Educating businesses, municipal employees, and the general public about the environmental and legal consequences of illegally disposing of waste into the storm sewer system
  - Providing and publicizing ways for citizens to properly dispose of waste
  - Providing opportunities for citizens to get involved in preventing and reporting illegal dumping
- **Targeted enforcement** This strategy should include a prohibition against illegal dumping via ordinance or another similar measure, backed up by trained law-enforcement personnel and possibly field operations.
- **Program measurement** Tracking and evaluation methods should be used to measure the impact of illegal-dumping prevention efforts and determine whether goals are being met.

Although the EPA Region 5 guidebook is targeted more to land dumping of solid waste, these strategies can also be applied to illegal dumping into the storm drain system. Some specific methods that municipalities can use to implement these strategies include the following:

- **Site maintenance and controls**
  - Storm-drain stenciling program
  - Spill-response plans for hazardous-waste spills
- **Community outreach and involvement**
  - An illegal-dumping reporting hotline
  - Outreach to business sectors that handle hazardous materials and/or have a history of illegal-dumping problems; outreach should include information on Best Management Practices for spill prevention and proper waste disposal

- Printed outreach materials for the public
- Publicizing of waste-disposal options, such as used oil recycling and household hazardous waste collections

➤ **Targeted enforcement**

- An illegal-dumping ordinance (or section of IDDE ordinance)
- Surveillance of known illegal-dumping locations
- Business facility inspections
- Training of municipal employees, police officers, and other local entities to be on lookout

➤ **Program measurement**

- Tracking of incident locations
- Compilation of statistics (e.g., annual cleanup costs, facility compliance, arrests, convictions, fines, complaints)

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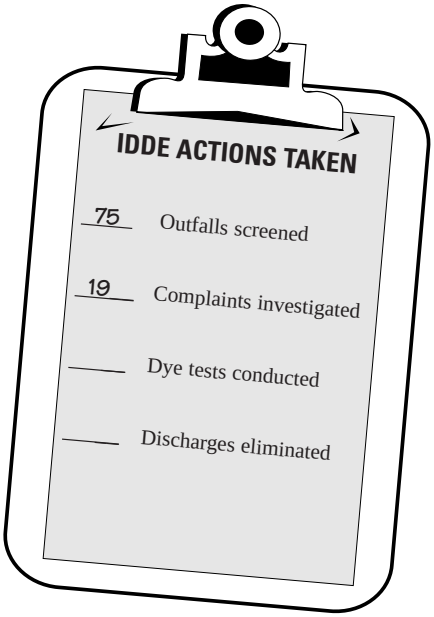
7 DEVELOPING AND IMPLEMENTING AN IDDE PLAN: EVALUATION OF THE IDDE PROGRAM

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The fourth component, program evaluation and assessment, is the subject of this chapter.

THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- ➤ Program evaluation and assessment

EPA recommends that the IDDE plan include procedures for program evaluation and assessment. Program evaluation is the time to step back, look at what has been done, determine what worked and what didn't, and make adjustments to planned future actions as appropriate. In this final component of your IDDE plan, you outline how you will go about evaluating your program.



EVALUATION STRATEGY

Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges. Such documentation might include numbers of outfalls screened, complaints taken and investigated, feet of storm sewers videotaped, numbers of discharges eliminated, or number of dye or smoke tests conducted. Note that this component of the IDDE plan fits in with the overall Phase II requirements for identifying measurable goals for each Best Management Practice (BMP) and reporting on progress toward achieving those goals. (Chapter 9 discusses BMPs and measurable goals in more detail.) Annual reports are necessary during the first permit term (typically five years), and in years two and four in subsequent terms. (For more information on reporting requirements, see EPA's Fact Sheet 2.9.)

Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges.

Determining the impact of these actions is more of a challenge, but it is an important part of the overall process because EPA allows for adjustments to the storm water management program over the life of the permit. Assessment of what worked and what didn't provides the information needed to make these adjustments to your IDDE program. EPA's Phase II regulations do not specify exactly how to evaluate your IDDE program, so check whether your permitting authority has made any particular specifications, and brainstorm from there.

Here are few suggestions for assessing the effectiveness of various IDDE strategies:

- Evaluate the number of possible illicit discharges that were detected using different detection methods. This can help you determine which detection methods are most effective.
- Evaluate the number of discharges and/or quantity of discharges eliminated using different possible enforcement and compliance measures.
- If you have access to monitoring data for receiving waters, evaluate changes in the water quality of receiving waters.
- Program evaluation might also include procedures for considering efficiency and feasibility. Questions you might want to ask include:
  - How much staff time and expense did it take to achieve a given result?
  - Were practical difficulties encountered with this approach? What were they, and how much of a problem did they present?

The strategies listed above are only suggestions. Because you are allowed a great deal of flexibility in determining what procedures you will use for program evaluation and assessment, you can decide what procedures will be most helpful in providing the information that you will need to move forward with your IDDE program.

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8 OUTREACH TO EMPLOYEES, BUSINESSES, AND THE GENERAL PUBLIC

The fourth mandatory element of an IDDE program calls for the MS4 operator to "inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste." As noted in the Introduction, the requirement for public education and outreach on storm water impacts is also one of the six minimum control measures in the storm water management program. Therefore, fulfilling the outreach requirement for IDDE helps the MS4 to comply with this mandatory element; IDDE outreach can be integrated into the broader storm water outreach program.

Some suggestions for conducting IDDE outreach to the different community sectors are presented below. Many examples of storm water outreach materials, including some that are intended to be modified and used by anyone, are available on the Web; some useful Web sites are listed in Chapter 10. Operators of regulated small MS4s may want to work together with other operators in their area in developing outreach materials and campaigns to share ideas and save money.

PUBLIC EMPLOYEES

While it is clear that public works employees should receive specific technical training on the requirements of the IDDE program and the techniques that will be used to carry it out, other municipal departments should also be targeted for training.

A training program for municipal employees on pollution prevention techniques is required under the "Pollution Prevention/Good Housekeeping for Municipal Operations" minimum control measure. Preventing non-storm water discharges into the storm sewer system from municipal operations can be one part of this training.

Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges.

Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges. For example, highway department staff who maintain catch basins can look for signs of illicit discharges. Municipal building inspectors can help ensure that illegal connections to the storm sewer system do not take place in construction and renovation projects. Police officers, public works employees, and other municipal staff whose jobs keep them outside and mobile can help spot illegal dumpers. Fire and police department personnel who respond to hazardous material spills can help keep these spills out of the storm sewer system and adjacent water bodies.

BUSINESSES

Most businesses are willing to comply with environmental requirements and take proactive steps to prevent pollution if they understand the issues and the possible solutions. Here are some steps you can take to reach out to businesses.

Most businesses are willing to comply with environmental requirements and take proactive steps to prevent pollution if they understand the issues and the possible solutions.

- Create a general brochure and presentation to inform businesses about the IDDE program. This information can be presented and/or made available at Chamber of Commerce meetings and other business forums.
- Conduct compliance assistance outreach (e.g., visits, group training, and/or printed materials) for specific business types (e.g., auto repair shops, mobile carpet cleaning, restaurants).
- Provide contractors and developers with information on preventing illegal connections (in coordination with training on construction and post-construction storm water requirements).

GENERAL PUBLIC

There are many ways in which the general public can be made aware of environmental issues and the things they can do to help mitigate or prevent problems. Here are some things you can do to inform and involve the public.

- Work with citizen groups to conduct storm-drain stenciling (e.g., "Don't Dump – Drains to River") and outfall surveys.
  - In conducting these activities, you should:
    - Educate the groups about their activity (either informally or via a video or other presentation)
    - Make sure volunteers understand constraints associated with storm-drain stenciling activities (e.g., heavy traffic use areas, historic districts)
    - Have volunteers sign liability forms, if necessary
  - You may also wish to:
    - Publicize the activities through the media
    - Give volunteers brochures to hand out to the public with who they interact
    - Repeat stenciling periodically (due to paint wear off), unless placards are used—stenciling on curbs lasts longer than on street surfaces
    - See Chapter 10 for information on storm-drain stenciling resources

If made aware of environmental issues, the general public can help mitigate or prevent problems.

- Create a program to promote, publicize, and facilitate public reporting of illicit connections or discharges (e.g., a hotline). Some considerations in running a hotline include:
  - Callers should be able to at least leave a message at any time of day
  - It may be helpful to have the hotline staffed during business hours
  - A system should be created for monitoring the hotline so that staff can follow up quickly on reports of discharges

  - The municipality may wish to offer a small reward for callers that provide information leading to the detection of an illicit discharge source

- Distribute (by mail and by making available at various locations and events) printed outreach materials. A general flyer about illicit discharges might include information on the following:
  - Background information on water pollution
  - A definition of what constitutes an illicit discharge
  - Measures to prevent illicit discharges
  - Information about the municipality's illicit discharge ordinance
- Create Public Service Announcements for radio and/or television.
- Work with the local access cable station and local newspapers to develop features on illicit discharge prevention.
- Create and publicize a household hazardous waste disposal/recycling program.
- Provide classroom speakers and/or printed information for schools.

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USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.3: *Public Education and Outreach Minimum Control Measure.* EPA 833-F-00-005. January 2000. *http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm*

USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.8: *Pollution Prevention/Good Housekeeping Minimum Control Measure*. EPA 833-F-00-010. January 2000. *http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm*

USEPA. 2002. Storm Water Phase II Menu of BMPs – *Public Education and Outreach on Storm Water Impacts.* *http://cfpub.epa.gov/npdes/stormwater/menuofbmps/pub_ed.cfm*

USEPA. 2002. Storm Water Phase II Menu of BMPs – *Public Education and Outreach on Storm Water Impacts: Proper Disposal of Household Hazardous Wastes.* *http://cfpub.epa.gov/npdes/stormwater/menuofbmps/edu_5.cfm*

9 BMPS AND MEASURABLE GOALS FOR IDDE

As mentioned in the Introduction, operators of regulated small MS4s generally must submit applications for Phase II storm water general permits by March 10, 2003. As part of their application, they must identify best management practices (BMPs) that they will use to comply with each of the six minimum control measures, and the measurable goals that they will use to demonstrate BMP implementation. Within the first permit term, the operators have to fully implement their storm water management programs.

GETTING STARTED

EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs. The agency has developed the following materials to assist operators in identifying appropriate BMPs:

- A *National Menu of Best Management Practices for Storm Water Phase II*, which includes a toolkit of example BMPs for each of the Phase II minimum control measures (available on the Web)
- *Measurable Goals Guidance for Small MS4s*
- A *Storm Water Phase II Compliance Guide*, which offers examples of BMPs and measurable goals for each of the six minimum measures

EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs.

Others, including states, regional agencies, trade associations, and non-profit organizations have also developed BMP information.

A sample list of IDDE BMPs and measurable goals is presented below. This list draws from BMP and measurable goal recommendations that have been offered by EPA and others. The list has not been officially endorsed by EPA or state agencies; it is intended to serve as a starting point to help municipalities think about the BMPs and measurable goals that are appropriate to their IDDE programs. BMPs are listed in bold, followed by the measurable goals for each BMP. (The BMPs are organized according to the four elements required in an IDDE program.)

STORM SEWER MAP

- **Create a storm sewer map**
  - Map a certain percentage of outfalls (adding up to 100% by the end of the permit term) or of the area of the town

ORDINANCE

➤ Pass an illicit discharge ordinance

- Draft an IDDE ordinance (or storm water ordinance with IDDE component) or an amendment to existing bylaws
- Pass an ordinance or amendment

IDDE PLAN

➤ Prepare an IDDE plan

- Complete a final plan and obtain the signature of the person overseeing the plan

➤ Conduct dry weather field screening of outfalls

- Screen a certain percentage of outfalls (adding up to 100% by the end of the permit term)

➤ Trace the source of potential illicit discharges

- Trace the source of a certain percentage of continuous flows (adding up to 100% by the end of the permit term)
- Trace the source of a certain percentage of intermittent flows and illegal dumping reports (100% may never be an achievable goal in this case)

➤ Eliminate illicit discharges

- Eliminate a certain number of discharges and/or a certain volume of flow, or a certain percentage of discharges whose source is identified (adding up to 100% by the end of the permit term)

OUTREACH

➤ Implement and publicize a household hazardous waste collection program

- Hold a periodic (e.g., annual) hazardous waste collection day
- Mail flyers about the hazardous waste collection program to all town residences

➤ Create and distribute an informational flyer for homeowners about IDDE

- Mail the flyer to town residences
- Print the flyer as a doorknob hanger and have water-meter readers distribute it

➤ Create and distribute an informational flyer for businesses about IDDE

- Mail the flyer to targeted businesses

➤ Work with community groups to stencil storm drains

- Stencil a certain percentage of drains

➤ **Create and publicize an illicit discharge reporting hotline**

- Put the hotline in place
- Include an announcement of the hotline in sewer bills
- Follow up on all hotline reports within 48 hours

REFERENCES: CHAPTER 9

North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination.* *http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html*

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. *http://www.epa.gov/npdes/regulations/phase2.pdf*

USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide.* EPA 833-R-00-002. Office of Water. *http://www.epa.gov/npdes/pubs/comguide.pdf*

USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.9: *Permitting and Reporting: The Process and Requirements.* EPA 833-F-011. January 2000. *http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm*

USEPA. 2002. *National Menu of Best Management Practices for Storm Water Phase II.* *http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm*

USEPA. 2002. *Measurable Goals Guidance for Phase II Small MS4s.* *http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm*

10 RESOURCES

WEB SITES AND PUBLICATIONS

Key Information Available on EPA's Storm Water Web Site

Entry Point and General Information
http://www.epa.gov/npdes
→ click on "Storm Water"
→ click on "Municipal Separate Storm Sewer Systems" or "Phase II"

Storm Water Phase II Final Rule
http://www.epa.gov/npdes/regulations/phase2.pdf
IDDE section of the Phase II Final Rule: see section II(H)(3)(b)(iii), pp. 68756-68758.

EPA's Fact Sheet Series
http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm

Overview
1.0 *Storm Water Phase II Final Rule: An Overview*

Small MS4 Program
2.0 *Small MS4 Storm Water Program Overview*
2.1 *Who's Covered? Designation and Waivers of Small Regulated MS4s*
2.2 *Urbanized Areas: Definition and Description*

Minimum Control Measures
2.3 *Public Education and Outreach*
2.4 *Public Participation/Involvement*
2.5 *Illicit Discharge Detection and Elimination*
2.6 *Construction Site Runoff Control*
2.7 *Post-Construction Runoff Control*
2.8 *Pollution Prevention/Good Housekeeping*
2.9 *Permitting and Reporting: The Process and Requirements*
2.10 *Federal and State-Operated MS4s: Program Implementation*

Construction Program
3.0 *Construction Program Overview*
3.1 *Construction Rainfall Erosivity Waiver*

Industrial "No Exposure"
4.0 *Conditional No Exposure Exclusion for Industrial Activity*

Documents
Storm Water Phase II Compliance Assistance Guide
http://www.epa.gov/npdes/pubs/comguide.pdf

National Menu of BMPs for Storm Water Phase II
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm

Measurable Goals Guidance for Phase II Small MS4s
http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm

Storm Water Web Sites

The Rouge River National Wet Weather Demonstration Project
http://www.rougeriver.com
(See specific information on IDDE at http://www.rougeriver.com/techtop/illicit/overview.html .)

Center for Watershed Protection's Storm Water Manager's Resource Center
http://www.stormwatercenter.net

The University of Tennessee's Municipal Technical Advisory Service NPDES Phase II Storm Water Management BMP Toolkit
http://www.mtas.utk.edu/bmptoolkit.htm
The Illicit Discharge section provides a number of useful web links and downloadable PDFs.

Organization Web Sites

Water Environment Federation
http://www.wef.org

American Public Works Association
http://www.apwa.net

Local Government Environmental Assistance Network
http://www.lgean.org

Center for Watershed Protection
http://www.cwp.org

The Boston Water and Sewer Commission
(the Web site includes the BWSC's regulations, outreach information, and other useful items)
http://www.bwsc.org

Storm Water Manuals

California Coastal Commission. 2002. *Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities.* *http://www.coastal.ca.gov/la/murp.html*

Colorado Department of Public Health and Environment, Water Quality Control Division. October 2001. *Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal stormwater discharge permit.*
http://www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html

IDDE Manuals

San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program. 2001. *Illicit Connection/Illicit Discharge (IC/ID) Detection and Elimination Model Program Guidance.*
http://www.projectcleanwater.org/html/model_programs.html

Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide.* USEPA Office of Research and Development. EPA/600/R-92/238. (Available on the Web via EPA's National Environmental Publications Information System, *http://www.epa.gov/clariton*.)

North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination.*
http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html

Information on Specific Topics

Ordinances

USEPA's Model Ordinances to Protect Local Resources: Illicit Discharges.
http://www.epa.gov/owow/nps/ordinance/discharges.htm
(The same information can be found at *http://www.stormwatercenter.net.*)

Boston Water and Sewer Commission's *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains. http://www.bwsc.org*

The Massachusetts Citizen Planner Training Collaborative offers "Tips on Drafting Bylaws" for Massachusetts municipalities: *http://www.umass.edu/masscptc/Tips_on_Drafting.html*

Optical Brighteners

Sargent, D. and W. Castonguay. 1998. *An Optical Brightener Handbook.* Available at:
http://www.mvpc.org/services_sec/mass_bays/optical_handbook.htm and
http://www.naturecompass.org/8tb/sampling/

Dye Testing

Dye supplier used by a reviewer of this manual: NORLAB, Inc., Amherst, OH. 1-800-247-9422;
http://www.norlabdyes.com

Smoke Testing

Smoke testing equipment supplier used by a reviewer of this manual: Hurco Technologies, Inc., 1-800-888-1436;
http://www.hurcotech.com

Outfall/Manhole Surveys

Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. Storm Drain Mapping Project Field Manual (Draft). January 2002. *http://www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf*

Jewell, C. 2001. A Systematic Methodology for Identification and Remediation of Illegal Connections. Presented at the Water Environment Federation Specialty Conference *2001 A Collection Systems Odyssey: Combining Wet Weather and O&M Solutions.* (Available for purchase via the WEF Web site, *http://www.wef.org*.)

Outreach

- **Household Hazardous Waste Collection**
  Household hazardous waste collection days in New Hampshire can be viewed online at *http://www.des.state.nh.us/hhw/hhwevent.htm.*

  Environmental Depot, Burlington VT. *http://www.cswd.net/facilities/hazardous_waste.shtml*

- **Storm-Drain Stenciling**
  Earthwater Stencils, an organization that does storm drain stenciling: *http://www.earthwater-stencils.com/*

  The Ocean Conservancy's Storm Drain Sentries program has a goal of having volunteers stencil one million storm drains with educational pollution prevention messages. The Ocean Conservancy supplies volunteers with a fact sheet about nonpoint source pollution, tips on conducting a stenciling project, and stencils for volunteer organizations to use. In return, stenciling project leaders are asked to submit data about the number of storm drains they stenciled, the types of pollutants found near the storm drains, and potential pollutant sources. This information is added to a growing database maintained by the Ocean Conservancy. Contact the Ocean Conservancy's Office of Pollution Prevention and Monitoring at 757-496-0920 or *stormdrain@oceanconservancyva.org.*
  http://www.oceanconservancy.org/dynamic/getInvolved/events/sentries/sentries.htm

  Resources for storm drain stenciling programs in New Hampshire:

  - Coordinated by Julia Peterson of UNH-Cooperative Extension in the coastal watershed *http://ceinfo.unh.edu/Common/Documents/gsc5401.htm*. Also described at *http://www.seagrant.unh.edu/extension.htm*
  - Coordinated by the NH Coastal Program (part of the Office of State Planning) *http://www.state.nh.us/coastal/CoastalEducation/marinedebris.htm*
  - Description of Manchester's storm drain stenciling on EPA's Web site describing the SEPP *http://www.epa.gov/region1/eco/csoman/sepp.html* (See #1 and #6)

- **Outreach Materials**
  EPA is preparing educational materials on different water topics each month as part of the year-long celebration of the 30th anniversary of the Clean Water Act. April 2003 will be Storm Water Month. The public education kit is expected to include:

  - General Storm Water Awareness brochure
  - Homeowner Guide (car washing, vehicle fluids changing, lawn & garden care, pet waste, septic system management)
  - Small Construction Guide poster
  - Press release
  - Public service announcement for the radio
  - Stickers
  - Door hanger with illicit discharge message
  - PowerPoint presentation

  These items will be available for download or order on EPA's Year of Clean Water Web site, *http://www.epa.gov/water/yearofcleanwater/month.html*. Before the materials are available on the Web site, you can contact EPA's contractor, TetraTech, to be on the mailing list for the materials.
  Email Kathryn Phillips at *tetratech1@earthlink.net* or *kathryn.phillips@tetratech-ffx.com.*

CONTACTS

USEPA-New England is the NPDES permitting authority for Massachusetts and New Hampshire. The other five NEIWPCC member states serve as NPDES permitting authorities for the storm water program. Contact information below was taken from the EPA-New England Web site *http://www.epa.gov/region01/npdes/stormwater/administration.html*, the EPA NPDES Web site *http://www.epa.gov/npdes*, and the New York State Department of Environmental Conservation Web site *http://www.dec.state.ny.us*.

U.S. EPA

EPA Region 1, New England
Regional Storm Water Coordinator
Thelma Murphy 617-918-1615; *murphy.thelma@epa.gov*

Regional Storm Water Assistance Team
Ann Herrick 617-918-1560; *herrick.ann@epa.gov*
Shelly Puleo 617-918-1545; *puleo.shelly@epa.gov*
Olga Vergara 617-918-1519, *vergara.olga@epa.gov*

Massachusetts Assistance
Dave Gray 617-918-1577; *gray.davidj@epa.gov*

EPA Region 2
Regional Storm Water Coordinator
Karen O'Brien 212-637-3717; *obrien.karen@epa.gov*

STATES

Connecticut
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement, and Remediation Division
http://www.dep.state.ct.us

Contact: Chris Stone 860-424-3850; *chris.stone@po.state.ct.us*

Maine
Maine Department of Environmental Protection
Bureau of Land and Water Quality
http://www.state.me.us/dep/blwq/stormwtr/index.htm

Contact: David Ladd 207-287-5404; *david.ladd@state.me.us*

Massachusetts
Massachusetts Department of Environmental Protection
Division of Watershed Management
http://www.state.ma.us/dep/brp/stormwtr/stormhom.htm

Contacts: Ginny Scarlet 508-767-2797; *ginny.scarlet@state.ma.us*
Linda Domizio 508-849-4005; *linda.domizio@state.ma.us*

New Hampshire
New Hampshire Department of Environmental Services
Storm Water Fact Sheet: *http://www.des.state.nh.us/factsheets/wwt/web-8.htm*
Storm Water Web Site: *http://www.des.state.nh.us/StormWater*
Contacts: Jeff Andrews 603-271-2984
Public Information and Permitting Office 603-271-2975

New York
New York State Department of Environmental Conservation
Division of Water
http://www.dec.state.ny.us/website/dow/mainpage.htm
Contact: Mike Rafferty 518-402-8094; *mrraffer@gw.dec.state.ny.us*

Rhode Island
Rhode Island Department of Environmental Management
Water Resources – Permitting
http://www.state.ri.us/dem/programs/benviron/water/permits/ripdes/stwater/index.htm
Contacts: Margarita Chatterton 401-222-4700 x7605; *mchatter@dem.state.ri.us*
Greg Goblick 401-222-4700 x7265; *ggoblick@dem.state.ri.us*

Vermont
Vermont Department of Environmental Conservation
Water Quality Division
http://www.anr.state.vt.us/dec/waterq/stormwater.htm
Contact: Peter LaFlamme 802-241-3765; *petel@dec.anr.state.vt.us*

APPENDIX A

Model Illicit Discharge and Connection Stormwater Ordinance[1]

ORDINANCE NO. _____

SECTION 1. PURPOSE/INTENT.

The purpose of this ordinance is to provide for the health, safety, and general welfare of the citizens of (_____) through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:

1)To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user

(2) To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system

(3) To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance

SECTION 2. DEFINITIONS.

For the purposes of this ordinance, the following shall mean:

Authorized Enforcement Agency: employees or designees of the director of the municipal agency designated to enforce this ordinance.

Best Management Practices (BMPs): schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Clean Water Act. The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

Construction Activity. Activities subject to NPDES Construction Permits. Currently these include construction projects resulting in land disturbance of 5 acres or more. Beginning in March 2003, NPDES Storm Water Phase II permits will be required for construction projects resulting in land disturbance of 1 acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

Hazardous Materials. Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illegal Discharge. Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section X of this ordinance.

Illicit Connections. An illicit connection is defined as either of the following:

[1] USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges.* http://www.epa.gov/owow/nps/ordinance/discharges.htm

Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or,
Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.
Industrial Activity. Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).
National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit. means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC § 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.
Non-Storm Water Discharge. Any discharge to the storm drain system that is not composed entirely of storm water.
Person. means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.
Pollutant. Anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.
Premises. Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.
Storm Drainage System. Publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.
Storm Water. Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.
Stormwater Pollution Prevention Plan. A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to Stormwater, Stormwater Conveyance Systems, and/or Receiving Waters to the Maximum Extent Practicable.
Wastewater means any water or other liquid, other than uncontaminated storm water, discharged from a facility.

SECTION 3. APPLICABILITY.
This ordinance shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

SECTION 4. RESPONSIBILITY FOR ADMINISTRATION.
The_____ [authorized enforcement agency] shall administer, implement, and enforce the provisions of this ordinance. Any powers granted or duties imposed upon the authorized enforcement agency may be delegated in writing by the Director of the authorized enforcement agency to persons or entities acting in the beneficial interest of or in the employ of the agency.

SECTION 5. SEVERABILITY.
The provisions of this ordinance are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this Ordinance or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this Ordinance.

SECTION 6. ULTIMATE RESPONSIBILITY.

The standards set forth herein and promulgated pursuant to this ordinance are minimum standards; therefore this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

SECTION 7. DISCHARGE PROHIBITIONS.

Prohibition of Illegal Discharges.

No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

(1) The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wetland flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire fighting activities, and any other water source not containing Pollutants.

(2) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

(3) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

(4) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

Prohibition of Illicit Connections.

(1) The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.

(2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(3) A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

SECTION 8. SUSPENSION OF MS4 ACCESS.

Suspension due to Illicit Discharges in Emergency Situations

The _____ [authorized enforcement agency] may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

Suspension due to the Detection of Illicit Discharge

Any person discharging to the MS4 in violation of this ordinance may have their MS4 access terminated if such

termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing.

A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

SECTION 9. INDUSTRIAL OR CONSTRUCTION ACTIVITY DISCHARGES.

Any person subject to an industrial or construction activity NPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the _____ [authorized enforcement agency] prior to the allowing of discharges to the MS4.

SECTION 10. MONITORING OF DISCHARGES.

1. Applicability.
   This section applies to all facilities that have storm water discharges associated with industrial activity, including construction activity.

2. Access to Facilities.

(1) The_____ [authorized enforcement agency] shall be permitted to enter and inspect facilities subject to regulation under this ordinance as often as may be necessary to determine compliance with this ordinance. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.

(3) Facility operators shall allow the _____[authorized enforcement agency] ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.

(3) The _____ [authorized enforcement agency] shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.

(4) The _____ [authorized enforcement agency] has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.

(5) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the [authorized enforcement agency] and shall not be replaced. The costs of clearing such access shall be borne by the operator.

(6) Unreasonable delays in allowing the _____ [authorized enforcement agency] access to a permitted facility is a violation of a storm water discharge permit and of this ordinance. A person who is the operator of a facility with a NPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this ordinance.

(7) If the _____ [authorized enforcement agency] has been refused access to any part of the premises from which stormwater is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

SECTION 11. REQUIREMENT TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTANTS BY THE USE OF BEST MANAGEMENT PRACTICES.

[Authorized enforcement agency] will adopt requirements identifying Best Management Practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or waters of the U.S. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPP) as necessary for compliance with requirements of the NPDES permit.

SECTION 12. WATERCOURSE PROTECTION.

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

SECTION 13. NOTIFICATION OF SPILLS.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or water of the U.S. said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the authorized enforcement agency in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the _____ [authorized enforcement agency] within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

SECTION 14. ENFORCEMENT.

1. Notice of Violation.
   Whenever the _____ [authorized enforcement agency] finds that a

person has violated a prohibition or failed to meet a requirement of this Ordinance, the authorized enforcement agency may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:
(a) The performance of monitoring, analyses, and reporting;
(b) The elimination of illicit connections or discharges;
(c) That violating discharges, practices, or operations shall cease and desist;
(d) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and
(e) Payment of a fine to cover administrative and remediation costs; and
(f) The implementation of source control or treatment BMPs.
If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

SECTION 15. APPEAL OF NOTICE OF VIOLATION.
Any person receiving a Notice of Violation may appeal the determination of the authorized enforcement agency. The notice of appeal must be received within _ days from the date of the Notice of Violation. Hearing on the appeal before the appropriate authority or his/her designee shall take place within 15 days from the date of receipt of the notice of appeal. The decision of the municipal authority or their designee shall be final.

SECTION 16. ENFORCEMENT MEASURES AFTER APPEAL.
If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or , in the event of an appeal, within __ days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

SECTION 17. COST OF ABATEMENT OF THE VIOLATION.
Within __ days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within __ days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment.
Any person violating any of the provisions of this article shall become liable to the city by reason of such violation. The liability shall be paid in not more than 12 equal payments. Interest at the rate of __ percent per annum shall be assessed on the balance beginning on the _st day following discovery of the violation.

SECTION 18. INJUNCTIVE RELIEF.
It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Ordinance. If a person has violated or continues to violate the provisions of this ordinance, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

SECTION 19. COMPENSATORY ACTION.
In lieu of enforcement proceedings, penalties, and remedies authorized by this Ordinance, the authorized enforcement agency may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

SECTION 20. VIOLATIONS DEEMED A PUBLIC NUISANCE.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Ordinance is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

SECTION 21. CRIMINAL PROSECUTION.

Any person that has violated or continues to violate this ordinance shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of _____ dollars per violation per day and/or imprisonment for a period of time not to exceed ____ days.

The authorized enforcement agency may recover all attorney's fees court costs and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.

SECTION 22. REMEDIES NOT EXCLUSIVE.

The remedies listed in this ordinance are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the authorized enforcement agency to seek cumulative remedies.

SECTION 23. ADOPTION OF ORDINANCE.

This ordinance shall be in full force and effect __ days after its final passage and adoption. All prior ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

PASSED AND ADOPTED this ____ day of _____, 19__, by the following vote:

APPENDIX H

IDDE Employee Training Record

ENVIRONMENTAL PARTNERS
— An Apex Company —

MS4 STORMWATER PERMIT IDDE TRAINING SESSION

Sign-in Sheet

Date of Training: _____

Name	Department	Email	Signature

ENVIRONMENTAL PARTNERS

— An Apex Company —

1900 Crown Colony Drive, Suite 402

Quincy, MA 02169

P: 617.657.0200 F: 617.657.0201

envpartners.com