Illicit Discharge Detection and Elimination (IDDE) Plan

Town of North Hampton

Permit Year 3

Prepared By:
Town of North Hampton,
Adapted from Plans developed by Seacoast Stormwater Coalition

EPA NPDES Permit Number NHR041024
Document Date – July 30, 2021
Updated – June 30, 2023

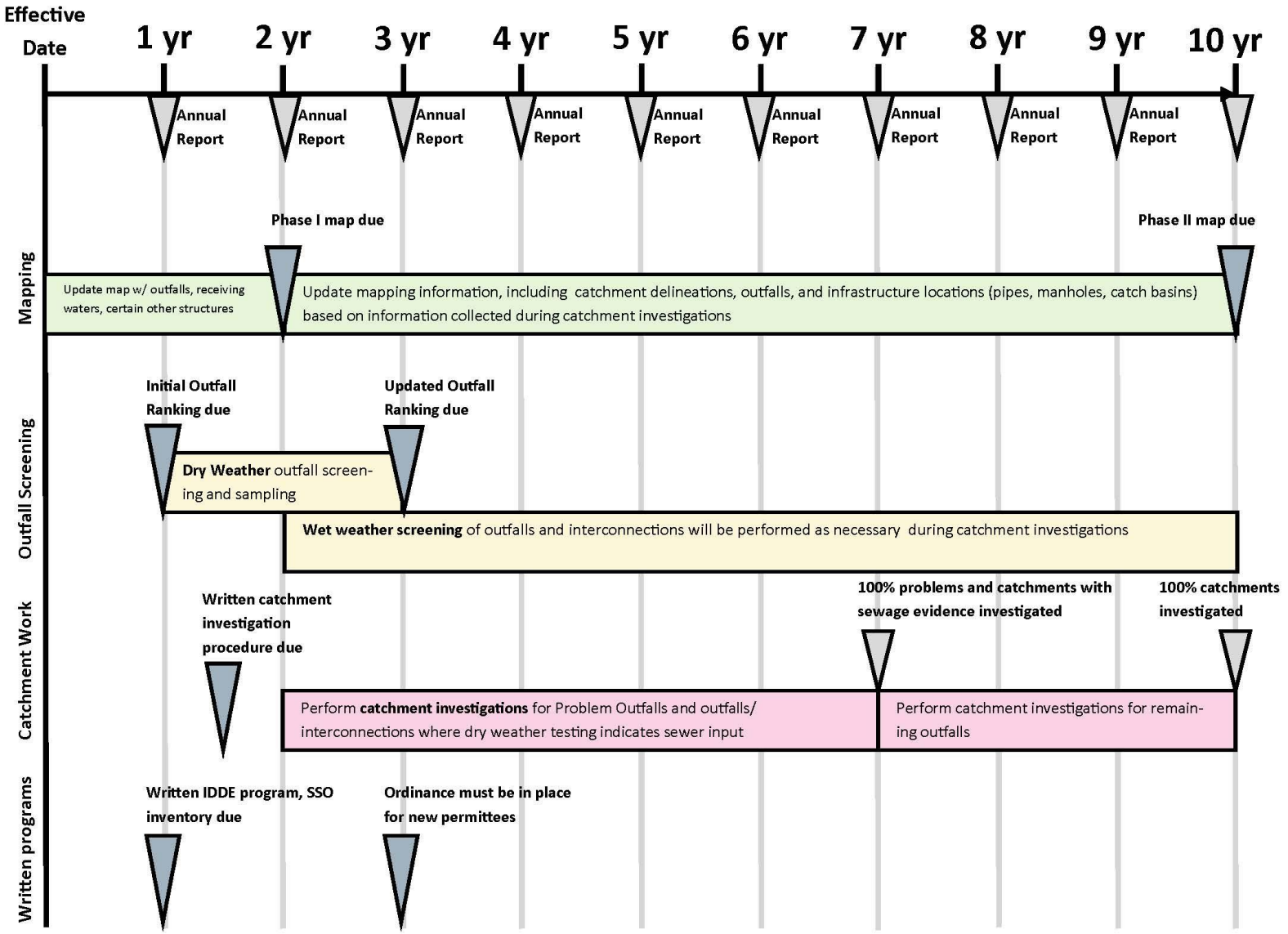

Effective Date
1 yr
2 yr
3 yr
4 yr
5 yr
6 yr
7 yr
8 yr
9 yr
10 yr
Annual Report
Mapping
Phase I map due
Phase II map due
Update map w/ outfalls, receiving waters, certain other structures
Update mapping information, including catchment delineations, outfalls, and infrastructure locations (pipes, manholes, catch basins) based on information collected during catchment investigations
Outfall Screening
Initial Outfall Ranking due
Updated Outfall Ranking due
Dry Weather outfall screening and sampling
Wet weather screening of outfalls and interconnections will be performed as necessary during catchment investigations
Catchment Work
Written catchment investigation procedure due
100% problems and catchments with sewage evidence investigated
100% catchments investigated
Perform catchment investigations for Problem Outfalls and outfalls/ interconnections where dry weather testing indicates sewer input
Perform catchment investigations for remaining outfalls
Written programs
Written IDDE program, SSO inventory due
Ordinance must be in place for new permittees

Table of Contents

Tables

Figures

1 IDDE Program Implementation Timeline

1.1 Introduction

The Town of North Hampton (Town) has developed an Illicit Discharge Detection and Elimination (IDDE) program to address the requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II rule, most recently updated with an effective date of July 1, 2018. The rule requires regulated operators of municipal separate storm sewer systems (MS4s) to obtain a permit to discharge stormwater runoff from their MS4, and establishes conditions they must meet to reducethe impacts of stormwater discharges.

The MS4 Permit requires that each permittee or regulated community address six (6) Minimum Control Measures. The measures include the following:

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

Under Minimum Control Measure #3, the Town is required to implement an IDDE program to provide the legal authority to prohibit and eliminate illicit discharges to the MS4, find the source of any illicit discharges, eliminate those illicit discharges, and ensure ongoing screeningand tracking to prevent and/or eliminate future illicit discharges. In this regard, the Town reliesheavily on its General Services staff to observe and scrutinize the Town's MS4 outfalls for illicit discharges, illegal dumping and illicit connections, during their routine duties. The main methodology used involves Dry Weather Screening, which helps to ensure the integrity of the stormwater drainage system by detecting non-stormwater discharges during dry weather conditions. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement.

1.2 Purpose:

The purpose of this Plan is to outline a program to systematically detect and eliminate non-stormwater illicit discharges to the North Hampton Municipal Separate Storm Sewer System (MS4) and waterways to improve water quality and meet the Federal Phase II Stormwater requirements. It provides the Town staff with direction as to the frequency and procedures for performing field screenings, collecting samples, equipment needed, discusses possible sources of potential pollutants, and outlines guidelines for investigating an illicit discharge.

1.3 Definitions:

An "illicit discharge" is any discharge to a municipal separate storm sewer 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 municipal separate storm sewer), and dischargesresulting from firefighting activities.

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage systemthrough 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 catchbasins, 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 intosurface waters.

Some illicit discharges are related to the unsuitability of original infrastructure to the modern regulatory environment. Examples of illicit discharges in this category include connected floordrains in old buildings, 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 wash water or old household products, in many cases due to a lackof understanding on the part of the homeowner.

Elimination of some discharges may require substantial costs and efforts, such as funding and designing a project to reconnect sanitary sewer laterals. Others, such as improving self- policing of dog waste management, can be accomplished by outreach in conjunction with the minimal additional cost of dog waste bins and the municipal commitment to disposal of collected materials on a regular basis.

Regardless of the intention, when not addressed, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

1.4 Allowable Non-Stormwater Discharges

The permit allows the following non-stormwater discharges unless they are identified as significant sources of pollutants:

Water line flushing	Landscape irrigation
Diverted stream flows	Rising ground waters
Uncontaminated ground water infiltration*	Uncontaminated pumped ground water
Discharge from potable water sources	Foundation drains
Air conditioning condensation	Irrigation water
Springs	Footing drains
Water from crawl space pumps	Individual resident car washing
Lawn watering	De-chlorinated swimming pool discharges
Flows from riparian habitats and wetlands	Residential building wash waters w/o detergents
Street wash waters	Firefighter flows or discharges**

* As defined at 40 CFR 35.2005(20))
** Discharges or flows from firefighting activities are allowed and only need to be addressed where they are identified as significant sources of pollutants to waters of the Town of North Hampton or State of New Hampshire.

1.5 Timeline:

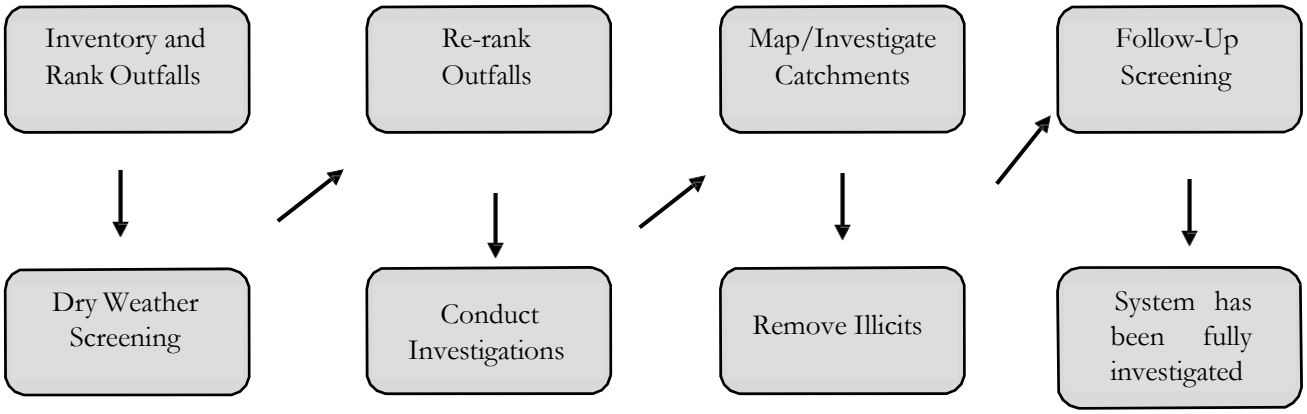


Table 1 below provides a timeline over which the Town intends to fully implement the requirements of the IDDE program.

Table 1 – IDDE Program Implementation Timeline

IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year	1.5 Years	2 Years	3 Years	7 Years	10 Years
Written IDDE Program Plan	X					
SSO Inventory	X					
Initial Outfall Ranking	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

2 Authority and Statement of IDDE Responsibilities

2.1 Legal Authority

The Town will adopt a bylaw, ordinance, or other regulatory mechanism to provide the Town 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 bylaw, ordinance, or other regulatory mechanism will meet the requirements of the 2017 MS4 Permit and will be in place within 3 years of the permit effective date (July 1, 2021).

2.2 Statement of Responsibilities

The Town of North Hampton, Public Works Department is the lead municipal agency or department responsible for implementing the IDDE program pursuant to the provisions of the bylaw, ordinance, or other regulatory mechanism to be adopted by the Planning and Zoning Department. The Public Works Department will be responsible for all aspects of the IDDE program in accordance with the general oversightof the Board of Selectmen. Other departments with responsibility for aspects of the program include:

- ***Public Works Department*** – implementing the stormwater components of the program to include such items as dry and wet weather screenings, catch basin cleaning, street sweeping, inspection of facilities, and infrastructure maintenance; and assisting in the public relations and education components
- ***Building Department*** – overseeing septic system construction, enforcing plumbing codes
- ***Health Department*** – first response to notification of spills or discharges that do not pose an immediate health or safety concern and implementing the wastewater components (if any)
- ***Public Works Department Director***– mapping services
- ***Recreation Department Director***– public relations and education
- ***Planning and Zoning Department***– implementing construction site stormwater runoff control measures and post construction stormwater management components to include written procedures for site plan reviews, erosion and sediment control, development of site inspections and enforcement procedures, and street design and parking lot guidelines.
- ***Town Council*** – general oversight of the program and enforcement, signatory authority.
- The Board of Selectmen have the authority to issue fines.
- ***Town Administrator*** – overall coordination oversight of the program and coordination of the Stormwater Committee
- ***Town Counsel –*** taking court-related enforcement actions as directed by Town Officials
- ***Emergency Management*** – first response to notification of spills or discharges which may posean immediate health or safety concern

3 Stormwater System Mapping

A copy of the existing storm system map is provided in **Appendix B**.

The MS4 Permit requires the storm system map to be updated in two phases as outlined below. The Public Works Department is responsible for updating the stormwater system mapping pursuant to the 2017 MS4 Permit. The town of North Hampton will report on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping will be included in **Appendix B**.

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 information per Part 2.3.4.5.a of the MS4.

The town of North Hampton will complete the following updates to its stormwater mapping to meet the Phase I requirements:

- Outfalls and receiving waters (required by MS4-2003 permit)
- Interconnections with other MS4s and other storm sewer systems
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems

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 information per Part 2.3.4.5.b of the MS4 Permit.

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

4 Sanitary Sewer Overflows (SSOs)

The town of North Hampton has no Sanitary Sewer Overflows (SSOs).

Discharges of wastewater from any point sources, including sanitary sewer overflows (SSO's) shall be reported in accordance with Part II, Section D.1.e. of the General Requirements of the Publicly Owned Treatment Works General Permit.

5 Assessment and Priority Ranking of Outfalls

The MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to have illicit discharges related public health significance. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

5.1 Outfall Catchment Delineations

The catchments for each of the MS4 outfalls were delineated to define contributing areas for investigation of potential sources of illicit discharges. Refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations.

5.2 Outfall and Interconnection Inventory and Initial Ranking

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

Outfall means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.

Interconnection means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

Outfalls and interconnections will be classified into one of the following categories:

Outfalls that Require Screening – Generally the following types of outfalls require screening:

- Both large and small diameter pipes that appear to be part of the storm drain infrastructure
- Outfalls that appear to be piped headwater streams
- Field connections to culverts
- Submerged or partially submerged outfalls
- Outfalls that are blocked with debris or sediment deposits
- Pipes that appear to be outfalls from stormwater treatment practices
- Drop inlets from roads in culverts

- Pipes that appear to only drain roof downspouts but that are subsurface, preventing definitive confirmation

Outfalls that Do Not Require Screening – Generally the following types of outfalls DO NOT require screening:

- Cross-drainage culverts in transportation right-of-way (can see daylight at the other end)
- Parking lot drains to curbs
- Weep holes
- Flexible HDPE pipes that are known to serve as slope drains
- Pipes that are clearly connected to roof downspouts via above-ground connections

Outfalls and interconnections will be classified into one of the following categories:

1. **Excluded outfalls**:
    - Outfalls/interconnections that do not discharge to an impaired waterbody or are not listed in Part II Summary of Receiving Waters in the NOI.
    - Outfalls/interconnections with no potential for illicit discharges including 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.

2. **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.

3. **High Priority Outfalls**: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:
    - Discharging to a water quality limited waterbody
    - 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 in **Appendix D**.

1. **Low Priority Outfalls**: Outfalls/interconnections determined by the Town as low priority based on the field investigations or other available information.

Outfalls will be ranked into the above priority categories (except for excluded outfalls, which may be excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. To prioritize initial mapping and outfall assessment work the permittee is using location-specific characteristics of water body impairments to focus initial work as included in **Appendix B**. It is understood that not all currently excluded catchments will remain

excluded throughout the 10 year assessment period, however for initial outfall ranking and catchment investigations this approach will target the worst areas first.

- **Previous screening results** – previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).

- **Past discharge complaints and reports.**

- **Poor receiving water quality** – the following guidelines are recommended to identify waters as having a high illicit discharge potential:
    - Exceeding water quality standards for bacteria
    - Ammonia levels above 0.5 mg/l
    - Surfactants levels greater than or equal to 0.25 mg/l

- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.

- **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.

- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.

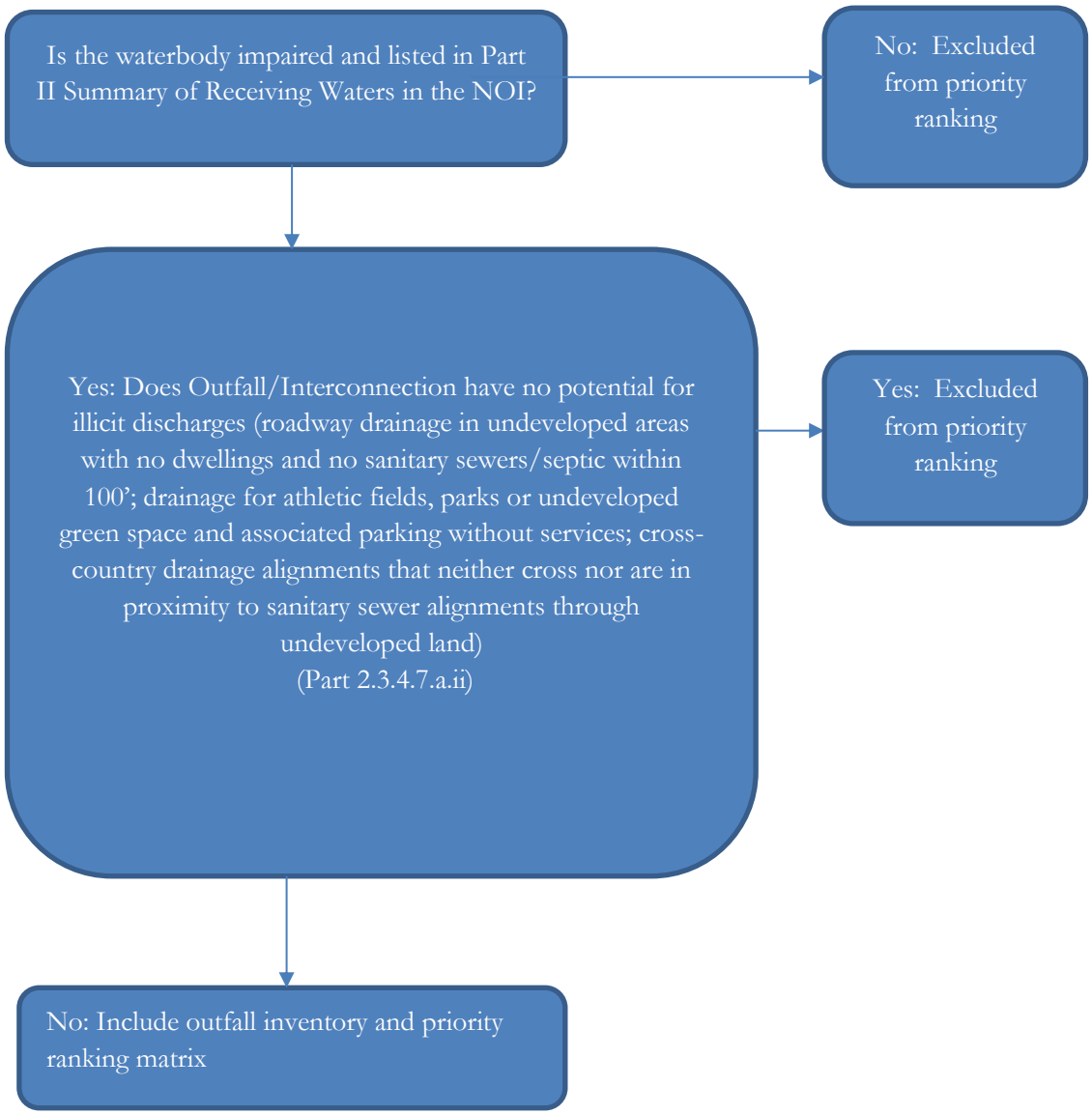
- **Historic combined sewer systems** – Contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.

- **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.

- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.

- **Water quality limited waterbodies** that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

The following is an initial outfall prioritization flowchart, see Appendix D for an outfall inventory and priority ranking matrix:



Outfalls are ranked into the above priority categories (except for excluded outfalls, whichmay be excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, or where information is available.

- **Previous screening results** – previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).
- **Past discharge complaints and reports.**
- **Poor receiving water quality** – the following guidelines are recommended to identify waters as having a high illicit discharge potential:
    - Exceeding water quality standards for bacteria
    - Ammonia levels above 0.5 mg/l
    - Surfactants levels greater than or equal to 0.25 mg/l
- **Density of generating sites** – Generating sites are those places, including

institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.

- **Age of development and infrastructure** – Industrial areas greater than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- **Water quality limited waterbodies** that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Note: To prioritize initial mapping and outfall assessment work the Town is using location-specific characteristics of water body impairments to focus initial work as included in Appendix B. It is understood that not all currently excluded catchments will remain excluded throughout the 10-year assessment period, however for initial outfall ranking and catchment investigations this approach will target the worst areas first.

Appendix C lists the waterbodies that the Town of North Hampton MS4 discharges to inclusive of the number of outfalls discharging into it, if applicable, its NH segment ID, and any impairments.

- **Resource Waters:** There are several resource waters throughout North Hampton that the Town values for habitat preservation, active and passive recreational uses, and education purposes. The primary resource waters include: Little River, Winnicut River, Chapel Brook, Garland Brook, and the Little River Mill Pond. Stormwater outfalls discharging in close proximity to these waters are more likely to adversely affect water quality than outfalls further away.
- **Public Drinking Water Supply:** There exist four privately-owned public water wells in North Hampton (not mapped for security concerns). Three of the four wells managed by Aquarion Water Co. are located within the Winnicut River watershed but not within the MS4 area (though a small amount of the headwaters drain MS4 areas). One well is located within the Little River watershed and within the MS4 area. The Town of North Hampton will prioritize the area around and draining to this well for MS4 activities and will follow and comply with N.H. Code Admin. R. Part Env-Wq 1500.

6 Dry Weather Outfall Screening and Sampling

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and Excluded Outfalls) to be inspected for the presence of dry weather flow. The Public Works Department 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 by the end of Year 3.

During a dry weather period, it is anticipated that minimal flow from stormwater outfalls will be observed. Therefore, dry weather inspections aim to characterize any/all flow observed during a dry weather period and identify potential source(s) of an illicit discharge through testing.

Dry weather outfall Screening and Sampling shall be completed in accordance with the following procedures, including sample collection, use of field kits, storage and conveyance of samples, and fielddata collection and storage, all of which are intended to meet the requirements as specified in Part 2.3.4.7.b. of the MS4 Permit.

6.1 Dry Weather Screening – General Procedure

Note: Screening and sampling shall proceed only when no more than 0.1 inch of rainfall has occurred in the previous twenty-four (24) hour period and no significant snow melt is occurring.

Unlike wet weather sampling, dry weather inspections are not intended to capture a "first flush" of stormwater discharge, rather they are intended to identify any/all discharges from a stormwater outfall during a period without recorded rainfall. The intent of inspections during a dry weather period is to characterize observed discharges and facilitate detection of illicit discharges.

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 andpriority ranking.
2. Acquire the necessary staff, mapping, and field equipment (see

4. Table 2 for list ofpotential field equipment).
5. Conduct the outfall inspection during dry weather (see Note above):
    a. Identify appropriate location of outfall. Observe outfall. Do not enter water below outfall as disturbance of sediments may skew sampling results.
    b. Mark and photograph the outfall. Make a note if the location of the mapped outfall needs to be updated to the real location and record its coordinates.
    c. Record the inspection information and outfall characteristics using the Dry Weather Outfall Screening Form located in **Appendix E**. This form will be used for initial site inspections and to document follow-up activities should a potential illicit discharge be detected.
    d. Look for and record visual/olfactory evidence of pollutants inflowing 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. It is important toindicate the conditions visually observed at an outfall location.This includes:
        i. Foam: indicator of upstream vehicle washingactivities, or an illicit discharge.
        ii. Oil sheen: result of a leak or spill
        iii. Cloudiness: indicator of suspended solids such as dust,ash, powdered chemicals and ground up materials.
        iv. Color or odor: indicator of raw materials, chemicals, or sewage.
        v. Excessive sediment: indicator or disturbed earth ofother unpaved areas lacking adequate erosion control measures.
        vi. Sanitary waste and optical enhancers (florescent dyes added to laundry detergent and some toilet paper): indicators of illicit discharge.
        vii. Orange staining: indicator of high mineral concentrations.
    e.
    f. Table 3 provides some possible sources of illicit discharges based on physicalparameters observed or collected during field reviews. Note that some of theseindicators may occur naturally. For instance, Foam can be formed when the physical characteristics of water are altered by the presence of organic materials. Natural foam is typically persistent, light, not slimy to the touch.
6. If flow is observed, a sample of the flow shall be collected and analyzed following theprocedures described in Section 0.
7. 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 theinitial 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.
8. Input results from screening and sampling into spreadsheet. Include pertinent information in the

outfall/interconnection inventory and priority ranking.

9. The number of outfalls screened and any monitoring results must be documented eachyear in the Town's SWMP and in the MS4 annual report.

Note: During field screening, the presence of a dry weather flow alone is not conclusive evidence of anillicit discharge. The presence of one or more indicator parameters is needed to verify a potential illicit storm sewer discharge. Observations for color, oil sheen, surface scum (floatables), odor, clarity, and sanitary sewer evidence etc. are made of any dry weather discharge. Field or laboratory analyses are used to quantify turbidity, pH, total chorine, total copper, total phenol, and detergents (surfactants).

Table 2 – Field Equipment – Dry Weather Outfall Screening and Sampling

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Sheets / Inspection Forms	Field sheets for both dry weather inspection
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
EPA approved cleaning / disinfecting agent	Rubbing alcohol-based cleaning agent of the end of the extension pole
Distilled water	For decontamination of end of extension pole if used
Waste Container	Plastic baggies for holding use testing strips
Watch or other time device	For recording observation times
Flashlight/headlamp w/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
Water Quality Meter	Handheld meter, if available, for testing for various water quality parameters such as pH.
Test Kits	To include Chlorine Testing chlorometer and reagent packets, Ammonia TestingStrips, Thermometer,
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean. Make sure there are proper sample containers for whatis being sampled for (i.e., bacteria requires sterile containers often with a preservative). Some sites also require samples to be collected for aluminum which gets collected in a separate bucket.
Pry Bar or Pick	For opening catch basins and manholes when necessary
Sandbags	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow

Equipment	Use/Notes
A 500mL bottle (or of other known size) and ping pong ball	To measure flow
Traffic Safety Cones	Safety
Paper Towels	For cleanup
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
First Aid Kit	For sampler first aid protection

Table 3 – Interpretation of Physical Observation Parameters

Parameter	Observations	Basis
Odor	Suspicious or Strong	Odors can vary widely and directly reflect the source of contamination. Sewage odors are associated with sanitary wastewater; Sulfur or rotten egg odors can indicate meat packers, canneries, dairies, and sanitary wastewater; oil and gas odors indicate petroleum refineries or facilities associated with vehicles; and spoiled food odors can indicate food preparation facilities.
Color	Yellow	Textile, chemical, and tanning facilities
	Brown	Meat packers, stone and concrete plants,fertilizers, printing facilities
	Green	Textile and chemical facilities
	Red	Metal works and meat packers
	Gray	Sewage, Dairies
Clarity	Other than clear	Lack of clarity is generally the result of suspendedclay, silt, organic, and inorganic matter. Natural waters have some degree of suspended solids thataffect clarity.
Floatables	Foaming	Foam, soap suds, oil sheen, trash, and fecal matterare all considered floatables.
	Oily	Oily sheen reflects contamination from petroleum refineries and vehicle service facilities.

Parameter	Observations	Basis
Deposits and Stains	Sediment - Oily -	Storage facilities, refineries, automobile servicestations, and restaurants. Sanitary wastewater
Turbidity	Cloudy or Opaque	Cloudy may indicate sanitary wastewater, concreteor stone plants, fertilizers, and vehicle facilities.Opaque may indicate food processors, lumber mills, metal facilities.
Vegetation	Excessive Growth Stressed Growth	Fertilizers, food product facilities Metal and printing plants, drug manufacturing,vehicle service stations, automobile dealers

6.2 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. The general procedure for collection of outfall samples is as follows:

1. Identify which parameters need to be included in the sampling according to Table 4. Note however that analysis for *E. coli*, surfactants, ammonia, and chlorine are required at each outfall if flowing. Table 4 states additional parameters some outfalls require.
2. Fill out all sample information on sample bottes and field sheets. The time written on the bottles must match the time written on the field sheet for that outfall, and all sample bottles filled will have that same time as well.
3. Put on protective gloves (nitrile/latex/other) before sampling.
4. Collect sample with dipper or directly in sample containers. If using the sample container (bottle) directly, invert the container and submerge it in the outfall, avoiding surface scum and bottom sediment. Then tilt the container upright and wait for it to fill beneath the surface. If possible, collect waterfrom the flow directly in the sample bottle. Be careful not to disturb sediments. If a container has a preservative, do not submerge this container. Either collect water directly from the cascading flow from the outfall or use another container without preservative to pour into the container with preservative. If using a dipper or other device, triple rinse the device with distilled water or sample water then inwater to be samples (not for bacteria sampling).

Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters(see

5. Table 3)
6. Place laboratory samples on ice for analysis of bacteria, surfactants, and pollutants of concern.
7. Fill out chain-of-custody form for laboratory samples.
8. Deliver samples to Town selected laboratory within the 8 hour hold time for *E. coli* samples (Absolute Resource Associates, Portsmouth NH).
9. Dispose of used test strips and test kit ampules properly.
10. Decontaminate all testing personnel and equipment.

In the event the outfall is submerged, either partially or completely, or inaccessible, field staffwill proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. Field staff will 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 instruments are permitted for all parameters except indicator bacteria andany pollutants of concern. Field kits need to have appropriate detection limits and ranges.

Table 4 – Parameters of concern by outfall

Outfall ID	Parameter of Concern
14016	E. coli, Surfactants
14019	E. coli, Surfactants
14022	E. coli, Surfactants

Table 5 – Guidance Used for Concentrations of Non-Stormwater Discharges

Sampling Parameters	Class A Waters	Class B Waters
Ammonia[1]	> 0.5 mg / L	> 0.5 mg/ L
Chloride[2]	Acute Standard–860 mg/l Chronic Standard – 230 mg/l	
Conductivity[2]	Background Levels-Normal: 0-100 µS/cm (Benchmark Field Indicator >2,000 µS/cm)	
Salinity	TBD	
E. Coli[4]	>153 colonies/100mL in a single sample	>406 colonies/100mL in asingle sample (Beach Area >88 colonies/100mL in asingle sample)
Surfactants (such as MBAS)[1]	>0.25 mg/L	
Temperature[3]	No numeric standard; as natural occurs	
pH[3]	As naturally occurs	Outside of 6.5 and 8.0 (unless due to natural causes)
Turbidity[3]	No turbidity unless naturally occurring	Shall not exceed naturally occurring conditions by more than 10 NTU
Dissolved Oxygen[3,7]	< 6 mg / L	< 5 mg / L
Chlorophyll-a[7]		

[1] – 2017 NH Small MS4 General Permit
[2] – NHDES Volunteer River Assessment Program/Chloride Reduction Implementation Plan for Dinsmore Brook Watershed
[3] – ENV-Wq1700, NHDES Surface Water Quality Regulations
[4] – NH RSA 485-A:8, Water Pollution and Waste Disposal
[5] – ENV-Or 600, NHDES Ambient Groundwater Quality Standards
[7] – Pollutant of Concern for Hooksett Impaired Water Bodies

If a discharge is directly into an impaired water, the Town must also monitor for the pollutants identified as the cause of the impairment as shown in AppendixC – Summary of Receiving Water Bodies. If the pollutant identified as the causeof the impairment is present in the discharge efforts designed to identify the source(s) of the pollutant(s) must be undertaken and measures implemented to eliminate it. All procedures used must be documented in the SWMP and MS4 annual report.

When collecting any type of stormwater sample, it is imperative that the sample is collected before the stormwater reaches the receiving water.

A new, clean pair of gloves should be worn when testing a new sample and especially when moving to a different outfall as dirty gloves could cause contamination of water samples and distort results.

The number of outfalls screened, and any monitoring results must be documentedeach year in the Town's SWMP and in the MS4 annual report.

6.3 Wet Weather Sampling

Wet weather analytical monitoring of all outfalls and at interconnections with another MS4 must be conducted, particularly for those that did not have flow in dry weather or those with dry weather flow that passed screening thresholds. The primary difference between dry and wet weather screening is that wet weather inspections aim to describe and evaluate the "first flush" of stormwater discharged from an outfall during a storm, representing the maximum pollutant load managed by receiving water. Ideally, the evaluation and any samples collected for wet weather screening should occur within the first thirty (30) minutes of discharge to reflect the first flush or maximum pollutant load.

A significant purpose for doing wet weather screening and sampling is to identify illicit discharges that may activate or become evident during wet weather; therefore, samples shouldbe taken under conditions where storm event intensities are likely to trigger a septic system failure in situations such as:

- Elevated groundwater that can now cause an exchange of wastewater between crackedor broken sanitary sewers, failed septic systems, underdrains, and storm drains.
- Increase sewer volume that can exfiltrate through cracks in the sanitary piping.
- Increase sewer volume that can enter the storm drain system in common manholes or directly-piped connections to storm drains through the storm drain system in dry- weather.
- In these cases, wet weather screening and sampling shall proceed during or after a storm eventof sufficient depth or intensity to produce a stormwater discharge but only during the spring (March to June) when groundwater levels are relatively high.

The Town shall conduct wet weather screening on problem outfalls as soon as they are identified (no later than two (2) years from the permit effective date). A portion of remaining outfalls will be wet weather screened each year of the permit beginning in the third year (July 2023-June 2024). The chosen outfalls should begin with those that are monitored for dry weather screening to the extent practical. If not, practical the reasoning why shall be explained in the MS4 annual report. Samples should be analyzed following the same procedures and parameters as outlined in section 6.1-6.2 for Dry Weather Screening, except for filling out theWet Weather Outfall Inspection Survey found in **Appendix E.**

6.4 Sample Preservation

Laboratory samples should be stored in a cooler with ice or cold packs as soon as possible. Refrigeration at temperatures near freezing is t h e best preservation technique available, but it is notapplicable to all types of samples.

Table 7 gives types of containers, preferred method of preservation, and holding times for various test parameters.

Table 7 – Required Containers, Preservation Techniques, and Holding Times

PARAMETER	*CONTAINER[2]*	*OLUME*	*PRESERVATION*	*MAXIMUM HOLDING TIME*
Ammonia	P		/A (Field Analysis), H_2SO_4 to pH<2, Cool at 4^0C	Within 28 days[2]
Chloride, Total Residual	P or G	500 mL	Analyze Immediately	Within 15 minutes[2]
Chlorine	G	100 ml	None required	Within 15 minutes
Color, Apparent	P or G	500 ml	Cool at 4^0C (39^0F)	Within 48 hours[2]
Conductivity	P or G	500 ml	Refrigerate	Within28 days
Cooper, Total	P or G	1000 ml	N/A (Field Analysis), Filter and HNO_3 to pH<:2 and Cool at 4^0C (39^0F) (Lab Analysis)	Within 6 months[2]
Surfactants	P or G	250 ml	N/A (Field Analysis), Cool at 4^0C (39^0F) (Lab Analysis)	Within 4 8 hours[2]
pH	P or G	50 ml	Analyze Immediately	Within 15 minutes[2]
Phenol, Total	P or G (PTFE lined cap)	500 ml	N/A (Field Analysis), Cool at 4^0C (39^0F)[3] and adjust pH < 2 with H_2SO_4 (Lab Analysis)	Within 28 days[2]
Turbidity	P or G	100 ml	N/A (Field Analysis), Store indark up to 24 hours, refrigerate	Within 48 hours[2]

Sources: Federal Register 40 CFR. PART 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants" September 16, 2002.Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1999. American Water Works Association

[1] *Polyethylene (P) or Glass (G).*

[2] *For field analysis, preserve at same temperature as outfall water by placing sample in outfall water until ready fortesting.*

[3] *Or colder for testing.*

6.5 Field Water Analysis

The Town shall generally follow the guidelines outlined in the EPA New England Bacterial Source Tracking Protocol. Table 8 below summarizes observations and/or tests that will be performed onsite (at the outfall) using the field test kits. Non-starred (*) analyses may be performed as long as the allowable holding times are not exceeded. Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants ofconcern. Field kits need to have appropriate detection limits and ranges.

Table 8 – Onsite Field Analysis Options

Parameter	Method	Range	Detection Limit
Ammonia	Test Strip	0-0.50 mg/L	

*Chlorine, Total Residual	DPD, Color Disc	0-3.5 mg/L	0.5 mg/L
Specific Conductance (Conductivity)	Field Meter	0-10,000 uS/cm	
Detergents	Laboratory Analysis	0-1 mg/L	0.05 mg/L
*pH	Platinum Electrode, Field Meter	0-14 pH	0.1 pH
Salinity	Field Meter	0-200mS	0.1 ppt
*Temperature	Thermometer	NA	0.1^{0}C

Methods must be updated when formal procedures are developed.

* Test MUST be performed immediately at outfall site, upon sample collection (no allowable holding time-as shown in Table 7).

6.6 Follow-up Ranking of Outfalls and Interconnections

The Town of North Hampton will update and re-prioritize the initial outfall and interconnection rankings based on information gathered during dry weather screening. The rankings will be updated periodically as dry weather screening information becomes available but will be completed within three (3) years of the effective date of the permit (June 2024).

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 will be ranked at the top of the High Priority Outfalls categoryfor investigation. Other outfalls and interconnections may be re-ranked based on any new information from the dry weather screening.

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.

Catchment Investigations shall be completed in accordance with Part 2.3.4.8 of the MS4 Permit. This section outlines a systematic procedure to investigate outfall catchments and identify the source(s) of potential illicit discharges. Information and data collected as part of the catchment investigations will be reported in each annual report. Investigations of catchments associatedwith the Problem Outfalls shall begin no later than (2) years from the permit effective date andshall be completed within seven (7) years.

7.1 Map and Record Review

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

- Plans related to the construction of the drainage network
- Prior work on the storm drains
- Health Department or other municipal data on septic system failures or required upgrades
- Records related to septic system breakouts, SSOs, and sanitary sewer surcharges

7.2 System Vulnerability Factors

Based on the Map and Records review, The General Services Division: Highway Department will identify any of the following System Vulnerability Factors (SVFs). SVFs indicate a risk of sanitary or septic system inputs to the MS4 under wet weather conditions.

The General Services Division: Highway Department's SVF inventory (Table 6) will be updated based on this information.

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages.
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs.
- 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.
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system.
- 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.
- Any storm drain infrastructure greater than 40 years old in medium and densely developed areas.
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance).

Table 6 – Outfall Catchment System Vulnerability Factor (SVF) Inventory

Outfall Priority Ranking		System Vulnerability Factors										
Receiving Water	Outfall ID	History of *unaddressed* SSO *in the catchment area*, including, but not limited to, due to rain events, high water table and *fat/oil/grease* blockages.	Common or twin-invert manholes serving storm and sanitary sewer	Common trench construction serving both storm sewer and sanitary sewer alignments	Crossing of storm and sanitary sewer where sewer is shallower than storm drain	Sanitary sewer alignments known or suspected to have been constructed with an underdrain/*infiltration* system	Inadequate sanitary sewer level of service resulting in regular surcharging, customer back-ups, or frequent customer complaints *(known aging septic[7] within catchment area - same as history of SSO)*	Area formally *(with-in last 40 years)* served by combined sewer systems	Area with known infrastructure defects and leaking	Optional Considerations[9]	Other as determined appropriate by municipality	Total SVFs
Information Source		Town Staff	Maps	Maps	Maps/Asset Management Program	Maps	Town Staff	Town Staff	Town Staff	Town Staff	Town Staff	
Scoring Criteria		Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	
Little River NHRIV600031004-04	14016	No	No	No	No	No	Yes	No	No	No	No	1
Little River NHRIV600031004-04	14019	No	No	No	No	No	No	No	No	No	No	0
Little River (Oliver Brook) NHRIV600031004-04	14022	No	No	No	No	No	Yes	No	No	No	No	1

[9] Sewer pump/lift stations, siphons, or knows sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSO's. Any sanitary sewer and storm drain infrastructure greater than 40 years old. Widespread code-required septic system upgrades required at property transfers. History of multiple Board of Health actions addressing widespread septic system failures.

7.3 Dry Weather Catchment Investigation (Manhole Inspections)

The General Services Division: Highway Department 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.

The General Services Division: 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 and confirm or identify potential system vulnerability factors. 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 and inspecting key junction manholes along the way.

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 E.**
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, provided that they meet the minimum threshold indicator concentrations

as outlined on Page 38 of the Permit (Section 2.3.4.7.b.iii.4.b). Sampling and analysis will be in accordance with procedures outlined in Section 6. Additional indicator sampling may assist in determining potential sources.

3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges, 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 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.

7.4 Wet Weather Catchment Investigation (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 General Services Division: 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:

At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening (refer to Table 7, Required Containers, Preservation Techniques, and Holding Times and Table 4 – Parameters of concern by outfall**).**

1. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall.
    a. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.
    b. 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.
    c. Sampling during the initial period of discharge ("first flush") will be avoided.
2. 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, below, Source Isolation and Confirmation
3. 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.

7.5 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 and Standard Operating Procedures for these and other IDDE methods are provided in **Appendix F**.

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

7.5.1 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 forecast. 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, 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.

7.5.2 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 place 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.

7.5.3 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.

7.5.4 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.

7.5.5 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.

7.5.6 IDDE Canines

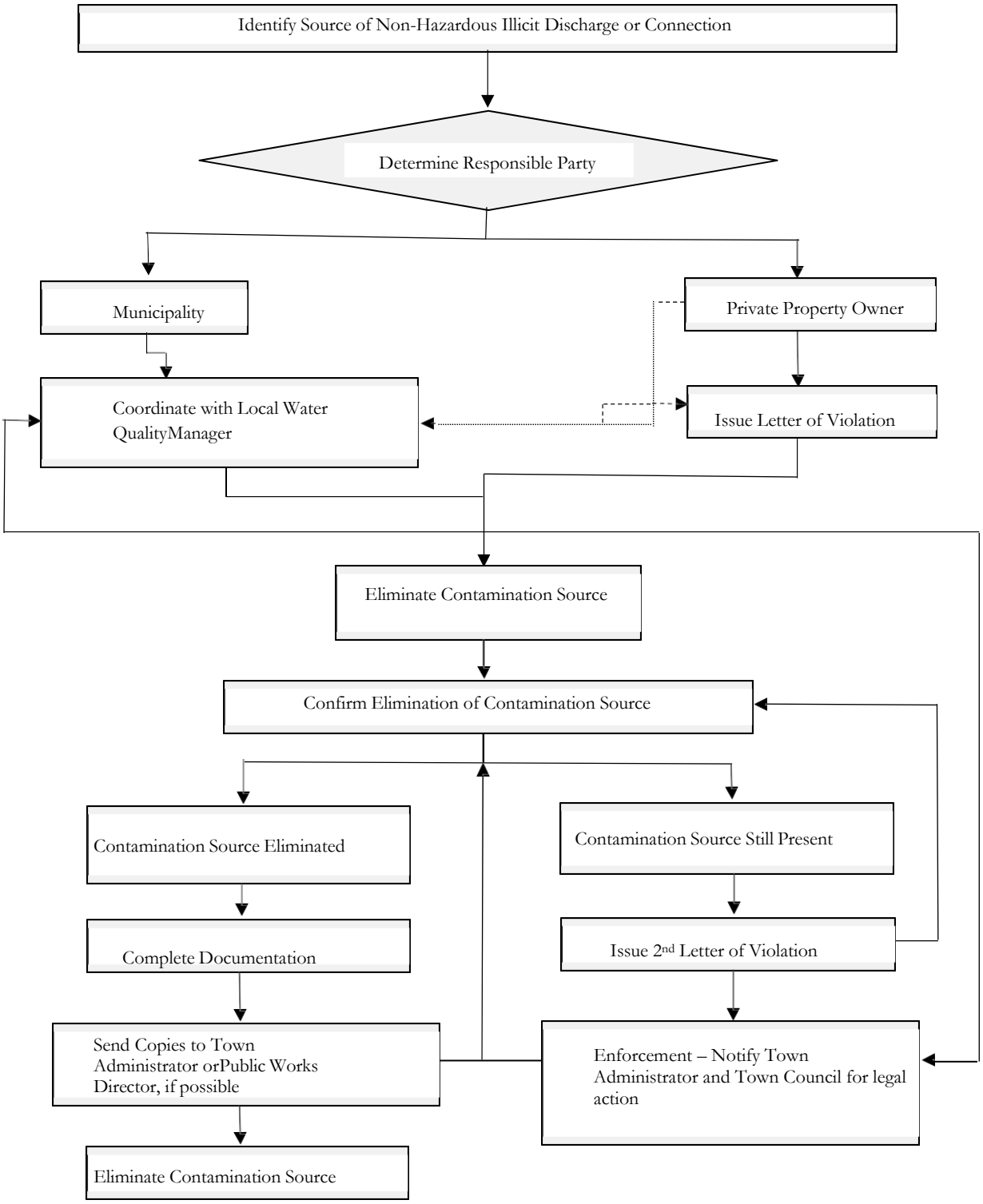
Dogs specifically trained to smell human related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is their accuracy. The use of IDDE canines is not recommended as a standalone practice 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.

7.6 Illicit Discharge Removal

When the specific source of an illicit discharge is identified, the Town will exercise its authority as necessary to require its removal. The annual report will include the status of IDDEinvestigation 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

Figure 1 - Escalating Process for Removing or Correcting an Illicit Discharge



The removal of an illicit discharge can be accomplished through either voluntary compliance by the responsible party or through legal enforcement by the Town as follows:

Voluntary Compliance: Once the Town determines and verifies the responsible party, the Community Development Department staff, normally through its Code Enforcement Administrator, shall contact the individual(s) and provide them with the following information:

1. Explanation of how the source was identified and verified
2. The types of actions of BMP (Best Management Practices) that should be implemented to recodify the problem, and
3. Any support that the Town or other parties could offer as a result of voluntarily addressing the matter.

Legal Enforcement: The Town will adopted the North Hampton Stormwater Management Program Ordinance see **Appendix A**, which will provide the Town with the authority to bring actions to force compliance with the Ordinance and the Town's MS4 Plan. The Ordinance will allow the Town to effectively remove illicit discharges to comply with the Phase II Stormwater Regulations.

The enforcement of illicit discharges may be implemented under the following general steps which are likely to be considered when formulating the Ordinance.

1. Responsible person(s) shall receive written notification to cease and desist discharging into Hooksett's storm water conveyance system and shall be required to take corrective measures to permanently eliminate the illicit discharge from entering Hooksett's storm water conveyance system and/or correct the run-off controls within ten (10) days of the notification.
2. Upon non-compliance of the cease-and-desist notification, responsible persons shall be fined $1000/day until illicit discharge is eliminated from the Hooksett storm water conveyance system.
3. Upon thirty (30) days of non-compliance, the New Hampshire Department of Environmental Services (NH DES) and the US EPA shall be notified for further enforcement actions.
4. In additional to the monetary fines established by this Ordinance, the Town further reserves the right to require, with the assistance of NH DES and US EPA, aforesaid persons to remediate any infrastructure and/or environmental damages caused by the illicit discharge.

7.6.1 Confirmatory Outfall Screening

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening shall 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. Confirmatory screening is not required in catchments where no illicit discharges or System Vulnerability Factors have been identified and no previous screening indicated suspicious flows.

7.7 Follow-up Screening

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be scheduled for follow-up screening within five (5) years, or sooner based on the catchment's illicit discharge priority. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in Section 6 of this document. 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. All sampling results will be reported in the annual report.

8 Training

Annual IDDE training will be made available to employees involved in the IDDE program. This training will at a minimum include 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 will be maintained in **Appendix G**. The frequency and type of training will be included in the annual report.

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:

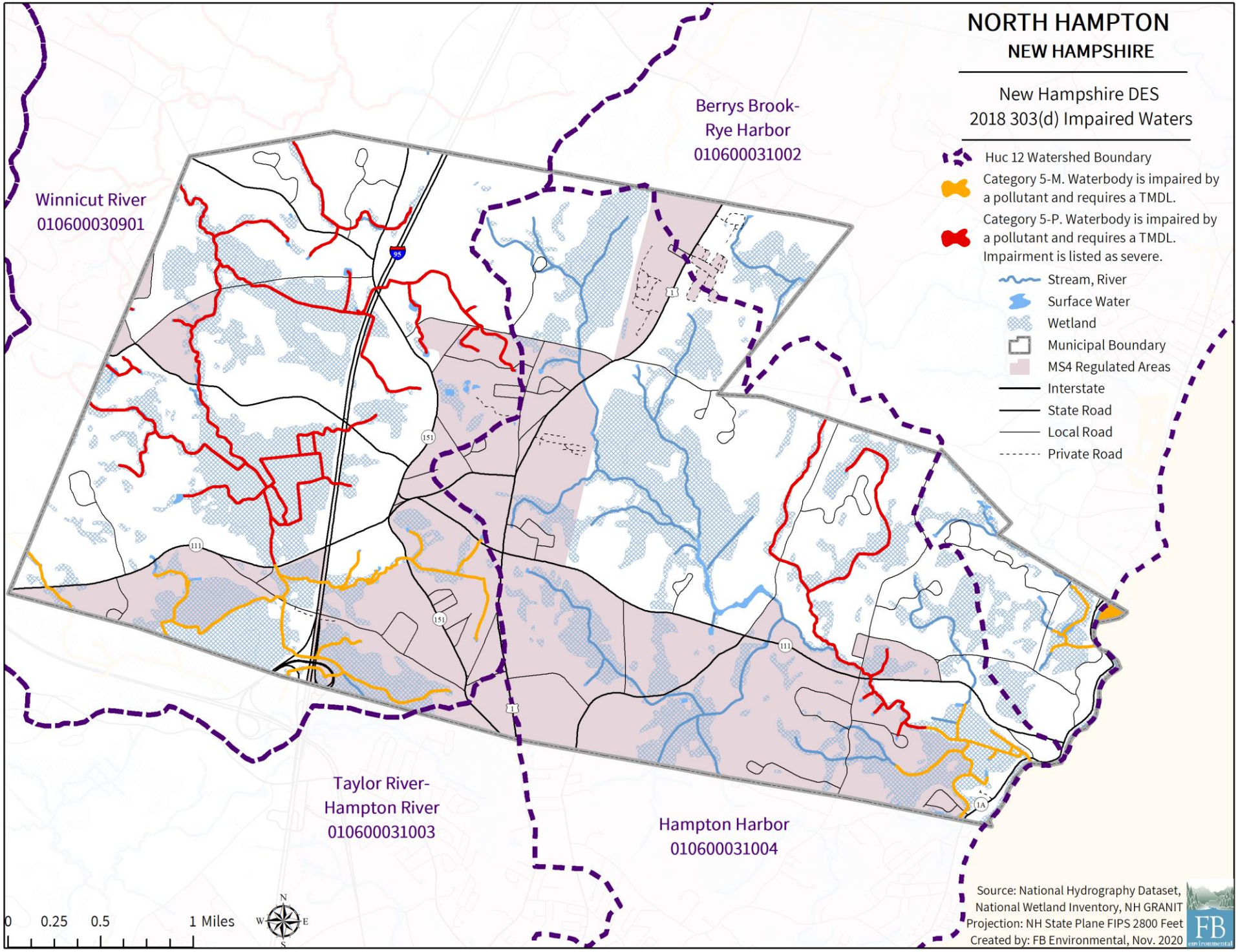
- Number of SSOs and illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/screenings
- Number of wet weather outfall inspections/sampling events
-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

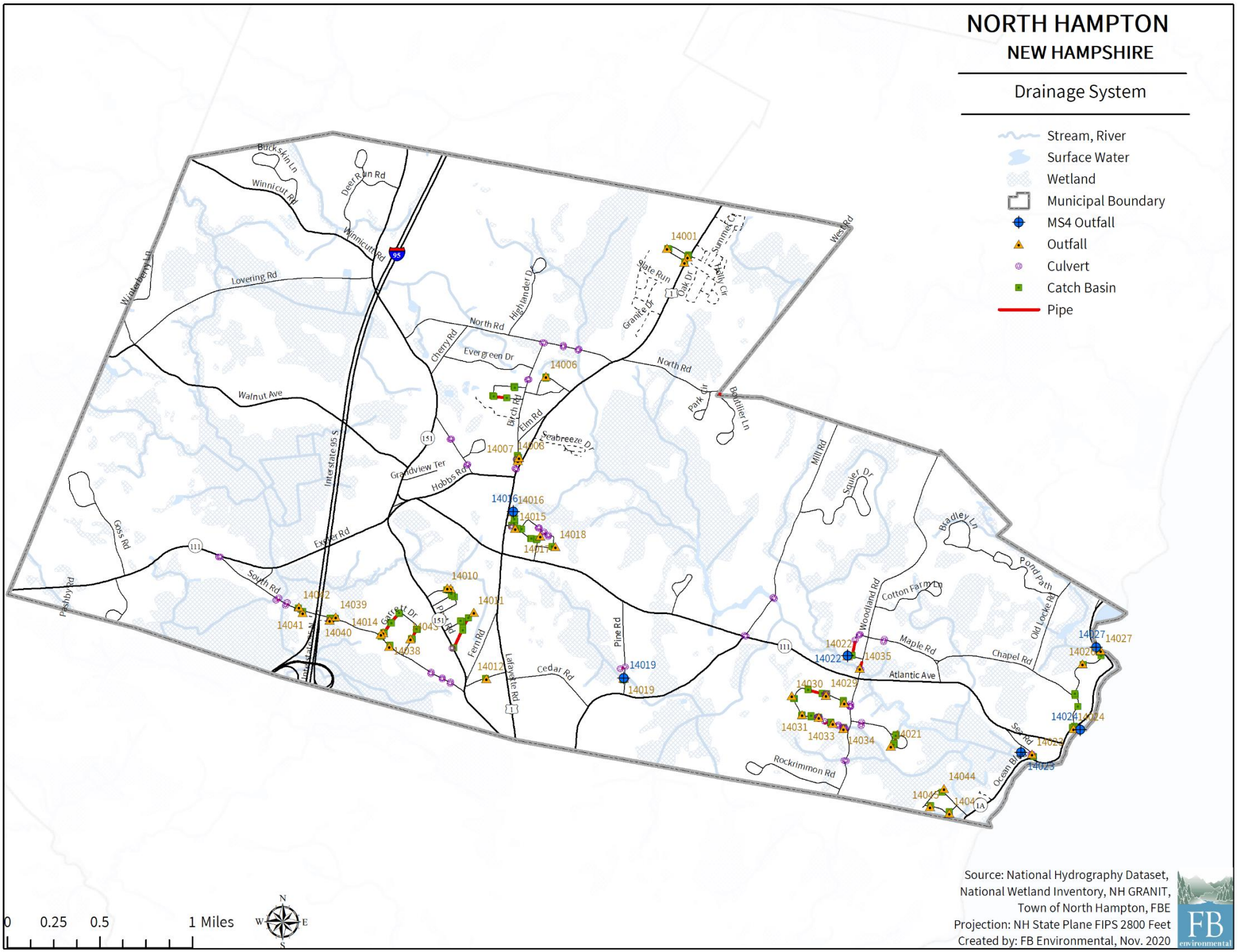
The success of the IDDE program will be measured by the IDDE activities completed within the required permit timelines.

Appendix A:
Legal Authority (IDDE Bylaw or Ordinance)

To be determined.

Appendix B:
Storm System Mapping


NORTH HAMPTON
NEW HAMPSHIRE
New Hampshire DES
2018 303(d) Impaired Waters
Huc 12 Watershed Boundary
Category 5-M. Waterbody is impaired by a pollutant and requires a TMDL.
Category 5-P. Waterbody is impaired by a pollutant and requires a TMDL. Impairment is listed as severe.
Stream, River
Surface Water
Wetland
Municipal Boundary
MS4 Regulated Areas
Interstate
State Road
Local Road
Private Road
Winnicut River
010600030901
Berrys Brook-
Rye Harbor
010600031002
Taylor River-
Hampton River
010600031003
Hampton Harbor
010600031004
0 0.25 0.5 1 Miles
N
W
E
S
Source: National Hydrography Dataset,
National Wetland Inventory, NH GRANIT
Projection: NH State Plane FIPS 2800 Feet
Created by: FB Environmental, Nov. 2020
FB
environmental


NORTH HAMPTON
NEW HAMPSHIRE
Drainage System
Stream, River
Surface Water
Wetland
Municipal Boundary
MS4 Outfall
Outfall
Culvert
Catch Basin
Pipe
Buckskin Ln
Winnicut Rd
Deer Run Rd
Winnicutt Rd
95
Winterberry Ln
Lovering Rd
Walnut Ave
Goss Rd
Pashby Rd
Interstate 95 S
Exeter Rd
111
South Rd
Granadview Ter
Hobbs Rd
151
Cherry Rd
Evergreen Dr
North Rd
Highlander Dr
Birch Rd
Elm Rd
Seabreeze Dr
Granite Dr
Slate Run
Oak Dr
Summer Ct
Holly Cir
West Rd
Park Cir
Bartlett Ln
Mill Rd
Sauler Dr
Bradley Ln
Pond Path
Old Locke Rd
Woodland Rd
Cotton Farm Dr
Maple Rd
Chapel Rd
Atlantic Ave
Pine Rd
Fern Rd
Cedar Rd
Lafayette Rd
1
Rockrimmon Rd
Ocean Blvd
1A
Sea Rd
14001
14002
14003
14004
14005
14006
14007
14008
14009
14010
14011
14012
14013
14014
14015
14016
14017
14018
14019
14020
14021
14022
14023
14024
14025
14026
14027
14028
14029
14030
14031
14032
14033
14034
14035
14036
14037
14038
14039
14040
14041
14042
14043
14044
14045
14046
0
0.25
0.5
1 Miles
N
S
E
W
Source: National Hydrography Dataset,
National Wetland Inventory, NH GRANIT,
Town of North Hampton, FBE
Projection: NH State Plane FIPS 2800 Feet
Created by: FB Environmental, Nov. 2020
FB
environmental

Appendix C:
Summary of Receiving Waters

Waterbody segment that receives flow from the MS4	Applicable TMDLs or Impairments	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Winnicut River – Unnamed Brook – Cornelius Brook NHRIV600030901-01	TN (App. H) Bacteria (App. F)	None, relieved from requirements of Part 2.2.2.a.i and Appendix H Part I	☐	☐	☒	☐	☐	☐	☐	☒	☐	Benthic-Macroinvertebrate Bioassessments (Streams), Mercury, pH
Winnicut River – Barton Brook – Marsh Brook – Thompson Brook NHRIV600030901-02	TN (App. H) Bacteria (App. F)	None, relieved from requirements of Part 2.2.2.a.i and Appendix H Part I	☐	☐	☒	☐	☐	☐	☐	☒	☐	
Winnicut River – Unnamed Brook NHRIV600030901-07	TN (App. H)	None, relieved from requirements of Part 2.2.2.a.i and Appendix H Part I	☐	☐	☒	☐	☐	☐	☐	☐	☐	pH
Little River – Unnamed / Oliver Brook NHRIV600031004-04		1	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
Little River NHEST600031004-10	Bacteria (App. F)		☐	☐	☐	☐	☐	☐	☐	☐	☒	Dioxin (including 2,3,77,8-TCDD), Fecal Coliform, Mercury, Polychlorinated biphenyls
Chapel Brook NHRIV600031002-24, -23	Bacteria (App. F)		☐	☐	☐	☐	☐	☐	☐	☒	☐	Mercury, fecal coliform
Chapel Brook NHEST600031002-03			☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury, fecal coliform
Garland Brook – Unnamed Brook NHRIV60031004-31			☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury
Little River – Unnamed Brook NHRIV60031004-01		1	☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury
Little River – Unnamed Brook NHRIV60031004-03		1	☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury
Little River – Mill Pond IMP60031004-02			☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury
Little River –Stevens Recreation Pond Dam IMP60031004-03			☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury

*Table updated and reflects outstanding resource waters, impairments, and completed TMDLS in the 2020/2022 303(d) Impaired Waters List.

Appendix D:
Outfall Inventory and Priority Ranking Matrix

North Hampton Outfall Inventory Priority Ranking Criteria

Receiving Water	Outfall ID	Previous Screening Results Indicate Likely Sewer Input? [1]	Receiving Water Body Impairment? [2]	Discharging to Area of Concern to Public Health? [3]	Frequency of Past Discharge Complaints	Density of Generating Sites [4]	Age of Development/ Infrastructure [5]	Historic Combined Sewers or Septic? [6]	Aging Septic? [7]	Culverted Streams? [8]	Additional Characteristics	Score	Priority Ranking
Information Source		Outfall inspections and sample results	Impaired Waters List	Maps	Town Staff	Land Use/GIS Maps, Aerial Photography	Land Use Information, Visual Observation	Town Staff, GIS Maps	Land Use, Town Staff	GIS and Storm System Maps	Other		
Scoring Criteria		Yes = 10 (Problem Outfall) No = 0	Yes = 10 (impairment listed as high priority in permit) No = 0	Yes = 10 No = 0	Frequent = 3 Occasional = 2 None = 0	High = 3 Medium = 2 Low = 1	High = 3 Medium = 2 Low = 1	Yes = 3 No = 0	Yes = 3 No = 0	Yes = 3 No = 0			
Little River NHRIV60003 1004-04	14016	0	0	0	0	2	2	0	0	0	None	4	Low Priority
Little River NHRIV60003 1004-04	14019	0	0	0	0	1	2	0	0	0	None	3	Low Priority
Little River (Oliver Brook) NHRIV60003 1004-04	14022	0	0	0	0	1	2	0	0	0	None	3	Low Priority

Scoring Criteria:

[1] Previous screening results indicate likely sewer input if any of the following are true:

- 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

[2] Catchments draining to any waterbody impaired for the following shall be designated either Problem Catchments or HIGH priority

- Bacteria or pathogens
- Nitrogen
- Phosphorus

[3] Outfalls/interconnections that discharge to or in the vicinity of any of the following areas:

- Public Beaches
- Recreational Areas
- Drinking Water Supplies
- Shellfish beds

[4] Generating sites are institutional, municipal, commercial, or industrial sites with a potential to contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, industrial manufacturing, etc.)

[5] Age of development and infrastructure:

- High = Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old
- Medium = Developments 20-40 years old
- Low = Developments less than 20 years old

[6] Areas once served by combined sewers and but have been separated, or areas once served by septic systems but have been converted to sanitary sewers.

[7] Aging septic systems are septic systems 30 years or older in residential areas.

[8] Any river or stream that is culverted for distance greater than a simple roadway crossing.

[9] Sewer pump/lift stations, siphons, or knows sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSO's. Any sanitary sewer and storm drain infrastructure greater than 40 years old. Widespread code-required septic system upgrades required at property transfers. History of multiple Board of Health actions addressing widespread septic system failures.

Problem Outfalls: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input.[4] Problem Outfalls need not be screened pursuant to Part 2.3.4.7.b.

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

• discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds;

• determined by the permittee as high priority based on the characteristics listed in the table with scores ≥11

Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed the table with scores ≤10

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.

Appendix E:
Field Forms, Sample Bottle Labels, and Chain of Custody Forms

Dry and Wet Weather
Outfall Inspection/Sample Collection Field Sheet

Section 1: Background Data

Subwatershed:		Outfall ID:	Outfall not in inventory: ☐
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature:	Rainfall (in.): Last 24 hours:		Last 48 hours:
Latitude:	Longitude:	GPS Unit:	Location as mapped: ☐
Camera:		Photo #s:	
Land Use in Drainage Area (Check all that apply): ☐ Industrial ☐ Open Space ☐ Urban Residential ☐ Institutional ☐ Suburban Residential Other: ☐ Commercial Known Industries:		Maintenance Priority: ☐ Priority 1 ☐ Priority 2 ☐ Priority 3 Notes:	
Notes (e.g., origin of outfall, if known):			

Section 2: Outfall Description

Location	Material	Shape		
☐ Closed Pipe Diameter/Dimensions:	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other:	☐ Circular ☐ Elliptical ☐ Box ☐ Other:	☐ Single ☐Double ☐ Triple ☐ Other:	In water: ☐No ☐ Partially ☐ Fully With Sediment: ☐ No ☐Partially ☐ Fully
☐ Open drainage	☐ Concrete/Paved ☐Earthen ☐ rip-rap ☐ Other:	☐ Trapezoid ☐ Parabolic ☐ Other:		Depth: Top Width: Bottom Width:
☐ In-Stream	(applicable when collecting samples)			
Flow Present?	☐ Yes ☐ No (If No, Skip to Section 5)			
Flow Description	☐ Trickle ☐ Moderate ☐ Substantial			

Section 3: Quantitative Characterization

Field Data For Flowing Outfalls				
Parameter		**Result**	**Unit**	**Equipment**
☐ Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	Stop watch
☐ Flow #2	Flow Depth		In	Tape measure
	Flow Width	_____’ _____”	Ft, In	Tape measure
	Measured length	_____’ _____”	Ft, In	Tape measure
	Time of travel		Sec	Stop watch

North Hampton
DRAIN MANHOLE INSPECTION LOG

Manhole ID: _____

Inspection Date: _____ Tributary Area: _____

Street: _____ Inspector: _____

Inspection: Not Found ____ Surface ____ Internal ____ Follow Up Inspection_____

Time Since Last Rain: < 48 hours _____ 48 – 72 hours _____ > 72 hours _____

Observations:

Standing Water in Manhole: Yes ____ No ____ Color of Water: Clear ____ Cloudy ____ Other _____ Flow in Manhole: Yes _____ No _____ Velocity: Slow _____ Medium _____ Fast _____ Depth of Flow: _____ in. Color of Flow: No Flow: _____ Clear _____ Cloudy _____ Suspended Solids _____ Other _____ Blockages: Yes _____ No _____ Sediment in Manhole: Yes ____ No____ If Yes: Percent of Pipe Filled: _____ % Floatables: None _____ Sewage _____ Oily Sheen _____ Foam _____ Other _____ Odor: None _____ Sewage _____ Oil _____ Soap _____Other _____

Field Testing:

Temp _____ Conductivity _____ Surfactants: Yes/No Ammonia: Yes/No Chlorine _____ Salinity _____

Lab analysis:

E. coli _____ Pollutants of Concern* _____

*For TMDLs or Water Quality Limited (WQL), refer to Appendix G of the MS4 Permit.

TAILS

Location:		Material:		MH Cover size:		MH Diameter:		Invert/Flow Channel:	
Roadway		Brick		24"		48"		Y/N	
Gutter		Block		26"		60"		:	
Grass		Concrete		30"		Other (describe below)		e	
Easement		Lined		36"				ortar	
Other (describe below)		Other (describe below)		Other (describe below)				escribe below)	

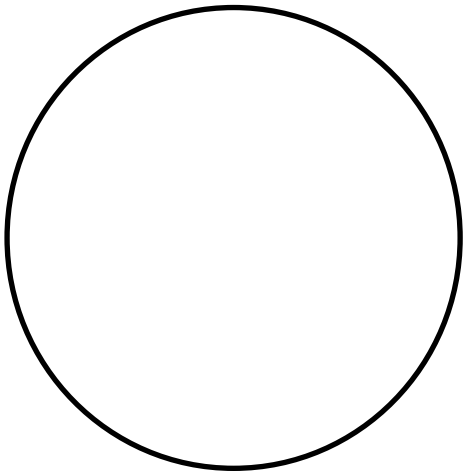
TION

Cover:		Ring &Frame		Chimney:		Wall:		Rungs:	
Serviceable		Serviceable		Serviceable		Serviceable		Serviceable	
Loose		Loose		Cracked/Broken		Cracked/Broken		Unsafe	
Below Grade		Displaced		Corroded		Corroded		Missing any	
Damaged		Missing Grout		Misaligned		Misaligned		Corroded	
Sealed		Raise		Infiltration		Infiltration		N/A - no rungs	
Holes (# of holes)		Lower		Roots at Joints		Roots at Joints			

e any pertinent notes regarding component conditions below:

MANHOLE DIAGRAM

(Outgoing pipe should be at the 6:00 position. Label all pipes with size/type and flow direction)



INSERT PHOTO(S) BELOW:

Sample Label

Sampler: _____ Date: _____ Time: _____

Field ID: _____

Analysis: _____

Preservative: _____

Absolute Resource associates

Sample COC

PAGE____OF____

Absolute Resource associates

124 Heritage Avenue #16
Portsmouth, NH 03801
603-436-2001
absoluteresourceassociates.com

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Company Name:

Company Address:

Report To:

Phone #:

Invoice to Email: _____

☐ Hard Copy Invoice Required

Project Name:

Project #:

Project Location: NH MA ME VT NY ____Other

Protocol: RCRA SDWA NPDES MCP NHDES OTHER

Reporting Limits: QAPP GW-1 S-1 EPA DW Other_____

Quote #_____ ☐ NH Reimbursement Pricing

PO # _____

ANALYSIS REQUEST

☐ VOC 8260 ☐ VOC 8260 NHDES ☐ VOC 8260 MADEP
☐ VOC 624 ☐ VOC BTEX ☐ MBE, only ☐ VOC 8021VT
☐ VPH MADEP ☐ MEGRO ☐ GRO 8015 ☐ 1,4-Dioxane
☐ VOC 524.2 ☐ VOC 524.2 NH List ☐ Gases-Lit:
☐ TPH ☐ DRO 8015 ☐ MEDRO ☐ EPH MADEP ☐ TPH Fingerprint
☐ 8270/PAH ☐ 8270/BN ☐ 625 ☐ EDB
☐ 8082 PCB ☐ 8081 Pesticides ☐ 608 Pest/PCB
☐ O&G 1664 ☐ Mineral O&G SM5520F
☐ pH ☐ BOD ☐ Conductivity ☐ Turbidity
☐ TSS ☐ TDS ☐ TS ☐ TVS ☐ Alkalinity
☐ RCRA Metals ☐ Priority Pollutant Metals ☐ TAL Metals ☐ Hardness
☐ Total Metals-list: ☐ Dissolved Metals-list:
☐ Ammonia ☐ COD ☐ TKN ☐ TN ☐ TON ☐ TOC
☐ T-Phosphorus ☐ Phenols ☐ Bacteria P/A ☐ Bacteria MPN
☐ Cyanide ☐ Sulfide ☐ Nitrate + Nitrite ☐ Ortho P
☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Sulfate ☐ Bromide ☐ Fluoride
☐ Corrosivity ☐ Reactive CN ☐ Reactive S- ☐ Ignitibility/FP
☐ TCLP Metals ☐ TCLP VOC ☐ TCLP SVOC ☐ TCLP Pesticide
Subcontract: ☐ Grain Size ☐ Herbicides ☐ Formaldehyde
Grab (G) or Composite (C)

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix: WATER	SOLID	OTHER	Preservation Method: HCl	HNO_3	H_2SO_4	NaOH	MeOH	Sampling: DATE	TIME	SAMPLER

TAT REQUESTED
Priority (24 hr)* ☐
Expedited (48 hr)* ☐
Standard (10 Business Days) ☐
*Date Needed _____

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

SPECIAL INSTRUCTIONS

REPORTING INSTRUCTIONS ☐ PDF (e-mail address)_____
☐ HARD COPY REQUIRED ☐ FAX (FAX#)_____

RECEIVED ON ICE ☐ YES ☐ NO
TEMPERATURE _____°C

CUSTODY RECORD
QSD-01 Revision 10/14/15

	Date	Time		Date	Time
Relinquished by Sampler:			Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received by Laboratory:		

Appendix F:
Water Quality Analysis Instructions, User's Manuals and Standard Operating Procedures

Outfall Inspection and Sampling Instructions

The purpose of this SOP is to outline the instructions for the inspection of stormwater drainage outfalls and interconnections in the town of North Hampton, NH to provide consistent and accurate results from the assessment of each structure to identify its current condition, determine the possibility for an illicit discharge, and to collect samples of discharge under dry weather conditions.

> Note: Dry weather conditions occur when no more than 0.1 inches of precipitation has occurred in the previous 24-hour period and/or there is no significant snow melt occurring. Wet weather conditions occur when over 0.25 inches of precipitation has occurred in the previous 24-hour period and/or there is significant snow melt occurring.

Preparation:

1. Check the current weather and the weather history from the Hampton Airfield 7B3 weather station to determine if dry weather conditions are occurring.
2. Gather all required equipment
    - Pen and sharpie
    - Field forms (one hard copy per outfall or an electronic form submission version)
    - Field meters to collect the following measurements
        - Chlorine
        - Conductivity
        - Salinity
        - Temperature
        - pH
    - Sample kits to measure the following parameters
        - Ammonia
        - Surfactants
    - Sampling bottles for the following parameters
        - *E. coli*
        - Total phosphorus
    - Cooler with ice
3. Calibrate all field meters in accordance to their instruction manuals at room temperature prior to going into the field.

In the Field:

1. Navigate to the outfall/interconnection using the GPS coordinates.
2. Determine if the area is safe for investigation (i.e. are there any fallen electrical wires or steep and crumbling slopes to traverse?)
3. Observe the outfall/interconnection. If the outfall/interconnection is inaccessible, observe the closest upstream access point to collect observations and samples.
4. Take photos of the outfall/interconnection and fill out the field form. Be sure to note the condition of the structure and the possibility of an illicit discharge.
5. Take all discharge samples priori to collecting field meter readings for in shallow conditions, field meter probes may resuspend settled materials by moving within the observation area.
6. If flow is present, collect discharge samples and add the sample ID, date, time, and parameters to the laboratory COC form.
    - Begin by putting on power-free nitrile gloves to protect the sampler from the discharge and the sample from the sampler.
    - Label each sample bottle that will be used at the site with the site/sample ID, date, and time.

- If a sample bottle contains a preservative, do not submerge the bottle in the discharge. Instead, catch the discharge into the bottle if cascading or use a sterile syringe to transfer discharge from the outfall/interconnection to the sample bottle.
- Fill each bottle to the bottle's shoulder, not the very top and recap.
- Place each sample into the chilled cooler with ice.

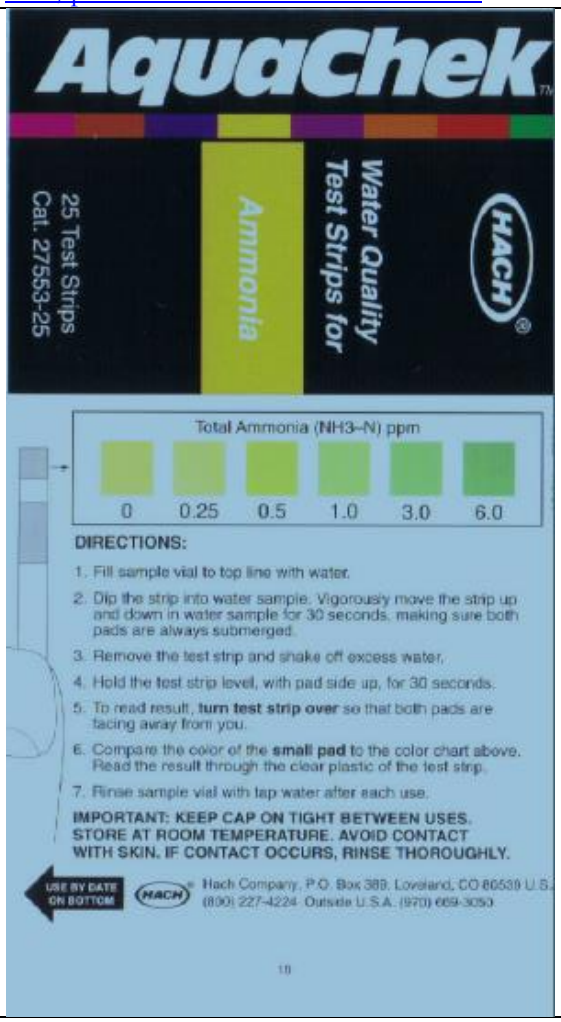
Note: If discharge is present but the sampler cannot reach it to collect the samples, use the sampling pole apparatus. First rinse the collection cup of the apparatus three times in the discharge ensuring no sediment was disturbed. Collect the discharge into the sample cup and pour the sample into the labeled sample bottle.

7. When placing the field meter into the discharge, ensure the sensing probe is not resting on the bottom and that has not become buried in benthic matter.
    - Note: field meters with membranes need to be "jigged" to take an accurate reading. Jigging consists of continuously raising and lowering the probe approximately 6 inches to 1 foot every second. Optical field meters do not need to be jigged.
8. Wait for the field meter readings to stabilize before recording the values.

Upon Completion:

1. Bring all samples and completed laboratory COC forms to the designated laboratory. Mind the hold time for certain parameters (i.e., E. coli must reach the lab within 6 hours from collection).
2. Clean all field supplies and field meters according to their individual instructions (outlined in the field meter manuals).
3. Store field meters at room temperature and according to their manuals.

Field Meter and Test Kit SOPs

Item	User's Manual and Instructions
YSI ProSolo field meter	https://www.ysi.com/file%20library/documents/manuals/prodigital-user-manual-english.pdf
Hatch pH field meter	https://pim-resources.coleparmer.com/instruction-manual/35634series.pdf
Chlorine test kit	https://www.hach.com/pocket-colorimeter-ii-chlorine-free-and-total/product-downloads?id=7640442953
Ammonia test strips	

Appendix G:
IDDE Employee Training Record

Illicit Discharge Detection and Elimination (IDDE)
Employee Training Record

Town of North Hampton

Date	Type of Training	Participants
June 2023	Training videos and review of IDDE plan.	Highway facilities crews and the Public Works staff.