Illicit Discharge Detection and Elimination (IDDE) Plan

TOWN OF STRATHAM

Permit Year 6

EPA NPDES Permit Number NHR041000
Permit Effective Date: 7-1-2018

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Appendices

1 IDDE Program Implementation Timeline

Table 1-1. IDDE Program Implementation Timeline

IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year	5 Years	6 Years	7 Years	10 Years	13 Years
Written IDDE Program Plan	X		X			
SSO Inventory*	X					
Initial Outfall Ranking	X		X			
Written Catchment Investigation Procedure				X		
Phase I Mapping	X		X			
Phase II Mapping						X
IDDE Regulatory Mechanism				X		
Dry Weather Outfall Screening			X	X		
Follow-up Ranking of Outfalls and Interconnections					X	
Catchment Investigations – Problem Outfalls				X		
Catchment Investigations – all Problem, High and Low Priority Outfalls					X	

*The Town of Stratham does not have a municipally owned sewer system.

2 Authority and Statement of IDDE Responsibilities

2.1 Legal Authority

The Town of Stratham will adopt a bylaw, ordinance, or other regulatory mechanism to provide the Town of Stratham 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 by September 30, 2024.

2.2 Statement of Responsibilities

The Stratham Department of Public Works (DPW) is the lead municipal department responsible for implementing the IDDE program pursuant to the provisions of the IDDE Regulations upon adoption. Other agencies or departments with responsibility for aspects of the program include:

- Planning Office – Coordination, technical, and administrative assistance to the DPW.
- Planning Board – Stormwater regulations through Site Plan and Subdivision reviews.
- Select Board and Town Administrator – Provide adequate financial and legislative support.

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 DPW and Planning Department is responsible for updating the stormwater system mapping pursuant to the 2017 MS4 Permit. The Town of Stratham 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

The Phase I map completed early in the permit term was determined in September 2023 to be inaccurate. Outfalls were identified and mapped in Year 6 in accordance with Part 2.3.4.5.a of the MS4 Permit.

3.2 Phase II Mapping

Phase II mapping must be completed by July 1, 2030 and include the information per Part 2.3.4.5.b of the MS4 Permit.

4 Sanitary Sewer Overflows (SSOs)

The Town of Stratham has no municipally owned sewer and therefore no Sanitary Sewer Overflows.

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. The ranking completed early in the permit term was determined in September 2023 to be inaccurate and the ranking was updated in Year 6.

5.1 Outfall Catchment Delineations

Preliminary catchments for each of the MS4 outfalls identified in Year 6 will be delineated to define contributing areas for investigation of potential sources of illicit discharges by June 30, 2024.

5.2 Outfall and Interconnection Inventory and Initial Ranking

The Department of Public Works completed an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information early in the permit term. The inventory was determined to be incorrect and was updated in Year 6. The inventory and ranking will be updated annually, as necessary, to include data collected in connection with dry weather screening and other relevant inspections.

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 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.

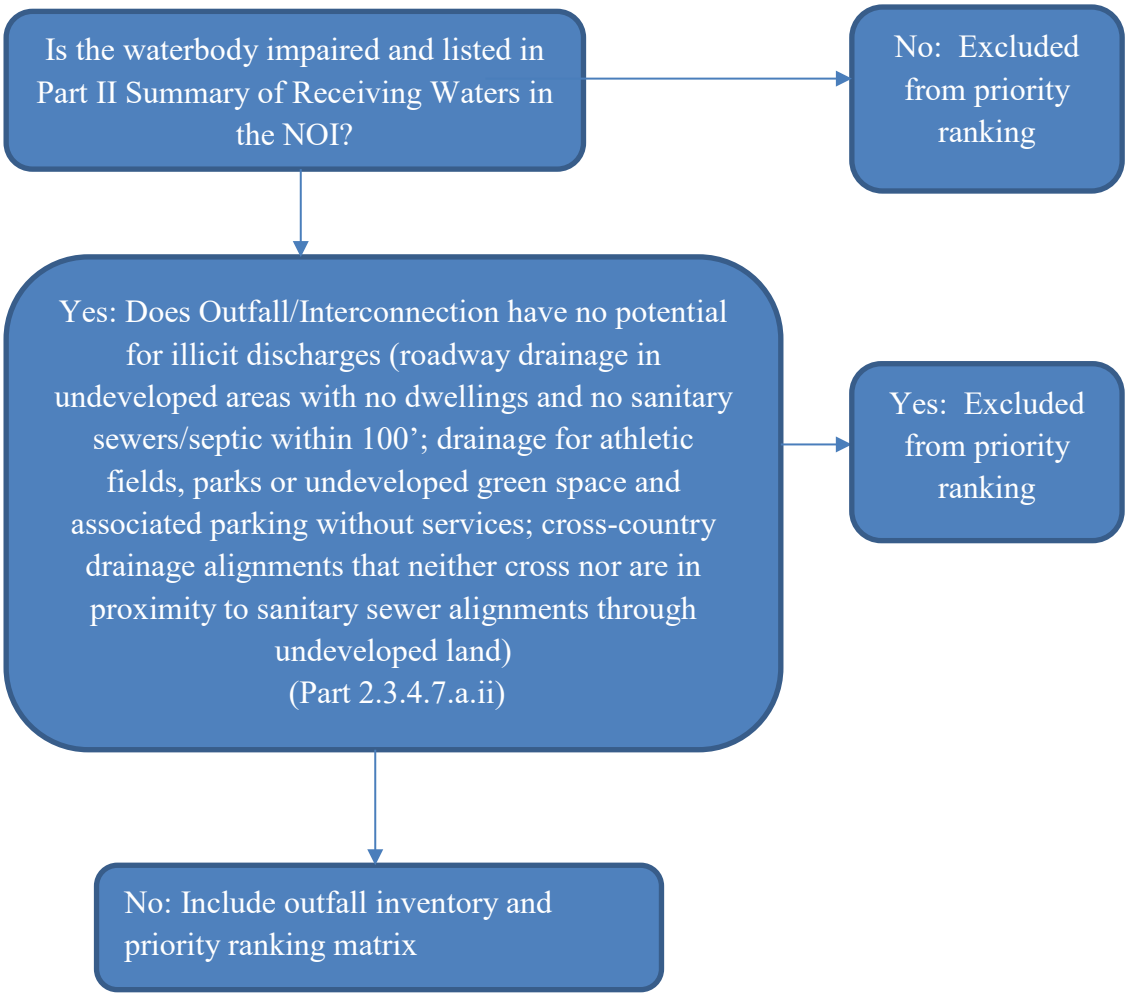
4. Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

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 C for an outfall inventory and priority ranking matrix:



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 Department of Public Works 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. This will be completed in Year 6 on the outfalls identified in Year 6.

Dry weather outfall Screening and Sampling shall be completed in accordance with Part 2.3.4.7.b of the MS4 Permit. Plans and procedures for such screening and sampling are detailed in **Appendix E**. Outfall and interconnection rankings will be updated to reprioritize outfalls and interconnections based on information gathered during this dry weather screening, within three years of the effective date of the permit.

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 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.

7.1 Map and Record Review

The Town of Stratham 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 Officer 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 (SVFs)

For each catchment being investigated, the Town of Stratham will review relevant historic plans, records, and maps gathered in accordance with Part 2.3.4.8.b.i of the MS4 Permit to identify areas within the catchment with higher potential for illicit connections. The Town will identify and record the presence of the following specific System Vulnerability Factors (SVFs):

- Storm drain infrastructure greater than 40 years old.

- Aging septic systems, 30 years or older, within the catchment area.
- 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 Health Officer 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).
- Other vulnerability factors identified through inflow/infiltration analyses or other infrastructure investigations.

SVFs documented for any catchment will be documented in an SVF inventory and included in the annual report. Wet weather investigation will occur where a minimum of one SVF is identified. See SOP in **Appendix E** for wet weather sampling protocols and parameters.

7.3 Source Isolation and Confirmation

When the source of an illicit discharge has been approximated between two manholes, additional investigation techniques will be used to isolate and confirm the source of the illicit discharge. The following methods (described in more detail below) may be used in isolating and confirming the source of illicit discharges:

- Canine Source Tracking
- Dye testing
- Optical brightener monitoring
- Sandbagging
- Smoke testing
- Video inspections

7.3.1 Canine Source Tracking

Trained canines can be used to assist in source tracking human fecal sources. These dogs are trained to ignore animal waste sources. This method can be used to cover a large area in a relatively short period of time, or can be used to locate hotspots. This method is often paired with or followed by dry weather sampling of identified potential sources.

7.3.2 Dye Testing

Dye testing can be relatively inexpensive and quick (approximately 30 minutes per test). It should be used when the likely source of an illicit discharge has been narrowed to just a few buildings. The test involves flushing a non-toxic dye into plumbing fixtures (such as toilets, showers, or sinks) and observing nearby storm drain manholes and outfalls for presence of the dye. Residents and business owners should be informed of the testing in advance, along with local police, fire, and public health staff in preparation of responding to concerned citizen outreach.

A team of two or more people will perform dye testing. One person will be stationed inside of the building being tested while the others are positioned at the appropriate manholes or outfalls suspected of being connected. Team members should have a method of communication during the testing (such as two-way radios or mobile phones). Open any manholes or storm drains ahead of time for optimal viewing. When ready, the person inside the building will add dye into a plumbing fixture and run a sufficient amount of water to move the dye through the system, alerting the other team members that the dye has been released. The outside team members will then watch and observe for the presence or absence of the dye.

7.3.3 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes used in detergents, soaps, and paper products. They are activated by wavelengths of light in the near-ultraviolet range (360 to 365 nanometers) and emit light in the blue range (400 to 440 nanometers). The presence of optical brighteners in surface waters or dry weather discharges suggests a possible illicit discharge or insufficient treatment from nearby septic systems. Various methods are suitable for testing for the presence of optical brighteners. One method involves the collection of samples and use of a fluorometer. This method allows for more quantification of the amount of optical brighteners present, with relatively inexpensive equipment and short testing times. A detailed SOP for this method can be found in **Appendix G**. An alternative method involves securing a cotton pad in a wire cage within a pipe, manhole, catch basin, or inlet to capture dry weather flows. The pad is retrieved at a later date and placed under UV light to determine the presence or absence of optical brighteners during the monitoring period.

7.3.4 Sandbagging

Sandbagging is best used when attempting to isolate illicit discharges from low flow or intermittent sources. This method is only suitable for periods of dry weather for at least 48 hours, limiting its use. If dry weather conditions are present, sandbags or similar barriers should be placed within manhole outlets to form a temporary dam that will collect any intermittent flows that occur. The barriers should be left in place for 48 hours. If no flow collects behind the sandbag, it will eliminate the upstream pipe network as a source of intermittent discharge. If flow does collect, it can be evaluated via dry weather sampling techniques and/or visual observations.

7.3.5 Smoke Testing

Similar to dye testing, the smoke testing method involves the injection of non-toxic smoke into drain lines to observe cracks and leaks in the system or illegal connections. A smoke bomb or smoke generator is typically used for smoke injection at a catch basin or manhole, followed by a source of air to force it through the system. Additional staff should be stationed in areas with suspected leaks or illegal connections to note any escape of smoke.

Notifying local residents, business owners, and local emergency personnel is vital for this method. Additionally, the smoke may cause minor irritation of respiratory passages, and may

require that nearby residents with respiratory conditions be monitored or evacuated during testing to ensure their safety.

7.3.6 Video Inspection

Video inspection remotely guides cameras through stormwater drain lines in order to observe potential illicit discharges or cracks or leaks in the system. This method may be more expensive and time consuming than other source isolation methods.

7.4 Illicit Discharge Removal

When the specific source of an illicit discharge is identified, the Town of Stratham 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.

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 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 F**. 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 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.

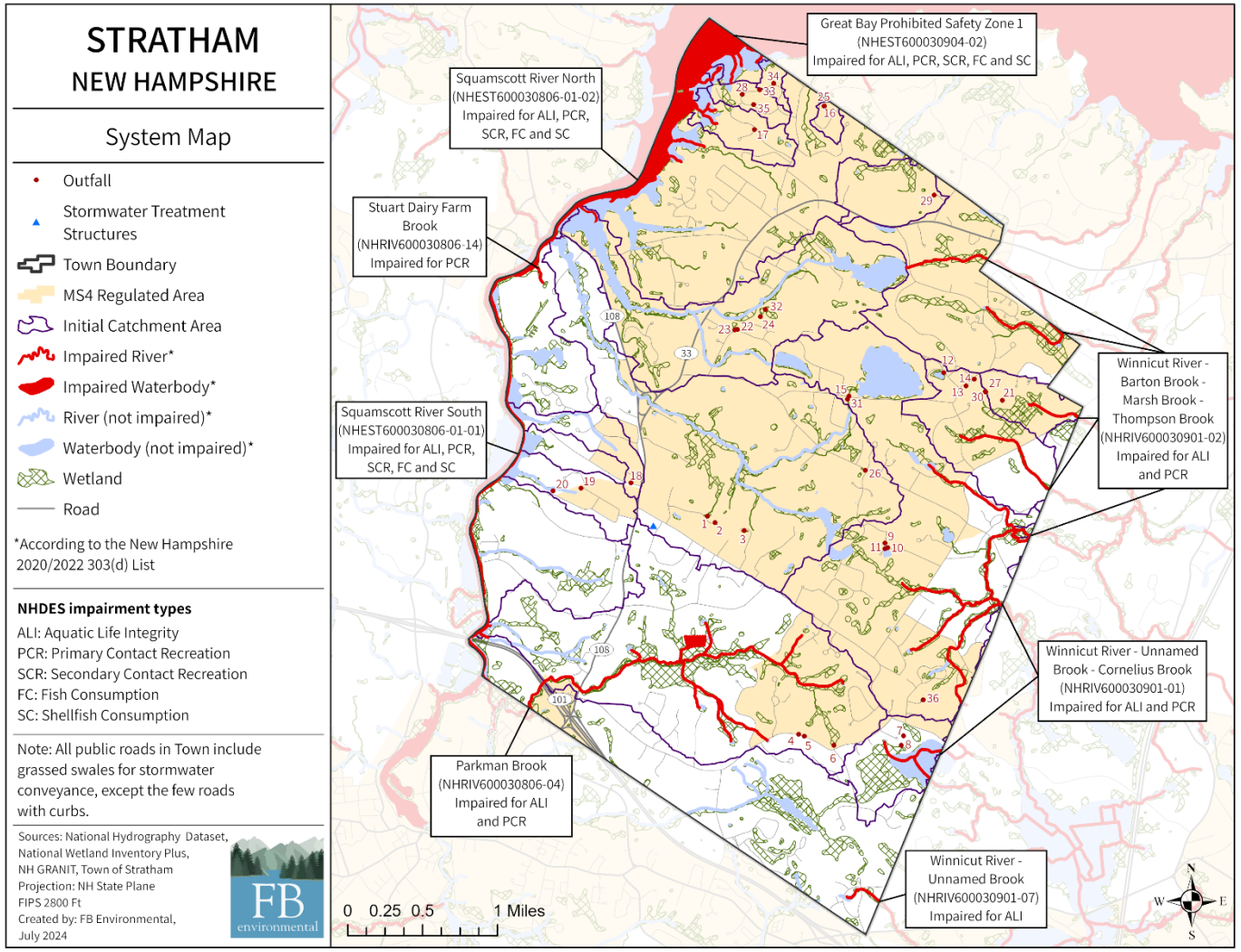
Appendix A

Legal Authority

Town Ordinance Chapter 9-01 Illicit Discharge Detection and Elimination (IDDE)

Appendix B

Storm System Mapping



Appendix C

Outfall Inventory and Priority Ranking Matrix

See “Outfall Inventory and Ranking” under MCM # 3, Illicit Discharge Detection and Elimination (IDDE) Program on the Town of Stratham’s website at:

https://www.strathamnh.gov/planning-zoning-department/pages/stormwater-and-strathams-ms4-permit

Appendix D

Field Forms, Chain of Custody Forms, Bottle Preservation Requirements, Sample Acceptance Policy

See following pages.

Town of Stratham
Outfall Inspection Form (Dry or Wet Weather)

Date:	Time:	Outfall ID:	Address:
Receiving Water:		Latitude/Longitude:	
Investigators:		Form completed by:	
Temperature:	Rainfall (inches): Last 24 hours:		Last 48 hours:
Photos taken? ☐ Yes ☐ No			

Physical Condition of Outfall:

Is maintenance required (if yes, explain below in notes)? ☐ Yes ☐ No

Outfall Maintenance Priority: ☐ High ☐ Medium ☐ Low

Notes:

Outfall Description:

Material: ☐ Concrete ☐ Metal ☐ PVC/HDPE ☐ Other:_____

Diameter/Dimensions:_____

Shape: ☐ Arch ☐ Circular ☐ Elliptical ☐ Box
☐ Single ☐ Double ☐ Triple ☐ Other:_____

Outfall under water? ☐ No ☐ Partially ☐ Fully

Outfall Flow Description: ☐ None ☐ Trickle ☐ Moderate ☐ Substantial

Odors present? ☐ None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Other:_____

Is there visual evidence of non-stormwater discharges from outfall? ☐ Yes ☐ No

If yes, describe:_____

Was a water sample collected from the outfall? ☐ Yes ☐ No

If so, check all parameters: ☐ ammonia ☐ chlorine ☐ conductivity ☐ salinity

☐ E. coli (freshwater) ☐ enterococcus (saline/brackish water) ☐ surfactants (MBAS) ☐ temperature

Appendix E

Water Quality Analysis Instructions, User Manuals, and Standard Operating Procedures (SOPs)

Grab water samples will be delivered to Absolute Resource Associates (ARA), 124 Heritage Avenue #16, Portsmouth NH 03801 for analysis in accordance with ARA's Bottle Preservation Requirements and Sample Acceptance Policy in Appendix D.

Procedures and SOPs for field test kits and/or meters will be added to this plan once kits or meters are purchased.

Appendix F

IDDE Employee Training Record

Illicit Discharge Detection and Elimination (IDDE)
Employee Training Record

Town of Stratham

Date	Type of Training	Participants
3/13/2024	MS4 Intro and focus on MCM 3, MCM 6, & Appendix H	4 Municipal Center Staff
3/26/2024	MS4 Intro and focus on MCM 3, MCM 6, & Appendix H	7 DPW Staff

Appendix G

Source Isolation and Confirmation Methods:
Instructions, Manuals, and SOPs

See Section 7, Catchment Investigations.

Sampling Parameters:

Table 1. Monitoring parameters for pollutants causing impairment to MS4 regulated waterbodies in the Town of Stratham.

Pollutant Causing Impairment	Monitoring Parameter
Squamscott River South, NHEST600030806-01-01:	
Acenaphthene	Acenaphthene and all other PAHs
Acenaphthylene	Acenaphthylene and all other PAHs
Aluminum	Aluminum, Total
Anthracene	Anthracene and all other PAHs
Arsenic	Arsenic, Total
Benzo[a]anthracene	Benzo[a]anthracene and all other PAHs
Benzo(a)pyrene	Benzo(a)pyrene and all other PAHs
Cadmium	Cadmium, Total
Chlorophyll-a	Total Nitrogen (marine waters)
Chrysene	Chrysene (C1-C4) and all other PAHs
Copper	Copper, Total
Dibenz[a,h]anthracene	Dibenz[a,h]anthracene and all other PAHs
Dioxin (including 2,3,7,8-TCDD)	Nuclear Magnetic Resonance (NMR) Spectroscopy
Dissolved oxygen and DO saturation	DO, BOD_5, Temperature, Total Nitrogen (marine waters)
Enterococcus (TMDL complete)	Enterococcus
Fluoranthene	Fluoranthene and all other PAHs
Fluorene	Fluorene and all other PAHs
Lead	Lead, Total
Mercury	NMR unless potentially present such (e.g., salvage yards crushing vehicles with Hg switches)
Nickel	Nickel, Total
Nitrogen (Total)	Nitrogen, Total
Phenanthrene	Phenanthrene and all other PAHs
Polychlorinated biphenyls (PCBs)	NMR
Pyrene	Pyrene and all other PAHs
trans-Nonachlor	Trans-Nonachlor and other pesticides
Zinc	Zinc, Total
Squamscott River North, NHEST600030806-01-02:	
Chlorophyll-a	Total Nitrogen (marine waters)
Dioxin (including 2,3,7,8-TCDD)	NMR

Pollutant Causing Impairment	Monitoring Parameter
Dissolved oxygen and DO saturation	DO, BOD_5, Temperature, Total Nitrogen (marine waters)
Enterococcus (TMDL complete)	Enterococcus
Estuarine Bioassessments	Total Nitrogen
Light Attenuation Coefficient	Total Suspended Solids, Total Nitrogen
Mercury	NMR unless potentially present such (e.g., salvage yards crushing vehicles with Hg switches)
Nitrogen (Total)	Nitrogen, Total
pH	pH
Polychlorinated biphenyls	NMR
Great Bay Prohib SZ1, NHEST600030904-02:	
Chlorophyll-a	Total Nitrogen (marine waters)
Dioxin (including 2,3,7,8-TCDD)	NMR
Enterococcus (TMDL complete)	Enterococcus
Estuarine Bioassessments	Total Nitrogen
Light Attenuation Coefficient	Total Suspended Solids, Total Nitrogen
Mercury	NMR unless potentially present such (e.g., salvage yards crushing vehicles with Hg switches)
Nitrogen (Total)	Nitrogen, Total
pH	pH
Polychlorinated biphenyls	NMR
Winnicut River – Unnamed Brook – Cornelius Brook, NHRIV600030901-01:	
Benthic-Macroinvertebrate Bioassessments (Streams)	Contact NHDES Watershed Management Bureau for requirements
Dissolved oxygen and DO saturation	DO, BOD_5, Temperature, Total Phosphorus (freshwater)
E. coli	E. coli
pH	pH
Winnicut River – Barton Brook – Marsh Brook – Thompson Brook, NHRIV600030901-02:	
Dissolved oxygen and DO saturation	DO, BOD_5, Temperature, Total Phosphorus (freshwater)
E. coli (TMDL complete)	E. coli
Winnicut River – Unnamed Brook, NHRIV600030901-07:	
Dissolved oxygen and DO saturation	DO, BOD_5, Temperature, Total Phosphorus (freshwater)
pH	pH
Wheelwright Creek – Parkman Brook, NHRIV600030806-04:	
Chloride	Chloride
E. coli (TMDL complete)	E. coli

Table 2. Instrumentation, test kit, and laboratory procedures for monitoring parameters.

Analyte or Parameter	Instrumentation	Field Test Kit	Laboratory Procedure
Acenaphthene and all other PAHs	N/A	N/A	Per ARA
Acenaphthylene and all other PAHs	N/A	N/A	Per ARA
Aluminum, Total	N/A	N/A	Per ARA
Anthracene and all other PAHs	N/A	N/A	Per ARA
Arsenic, Total	N/A	N/A	Per ARA
Benzo(a)pyrene and all other PAHs	N/A	N/A	Per ARA
Benzo[a]anthracene and all other PAHs	N/A	N/A	Per ARA
BOD_5	N/A	N/A	Per ARA
Cadmium, Total	N/A	N/A	Per ARA
Chloride	TBD	TBD	TBD
Chrysene (C1-C4) and all other PAHs	N/A	N/A	Per ARA
Copper, Total	N/A	N/A	Per ARA
Dibenz[a,h]anthracene and all other PAHs	N/A	N/A	Per ARA
Dissolved oxygen	TBD	TBD	TBD
E. coli	N/A	N/A	Per ARA
Enterococcus	N/A	N/A	Per ARA
Fluoranthene and all other PAHs	N/A	N/A	Per ARA
Fluorene and all other PAHs	N/A	N/A	Per ARA
Lead, Total	N/A	N/A	Per ARA
Nitrogen, Total	N/A	N/A	Per ARA
pH	TBD	TBD	TBD
Phenanthrene and all other PAHs	N/A	N/A	Per ARA
Phosphorus, Total	N/A	N/A	Per ARA
Pyrene and all other PAHs	N/A	N/A	Per ARA
Temperature	TBD	TBD	TBD
Zinc, Total	N/A	N/A	Per ARA

Table 3. Analytical methods, detection limits, hold times, and preservatives for Stratham monitoring parameters.

Analyte or Parameter	Analytical Method	Detection Limit	Maximum Hold Time	Preservative
Acenaphthene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Acenaphthylene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Aluminum, Total	Per ARA	Per ARA	Per ARA	Per ARA
Anthracene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Arsenic, Total	Per ARA	Per ARA	Per ARA	Per ARA
Benzo(a)pyrene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA

Analyte or Parameter	Analytical Method	Detection Limit	Maximum Hold Time	Preservative
Benzo[a]anthracene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
BOD_5	Per ARA	Per ARA	Per ARA	Per ARA
Cadmium, Total	Per ARA	Per ARA	Per ARA	Per ARA
Chloride	TBD	TBD	TBD	TBD
Chrysene (C1-C4) and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Copper, Total	Per ARA	Per ARA	Per ARA	Per ARA
Dibenz[a,h]anthracene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Dissolved oxygen	TBD	TBD	TBD	TBD
E. coli	Per ARA	Per ARA	Per ARA	Per ARA
Enterococcus	Per ARA	Per ARA	Per ARA	Per ARA
Fluoranthene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Fluorene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Lead, Total	Per ARA	Per ARA	Per ARA	Per ARA
Nitrogen, Total	Per ARA	Per ARA	Per ARA	Per ARA
pH	TBD	TBD	TBD	TBD
Phenanthrene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Phosphorus, Total	Per ARA	Per ARA	Per ARA	Per ARA
Pyrene and all other PAHs	Per ARA	Per ARA	Per ARA	Per ARA
Temperature	TBD	TBD	TBD	TBD
Zinc, Total	Per ARA	Per ARA	Per ARA	Per ARA

Standard Operating Procedure for
Dry Weather Outfall & Interconnection Screening & Sampling
Prepared by: FB Environmental May 16, 2024

Applicability:
The MS4 permit requires all low and high priority outfalls/interconnections (excluding Problem and excluded outfalls) to be inspected for the presence of flow during dry weather. The Town of Stratham Department of Public Works (DPW) will be responsible for conducting monitoring activities.

Requirements:
- Field duplicates of grab samples should be taken every 10 samples or 10% of the entire sample set per year and parameter.
- Dry weather screening and sampling shall proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. To determine dry weather conditions, DPW staff will use online precipitation data from Weather Underground (wunderground.com) for three weather stations within or closest to Stratham. Dry weather sampling will not occur if any of the three stations have a record of more than 0.1 inches of rainfall within the previous 24-hour period.
- If an outfall is submerged or inaccessible, field staff shall visit the first accessible upstream manhole or structure for the observation and sampling. The new location should be noted in the field form.
- Outfalls will only be sampled if flow is observed during appropriate weather conditions as described above. If no flow is observed but there is evidence of illicit discharge, field staff shall 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.

Prior to sampling:
- Inspect all equipment and supplies for integrity.

Supplies:
- Bottles (obtained from laboratory) with labels
- Camera
- Clipboard, pens/pencils/sharpies
- Cooler & ice
- Distilled water
- Field forms
- Field meters or sondes (if needed for sampling specific water quality parameters such as temperature, dissolved oxygen, conductivity, pH, ammonia, surfactants, or chlorine)
- Flashlight or headlamp and spare batteries
- GPS device

- Hand sanitizer
- Laboratory COC form
- Map of identified outfalls
- Measuring tape
- Nitrile gloves
- Personal Protective Equipment (reflective vest, safety glasses, steel-toed boots)
- Plastic bag for disposal of dirty or used supplies
- Pry bar or other tool for opening manholes or catch basins when required
- Rubber boots or waders (for accessing shallow streams if necessary)
- Safety cones
- Sampling pole with attachments (for accessing hard to reach outfalls and manholes if necessary)
- Sandbags for damming low flows to collect samples
- Small mallet or hammer (to free stuck manhole and catch basin covers if necessary)
- Test kits
- Utility knife
- Whirl-paks

Sample Collection Protocol:

1. Verify that dry weather sampling requirements have been met (<0.1 inches of precipitation in previous 24-hour period).
2. Obtain all necessary equipment from DPW office or laboratory. Put on necessary personal protective equipment.
3. Navigate to each sampling site.
4. Put on protective gloves.
5. Fill out all sample information (Site ID, date, time, and sampler initials) on sample bottles and field forms. Add “dup” for any duplicate sample.
6. Fill sample bottles directly from flow if possible. Avoid surface debris or foam and disturbing sediment. Do not touch the opening of the bottles or the inside of the bottle cap. If using a sampling pole or other secondary container triple rinse the container before each site with distilled water and then the water to be sampled. Laboratory bottles should not be rinsed.
7. Place laboratory sample bottles on ice in cooler, unless it is specified that the samples should be kept at room temperature (e.g. optical brighteners). Ice must be loose around the bottles to cool the samples quicker and keep the samples within the required temperature range (0-10 °C).
8. Use test strips, test kits, and field meters. Triple rinse field meters using the process described above.
9. Record all information on field data form and double-check for entry completeness before leaving each site. Note any deviations from the SOP.
10. Repeat the above sampling process for all sites. For every 10 samples, choose one site to collect a duplicate sample. Duplicate sample sites should be rotated for each sampling event.
11. Fill out chain-of-custody forms for laboratory samples.

12. Deliver samples to the laboratory. Samples must be delivered by 4 PM Monday-Thursday (no Friday sample deliveries).
13. Obtain a signed copy of the chain-of-custody form.
14. Properly dispose of used equipment and test kits.
15. Clean and return all sampling equipment.

Field Data Collection & Storage

The field data form in Appendix D must be filled out for each outfall site prior to sampling. This includes recording data for each of the following parameters: Outfall ID, Receiving water, Date of most recent inspection, Dimensions, Shape, Material (PVC, concrete, etc.), Spatial location (within +/- 30 feet), Physical condition, and Indicators of potential non-stormwater discharges (odor, color, turbidity, floatables, oil sheen, etc.).

Standard Operating Procedure for
Wet Weather Outfall & Interconnection Screening & Sampling
Prepared by: FB Environmental May 16, 2024

Applicability:
The MS4 permit requires inspection and sampling at all outfalls with a minimum of one (1) identified System Vulnerability Factor (SVF). The Town of Stratham Department of Public Works (DPW) will be responsible for conducting monitoring activities and making updates as necessary.

Requirements:

- Outfalls will be inspected and sampled under wet weather conditions, to the extent necessary, to determine whether high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4 catchment.
- At least one wet weather sample will be collected at the identified outfall(s) for the same parameters required during dry weather screening.
- Wet weather sampling shall take place during or after a storm event of sufficient intensity to produce a stormwater discharge at the outfall. As practicable, these samples will be collected during the spring (between the months of March and June) when groundwater levels are relatively high. Typically wet weather sampling events are conducted, after precipitation >0.25" in the prior 24 hours, >0.50" in the prior 48 hours, >1.0" in the prior 72 hours, or >2.0" in the prior 96 hours.
- Field duplicates of grab samples should be taken every 10 samples or 10% of the entire sample set per year and parameter.

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 7.3 of this IDDE Plan. If wet weather outfall sampling and dry weather manhole inspections together do not identify evidence of illicit discharges, catchment investigations will be considered complete

Prior to sampling:

- Inspect all equipment and supplies for integrity.

Supplies:

- Bottles (obtained from laboratory) with labels
- Camera
- Clipboard, pens/pencils/sharpies
- Cooler & ice
- Distilled water
- Field forms
- Field meters or sondes (if needed for sampling specific water quality parameters such as temperature, dissolved oxygen, conductivity, pH, ammonia, surfactants, or chlorine)

- Flashlight or headlamp and spare batteries
- GPS device
- Hand sanitizer
- Laboratory COC form
- Map of identified outfalls
- Measuring tape
- Nitrile gloves
- Personal Protective Equipment (reflective vest, safety glasses, steel-toed boots)
- Plastic bag for disposal of dirty or used supplies
- Pry bar or other tool for opening manholes or catch basins when required
- Rubber boots or waders (for accessing shallow streams if necessary)
- Safety cones
- Sampling pole with attachments (for accessing hard to reach outfalls and manholes if necessary)
- Sandbags for damming low flows to collect samples
- Small mallet or hammer (to free stuck manhole and catch basin covers if necessary)
- Test kits
- Utility knife
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2. Obtain all necessary equipment from DPW office or laboratory. Put on necessary personal protective equipment.
3. Navigate to each sampling site.
4. Put on protective gloves.
5. Fill out all sample information (Site ID, date, time, and sampler initials) on sample bottles and field forms. Add “dup” for any duplicate sample.
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