



ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PLAN

Town of Milford

September 2021 (revision)



Illicit Discharge Detection and Elimination (IDDE) Plan Revision History

MS4 Materials that supplement the 2019 IDDE Plan Document

Revision #	Date	Comments
0	6/2019	IDDE Plan Published
1	9/2021	Year 3 Updates

"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."

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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 Milford to address the requirements of the United States Environmental Protection Agency's (USEPA'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 requires 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-storm water discharges are allowed under the MS4 Permit unless the permittee, USEPA 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 detergent

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 them entirely).

SECTION 1.4 RECEIVING WATERS AND IMPAIRMENTS

Table 1-1 lists the “impaired waters” within the boundaries of Milford’s regulated area based on the 2014 Massachusetts Integrated List of Waters produced by MassDEP every two years. 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 2016 Integrated List of Waters published by MassDEP in December 2020 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 were minor updates to the 2014 Integrated Lists of Waters that are now reflected in the 2016 Integrated Lists of Waters that apply to Milford. Impairments from one water body were updated: the Charles River segment MA72-01 now has new dewatering and flow regime alterations impairments.

**Table 1-1 Impaired Waters
Milford, Massachusetts**

Category	Water Body Name	Segment ID	Impairment(s)	Associated Approved TMDL
4a	Beaver Pond	MA72004	Mercury in Fish Tissue	42394
	Cedar Swamp Pond (Milford Pond)	MA72016	(Non-Native Aquatic Plants*) Dissolved Oxygen Mercury in Fish Tissue	
	Charles River	MA72-01	(Dewatering*) (Flow Regime Modification*) Dissolved Oxygen	
	Charles River	MA72-33	(Physical substrate habitat alterations*) Escherichia Coli (E. Coli) Nutrient/Eutrophication Biological Indicators	
	Echo Lake	MA72035	Mercury in Fish Tissue	
4c	North Pond	MA51112	(Non-Native Aquatic Plants*)	
5	Mill River	MA51-35	(Non-Native Aquatic Plants*) Aquatic Plants (Macrophytes) Metals PCBs In Fish Tissue	
	Charles River	MA72-03	Algae DDT in Fish Tissue Dissolved Oxygen Supersaturation Escherichia Coli (E. Coli) Organic Enrichment (Sewage) Biological Indicators Phosphorus, Total	

Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL).

Category 4c Waters – impairment not caused by a pollutant—TMDL not 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 2016 MS4 Permit.

* TMDL not required (non-pollutant)

These impairments require additional sampling in accordance with Appendix G of the MS4 Permit. The Town must sample for dissolved oxygen, biological oxygen demand, and total phosphorus at outfalls discharging to Beaver Pond and Cedar Swamp Pond; and dissolved oxygen, biological oxygen demand, total phosphorus, and E. coli at outfalls discharging to the Charles River. Due to the Charles River Watershed’s TMDL for pathogens, the Town must sample all outfalls for E. coli and fecal coliform. Similarly, due to the Upper/Middle Charles River Watershed’s TMDL for phosphorus, the Town must also sample all outfalls for total phosphorus.

In order to comply with the 2016 MS4 Permit Appendix H, the Town of Milford must implement the illicit discharge program. Outfalls draining to Beaver Pond, Cedar Swamp Pond, Charles River (all segments) and Echo Lake shall be designated either problem outfalls or high priority outfalls 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

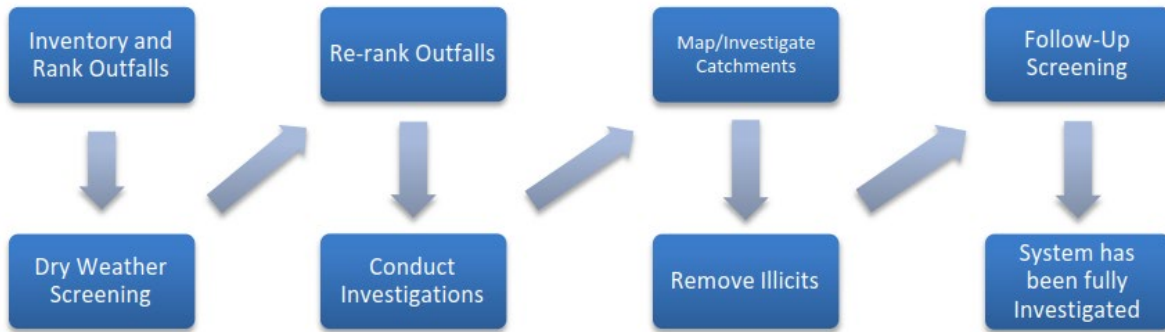


Table 1-2 IDDE Program Implementation Timeline

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 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 Milford has completed the following IDDE program activities consistent with the 2003 MS4 Permit requirements:

- Developed a map of outfalls and receiving waters
- 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:

- 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 Milford has developed and implemented a Stormwater Management General By-Law, which covers erosion and sediment control, post-construction stormwater management and discharge control. A copy of the Stormwater Management By-Law is provided in **Appendix A**. The Stormwater Management By-Law provides the Town of Milford 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
- Implement appropriate enforcement procedures and actions.

The Town of Milford is in the process of reviewing its Stormwater Management By-Law and related land use regulations and policies for consistency with the 2016 MS4 Permit and 2020 Permit Modifications.

SECTION 2.2 STATEMENT OF RESPONSIBILITIES

The Milford Highway 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:

- Highway Department – Highway Supervisor, Scott Crisafulli
- Planning and Engineering Department – Town Engineer, Michael Dean, P.E.
- Planning and Engineering Department – Town Planner, Larry L. Dunkin, AICP
- Board of Health
- Conservation Commission.

SECTION 3 STORMWATER SYSTEM MAPPING

The Town of Milford 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 Highway Department is responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. The Town of Milford 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 Milford has completed the following updates to its stormwater mapping to meet the Phase I requirements:

- Outfalls and receiving waters
- 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 USEPA approved Massachusetts Integrated List of Waters report (*taken from USGS/MassDEP Hydrography data updated April 2017*)
- Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations (*attached as Appendix C and further developed in Section 5.1*).

The following table contains information regarding the total number of drainage structures mapped within the MS4 Urbanized Area in Milford. It has been compiled using data collected by the Town.

Table 3-1 Summary of Mapped MS4 Structures

Structure Type	Number of Structures
Outfalls	248
Catch Basins	3807
Drain Manholes	1944
Drain Pipes	55875
Culverts	18
BMPs	32
Inlets	399
Outlets	380
Scuppers	5
Swales	42
Interconnections	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 Milford has completed the following updates to its stormwater mapping to meet the Phase II requirements:

- 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

SECTION 3.3 ADDITIONAL RECOMMENDED MAPPING ELEMENTS

Although not a requirement of the 2016 MS4 Permit, the Town of Milford 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 (SSO)

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including sanitary septic and sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary septic or 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 has completed an inventory of SSOs that have discharged to the MS4 within the five (5) years prior to the effective date of the 2016 MS4 Permit, based on review of available documentation pertaining to SSOs. The inventory included 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 with data on each of the ten SSOs and as reference for future use.

Upon detection of an SSO, the Town of Milford 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 Milford will provide oral notice to USEPA within 24 hours and written notice to USEPA and MassDEP within five (5) days of becoming aware of the SSO occurrence.

The inventory in **Table 4-1** is updated by the Board of Health 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
Milford, Massachusetts
Revision Date: September 2021**

SSO Location¹	Discharge Statement²	Date³	Time Start³	Time End³	Estimated Volume⁴	Description⁵	Mitigation Completed⁶	Mitigation Planned⁷
495 Pump Station	Entered MS4, catch basin to receiving water	4/2/14	9:55am	9:55am	200-300 gal	Crack in sewer force main	Repaired force main, septic company pumped drain and retaining pond, spread pulverized lime	
Field Pond Pump Station	Entered MS4, ground surface discharge	4/12/14	11:35am	2:30pm	<100 gal	Leak in sewer force main	Repaired force main	
West Pine Street and Gibon Street	Entered MS4, ground surface discharge	9/2/15	3:10pm	3:45pm	<100 gal	Grease blockage	Area cleaned, disinfected with 2 bags of lime	
495 Pump Station on Route 109	Entered MS4, ground surface discharge	3/10/16	11:10am	11:22am	<200 gal	Force main break	Force main repaired, area cleaned and disinfected with lime	
18 Purdue Street near Field Pond Pump Station	Entered MS4, ground surface discharge	5/21/16	4:10pm	8:00pm	Unknown	Force main break	Force main repaired, area cleaned and disinfected with lime	
18 Purdue Street near Field Pond Pump Station	Entered MS4, ground surface discharge	7/25/17	5:00pm	5:45pm	<100 gal	Force main break	Force main repaired, area cleaned and disinfected with lime	
31 Parkhurst Street	Entered MS4, ground surface discharge	8/3/17	4:10pm	5:00pm	<100 gal	Grease blockage	Jettied the line to remove grease blockage, area cleaned and disinfected with lime	
18 Purdue Street near Field Pond Pump Station	Entered MS4, ground surface discharge	3/14/18	6:28pm	8:05pm	<100 gal	Force main break	Force main repaired, area cleaned and disinfected with lime	
173-250 Main Street	Backup into property basement	11/3/18	-	-	Unknown, overflow confined to businesses	Sewer system blockage	Flushed and cleared partial blockage in manhole; cleaning/disinfecting addressed by property owners	
12-14 Colonial Road	Discharge Statement	6/16/19	-	-	Unknown	Grease blockage	Mitigation Completed	

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 schedule

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. Catchment delineations will be refined each year as catchment investigations are completed.

SECTION 5.2 OUTFALL AND INTERCONNECTION INVENTORY AND INITIAL RANKING

The Highway 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.

To date, Milford has identified one (1) Problem Outfall and zero (0) Problem Interconnections.

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.

To date, Milford has identified 87 High Priority Outfalls and 8 High Priority Interconnections.

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

To date, Milford has identified 169 Low Priority Outfalls and one (1) Low Priority Interconnection.

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; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

To date, Milford has identified zero (0) Excluded Outfalls or Interconnections.

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 on responses provided by the Town of Milford in May 2019, and the ranking has since been updated based on field investigations completed. The initial characteristics considered include:

- **Previous screening results** – previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).
 - 240 outfalls screened during dry weather outfall.
 - Outfall screening results showed no sign of likely sewer input.
- **Past discharge complaints and reports.**
 - None received.

- **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 (236 MPN/100mL)
 - Ammonia levels above 0.5 mg/L
 - Surfactants levels greater than or equal to 0.25 mg/L
- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
 - Generating sites were located within the A, C, D, E, F, G, J and K catchments.
- **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.
 - Determined by age of parcel, “year built” data.
- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
 - None reported.
- **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.
 - None in Milford.
- **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
 - Catchments C, D, G, K, O, P, Q, L, U, V, W, and X overlay areas with older septic systems.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
 - Godfrey Brook (catchments A, D and F).
 - Hospital Brook (catchment E)
 - O’Brien Brook (catchment E)
 - Ivy Brook (catchment U)
 - Charles River (catchment D)
- **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**.

Appendix C contains the initial outfall priority ranking matrix and catchment delineation mapping completed for the Town. Based on this initial ranking, the highest-ranking catchments are associated with Beaver Pond, Cedar Swamp Pond (also known as Milford Pond), the Charles River (both segments), Echo Lake, and Mill River.

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 Highway Department is 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 Jionzo Road Station (Station ID KMAMILFO29) If this station is not available or not reporting current weather data, then the Bowdoin Station (Station ID KMAMILFO16) 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	Hand held 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 (i.e., bacteria requires sterile containers).
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

Equipment	Use/Notes
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 will 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

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 ₂ SO ₄ to pH <2, No preservative required if analyzed immediately
Surfactants	SM: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
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 μ S/cm	28 days	Cool $\leq 6^{\circ}\text{C}$
Salinity	SM: 2520	-	28 days	Cool $\leq 6^{\circ}\text{C}$
Biochemical Oxygen Demand (BOD)	EPA: 360.1	EPA: 3 mg/L	48 hours	Cool $\leq 6^{\circ}\text{C}$
Dissolved Oxygen	EPA: 365.1	EPA: 1 mg/L	Immediate	Cool $\leq 6^{\circ}\text{C}$
Turbidity	EPA: 160.2	EPA: 1 NTU	48 hours	Cool $\leq 6^{\circ}\text{C}$
Indicator Bacteria: <i>E.coli</i> <i>Enterococcus</i> <i>Fecal Coliform</i>	<i>E.coli</i> EPA: 1603 SM: 9221B, 9221F, 9223 B Other: Colilert®, Colilert-18® <i>Enterococcus</i> EPA: 1600 SM: 9230 C Other: Enterolert® <i>Fecal Coliform</i> EPA: 1680	<i>E.coli</i> EPA: 1 cfu/100mL SM: 2 MPN/100mL Other: 1 MPN/100mL <i>Enterococcus</i> EPA: 1 cfu/100mL SM: 1 MPN/100mL Other: 1 MPN/100mL <i>Fecal Coliform</i> EPA: 1 ctu	8 hours	Cool $\leq 10^{\circ}\text{C}$, 0.0008% $\text{Na}_2\text{S}_2\text{O}_3$
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 $\leq 6^{\circ}\text{C}$, H_2SO_4 to pH <2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	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 $\leq 6^{\circ}\text{C}$, H_2SO_4 to pH <2

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 USEPA 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 μ S/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria: <i>E.coli</i> <i>Enterococcus</i>	<i>E.coli</i> : 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 <i>Enterococcus</i> : 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 199 outfalls when the NOI was submitted in 2018. Town field staff, or hired representatives, screened a portion of the outfalls as part of the 2003 MS4 Permit. Since the start of the new 2016 MS4 Permit, the Town has completed dry weather screening of the remaining outfalls, in addition to some newly identified outfalls. Additionally, based on field observations, the Town removed 32 previously identified outfall structures from the Town's outfall inventory for one of the following reasons: the structures were verified as culvert outlets/inlets; the drainage network changed since the original mapping was completed; or the structure was located outside the Town's MS4 area. Screening since the 2016 MS4 Permit began saw the total outfall inventory increase to 248. However, eight (8) of these 248 outfalls that discharge to culverted sections of the Charles River require specially trained field staff to access and have not been

screened yet under the 2016 MS4 Permit. Of the 240 accessible outfalls, field staff observed that 193 were dry and 47 were flowing during dry weather. Screening and sampling results are attached in **Appendix E**.

Screenings of all interconnection locations were also completed. The Town—or hired representatives—mapped, inventoried, and field-verified all interconnection locations with other MS4s, including drainage belonging to the Massachusetts Department of Transportation (MassDOT) and the Towns of Medway and Hopkinton. In total, 14 interconnection locations were identified, nine (9) of which are locations where the Town of Milford's MS4 drains into another MS4. Those nine (9) locations were screened during dry weather on June 28, 2021 and August 4, 2021. Eight (8) interconnections were found to be dry during dry weather, and one (1) interconnection location with the MassDOT was found to be flowing and was sampled on August 4, 2021. Interconnection sampling results are included in **Appendix E** along with outfall sampling results.

SECTION 6.5 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

The Town of Milford is responsible for updating the ranking of outfalls and interconnections. Outfalls/interconnections where relevant information was 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 have been 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 screening over the first three (3) years of the permit term (June 30, 2021). 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 will be recorded and reported in each annual report.

SECTION 7.1 SYSTEM VULNERABILITY FACTORS

The Highway 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 **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 than poor owner maintenance)
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- 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.

An SVF inventory is in the process of being developed for each catchment (see **Appendix F**) and will continue to be filled out for each catchment as SVFs are identified. The SVF inventory will be included in each annual report.

SECTION 7.2 DRY WEATHER MANHOLE INSPECTIONS

The Town of Milford will implement 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 Highway Department will be responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information will be incorporated into the storm system map, and catchment delineations will be 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 will 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 will be 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 will 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 will proceed as follows:

1. Manholes will be 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 will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be 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 will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.
4. Subsequent key junction manhole inspections will 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 will be 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 Highway Department will be responsible for implementing the wet weather outfall sampling program and making updates as necessary.

Outfalls will be 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 will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.
2. Wet weather sampling will occur 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 will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur 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 will be performed, as warranted, or source isolation and confirmation procedures will be 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 will be 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 will be used to isolate and confirm the source of the illicit discharge. The following methods may be used in isolating and confirming the source of illicit discharges

- Sandbagging
- 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 Highway 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 sandbag/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 (i.e., 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 their 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 Milford 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 Sampling

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 CATCHMENT INVESTIGATION WORK COMPLETED TO DATE

The Town of Milford has begun conducting catchment investigations. On July 27 and August 3 and 4 of 2021, Town representatives visited five (5) catchments during dry weather conditions. These catchments were selected based on their high priority ranking in the outfall catchment ranking table. No indicators of likely sewer input were observed. Catchment investigations for four (4) out of the five (5) catchments visited are considered complete, pending refined catchment delineation and completion of the SVF inventory. The full catchment investigation memo is included in **Appendix E**.

The Town has also begun inventorying SVFs and conducting wet weather sampling. Town representatives sampled 15 outfalls during wet weather conditions on July 9 and August 5, 2021. These outfall catchments were visited because an SVF was identified, which consisted of a previous SSO event. During sampling, one (1) outfall (OF-504) on Jionzo Street was identified as a Problem Outfall based on olfactory evidence. **Appendix E** contains the complete wet weather sampling memo and results.

SECTION 7.7 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 will be evaluated on an annual basis. The evaluation will be documented in the annual report and will include 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 Bylaw or Ordinance)

TOWN OF MILFORD, MASSACHUSETTS

STORMWATER MANAGEMENT GENERAL BY-LAW



**EROSION AND SEDIMENT CONTROL,
POST-CONSTRUCTION STORMWATER MANAGEMENT AND
DISCHARGE CONTROL**

10-24-05

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**TOWN OF MILFORD, MASSACHUSETTS
GENERAL BY-LAWS**

ARTICLE 36

STORMWATER MANAGEMENT BY-LAW

Adopted by Town Meeting 10-24-05

Approved by Attorney General 2-9-06

SECTION I. PURPOSE AND AUTHORITY

1.1 Purpose

The purpose of this By-Law is to protect, maintain, and enhance the public health, safety, and general welfare of the citizens of Milford, and protect and enhance the water quality of watercourses and water bodies, through the management of land development by establishing minimum requirements and procedures to control the adverse impacts associated with stormwater runoff and through the regulation of non-stormwater discharges to the municipal separate storm sewer system.

1.2 Administration

This By-Law shall be administered and enforced by the Town of Milford, acting by and through its Town Engineer, under the supervision of the Board of Selectmen. In the absence of the Town Engineer, administration and enforcement action may be undertaken by such individual or individuals as may be designated in writing by the Board of Selectmen.

SECTION II. DEFINITIONS

The following definitions describe the meaning of the terms used in this By-Law:

“Adverse impact” means any deleterious effect on waters or wetlands, including their quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses, which are or may potentially be harmful or injurious to human health, welfare, safety or property, biological productivity, diversity, or stability, or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.

“Best management practice (BMP)” is a structural or biological device that temporarily stores or treats urban stormwater runoff to reduce flooding, remove pollutants, and manage stormwater runoff. A BMP may also be a non-structural practice that reduces pollutants at their source. BMPs are described in a stormwater design manual, Stormwater Management, Volume Two: Stormwater Technical Handbook (March, 1997, Massachusetts Department of Environmental Protection [MADEP], as updated or amended).

“Construction activity” is disturbance of the ground by removal of vegetative surface cover or topsoil, grading, excavation, clearing or filling.

“Disturbance” is any land clearing, grading, bulldozing, digging, or similar activities.

“Hydrology model” may include one of the following:

- a. TR-20, a watershed hydrology model developed by the Natural Resources Conservation Service (NRCS) that is used to route a design storm hydrograph through a pond;
- b. TR-55, or Technical Release 55, “Urban Hydrology for Small Watersheds”, a publication developed by the NRCS to calculate stormwater runoff and an aid in designing detention basins; or
- c. HydroCad or other comparable software models.

“Illegal discharge” is any direct or indirect non-stormwater discharge to the municipally owned separate storm sewer system, except as exempted in Section X of this By-Law.

“Illicit connections” are defined as either of the following: Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the municipally-owned separate storm sewer system including but not limited to any conveyances which allow any non-stormwater 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.

“Municipally owned separate storm sewer system (MS4)” means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- a. Owned or operated by a State, city, township, county, district, association, or other public body (created by or pursuant to State law) including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, that discharges into waters of the state.
- b. Designed or used for collecting or conveying stormwater;
- c. Which is not a combined sewer; and
- d. Which is not part of a Publicly Owned Treatment Works.”

“National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit” means a permit issued by EPA 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.

“Waters of the United States” are surface watercourses and water bodies as defined at 40 CFR § 122.2, including all natural waterways and defined channels and depressions in the earth that may carry water, even though such waterways may only carry water during storms and may not carry stormwater during all times and seasons.

SECTION III. APPLICABILITY

3.1 Applicability

This By-Law shall apply to all flows entering the municipally owned separate storm sewer system (MS4) generated on any developed and undeveloped lands within the Town of Milford including any amendments or revisions thereto, unless explicitly exempted by an authorized enforcement agency.

Prior to the issuance of any building permit for any proposed development listed below, a stormwater management permit, or a waiver of the requirement for a stormwater management permit, must be approved by the Office of Planning and Engineering. No person shall, on or after the effective date of this By-Law, initiate any land clearing, land grading, earth moving or development activities without first complying with this By-Law. The following activities shall be required to submit drainage reports, plans, construction drawings, specifications and as-constructed information in conformance with the requirements of this By-Law:

3.1.1 Construction activities of any kind disturbing greater than 43,560 square feet (1 acre) or which is part of a common plan of development or sale that will disturb greater than 43,560 square feet (1 acre).

3.2 Exemptions

To prevent the adverse impacts of stormwater runoff, the Milford Office of Planning and Engineering has developed a set of performance standards that must be met at new development sites. These standards apply to construction activities as described under Section 3.1. The following activities may be exempt from these stormwater performance standards:

3.2.1 Any agricultural activity which is consistent with an approved soil conservation plan prepared or approved by the Natural Resource Conservation Service.

3.2.2 Any logging which is consistent with a timber management plan approved under the Forest Cutting Practices Act by Massachusetts Department of Environmental Management.

3.2.3 Additions or modification to existing single-family structures.

3.2.4 Any emergency activity that is immediately necessary for the protection of life, property or the environment, as determined by the Office of Planning and Engineering.

3.2.5 Construction activities on sites with an overall area greater than one acre with written certification by a registered professional engineer or registered land surveyor that the land disturbance will be less than one acre.

3.2.6 Projects permitted and approved by the Town of Milford prior to the effective date of this By-Law.

3.2.7 Projects that have filed a Notice of Intent with the Milford Conservation Commission and that included a fully executed Stormwater Management Form and that were designed in conformance with the MADEP's Stormwater Management Policy and the Stormwater Design Manual, and that have obtained a valid Order of Conditions from the Town of Milford Conservation Commission or the MADEP.

3.3 Stormwater Design Manual

A stormwater design manual, Stormwater Management, Volume One: Stormwater Policy Handbook and Volume Two: Stormwater Technical Handbook (March, 1997, MADEP, as updated or amended) is hereby incorporated by reference as part of this By-Law, and shall furnish additional policy, criteria and information including specifications and standards, for the proper implementation of the requirements of this By-Law.

SECTION IV. COMPATIBILITY WITH OTHER PERMIT AND BY-LAW REQUIREMENTS

This By-Law is not intended to interfere with, abrogate, or annul any other by-law, rule or regulation, statute, or other provision of law. The requirements of this By-Law should be considered minimum requirements, and where any provision of this By-Law imposes restrictions different from those imposed by any other by-law, rule or regulation, or other provision of law, whichever provisions are more restrictive or impose higher protective standards for human health or the environment shall be considered to take precedence.

SECTION V. PERMIT PROCEDURES AND REQUIREMENTS

5.1 Permit Required

No land owner or land operator shall commence any work under a Building Permit, a Definitive Plan for Subdivision, or other grading or land development permit required for land disturbance activities, and no land owner shall commence land disturbance activities, without approval of a Stormwater Management Permit from the Office of Planning and Engineering and meeting the requirements of this By-Law, unless the project has included a fully executed Stormwater Management Form and was designed in conformance with the MADEP's Stormwater Management Policy and the Stormwater Design Manual, and which has obtained a valid Order of Conditions from the Town of Milford Conservation Commission or the MADEP.

5.2 Application Requirements

Application for approval of a Stormwater Management Permit shall include the following:

5.2.1 A complete Stormwater Management and Erosion and Sediment Control Plan (Plan) or an application for waiver shall be submitted to the Milford Office of Planning and Engineering for review and approval for any proposed development specified in Section 3.1 prior to or concurrently with any building permit application or Preliminary or Definitive Plan for subdivision approval. Three copies of the Plan shall be submitted, and clearly labeled, along

with other documents required in the zoning by-law for site plan review. The Plan shall contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff will be managed from the entire development. The Plan shall serve as the basis for all subsequent construction.

5.2.2 An Operation, Maintenance and Inspection Schedule.

5.2.3 Non-refundable permit review and inspection fee.

The applicant may request, and the Milford Office of Planning and Engineering may grant, a waiver from any information requirements it judges to be unnecessary to the review of a particular plan.

5.3 Procedures for Review and Approval of Stormwater Permits

5.3.1 The procedures for review and approval of stormwater management plans shall be consistent with Section 5.4 Criteria for Review of Stormwater Permits and Section 5.5 Office of Planning and Engineering Action, as appropriate to the use.

5.3.2 The Office of Planning and Engineering shall have seven days from the receipt of the application to review the application for administrative completeness.

5.3.3 The Office of Planning and Engineering shall take final action within twenty-one days of the receipt of a complete application unless such time is extended by agreement between the applicant and the Office of Planning and Engineering. The twenty-one days includes the seven day administrative completeness review period (Section 5.3.2) for applications found to be complete. The twenty-one day review period will re-commence upon receipt of a re-submitted application for those applications found to be administratively incomplete.

5.4 Criteria for Review of Stormwater Permits

In addition to other criteria used by the Milford Office of Planning and Engineering in making permit decisions, for the uses specified in this By-Law, the Office of Planning and Engineering must also find that the Stormwater Management Plan submitted with the permit application meets the following criteria:

5.4.1 The Stormwater Management Plan and the Erosion and Sediment Control Plan are consistent with the Purposes and Objectives of this Bylaw in Section I.

5.4.2 The Stormwater Management Plan meets the Performance Standards described in Section VII.

5.4.3 The Erosion and Sediment Control Plan must meet the Design Requirements in Section VIII.

5.5 Office of Planning and Engineering Action

The Office of Planning and Engineering's action, rendered in writing and submitted to the applicant and the appropriate Town Department(s) and Board(s), shall consist of either:

5.5.1 Disapproval of the Stormwater Management Permit Application based on a determination within seven days of the receipt of the application that the application is administratively incomplete;

5.5.2 Approval of the Stormwater Management Permit Application based upon determination that the proposed plan meets the requirements in Section I and the standards in Section VII and Section VIII and will adequately protect the water resources of the community and is in compliance with the requirements set forth in this By-Law;

5.5.3 Approval of the Stormwater Management Permit Application subject to any conditions, modifications or restrictions required by the Office of Planning and Engineering which will ensure that the project meets the purposes in Section I and the standards in Section VII and Section VIII and adequately protects water resources, as set forth in this By-Law; or

5.5.4 Disapproval of the Stormwater Management Permit Application based upon a determination that the proposed plan, as submitted, does not meet the requirements in Section I and the standards in Section VII and Section VIII or adequately protect water resources, as set forth in this By-Law.

Failure of the Office of Planning and Engineering to take final action upon an Application within the time specified above shall be deemed to be approval of said Application and shall authorize the applicant to proceed in accordance with the plans filed unless such time is extended by agreement between the applicant and the Office of Planning and Engineering.

5.6 Inspections

The Office of Planning and Engineering shall inspect the work and either approve it or notify the applicant in writing in what respects there has been a failure to comply with the requirements of the approved plan. Any portion of the work which does not comply shall be promptly corrected by the applicant or the applicant will be subject to the performance guarantee provisions of Section XI or the penalty provisions of Section XII. The Town may conduct random inspections to ensure effective control of erosion and sedimentation during all phases of construction.

5.7 Right-of-Entry for Inspection

When any new drainage control facility is installed on private property, or when any new connection is made between private property and a municipal drainage system, the filing of a stormwater management permit application shall be deemed as the property owner's permission to the Milford Office of Planning and Engineering or its agent or designee for the right to enter the property at reasonable times and in a reasonable manner for the purpose of the inspection. This includes the right to enter a property when it has a reasonable basis to believe that a

violation of this By-Law is occurring or has occurred, and to enter when necessary during emergencies, for abatement of a public nuisance or correction of a violation of this By-Law.

5.8 Application Review and Inspection Fees

The fee for review and inspection of any land development application shall be based on the amount of land to be disturbed at the site and the fee structure established by the Milford Board of Selectmen. All of the monetary contributions shall be credited to the Stormwater Revolving Fund, and shall be made prior to issuance of any building permit for development.

5.9 Permit Duration

Permits issued under this By-Law shall be valid from the date of issuance through the date the Milford Office of Planning and Engineering notifies the permit-holder that all stormwater management practices have passed the final inspection required under permit conditions.

SECTION VI. THE STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL PLAN

6.1 Contents of the Stormwater Management and Erosion and Sediment Control Plan

The application for a stormwater management permit shall consist of submittal of a Stormwater Management and Erosion and Sediment Control Plan (Plan), prepared by a professional engineer licensed by the Commonwealth of Massachusetts, which meets the design requirements provided by this By-Law. The Plan shall include sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The Plan must be designed to meet the Massachusetts Stormwater Management Standards as set forth in Section VII of this By-Law and the MADEP's Stormwater Management Handbook Volumes I and II.

SECTION VII. STORMWATER MANAGEMENT PERFORMANCE STANDARDS

7.1 Minimum Control Requirements

Projects must meet the Stormwater Management Standards of the Massachusetts Stormwater Management Policy.

The Office of Planning and Engineering may waive the requirement that post-development peak discharge rates not exceed pre-development peak discharge rates, in developed urban areas, upon approval of an evaluation of available capacity in the Town's stormwater system, prepared by a Massachusetts registered professional engineer. When the proposed discharge may have an impact upon a sensitive receptor, including streams, and/or storm sewers, the Office of Planning and Engineering may require more stringent controls, based on existing capacity.

7.2 Stormwater Management Measures

7.2.1 Stormwater management measures shall be required to satisfy the minimum control requirements and shall be implemented in the following order of preference:

- a. Infiltration, flow attenuation, and pollutant removal of runoff on-site to existing areas with grass, trees, and similar vegetation and through the use of open vegetated swales and natural depressions;
- b. Stormwater detention structures for the temporary storage of runoff which is designed so as not to create a permanent pool of water; and
- c. Stormwater retention structures for the permanent storage of runoff by means of a permanent pool of water.

7.2.2 Infiltration practices shall be utilized to reduce runoff volume increases. A combination of successive practices may be used to achieve the applicable minimum control requirements. Justification shall be provided by the applicant for BMP selection based on site conditions.

7.2.3 Best Management Practices shall be employed to minimize pollutants in stormwater runoff.

7.2.4 All stormwater management facilities shall be designed to provide an emergency overflow system, and incorporate measures to provide a non-erosive velocity of flow along its length and at any outfall.

7.2.5 The designed release rate of any stormwater structure shall be modified if any increase in flooding or stream channel erosion would result at any downstream point.

SECTION VIII. DESIGN REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL PLAN

Projects must meet the erosion and sediment control provisions of the Massachusetts Stormwater Management Policy.

SECTION IX. MAINTENANCE

9.1 Operation, Maintenance and Inspection Schedule for Privately-Owned Facilities

9.1.1 Prior to issuance of any building permit for which stormwater management is required, the Office of Planning and Engineering shall require the applicant or owner to execute an operation, maintenance and inspection schedule (schedule) binding on all subsequent owners of land served by the private stormwater management facility. The schedule shall be designed to ensure that water quality standards are met in all seasons and throughout the life of the system. Such schedule shall provide for access to the facility at reasonable times for regular inspections by the Town or its authorized representative and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any provision established. The schedule shall include:

- (1) The name(s) of the owner(s) for all components of the system.
- (2) The names and addresses of the person(s) responsible for operation, maintenance, and regular inspections.
- (3) The names and addresses of the person(s) responsible for financing maintenance and emergency repairs.
- (4) An inspection and maintenance schedule for all drainage structures, including swales and ponds.
- (5) The signature(s) of the owner(s).
- (6) A list of easements with the purpose of each and a plan showing the location of each.
- (7) Stormwater management easements as necessary for:
 - (a) Access for facility inspections and maintenance.
 - (b) Preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event.
 - (c) Direct maintenance access by heavy equipment to structures requiring regular cleanout.
- (8) Stormwater management easement requirements:
 - (a) The purpose of each easement shall be specified in the maintenance agreement signed by the property owner.
 - (b) Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the Town.
 - (c) Easements shall be recorded with the Registry of Deeds prior to issuance of a Certificate of Completion.
- (9) Changes to Operation and Maintenance Plans
 - (a) The owner(s) of the stormwater management system must notify the Office of Planning and Engineering of changes in ownership or assignment of financial responsibility.
 - (b) The maintenance schedule in the Maintenance Agreement may be amended to achieve the purposes of this by-law by mutual agreement of the Office of Planning and Engineering and the Responsible Parties. Amendments must be in writing and signed by all Responsible Parties. Responsible Parties must include owner(s), persons with financial responsibility, and persons with operational responsibility.

9.1.2 The schedule shall also provide that, if after notice by the Town Engineer to correct a violation requiring maintenance work, satisfactory corrections are not made by the owner(s) within thirty days, the Office of Planning and Engineering may perform all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the cost of the work and any penalties.

9.2 Maintenance Responsibility

9.2.1 The owner of the property on which work has been done pursuant to this By-Law 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 sediment control measures, riprap and other protective devices. Such repairs or restoration and maintenance shall be in accordance with approved plans.

9.2.2 A maintenance schedule shall be developed for the life of any stormwater management facility and shall state the maintenance to be completed, the time period for completion, and who shall be legally responsible to perform the maintenance. This maintenance schedule shall be printed on the stormwater management plan.

9.2.3 Records of installation and maintenance performed on stormwater management facilities shall be maintained with the maintenance schedule.

9.2.4 If failure to maintain BMPs results in the need for the Office of Planning and Engineering to perform all necessary work to place the facility in proper working condition, then the owner(s) of the facility shall be assessed the cost of the work and any penalties.

SECTION X. DISCHARGE PROHIBITIONS

10.1 Prohibition of Illegal Discharges

No person shall discharge or cause to be discharged into the municipally owned separate storm sewer 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 stormwater.

The commencement, conduct or continuance of any illegal discharge to the municipally owned separate storm sewer system is prohibited except those discharges described as follows:

10.1.1 Unpolluted discharges from water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising groundwater, groundwater infiltration to storm drains, uncontaminated pumped groundwater, 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, dechlorinated swimming pool water, and fire fighting activities.

10.1.2 Discharges specified in writing by the Milford Office of Planning and Engineering as being necessary to protect public health and safety.

10.1.3 Dye testing with verbal notification to the Milford Office of Planning and Engineering 24 hours prior to the test.

10.1.4 Any non-stormwater 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.

10.2 Prohibition of Illicit Connections

10.2.1 The construction, use, maintenance or continued existence of illicit connections to the municipally owned separate storm sewer system is prohibited.

10.2.2 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.

10.2.3 A person is considered to be in violation of this By-Law if the person connects a pipeline conveying sewage into the municipally owned separate storm sewer system, or allows such a connection to continue.

10.2.4 Upon written notification by the Town of Milford, a person who has an illicit connection to the municipally owned storm sewer shall at his own expense remove said illicit connection as soon as possible or be subject to penalties as specified in Section XII herein.

10.3 Waste Disposal Prohibitions

No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, left, or maintained, in or upon any public or private property, driveway, parking area, street, alley, sidewalk, component of the storm drain system, or water of the U.S., any refuse, rubbish, garbage, litter, lawn/garden wastes or other discarded or abandoned objects, articles, and accumulations, so that the same may cause or contribute to pollution. Wastes deposited in proper waste receptacles for the purposes of collection are exempted from this prohibition.

SECTION XI. PERFORMANCE GUARANTEE

The Office of Planning and Engineering may require from the developer a cash escrow or other means of security acceptable to the Office of Planning and Engineering prior to the issuance of any building permit for the construction of a development requiring a stormwater management facility. The amount of the security shall not be less than the total estimated construction cost of the stormwater management facility. The guarantee so required in this section shall include provisions relative to forfeiture for failure to complete work specified in the approved stormwater management plan, compliance with all of the provisions of this By-Law and other applicable laws and regulations, and any time limitations. The guarantee shall not be fully released without a final inspection of the completed work by the Town Engineer, submission of "As-built" plans, and certification of completion by the Office of Planning and Engineering of the stormwater management facilities being in compliance with the approved plan and the provisions of this By-Law. When a performance guarantee is supplied by the applicant as part of a subdivision, the principal held by the Planning Board may be increased by the amount determined by the Office of Planning and Engineering instead of the Office of Planning and Engineering holding a separate performance guarantee, to avoid the double funding of projects and to avoid the added cost of carrying two performance guarantees. If the applicant chooses such a combined guarantee, the Planning Board shall not release or reduce the security without written approval of the Office of Planning and Engineering.

SECTION XII. ENFORCEMENT AND PENALTIES

12.1 Violations

Any activity that has commenced or is conducted contrary to this By-Law may be restrained by injunction or otherwise abated in a manner provided by law.

12.2 Notice of Violation

When the Milford Office of Planning and Engineering determines that an activity is not being carried out in accordance with the requirements of this By-Law, it shall issue a written notice of violation to the owner of the property. The notice of violation shall contain:

- A. The name and address of the owner/applicant;
- B. The address when available or the description of the building, structure, or land upon which the violation is occurring;
- C. A statement specifying the nature of the violation;
- D. A description of the remedial measures necessary to bring the activity into compliance with this By-Law and a time schedule for the completion of such remedial action;
- E. A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed;
- F. A statement that the determination of violation may be appealed to the municipality by filing a written notice of appeal within fifteen (15) days of service of notice of violation.

12.3 Stop Work Orders

Persons receiving a notice of violation will be required to halt all construction activities, if applicable. This “stop work order” will be in effect until the Milford Office of Planning and Engineering confirms that the development activity is in compliance with this By-Law and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner can result in civil, criminal, or monetary penalties in accordance with the enforcement measures authorized in this By-Law.

12.4 Criminal and Civil Penalties

Any person who violates any provision of this by-law, regulations thereunder, or permits issued thereunder, shall be punished by a fine of not more than \$300. Each day or portion thereof during which the violation continues shall constitute a separate offense, and each provision of the by-law, regulations, or permit violated, shall constitute a separate offense.

12.5 Restoration of Lands

Any person deemed to be a violator of this By-Law may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time

after notice, the Milford Office of Planning and Engineering may take necessary corrective action, the cost of which shall become a lien upon the property until paid.

SECTION XIII. SEVERABILITY

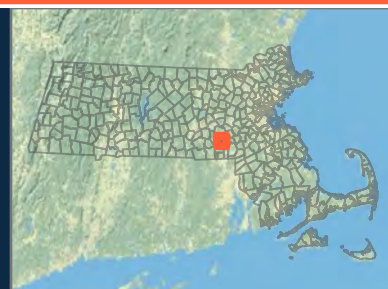
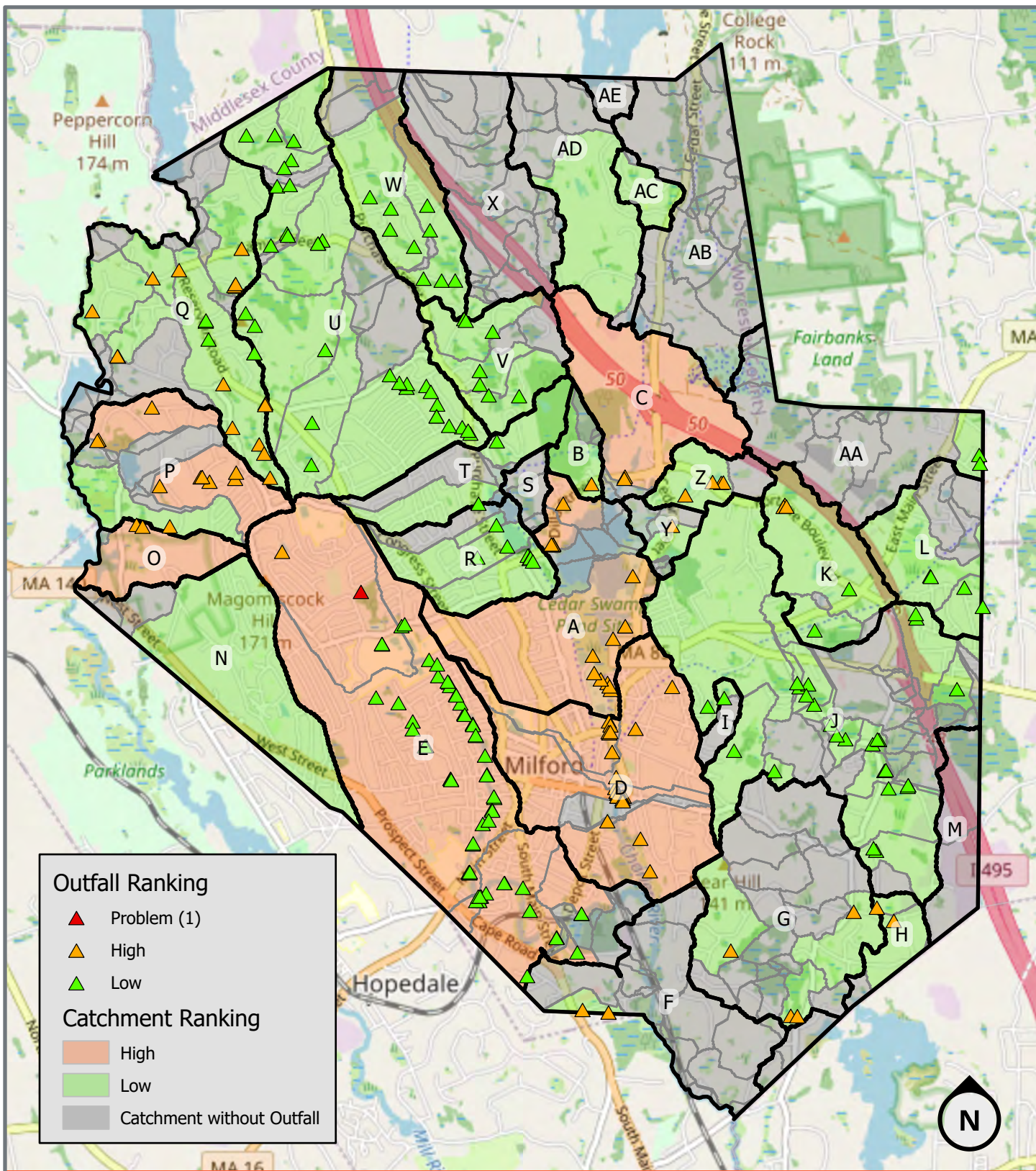
The invalidity of any section or provision of this By-Law shall not invalidate any other section or provision thereof.

APPENDIX B

Storm System Mapping

APPENDIX C

Catchment Delineation Mapping and Ranking Matrix



Milford Outfall/Interconnection Ranking Table
September 2021

Catchment ID	Subcatchment ID	Receiving Water or MS4	Outfall ID	Catchment Scores						Outfall Scores				Dry Weather Screening Results	Outfall Score	Catchment Score	Outfall Ranking*	Catchment Ranking**	
				Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)						
				Information Source	Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Septic Repair/ Replacement	GIS and Storm System Maps	GIS Maps, Town Input	Impaired Waters List	Outfall inspections and sample results	Town Input	GIS Maps, Town Input					Screening Status and Screening Date(s)
				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	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0	Yes = 2 No Data = 1 No = 0					
E	127	Unnamed Wetlands to Godfrey Brook	OF-504	1	2	0	0	2	1	0	2	1	0	7/27/21 - Dry	3	6	Problem	High	
D	157	Charles River	314	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	236	Charles River	317	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	236	Charles River	318	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	236	Charles River	319	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	157	Charles River	320	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	157	Charles River	323	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	236	Charles River	327	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
D	236	Charles River	328	2	2	0	2	2	2	2	1	1	2	Not Screened	6	10	High	High	
C	19	Charles River	1	1	2	0	2	0	2	2	0	1	2	5/2018, 7/25/2019 - Dry, Dry	5	7	High	High	
C	19	Charles River	2	1	2	0	2	0	2	2	0	1	2	5/2018, 7/25/2019 - Dry, Sampled	5	7	High	High	
Y	205	Unnamed Wetlands East of Cedar Swamp Pond	5	0	1	0	0	0	0	2	0	1	2	8/14/2019 - Dry	5	1	High	Low	
A	121	Charles River	9	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
A	121	Charles River	15	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
A	25	Cedar Swamp Pond	22	1	2	0	0	2	2	2	0	1	2	5/2018 - Dry	5	7	High	High	
A	121	Charles River	25	1	2	0	0	2	2	2	0	1	2	7/25/2019, 5/12/2021 - Dry, Sampled	5	7	High	High	
A	121	Cedar Swamp Pond	26	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
D	157	Charles River	31	2	2	0	2	2	2	2	0	1	2	7/25/2019 - Dry	5	10	High	High	
D	157	Charles River	33	2	2	0	2	2	2	2	0	1	2	7/25/2019 - Dry	5	10	High	High	
A	121	Charles River	34	1	2	0	0	2	2	2	0	1	2	5/2018, 7/25/2019 - Dry, Dry	5	7	High	High	
A	121	Charles River	35	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
A	121	Charles River	36	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
D	236	Charles River	37	2	2	0	2	2	2	2	0	1	2	6/3/2019 - Dry	5	10	High	High	
D	236	Charles River	38	2	2	0	2	2	2	2	0	1	2	6/9/2020 - Dry	5	10	High	High	
D	262	Charles River	39	2	2	0	2	2	2	2	0	1	2	6/9/2020 - Dry	5	10	High	High	
D	262	Charles River	40	2	2	0	2	2	2	2	0	1	2	6/3/2019 - Sampled	5	10	High	High	
D	236	Charles River	41	2	2	0	2	2	2	2	0	1	2	5/12/2021 - Dry	5	10	High	High	
D	247	Charles River	42	2	2	0	2	2	2	2	0	1	2	6/3/2019 - Dry	5	10	High	High	
F	110	Unnamed Tributary to Charles River	55	1	2	0	0	2	0	2	0	1	2	6/28/2021 - Dry	5	5	High	Low	
A	56	Cedar Swamp Pond	182	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Sampled	5	7	High	High	
A	56	Cedar Swamp Pond	183	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
A	56	Cedar Swamp Pond	304	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
A	121	Charles River and Cedar Swamp Pond	312	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Sampled	5	7	High	High	
A	121	Cedar Swamp Pond	313	1	2	0	0	2	2	2	0	1	2	5/12/2021 - Dry	5	7	High	High	
D	157	Charles River	315	2	2	0	2	2	2	2	0	1	2	3/25/2009 - Dry (GZA)	5	10	High	High	
D	236	Charles River	316	2	2	0	2	2	2	2	0	1	2	2010 - Dry (GZA)	5	10	High	High	
D	236	Charles River	321	2	2	0	2	2	2	2	0	1	2	5/2018 - Dry	5	10	High	High	
D	236	Charles River	322	2	2	0	2	2	2	2	0	1	2	3/25/2009 - Dry (GZA)	5	10	High	High	
D	94	Unnamed Wetlands East of Cedar Swamp Pond	1021	1	1	0	2	0	0	2	0	1	2	6/3/2019 - Dry	5	4	High	Low	
D	94	Unnamed Wetlands East of Cedar Swamp Pond	1022	1	1	0	2	0	0	2	0	1	2	6/3/2019 - Dry	5	4	High	Low	
D	166	Unnamed Tributary to Charles River	1027	2	1	0	2	0	0	2	0	1	2	6/3/2019 - Dry	5	5	High	Low	
D	134	Charles River	1029	2	2	0	2	2	2	2	0	1	2	6/3/2019 - Sampled	5	10	High	High	
D	56	Cedar Swamp Pond	1067	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
K	94	Unnamed Wetlands East of Cedar Swamp Pond	OF-15	1	1	0	2	0	0	2	0	1	2	6/3/2019 - Dry	5	4	High	Low	
Q	183	Charles River	OF-162	0	1	0	2	0	2	2	0	1	2	6/9/2020 - Dry	5	5	High	Low	
Z	54	Unnamed Wetlands East of Cedar Swamp Pond	OF-191	1	1	0	0	0	0	2	0	1	2	6/19/2020 - Dry	5	2	High	Low	
D	134	Charles River	OF-307	0	1	0	2	0	0	2	0	1	2	6/28/2021 - Dry	5	3	High	Low	
D	262	Unnamed Wetlands to Charles River	OF-361	0	1	0	2	0	0	2	0	1	2	6/28/2021 - Dry	5	3	High	Low	
F	110	Unnamed Tributary to Charles River	OF-382	1	2	0	0	2	0	2	0	1	2	6/3/2019 - Dry	5	5	High	Low	
Z	54	Unnamed Wetlands East of Cedar Swamp Pond	OF-387	1	1	0	0	0	0	2	0	1	2	6/3/2019 - Dry	5	2	High	Low	
D	262	Unnamed Wetlands to Charles River	OF-510	0	1	0	2	0	0	2	0	1	2	7/27/21 - Dry	5	3	High	Low	
A	121	Cedar Swamp Pond	OF-72	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
A	121	Cedar Swamp Pond	OF-73	1	2	0	0	2	2	2	0	1	2	7/25/2019 - Dry	5	7	High	High	
B	24	Cedar Swamp Pond	OF-78	0	2	0	0	0	2	2	0	1	2	5/2018 - Dry	5	4	High	Low	
Z	54	Unnamed Wetlands East of Cedar Swamp Pond	OF-80	1	1	0	0	0	0	2	0	1	2	6/3/2019 - Dry	5	2	High	Low	

Milford Outfall/Interconnection Ranking Table
September 2021

Catchment ID	Subcatchment ID	Receiving Water or MS4	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)	Dry Weather Screening Results	Outfall Score	Catchment Score	Outfall Ranking*	Catchment Ranking**
Information Source				Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Septic Repair/ Replacement	GIS and Storm System Maps	GIS Maps, Town Input	Impaired Waters List	Outfall inspections and sample results	Town Input	GIS Maps, Town Input	Screening Status and Screening Date(s)				
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	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0	Yes = 2 No Data = 1 No = 0					
Z	54	Unnamed Wetlands East of Cedar Swamp Pond	OF-82	1	1	0	0	0	0	2	0	1	2	8/14/2019 - Dry	5	2	High	Low
H	146	Beaver Pond	271	0	1	0	0	0	2	2	0	1	0	5/2018 - Sampled	3	3	High	Low
D	100	Unnamed Wetlands North of Beaver Pond	1096	2	1	0	2	0	0	2	0	1	0	8/4/2021 - Dry	3	5	High	Low
E	127	Unnamed pond	OF-501	1	2	0	0	2	1	2	0	1	0	6/28/2021 - Dry	3	6	High	High
H	132	Unnamed Tributary to Beaver Pond	OF-508	0	1	0	0	0	2	2	0	1	0	6/28/21 - Dry	3	3	High	Low
G	144	Unnamed Tributary to Beaver Pond	OF-94	2	1	0	2	0	0	2	0	1	0	6/28/2021 - Dry	3	5	High	Low
G	100	Unnamed Wetlands North of Beaver Pond	OF-95	2	1	0	2	0	0	2	0	1	0	6/19/2020 - Dry	3	5	High	Low
P	74	Unnamed Wetlands to Little Field Pond	231	0	2	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	6	High	High
P	74	Unnamed Wetlands to Little Field Pond	232	0	2	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	6	High	High
P	74	Unnamed Wetlands to Little Field Pond	233	0	2	0	2	0	2	1	0	1	0	6/4/2019, 6/9/2020 - Dry, Dry	2	6	High	High
P	74	Unnamed Wetlands to Little Field Pond	237	0	2	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	6	High	High
O	120	Unnamed Wetlands to Little Field Pond	239	0	2	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	6	High	High
D	254	Fiske Millpond	1002	0	1	0	2	0	2	1	0	1	0	5/2018 - Dry	2	5	High	Low
D	254	Fiske Millpond	1003	0	1	0	2	0	2	1	0	1	0	5/2018 - Sampled	2	5	High	Low
D	59	Unnamed Wetlands to Little Field Pond	1037	0	1	0	2	0	2	1	0	1	0	5/2018 - Sampled	2	5	High	Low
D	198	Mill River	1048	0	1	0	2	0	2	1	0	1	0	6/4/2019 - Dry	2	5	High	Low
D	59	Unnamed Wetlands to Little Field Pond	1052	0	1	0	2	0	2	1	0	1	0	6/4/2019, 6/9/2020 - Dry, Dry	2	5	High	Low
D	74	Unnamed Wetlands to Little Field Pond	1066	0	2	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	6	High	High
D	198	Mill River	1085	0	1	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	5	High	Low
D	231	Unnamed Wetlands to Little Field Pond	1135	0	1	0	2	0	0	1	0	1	0	6/28/2021 - Dry	2	3	High	Low
D	59	Unnamed Wetlands to Little Field Pond	1136	0	1	0	2	0	2	1	0	1	0	6/19/2020 - Dry	2	5	High	Low
Q	59	Mill River	OF-110	0	1	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	5	High	Low
Q	90	Mill River	OF-163	0	1	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	5	High	Low
Q	59	Unnamed Wetlands to Little Field Pond	OF-199B	0	1	0	2	0	2	1	0	1	0	5/12/2021 - Dry	2	5	High	Low
Q	59	Unnamed Wetlands to Little Field Pond	OF-2	0	1	0	2	0	2	1	0	1	0	6/4/2019 - Dry	2	5	High	Low
P	74	Unnamed Wetlands to Little Field Pond	OF-200	0	2	0	2	0	2	1	0	1	0	5/2018 - Sampled	2	6	High	High
Q	297	Mill River	OF-217	0	1	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	5	High	Low
E	1	Fiske Millpond	OF-227	1	2	0	0	2	1	1	0	1	0	5/2018 - Sampled	2	6	High	High
D	59	Unnamed Wetlands to Little Field Pond	OF-229	0	1	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	5	High	Low
N	120	Unnamed Wetlands to Little Field Pond	OF-238	0	2	0	2	0	2	1	0	1	0	6/9/2020 - Dry	2	6	High	High
Q	38	Mill River	OF-365	0	1	0	2	0	2	1	0	1	0	6/4/2019 - Sampled	2	5	High	Low
Q	59	Unnamed Wetlands to Little Field Pond	OF-391	0	1	0	2	0	2	1	0	1	0	5/2018, 6/9/2020 - Dry, Dry	2	5	High	Low
P	1	Unnamed Tributary To Mill River	OF-505	0	2	0	2	0	2	1	0	1	0	7/27/21 - Dry	2	6	High	High
R	76	Louisa Lake	17	0	2	0	0	0	2	0	0	1	0	5/2018 - Sampled	1	4	Low	Low
R	76	Louisa Lake	18	0	2	0	0	0	2	0	0	1	0	7/25/2019 - Dry	1	4	Low	Low
R	76	Louisa Lake	23	0	2	0	0	0	2	0	0	1	0	5/2018, 7/25/2019 - Sampled, Dry	1	4	Low	Low
R	76	Louisa Lake	24	0	2	0	0	0	2	0	0	1	0	7/25/2019 - Dry	1	4	Low	Low
E	234	Godfrey Brook	61	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	111	Godfrey Brook	75	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	111	Godfrey Brook	77	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	135	Godfrey Brook	78	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	111	Godfrey Brook	86	1	2	0	0	2	1	0	0	1	0	6/19/2020 - Dry	1	6	Low	High
E	111	Godfrey Brook	87	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	111	Godfrey Brook	89	1	2	0	0	2	1	0	0	1	0	6/28/2021 - Dry	1	6	Low	High
E	111	Godfrey Brook	92	1	2	0	0	2	1	0	0	1	0	6/3/2019 - Dry	1	6	Low	High
E	106	Godfrey Brook	93	1	2	0	0	2	1	0	0	1	0	6/3/2019 - Dry	1	6	Low	High
E	106	Godfrey Brook	94	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	102	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	234	Godfrey Brook	105	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	108	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	112	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	116	1	2	0	0	2	1	0	0	1	0	6/4/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	118	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	120	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	124	1	2	0	0	2	1	0	0	1	0	6/4/2019 - Sampled	1	6	Low	High
E	234	Godfrey Brook	125	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
E	234	Godfrey Brook	126	1	2	0	0	2	1	0	0	1	0	3/7/2017 - Dry	1	6	Low	High

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Catchment ID	Subcatchment ID	Receiving Water or MS4	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)	Dry Weather Screening Results	Outfall Score	Catchment Score	Outfall Ranking*	Catchment Ranking**
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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	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0	Yes = 2 No Data = 1 No = 0					
E	234	Godfrey Brook	127	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
R	224	Louisa Lake	145	0	2	0	0	0	2	0	0	1	0	5/2018 - Sampled	1	4	Low	Low
T	43	Louisa Lake	146	0	2	0	0	0	2	0	0	1	0	7/25/2019 - Sampled	1	4	Low	Low
T	275	Huckleberry Brook	149	0	2	0	0	0	2	0	0	1	0	6/4/2019 - Dry	1	4	Low	Low
U	216	Unnamed Tributary to Huckleberry Brook	158	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Dry	1	5	Low	Low
Q	59	Unnamed Tributary to Huckleberry Brook	160	0	1	0	2	0	2	0	0	1	0	6/4/2019 - Dry	1	5	Low	Low
E	234	Godfrey Brook	244	1	2	0	0	2	1	0	0	1	0	3/8/2017 - Dry	1	6	Low	High
E	234	Godfrey Brook	245	1	2	0	0	2	1	0	0	1	0	3/8/2017 - Dry	1	6	Low	High
E	234	Godfrey Brook	246	1	2	0	0	2	1	0	0	1	0	3/8/2017 - Dry	1	6	Low	High
E	234	Godfrey Brook	247	1	2	0	0	2	1	0	0	1	0	5/2018 - Dry	1	6	Low	High
J	267	Unnamed Wetlands to Stall Brook	258	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
J	117	Unnamed Wetlands to Stall Brook	262	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
J	119	Unnamed Wetlands to Stall Brook	264	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
J	129	Unnamed Wetlands to Stall Brook	268	1	2	0	0	0	1	0	0	1	0	6/19/2020 - Dry	1	4	Low	Low
J	129	Unnamed Wetlands to Stall Brook	269	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
J	119	Unnamed Wetlands to Stall Brook	273	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
J	49	Unnamed Wetlands East of Stall Brook	285	1	2	0	0	0	1	0	0	1	0	6/28/2021 - Dry	1	4	Low	Low
J	49	Unnamed Wetlands East of Stall Brook	286	1	2	0	0	0	1	0	0	1	0	6/28/2021 - Dry	1	4	Low	Low
E	234	Godfrey Brook	291	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	234	Godfrey Brook	292	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
R	76	Louisa Lake	305	0	2	0	0	0	2	0	0	1	0	5/2018 - Sampled	1	4	Low	Low
D	156	Unnamed Wetlands to Stall Brook	1005	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
D	241	Huckleberry Brook	1026	0	1	0	2	0	0	0	0	1	0	6/9/2020 - Dry	1	3	Low	Low
D	26	Huckleberry Brook	1039	0	1	0	2	0	0	0	0	1	0	5/12/2021 - Dry	1	3	Low	Low
D	235	Huckleberry Brook	1040	0	1	0	2	0	0	0	0	1	0	5/12/2021 - Sampled	1	3	Low	Low
D	287	Unnamed Tributary to Huckleberry Brook	1041	0	1	0	2	2	0	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
D	241	Huckleberry Brook	1044	0	1	0	2	0	0	0	0	1	0	5/2018 - Dry	1	3	Low	Low
D	287	Unnamed Tributary to Huckleberry Brook	1047	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
D	272	Huckleberry Brook	1053	0	1	0	2	0	0	0	0	1	0	5/12/2021 - Dry	1	3	Low	Low
D	264	Unnamed Wetlands to Stall Brook	1054	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
D	71	Stall Brook	1057	0	1	0	2	0	0	0	0	1	0	1/31/2017 - Dry	1	3	Low	Low
D	111	Godfrey Brook	1060	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
D	234	Godfrey Brook	1072	1	2	0	0	2	1	0	0	1	0	5/2018 - Sampled	1	6	Low	High
D	234	Godfrey Brook	1073	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
D	234	Godfrey Brook	1074	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
D	234	Godfrey Brook	1075	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
D	234	Godfrey Brook	1076	1	2	0	0	2	1	0	0	1	0	5/12/2021 - Dry	1	6	Low	High
D	234	Godfrey Brook	1077	0	1	0	2	0	0	0	0	1	0	7/27/21 - Dry	1	3	Low	Low
D	126	Unnamed Wetlands to Stall Brook	1093	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
D	145	Godfrey Brook	1095	1	2	0	0	2	1	0	0	1	0	8/14/2019 - Dry	1	6	Low	High
D	93	Unnamed Tributary to Huckleberry Brook	1097	0	1	0	2	2	0	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
D	26	Huckleberry Brook	1101	0	1	0	2	0	0	0	0	1	0	6/19/2020 - Dry	1	3	Low	Low
D	46	Unnamed Wetlands West of Hopping Brook	1106	0	1	0	2	0	0	0	0	1	0	6/28/2021 - Sampled	1	3	Low	Low
D	234	Godfrey Brook	1108	1	2	0	0	2	1	0	0	1	0	6/19/2020 - Dry	1	6	Low	High
D	234	Godfrey Brook	1109	1	2	0	0	2	1	0	0	1	0	6/19/2020 - Dry	1	6	Low	High
D	111	Godfrey Brook	1114	0	1	0	2	0	0	0	0	1	0	6/28/2021 - Dry	1	3	Low	Low
D	23	Unnamed Wetlands West of Hopping Brook	1132	0	1	0	2	0	0	0	0	1	0	6/28/2021 - Dry	1	3	Low	Low
D	23	Unnamed Wetlands West of Hopping Brook	1133	0	1	0	2	0	0	0	0	1	0	6/28/2021 - Dry	1	3	Low	Low
D	234	Godfrey Brook	1138	0	1	0	2	0	0	0	0	1	0	3/8/2017 - Dry	1	3	Low	Low
D	111	Godfrey Brook	1146	0	1	0	2	0	0	0	0	1	0	9/23/2009 - Dry	1	3	Low	Low
D	234	Godfrey Brook	1238	0	1	0	2	0	0	0	0	1	0	6/28/2021 - Dry	1	3	Low	Low
D	234	Godfrey Brook	1239	0	1	0	2	0	0	0	0	1	0	7/27/21 - Dry	1	3	Low	Low
Q	59	Unnamed Tributary to Huckleberry Brook	1151A	0	1	0	2	0	2	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
Q	59	Unnamed Tributary to Huckleberry Brook	1151B	0	1	0	2	0	2	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
E	127	Godfrey Brook	OF-101	1	2	0	0	2	1	0	0	1	0	2015 - Dry (GZA)	1	6	Low	High
E	127	Godfrey Brook	OF-102	1	2	0	0	2	1	0	0	1	0	9/2/2015 - Dry	1	6	Low	High

Milford Outfall/Interconnection Ranking Table
September 2021

Catchment ID	Subcatchment ID	Receiving Water or MS4	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)	Dry Weather Screening Results	Outfall Score	Catchment Score	Outfall Ranking*	Catchment Ranking**
Information Source				Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Septic Repair/ Replacement	GIS and Storm System Maps	GIS Maps, Town Input	Impaired Waters List	Outfall inspections and sample results	Town Input	GIS Maps, Town Input	Screening Status and Screening Date(s)				
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	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0	Yes = 2 No Data = 1 No = 0					
E	127	Godfrey Brook	OF-103	1	2	0	0	2	1	0	0	1	0	2015 - Dry (GZA)	1	6	Low	High
E	127	Godfrey Brook	OF-104	1	2	0	0	2	1	0	0	1	0	9/2/2015 - Dry	1	6	Low	High
U	93	Unnamed Tributary to Huckleberry Brook	OF-106	0	1	0	2	2	0	0	0	1	0	2015 - Dry (GZA)	1	5	Low	Low
E	234	Godfrey Brook	OF-112	1	2	0	0	2	1	0	0	1	0	2015 - Dry	1	6	Low	High
W	195	Huckleberry Brook	OF-114	0	1	0	2	0	0	0	0	1	0	6/9/2020 - Dry	1	3	Low	Low
U	216	Unnamed Tributary to Huckleberry Brook	OF-117	0	1	0	2	2	0	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
Q	59	Unnamed Tributary to Huckleberry Brook	OF-119	0	1	0	2	0	2	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
W	241	Huckleberry Brook	OF-122	0	1	0	2	0	0	0	0	1	0	5/2018 - Dry	1	3	Low	Low
V	291	Huckleberry Brook	OF-123	0	1	0	2	0	0	0	0	1	0	6/9/2020 - Sampled	1	3	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-124	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-125	0	1	0	2	2	0	0	0	1	0	5/2018 - Dry	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-126	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-127	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Dry	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-128	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Sampled	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-129	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Sampled	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-130	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Dry	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-131	0	1	0	2	2	0	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
R	32	Louisa Lake	OF-133	0	2	0	0	0	2	0	0	1	0	7/25/2019 - Dry	1	4	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-141	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Dry	1	5	Low	Low
U	93	Unnamed Tributary to Huckleberry Brook	OF-145	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Sampled	1	5	Low	Low
U	187	Unnamed Tributary to Huckleberry Brook	OF-148	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Sampled	1	5	Low	Low
V	287	Unnamed Tributary to Huckleberry Brook	OF-155	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-156	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-157	0	1	0	2	2	0	0	0	1	0	2018 - Sampled	1	5	Low	Low
W	195	Huckleberry Brook	OF-158	0	1	0	2	0	0	0	0	1	0	5/2018 - Sampled	1	3	Low	Low
J	274	Unnamed Wetlands to Stall Brook	OF-16	1	2	0	0	0	1	0	0	1	0	6/28/2021 - Dry	1	4	Low	Low
U	287	Unnamed Tributary to Huckleberry Brook	OF-164	0	1	0	2	2	0	0	0	1	0	6/9/2020 - Dry	1	5	Low	Low
Q	287	Unnamed Tributary to Huckleberry Brook	OF-166	0	1	0	2	2	0	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
U	216	Unnamed Tributary to Huckleberry Brook	OF-169	0	1	0	2	2	0	0	0	1	0	5/12/2021 - Dry	1	5	Low	Low
X	93	Unnamed Tributary to Huckleberry Brook	OF-170	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Sampled	1	5	Low	Low
W	241	Huckleberry Brook	OF-173	0	1	0	2	0	0	0	0	1	0	6/4/2019, 5/12/2021 - Dry, Dry	1	3	Low	Low
W	195	Huckleberry Brook	OF-176	0	1	0	2	0	0	0	0	1	0	8/4/2021 - Dry	1	3	Low	Low
U	3	Unnamed Tributary to Huckleberry Brook	OF-178	0	1	0	2	2	0	0	0	1	0	6/4/2019 - Sampled	1	5	Low	Low
U	3	Unnamed Tributary to Huckleberry Brook	OF-179	0	1	0	2	2	0	0	0	1	0	5/2018, 6/9/2020 - Dry, Dry	1	5	Low	Low
U	3	Unnamed Tributary to Huckleberry Brook	OF-180	0	1	0	2	2	0	0	0	1	0	5/2018, 6/9/2020 - Sampled, Sampled	1	5	Low	Low
U	39	Unnamed Wetlands West of Godfrey Brook	OF-183	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
V	235	Huckleberry Brook	OF-186	0	1	0	2	0	0	0	0	1	0	5/2018, 6/9/2020 - Sampled, Sampled	1	3	Low	Low
W	195	Huckleberry Brook	OF-193	0	1	0	2	0	0	0	0	1	0	5/12/2021 - Dry	1	3	Low	Low
U	39	Unnamed Wetlands to Little Field Pond	OF-201	0	1	0	2	2	0	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
L	46	Unnamed Wetlands West of Hopping Brook	OF-203	0	1	0	2	0	0	0	0	1	0	6/19/2020 - Dry	1	3	Low	Low
J	72	Unnamed Wetlands East of Stall Brook	OF-21	1	2	0	0	0	1	0	0	1	0	8/4/2021 - Dry	1	4	Low	Low
E	195	Huckleberry Brook	OF-211	1	2	0	0	2	1	0	0	1	0	5/2018 - Sampled	1	6	Low	High
E	234	Godfrey Brook	OF-226	1	2	0	0	2	1	0	0	1	0	6/28/2021 - Dry	1	6	Low	High
K	6	Unnamed Wetlands East of Stall Brook	OF-234	1	1	0	2	0	0	0	0	1	0	5/12/2021 - Dry	1	4	Low	Low
J	72	Unnamed Wetlands to Stall Brook	OF-25	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
E	234	Godfrey Brook	OF-250	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	234	Godfrey Brook	OF-253	1	2	0	0	2	1	0	0	1	0	5/2018 - Dry	1	6	Low	High
J	83	Unnamed Wetlands to Stall Brook	OF-27	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
E	234	Godfrey Brook	OF-270	1	2	0	0	2	1	0	0	1	0	7/27/21 - Dry	1	6	Low	High
I	84	Unnamed Wetlands to Stall Brook	OF-276	1	2	0	0	0	1	0	0	1	0	6/19/2020 - Dry	1	4	Low	Low
J	267	Unnamed Wetlands to Stall Brook	OF-277	1	2	0	0	0	1	0	0	1	0	10/13/2017 - Dry	1	4	Low	Low
J	274	Unnamed Wetlands to Stall Brook	OF-286	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
J	119	Unnamed Wetlands to Stall Brook	OF-292	1	2	0	0	0	1	0	0	1	0	6/4/2019, 5/12/2021 - Dry, Dry	1	4	Low	Low
J	57	Unnamed Wetlands to Stall Brook	OF-30	1	2	0	0	0	1	0	0	1	0	5/2018 - Dry	1	4	Low	Low
J	122	Unnamed Wetlands to Stall Brook	OF-31	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
E	234	Godfrey Brook	OF-315	1	2	0	0	2	1	0	0	1	0	8/4/2021 - Sampled	1	6	Low	High
E	234	Godfrey Brook	OF-316	1	2	0	0	2	1	0	0	1	0	8/4/21 - Dry	1	6	Low	High

Milford Outfall/Interconnection Ranking Table
September 2021

Catchment ID	Subcatchment ID	Receiving Water or MS4	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)	Dry Weather Screening Results	Outfall Score	Catchment Score	Outfall Ranking*	Catchment Ranking**
Information Source				Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Septic Repair/ Replacement	GIS and Storm System Maps	GIS Maps, Town Input	Impaired Waters List	Outfall inspections and sample results	Town Input	GIS Maps, Town Input	Screening Status and Screening Date(s)				
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	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0	Yes = 2 No Data = 1 No = 0					
E	234	Godfrey Brook	OF-322	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	234	Godfrey Brook	OF-324	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
E	234	Godfrey Brook	OF-325	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
J	122	Unnamed Wetlands to Stall Brook	OF-34	1	2	0	0	0	1	0	0	1	0	6/3/2019 - Dry	1	4	Low	Low
E	252	Godfrey Brook	OF-341	1	2	0	0	2	1	0	0	1	0	5/12/2021 - Dry	1	6	Low	High
E	234	Godfrey Brook	OF-346	1	2	0	0	2	1	0	0	1	0	6/19/2020, 5/12/2021 - Dry, Dry	1	6	Low	High
E	135	Godfrey Brook	OF-348	1	2	0	0	2	1	0	0	1	0	6/3/2019 - Sampled	1	6	Low	High
Q	59	Unnamed Tributary to Huckleberry Brook	OF-362	0	1	0	2	0	2	0	0	1	0	5/2018 - Sampled	1	5	Low	Low
K	94	Unnamed Wetlands East of Stall Brook	OF-374	1	1	0	2	0	0	0	0	1	0	5/2018 - Sampled	1	4	Low	Low
E	234	Godfrey Brook	OF-375	1	2	0	0	2	1	0	0	1	0	2015 - Dry	1	6	Low	High
L	219	Unnamed Wetlands West of Hopping Brook	OF-38	0	1	0	2	0	0	0	0	1	0	6/3/2019 - Sampled	1	3	Low	Low
J	117	Unnamed Wetlands to Stall Brook	OF-394	1	2	0	0	0	1	0	0	1	0	6/28/2021 - Dry	1	4	Low	Low
J	273	Unnamed Wetlands to Stall Brook	OF-43	1	2	0	0	0	1	0	0	1	0	5/12/2021 - Dry	1	4	Low	Low
P	1	Unnamed Tributary To Mill River	OF-500	0	2	0	2	0	2	1	0	1	0	6/28/2021 - Dry	2	6	High	High
U	220	Unnamed Tributary to Huckleberry Brook	OF-502	0	1	0	2	2	0	0	0	1	0	6/28/2021 - Dry	1	5	Low	Low
U	220	Unnamed Tributary to Huckleberry Brook	OF-503	0	1	0	2	2	0	0	0	1	0	6/28/2021 - Sampled	1	5	Low	Low
E	234	Godfrey Brook	OF-506	1	2	0	0	2	1	0	0	1	0	7/27/21 - Dry	1	6	Low	High
J	274	Unnamed Wetlands to Stall Brook	OF-507	1	2	0	0	0	1	0	0	1	0	6/28/21 - Dry	1	4	Low	Low
L	219	Unnamed Wetlands to Stall Brook	OF-509	0	1	0	2	0	0	0	0	1	0	6/28/21 - Dry	1	3	Low	Low
J	264	Unnamed Wetlands to Stall Brook	OF-6	1	2	0	0	0	1	0	0	1	0	6/9/2020 - Dry	1	4	Low	Low
E	111	Godfrey Brook	OF-62	1	2	0	0	2	1	0	0	1	0	6/9/2020 - Dry	1	6	Low	High
V	291	Huckleberry Brook	OF-69	0	1	0	2	0	0	0	0	1	0	6/19/2020 - Dry	1	3	Low	Low
R	224	Louisa Lake	OF-97	0	2	0	0	0	2	0	0	1	0	6/19/2020 - Dry	1	4	Low	Low
N	108	Interconnection with MassDOT	I-1	1	1	0	2	0	0	N/A	0	N/A	N/A	6/28/2021 - Dry	0	4	Low	Low
J	60	Interconnection with Town of Medway	I-11	0	1	0	2	0	0	N/A	0	N/A	N/A	6/28/2021 - Dry	0	3	Low	Low
N	108	Interconnection with MassDOT	I-12	0	2	0	2	0	2	N/A	0	N/A	N/A	6/28/2021 - Dry	0	6	Low	High
N	108	Interconnection with MassDOT	I-13	0	2	0	2	0	2	N/A	0	N/A	N/A	6/28/2021 - Dry	0	6	Low	High
N	108	Interconnection with MassDOT	I-2	0	2	0	2	0	2	N/A	0	N/A	N/A	8/4/2021 - Sampled	0	6	Low	High
N	108	Interconnection with MassDOT	I-3	0	2	0	2	0	2	N/A	0	N/A	N/A	6/28/2021 - Dry	0	6	Low	High
N	108	Interconnection with MassDOT	I-4	0	2	0	2	0	2	N/A	0	N/A	N/A	6/28/2021 - Dry	0	6	Low	High
E	234	Interconnection with MassDOT	I-6	1	1	0	0	0	0	N/A	0	N/A	N/A	6/28/2021 - Dry	0	2	Low	Low
E	234	Interconnection with MassDOT	I-9	1	2	0	0	2	1	N/A	0	N/A	N/A	6/28/2021 - Dry	0	6	Low	High

*Outfall/Interconnection classification:

Problem outfall: Outfalls/interconnections with known or suspected contributions of illicit discharges are Problem Outfalls. This includes outfalls/interconnections with previous screening that indicates likely sewer input, including:

- 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.

High priority outfalls: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:

- Discharging to a waterbody that has a Category 4 or 5 impairment,
- Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds, or
- Determined by the permittee as high priority based on the characteristics listed below or other available information.

Low priority outfalls: Outfalls/interconnections determined by the permittee as low priority based on previous screening results, frequency of past discharge complaints, and discharging to areas of public concern.

Excluded outfalls: Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments through undeveloped land.

**Catchment classification:

High priority catchments: These catchments have the highest amount of indicators for illicit discharge potential.

Low priority catchments: These catchments have the fewest amount of indicators for illicit discharge potential.

APPENDIX D

Field Forms and Hyperlinks to Laboratories and Field Services Companies

Date: _____

Weather Observations: _____

Staff Onsite: _____

Photos: _____

Milford 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)

Field Screening Data:

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)

Additional comments/Sketch:

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

IDDE investigation Results

Appendix E - Summary of Outfall Sampling History
Milford, MA

				Field Test Results					Analytical Results						
Structure ID	Discharging Waterbody	Type of Sampling	Sample Date	DO (mg/L)	Specific Conductance (μS/cm) Threshold: 2,000	Salinity (ppt)	Temp. (°C)	pH Threshold: 6.5-8.0	Ammonia as Nitrogen (mg/L) Threshold: 0.5	Chlorine, TRC (mg/L)	Fecal Coliform, MF (col/100ml)	Biological Oxygen Demand, BOD (mg/L)	E. coli (MPN/100 mL) Threshold: 236	Phosphorus, Total (mg/L)	Surfactants, MBAS (mg/L) Threshold: 0.25
2	Charles River	Dry Weather	7/26/2019	9.71	909	-	21.3	7.00	0.093	ND	-	ND	6.32	0.014	ND
OF-123	Huckleberry Brook	Dry Weather	6/10/2020	7.68	441.1	0.21	17.1	7.86	0.09	0.12	-	ND	1	0.328	0.05
1040	Huckleberry Brook	Dry Weather	5/20/2021	7.48	768	0.38	15.2	7.48	ND	0	220	ND	1.0	0.655	ND
1106	Unnamed Wetlands West of Hopping Brook	Dry Weather	6/28/2021	7.12	2189	1.12	18.8	7.12	ND	0	650	-	1.0	0.045	ND
25	Charles River	Dry Weather	6/28/2021	6.51	560	0.27	15.60	6.51	0.141	0	120	ND	6.32	0.055	ND
OF-503	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/28/2021	7.12	619	0.3	18.00	7.12	0.10	0	150	-	547.5	0.05	ND
		Wet Weather	7/9/2021	8.5	93	0.05	20.13	7.44	0.089	ND	16000	-	7572.0	0.102	0.05
I-2	N/A (Interconnection)	Dry Weather	8/4/2021	8.04	886	0.44	18.8	8.04	0.129	ND	150	ND	83.92	0.017	ND
OF-124	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/9/2018	11.54	808	0.4	7.6	7.33	0.15	-	-	-	3	ND	0.006
OF-126	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/9/2018	10.38	553.6	0.27	7.4	6.31	ND	-	-	-	<1	ND	0.004
OF-157	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/9/2018	18.55	740	0.36	8.4	6.95	0.39	-	-	-	12.0	ND	0.007
OF-156	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/9/2018	9.27	537	0.26	10	7.10	0.5	ND	-	-	21.0	ND	0.006
OF-362	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/9/2018	9.84	650.5	0.32	10.10	7.39	0.22	-	-	-	16	ND	0.012
OF-201	Unnamed Wetlands to Little Field Pond	Dry Weather	5/10/2018	8.34	387.8	0.19	9	7.09	0.33	-	-	-	235	0.13	ND
1037	Unnamed Wetlands to Little Field Pond	Dry Weather	5/10/2018	4.44	249.8	0.14	9.1	6.94	0.15	-	-	-	13.0	0.16	0.09
OF-200	Unnamed Wetlands to Little Field Pond	Dry Weather	5/10/2018	9.03	777	0.39	8.4	7.24	0.11	-	-	-	21.0	ND	ND
OF-183	Unnamed Wetlands West of Godfrey Brook	Dry Weather	5/10/2018	7.94	259.6	0.12	9.40	6.77	0.37	-	-	-	5	ND	ND
OF-119	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/10/2018	10.76	1121	0.56	7.80	7.03	0.20	-	-	-	10	ND	ND
OF-164	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/10/2018	8.09	478	0.23	9.10	6.15	0.18	-	-	-	1	ND	ND
OF-180	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/10/2018	11.33	533	0.26	6.7	6.68	0.11	-	-	-	<1	ND	ND
		Dry Weather	6/10/2020	7.43	407.8	0.2	13	7.43	ND	ND	-	ND	34.51	0.017	0.05
1002	Fiske Millpond	Dry Weather	5/10/2018	10.78	195	0.09	8.4	7.11	ND	-	-	-	3	ND	ND
OF-133	Louisa Lake	Dry Weather	5/22/2018	10.19	781	0.39	8.6	6.88	0.18	ND	-	-	11	0.14	0.014
1072	Godfrey Brook	Dry Weather	5/22/2018	10.14	802	0.4	9.4	6.67	ND	ND	-	-	3.0	ND	0.005
OF-211	Huckleberry Brook	Dry Weather	5/23/2018	8.46	1020	0.51	10.1	6.44	0.34	ND	-	-	61	0.12	0.023
OF-158	Huckleberry Brook	Dry Weather	5/23/2018	9.51	1142	0.57	8.7	6.45	ND	ND	-	-	<10	ND	0.013

Appendix E - Summary of Outfall Sampling History
Milford, MA

				Field Test Results					Analytical Results						
Structure ID	Discharging Waterbody	Type of Sampling	Sample Date	DO (mg/L)	Specific Conductance (µS/cm) Threshold: 2,000	Salinity (ppt)	Temp. (°C)	pH Threshold: 6.5-8.0	Ammonia as Nitrogen (mg/L) Threshold: 0.5	Chlorine, TRC (mg/L)	Fecal Coliform, MF (col/100ml)	Biological Oxygen Demand, BOD (mg/L)	E. coli (MPN/100 mL) Threshold: 236	Phosphorus, Total (mg/L)	Surfactants, MBAS (mg/L) Threshold: 0.25
1047	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/23/2018	8.62	998	0.5	8.8	6.34	0.18	ND	-	-	<10	ND	0.007
OF-155	Unnamed Tributary to Huckleberry Brook	Dry Weather	5/23/2018	10.41	514	0.25	9.9	6.96	0.13	ND	-	-	6.0	ND	0.011
23	Louisa Lake	Dry Weather	5/23/2018	6.26	561	0.27	17	6.9	0.29	ND	-	-	31	ND	0.018
305	Louisa Lake	Dry Weather	5/23/2018	5.44	645	0.32	9.1	6.36	ND	ND	-	-	10	ND	0.021
145	Louisa Lake	Dry Weather	5/23/2018	10.3	623	0.31	10.6	7.44	ND	ND	-	-	24.0	ND	0.006
OF-186	Huckleberry Brook	Dry Weather	5/23/2018	7.08	826	0.41	8.10	6.06	0.11	ND	-	-	<1	ND	0.008
OF-315	Godfrey Brook	Dry Weather	5/31/2018	8.81	594	0.29	14.50	7.97	ND	ND	-	-	26	0.11	ND
		Dry Weather	8/4/2021	7.88	501	0.24	21.90	7.88	ND	0	-	ND	1046.24	0.036	ND
		Wet Weather	7/9/2021	7.01	182	0.09	20.49	7.27	0.193	ND	10000	10	7972	0.165	ND
17	Louisa Lake	Dry Weather	5/31/2018	9.8	1010	0.5	10.6	7.75	ND	ND	-	-	55	ND	0.18
OF-69	Huckleberry Brook	Dry Weather	5/31/2018	11.96	1540	0.78	10.2	7.55	ND	ND	-	-	24	ND	ND
OF-227	Fiske Millpond	Dry Weather	5/31/2018	10.71	383.4	0.18	10.4	7.84	0.16	ND	-	-	152.0	0.23	0.06
271	Beaver Pond	Dry Weather	5/31/2018	10.92	3100	1.63	10.6	7.69	ND	ND	-	-	<1	ND	0.05
OF-374	Unnamed Wetlands East of Stall Brook	Dry Weather	5/31/2018	9.92	1323	0.67	14.5	7.76	ND	ND	-	-	3	ND	ND
40	Charles River	Dry Weather	6/4/2019	11.83	7.248	0.35	4.8	7.61	0.117	ND	-	-	770.1	0.022	ND
		Wet Weather	7/9/2021	6.9	65	0.03	17.5	7.10	ND	ND	8900	8.6	3698	0.15	ND
OF-348	Godfrey Brook	Dry Weather	6/4/2019	12.25	445.6	0.22	5	7.72	0.081	ND	-	-	488.4	0.089	ND
1029	Charles River	Dry Weather	6/4/2019	105.1	702	0.34	6.1	7.22	0.148	ND	-	-	<1	ND	ND
OF-38	Unnamed Wetlands West of Hopping Brook	Dry Weather	6/4/2019	13.82	346.6	0.17	4.50	7.71	0.082	ND	-	-	<1	ND	ND
OF-145	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/5/2019	17.11	1123	0.56	4.60	7.2	0.13	ND	-	-	<1	0.04	ND
OF-148	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/5/2019	12.53	998	0.49	4.1	7.19	0.397	ND	-	-	<1	ND	ND
OF-170	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/5/2019	14.66	668.7	0.33	4.3	7.76	0.078	ND	-	-	2.02	0.055	ND
OF-178	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/5/2019	14.83	467.9	0.23	5.2	7.96	ND	ND	-	-	1.0	ND	ND
OF-365	Mill River	Dry Weather	6/5/2019	11.26	300	0.14	9.2	7.90	0.172	ND	-	-	<1	-	ND
124	Godfrey Brook	Dry Weather	6/5/2019	11.46	490.2	0.24	10.1	7.61	0.19	ND	-	-	4.1	0.015	ND
OF-128	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/5/2019	11.76	275	0.13	6.3	7.81	0.076	ND	-	-	<1	0.052	ND
OF-129	Unnamed Tributary to Huckleberry Brook	Dry Weather	6/5/2019	11.82	554.3	0.26	8.00	8.02	0.159	ND	-	-	5.16	0.058	ND

Appendix E - Summary of Outfall Sampling History
Milford, MA

Structure ID	Discharging Waterbody	Type of Sampling	Sample Date	Field Test Results					Analytical Results						
				DO (mg/L)	Specific Conductance (µS/cm) Threshold: 2,000	Salinity (ppt)	Temp. (°C)	pH Threshold: 6.5-8.0	Ammonia as Nitrogen (mg/L) Threshold: 0.5	Chlorine, TRC (mg/L)	Fecal Coliform, MF (col/100ml)	Biological Oxygen Demand, BOD (mg/L)	E. coli (MPN/100 mL) Threshold: 236	Phosphorus, Total (mg/L)	Surfactants, MBAS (mg/L) Threshold: 0.25
312	Charles River and Cedar Swamp Pond	Dry Weather	7/26/2019	16.75	841	-	22.12	8.27	0.67	ND	-	ND	65108	0.27	ND
182	Cedar Swamp Pond	Dry Weather	7/26/2019	10.29	235	-	19.7	7.02	0.145	ND	-	ND	4.06	ND	ND
146	Louisa Lake	Dry Weather	7/26/2019	10.38	466	-	18.82	6.33	0.128	ND	-	ND	56.14	0.018	ND
OF-103	Godfrey Brook	Wet Weather	7/9/2021	7.35	87	0.05	19.7	6.42	0.122	ND	14000	-	18172	0.1	ND
OF-104	Godfrey Brook	Wet Weather	7/9/2021	7.48	76	0.04	20.18	6.68	ND	ND	1700	-	980.39	0.038	ND
OF-504	Godfrey Brook	Wet Weather	7/9/2021	3.42	163	0.08	20.26	5.95	0.387	ND	34000	13	97688.0	0.21	0.3
37	Charles River	Wet Weather	7/9/2021	7.04	259	0.14	20.10	8.42	0.81	ND	170000	20	111230	0.34	ND
39	Charles River	Wet Weather	7/9/2021	7.97	150	0.08	20.04	7.46	0.116	ND	3400	4	113.7	0.062	ND
31	Charles River	Wet Weather	7/9/2021	7.39	4	0	20.43	6.54	ND	ND	38000	6.7	6131.4	0.258	ND
OF-101	Godfrey Brook	Wet Weather	7/9/2021	8	9	0	19.37	6.64	ND	ND	37000	-	52050.0	0.096	ND
OF-102	Godfrey Brook	Wet Weather	7/9/2021	7.69	71	0.04	19.57	6.54	ND	ND	8900	-	11110	0.024	ND
OF-510	Charles River	Wet Weather	8/5/2021	6.57	142	0.07	19.4	6.94	0.133	ND	26000	2.3	20288	0.096	0.07
OF-238	Littlefield Pond	Wet Weather	8/5/2021	7.04	35.7	0.02	20.2	6.8	0.105	ND	6900	-	1732.9	0.096	0.07
239	Littlefield Pond	Wet Weather	8/5/2021	6.9	17	0.01	20	6.67	ND	ND	3100	-	1553.1	0.131	ND
102	Godfrey Brook	Wet Weather	8/5/2021	8.81	20.7	0.01	24.40	6.96	0.078	ND	7300	2.7	6902	0.087	0.06

Notes
- : Not Tested
ND: Non-detect
Bold, highlighted values exceed contaminant criteria

Memorandum

Date 09/05/19

To Michael Dean, P.E. – Town Engineer
Scott J. Crisafulli, Highway Surveyor

From Marissa Carvalho, Project Scientist - EP

CC Robert Rafferty, P.E., Principal - EP
Natalie Pommersheim, Project Manager – EP

Subject Task 4 – IDDE Investigations

Agreement for Professional Engineering Services for MS4 General Permit Assistance

The following memorandum summarizes the 2019 outfall sampling program, outlined in Task 4 – IDDE Investigations of the Agreement for Professional Engineering Services for MS4 General Permit Assistance. The sampling program was authorized by the Town of Milford and was conducted by Environmental Partners Group, Inc. (EP) over the course of four (4) days from June through August 2019.

In accordance with the Permit, all 199 MS4 outfalls in Milford are required to be screened within the first three (3) years of the Permit, or by June 30, 2021. Under the FY18 contract, EP screened 32 of the total 199 MS4 outfalls. Under this task, EP screened 82 MS4 outfalls during dry weather.

OUTFALL SAMPLING

A total of 109 outfalls were selected for dry weather screening based on flow data from previous outfall inspections and proximity to Milford's impaired waterbodies. EP selected a group of 83 outfall locations to start, and 26 additional outfall locations for EP to screen in case some outfalls from the original list of 83 were inaccessible. On June 4th, June 5th, July 26th and August 15th EP field staff screened 82 of these 109 MS4 outfall locations, most from the original list of 83 and some from the 26 additional outfalls. The complete list of all outfalls to screen/sample is attached as *Table 1: Outfalls to Screen/Sample 2019* and the locations are shown in *Figure 1: Milford Outfall Sampling Locations*.

EP was able to screen a total of 82 outfalls throughout dry weather inspections. During the screening process, 16 of the 82 MS4 outfalls were found flowing. The other 66 locations had no flow at the time of the investigation. EP collected samples at these 16 outfalls and field screened for temperature, conductivity, salinity, dissolved oxygen and pH. Water samples for ammonia nitrogen, surfactants (MBAS), total residual chlorine and E.coli were sent to a certified laboratory, ESS Laboratory located in Cranston, Rhode Island. Additional sampling parameters were applied to outfalls discharging to waterbodies with

TMDL requirements, such as nitrogen, turbidity, fecal coliform, phosphorus and biological oxygen demand. Both field and analytical results are shown in *Table 2: Milford Dry Weather Outfall Sampling Results*.

INSPECTION UPDATES

Throughout the outfall screening process, EP updated the inspection data for each structure visited. This information includes a photograph, updated location, structure type, material, size, condition, flow condition, receiving waterbody and headwall type. As described in the scope of work, this was most important to verify the outfall's receiving waterbody and eliminate any improperly categorized outlets, inlets or culverts from the Town's MS4 outfall count.

EP did identify five (6) structures that were improperly categorized as outfalls, and should be eliminated from the Town's outfall count. These structures include several 4" PVC gutters, an outlet to a BMP and a box culvert. Therefore, there are 79 remaining outfalls to be screened by June 2021. A log of each structure's updated inspection data is included in *Table 3: Outfall Structure Log*.

In addition to the 82 screened outfall locations, EP visited 22 other outfall locations which will require a second visit in order to complete the screening process. EP was unable to screen these locations due to excess vegetation or an upstream manhole being located on a busy road (requiring a police detail). These locations should be revisited during the next phase of outfall screening. *Table 4* lists the 22 outfall locations to be revisited, and any action items for Town maintenance.

RESULTS AND RECOMMENDATIONS

Of the 16 outfalls that were sampled during dry weather, three (3) tested above method reporting limits for E.coli. The limit threshold for E.coli is 236 MPN/100 mL. These outfalls include OF-40 (770.1 MPN/100mL), OF-348 (488.44 MPN/100 mL) and OF-312 (68,108 MPN/100mL), which discharge to the Charles River, Godfrey Brook and Milford Pond respectively. The US-EPA has determined that if levels of E.coli exceed 236 MPN (most probable number) per 100 mL of water, a health risk to humans may exist and a recreational water quality advisory should be issued. One of these outfalls, OF-312, also tested above limit thresholds for ammonia nitrogen and total phosphorus. Sampling results are shown in *Table 2: Milford Dry Weather Outfall Sampling Results*.

As stated in the Permit, a Problem Outfall is defined as one with known or suspected contributions of illicit discharges based on previous screening results indicating likely sewer input. Likely sewer input is classified as: 1) olfactory or visual evidence of sewage, 2) 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 3) Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L and detectable levels of chlorine. If any outfalls are categorized as Problem Outfalls, they are to be reprioritized in the outfall ranking as part of the IDDE plan, and ranked at the top of the Problem Priority Outfalls category for investigation. Investigations of catchments associated with Problem Outfalls are to begin no later than two (2) years from the permit effective date.

Although none of the Town's outfalls qualify as a Problem Outfall, including those sampled under the FY18 scope, EP recommends that the Town reprioritize these three (3) outfalls at the top of the ranking for catchment investigations.

In order to comply with the Permit, EP recommends screening the remaining 79 outfall locations in Year 2 of the Permit. This would include the 22 outfalls that were visited under this task and need to be revisited

with a police detail or after overgrown vegetation has been cleared. This will ensure that all MS4 outfalls have been visited by June 2021, within the first three (3) years of the Permit.

Enclosures:

Figure 1 – Milford Outfall Sampling Locations

Table 1 – Outfalls to Screen and Sample 2019

Table 2 – Milford Dry Weather Outfall Sampling Results: June – August 2019

Table 3 – Outfall Structure Log

Table 4 – Outfalls to be Revisited

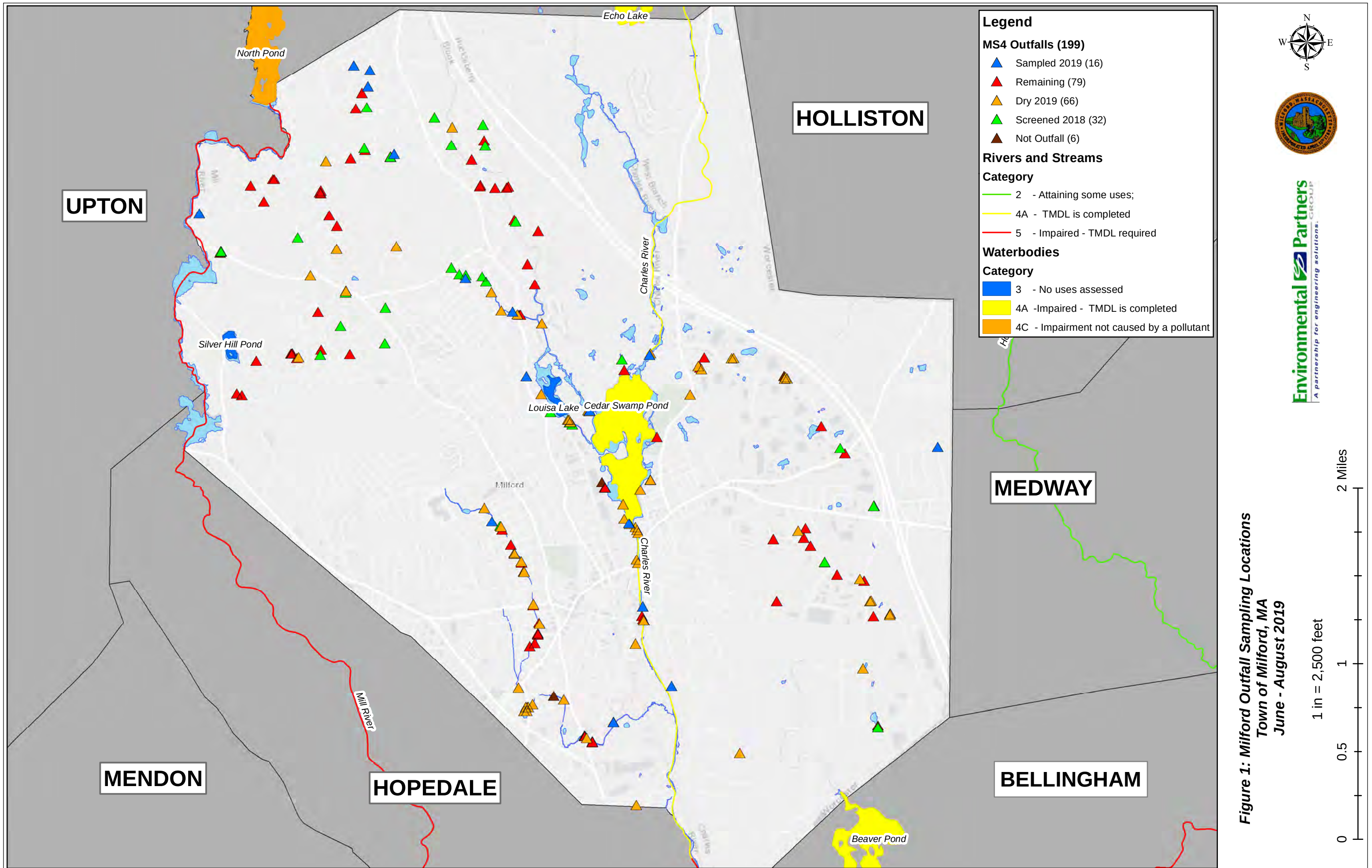


Table 1: Outfalls to Screen/Sample

	Outfall_ID	Flow_Notes	MS4Outfalls	Receiving Water	Additional Sampling Parameters	All outfalls sampled for:
1	31		Yes	Charles River	*Phosphorus; **Bacteria/pathogens	Ammonia, Chlorine, E. coli, Surfactants - = Only Ammonia, Chlorine, E.coli and Surfactants to be tested * = Upper/Middle Charles River Watershed Phosphorus TMDL ** = Charles River Watershed Bacteria/Pathogen TMDL
2	33		Yes	Charles River		
3	37	No	Yes	Charles River		
4	38		Yes	Charles River		
5	39	No	Yes	Charles River		
6	40		Yes	Charles River		
7	41		Yes	Charles River		
8	42		Yes	Charles River		
9	1029	No	Yes	Charles River		
10	OF-382	No	Yes	Charles River		
11	1001		Yes	Fiske Millpond	-	
12	92	No	Yes	Godfrey Brook	*Phosphorus; **Bacteria/pathogens	
13	93	No	Yes	Godfrey Brook		
14	116	Yes	Yes	Godfrey Brook		
15	124	Yes	Yes	Godfrey Brook		
16	OF-348	No	Yes	Godfrey Brook		
17	1026	Yes	Yes	Huckleberry Brook	*Phosphorus; **Bacteria/pathogens	
18	OF-173	No	Yes	Huckleberry Brook		
19	18	No	Yes	Louisa Lake	*Phosphorus; **Bacteria/pathogens	
20	24		Yes	Louisa Lake		
21	146	Yes	Yes	Louisa Lake		
22	OF-133	No	Yes	Louisa Lake		
23	9	No	Yes	Milford Pond	*Phosphorus; **Bacteria/pathogens; Dissolved Oxygen (BOD, and either Total Phos (freshwater) or Total Nitrogen (salt water)	
24	15		Yes	Milford Pond		
25	25		Yes	Milford Pond		
26	26		Yes	Milford Pond		
27	27		Yes	Milford Pond		
28	30		Yes	Milford Pond		
29	35		Yes	Milford Pond		
30	36		Yes	Milford Pond		
31	302	No	Yes	Milford Pond		
32	312	No	Yes	Milford Pond		
33	313	No	Yes	Milford Pond	*Phosphorus; **Bacteria/pathogens	
34	OF-72	No	Yes	Milford Pond		
35	OF-73	No	Yes	Milford Pond		
36	3		Yes	Milford Pond		
37	OF-365	Yes	Yes	Mill River	-	
38	OF-371	Unknown	Yes	Unnamed Pond East of Milford Pond (2)	*Phosphorus; **Bacteria/pathogens; Dissolved Oxygen (BOD, and either Total Phos (freshwater) or Total Nitrogen (salt water)	
39	OF-82	No	Yes	Unnamed Pond East of Milford Pond (2)		
40	OF-83	Unknown	Yes	Unnamed Pond East of Milford Pond (2)		
41	1024		Yes	Unnamed Pond East of Milford Pond (2)		
42	OF-387	No	Yes	Unnamed Pond East of Milford Pond (2)		
43	OF-80	No	Yes	Unnamed Pond East of Milford Pond (2)	*Phosphorus; **Bacteria/pathogens	
44	OF-81		Yes	Unnamed Pond East of Milford Pond (2)		
45	158		Yes	Unnamed Pond North of Louisa Lake	*Phosphorus; **Bacteria/pathogens	
46	1158		Yes	Unnamed Pond North of Louisa Lake		
47	160		Yes	Unnamed Stream East of Fiske Millpond (2)	-	
					*Phosphorus; **Bacteria/pathogens; Dissolved Oxygen (BOD, and either Total Phos (freshwater) or Total Nitrogen (salt water)	
48	253		Yes	Unnamed Stream East of Milford Pond	*Phosphorus; **Bacteria/pathogens	
49	1292		Yes	Unnamed Tributary to Beaver Pond		
50	1027		Yes	Unnamed Tributary to Beaver Pond (2)		
51	OF-145	Yes	Yes	Unnamed Tributary to Huckleberry Brook (2)	*Phosphorus; **Bacteria/pathogens	
52	OF-148	Yes	Yes	Unnamed Tributary to Huckleberry Brook (2)		
53	OF-170	Yes	Yes	Unnamed Tributary to Huckleberry Brook (2)		
54	OF-178	Yes	Yes	Unnamed Tributary to Huckleberry Brook (3)		
55	233	Yes	Yes	Unnamed Tributary to Huckleberry Brook (6)		
56	1052	No	Yes	Unnamed Tributary to Huckleberry Brook (6)	*Phosphorus; **Bacteria/pathogens	
57	OF-2	Yes	Yes	Unnamed Tributary to Huckleberry Brook (6)		
58	149		Yes	Unnamed Tributary to Louisa Lake		
59	OF-127	No	Yes	Unnamed Tributary to Louisa Lake		
60	OF-128		Yes	Unnamed Tributary to Louisa Lake	*Phosphorus; **Bacteria/pathogens	
61	OF-129	No	Yes	Unnamed Tributary to Louisa Lake		
62	OF-130	No	Yes	Unnamed Tributary to Louisa Lake		
63	OF-131		Yes	Unnamed Tributary to Louisa Lake		
64	OF-141	No	Yes	Unnamed Tributary to Louisa Lake		
65	182	No	Yes	Unnamed Tributary to Milford Pond	*Phosphorus; **Bacteria/pathogens; Dissolved Oxygen (BOD, and either Total Phos (freshwater) or Total Nitrogen (salt water)	
66	183	No	Yes	Unnamed Tributary to Milford Pond		
67	304	No	Yes	Unnamed Tributary to Milford Pond		
68	1067		Yes	Unnamed Tributary to Milford Pond	*Phosphorus; **Bacteria/pathogens	
69	5		Yes	Unnamed Tributary to Milford Pond		
70	264	No	Yes	Unnamed Tributary to Stall Brook		
71	269	Yes	Yes	Unnamed Tributary to Stall Brook		
72	273	No	Yes	Unnamed Tributary to Stall Brook		
73	OF-25	No	Yes	Unnamed Tributary to Stall Brook	*Phosphorus; **Bacteria/pathogens	
74	OF-286	Yes	Yes	Unnamed Tributary to Stall Brook		
75	OF-292	No	Yes	Unnamed Tributary to Stall Brook		
76	OF-31	No	Yes	Unnamed Tributary to Stall Brook		
77	OF-34	No	Yes	Unnamed Tributary to Stall Brook	*Phosphorus; **Bacteria/pathogens; Dissolved Oxygen (BOD, and either Total Phos (freshwater) or Total Nitrogen (salt water)	
78	1021	No	Yes	Unnamed Wetlands East of Milford Pond		
79	1022	No	Yes	Unnamed Wetlands East of Milford Pond		
80	OF-14		Yes	Unnamed Wetlands East of Milford Pond		
81	OF-15	No	Yes	Unnamed Wetlands East of Milford Pond		
82	1048	No	Yes	Unnamed Wetlands South of North Pond	-	
83	OF-38	Yes	Yes	Unnamed Wetlands West of Hopping Brook	*Phosphorus; **Bacteria/pathogens	

Additional Sampling Locations					
	Outfall_ID	Flow_Notes	MS4Outfalls	Receiving Water	Additional Sampling Parameters
1	1060	No	Yes	Godfrey Brook	*Phosphorus; **Bacteria/pathogens
2	87		Yes	Godfrey Brook	
3	88		Yes	Godfrey Brook	
4	94	No	Yes	Godfrey Brook	
5	75		Yes	Godfrey Brook	
6	76		Yes	Godfrey Brook	
7	77		Yes	Godfrey Brook	
8	61		Yes	Godfrey Brook	
9	105	No	Yes	Godfrey Brook	
10	108	No	Yes	Godfrey Brook	
11	112	No	Yes	Godfrey Brook	
12	118	No	Yes	Godfrey Brook	
13	120		Yes	Godfrey Brook	
14	125	No	Yes	Godfrey Brook	
15	127	No	Yes	Godfrey Brook	
16	291	No	Yes	Godfrey Brook	
17	292	No	Yes	Godfrey Brook	
18	70		Yes	Godfrey Brook	
19	72		Yes	Godfrey Brook	
20	73		Yes	Godfrey Brook	
21	74		Yes	Godfrey Brook	
22	71		Yes	Godfrey Brook	*Phosphorus; **Bacteria/pathogens; Dissolved Oxygen (BOD, and either Total Phos (freshwater) or Total Nitrogen (salt water)
23	1095		Yes	Godfrey Brook	
24	34	Yes	Yes	Milford Pond	
25	1	No	Yes	Milford Pond	
26	2	Yes	Yes	Milford Pond	



Table 2: Milford Dry Weather Outfall Sampling Results
June - August 2019

June 4, 2019

		<i>Beach St</i>	<i>Vernon St</i>	<i>Cedar St</i>	<i>Janock Rd</i>
		OF-40	OF-348	OF-1029	OF-38
Date Sampled		6/4/2019	6/4/2019	6/4/2019	6/4/2019
Time Sampled		9:20 AM	10:00 AM	11:10 AM	2:00 PM
<i>Field Test Results</i>	<i>Threshold</i>				
Temperature (°C)		4.8	5	6.1	4.5
Conductivity (µS/cm)	2000 (µS/cm)	7.2	445.6	701.8	346.6
Salinity (ppt)		0.35	0.22	0.34	0.17
Dissolved Oxygen (mg/L)		11.83	12.25	105.1	13.82
pH	<6.5, >8.0	7.61	7.72	7.22	7.71
<i>Analytical Results</i>					
Nitrogen, Ammonia (mg/L)	0.5 mg/L	0.1	0.1	0.148	0.08
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	ND	ND	ND
Phosphorus, Total (mg/L)	0.1 mg/L	0.022	0.089	ND	ND
Chlorine, Total (mg/L)	0.011/0.02 mg/L	ND	ND	ND	ND
E. Coli (MPN/100 mL)	236 MPN/100 mL	770.1	488.44	<1	<1

Notes:

NT: Not Tested

Bold Values exceed contaminant criteria.

*MA Department of Public Health Swimming Code

**US EPA Guidelines - Recreational Water Quality Advisory (235 CFU/100 mL)

Chlorine Levels

a. >0.011 mg/L - detectable level of HACH field kit

b. 0.2 - target for drinking water distribution

Table 2: Milford Dry Weather Outfall Sampling Results
June - August 2019

June 5, 2019

		<i>Tanglewood Dr</i>	<i>Brook Hollow Rd</i>	<i>Sunwood Dr</i>	<i>Esther Dr</i>	<i>Mill Pond Cir</i>	<i>Kellett Dr</i>	<i>Lucia Dr</i>	<i>Princess Pine Ln</i>
		OF-145	OF-148	OF-170	OF-178	OF-365	124	OF-128	OF-129
Date Sampled		6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/5/2019
Time Sampled		3:09 PM	2:56 PM	2:36 PM	2:05 PM	12:55 PM	11:43 AM	10:17 AM	9:43 AM
<i>Field Test Results</i>	<i>Threshold</i>								
Temperature (°C)		4.6	4.1	4.3	5.2	9.2	10.1	6.3	8.0
Conductivity (µS/cm)	2000 (µS/cm)	1123.0	998.0	668.7	467.9	299.8	490.2	274.9	554.3
Salinity (ppt)		0.56	0.49	0.33	0.23	0.14	0.24	0.13	0.26
Dissolved Oxygen (mg/L)		17.11	12.53	14.66	14.83	11.26	11.46	11.76	11.82
pH	<6.5, >8.0	7.20	7.19	7.76	7.96	7.90	7.61	7.81	8.02
<i>Analytical Results</i>									
Nitrogen, Ammonia (mg/L)	0.5 mg/L	0.13	0.40	0.08	ND	0.17	0.19	0.08	0.16
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	ND	ND	ND	ND	ND	ND	ND
Phosphorus, Total (mg/L)	0.1 mg/L	0.040	ND	0.055	ND	-	0.015	0.052	0.058
Chlorine, Total (mg/L)	0.011/0.02 mg/L	ND	ND	ND	ND	ND	ND	ND	ND
E. Coli (MPN/100 mL)	236 MPN/100 mL	<1	<1	2	1	<1	4	<1	5

Notes:

NT: Not Tested

Bold Values exceed contaminant criteria.

*MA Department of Public Health Swimming Code

**US EPA Guidelines - Recreational Water Quality Advisory (235 CFU/100 mL)

Chlorine Levels

a. >0.011 mg/L - detectable level of HACH field kit

b. 0.2 - target for drinking water distribution

Table 2: Milford Dry Weather Outfall Sampling Results
June - August 2019

July 26, 2019

		<i>Fino Field</i>	<i>29 Dilla St</i>	<i>Reed St</i>	<i>65-67 Dilla St</i>
		OF-312	OF-182	OF-146	OF-002
Date Sampled		7/26/2019	7/27/2019	7/28/2019	7/29/2019
Time Sampled		10:15 AM	12:45 PM	1:17 PM	2:05 PM
<i>Field Test Results</i>	<i>Threshold</i>				
Temperature (°C)		22.1	19.7	18.8	21.3
Conductivity (µS/cm)	2000 (µS/cm)	841.0	235.0	466.0	909.0
Salinity (ppt)					
Dissolved Oxygen (mg/L)		16.75	10.29	10.38	9.71
pH	<6.5, >8.0	8.27	7.02	6.33	7.00
<i>Analytical Results</i>					
Nitrogen, Ammonia (mg/L)	0.5 mg/L	0.67	0.15	0.13	0.09
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	ND	ND	ND
Phosphorus, Total (mg/L)	0.1 mg/L	0.270	ND	0.018	0.014
Chlorine, Total (mg/L)	0.011/0.02 mg/L	ND	ND	ND	ND
E. Coli (MPN/100 mL)	236 MPN/100 mL	65108	4	56	6

Notes:

NT: Not Tested

Bold Values exceed contaminant criteria.

*MA Department of Public Health Swimming Code

**US EPA Guidelines - Recreational Water Quality Advisory (235 CFU/100 mL)

Chlorine Levels

a. >0.011 mg/L - detectable level of HACH field kit

b. 0.2 - target for drinking water distribution

Table 3: Outfall Structure Log
June - August 2019

Status	Outfall ID	Date	Time	Address	Structure Type	Structure Condition	Structure Material	Pipe Material	Pipe Diameter	Pipe Condition	Flow	Sediment	Submerged	Flow Notes	Inspection Notes	Headwall Material	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Specific Conductance (µs/cm)	Salinity (ppt)	Connectivity Verified	Receiving Water Verified	Notes
Sampled	312	2019-07-26	10:09	Milford MA 01757 US				RCP	12		Yes			Sample taken from manhole	Apparent trash can in manhole; outfall was inaccessible behind fence		22.12	8.27	16.75	841		yes	yes	
Sampled	002	2019-07-26	13:56	65–67 Dilla St Milford MA 01757 US	Pipe	N/A		RCP	18	Poor	Yes	No	No	Low trickle	Soap bubbles	N/A	21.32	7	9.71	909		yes	yes	
Sampled	146	2019-07-26	13:12	116 Reed St Milford MA 01757 US	Headwall	Fair		RCP	24	Fair	Yes	No	No	Heavy flow		Stone	18.82	6.33	10.38	466		yes	yes	
Sampled	182	2019-07-26	12:50	29 Dilla St Milford MA 01757 US	Headwall	Good		RCP	12	Good	Yes				Sewer odor	Stone	19.7	7.02	10.29	235		yes	yes	
Sampled	OF-145	2019-06-05	15:09	38 Tanglewood Dr Milford MA 01757 US	Headwall	Fair		RCP	18	Good	Yes	No	<25%			Stone	4.6	7.2	17.11	1123	0.56	yes	yes	
Sampled	OF-148	2019-06-05	14:56	9 Brook Hollow Rd Milford MA 01757 US	Headwall	Good		CPP	12	Fair	Yes	<25%	~50%			Concrete	4.1	7.19	12.53	998	0.49	yes	yes	
Sampled	OF-170	2019-06-05	14:36	5 Sunwood Dr Milford MA 01757 US	Headwall	Good		RCP	12	Good	Yes	No	10%	Sampled from upstream MH	CB in front of 2 sun wood drive infiltrating groundwater through cracks in structure.	Stone	4.3	7.76	14.66	668.7	0.33	yes	yes	Sampled from upstream MH
Sampled	OF-178	2019-06-05	14:05	2 Esther Dr Milford MA 01757 US	Flared End Section	N/A		RCP		Good	Yes	No	No	Sampled from upstream CB		N/A	5.2	7.96	14.83	467.9	0.23	yes	yes	Sampled from upstream CB
Sampled	OF-365	2019-06-05	12:55	12 Mill Pond Cir Milford MA 01757 US	Headwall	Good		RCP	24”	Good	Yes	Yes	10%		Sampled from upstream MH	Concrete	9.2	7.9	11.26	299.8	0.14	yes	yes	
Sampled	124	2019-06-05	11:43	21 Kellett Dr Milford MA 01757 US	Pipe	N/A		RCP	18”	Good	Yes	No	No		Sampling from upstream CB	N/A	10.1	7.61	11.46	490.2	0.24	yes	yes	Sampled from upstream CB
Sampled	OF-128	2019-06-05	10:17	2 Lucia Dr Milford MA 01757 US	Pipe			ICP	15”	Good	Yes	Yes	20%		Sampled from upstream MH		6.3	7.81	11.76	274.9	0.13	no	yes	Sampled from upstream MH
Sampled	OF-129	2019-06-05	09:43	21 Princess Pine Ln Milford MA 01757 US	Pipe	N/A		RCP		Good	No	No	10%		Outfall dry. Sampled from upstream MH	N/A	8	8.02	11.82	554.3	0.26	yes	yes	Sampled from upstream MH.
Sampled	OF-38	2019-06-04	13:41	29 Janock Rd Milford MA 01757 US	Headwall	Good		RCP		Good	Yes	Yes	15%			Stone	4.5	7.71	13.82	346.6	0.17	yes	yes	
Sampled	1029	2019-06-04	11:00	14 S Cedar St Milford MA 01757 US	Headwall	Good		RCP		Good	No	No	No		Could not locate outfall, sampled from 4” PVC upstream CB in front of #92 East St.	Concrete	6.1	7.22	105.1	701.8	0.34	yes	yes	Sample collected from steady flow out of 4” pvc pipe into CB in front of #92 East St. Pipe may be coming from #21 South Central St.
Sampled	OF-348	2019-06-04	09:37	77–81 Vernon St Milford MA 01757 US	Headwall	Good		RCP	12”	Good	No	No	<25%	Upstream manhole opened, flowing		Concrete	5	7.72	12.25	445.6	0.22	yes	yes	Sampled from upstream MH
Sampled	040	2019-06-04	09:09	35 Beach St Milford MA 01757 US				RCP	36		Yes				Could not access, in brush behind fence		4.8	7.61	11.83	7,248	0.35	yes	no	Sampled upstream MH
Dry	005	2019-08-15	08:58	80–82 Cedar St Milford MA 01757 US	Pipe			RCP	12	Good	No	Unknown	20% submerged		Behind a fence							yes	yes	
Dry	1060	2019-08-15	13:08	24 Green St Milford MA 01757 US	Culvert	Unknown			0		No		Unknown	Observed from upstream catch basin, no flow. Standing water.	Unable to observe pipe end, no access to inside of culvert.							no	no	
Dry	1095	2019-08-15	13:05	19 Green St Milford MA 01757 US	Culvert wall	Good	Stone	CMP	12	Poor	No				Pipe in wall of culvert							yes	yes	
Dry	094	2019-08-15	13:02	33 Green St Milford MA 01757 US	Pipe			RCP	12	Good	No	80%	No		Catch basin connected to outfall has collapsed, requires immediate attention							yes	yes	
Dry	074	2019-08-15	12:29	110 S Main St Milford MA 01757 US	Pipe	Good	Stone/rip rap	CMP	10	Good	No	None	No		Corrugated metal pipe coming out of bottom of riprap hill into stream	None						yes	yes	
Dry	087	2019-08-15	12:17	43 Fruit St Milford MA 01757 US	Pipe	fair	VC	VC	18	Fair	No				Behind house							yes	yes	
Dry	061	2019-08-15	12:07	340 Main St Milford MA 01757 US				RCP	12	Fair	No	Unknown	Yes	No flow	Stormwater connects to stream through this catch basin, no flow.							yes	yes	
Dry	105	2019-08-15	11:49	9 Water St Milford MA 01757 US	Culvert	Fair	Cement/stone	RCP	24	Good	No	No	No		Headwall is culvert wall							yes	yes	
Dry	108	2019-08-15	11:44	21-23 West St Milford MA 01757 US	Culvert	Fair	Cement	RCP	12	Good	No	No	No		Goes to culverted stream from manhole in driveway							yes	yes	
Dry	112	2019-08-15	11:19	140 W Spruce St Milford MA 01757 US	Culvert	Fair	Cement	CMP	12	Fair	No	No	No		Outfall drops into culvert from catch basin							yes	yes	
Dry	118	2019-08-15	11:10	37 W Walnut St Milford MA 01757 US	Culvert	Fair	Stone	RCP	12	Good, rusty	No	No	No		Pipe under road in middle of culvert in stone wall							yes	yes	
Dry	120	2019-08-15	11:03	38 W Walnut St Milford MA 01757 US	Catch basin	Fair	Iron				No			Dry	Drop inlet	None						yes	yes	CB drops into culverted stream, no flow
Dry	125	2019-08-15	10:42	16 Hale Ave Milford MA 01757 US	Headwall	Fair	Stone	RCP	6”	Good	No	No	Yes, 60%	No, stagnant water	No sign of flow in stagnant water, submerged 60%	Stone						yes	yes	
Dry	127	2019-08-15	10:32	15 Packard Rd Milford MA 01757 US	Headwall	Fair	Concrete	RCP	10”	Good	No	No	No	No flow	Rock wedged in pipe	Concrete						yes	yes	
Dry	OF-82	2019-08-15	08:56	91 Cedar St Milford MA 01757 US	Flared End Section	N/A		RCP		Poor	No	No	No		Pipe disconnected, causing erosion							yes	yes	Pipe disconnected, requires maintenance
Dry	001	2019-07-26	13:51	68 Dilla St Milford MA 01757 US	Headwall	Fair	Other	Other	12		No		No	DRIPPING water, not enough to sample	Soap bubbles	Concrete						yes	yes	
Dry	OF-133	2019-07-26	13:37	115 Purchase St Milford MA 01757 US	Headwall	Good	Stone	CMP	18	Fair	No	Yes	No	No	Outfall covered in stones, clogged w sediment	Block						yes	yes	
Dry	1067	2019-07-26	12:57	26 Dilla St Milford MA 01757 US	Other	Good					No			Dry	Catch basin is the outfall in this situation							yes	yes	
Dry	304	2019-07-26	12:50	29 Dilla St Milford MA 01757 US	Headwall	Good		RCP	12	Good	No					Stone						yes	yes	
Dry	183	2019-07-26	12:33	27 Dilla St Milford MA 01757 US	Headwall	Good	RCP	RCP	12	Good	No	No	No	No	Access from 29 Dilla backyard	Stone						yes	yes	
Dry	018	2019-07-26	12:25	13 Dilla St Milford MA 01757 US	Headwall	Good	RCP	RCP	10	Good	No	No	No	None	On headwall	Concrete						yes	yes	
Dry	024	2019-07-26	12:19	8 Dilla St Milford MA 01757 US	Pipe	N/A		DI	8”	Good	No	No	20%			N/A						yes	yes	
Dry	023	2019-07-26	12:16	22–28 Dilla St Milford MA 01757 US	Pipe	N/A	Precast	RCP	48	Good	No	No	5%			N/A						yes	yes	
Dry	015	2019-07-26	10:59	Milford MA 01757 US	Flared end section	Good	Cement	RCP	15	Good	No	None	No									yes	yes	
Dry	026	2019-07-26	10:52	35 Granite St Milford MA 01757 US	Headwall	Good	Good	CMP	15	Good	No	No	No	Non	Clogged w leaves	Cement						yes	yes	
Dry	035	2019-07-26	09:35	33 Granite St Milford MA 01757 US	Pipe	Good	Stone	RCP	15	Good	No	50%	No	No	Private	Stone						yes	yes	
Dry	036	2019-07-26	09:30	33 Granite St Milford MA 01757 US	Pipe	Good	RCP	RCP	12	Good	No	10%	No	None	Private	No headwall						yes	yes	
Dry	034	2019-07-26	09:20	33 Granite St Milford MA 01757 US	Flared End Section	Good	Precast	RCP	24	Good	No	Yes; 5%	15%	Standing water	Standing water	Concrete						yes	yes	
Dry	031	2019-07-26	09:49	33 Granite St Milford MA 01757 US	Headwall	Good	Cement	RCP	24	Good	No	No	No			Cement						yes	yes	
Dry	033	2019-07-26	09:46	33 Granite St Milford MA 01757 US	Flared End	Poor	RCP	RCP	12	Poor	No	None	None	No	Thick brush							yes	yes	
Dry	OF-72	2019-07-26	09:07	29 Cedarview Cir Milford MA 01757 US	Headwall	Good		RCP	18”	Good	No	No	No			Concrete						yes	yes	

Table 3: Outfall Structure Log
June - August 2019

Status	Outfall ID	Date	Time	Address	Structure Type	Structure Condition	Structure Material	Pipe Material	Pipe Diameter	Pipe Condition	Flow	Sediment	Submerged	Flow Notes	Inspection Notes	Headwall Material	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Specific Conductance (µs/cm)	Salinity (ppt)	Connectivity Verified	Receiving Water Verified	Notes
Dry	OF-73	2019-07-26	09:05	29 Cedarview Cir Milford MA 01757 US	Headwall	Good		RCP	12"	Good	No	No	No			Concrete						yes	yes	
Dry	009	2019-07-26	08:52	23 Columbus Ave Milford MA 01757 US	Headwall	Fair	RCP	RCP	12	Poor	No	100%	No		Buried	Block						yes	yes	Pipe damaged, pieces of broken pipe in area
Dry	1048	2019-06-05	13:59	45 Camp St Milford MA 01757 US	Flared End Section	N/A		RCP	12	Good	No	No	No			Concrete						yes	yes	
Dry	1052	2019-06-05	13:22	12 Whitewood Rd Milford MA 01757 US	Headwall	Good		RCP	12"	Good	No	Yes	50%	Upstream CBs checked. No flow.	Other orifice is a culvert	Concrete						yes	yes	
Dry	160	2019-06-05	13:17	4 Oak Ter Milford MA 01757 US	Pipe			RCP	12	Poor	No	Yes	No									yes	yes	
Dry	OF-2	2019-06-05	12:47	199 Highland St Milford MA 01757 US	Headwall	Good		RCP		Good	No	No	No	Wet weather		Other						yes	yes	
Dry	233	2019-06-05	12:39	4 Tallpine Rd Milford MA 01757 US	Headwall	Good		RCP	15	Good	No	No	No	Wet weather		Concrete						yes	yes	
Dry	116	2019-06-05	11:37	29 Pleasant St Milford MA 01757 US	Culvert	Good		VC	8"	Fair	Yes	No	No			Block						no	yes	Outfall disconnected from pipe. ArcMap needs updating.
Dry	OF-127	2019-06-05	10:07	20 Lucia Dr Milford MA 01757 US	Headwall	Good		RCP		Good	No	No	No			Stone						yes	yes	
Dry	OF-141	2019-06-05	09:21	20 Chapel St Milford MA 01757 US	Pipe	N/A		RCP		Good	No	Yes	No			N/A						yes	yes	
Dry	OF-130	2019-06-05	09:12	168 Purchase St Milford MA 01757 US	Headwall	Good	Stone	VC	12"	Fair	No	No	No		Pipe is cracked	Block						yes	yes	
Dry	149	2019-06-05	08:55	24–214 Shadowbrook Ln Milford MA 01757 US				AC	4		No				MH is not connected to CB and Outfall. It's electric.							no	yes	MH is not connected to CB and Outfall. It's electric.
Dry	OF-80	2019-06-04	15:02	200 Fortune Blvd Milford MA 01757 US	Headwall	Good		RCP		Good	No	No	No			Concrete						yes	yes	
Dry	OF-387	2019-06-04	15:01	230 Fortune Blvd Milford MA 01757 US	Headwall	Good	Concrete	RCP	12"	Good	No	No	No		From bed bath and beyond	Concrete						yes	yes	To drainage basin
Dry	1021	2019-06-04	14:49	345 Fortune Blvd Milford MA 01757 US	Headwall	Good		RCP		Good	No	No	No			Block						no	no	Unable to find outlet pipe, enters drainage swale
Dry	1022	2019-06-04	14:48	345 Fortune Blvd Milford MA 01757 US	Flared End Section	N/A		RCP		Good	No	50%	No			N/A						yes	no	No waters, enters drainage swale
Dry	OF-15	2019-06-04	14:47	345 Fortune Blvd Milford MA 01757 US	Flared End Section	N/A		RCP	36	Good	No	No	No			N/A						yes	no	No waters, drainage swale
Dry	1027	2019-06-04	13:29	13 Huff Rd Milford MA 01757 US	Headwall	Good		RCP		Good						Concrete						no	no	Structure appears to be drainage culvert outlet or overflow from basin. Opened upstream manhole to basin and observed no flow
Dry	269	2019-06-04	13:13	4 Mason Dr Milford MA 01757 US	Headwall	Good		CPP		Good	Yes	No	No			Concrete						yes	yes	Opened upstream manholes and found no flow, no sample
Dry	273	2019-06-04	12:45	2–22 Maple St Milford MA 01757 US	Culvert	Good		RCP	12	Good	No		60%			Concrete						yes	yes	Outfall from CB, both pipes partially submerged, no flow, no sample
Dry	264	2019-06-04	12:43	1–15 Maple St Milford MA 01757 US	Headwall	Good		RCP	12	Good	No		50%			Concrete						yes	yes	Outfall from CB both partially submerged, no flow, no sample
Dry	OF-31	2019-06-04	12:25	1–15 Maple St Milford MA 01757 US	Headwall	Good		RCP	12	Fair	No	Yea	100%			Concrete						yes	yes	Outfall pipe and CB inlet pipe completely submerged, no flow
Dry	OF-34	2019-06-04	12:25	2–22 Maple St Milford MA 01757 US	Headwall	Good		RCP	12	Fair	No	Yes	100%			Concrete						yes	yes	Outfall pipe and CB inlet pipe completely submerged, no flow
Dry	OF-286	2019-06-04	12:07	48–98 Birch St Milford MA 01757 US	Flared End Section	Good	Concrete	RCP	12"	Good	Yes	Yes	10%	Flow from culvert inlet across Street	Flow verified to be from culvert inlet across street. No sample collected.	N/A						no	yes	Structure is also a culvert outlet for unrecorded culvert inlet across street.. Culvert inlet across street providing flow out of culvert outlet.
Dry	OF-25	2019-06-04	12:02	12–14 Birch St Milford MA 01757 US	Pipe	N/A		CMP		Fair	No	Yes	100%		Pipe between CBs acts as a culvert under Road.	N/A						yes	yes	Stagnant water in both CBs, drainage network is essentially a culvert
Dry	OF-382	2019-06-04	10:24	8 Evans Rd Milford MA 01757 US	Flared End Section	N/A		RCP		Good	No	~50%	No		Significant sediment buildup in pipe	N/A						yes	yes	
Dry	093	2019-06-04	10:13	33 Green St Milford MA 01757 US	Flared End Section	N/A		RCP	12	Good	No	Yes	70%	No flow in upstream CB	Unable to visually inspect	N/A						yes	yes	
Dry	092	2019-06-04	10:06	24 Green St Milford MA 01757 US		Good		RCP	12	Poor	No	Yes	90%	No flow in upstream CB		Stone						yes	yes	
Dry	042	2019-06-04	09:26	2 River St Milford MA 01757 US	Outfall	Poor	Concrete	RCP	15	Unknown	No Flow	Unknown	Yes									yes	yes	
Dry	037	2019-06-04	08:20	214–216 Central St Milford MA 01757 US	Headwall	Good		CMP	12	Good	No	No	No	None	Outlet from BMP STRUCTURE	Stone						yes	yes	From drainage BMP see photos
Dry	OF-371	2019-08-15	08:55	91 Cedar St Milford MA 01757 US	Pipe	N/A		RCP		Good	Unknown	<25%	~50%		9-15-15							no	no	Unable to locate pipe end, possibly under water in pond?
Dry	025	2019-07-26	10:38	Milford MA 01757 US				RCP	0		No		NO									yes	yes	
Dry	158	2019-06-05	13:44	4 Village Cir Milford MA 01757 US				HDPE	36						MH in front of 7 Village Circle infiltrating ground water. No flow from upstream pipe.							yes	yes	Flow appears to be infiltrating groundwater at MH in front of #7 Village Circle
Dry	OF-173	2019-06-05	11:03	15 Windsor Rd Milford MA 01757 US	Culvert	Good		CMP		Fair	No	<25%	~50%		Drops into culvert	Stone						yes	yes	
Dry	OF-292	2019-06-05	11:04	2–22 Maple St Milford MA 01757 US	Headwall	Good		CMP		Fair	No		50%			Concrete						no	no	
Could not Locate	077	2019-08-15	12:45	125–135 Depot St Milford MA 01757 US				PVC	6						Not sure this is an OF. Not located in the field.							no	no	
Could not Locate	076	2019-08-15	12:46	110 S Main St Milford MA 01757 US				PVC	6						Not sure this is an outfall. Not located in field. Excessive vegetation.							no	no	
Could not Locate	075	2019-08-15	12:46	110 S Main St Milford MA 01757 US				PVC	6						Not sure this is an outfall. Not located in vegetation.							no	no	
Could not Locate	071	2019-08-15	12:55	110 S Main St Milford MA 01757 US				CMP	6													no	no	
Could not Locate	313	2019-08-15	08:55	68–74 Cedar St Milford MA 01757 US	Pipe	N/A		RCP		Good	No	Yes	50%		Pipe seems to be GPSd behind 4' of vegetation, and over a chain linked fence, to edge of water. Unable to scale this fence covered in brush.	N/A						no	no	
Could not Locate	OF-83	2019-08-15	08:56	91 Cedar St Milford MA 01757 US	Flared End Section	N/A		RCP		Fair	Unknown	<25%	~50%			N/A						no	no	Pipe may be completely submerged, not able to visually confirm location.
Could not Locate	OF-131	2019-06-05	09:13	173 Purchase St Milford MA 01757 US	Pipe										Can't locate, assumed							no	no	Unable to locate
Could not Locate	003	2019-06-04	15:21	38 Ramsdell St Milford MA 01757 US	Pipe			RCP	24						Inlet located with flow. Could not locate outfall.							no	no	Outfall not accessible. Need police detail to open MH.
Could not Locate	038	2019-06-04	08:50	222 Central St Milford MA 01757 US				RCP	12						Private							no	yes	Unable to access. No upstream structures located.
Could not Locate	041	2019-06-04	08:37	186 Central St Milford MA 01757 US				RCP	18						Could not locate, may not exist?							no	no	No outfalls or structures
Could not Locate	039	2019-06-04	08:38	30 Front St Milford MA 01757 US	Pipe	Fair		PVC	10	Fair	No											no	no	No outfall, CB in front of garage door filled with white milky liquid, unable to see invert in CB

Table 3: Outfall Structure Log
June - August 2019

Status	Outfall ID	Date	Time	Address	Structure Type	Structure Condition	Structure Material	Pipe Material	Pipe Diameter	Pipe Condition	Flow	Sediment	Submerged	Flow Notes	Inspection Notes	Headwall Material	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Specific Conductance (µs/cm)	Salinity (ppt)	Connectivity Verified	Receiving Water Verified	Notes
To Be Revisited	292	2019-08-15	11:59	12 Water St Milford MA 01757 US				RCP	18	Good	No	No	No									no	no	
To Be Revisited	1026	2019-06-05	10:57	2 Julie Cir Milford MA 01757 US	Headwall	Poor		RCP		Good	Yes	Yes	No		Headwall fell over. Overflow outlet from retention pond.	Concrete						yes	yes	
To Be Revisited	291	2019-08-15	11:59	11 Water St Milford MA 01757 US				RCP	15	Good	No	No	No									no	no	
To Be Revisited	027	2019-08-15	15:31	Unknown	Pipe			RCP	18						Private							no	no	
To Be Revisited	302	2019-08-15	15:30	Unknown	Pipe			Other	0		No		NO		Private							no	no	
To Be Revisited	073	2019-08-15	12:37	110 S Main St Milford MA 01757 US				CMP	10						To be revisited in winter once vegetation is minimized							no	no	
To Be Revisited	070	2019-08-15	12:38	110 S Main St Milford MA 01757 US				CMP	10						To be revisited in winter once vegetation is minimal							no	no	
To Be Revisited	072	2019-08-15	12:39	110 S Main St Milford MA 01757 US				CMP	10						To be revisited when there is less vegetation							no	no	
To Be Revisited	017	2019-07-26	12:21	17–21 Dilla St Milford MA 01757 US	Headwall	Good		RCP	32"	Good	Yes	No	5%			Concrete						yes	yes	
To Be Revisited	OF-81	2019-06-04	15:09	3 Fortune Blvd Milford MA 01757 US											Outfall not accessible. Need police detail to open MH.							no	no	Outfall not accessible. Need police detail to open MH.
To Be Revisited	1024	2019-06-04	14:42	411–499 Fortune Blvd Milford MA 01757 US				RCP	12						Shot not taken on pipe							yes	yes	Need police detail to open upstream MH
To Be Revisited	253	2019-06-04	14:31	350 E Main St Milford MA 01757 US				RCP	12						2 CBs and a DMH lead to culvert. No info on arcmap for these structures							no	no	2 CBs and a DMH lead to culvert. No info on arcmap for these structures. May need police detail for upstream structure
Not Outfall	OF-14	2019-06-04	14:52	347–383 Fortune Blvd Milford MA 01757 US	Flared End Section			RCP	12						MH							no	no	Drain MH
Not Outfall	1292	2019-06-04	12:58	51 Maple St Milford MA 01757 US											Structure is a culvert inlet. Pipe from 1292 to nearest upstream MH does not exist.							no	no	Structure is a culvert inlet. Pipe from 1292 to nearest upstream MH does not exist.
Not Outfall	1158	2019-06-05	09:07	173 Purchase St Milford MA 01757 US	Culvert	Good	Stone	RCP	36"	Good	Yes	No	No	Culverted stream	Structure is a culvert not an outfall	Stone						yes	yes	Culvert outlet
Not Outfall	088	2019-08-15	13:23	43 Fruit St Milford MA 01757 US				PVC	4		No		No	No	Not an outfall.							no	no	This has not been confirmed as an outfall, small PVC pipe. Unsure of connectivity.
Not Outfall	030	2019-07-26	11:56	49 Sumner St Milford MA 01757 US	Pipe			HDPE	12		No	None	No	No	BMP outlet, behind fence, potentially private	None						yes	yes	
Not Outfall	1001	2019-06-05	12:50	66 Whitewood Rd Milford MA 01757 US	Headwall	Poor									Falling over, box culvert	Concrete						yes	yes	

Table 4: Outfalls to be Revisited
June - August 2019

Status	Outfall ID	Address	Inspection Notes	Additional Notes	Action
Could not Locate	038	222 Central St Milford MA 01757 US	Private	Unable to access. No upstream structures located.	Verify Private land
To Be Revisited	027	Unknown	Private		Verify Private land
To Be Revisited	302	Unknown	Private		Verify Private land
To Be Revisited	1026	2 Julie Cir Milford MA 01757 US	Headwall fell over. Overflow outlet from retention pond.		Town to maintain structure
Could not Locate	OF-131	173 Purchase St Milford MA 01757 US	Can't locate, assumed	Unable to locate	Town to locate structure
Could not Locate	041	186 Central St Milford MA 01757 US	Could not locate, may not exist?	No outfalls or structures	Town to locate structure
Could not Locate	076	110 S Main St Milford MA 01757 US	Not sure this is an outfall. Not located in field. Excessive vegetation.		Town to clear out vegetation
Could not Locate	075	110 S Main St Milford MA 01757 US	Not sure this is an outfall. Not located in vegetation.		Town to clear out vegetation
Could not Locate	071	110 S Main St Milford MA 01757 US			Town to clear out vegetation
Could not Locate	313	68–74 Cedar St Milford MA 01757 US	Pipe seems to be GPSd behind 4’ of vegetation, and over a chain linked fence, to edge of water. Unable to scale this fence covered in		Town to clear out vegetation
Could not Locate	OF-83	91 Cedar St Milford MA 01757 US		Pipe may be completely submerged, not able to visually confirm location.	Town to clear out vegetation
To Be Revisited	073	110 S Main St Milford MA 01757 US	To be revisited when there is less vegetation		Town to clear out vegetation
To Be Revisited	070	110 S Main St Milford MA 01757 US	To be revisited when there is less vegetation		Town to clear out vegetation
To Be Revisited	072	110 S Main St Milford MA 01757 US	To be revisited when there is less vegetation		Town to clear out vegetation
Could not Locate	039	30 Front St Milford MA 01757 US		No outfall, CB in front of garage door filled with white milky liquid, unable to see invert in CB	Town to clean CB
Could not Locate	003	38 Ramsdell St Milford MA 01757 US	Inlet located with flow. Could not locate outfall.	Outfall not accessible. Need police detail to open MH.	Police Detail
To Be Revisited	OF-81	3 Fortune Blvd Milford MA 01757 US	Outfall not accessible. Need police detail to open MH.	Outfall not accessible. Need police detail to open MH.	Police Detail
To Be Revisited	1024	411–499 Fortune Blvd Milford MA 01757 US	Shot not taken on pipe	Need police detail to open upstream MH	Police Detail
To Be Revisited	253	350 E Main St Milford MA 01757 US	2 CBs and a DMH lead to culvert. No info on arcmap for these structures	2 CBs and a DMH lead to culvert. No info on arcmap for these structures. May need police detail for upstream structure	Police Detail
Could not Locate	077	125–135 Depot St Milford MA 01757 US	Not sure this is an OF. Not located in the field.		EP to locate structure
To Be Revisited	291	11 Water St Milford MA 01757 US			EP to locate structure
To Be Revisited	292	12 Water St Milford MA 01757 US			EP to locate structure

TECHNICAL MEMORANDUM

Date: September 18, 2020

To Michael Dean, P.E. –Town Engineer, Town of Milford

Scott Crisafulli – Highway Surveyor, Town of Milford

From Scott Turner, P.E. – Director of Planning, Environmental Partners

CC Natalie Pommersheim – Project Manager, Environmental Partners

Subject Illicit Discharge Detection & Elimination (IDDE) Investigations
MS4 General permit Assistance for the Office of Planning & Engineering

This memorandum summarizes the FY20 Dry Weather Investigations, outlined in Task 2 of the Agreement for Professional Engineering Services –MS4 General permit Assistance for the Office of Planning & Engineering of the Town of Milford.

Under this task, Environmental Partners Group, Inc. (EP) conducted outfall screening and sampling over the course of three (3) days in June 2020. During the time of the outfall screening, the weather was clear. There was 0.44 inches of precipitation in the previous 48 hours of the June 9th inspection event, and there was 0.0 inches of precipitation in the previous 48 hours of the June 10th and 19th inspection events. A total of forty-seven (47) outfalls were screened, of which two were found to be flowing during dry weather. Due to the ongoing COVID-19 pandemic, EP's field work protocol was to avoid interacting with residents while conducting outfall investigations. Any outfalls that would require crossing through private property were avoided during this investigation, and will be prioritized in future visits when safe to do so.

Outfall Sampling

On June 9th, 10th and 19th, 2020, EP staff attempted to visit eighty-nine (89) outfalls during dry weather, approximately 46% of the 193 total identified MS4 outfalls in the Town of Milford. The locations of all eighty-nine (89) screened outfalls are shown on Figure 1: Dry Weather Outfall Sampling Locations.

Throughout the outfall screening process, EP personnel made the following observations:

- Forty-Five (45) outfalls were found to be dry.
- Two (2) outfalls (OF-123 and OF-180) were observed to be flowing during dry weather. EP personnel sampled these outfalls on June 10, 2020.
- Seven (7) outfalls (OF-117, OF-166, OF-169, 1039, 1041, 1097, 1100) could not be safely accessed due to their proximity to private residences. Due to the ongoing COVID-19 pandemic, EP field work protocol is to avoid interacting with residents while conducting outfall investigations. Any outfalls that would require crossing through private property were avoided. These 7 outfalls will be targeted for inspection in Fiscal Year 2021.
- Seven (7) outfalls (OF-81, OF-173, OF-292, 3, 25, 253, 1024) require further inspection of upstream structures that may require a police detail. These 7 outfalls will be targeted for inspection in Fiscal Year 2021.
- Five (5) outfalls (OF-193, OF-371, 313, 1040, 1053) require clearing of heavy brush before being revisited. These 5 outfalls will be targeted for inspection in Fiscal Year 2021.
- Four (4) outfalls could not be located by field personnel. These 4 outfalls will be targeted for inspection in Fiscal Year 2021.

Results and Recommendations

Of the 2 outfalls that were sampled during dry weather, one (1) tested above the limit threshold for Total Chlorine. The sample collected from OF-123, which discharges to Huckleberry Brook, had a Chlorine concentration of 0.12 mg/L, which is above the EPA Benchmark for Chlorine of 0.02 mg/L. All sampling results are compiled in Table 1: Dry Weather Outfall Sampling Results.

As stated in the Permit, a Problem Outfall is defined as one with known or suspected contributions of illicit discharges based on previous screening results indicating likely sewer input. Likely sewer input is classified as: 1) olfactory or visual evidence of sewage, 2) Ammonia $\geq$ 0.5 mg/L, surfactants $\geq$ 0.25 mg/L and bacteria levels greater than the water quality criteria applicable to the receiving water, or 3) Ammonia $\geq$ 0.5 mg/L, surfactants $\geq$ 0.25 mg/L and detectable levels of chlorine. If any outfalls are categorized as Problem Outfalls, they are to be reprioritized in the outfall ranking as part of the IDDE plan, and ranked at the top of the Problem Priority Outfalls category for investigation. Investigations of catchments associated with Problem Outfalls are to begin no later than two (2) years from the permit effective date.

Although OF-123 does not qualify as a Problem Outfall, EP recommends that the Town reprioritize the outfalls ranking for catchment investigations.

In order to comply with the Permit, EP recommends screening the remaining 23 outfall locations in Year 3 of the Permit. This will ensure that all MS4 outfalls have been visited by June 2021, within the first three (3) years of the Permit.

Attachments

Milford MS4 Certification Page

Table 1: Dry Weather Outfall Sampling Results

Figure 1: Dry Weather Outfall Sampling Locations

Laboratory Analytical Results

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

Signature

Date

Table 1: Dry Weather Outfall Sampling Results
June 2020

June 10, 2020

Location		<i>Pinewood Road</i>	<i>Camp Street</i>
Outfall ID		OF-123	OF-180
Date Sampled		6/10/2020	6/10/2020
Time Sampled		11:00 AM	11:45 AM
<i>Field Test Results</i>	<i>Threshold</i>		
Temperature (°C)		17.1	13
Conductivity (µS/cm)	2000 (µS/cm)	441.1	407.8
Salinity (ppt)		0.21	0.2
Dissolved Oxygen (mg/L)		6.69	7.7
pH	<6.5, >8.0	7.86	7.43
<i>Analytical Results</i>			
Nitrogen, Ammonia (mg/L)	0.5 mg/L	0.1	ND
Surfactants, MBAS (mg/L)	0.25 mg/L	0.05	0.05
Phosphorus, Total (mg/L)		0.328	0.017
Chlorine, Total (mg/L)	0.02 mg/L	0.12	ND
E. Coli (MPN/100 mL)	126*/235** MPN/100 mL	1	34.51

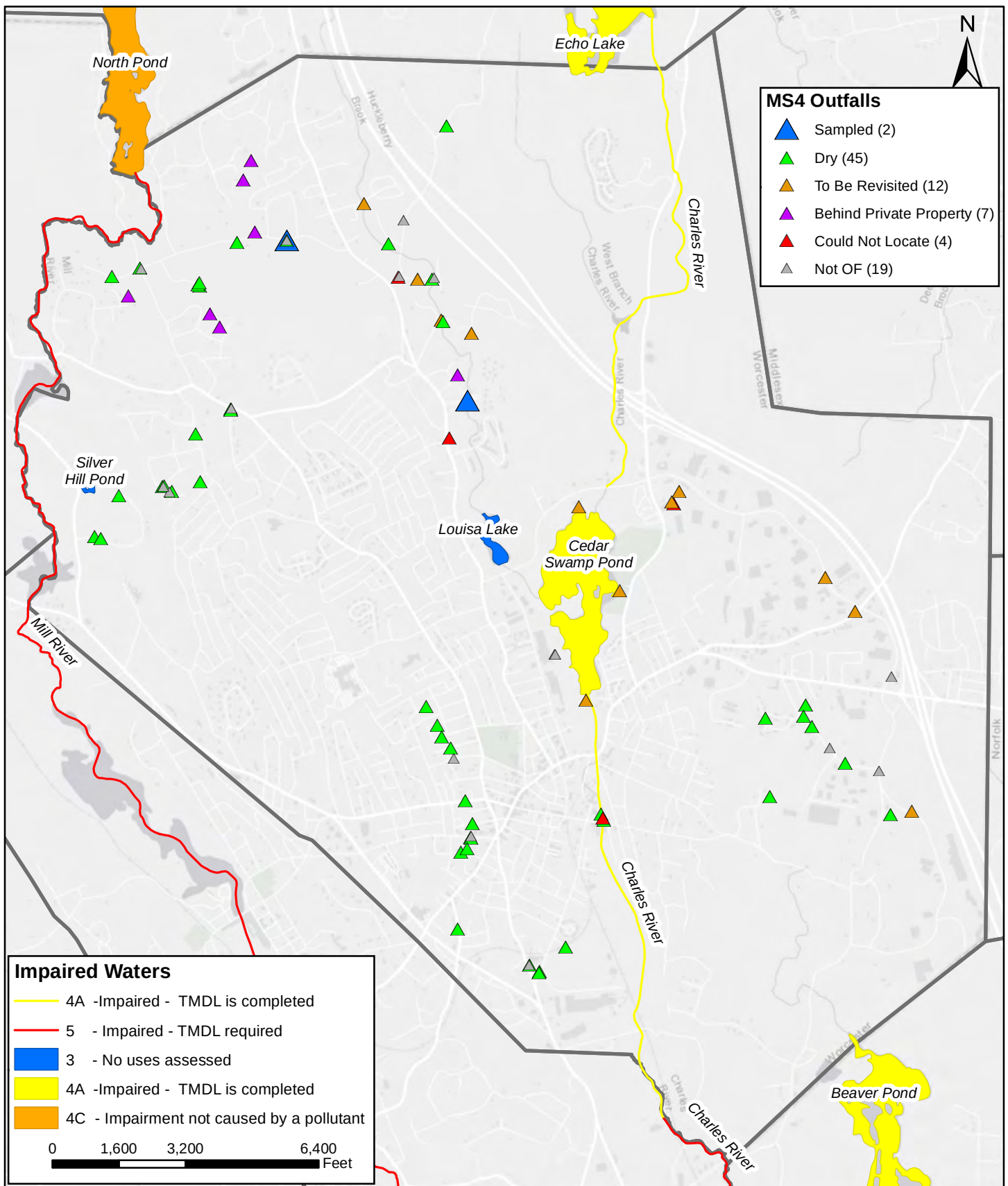
Notes:

ND: Non-Detect

Bold Values exceed contaminant criteria.

*MA Department of Public Health Swimming Code

**US EPA Guidelines - Recreational Water Quality Advisory (235 CFU/100 mL)



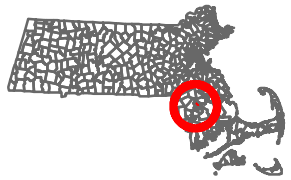




Figure 1
Dry Weather Outfall Sampling Locations
Milford, Massachusetts
June 2020





ANALYTICAL REPORT

Lab Number:	L2024055
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	William Watts
Phone:	(617) 657-0262
Project Name:	MILFORD OF
Project Number:	Not Specified
Report Date:	06/16/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2024055-01	OF-123	WATER	MILFORD, MA	06/10/20 11:00	06/10/20
L2024055-02	OF-180	WATER	MILFORD, MA	06/10/20 11:45	06/10/20



Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

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: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

Case Narrative (continued)

Sample Receipt

The samples were received at the laboratory above the required temperature range. The samples were delivered directly from the sampling site but were not on ice.

Surfactants, MBAS

The WG1380294-3 Laboratory Duplicate RPD for surfactants, mbas (46%), performed on L2024055-02, is above the acceptance criteria; however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPD is valid.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 06/16/20

INORGANICS & MISCELLANEOUS

Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

SAMPLE RESULTS

Lab ID: L2024055-01
Client ID: OF-123
Sample Location: MILFORD, MA

Date Collected: 06/10/20 11:00
Date Received: 06/10/20
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										
E. Coli (MPN)	1		MPN/100ml	1	NA	1	-	06/10/20 16:07	121,9223B	CM
General Chemistry - Westborough Lab										
Chlorine, Total Residual	0.12		mg/l	0.02	--	1	-	06/10/20 23:47	121,4500CL-D	AS
Nitrogen, Ammonia	0.090		mg/l	0.075	--	1	06/11/20 11:43	06/11/20 22:06	121,4500NH3-BH	AT
Phosphorus, Total	0.328		mg/l	0.010	--	1	06/11/20 10:15	06/11/20 13:51	121,4500P-E	SD
Surfactants, MBAS	0.050		mg/l	0.050	--	1	06/11/20 06:00	06/11/20 10:55	121,5540C	JA



Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

SAMPLE RESULTS

Lab ID: L2024055-02
Client ID: OF-180
Sample Location: MILFORD, MA

Date Collected: 06/10/20 11:45
Date Received: 06/10/20
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										
E. Coli (MPN)	34.51		MPN/100ml	1	NA	1	-	06/10/20 16:07	121,9223B	CM
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	06/10/20 23:47	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/11/20 11:43	06/11/20 22:07	121,4500NH3-BH	AT
Phosphorus, Total	0.017		mg/l	0.010	--	1	06/11/20 10:15	06/11/20 13:53	121,4500P-E	SD
Surfactants, MBAS	0.050		mg/l	0.050	--	1	06/11/20 06:00	06/11/20 10:55	121,5540C	JA



Project Name: MILFORD OF

Lab Number: L2024055

Project Number: Not Specified

Report Date: 06/16/20

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): 01-02 Batch: WG1380086-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	06/10/20 16:07	121,9223B	CM
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1380198-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	06/10/20 23:47	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1380294-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/11/20 06:00	06/11/20 10:52	121,5540C	JA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1380357-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	06/11/20 10:15	06/11/20 13:44	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1380367-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/11/20 11:43	06/11/20 22:02	121,4500NH3-BH	AT



Lab Control Sample Analysis

Batch Quality Control

Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1380198-2								
Chlorine, Total Residual	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1380294-2								
Surfactants, MBAS	96		-		65-126	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1380357-2								
Phosphorus, Total	104		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1380367-2								
Nitrogen, Ammonia	94		-		80-120	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1380198-4 QC Sample: L2024055-02 Client ID: OF-180												
Chlorine, Total Residual	ND	0.25	0.22	88		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1380294-4 QC Sample: L2024055-02 Client ID: OF-180												
Surfactants, MBAS	0.050	0.4	0.500	112		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1380357-3 QC Sample: L2023829-01 Client ID: MS Sample												
Phosphorus, Total	0.029	0.5	0.534	101		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1380367-4 QC Sample: L2024027-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.60	90		-	-		80-120	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MILFORD OF

Project Number: Not Specified

Lab Number: L2024055

Report Date: 06/16/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1380198-3	QC Sample: L2024055-01	Client ID: OF-123		
Chlorine, Total Residual	0.12	0.11	mg/l	9		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1380294-3	QC Sample: L2024055-02	Client ID: OF-180		
Surfactants, MBAS	0.050	0.080	mg/l	46	Q	32
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1380357-4	QC Sample: L2023829-01	Client ID: DUP Sample		
Phosphorus, Total	0.029	0.026	mg/l	11		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1380367-3	QC Sample: L2024027-01	Client ID: DUP Sample		
Nitrogen, Ammonia	ND	0.105	mg/l	NC		20

Project Name: MILFORD OF**Lab Number:** L2024055**Project Number:** Not Specified**Report Date:** 06/16/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2024055-01A	Plastic 60ml unpreserved	A	6	6	17.2	Y	Absent		MBAS-5540(2)
L2024055-01B	Bacteria Cup Na2S2O3 preserved	A	NA		17.2	Y	Absent		E-COLI-QT(.33)
L2024055-01C	Bacteria Cup Na2S2O3 preserved	A	NA		17.2	Y	Absent		E-COLI-QT(.33)
L2024055-01D	Plastic 500ml H2SO4 preserved	A	<2	<2	17.2	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2024055-01E	Amber 500ml unpreserved	A	6	6	17.2	Y	Absent		TRC-4500(1)
L2024055-01F	Plastic 950ml unpreserved	A	6	6	17.2	Y	Absent		MBAS-5540(2)
L2024055-02A	Plastic 60ml unpreserved	A	6	6	17.2	Y	Absent		MBAS-5540(2)
L2024055-02B	Bacteria Cup Na2S2O3 preserved	A	NA		17.2	Y	Absent		E-COLI-QT(.33)
L2024055-02C	Bacteria Cup Na2S2O3 preserved	A	NA		17.2	Y	Absent		E-COLI-QT(.33)
L2024055-02D	Plastic 500ml H2SO4 preserved	A	<2	<2	17.2	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2024055-02E	Amber 500ml unpreserved	A	6	6	17.2	Y	Absent		TRC-4500(1)
L2024055-02F	Plastic 950ml unpreserved	A	6	6	17.2	Y	Absent		MBAS-5540(2)

Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report



Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

- 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. 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.
- 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 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

Report Format: Data Usability Report



Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

Data Qualifiers

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.

Project Name: MILFORD OF
Project Number: Not Specified

Lab Number: L2024055
Report Date: 06/16/20

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 17

Published Date: 4/28/2020 9:42:21 AM

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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 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; 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.**EPA TO-12** Non-methane organics**EPA 3C** Fixed gases**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, SM4500CI-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.****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.****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.

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320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

FORM NO: 01-01 (rev. 12-Mar-2012)

TOTAL # BOTTLES

Filtration
☐ Field
☐ Lab to do

Preservation
☐ Lab to do

TECHNICAL MEMORANDUM

Date: August 27, 2021

To Michael Dean, P.E. – Town Engineer, Town of Milford

Scott Crisafulli – Highway Surveyor, Town of Milford

From Scott Turner, P.E. – Director of Planning, Environmental Partners

CC Natalie Pommersheim – Project Manager, Environmental Partners

Subject FY21 Illicit Discharge Detection & Elimination (IDDE) Dry Weather Screening
MS4 General Permit Assistance for the Office of Planning & Engineering

This memorandum summarizes the FY21 Dry Weather Investigations, outlined in Task 4C of the Agreement for Professional Engineering Services – MS4 General Permit Assistance for the Office of Planning & Engineering of the Town of Milford.

Under this task, Environmental Partners Group, LLC. (EP) conducted outfall screening and sampling over the course of five (5) days. During the time of outfall screenings, the weather was clear. There was less than 0.10 inches of precipitation in the 24 hours prior to all screenings. A total of eighty (80) outfalls were screened, of which five (5) were found to be flowing during dry weather. The Town of Milford's current MS4 outfall inventory includes 248 outfalls.

Additionally, EP inventoried, field-verified, and screened during dry weather nine (9) stormwater structures that represent MS4 interconnections or locations where the Town of Milford's stormwater system discharges into another MS4 that is managed by either neighboring Towns or the Massachusetts Department of Transportation (MassDOT). Of those interconnections screened, one (1) was found flowing during dry weather and sampled for field and laboratory analysis.

Outfall Sampling

On May 14, May 20, June 28, July 27, and August 4, 2021, EP staff attempted to visit eighty (80) outfalls during dry weather. The locations of all screened outfalls are shown on Figure 1: Outfall and Interconnection Sampling Locations and listed on Table 1: Outfall Sampling Locations. All the outfalls unable to be screened or located during the FY20 outfall screenings were successfully screened during this round of sampling with the help of Milford Highway Department staff.

Throughout the outfall screening process, EP staff made the following observations:

- Fifty-three (53) outfalls were found to be dry.
- Five (5) outfalls (25, 1040, 1106, OF-315, and OF-503) were observed to be flowing during dry weather. EP personnel sampled these outfalls on May 20, June 28, July 27, and August 4, 2021.
- Twenty-two (22) outfall structures were removed from the Town's MS4 Outfall inventory. Field staff verified that these structures were inlets, outlets to stormwater best management practices (BMPs), or located on private roads receiving no Town drainage.

Interconnection Sampling

On May 28 and August 4, 2021, EP staff visited nine (9) interconnection locations during dry weather. These interconnections comprise the Town's entire inventory of interconnections where the Town's MS4 stormwater discharges into another MS4. The locations of all interconnections screened are listed on Table 2: Interconnection Sampling Locations and shown on Figure 1: Outfall and Interconnection Sampling Locations.

Throughout the interconnection screening process, EP staff made the following observations:

- Eight (8) interconnection locations were found to be dry.
- One (1) interconnection (I-2) at the intersection of Asylum Street and West Street was found to be flowing during dry weather. EP staff sampled this location on August 4, 2021.

Results and Recommendations

Of the five (5) outfalls and one (1) interconnection sampled during dry weather, four (4) structures had parameter concentrations above regulated thresholds:

- Outfall OF-315, which discharges to Godfrey Brook, had an E. Coli concentration of 1046.24 MPN/100mL, which is above the EPA Benchmark for E. Coli of 236 MPN/100mL.
- Outfall OF-503, which discharges to Littlefield Pond, had an E. Coli concentration of 547.5 MPN/100mL, which is above the EPA Benchmark for E. Coli of 236 MPN/100mL.
- Outfall 1106, which discharges to Hopping Brook, had a specific conductance concentration of 2,189 µg/L, which is slightly above the EPA Benchmark for specific conductance of 2,000 µg/L.
- Interconnection I-2, which connects the Town of Milford's MS4 to the MassDOT's MS4, had a pH value of 8.04, which is slightly above the EPA Benchmark range of acceptable pH values of less than 8.0 and more than 6.5.

All sampling results are compiled in Table 3: Stormwater Field Screening and Analytical Results. EP recommends that the Town reprioritize the outfall/interconnection rankings for catchment investigations based on these results.

Additionally, the Town should revisit the eight (8) outfalls in their MS4 outfall inventory remaining to be screened. These outfalls are listed on Table 4: Remaining Outfalls to be Screened. These are structures GZA previously screened during dry weather and found to be flowing. GZA sampled for parameters required under the 2003 MS4 Permit, but not all parameters required under the current 2018 MS4 Permit. Therefore, they need to be re-screened.

Attachments

Milford MS4 Certification Page

Figure 1: Outfall and Interconnection Sampling Locations

Table 1: Dry Weather Outfall Sampling Locations

Table 2: Dry Weather Interconnection Sampling Locations

Table 3: Stormwater Field Screening and Analytical Results

Table 4: Remaining Outfalls to be Screened

Laboratory Analytical Results

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

Signature

Date

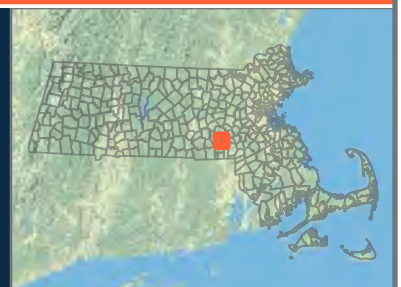
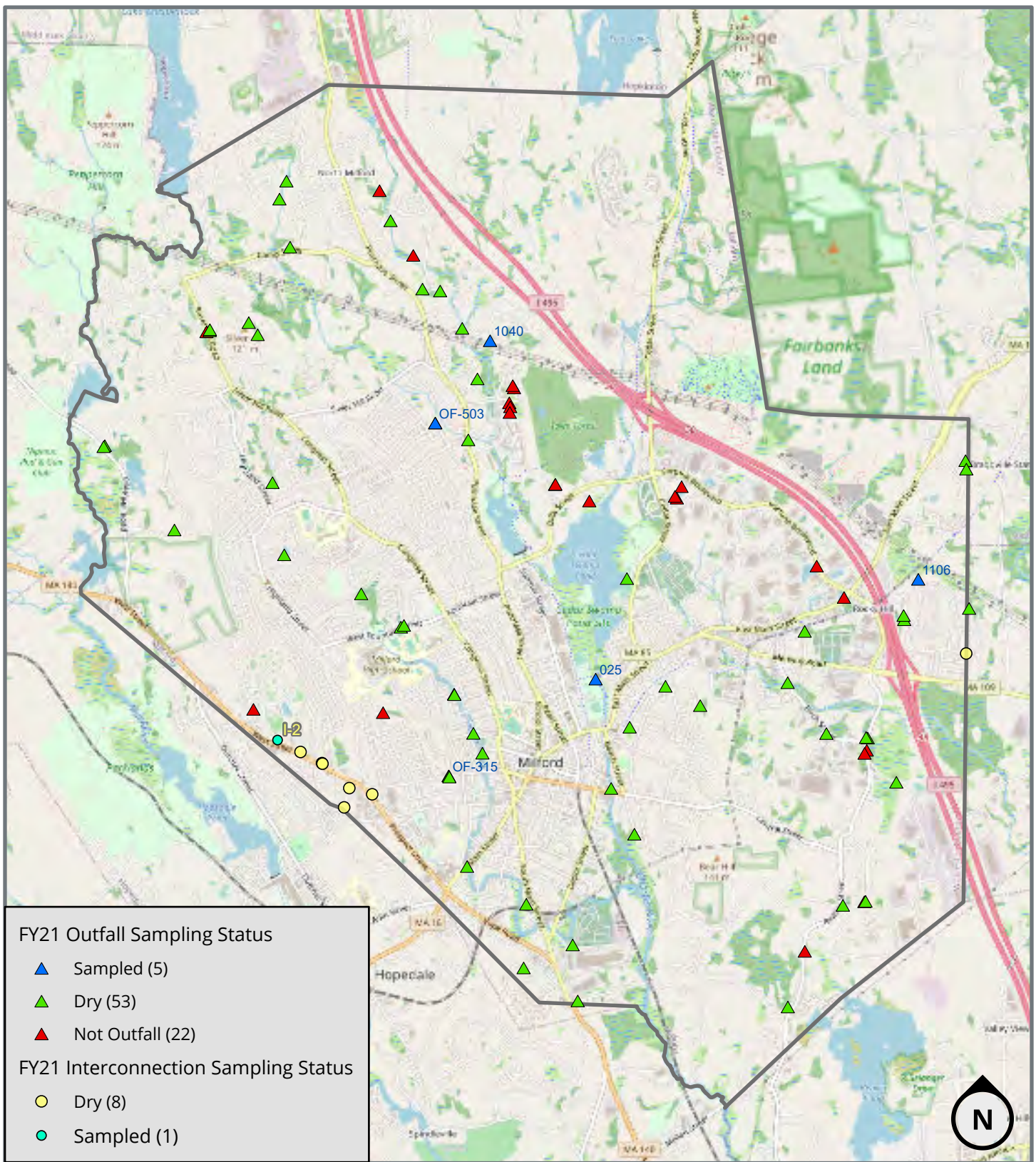


Table 1: Outfall Sampling Locations
Milford, MA

Receiving Waterbody	Outfall ID	Approximate Street Address	Screening Date	Outfall Sampling Status
Milford Pond	25	13 Hayward Field	5/20/2021	Sampled
Unnamed Pond North of Huckleberry Brook	1040	25 Eben Street	6/28/2021	Sampled
Unnamed Wetlands West of Hopping Brook	1106	27 Virginia Drive	6/28/2021	Sampled
Unnamed Tributary to Huckleberry Brook	OF-503	1 1/2 Whip O Will Lane	6/28/2021	Sampled
Godfrey Brook	OF-315	57 West Street	8/4/2021	Sampled
Charles River	41	222 Central Street	6/28/2021	Dry
Unnamed Tributary to Charles River	55	3 Howard Street	6/28/2021	Dry
Godfrey Brook	89	87 South Main Street	5/20/2021	Dry
Unnamed Wetlands East of Stall Brook	285	10 Bodio Circle	7/27/2021	Dry
Unnamed Wetlands East of Stall Brook	286	12 Bodio Circle	7/27/2021	Dry
Milford Pond	313	60 Cedar Street	5/14/2021	Dry
Unnamed Wetlands East of Huckleberry Brook	1039	7 Dynasty Drive	7/27/2021	Dry
Unnamed Tributary to Huckleberry Brook (2)	1041	3 Stub Toe Lane	5/20/2021	Dry
Huckleberry Brook	1053	23 Eben Street	7/27/2021	Dry
Godfrey Brook	1076	139 West Spruce Street	6/28/2021	Dry
Godfrey Brook	1077	58 West Street	7/27/2021	Dry
Charles River	1096	141 Beaver Street	8/4/2021	Dry
Unnamed Tributary to Huckleberry Brook (2)	1097	2 Stub Toe Lane	7/27/2021	Dry
Godfrey Brook	1114	29 Courtland Street	5/20/2021	Dry
Unnamed Wetlands West of Hopping Brook	1132	3 Pine Needle Circle	5/20/2021	Dry
Unnamed Wetlands West of Hopping Brook	1133	8 Whispering Pine Drive	5/20/2021	Dry
Unnamed Wetlands to Little Field Pond	1135	18 Field Pond Road	6/28/2021	Dry
Godfrey Brook	1238	1 Godfrey Lane	6/28/2021	Dry
Godfrey Brook	1239	3 Congress Terrace	5/20/2021	Dry
Unnamed tributary East of Fiske Mill Pond	1151A	21 Reservoir Street	5/20/2021	Dry
Unnamed tributary East of Fiske Mill Pond	1151B	21 Reservoir Street	7/27/2021	Dry
Unnamed Tributary to Huckleberry Brook (5)	OF-117	12 Joan Circle	6/28/2021	Dry
Unnamed Tributary to Louisa Lake	OF-131	169 Purchase Street	6/28/2021	Dry
Unnamed Wetland to Stall Brook	OF-16	33 Beaver Street	6/28/2021	Dry
Unnamed Tributary to Huckleberry Brook (2)	OF-166	31 Camp Street	5/14/2021	Dry
Unnamed Tributary to Huckleberry Brook (5)	OF-169	8 Fox Lane	5/20/2021	Dry
Huckleberry Brook	OF-173	15 Windsor Road	6/28/2021	Dry
Huckleberry Brook	OF-176	9 Haven Street	8/4/2021	Dry
Huckleberry Brook	OF-193	6 Rupert Road	5/20/2021	Dry
Unnamed Tributary to Huckleberry Brook (6)	OF-199B	3 Hamel Circle	6/28/2021	Dry
Unnamed Tributary to Stall Brook	OF-21	10 Birch Street	8/4/2021	Dry
Godfrey Brook	OF-226	Milford	7/27/2021	Dry
Unnamed Tributary to Stall Brook	OF-234	10 Turin Street	5/14/2021	Dry
Godfrey Brook	OF-270	12 West Pine Street	6/28/2021	Dry
Unnamed Tributary to Stall Brook	OF-292	32 Maple Street	6/28/2021	Dry
Charles River	OF-307	69 East Street	7/27/2021	Dry
Godfrey Brook	OF-316	57 West Street	8/4/2021	Dry
Godfrey Brook	OF-341	138 South Main Street	5/20/2021	Dry
Godfrey Brook	OF-346	335 1/2 Main Street	6/28/2021	Dry
Unnamed Wetlands to Charles River	OF-361	22 Carroll Street	5/20/2021	Dry
Unnamed Wetlands to Stall Brook	OF-394	23 Birch Street	6/28/2021	Dry
Unnamed Tributary to Stall Brook	OF-43	27 Lena Lane	6/28/2021	Dry



Unnamed wetland to Godfrey Brook	OF-500	34 Jionzo Road	6/28/2021	Dry
Unnamed pond	OF-501	13 Fordham Drive	6/28/2021	Dry
Unnamed Tributary to Huckleberry Brook	OF-502	1 1/2 Whip O Will Lane	5/14/2021	Dry
Unnamed Tributary to Mill River	OF-504	Field Pond Rd	5/14/2021	Dry
Unnamed Tributary To Mill River	OF-505	Field Pond Rd	5/14/2021	Dry
Godfrey Brook	OF-506	10 Congress Terrace	6/28/2021	Dry
Unnamed Wetlands	OF-507	33 Beaver Street	6/28/2021	Dry
Unnamed Tributary to Beaver Pond	OF-508	21 Jencks Road	6/28/2021	Dry
Unnamed Wetlands to Stall Brook	OF-509	5 Mary Road	6/28/2021	Dry
Unnamed Wetlands to Charles River	OF-510	33 Parkhurst Street	6/28/2021	Dry
Unnamed Tributary to Beaver Pond	OF-94	122 Beaver Street	7/27/2021	Dry
-	1232	12 Jencks Road	6/28/2021	Not Outfall
-	OF-65	12 Governors Way	5/14/2021	Not Outfall
-	OF-68	1B Governors Way	5/14/2021	Not Outfall
Huckleberry Brook	OF-212	5 Farmer Circle	5/14/2021	Not Outfall
Huckleberry Brook	204	22 Haven Street	5/14/2021	Not Outfall
Unnamed Wetlands to Stall Brook	OF-396	33 Beaver Street	5/20/2021	Not Outfall
Unnamed Wetlands to Stall Brook	OF-397	33 Beaver Street	5/20/2021	Not Outfall
Unnamed Pond East of Milford Pond (2)	OF-81	3 Fortune Boulevard	6/28/2021	Not Outfall
Unnamed Pond East of Milford Pond (2)	OF-83	91 Cedar Street	6/28/2021	Not Outfall
Unnamed Pond East of Milford Pond (2)	1024	450 Fortune Boulevard	6/28/2021	Not Outfall
Milford Pond	3	57 1/2 Dilla Street	6/28/2021	Not Outfall
Unnamed Stream East of Milford Pond	253	256 East Main Street	6/28/2021	Not Outfall
Unnamed Pond East of Milford Pond (2)	OF-371	91 Cedar Street	6/28/2021	Not Outfall
-	OF-167	24 Reservoir Street	6/28/2021	Not Outfall
Unnamed Wetland	1092	24 Asylum Street	6/28/2021	Not Outfall
-	OF-66	28B Governors Way	6/28/2021	Not Outfall
-	OF-70	1B Governors Way	6/28/2021	Not Outfall
Unnamed Wetlands to Milford Pond	1170	4 Mohegan Circle	6/28/2021	Not Outfall
Godfrey Brook	OF-246	51 Madden Avenue	7/26/2021	Not Outfall
Unnamed Tributary to Beaver Pond	1019	136 Beaver Street	7/26/2021	Not Outfall
-	OF-67	5A Governors Way	7/27/2021	Not Outfall
Unnamed Wetlands to Charles River	OF-363	4 Mohegan Circle	7/27/2021	Not Outfall



Table 2: Interconnection Sampling Locations
Milford, MA

Interconnection ID	Interconnection With	Approximate Street Address	Screening Date	Interconnection Sampling Status
I-1	MassDOT	2 Western Ave	6/28/2021	Dry
I-11	Town of Medway	12 James Street	6/28/2021	Dry
I-12	MassDOT	18 Freedom Street	6/28/2021	Dry
I-13	MassDOT	0 Asylum Street	6/28/2021	Dry
I-2	MassDOT	0 Asylum Street	8/4/2021	Sampled
I-3	MassDOT	189 West Street	6/28/2021	Dry
I-4	MassDOT	189 West Street	6/28/2021	Dry
I-6	MassDOT	9 John Street	6/28/2021	Dry
I-9	MassDOT	95 Prospect Street	6/28/2021	Dry



Table 2: Stormwater Field Screening and Analytical Results
Milford, MA
August 2021

Structure Identification		1040		1106		25		OF-503		OF-315	I-2
Discharge Waterbody/Location		Unnamed Pond North of Huckleberry Brook		Unnamed Wetlands West of Hopping Brook		Milford Pond		Unnamed Wetlands North of Littlefield Pond		Unnamed Tributary to Godfrey Brook	Mass DOT
Approx. Address		25 Eben Street		27 Virginia Drive		13 Hayward Field		1 1/2 Whip O Will Lane		57 West Street	0 Asylum Street
Date Sampled		5/20/2021	7/27/2021	6/28/2021	7/27/2021	6/28/2021	7/27/2021	6/28/2021	7/27/2021	8/4/2021	8/4/2021
Sample Time		2:30 PM	11:30 AM	3:40 PM	10:50 AM	2:45 PM	10:55 AM	3:00 PM	11:10 AM	3:00 PM	2:30 PM
Field Test Results	Threshold										
Temperature (°C)		15.2	-	18.8	-	15.6	-	18	-	21.9	18.8
Specific Conductance (µS/cm)	2000	768	-	2189	-	560	-	619	-	501	886
Salinity (ppt)		0.38	-	1.12	-	0.27	-	0.3	-	0.24	0.44
DO (mg/L)		6.52	-	6.38	-	3.60	-	6.73	-	5.11	7.98
pH	6.5-8.0	7.48	-	7.12	-	6.51	-	7.12	-	7.88	8.04
Total Chlorine (mg/L)	0.01	-	0.00	-	0.00	-	0.00	-	0.00	-	-
Analytical Results											
Ammonia as Nitrogen (mg/L)	0.5	ND	-	ND	-	0.141	-	0.096	-	ND	0.129
Biochemical Oxygen Demand (mg/L)		ND	-	-	-	ND	-	-	-	ND	ND
Chloride (TRC) (mg/L)		220	-	650	-	120	-	150	-	-	-
Coliform, Fecal (MF) (col/100mL)		ND	-	540	-	1600	-	ND	-	500	150
E. coli (MPN/100 mL)	236	1	-	1	-	6.32	-	547.5	-	1046.24	83.92
Phosphorus, Total (mg/L)		0.655	-	0.045	-	0.055	-	0.05	-	0.036	0.017
Surfactants, MBAS (mg/L)	0.25	ND	-	ND	-	ND	-	ND	-	ND	ND
Total Residual Chlorine (mg/L)	0.01	-	-	-	-	-	-	-	-	ND	ND

Notes:

- : Not Tested

ND: Non-detect

Bold Values exceed contaminant criteria



Table 4: Remaining Outfalls to be Screened
 Milford, MA

Receiving Waterbody	Outfall ID	Approximate Street Address	Outfall Sampling Status
Charles River	314	2 Beach St	Not Screened - stormwater discharges to culverted portion of Charles River
Charles River	317	222 Central St	
Charles River	318	222 Central St	
Charles River	319	222 Central St	
Charles River	320	2 Beach St	
Charles River	323	2 Beach St	
Charles River	327	2 Archer Avenue	
Charles River	328	2 Archer Avenue	





ANALYTICAL REPORT

Lab Number:	L2126732
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Vern S. Lincoln
Phone:	(617) 657-0275
Project Name:	MILFORD OUTFALL SAMPLING
Project Number:	Not Specified
Report Date:	06/08/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2126732-01	1040	WATER	MILFORD, MA	05/20/21 14:30	05/20/21

Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

Case Narrative (continued)

Coliform, Fecal (MF)

L2126732-01: 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: 06/08/21

INORGANICS & MISCELLANEOUS

Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

SAMPLE RESULTS

Lab ID: L2126732-01
Client ID: 1040
Sample Location: MILFORD, MA

Date Collected: 05/20/21 14:30
Date Received: 05/20/21
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	-	05/20/21 21:30	121,9222D	JT
E. Coli (MPN)	1		MPN/100ml	1	NA	1	-	05/20/21 18:00	121,9223B	JT
General Chemistry - Westborough Lab										
Chloride	220		mg/l	10	--	10	-	06/08/21 00:28	121,4500CL-E	TL
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/07/21 16:00	06/07/21 22:59	121,4500NH3-BH	AT
Phosphorus, Total	0.655		mg/l	0.010	--	1	06/02/21 07:30	06/02/21 14:40	121,4500P-E	SD
BOD, 5 day	ND		mg/l	2.0	NA	1	05/20/21 23:55	05/25/21 19:35	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	05/22/21 01:30	05/22/21 05:29	121,5540C	AW



Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

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 Batch: WG1501743-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/20/21 18:00	121,9223B	JT
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1501748-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	05/20/21 21:30	121,9222D	JT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1501771-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	05/20/21 23:55	05/25/21 19:35	121,5210B	JD
General Chemistry - Westborough Lab for sample(s): 01 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): 01 Batch: WG1506396-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	06/02/21 07:30	06/02/21 14:15	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1508716-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/07/21 16:00	06/07/21 22:55	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1508720-1										
Chloride	ND		mg/l	1.0	--	1	-	06/07/21 22:53	121,4500CL-E	TL



Lab Control Sample Analysis**Batch Quality Control****Project Name:** MILFORD OUTFALL SAMPLING**Project Number:** Not Specified**Lab Number:** L2126732**Report Date:** 06/08/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1501771-2								
BOD, 5 day	105		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1502328-2								
Surfactants, MBAS	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1506396-2								
Phosphorus, Total	101		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1508716-2								
Nitrogen, Ammonia	98		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1508720-2								
Chloride	100		-		90-110	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: MILFORD OUTFALL SAMPLING

Project Number: Not Specified

Lab Number: L2126732

Report Date: 06/08/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1501771-4 QC Sample: L2126294-01 Client ID: MS Sample												
BOD, 5 day	ND	100	110	112		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1502328-4 QC Sample: L2126976-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.410	102		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1506396-4 QC Sample: L2126580-01 Client ID: MS Sample												
Phosphorus, Total	0.047	0.5	0.562	103		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1508716-4 QC Sample: L2128191-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.31	83		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1508720-4 QC Sample: L2126659-01 Client ID: MS Sample												
Chloride	16	20	37	105		-	-		58-140	-		7

Lab Duplicate Analysis *Batch Quality Control*

Project Name: MILFORD OUTFALL SAMPLING

Project Number: Not Specified

Lab Number: L2126732

Report Date: 06/08/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1501771-3 QC Sample: L2126294-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1502328-3 QC Sample: L2126976-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1506396-3 QC Sample: L2126580-01 Client ID: DUP Sample						
Phosphorus, Total	0.047	0.047	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1508716-3 QC Sample: L2128191-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1508720-3 QC Sample: L2126659-01 Client ID: DUP Sample						
Chloride	16	16	mg/l	0		7

Project Name: MILFORD OUTFALL SAMPLING**Lab Number:** L2126732**Project Number:** Not Specified**Report Date:** 06/08/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2126732-01A	Bacteria Cup Na2S2O3 preserved	A	NA		5.4	Y	Absent		E-COLI-QT(.33)
L2126732-01B	Bacteria Cup Na2S2O3 preserved	A	NA		5.4	Y	Absent		E-COLI-QT(.33)
L2126732-01C	Bacteria Cup Na2S2O3 preserved	A	NA		5.4	Y	Absent		F-COLI-MF(.33)
L2126732-01D	Bacteria Cup Na2S2O3 preserved	A	NA		5.4	Y	Absent		F-COLI-MF(.33)
L2126732-01E	Plastic 120ml unpreserved	A	7	7	5.4	Y	Absent		CL-4500(28)
L2126732-01F	Plastic 500ml H2SO4 preserved	A	<2	<2	5.4	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2126732-01G	Plastic 950ml unpreserved	A	7	7	5.4	Y	Absent		MBAS-5540(2),BOD-5210(2)

Project Name: MILFORD OUTFALL SAMPLING**Lab Number:** L2126732**Project Number:** Not Specified**Report Date:** 06/08/21

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: MILFORD OUTFALL SAMPLING**Lab Number:** L2126732**Project Number:** Not Specified**Report Date:** 06/08/21**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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

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.

Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2126732
Report Date: 06/08/21

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

Date Rec'd in Lab: 5/20/21

ALPHA Job #: L2126732

9 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: Milford Outfall Sampling

Project Location: Milford, MA

Project #:

Project Manager:

ALPHA Quote #

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

☐ ADEX ☒ EMAIL

☒ 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

Client Information

Client: Environmental Partners

Address: 1900 Crown Colony Dr
Quincy MA 02169

Phone: 617-657-0275

Email: USL@envpartners.com

Additional Project Information:

ANALYSIS										SAMPLE INFO		TOTAL # BOTTLES
VOC: ☐ 2260 ☐ 624 ☐ 524.2		SVOC: ☐ ABN ☐ PAH		METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15		EPH: ☐ RCRA5 ☐ RCRA8 ☐ PP13		VPH: ☐ Ranges & Targets ☐ Ranges Only		☐ PCB ☐ PEST		
TPH: ☐ Ranges Only ☐ Ranges Only		BOD 5H 31D		Ammonia Nitrogen		Chloride 5M 4500		E Coli 5M 9213		Surfactants 5M 5310		
Total Phosphorus 5M 4500		Fecal Coliform 5M 9222		Filtration		☐ Field ☐ Lab to do		Preservation		☐ Lab to do		
Sample Comments												

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
26732-01	1040	5/20/21	14:30	stem water	USL

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= HNO₃
 D= H₂SO₄
 E= NaOH
 F= MeOH
 G= NaHSO₄
 H= Na₂S₂O₃
 I= Ascorbic Acid
 J= NH₄Cl
 K= Zn Acetate
 O= Other

Container Type

Preservative

Relinquished By:

Date/Time 15:35

5/20/21

Received By:

Date/Time

5/20/21 15:35

All samples submitted are subject to
 Alpha's Terms and Conditions.
 See reverse side.

FORM NO. 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L2134985
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Natalie Pommersheim
Phone:	(617) 657-0257
Project Name:	MILFORD OUTFALL SAMPLING
Project Number:	Not Specified
Report Date:	07/16/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2134985-01	025	WATER	MILFORD, MA	06/28/21 14:45	06/28/21
L2134985-02	NEW 2	WATER	MILFORD, MA	06/28/21 15:00	06/28/21
L2134985-03	1106	WATER	MILFORD, MA	06/28/21 15:40	06/28/21

Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

Case Narrative (continued)

Sample Receipt

The samples were received at the laboratory above the required temperature range. The samples were transported to the laboratory in a cooler with ice and delivered directly from the sampling site. This is considered acceptable since the samples were in the process of cooling.

Coliform, Fecal (MF)

L2134985-02: 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:

Caitlin Walukevich Caitlin Walukevich

Title: Technical Director/Representative

Date: 07/16/21

INORGANICS & MISCELLANEOUS

Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

SAMPLE RESULTS

Lab ID: L2134985-01
Client ID: 025
Sample Location: MILFORD, MA

Date Collected: 06/28/21 14:45
Date Received: 06/28/21
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)	1600		col/100ml	10	NA	10	-	06/28/21 19:34	121,9222D	SH
E. Coli (MPN)	6.32		MPN/100ml	1	NA	1	-	06/28/21 18:35	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	120		mg/l	10	--	10	-	06/29/21 22:25	121,4500CL-E	TL
Nitrogen, Ammonia	0.141		mg/l	0.075	--	1	07/15/21 11:00	07/15/21 20:57	121,4500NH3-BH	AT
Phosphorus, Total	0.055		mg/l	0.010	--	1	07/08/21 11:30	07/09/21 09:31	121,4500P-E	SD
BOD, 5 day	ND		mg/l	2.0	NA	1	06/28/21 22:30	07/03/21 16:34	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/30/21 01:00	06/30/21 05:25	121,5540C	AW



Project Name: MILFORD OUTFALL SAMPLING**Lab Number:** L2134985**Project Number:** Not Specified**Report Date:** 07/16/21**SAMPLE RESULTS****Lab ID:** L2134985-02**Date Collected:** 06/28/21 15:00**Client ID:** NEW 2**Date Received:** 06/28/21**Sample Location:** MILFORD, MA**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	-	06/28/21 19:34	121,9222D	SH
E. Coli (MPN)	547.5		MPN/100ml	1	NA	1	-	06/28/21 18:35	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	150		mg/l	10	--	10	-	06/29/21 22:26	121,4500CL-E	TL
Nitrogen, Ammonia	0.096		mg/l	0.075	--	1	07/15/21 11:00	07/15/21 20:58	121,4500NH3-BH	AT
Phosphorus, Total	0.050		mg/l	0.010	--	1	07/08/21 11:30	07/09/21 09:32	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/30/21 01:00	06/30/21 05:25	121,5540C	AW



Project Name: MILFORD OUTFALL SAMPLING**Lab Number:** L2134985**Project Number:** Not Specified**Report Date:** 07/16/21**SAMPLE RESULTS****Lab ID:** L2134985-03**Date Collected:** 06/28/21 15:40**Client ID:** 1106**Date Received:** 06/28/21**Sample Location:** MILFORD, MA**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)	540		col/100ml	10	NA	10	-	06/28/21 19:34	121,9222D	SH
E. Coli (MPN)	1		MPN/100ml	1	NA	1	-	06/28/21 18:35	121,9223B	SH
General Chemistry - Westborough Lab										
Chloride	650		mg/l	10	--	10	-	06/30/21 10:44	121,4500CL-E	MR
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/15/21 11:00	07/15/21 20:59	121,4500NH3-BH	AT
Phosphorus, Total	0.045		mg/l	0.010	--	1	07/08/21 11:30	07/09/21 09:33	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/30/21 01:00	06/30/21 05:26	121,5540C	AW



Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

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): 01-03 Batch: WG1517951-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	06/28/21 18:35	121,9223B	SH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1517957-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	06/28/21 22:30	07/03/21 16:34	121,5210B	JD
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1517960-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	06/28/21 19:34	121,9222D	SH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1518466-1										
Chloride	ND		mg/l	1.0	--	1	-	06/29/21 21:37	121,4500CL-E	TL
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1518584-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/30/21 01:00	06/30/21 05:21	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1518674-1										
Chloride	ND		mg/l	1.0	--	1	-	06/30/21 10:08	121,4500CL-E	MR
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1521756-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	07/08/21 11:30	07/09/21 09:20	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1524161-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/15/21 11:00	07/15/21 20:44	121,4500NH3-BH	AT



Lab Control Sample Analysis

Batch Quality Control

Project Name: MILFORD OUTFALL SAMPLING

Project Number: Not Specified

Lab Number: L2134985

Report Date: 07/16/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1517957-2								
BOD, 5 day	92		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1518466-2								
Chloride	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1518584-2								
Surfactants, MBAS	96		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG1518674-2								
Chloride	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1521756-2								
Phosphorus, Total	106		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1524161-2								
Nitrogen, Ammonia	102		-		80-120	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: MILFORD OUTFALL SAMPLING

Project Number: Not Specified

Lab Number: L2134985

Report Date: 07/16/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1517957-4 QC Sample: L2134985-01 Client ID: 025												
BOD, 5 day	ND	100	94	94		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1518466-4 QC Sample: L2135062-02 Client ID: MS Sample												
Chloride	63	20	81	90		-	-		58-140	-		7
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1518584-4 QC Sample: L2135122-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.400	100		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1518674-4 QC Sample: L2135221-03 Client ID: MS Sample												
Chloride	11	20	32	100		-	-		58-140	-		7
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1521756-4 QC Sample: L2132994-07 Client ID: MS Sample												
Phosphorus, Total	0.044	0.5	0.558	103		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1524161-4 QC Sample: L2135037-05 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.62	90		-	-		80-120	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: MILFORD OUTFALL SAMPLING

Project Number: Not Specified

Lab Number: L2134985

Report Date: 07/16/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1517957-3 QC Sample: L2134985-01 Client ID: 025						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1518466-3 QC Sample: L2135062-02 Client ID: DUP Sample						
Chloride	63	65	mg/l	3		7
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1518584-3 QC Sample: L2135122-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1518674-3 QC Sample: L2135221-03 Client ID: DUP Sample						
Chloride	11	11	mg/l	0		7
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1521756-3 QC Sample: L2132994-07 Client ID: DUP Sample						
Phosphorus, Total	0.044	0.044	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1524161-3 QC Sample: L2135037-05 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20

Project Name: MILFORD OUTFALL SAMPLING**Lab Number:** L2134985**Project Number:** Not Specified**Report Date:** 07/16/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2134985-01A	Plastic 950ml unpreserved	A	7	7	9.7	Y	Absent		BOD-5210(2)
L2134985-01B	Plastic 120ml unpreserved	A	7	7	9.7	Y	Absent		CL-4500(28)
L2134985-01C	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		E-COLI-QT(.33)
L2134985-01D	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		E-COLI-QT(.33)
L2134985-01E	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		F-COLI-MF(.33)
L2134985-01F	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		F-COLI-MF(.33)
L2134985-01G	Plastic 950ml unpreserved	A	7	7	9.7	Y	Absent		MBAS-5540(2)
L2134985-01H	Plastic 500ml H2SO4 preserved	A	<2	<2	9.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2134985-02A	Plastic 120ml unpreserved	A	7	7	9.7	Y	Absent		CL-4500(28)
L2134985-02B	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		E-COLI-QT(.33)
L2134985-02C	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		E-COLI-QT(.33)
L2134985-02D	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		F-COLI-MF(.33)
L2134985-02E	Plastic 950ml unpreserved	A	7	7	9.7	Y	Absent		MBAS-5540(2)
L2134985-02F	Plastic 500ml H2SO4 preserved	A	<2	<2	9.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2134985-02X	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		F-COLI-MF(.33)
L2134985-03A	Plastic 950ml unpreserved	A	7	7	9.7	Y	Absent		CL-4500(28),MBAS-5540(2)
L2134985-03B	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		E-COLI-QT(.33)
L2134985-03C	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		E-COLI-QT(.33)
L2134985-03D	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		F-COLI-MF(.33)
L2134985-03E	Bacteria Cup Na2S2O3 preserved	A	NA		9.7	Y	Absent		F-COLI-MF(.33)
L2134985-03G	Plastic 500ml H2SO4 preserved	A	<2	<2	9.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)

Project Name: MILFORD OUTFALL SAMPLING**Lab Number:** L2134985**Project Number:** Not Specified**Report Date:** 07/16/21

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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

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 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: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

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.

Project Name: MILFORD OUTFALL SAMPLING
Project Number: Not Specified

Lab Number: L2134985
Report Date: 07/16/21

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.



ANALYTICAL REPORT

Lab Number:	L2141709
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	MILFORD
Project Number:	Not Specified
Report Date:	08/12/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2141709-01	I-2	WATER	Not Specified	08/04/21 14:30	08/04/21
L2141709-02	OF-315	WATER	Not Specified	08/04/21 15:00	08/04/21

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

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.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 08/12/21

INORGANICS & MISCELLANEOUS

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

SAMPLE RESULTS

Lab ID: L2141709-01
Client ID: I-2
Sample Location: Not Specified

Date Collected: 08/04/21 14:30
Date Received: 08/04/21
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)	150		col/100ml	2.0	NA	2	-	08/04/21 22:11	121,9222D	JW
E. Coli (MPN)	83.92		MPN/100ml	1	NA	1	-	08/04/21 19:15	121,9223B	TL
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 04:00	121,4500CL-D	KA
Nitrogen, Ammonia	0.129		mg/l	0.075	--	1	08/10/21 16:30	08/11/21 15:45	121,4500NH3-BH	JO
Phosphorus, Total	0.017		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:49	121,4500P-E	MC
BOD, 5 day	ND		mg/l	2.0	NA	1	08/04/21 23:40	08/09/21 17:45	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	08/05/21 03:00	08/05/21 06:25	121,5540C	AW



Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

SAMPLE RESULTS

Lab ID: L2141709-02
Client ID: OF-315
Sample Location: Not Specified

Date Collected: 08/04/21 15:00
Date Received: 08/04/21
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)	500		col/100ml	10	NA	10	-	08/04/21 22:11	121,9222D	JW
E. Coli (MPN)	1046.24		MPN/100ml	1	NA	1	-	08/04/21 19:15	121,9223B	TL
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 04:00	121,4500CL-D	KA
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/10/21 16:30	08/11/21 15:45	121,4500NH3-BH	JO
Phosphorus, Total	0.036		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:51	121,4500P-E	MC
BOD, 5 day	ND		mg/l	2.0	NA	1	08/04/21 23:40	08/09/21 17:45	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	08/05/21 03:00	08/05/21 06:26	121,5540C	AW



Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

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): 01-02 Batch: WG1531644-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	08/04/21 19:15	121,9223B	TL
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1531646-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	08/04/21 23:40	08/09/21 17:45	121,5210B	JD
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1531668-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	08/04/21 22:11	121,9222D	JW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1531684-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	08/05/21 03:00	08/05/21 06:22	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1531693-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 04:00	121,4500CL-D	KA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1532215-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:33	121,4500P-E	MC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1533563-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/10/21 16:30	08/11/21 15:42	121,4500NH3-BH	JO



Lab Control Sample Analysis

Batch Quality Control

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1531646-2								
BOD, 5 day	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1531684-2								
Surfactants, MBAS	94		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1531693-2								
Chlorine, Total Residual	96		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1532215-2								
Phosphorus, Total	97		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1533563-2								
Nitrogen, Ammonia	106		-		80-120	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02				QC Batch ID: WG1531646-4			QC Sample: L2141709-02			Client ID: OF-315		
BOD, 5 day	ND	100	100	106		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01-02				QC Batch ID: WG1531684-4			QC Sample: L2141709-02			Client ID: OF-315		
Surfactants, MBAS	ND	0.4	0.420	105		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02				QC Batch ID: WG1531693-4			QC Sample: L2141709-02			Client ID: OF-315		
Chlorine, Total Residual	ND	0.25	0.23	92		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02				QC Batch ID: WG1532215-4			QC Sample: L2141569-01			Client ID: MS Sample		
Phosphorus, Total	0.048	0.5	0.519	94		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02				QC Batch ID: WG1533563-4			QC Sample: L2141730-06			Client ID: MS Sample		
Nitrogen, Ammonia	11.3	4	17.5	155	Q	-	-		80-120	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1531646-3 QC Sample: L2141709-02 Client ID: OF-315						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1531684-3 QC Sample: L2141709-02 Client ID: OF-315						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1531693-3 QC Sample: L2141709-01 Client ID: I-2						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1532215-3 QC Sample: L2141569-01 Client ID: DUP Sample						
Phosphorus, Total	0.048	0.043	mg/l	11		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1533563-3 QC Sample: L2141730-06 Client ID: DUP Sample						
Nitrogen, Ammonia	11.3	11.6	mg/l	3		20

Project Name: MILFORD**Lab Number:** L2141709**Project Number:** Not Specified**Report Date:** 08/12/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2141709-01A	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		E-COLI-QT(.33)
L2141709-01B	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		E-COLI-QT(.33)
L2141709-01C	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		F-COLI-MF(.33)
L2141709-01D	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		F-COLI-MF(.33)
L2141709-01E	Plastic 500ml H2SO4 preserved	A	<2	<2	4.2	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2141709-01F	Plastic 950ml unpreserved	A	7	7	4.2	Y	Absent		TRC-4500(1),BOD-5210(2)
L2141709-01G	Plastic 950ml unpreserved	A	7	7	4.2	Y	Absent		MBAS-5540(2)
L2141709-02A	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		E-COLI-QT(.33)
L2141709-02B	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		E-COLI-QT(.33)
L2141709-02C	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		F-COLI-MF(.33)
L2141709-02D	Bacteria Cup Na2S2O3 preserved	A	NA		4.2	Y	Absent		F-COLI-MF(.33)
L2141709-02E	Plastic 500ml H2SO4 preserved	A	<2	<2	4.2	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2141709-02F	Plastic 950ml unpreserved	A	7	7	4.2	Y	Absent		TRC-4500(1),BOD-5210(2)
L2141709-02G	Plastic 950ml unpreserved	A	7	7	4.2	Y	Absent		MBAS-5540(2)

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

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: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

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 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: MILFORD
Project Number: Not Specified

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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.

Project Name: MILFORD
Project Number: Not Specified

Lab Number: L2141709
Report Date: 08/12/21

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.

TECHNICAL MEMORANDUM

Date: September 7, 2021

To Michael Dean, P.E. – Town Engineer, Town of Milford
Scott Crisafulli – Highway Surveyor, Town of Milford

From Natalie Pommersheim – Project Manager, Environmental Partners

CC Scott Turner, P.E. – Director of Planning, Environmental Partners

Subject FY20 Illicit Discharge Detection & Elimination (IDDE) Wet Weather Sampling
MS4 General Permit Assistance for the Office of Planning & Engineering

This memorandum summarizes the FY20 Wet Weather Investigations, outlined in Task 3 of the Agreement for Professional Engineering Services – MS4 General Permit Assistance for the Office of Planning & Engineering of the Town of Milford.

Wet weather outfall sampling is a requirement of the MS4 General Permit for outfalls within drainage catchments that have at least one (1) System Vulnerability Factor (SVF) identified. The MS4 General Permit includes the following factors as SVFs: a history of sanitary sewer overflows (SSOs), areas with inadequate sanitary sewer level of service, crossings of storm and sanitary sewer alignments, areas needing septic system upgrades, and more.

Under this task, Environmental Partners Group, LLC. (EP) identified SVFs within Milford's MS4 catchments using an updated inventory of SSOs included in the Town's most recent IDDE Plan. EP selected fifteen (15) outfalls within catchments that have historically experienced at least one (1) SSO. These outfalls were then sampled during wet weather over the course of two (2) days on July 9 and August 5, 2021.

The MS4 General Permit requires wet weather sampling to occur during a storm event of sufficient depth or intensity to produce a stormwater discharge. EP used daily precipitation totals from the National Oceanic and Atmospheric Administration (NOAA) rain gauge station near Fenway Drive in Milford (Station ID US1MAWR0001). During the 48 hours prior to the sampling event on July 9, 2021, there was 1.57 inches of rain, and 0.41 inches of rain accumulated throughout the day of sampling. During the sampling event on August 5, 2021, 0.3 inches of rain accumulated throughout the day. During both sampling days, stormwater discharge was flowing through the MS4.

Outfall Sampling and Results

On July 9 and August 5, 2021, EP staff visited fifteen outfalls during wet weather. The locations of all sampled outfalls are shown on Figures 1, 2, and 3 and listed in the table below.

Table 1: Wet Weather Outfall Sampling Locations

Receiving Waterbody	Outfall ID	Approximate Street Address	Sample Date	System Vulnerability Factor (SVF)
Charles River	31	16 E Main St	7/9/2021	2017 Parkhurst St SSO occurred in this catchment
	39	43 Beach St	7/9/2021	
	40	35 Beach St	7/9/2021	
	OF-510	33 Parkhurst St	8/5/2021	
	37	222 Central St	7/9/2021	2018 173-250 Main Street SSO occurred in this catchment
Godfrey Brook	102	23 Church St	8/5/2021	2015 West Pine St/Gibon St and 2021 West St/Highland St SSO occurred in this catchment
	OF-101	31 W Fountain St	7/9/21	2019 Colonial Rd SSO and 2021 Jionzo Rd SSO occurred in this catchment
	OF-102		7/9/21	
	OF-103		7/9/21	
	OF-104		7/9/21	
	OF-315	57 West St	7/9/21	2015 West Pine St/Gibon St and 2021 West St/Highland St SSO occurred in this catchment
	OF-503	13 Fordham Dr	7/9/21	2019 Colonial Rd SSO and 2021 Jionzo Rd SSO occurred in this catchment
	OF-504	30 Jionzo Rd	7/9/21	
Littlefield Pond	239	8 Field Pond Rd	8/5/21	2016, 2017, 2018 Purdue St SSOs occurred in this catchment
	OF-238	4 Field Pond Rd	8/5/21	

During wet weather screening on July 9, 2021, EP observed evidence of two (2) active SSOs that were reported to the Town. The first SSO was observed in front of 38 to 30 Jionzo Road at 1PM. EP observed toilet paper and flow coming out of two (2) sewer manholes. The outfall downstream of this SSO is outfall OF-504, which EP sampled. The second SSO was observed at the junction of Highland Street and West Street at 2:55 PM. EP observed flow and toilet paper remnants coming up out of a sewer manhole in the middle of the intersection. The downstream outfall that EP sampled was outfall OF-315.

Of the fifteen outfalls sampled during wet weather, fourteen of them resulted in elevated bacteria concentrations of *E. coli* and fecal coliform greater than their respective thresholds, which is indicative of urban stormwater. Additionally, samples from outfalls OF-504 and 37 resulted in pH values outside the regulated threshold. At OF-504, surfactants were also detected at 0.30 mg/L, above the threshold of 0.25 mg/L. Outfall 37 resulted in an ammonia as nitrogen concentration of 0.806 mg/L, above the threshold of 0.5 mg/L. The full list of all field and analytical sampling results is shown in Table 2.

Prior to this sampling event, outfalls OF-315 and 40 were found to be flowing during dry weather and sampled:

- In May 2018, OF-315 was sampled during dry weather for the same field and analytical parameters as was sampled in this wet weather sampling round. During dry weather, OF-315 did not have any results outside regulated thresholds.
- In June 2019, outfall 40 was sampled during dry weather and resulted in an *E. coli* concentration of 770.1 Most Probable Number (MPN)/100 mL, greater than the threshold of 126 MPN/100 mL. Wet weather sampling at outfall 40 resulted in an elevated *E. coli* level of 3,698 mg/L. EP conducted a dry weather catchment investigation for outfall 40 (located off Beach Street) on August 3, 2021 and found no signs of likely sewer input.

Conclusions & Recommendations

According the MS4 Permit (Section 2.3.4.8a), “likely sewer input” indicators must consist of the following scenarios:

1. Olfactory or visual evidence of sewage,
2. 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
3. Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

If an outfall has indicators of likely sewer input, then it must be ranked as a problem outfall. Outfall OF-504 was downstream of the active SSO on Jionzo Street, and EP observed olfactory evidence of sewage at that structure. Therefore, outfall OF-504 is now a problem outfall and is recommended for further evaluation.

The remaining fourteen outfalls that were sampled did not meet the criteria listed above, and the elevated bacteria levels could be attributed to other factors (animal waste, waterfowl, pipe maintenance, etc.).

EP recommends the following:

- Milford should rank outfall OF-504 as a problem outfall and peruse additional IDDE investigation.
- Milford should prioritize the remaining fourteen outfalls for IDDE catchment investigations.
- Milford should complete their inventory of SVFs to determine which additional outfalls are located within catchments that have at least one (1) SVF and thus require wet weather sampling.

Attachments

Certification Page

Figure 1: Wet Weather Outfall Sampling Locations

Figure 2: Wet Weather Outfall Sampling Locations

Figure 3: Wet Weather Outfall Sampling Locations

Table 1: Wet Weather Outfall Sampling Locations (embedded within memorandum text)

Table 2: Stormwater Field Screening and Analytical Results

Laboratory Analytical Results

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

Signature

Date

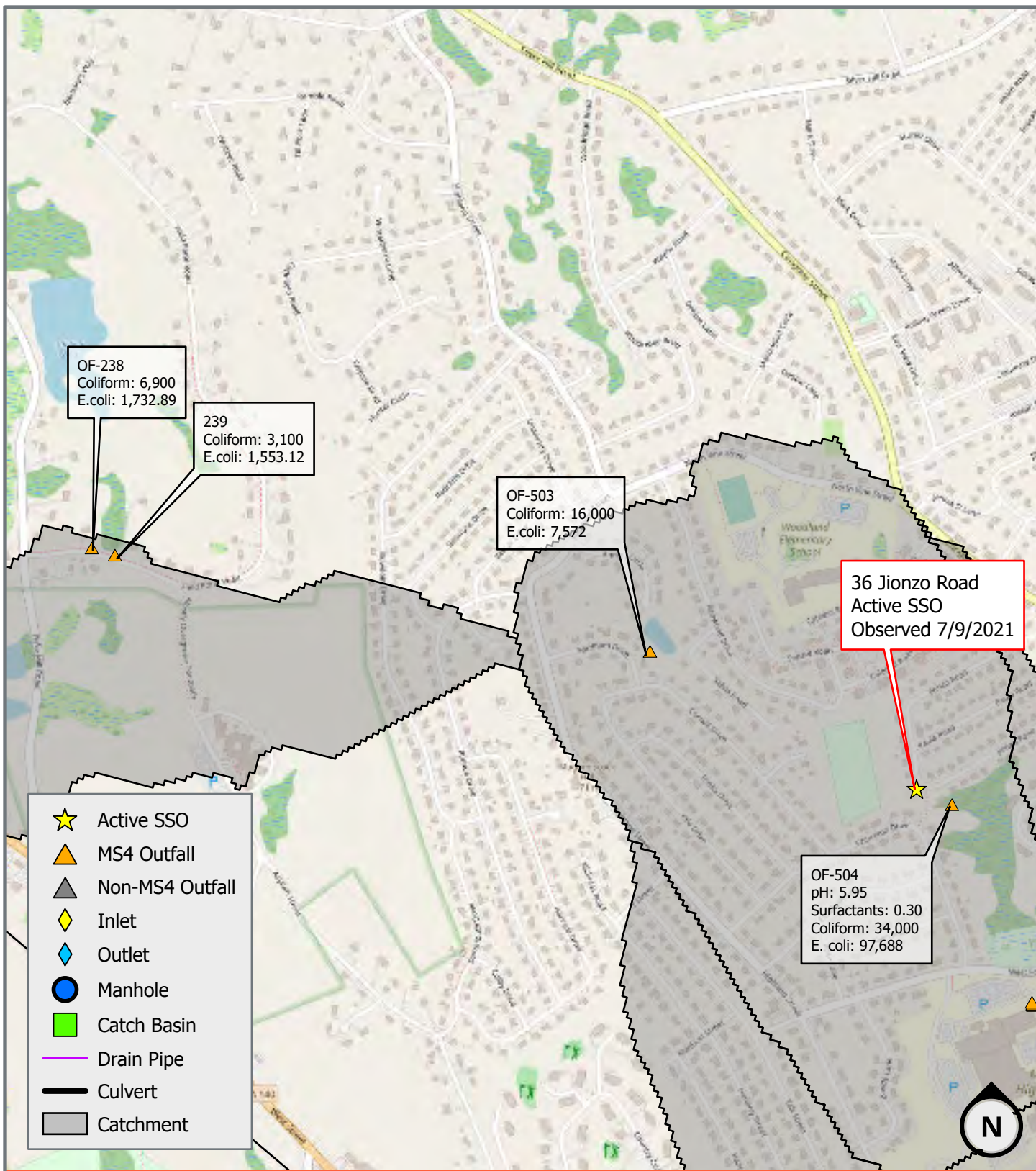
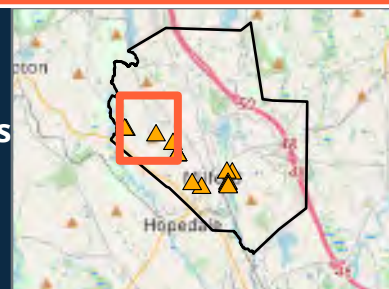


Figure 1: Wet Weather Sampling Locations

Milford, Massachusetts

0 375 750 1,500
Feet



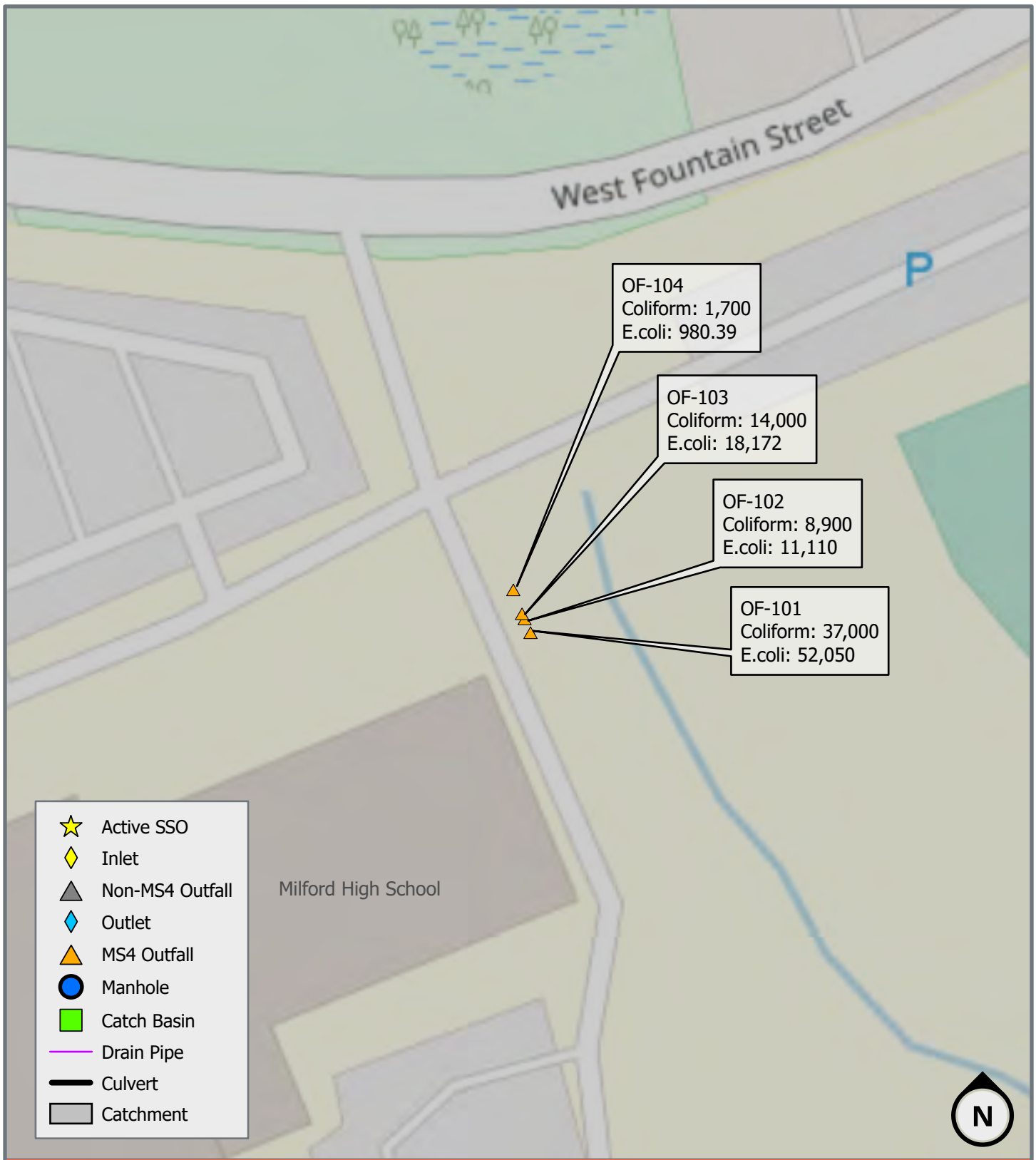
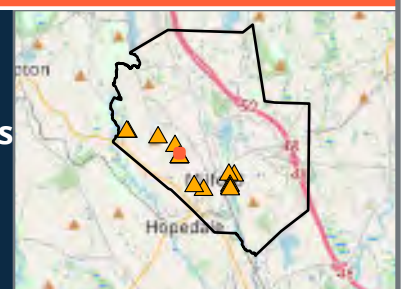


Figure 2: Wet Weather Sampling Locations

Milford, Massachusetts



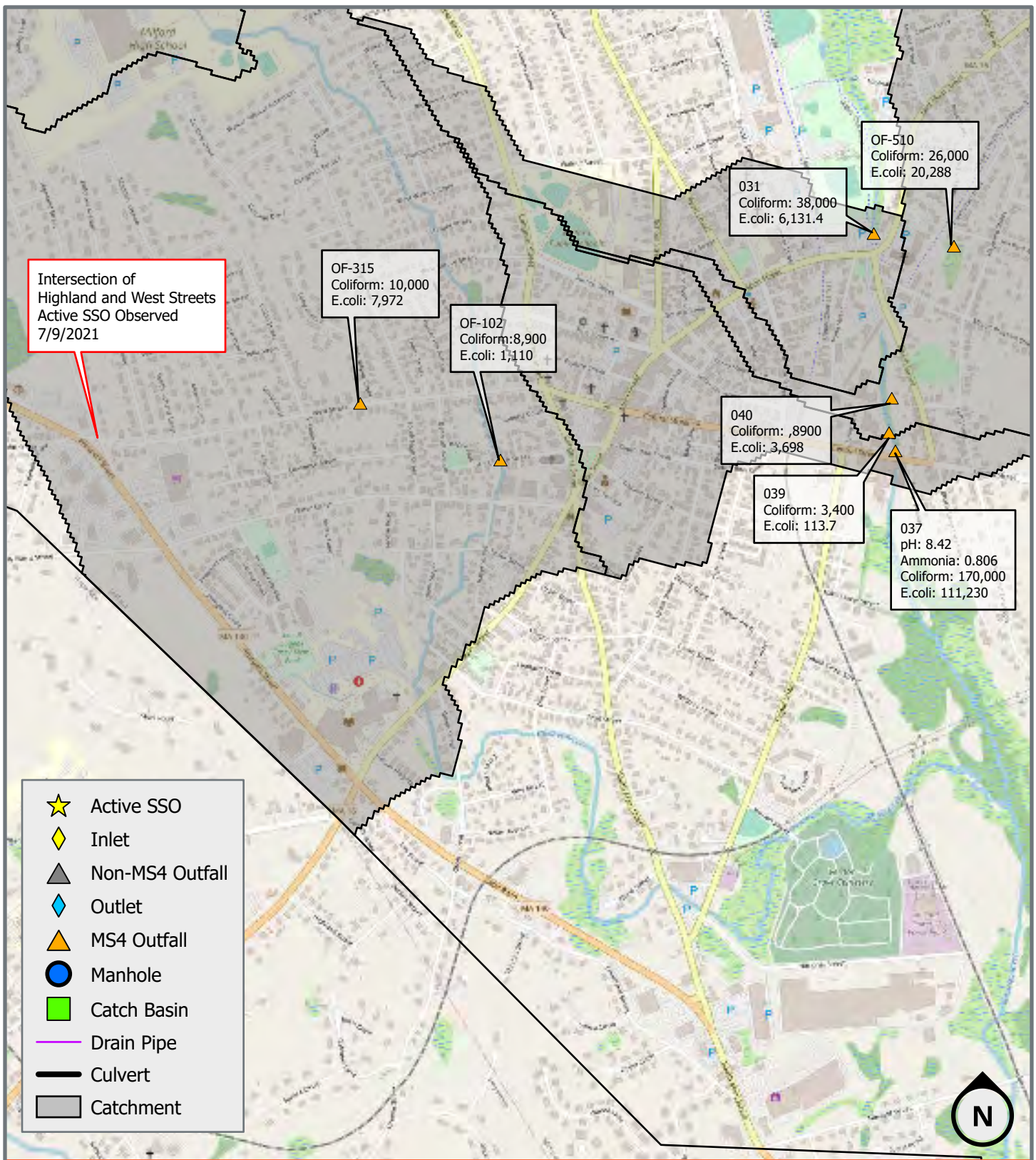


Figure 3: Wet Weather Sampling Locations

Milford, Massachusetts

0 375 750 1,500
Feet

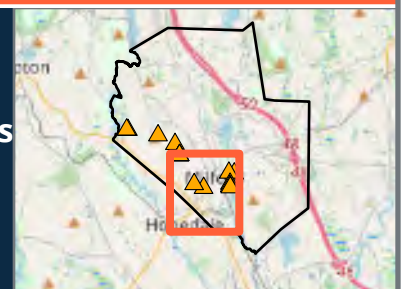


Table 2: Stormwater Wet Weather Field Screening and Analytical Results
 Milford, MA
 September 3, 2021

Outfall Identification		OF-103	OF-104	OF-504	OF-503	OF-315	37	39	40	31
Discharge Waterbody		Godfrey Brook	Godfrey Brook	Godfrey Brook	Godfrey Brook	Godfrey Brook	Charles River	Charles River	Charles River	Charles River
Date Sampled		7/9/2021	7/9/2021	7/9/2021	7/9/2021	7/9/2021	7/9/2021	7/9/2021	7/9/2021	7/9/2021
Sample Time		12:42 PM	12:25 PM	1:50 PM	2:25 PM	2:55 PM	9:25 AM	9:35 AM	10:25 AM	11:00 AM
Field Test Results	Threshold									
Temperature (°C)		19.70	20.18	20.26	20.13	20.49	20.1	20.04	17.5	20.43
Specific Conductance (µS/cm)	2000 µS/cm	87	76	163	93	182	259	150	65	4
Salinity (ppt)		0.05	0.04	0.08	0.05	0.09	0.14	0.08	0.03	0
DO (mg/L)		7.35	7.48	3.42	8.50	7.01	7.04	7.97	6.90	7.39
pH	6.5-8.0	6.42	6.68	5.95	7.44	7.27	8.42	7.46	7.1	6.54
Analytical Results										
Total Residual Chlorine (mg/L)	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.122	ND	0.387	0.089	0.193	0.806	0.116	ND	ND
Phosphorous, Total (mg/L)		0.10	0.038	0.21	0.102	0.165	0.34	0.062	0.15	0.258
BOD, 5 Day (mg/L)	-	-	-	13.0	-	10	20	4	8.6	6.7
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	ND	0.30	0.05	ND	ND	ND	ND	ND
Coliform, Fecal (MF, (col/100mL)		14000.00	1700	34000.0	16000	10000	170000	3400	8900	38000
E. coli (MPN/100 mL)	236 MPN/100 mL	18172.00	980.39	97688.0	7572	7972	111230	113.7	3698	6131.4

Notes:
 - : Not Tested
 ND: Non-detect
Bold, highlighted values exceed contaminant criteria.

Table 2: Stormwater Wet Weather Field Screening and Analytical Results
Milford, MA
September 3, 2021

Outfall Identification		OF-101	OF-102	OF-510	OF-238	239	102
Discharge Waterbody		Godfrey Brook	Godfrey Brook	Charles River	Littlefield Pond	Littlefield Pond	Godfrey Brook
Date Sampled		7/9/2021	7/9/2021	8/5/2021	8/5/2021	8/5/2021	8/5/2021
Sample Time		11:50 AM	11:55 AM	9:55 AM	10:25 AM	10:30 AM	11:20 AM
Field Test Results	Threshold						
Temperature (°C)		19.37	19.57	19.4	20.2	20	24.4
Specific Conductance (µS/cm)	2000 µS/cm	9	71	142	35.7	16.6	20.7
Salinity (ppt)		0	0.04	0.07	0.02	0.01	0.01
DO (mg/L)		8.00	7.69	6.57	7.04	6.90	8.81
pH	6.5-8.0	6.64	6.54	6.94	6.8	6.67	6.96
Analytical Results							
Total Residual Chlorine (mg/L)	-	ND	ND	ND	ND	ND	ND
Ammonia as Nitrogen (mg/L)	0.5 mg/L	ND	ND	0.133	0.105	ND	0.078
Phosphorous, Total (mg/L)		0.096	0.024	0.096	0.096	0.131	0.087
BOD, 5 Day (mg/L)		-	-	2.3	-	-	2.7
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	ND	0.07	0.07	ND	0.06
Coliform, Fecal (MF, (col/100mL)		37000	8900	26000	6900	3100	7300
E. coli (MPN/100 mL)	236 MPN/100 mL	52050	11110	20288	1732.89	1553.12	6902

Notes:
- : Not Tested
ND: Non-detect
Bold, highlighted values exceed contaminant criteria.



ANALYTICAL REPORT

Lab Number:	L2137082
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	MILFORD WET WEATHER
Project Number:	R311-2001.00
Report Date:	08/03/21

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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: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2137082-01	OF-103	WATER	TOWN OF MILFORD	07/09/21 12:15	07/09/21
L2137082-02	OF-104	WATER	TOWN OF MILFORD	07/09/21 12:25	07/09/21
L2137082-03	OF-5004	WATER	TOWN OF MILFORD	07/09/21 13:50	07/09/21
L2137082-04	OF-5003	WATER	TOWN OF MILFORD	07/09/21 14:25	07/09/21
L2137082-05	OF-315	WATER	TOWN OF MILFORD	07/09/21 14:55	07/09/21

Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

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.

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: 08/03/21

INORGANICS & MISCELLANEOUS

Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2137082-01
Client ID: OF-103
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 12:15
Date Received: 07/09/21
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)	14000		col/100ml	100	NA	100	-	07/09/21 20:00	121,9222D	JT
E. Coli (MPN)	18172		MPN/100ml	200	NA	200	-	07/09/21 20:07	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 22:16	121,4500CL-D	AS
Nitrogen, Ammonia	0.122		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:15	121,4500NH3-BH	AT
Phosphorus, Total	0.100		mg/l	0.010	--	1	07/21/21 12:05	07/22/21 13:25	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:32	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2137082-02
Client ID: OF-104
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 12:25
Date Received: 07/09/21
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)	1700		col/100ml	10	NA	10	-	07/09/21 20:00	121,9222D	JT
E. Coli (MPN)	980.39		MPN/100ml	1	NA	1	-	07/09/21 20:07	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 22:16	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:16	121,4500NH3-BH	AT
Phosphorus, Total	0.038		mg/l	0.010	--	1	07/21/21 12:05	07/22/21 13:26	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:33	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2137082-03
Client ID: OF-5004
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 13:50
Date Received: 07/09/21
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)	34000		col/100ml	100	NA	100	-	07/09/21 20:00	121,9222D	JT
E. Coli (MPN)	97688		MPN/100ml	200	NA	200	-	07/09/21 20:07	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 22:16	121,4500CL-D	AS
Nitrogen, Ammonia	0.387		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:20	121,4500NH3-BH	AT
Phosphorus, Total	0.210		mg/l	0.010	--	1	07/21/21 12:05	07/22/21 13:27	121,4500P-E	SD
BOD, 5 day	13.		mg/l	2.0	NA	1	07/09/21 23:45	07/14/21 17:20	121,5210B	JD
Surfactants, MBAS	0.300		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:34	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2137082-04
Client ID: OF-5003
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 14:25
Date Received: 07/09/21
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)	16000		col/100ml	100	NA	100	-	07/09/21 20:00	121,9222D	JT
E. Coli (MPN)	7572		MPN/100ml	200	NA	200	-	07/09/21 20:07	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 22:16	121,4500CL-D	AS
Nitrogen, Ammonia	0.089		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:21	121,4500NH3-BH	AT
Phosphorus, Total	0.102		mg/l	0.010	--	1	07/21/21 12:05	07/22/21 13:29	121,4500P-E	SD
Surfactants, MBAS	0.050		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:36	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2137082-05
Client ID: OF-315
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 14:55
Date Received: 07/09/21
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)	10000		col/100ml	100	NA	100	-	07/09/21 20:00	121,9222D	JT
E. Coli (MPN)	7972		MPN/100ml	200	NA	200	-	07/09/21 20:07	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 22:16	121,4500CL-D	AS
Nitrogen, Ammonia	0.193		mg/l	0.075	--	1	08/02/21 18:00	08/02/21 23:51	121,4500NH3-BH	AT
Phosphorus, Total	0.165		mg/l	0.010	--	1	07/21/21 12:05	07/22/21 13:30	121,4500P-E	SD
BOD, 5 day	10.		mg/l	2.0	NA	1	07/09/21 23:45	07/14/21 17:20	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:37	121,5540C	KA



Project Name: MILFORD WET WEATHER

Lab Number: L2137082

Project Number: R311-2001.00

Report Date: 08/03/21

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): 01-05 Batch: WG1522388-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	07/09/21 20:07	121,9223B	JD
Microbiological Analysis - Westborough Lab for sample(s): 01-05 Batch: WG1522390-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	07/09/21 20:00	121,9222D	JT
General Chemistry - Westborough Lab for sample(s): 03,05 Batch: WG1522401-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	07/09/21 23:45	07/14/21 17:20	121,5210B	JD
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1522407-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 22:16	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1522419-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:13	121,5540C	KA
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1526313-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	07/21/21 12:05	07/22/21 13:11	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1530058-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:08	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 05 Batch: WG1530692-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/02/21 18:00	08/02/21 23:35	121,4500NH3-BH	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: MILFORD WET WEATHER

Project Number: R311-2001.00

Lab Number: L2137082

Report Date: 08/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03,05 Batch: WG1522401-2								
BOD, 5 day	111		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1522407-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1522419-2								
Surfactants, MBAS	102		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1526313-2								
Phosphorus, Total	110		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1530058-2								
Nitrogen, Ammonia	104		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 05 Batch: WG1530692-2								
Nitrogen, Ammonia	106		-		80-120	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: MILFORD WET WEATHER

Project Number: R311-2001.00

Lab Number: L2137082

Report Date: 08/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03-05 QC Batch ID: WG1522401-4 QC Sample: L2137062-01 Client ID: MS Sample												
BOD, 5 day	ND	100	140	137		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1522407-4 QC Sample: L2137082-02 Client ID: OF-104												
Chlorine, Total Residual	ND	0.25	0.25	100		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1522419-4 QC Sample: L2137082-03 Client ID: OF-5004												
Surfactants, MBAS	0.300	0.4	0.720	105		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1526313-4 QC Sample: L2135987-01 Client ID: MS Sample												
Phosphorus, Total	2.84	1	3.97	113		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1530058-4 QC Sample: L2137031-01 Client ID: MS Sample												
Nitrogen, Ammonia	1.36	4	5.48	103		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 05 QC Batch ID: WG1530692-4 QC Sample: L2137708-02 Client ID: MS Sample												
Nitrogen, Ammonia	0.134	4	4.12	100		-	-		80-120	-		20

Project Name: MILFORD WET WEATHER

Project Number: R311-2001.00

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2137082

Report Date: 08/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 03,05	QC Batch ID: WG1522401-3	QC Sample: L2137062-01	Client ID: DUP Sample		
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab	Associated sample(s): 01-05	QC Batch ID: WG1522407-3	QC Sample: L2137082-01	Client ID: OF-103		
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-05	QC Batch ID: WG1522419-3	QC Sample: L2137082-03	Client ID: OF-5004		
Surfactants, MBAS	0.300	0.340	mg/l	13		32
General Chemistry - Westborough Lab	Associated sample(s): 01-05	QC Batch ID: WG1526313-3	QC Sample: L2135987-01	Client ID: DUP Sample		
Phosphorus, Total	2.84	2.67	mg/l	6		20
General Chemistry - Westborough Lab	Associated sample(s): 01-04	QC Batch ID: WG1530058-3	QC Sample: L2137031-01	Client ID: DUP Sample		
Nitrogen, Ammonia	1.36	1.42	mg/l	4		20
General Chemistry - Westborough Lab	Associated sample(s): 05	QC Batch ID: WG1530692-3	QC Sample: L2137708-02	Client ID: DUP Sample		
Nitrogen, Ammonia	0.134	0.158	mg/l	16		20

Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Serial_No:08032112:12
Lab Number: L2137082
Report Date: 08/03/21

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2137082-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-01C	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-01D	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-01E	Plastic 120ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)
L2137082-01F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2137082-01G	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2137082-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-02B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-02C	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-02D	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-02E	Plastic 120ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)
L2137082-02F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2137082-02G	Plastic 500ml unpreserved	A	7	7	3.7	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2137082-03A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-03B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-03C	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-03D	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-03E	Plastic 120ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)
L2137082-03F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2137082-03G	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2137082-03H	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		BOD-5210(2)
L2137082-04A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)

Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Serial_No:08032112:12
Lab Number: L2137082
Report Date: 08/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2137082-04B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-04C	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-04D	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-04E	Plastic 120ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)
L2137082-04F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2137082-04G	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2137082-05A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-05B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-QT(.33)
L2137082-05C	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-05D	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		F-COLI-MF(.33)
L2137082-05E	Plastic 120ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)
L2137082-05F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2137082-05G	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2137082-05H	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		BOD-5210(2)

Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

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: MILFORD WET WEATHER
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Lab Number: L2137082
Report Date: 08/03/21

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 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: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

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.

Project Name: MILFORD WET WEATHER
Project Number: R311-2001.00

Lab Number: L2137082
Report Date: 08/03/21

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-Terpeneol

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-Terpeneol; 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, SM4500CI-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-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.



8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 7/9/21

ALPHA Job #: L2137082

Project Information

Project Name: Milford wet weather

Project Location: Town of Milford

Project #: R311-2001.00

Project Manager:

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

☒ ADEX ☒ EMAIL

☐ 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

Client Information

Client: Environmental Partners

Address: 1900 Crown Colony #402

Quincy MA

Phone: 207-939-3883

Email: AET@envpartners.com

Additional Project Information:

MS4

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	ANALYSIS															SAMPLE INFO	TOTAL # BOTTLES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		Date	Time			VOC: ☐ 8260 ☐ 824 ☐ 524.2	SVOC: ☐ ABRN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRAS ☐ RCRAS	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	PCB: ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	Surfactant S	BOD	Total Ammonia Chloride	Ammonia	E. Coli + Fecal Coliform	Total Phosphorus																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
37082-01	OF-103	7/9	12:15	Water	AET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Container Type

P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
Q= BOD Bottle

Preservative

A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₅
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type

Preservative

Relinquished By:

James E. Desjardis

Date/Time

15:27 7/9
7/9/21 18:35

Received By:

James E. Desjardis

Date/Time

7/9/21 15:27
7/9/21 18:35

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L2136971
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	MILFORD WET WEATHER
Project Number:	R311-2001
Report Date:	08/03/21

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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: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2136971-01	037	WATER	TOWN OF MILFORD	07/09/21 09:25	07/09/21
L2136971-02	039	WATER	TOWN OF MILFORD	07/09/21 09:35	07/09/21
L2136971-03	040	WATER	TOWN OF MILFORD	07/09/21 10:25	07/09/21
L2136971-04	031	WATER	TOWN OF MILFORD	07/09/21 11:00	07/09/21
L2136971-05	OF-101	WATER	TOWN OF MILFORD	07/09/21 11:50	07/09/21
L2136971-06	OF-102	WATER	TOWN OF MILFORD	07/09/21 11:55	07/09/21

Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

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: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

Case Narrative (continued)

Nitrogen, Ammonia

L2136971-03: The sample has an elevated detection limit due to the dilution required by the sample matrix.

Coliform, Fecal (MF)

L2136971-04 and -05: The result is estimated due to the elevated concentration in the sample. Due to the expiration of the method required holding time, re-analysis could not be performed.

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: 08/03/21

INORGANICS & MISCELLANEOUS

Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2136971-01
Client ID: 037
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 09:25
Date Received: 07/09/21
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)	170000		col/100ml	1000	NA	1000	-	07/09/21 16:45	121,9222D	JT
E. Coli (MPN)	111230		MPN/100ml	1000	NA	1000	-	07/09/21 15:30	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
Nitrogen, Ammonia	0.806		mg/l	0.375	--	5	07/30/21 18:30	08/02/21 20:43	121,4500NH3-BH	AT
Phosphorus, Total	0.340		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:34	121,4500P-E	SD
BOD, 5 day	20.		mg/l	2.0	NA	1	07/09/21 19:40	07/14/21 16:20	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:16	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2136971-02
Client ID: 039
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 09:35
Date Received: 07/09/21
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)	3400		col/100ml	100	NA	100	-	07/09/21 16:45	121,9222D	JT
E. Coli (MPN)	113.7		MPN/100ml	1	NA	1	-	07/09/21 15:30	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
Nitrogen, Ammonia	0.116		mg/l	0.075	--	1	07/30/21 18:30	08/02/21 20:43	121,4500NH3-BH	AT
Phosphorus, Total	0.062		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:35	121,4500P-E	SD
BOD, 5 day	4.0		mg/l	2.0	NA	1	07/09/21 19:40	07/14/21 16:20	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:17	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2136971-03
Client ID: 040
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 10:25
Date Received: 07/09/21
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)	8900		col/100ml	100	NA	100	-	07/09/21 16:45	121,9222D	JT
E. Coli (MPN)	3698		MPN/100ml	200	NA	200	-	07/09/21 15:30	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.150	--	2	07/30/21 18:30	08/02/21 20:44	121,4500NH3-BH	AT
Phosphorus, Total	0.150		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:36	121,4500P-E	SD
BOD, 5 day	8.6		mg/l	2.0	NA	1	07/09/21 19:40	07/14/21 16:20	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:18	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2136971-04
Client ID: 031
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 11:00
Date Received: 07/09/21
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)	38000		col/100ml	100	NA	100	-	07/09/21 16:45	121,9222D	JT
E. Coli (MPN)	6131.4		MPN/100ml	10	NA	10	-	07/09/21 15:30	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:24	121,4500NH3-BH	AT
Phosphorus, Total	0.258		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:37	121,4500P-E	SD
BOD, 5 day	6.7		mg/l	2.0	NA	1	07/09/21 19:40	07/14/21 16:20	121,5210B	JD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:18	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2136971-05
Client ID: OF-101
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 11:50
Date Received: 07/09/21
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)	37000		col/100ml	100	NA	100	-	07/09/21 16:45	121,9222D	JT
E. Coli (MPN)	52050		MPN/100ml	200	NA	200	-	07/09/21 15:30	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:25	121,4500NH3-BH	AT
Phosphorus, Total	0.096		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:38	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:19	121,5540C	KA



Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

SAMPLE RESULTS

Lab ID: L2136971-06
Client ID: OF-102
Sample Location: TOWN OF MILFORD

Date Collected: 07/09/21 11:55
Date Received: 07/09/21
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)	8900		col/100ml	100	NA	100	-	07/09/21 16:45	121,9222D	JT
E. Coli (MPN)	11110		MPN/100ml	200	NA	200	-	07/09/21 15:30	121,9223B	JD
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:26	121,4500NH3-BH	AT
Phosphorus, Total	0.024		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:40	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:20	121,5540C	KA



Project Name: MILFORD WET WEATHER

Lab Number: L2136971

Project Number: R311-2001

Report Date: 08/03/21

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): 01-06 Batch: WG1522292-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	07/09/21 15:30	121,9223B	JD
Microbiological Analysis - Westborough Lab for sample(s): 01-06 Batch: WG1522293-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	07/09/21 16:45	121,9222D	JT
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1522342-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	07/09/21 19:40	07/14/21 16:20	121,5210B	JD
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG1522374-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/09/21 18:56	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG1522419-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/10/21 00:01	07/10/21 05:13	121,5540C	KA
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG1526235-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	07/21/21 09:00	07/21/21 13:19	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1530010-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/30/21 18:30	08/02/21 20:36	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 04-06 Batch: WG1530058-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/31/21 04:31	08/02/21 21:08	121,4500NH3-BH	AT

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MILFORD WET WEATHER

Project Number: R311-2001

Lab Number: L2136971

Report Date: 08/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1522342-2								
BOD, 5 day	106		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG1522374-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG1522419-2								
Surfactants, MBAS	102		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG1526235-2								
Phosphorus, Total	110		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1530010-2								
Nitrogen, Ammonia	104		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 04-06 Batch: WG1530058-2								
Nitrogen, Ammonia	104		-		80-120	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: MILFORD WET WEATHER

Project Number: R311-2001

Lab Number: L2136971

Report Date: 08/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04				QC Batch ID: WG1522342-4			QC Sample: L2136795-02			Client ID: MS Sample		
BOD, 5 day	ND	100	130	130		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01-06				QC Batch ID: WG1522374-4			QC Sample: L2136963-02			Client ID: MS Sample		
Chlorine, Total Residual	ND	0.25	0.20	80		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-06				QC Batch ID: WG1522419-4			QC Sample: L2137082-03			Client ID: MS Sample		
Surfactants, MBAS	0.300	0.4	0.720	105		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-06				QC Batch ID: WG1526235-4			QC Sample: L2136958-01			Client ID: MS Sample		
Phosphorus, Total	0.158	0.5	0.665	101		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1530010-4			QC Sample: L2136923-02			Client ID: MS Sample		
Nitrogen, Ammonia	7.45	4	10.5	76	Q	-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 04-06				QC Batch ID: WG1530058-4			QC Sample: L2137031-01			Client ID: MS Sample		
Nitrogen, Ammonia	1.36	4	5.48	103		-	-		80-120	-		20

Project Name: MILFORD WET WEATHER

Project Number: R311-2001

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2136971

Report Date: 08/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01-04	QC Batch ID: WG1522342-3	QC Sample: L2136795-02	Client ID: DUP Sample		
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab	Associated sample(s): 01-06	QC Batch ID: WG1522374-3	QC Sample: L2136963-01	Client ID: DUP Sample		
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-06	QC Batch ID: WG1522419-3	QC Sample: L2137082-03	Client ID: DUP Sample		
Surfactants, MBAS	0.300	0.340	mg/l	13		32
General Chemistry - Westborough Lab	Associated sample(s): 01-06	QC Batch ID: WG1526235-3	QC Sample: L2136958-01	Client ID: DUP Sample		
Phosphorus, Total	0.158	0.154	mg/l	3		20
General Chemistry - Westborough Lab	Associated sample(s): 01-03	QC Batch ID: WG1530010-3	QC Sample: L2136923-02	Client ID: DUP Sample		
Nitrogen, Ammonia	7.45	7.69	mg/l	3		20
General Chemistry - Westborough Lab	Associated sample(s): 04-06	QC Batch ID: WG1530058-3	QC Sample: L2137031-01	Client ID: DUP Sample		
Nitrogen, Ammonia	1.36	1.42	mg/l	4		20

Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Serial_No:08032112:53
Lab Number: L2136971
Report Date: 08/03/21

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2136971-01A	Plastic 120ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2136971-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-01C	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-01D	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-01E	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-01F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.0	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2136971-01G	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2136971-01H	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2136971-02A	Plastic 120ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),BOD-5210(2),MBAS-5540(2)
L2136971-02B	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-02C	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-02D	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-02E	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-02F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.0	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2136971-02G	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),BOD-5210(2),MBAS-5540(2)
L2136971-02H	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),BOD-5210(2),MBAS-5540(2)
L2136971-03A	Plastic 120ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2136971-03B	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-03C	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-03D	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-03E	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-03F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.0	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2136971-03G	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)

Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Serial_No: 08032112:53
Lab Number: L2136971
Report Date: 08/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2136971-03H	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2136971-04A	Plastic 120ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),BOD-5210(2),MBAS-5540(2)
L2136971-04B	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-04C	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-04D	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-04E	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-04F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.0	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2136971-04G	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),BOD-5210(2),MBAS-5540(2)
L2136971-04H	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),BOD-5210(2),MBAS-5540(2)
L2136971-05A	Plastic 120ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2136971-05B	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-05C	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-05D	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-05E	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-05F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.0	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2136971-05G	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2136971-06A	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-06B	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		F-COLI-MF(.33)
L2136971-06C	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-06D	Bacteria Cup Na2S2O3 preserved	A	NA		3.0	Y	Absent		E-COLI-QT(.33)
L2136971-06E	Plastic 500ml H2SO4 preserved	A	<2	<2	3.0	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2136971-06F	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2136971-06G	Plastic 950ml unpreserved	A	7	7	3.0	Y	Absent		TRC-4500(1),MBAS-5540(2)

Project Name: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

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.

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Project Name: MILFORD WET WEATHER
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Report Date: 08/03/21

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 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: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

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: MILFORD WET WEATHER
Project Number: R311-2001

Lab Number: L2136971
Report Date: 08/03/21

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, SM4500CI-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-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

8 Watup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: ~~Form of National~~ Environmental Partners
Address: 1900 Crown Colony Suite
#402 Quincy, MA

Phone: 207-939-3893

Email: aet@envpartners.com

Additional Project Information:

MSU

Project Information

Project Name: Milford Wet Weather

Project Location: Town of Milford

Project #: R311-2001

Project Manager:

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

[illegible]

Container Type

P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encone
D= BOD Bottle

Preservative

A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H = Na₂S₂O₅
I= Ascorbic Acid
J = NH₄Cl
K= Zn Acetate
O= Other

Container Type

Preservative

Relinquished By:

Date/Time

Received By:

Date/Time

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

FORM NO. 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L2141865
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	MILFORD WET WEATHER DAY 2
Project Number:	Not Specified
Report Date:	08/13/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2141865-01	OF-76	WATER	TOWN OF MILFORD	08/05/21 09:55	08/05/21
L2141865-02	OF-238	WATER	TOWN OF MILFORD	08/05/21 10:25	08/05/21
L2141865-03	239	WATER	TOWN OF MILFORD	08/05/21 10:30	08/05/21
L2141865-04	102	WATER	TOWN OF MILFORD	08/05/21 11:20	08/05/21

Project Name: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

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.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 08/13/21

INORGANICS & MISCELLANEOUS

Project Name: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

SAMPLE RESULTS

Lab ID: L2141865-01
Client ID: OF-76
Sample Location: TOWN OF MILFORD

Date Collected: 08/05/21 09:55
Date Received: 08/05/21
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)	26000		col/100ml	100	NA	100	-	08/05/21 14:50	121,9222D	JT
E. Coli (MPN)	20288		MPN/100ml	200	NA	200	-	08/05/21 15:26	121,9223B	JW
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 22:38	121,4500CL-D	AS
Nitrogen, Ammonia	0.133		mg/l	0.075	--	1	08/11/21 06:50	08/12/21 18:34	121,4500NH3-BH	AT
Phosphorus, Total	0.096		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:52	121,4500P-E	MC
BOD, 5 day	2.3		mg/l	2.0	NA	1	08/06/21 13:00	08/11/21 11:30	121,5210B	MT
Surfactants, MBAS	0.070		mg/l	0.050	--	1	08/07/21 04:10	08/07/21 08:49	121,5540C	AW



Project Name: MILFORD WET WEATHER DAY 2**Lab Number:** L2141865**Project Number:** Not Specified**Report Date:** 08/13/21**SAMPLE RESULTS****Lab ID:** L2141865-02**Date Collected:** 08/05/21 10:25**Client ID:** OF-238**Date Received:** 08/05/21**Sample Location:** TOWN OF MILFORD**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)	6900		col/100ml	100	NA	100	-	08/05/21 14:50	121,9222D	JT
E. Coli (MPN)	1732.89		MPN/100ml	1	NA	1	-	08/05/21 15:26	121,9223B	JW
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 22:38	121,4500CL-D	AS
Nitrogen, Ammonia	0.105		mg/l	0.075	--	1	08/11/21 06:50	08/12/21 18:35	121,4500NH3-BH	AT
Phosphorus, Total	0.096		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:53	121,4500P-E	MC
Surfactants, MBAS	0.070		mg/l	0.050	--	1	08/07/21 04:10	08/07/21 08:50	121,5540C	AW



Project Name: MILFORD WET WEATHER DAY 2**Lab Number:** L2141865**Project Number:** Not Specified**Report Date:** 08/13/21**SAMPLE RESULTS****Lab ID:** L2141865-03**Date Collected:** 08/05/21 10:30**Client ID:** 239**Date Received:** 08/05/21**Sample Location:** TOWN OF MILFORD**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)	3100		col/100ml	100	NA	100	-	08/05/21 14:50	121,9222D	JT
E. Coli (MPN)	1553.12		MPN/100ml	1	NA	1	-	08/05/21 15:26	121,9223B	JW
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 22:38	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/11/21 06:50	08/12/21 18:35	121,4500NH3-BH	AT
Phosphorus, Total	0.131		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:56	121,4500P-E	MC
Surfactants, MBAS	ND		mg/l	0.050	--	1	08/07/21 04:10	08/07/21 08:50	121,5540C	AW



Project Name: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

SAMPLE RESULTS

Lab ID: L2141865-04
Client ID: 102
Sample Location: TOWN OF MILFORD

Date Collected: 08/05/21 11:20
Date Received: 08/05/21
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)	7300		col/100ml	100	NA	100	-	08/05/21 14:50	121,9222D	JT
E. Coli (MPN)	6902		MPN/100ml	200	NA	200	-	08/05/21 15:26	121,9223B	JW
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 22:38	121,4500CL-D	AS
Nitrogen, Ammonia	0.078		mg/l	0.075	--	1	08/11/21 06:50	08/12/21 18:36	121,4500NH3-BH	AT
Phosphorus, Total	0.087		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:57	121,4500P-E	MC
BOD, 5 day	2.7		mg/l	2.0	NA	1	08/06/21 13:00	08/11/21 11:30	121,5210B	MT
Surfactants, MBAS	0.060		mg/l	0.050	--	1	08/07/21 04:10	08/07/21 08:51	121,5540C	AW



Project Name: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

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): 01-04 Batch: WG1531965-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	08/05/21 15:26	121,9223B	JW
Microbiological Analysis - Westborough Lab for sample(s): 01-04 Batch: WG1531984-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	08/05/21 14:50	121,9222D	JT
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1532096-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/05/21 22:38	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1532215-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	08/06/21 08:10	08/06/21 11:33	121,4500P-E	MC
General Chemistry - Westborough Lab for sample(s): 01,04 Batch: WG1532233-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	08/06/21 13:00	08/11/21 11:30	121,5210B	MT
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1532514-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	08/07/21 04:10	08/07/21 08:46	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1533735-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/11/21 06:50	08/12/21 18:09	121,4500NH3-BH	AT



Lab Control Sample Analysis

Batch Quality Control

Project Name: MILFORD WET WEATHER DAY 2

Project Number: Not Specified

Lab Number: L2141865

Report Date: 08/13/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1532096-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1532215-2								
Phosphorus, Total	97		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01,04 Batch: WG1532233-2								
BOD, 5 day	98		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1532514-2								
Surfactants, MBAS	106		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1533735-2								
Nitrogen, Ammonia	98		-		80-120	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04				QC Batch ID: WG1532096-4			QC Sample: L2142025-01			Client ID: MS Sample		
Chlorine, Total Residual	ND	0.25	0.24	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04				QC Batch ID: WG1532215-4			QC Sample: L2141569-01			Client ID: MS Sample		
Phosphorus, Total	0.048	0.5	0.519	94		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01,04				QC Batch ID: WG1532233-4			QC Sample: L2141888-04			Client ID: MS Sample		
BOD, 5 day	4.2	100	95	91		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01-04				QC Batch ID: WG1532514-4			QC Sample: L2141865-03			Client ID: 239		
Surfactants, MBAS	ND	0.4	0.480	120		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-04				QC Batch ID: WG1533735-4			QC Sample: L2141849-01			Client ID: MS Sample		
Nitrogen, Ammonia	0.418	4	4.14	93		-	-		80-120	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MILFORD WET WEATHER DAY 2

Project Number: Not Specified

Lab Number: L2141865

Report Date: 08/13/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01-04	QC Batch ID: WG1532096-3	QC Sample: L2142025-01	Client ID: DUP	Sample	
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-04	QC Batch ID: WG1532215-3	QC Sample: L2141569-01	Client ID: DUP	Sample	
Phosphorus, Total	0.048	0.043	mg/l	11		20
General Chemistry - Westborough Lab	Associated sample(s): 01,04	QC Batch ID: WG1532233-3	QC Sample: L2141888-04	Client ID: DUP	Sample	
BOD, 5 day	4.2	4.6	mg/l	9		35
General Chemistry - Westborough Lab	Associated sample(s): 01-04	QC Batch ID: WG1532514-3	QC Sample: L2141865-03	Client ID: 239		
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab	Associated sample(s): 01-04	QC Batch ID: WG1533735-3	QC Sample: L2141849-01	Client ID: DUP	Sample	
Nitrogen, Ammonia	0.418	0.410	mg/l	2		20

Project Name: MILFORD WET WEATHER DAY 2**Lab Number:** L2141865**Project Number:** Not Specified**Report Date:** 08/13/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2141865-01A	Plastic 120ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2141865-01B	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-01C	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-01D	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-01E	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-01F	Plastic 500ml H2SO4 preserved	A	<2	<2	2.3	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2141865-01G	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2141865-01H	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2141865-02A	Plastic 120ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2141865-02B	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-02C	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-02D	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-02E	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-02F	Plastic 500ml H2SO4 preserved	A	<2	<2	2.3	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2141865-02G	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2141865-03A	Plastic 120ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2141865-03B	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-03C	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-03D	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-03E	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-03F	Plastic 500ml H2SO4 preserved	A	<2	<2	2.3	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2141865-03G	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2)
L2141865-04A	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)

Project Name: MILFORD WET WEATHER DAY 2**Lab Number:** L2141865**Project Number:** Not Specified**Report Date:** 08/13/21**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2141865-04B	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-QT(.33)
L2141865-04C	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-04D	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		F-COLI-MF(.33)
L2141865-04E	Plastic 500ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2141865-04F	Plastic 500ml H2SO4 preserved	A	<2	<2	2.3	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2141865-04G	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)
L2141865-04H	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		TRC-4500(1),MBAS-5540(2),BOD-5210(2)

Project Name: MILFORD WET WEATHER DAY 2**Lab Number:** L2141865**Project Number:** Not Specified**Report Date:** 08/13/21

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: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

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 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: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

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.

Project Name: MILFORD WET WEATHER DAY 2
Project Number: Not Specified

Lab Number: L2141865
Report Date: 08/13/21

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 19

Published Date: 4/2/2021 1:14:23 PM

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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.

MEMORANDUM

Date: September 23, 2021

To: Michael Dean, P.E. – Town Engineer, Town of Milford

Scott Crisafulli – Highway Surveyor, Town of Milford

From: Natalie Pommersheim – Project Manager, Environmental Partners

CC: Scott Turner, P.E. – Director of Planning, Environmental Partners

Subject: Illicit Discharge Detection & Elimination (IDDE) FY21 Catchment Investigations

This memorandum summarizes the FY21 IDDE catchment investigations, outlined in Task 4D of the Agreement for Professional Engineering Services – MS4 General Permit Assistance for the Office of Planning & Engineering of the Town of Milford. In accordance with the Massachusetts MS4 General Permit, the Town of Milford must perform catchment investigations at each catchment by the end of the Permit term.

On July 27 and August 3 and 4 of 2021, EP personnel visited 5 catchments during dry weather conditions. No catchments exhibited indicators of likely sewer input. The catchments were selected based on dry weather sampling lab results, which is further detailed in the following section. The locations of the catchments screened under the FY21 contract are shown in *Figures 1: Location of FY21 Catchment Investigations* and listed in *Table 1: Catchment Investigation Locations*. Catchment Packages for each catchment investigated are attached to this report and contain field forms and a detailed figure summarizing the work and findings.

To complete the 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 the 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, 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 SVF inventory and any catchment mapping updates identified.

Catchment Investigation Findings

A summary of the field sampling results is presented in *Table 2: Catchment Investigations Field Test Results*. No sampling results or other evidence indicated likely sewer input. Thus, no catchments were flagged for further investigation. There are some areas that need maintenance, and some further mapping updates will be required

For each catchment investigated, EP recorded the following notes.

Catchment of Outfall 40 (Beach Street)

- The catchment of Outfall 40 was investigated because dry weather sampling in 2019 resulted in E. coli concentrations greater than the regulated threshold.
- The catchment includes 10 catch basins, 7 manholes, and 3 inlets.
- All 4 KJMs were observed and found to be flowing.
- Field test kit results indicated no evidence of a sanitary sewer connection.
- No olfactory or visual evidence of an illicit discharge was observed.
- EP observed a plank of wood and a 12" pipe transecting a manhole (Manhole ID 1665). The Town should visit to determine if maintenance is required and if the pipe represents a System Vulnerability Factor (SVF).
- A catch basin (CB-3309) discharges to a manhole with a sewer manhole cover. EP believes that the manhole cover may be mislabeled and that a second MS4 drain system may be located on Beach Street, crossing the system investigated for this report. The Town should verify the discharge location of this catch basin.
- The mapping of stormwater structures on this street needs to be improved.
- Catchment investigation is completed, but SVF inventory and refined catchment delineation are pending, and Town follow-up is needed.

Catchment of Outfall 271 (Maple Street)

- The catchment of Outfall 271 was investigated because dry weather sampling in 2018 resulted in a specific conductivity concentration greater than the regulated threshold.
- The catchment includes 8 catch basins and 5 manholes.
- The sole KJM was observed and found to be flowing.
- Field test kit results indicated no evidence of a sanitary sewer connection.
- No olfactory or visual evidence of an illicit discharge was observed.
- Catchment investigation is completed, but SVF inventory and refined catchment delineation are pending.

Catchment of Outfall OF-156 (Princess Pine Lane)

- The catchment of Outfall OF-156 was investigated because dry weather sampling in 2018 resulted in a chorine concentration greater than the regulated threshold.
- The catchment includes 12 catch basins and 7 manholes.
- The sole KJM was observed and found to be flowing.
- Field test kit results indicated no evidence of a likely sanitary sewer connection. The KJM also had no visual or olfactory evidence of an illicit connection.
- During connectivity verification on 7/27/21, EP noticed that Manhole 143 had visible suds. When EP returned on 8/3/21, no suds were visible and field sampling results showed no sign of likely sanitary sewer input.
- The Town should revisit Manhole 143 and if suds are observed again the Town should attempt to determine the source of the suds.
- Catchment investigation is completed, although Town follow-up is suggested and SVF and refined catchment delineation are pending.

Catchment of Outfall OF-200 (Bowdoin Drive)

- The catchment of Outfall 271 was investigated because dry weather sampling in 2018 resulted in a chorine concentration greater than the regulated threshold.
- The catchment includes 32 catch basins and 13 manholes.
- The catchment includes 5 KJMs, all of which were found to be flowing.
- 4 of the 5 KJMs were field sampled; all sampling results showed no evidence of a likely sanitary sewer connection.
- No olfactory or visual evidence of an illicit discharge was observed.
- The final KJM requires a police detail to safely access and sample. Currently, the catchment investigation is **incomplete**, and the SVF inventory and refined catchment delineation are pending.

Catchment of Outfall OF-201 (Manoogian Circle)

- The catchment of Outfall 201 was investigated because dry weather sampling in 2018 resulted in an E. coli concentration greater than the regulated threshold.
- The catchment includes 14 catch basins and 12 manholes.
- The 2 KJMs were observed and found to be flowing.
- Only 1 of the 2 KJMs had enough stormwater flow to be sampled. Field test kit results at that manhole indicated no evidence of a sanitary sewer connection.
- No olfactory or visual evidence of an illicit discharge was observed.
- Catchment investigation is completed, but SVF inventory and refined catchment delineation are pending.

Recommendations

In conclusion, EP recommends the following:

1. Complete catchment investigation for Catchment OF-200 (requires police detail),
2. Complete mapping updates as required from field investigations, especially on Beach Street
3. Refine catchment delineations,
4. Conduct maintenance on structures as noted,

5. Identify/deny presence of SVFs in these catchments,
6. Continue IDDE catchment investigations, investigating a portion of the remaining catchments each year for the next 6 years, and
7. Continue performing wet weather outfall sampling at outfalls within catchments that have at least 1 SVF identified.

Attachments:

Certification Page

Table 1: Catchment Investigation Locations

Table 2: Stormwater Field Test Kit Results

Figure 1: Locations of FY21 Catchment Investigations

Catchment Packages

Catchment Investigation for Outfall 40

Catchment Investigation for Outfall 271

Catchment Investigation for Outfall OF-156

Catchment Investigation for Outfall OF-200

Catchment Investigation for Outfall OF-201

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

Signature

Date

Table 1: Catchment Investigation Locations
Milford, MA

Outfall ID	Catchment	Subcatchment	Receiving Water	Approximate Street Address	Catchment Investigation Date	Dry Weather Screening Status	Catchment Investigation Notes	Catchment Investigation Status
40	D	262	Charles River	35 Beach Street	8/3/2021	Flowing	- 4 Key Junction Manholes visited - No signs of likely sewer input	Completed, pending SVF identification and catchment delineation
271	H	146	Unnamed stream north of Beaver Pond	55 Maple Street	8/3/2021	Flowing	- 1 Key Junction Manhole visited - No sign of likely sewer input	Completed, pending SVF identification and catchment delineation
OF-156	U	220	Unnamed Tributary to Huckleberry Brook	27 Pricess Pine Lane	7/27/2021 and 8/3/2021	Flowing	- 1 Key Junction Manhole visited - No sign of likely sewer input	Completed, pending SVF identification and catchment delineation
OF-200	P	74	Unnamed Wetlands to Little Field Pond	7 Bowdoin Drive	8/4/2021	Flowing	- 4 Key Junction Manholes within the catchment - 3 Key Junction Manholes observed and sampled - 1 Key Junction Manhole observed, but not sampled due to traffic - So far, no sign of likely sewer input	NOT COMPLETED - police detail required to safely sample last KJM
OF-201	U	39	Unnamed Wetlands to Little Field Pond	7 Manoogian Circle	8/4/21	Flowing	- 2 Key Junction Manholes visited - No sign of likely sewer input	Completed, pending SVF identification and catchment delineation

Table 2: Stormwater Field Test Kit Results
Milford, MA

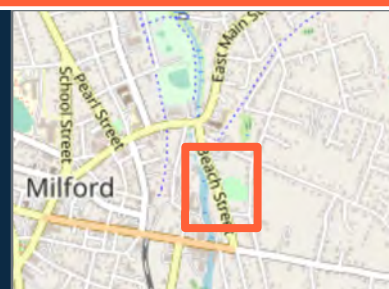
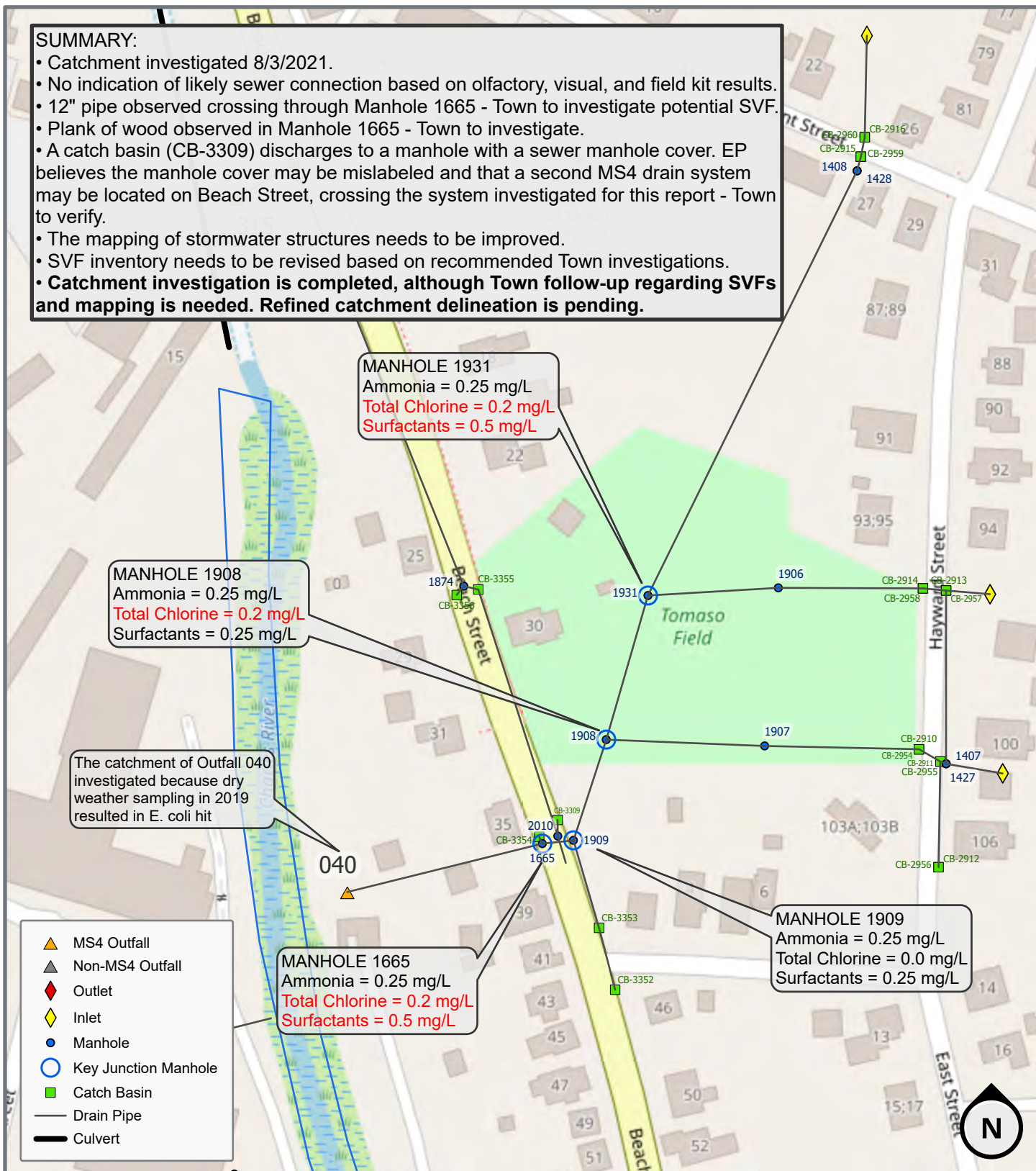
Outfall ID		40				271	OF-156		OF-200			OF-201
Catchment		D				H	U		P			U
Discharge Waterbody		Charles River				Beaver Pond	Huckleberry Brook		Little Field Pond			Little Field Pond
Structure ID		Manhole 1665	Manhole 1909	Manhole 1908	Manhole 1931	Manhole 1104	Manhole 92	Manhole 143	Manhole 793	Manhole 740	Manhole 791	Manhole 859
Date Sampled		8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	7/27/2021	8/3/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021
Field Test Results												
Ammonia (mg/L)	0.5 mg/L	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.0
Total Chlorine (mg/L)	0.1 mg/L	0.2	0.0	0.2	0.2	0.5	0.1	0.2	0.4	0.5	0.5	0.0
Surfactants (mg/L)	0.25 mg/L	0.5	0.25	0.25	0.5	0.5	1.5	0.25	0.25	0.25	0.25	0.25

Bold Values exceed contaminant criteria.

**CATCHMENT INVESTIGATION PACKAGE FOR
OUTFALL 040**

SUMMARY:

- Catchment investigated 8/3/2021.
- No indication of likely sewer connection based on olfactory, visual, and field kit results.
- 12" pipe observed crossing through Manhole 1665 - Town to investigate potential SVF.
- Plank of wood observed in Manhole 1665 - Town to investigate.
- A catch basin (CB-3309) discharges to a manhole with a sewer manhole cover. EP believes the manhole cover may be mislabeled and that a second MS4 drain system may be located on Beach Street, crossing the system investigated for this report - Town to verify.
- The mapping of stormwater structures needs to be improved.
- SVF inventory needs to be revised based on recommended Town investigations.
- **Catchment investigation is completed, although Town follow-up regarding SVFs and mapping is needed. Refined catchment delineation is pending.**



040,1665

Created	2021-08-03 14:23:43 UTC by EPField 01
Updated	2021-08-04 20:01:24 UTC by EPField 01
Location	42.1423091893813, -71.5140790119767

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	1665
Structure Type	Manhole
Outfall ID	040
Date	2021-08-03
Time	10:23
Address	21 Pond Street Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	75

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	75

9

Pipe Clock Position	9
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	39
Pipe Notes	Dry

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	?
Pipe Diameter (inches)	0
Pipe Invert (inches)	0
Pipe Notes	Unable to see pipe - manhole is wide - flow must be coming from an assumed pipe
Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate
Flow Source	Manhole 1930

Structure Notes	12in RCP pipe going through manhole - SVF
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Physical Indicators

Floatables	No
Odor	No

Structure

Sampling Location	Structure
-------------------	-----------

Field Kits

Surfactants	0.5
Chlorine	0.2
Ammonia	0.25

Surface Photos



Interior Photos



040, 1908

Created	2021-08-03 17:04:03 UTC by EPField 01
Updated	2021-08-03 17:34:56 UTC by EPField 01
Location	42.1410485225067, -71.51162981987

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	1908
Structure Type	Manhole
Outfall ID	040
Date	2021-08-03
Time	13:04
Address	30 Beach Street Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	65

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	65

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	64.5

2

Pipe Clock Position	2
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	57.5
Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate
Flow Source	Manholes 1907 and 1931

Physical Indicators

Floatables	No
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Odor	No
------	----

Structure

Sampling Location	Structure
-------------------	-----------

Field Kits

Surfactants	0.22
Chlorine	0.2
Ammonia	0.25

Surface Photos



Interior Photos



040, 1909

Created	2021-08-03 15:10:56 UTC by EPField 01
Updated	2021-08-03 15:53:14 UTC by EPField 01
Location	42.1407248370785, -71.5117310732603

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	1909
Structure Type	Manhole
Outfall ID	040
Date	2021-08-03
Time	11:10
Address	35 Beach Street Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	74

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	?
Pipe Diameter (inches)	30
Pipe Invert (inches)	74
Pipe Notes	Unable to get clear view of pipe - measurements are estimations

11

Pipe Clock Position	11
Flow Direction	In
Pipe Material	?
Pipe Diameter (inches)	30
Pipe Invert (inches)	73
Pipe Notes	Can't determine material

3

Pipe Clock Position	3
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	1.5
Pipe Invert (inches)	54
Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate
Flow Source	MH 1908

Structure Notes	Pipe supposedly located at 8pm did not exist. Pipe from cb actually goes to manhole with sewer manhole cover; EP suspects that there is a second drainage system on this road and the sewer manhole cover is mislabeled - Town to investigate further
Physical Indicators	
Floatables	No
Odor	No

Structure	
Sampling Location	Structure

Field Kits	
Surfactants	0.22
Chlorine	0
Ammonia	0.25



Interior Photos



Other Photos



040, 1931

Created	2021-08-03 17:39:43 UTC by EPField 01
Updated	2021-08-03 18:00:36 UTC by EPField 01
Location	42.1413966, -71.5114213

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	1931
Structure Type	Manhole
Outfall ID	040
Date	2021-08-03
Time	13:39
Address	24 Beach Street Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	68

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	69

3

Pipe Clock Position	3
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	67

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	68.5
Pipe Invert (inches)	68.5
Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate
Flow Source	1408/1428 and 1906

Physical Indicators

Floatables	No
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Odor	No
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Structure

Sampling Location	Structure
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Field Kits

Surfactants	0.5
Chlorine	0.2
Ammonia	0.25

Surface Photos



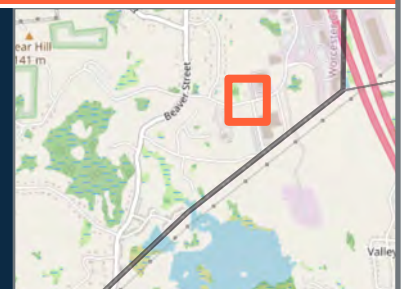
Interior Photos



**CATCHMENT INVESTIGATION PACKAGE FOR
OUTFALL 271**

SUMMARY:

- Catchment investigated 8/3/2021.
- No indication of likely sewer connection based on olfactory, visual, and field kit results.
- **Catchment investigation is completed, but SVF inventory and refined catchment delineation are pending.**



271, 1104

Created	2021-08-03 18:56:14 UTC by EPField 01
Updated	2021-08-03 19:20:09 UTC by EPField 01
Location	42.1305968, -71.4864338

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	1104
Structure Type	Manhole
Outfall ID	271
Date	2021-08-03
Time	14:56
Address	51 Maple Street Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	116

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	24
Pipe Invert (inches)	116

2

Pipe Clock Position	2
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	53

9

Pipe Clock Position	9
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	84
Pipes Submerged	No
Flow Present	Yes
Flow Description	Trickle
Flow Source	Manhole 1103

Physical Indicators

Floatables	No
------------	----

Odor	No
------	----

Pipe, 2

Sampling Location	Pipe
-------------------	------

Pipe Clock Position	2
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Field Kits

Surfactants	0.5
-------------	-----

Chlorine	0.5
----------	-----

Ammonia	0.25
---------	------

Surface Photos

Interior Photos



**CATCHMENT INVESTIGATION PACKAGE FOR
OUTFALL OF-156**

SUMMARY:

- Catchment investigated 7/27/2021 and 8/3/2021
- No indication of likely sewer connection based on olfactory, visual, and field kit results.
- During connectivity verification on 7/27/21, EP noticed that Manhole 143 had visible suds. When EP returned on 8/3/21, no suds were visible and field sampling results showed no sign of likely sanitary sewer input - Town to revisit Manhole 143 and if suds are observed again, Town should attempt to determine the source of suds.
- **Catchment investigation is completed, but SVF inventory and refined catchment delineation are pending. Town to follow-up regarding suds.**

Catchment was investigated because dry weather sampling in 2018 resulted in a chlorine concentration greater than the regulated threshold.

MANHOLE 143
Suds observed 7/27/21

No suds observed 8/3/21
Sampled 8/3/21:
Ammonia = 0.25 mg/L
Total Chlorine = 0.2mg/L
Surfactants = 0.25 mg/L

MANHOLE 92
Sampled 7/27/21:
Ammonia = 0.25 mg/L
Total Chlorine = 0.1 mg/L
Surfactants = 1.5 mg/L

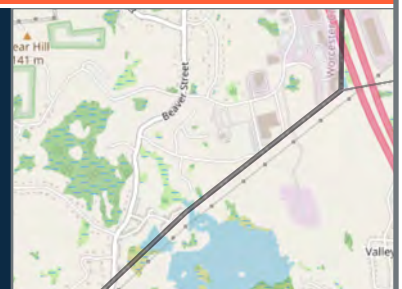
- ▲ MS4 Outfall
- ▲ Non-MS4 Outfall
- ◆ Outlet
- ◆ Inlet
- Manhole
- Key Junction Manhole
- Catch Basin
- Drain Pipe
- Culvert

ENVIRONMENTAL
PARTNERS
— An Apex Company —

Catchment Investigation for OF-156

Milford, Massachusetts

0 125 250 500
Feet



OF-156, 92

Project	MVGP - 10/05 - Friday
Created	2021-07-27 18:44:15 UTC by EPField 01
Updated	2021-07-27 19:34:53 UTC by EPField 01
Location	42.167647, -71.5331822

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	92
Structure Type	Manhole
Outfall ID	OF-156
Date	2021-07-27
Time	14:44
Address	24 Princess Pine Lane Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	52.5

1

Pipe Clock Position	1
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	51.5
Pipe Notes	Source of flow

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	52.5
Pipe Notes	Outlet

3

Pipe Clock Position	3
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	49
Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate

Flow Source	Manhole ID 143
-------------	----------------

Physical Indicators

Floatables	No
Odor	No

Pipe, 1

Sampling Location	Pipe
Pipe Clock Position	1

Field Kits

Surfactants	1.5
Chlorine	0.1
Ammonia	0.25

Surface Photos



Interior Photos



Other Photos



OF-156, 143

Project	MVGP - 10/05 - Friday
Created	2021-07-27 19:40:40 UTC by EPField 01
Updated	2021-08-03 13:42:08 UTC by EPField 01
Location	42.1676499, -71.5334361

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	143
Structure Type	Manhole
Outfall ID	OF-156
Date	2021-07-27
Time	15:40
Address	24 Princess Pine Lane Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	50.5

10

Pipe Clock Position	10
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	49
Pipe Notes	No flow

11

Pipe Clock Position	11
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	48
Pipe Notes	Flowing

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	49
Pipe Notes	Flowing

6

Pipe Clock Position	6
---------------------	---

Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	50.5
Pipe Notes	Outlet
Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate
Flow Source	CB-292 and manhole 144

Physical Indicators

Floatables	Yes
Floatables Type	Suds/Soap
Floatables Note	Small amount of suds
Odor	No

Structure

Sampling Location	Structure
-------------------	-----------

Field Kits

Surfactants	0.25
Chlorine	0.2
Ammonia	0.25
Sampling Notes	Sampled 8/3/21 9:40, sampled from pipe with most flow
Surface Photos	



Interior Photos



**CATCHMENT INVESTIGATION PACKAGE FOR
OUTFALL OF-200**

SUMMARY:

- Catchment investigated 8/4/2021.
- No indication of likely sewer connection based on olfactory, visual, and field kit results.
- Catchment investigation is **INCOMPLETE** - final KJM needs to be sampled and SVF inventory and refined catchment delineation are pending.

MANHOLE 793
Ammonia = 0.25 mg/L
Total Chlorine = 0.4 mg/L
Surfactants = 0.25 mg/L

MANHOLE 792
Ammonia = 0.25 mg/L
Total Chlorine = 0.5 mg/L
Surfactants = 0.25 mg/L

MANHOLE 791
Ammonia = 0.25 mg/L
Total Chlorine = 0.5 mg/L
Surfactants = 0.25 mg/L

MANHOLE 641
No visual or olfactory evidence of
sanitary sewage
Flow observed, but not sampled -
need police detail to sample safely

Catchment was investigated
because dry weather sampling
in 2018 resulted in a chlorine
concentration greater than the
regulated threshold

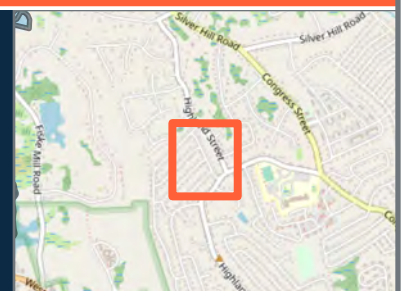
- ▲ MS4 Outfall
- ▲ Non-MS4 Outfall
- ◆ Outlet
- ◆ Inlet
- Manhole
- Key Junction Manhole
- Catch Basin
- Drain Pipe
- Culvert

ENVIRONMENTAL
PARTNERS
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Catchment Investigation for OF-200

Milford, Massachusetts

0 100 200 400
US Feet



OF-200, Manhole 641

Created	2021-08-04 16:52:50 UTC by EPField 01
Updated	2021-08-04 19:21:04 UTC by EPField 01
Location	42.3197499150562, -71.1064167693257

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	Manhole 641
Structure Type	Manhole
Outfall ID	OF-200
Date	2021-08-04
Time	12:52
Address	

Structure Information

Maintenance Required	No
Manhole Invert (inches)	99

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	99

6

Pipe Clock Position	6
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	55

9

Pipe Clock Position	9
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	73

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	69.5

3

Pipe Clock Position	3
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	58
Pipes Submerged	No
Flow Present	Yes
Flow Description	Trickle
Flow Source	See Figure

Physical Indicators

Floatables	No
Odor	No

Surface Photos

Interior Photos



OF-200, 791

Created	2021-08-04 15:18:13 UTC by EPField 01
Updated	2021-08-04 15:54:40 UTC by EPField 01
Location	42.1598151, -71.5464207

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	791
Structure Type	Manhole
Outfall ID	OF-200
Date	2021-08-04
Time	11:18
Address	9 University Drive Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	68

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	24
Pipe Invert (inches)	68

3

Pipe Clock Position	3
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	60

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	66

9

Pipe Clock Position	9
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	61

7

Pipe Clock Position	7
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	43
Pipes Submerged	No
Flow Present	No

Physical Indicators

Floatables	No
Odor	No

Structure

Sampling Location	Structure
-------------------	-----------

Field Kits

Surfactants	0.25
Chlorine	0.5
Ammonia	0.25

Surface Photos



Interior Photos



OF-200, 792

Created	2021-08-04 15:55:13 UTC by EPField 01
Updated	2021-08-04 17:04:52 UTC by EPField 01
Location	42.1604893, -71.5467619

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	792
Structure Type	Manhole
Outfall ID	OF-200
Date	2021-08-04
Time	11:55
Address	15 University Drive Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	66.5

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	68

2

Pipe Clock Position	2
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	65.5

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	24
Pipe Invert (inches)	67

10

Pipe Clock Position	10
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	55

Pipes Submerged	No
Flow Present	Yes
Flow Description	Trickle
Flow Source	MH 791, CB 713

Physical Indicators

Floatables	No
Odor	No

Structure

Sampling Location	Structure
-------------------	-----------

Field Kits

Surfactants	0.25
Chlorine	0.5
Ammonia	0.25

Surface Photos



Interior Photos



OF-200, 794

Created	2021-08-04 14:30:31 UTC by EPField 01
Updated	2021-08-04 15:18:09 UTC by EPField 01
Location	42.1612502285452, -71.547553986311

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	794
Structure Type	Manhole
Outfall ID	OF-200
Date	2021-08-04
Time	10:30
Address	5 Bowdoin Drive Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	77

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	36
Pipe Invert (inches)	77

1

Pipe Clock Position	1
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	71

3

Pipe Clock Position	3
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	76

4

Pipe Clock Position	4
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	12
Pipe Invert (inches)	72

Pipes Submerged	No
Flow Present	Yes
Flow Description	Moderate
Flow Source	Manhole 740, catch basin 1599

Physical Indicators

Floatables	No
Odor	No

Structure

Sampling Location	Structure
-------------------	-----------

Field Kits

Surfactants	0.25
Chlorine	0.4
Ammonia	0.25

Surface Photos

Interior Photos



**CATCHMENT INVESTIGATION PACKAGE FOR
OUTFALL OF-201**

SUMMARY:

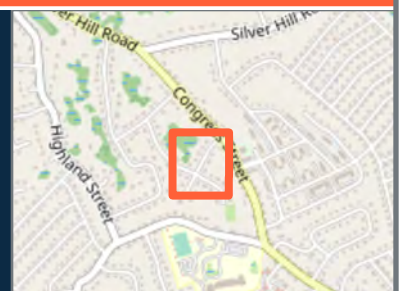
- Catchment investigated 8/4/2021.
- No indication of likely sewer connection based on olfactory, visual, and field kit results.
- **Catchment investigation is completed, but SVF inventory and refined catchment delineation are pending.**

Catchment was investigated because dry weather sampling in 2018 resulted in an E. coli concentration greater than the regulated threshold

MANHOLE 859
Ammonia = 1.0 mg/L
Total Chlorine = 0.0 mg/L
Surfactants = 0.25 mg/L

MANHOLE 850
Trickling - not enough to sample

- ▲ MS4 Outfall
- ▲ Non-MS4 Outfall
- ◆ Outlet
- ◆ Inlet
- Manhole
- Key Junction Manhole
- Catch Basin
- Drain Pipe
- Culvert



OF-201, 850

Created	2021-08-04 13:42:42 UTC by EPField 01
Updated	2021-08-04 13:51:26 UTC by EPField 01
Location	42.1614634637962, -71.5410010144114

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	850
Structure Type	Manhole
Outfall ID	OF-201
Date	2021-08-04
Time	09:42
Address	6 Manoogian Circle Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	59

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	24
Pipe Invert (inches)	59

9

Pipe Clock Position	9
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	18
Pipe Invert (inches)	49

12

Pipe Clock Position	12
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	20
Pipe Invert (inches)	53
Pipes Submerged	No
Flow Present	Yes
Flow Description	Trickle
Flow Source	Man hole 851

Physical Indicators

Floatables	No
------------	----

Odor	No
General Notes	Attempted to sample but found the amount of flow was too little to sample
Surface Photos	
Interior Photos	

OF-201, 859

Created	2021-08-04 13:04:17 UTC by EPField 01
Updated	2021-08-04 13:36:28 UTC by EPField 01
Location	42.1619341693703, -71.5406620502472

Background Data

Client	Town of Milford
EP Representatives	Annie Tucker, Mike Franck
Structure ID	859
Structure Type	Manhole
Outfall ID	OF-201
Date	2021-08-04
Time	09:04
Address	4 Manoogian Circle Milford, Massachusetts 01757

Structure Information

Maintenance Required	No
Manhole Invert (inches)	67

6

Pipe Clock Position	6
Flow Direction	Out
Pipe Material	RCP
Pipe Diameter (inches)	30
Pipe Invert (inches)	67

9

Pipe Clock Position	9
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	24
Pipe Invert (inches)	66.5

2

Pipe Clock Position	2
Flow Direction	In
Pipe Material	RCP
Pipe Diameter (inches)	24
Pipe Invert (inches)	66.5
Pipe Notes	Could not see pipe. Assumed it was roughly same size as 9 pipe Inlet
Pipes Submerged	No
Flow Present	No

Physical Indicators

Floatables	No
Odor	No

Structure

Sampling Location

Structure

Field Kits

Surfactants

0.25

Chlorine

0

Ammonia

1

Surface Photos



Interior Photos



APPENDIX F

Outfall Catchment System Vulnerability Factor (SVF) Inventory

Appendix F – Outfall Catchment System Vulnerability Factor (SVF) Inventory
Milford, Massachusetts
Revision Date: September 2021

Outfall ID	Receiving Water	1 History of SSOs	2 Common or Twin Invert Manholes	3 Common Trench Construction	4 Storm/Sanitary Crossings (Sanitary Above)	5 Sanitary Lines with Underdrains	6 Inadequate Sanitary Level of Service	7 Areas Formerly Served by Combined Sewers	8 Sanitary Infrastructur e Defects	9 SSO Potential In Event of System Failures	10 Sanitary and Storm Drain Infrastructure >40 years Old	11 Septic with Poor Soils or Water Table Separation	12 History of BOH Actions Addressing Septic Failure
31	Charles River	Yes											
39	Charles River	Yes											
40	Charles River	Yes											
OF-510	Charles River	Yes											
37	Charles River	Yes											
102	Godfrey Brook	Yes											
OF-101	Godfrey Brook	Yes											
OF-102	Godfrey Brook	Yes											
OF-103	Godfrey Brook	Yes											
OF-104	Godfrey Brook	Yes											
OF-315	Godfrey Brook	Yes											
OF-503	Godfrey Brook	Yes											
OF-504	Godfrey Brook	Yes											
239	Littlefield Pond	Yes											
OF-238	Littlefield Pond	Yes											

Presence/Absence Evaluation Criteria:

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
2. Common or twin-invert manholes serving storm and sanitary sewer alignments
3. Common trench construction serving both storm and sanitary sewer alignments
4. Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
5. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
6. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
7. Areas formerly served by combined sewer systems
8. 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
9. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
10. Any sanitary sewer and storm drain infrastructure greater than 40 years old
11. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
12. History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)

APPENDIX G

New England Interstate Water Pollution Control Commission IDDE Manual

ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL

A Handbook for Municipalities



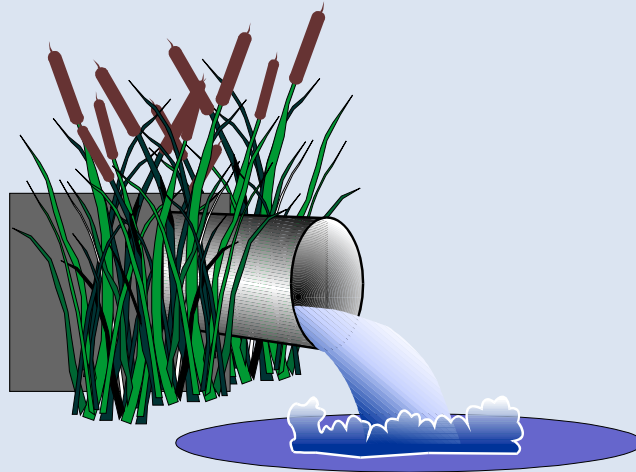
NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

January 2003

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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.

NEIWPCC would also like to thank the following people who contributed their time in providing information for and/or reviewing the manual:

Interviews or Other Information

Kathy Baskin, Charles River Watershed Association
Paul Barden, BWSC
Michael Cuneo, Town of Dedham, MA
Andrea Donlon, NHDES
Tim Grover, City of Winooski, VT
Charlie Jewell, BWSC
Natalie Landry, NHDES
Ginny Scarlet, MADEP

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Greg Goblick, RIDEM
Tim Grover, City of Winooski, VT
David Ladd, MEDEP
Steve Lipman, MADEP
Thomas Mahin, MADEP
Thelma Murphy, USEPA
Jim Pease, VTDEC
Ginny Scarlet, MADEP
Chris Stone, CTDEP

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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

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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.

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 activities¹ 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.

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.

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, 2003². 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.

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.

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.

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.

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

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.

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.

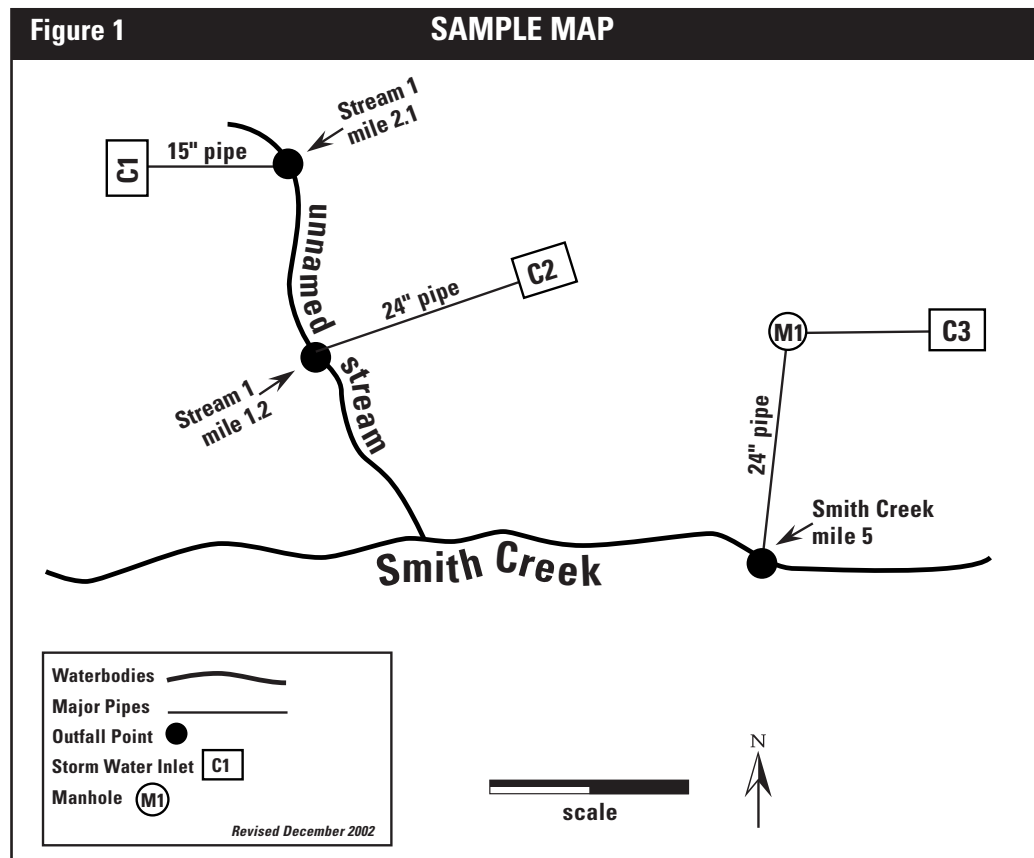
If you plan to map via computer, decide if you want to make the mapping system compatible with other departments within your municipality and/or with other data sources (e.g., state agencies that provide GIS layers). Since storm sewer systems are often constructed in roadways, the use of the GIS road 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.

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.

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.





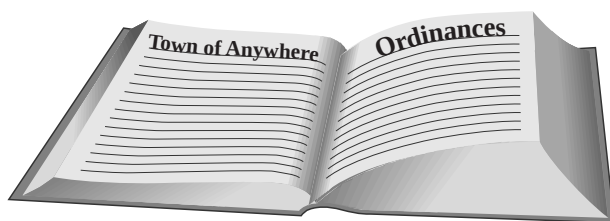
REFERENCES: CHAPTER 2

- 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>
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- 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 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.

A municipal ordinance created to comply with Phase II regulations must include a prohibition of illicit discharges and an enforcement mechanism.

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, <i>E. coli</i>, and/or <i>enterococci</i>)	Used to indicate the presence of sanitary wastewater	- Used by NHDES (see case example in chapter 5)

REFERENCES: CHAPTER 4

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Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal storm water discharge permit.
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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>
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- Interview with Andrea Donlon, NHDES, July 29, 2002.
- Interview with Tim Grover, City of Winooski, VT, August 9, 2002.
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DEVELOPING AND IMPLEMENTING AN IDDE PLAN: TRACING 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 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.

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.



A key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source.

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.

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



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.



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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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.

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

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.

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 non-compliance. 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)

REFERENCES: CHAPTER 6

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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

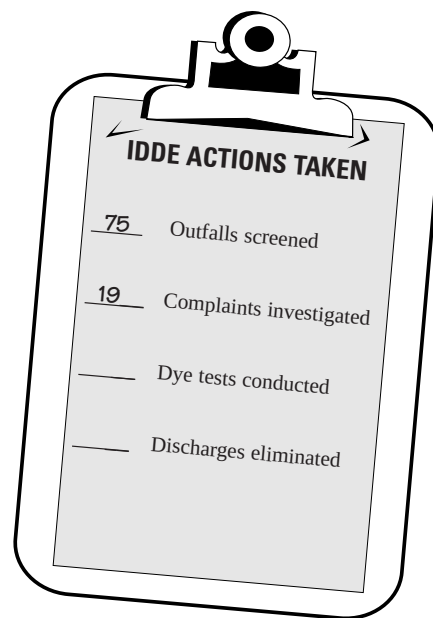
- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

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.)

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.



Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges.

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.

REFERENCES: CHAPTER 7

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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. 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.

Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges.

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.

- 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).

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.

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
- 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

If made aware of environmental issues, the general public can help mitigate or prevent problems.

- 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.

REFERENCES: CHAPTER 8

Chesterfield County (VA). Undated. *Household Guide to Chesterfield County's Illicit Discharge Ordinance*. <http://www.chesterfield.gov/CommunityDevelopment/Engineering/HouseholdFactSheet.pdf>

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 2.3: *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

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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

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.)

EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs.

■ 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>

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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.cdph.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.dfstormwater.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 tetrattech1@earthlink.net or kathryn.phillips@tetrattech-ffx.com.

CONTACTS

USEPA-New England is the NPDES permitting authority for Massachusetts and New Hampshire. The other five NEIWPC 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 Gobllick 401-222-4700 x7265; ggobllick@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 Ordinance¹

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

Illicit Discharge Detection and Elimination (IDDE)
Employee Training Record
Milford, Massachusetts

Date of Training: _____

Duration of Training: _____

Name	Title	Signature

ENVIRONMENTAL
 PARTNERS

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