

ADAPTIVE MANAGEMENT FRAMEWORK PROPOSAL

Town of Exeter, New Hampshire

INTRODUCTION

The United States Environmental Protection Agency (USEPA) Region 1 issued a Great Bay Total Nitrogen General Permit for Wastewater Facilities in New Hampshire (National Pollutant Discharge Elimination System [NPDES] General Permit: NHG58A000) for 13 eligible wastewater treatment facilities (WWTFs). The General Permit was issued on November 24, 2020 and became effective beginning on February 1, 2021.

The General Permit establishes total nitrogen effluent limitations, monitoring requirements, reporting requirements, and standard conditions. The discharge of all pollutants other than nitrogen from these WWTFs is authorized by each WWTF's respective individual NPDES permit. USEPA developed the General Permit, as part of an Adaptive Management Framework (AMF), to comprehensively regulate nitrogen loads from the 13 WWTFs on a watershed-wide scale. The General Permit also incorporates an innovative and adaptive approach to achieve reductions in total nitrogen loads to the Great Bay estuary through a combination of mandatory load limits at the WWTFs and voluntary nonpoint source nitrogen reductions.

The General Permit is only one aspect of the AMF; other elements include ambient monitoring, pollution tracking, reduction planning, and review. Implementing an adaptive management approach would include collaboration among USEPA, the State of New Hampshire, and public and private stakeholders. This needed collaboration entails participating in the following:

- Monitoring ambient water quality in the Great Bay
- Tracking loads of total nitrogen
- Planning for overall source reductions
- Evaluating a load-based threshold, 0.32 milligrams per liter (mg/L) instream total nitrogen criterion, or other threshold for demonstrating attainment of water quality standards
- Establishing a timeline for completing a total nitrogen total maximum daily load (TMDL) for the Great Bay

This detailed proposal demonstrates the Town of Exeter's (the Town) election to opt into the voluntary AMF option.

BACKGROUND

The Town understands the value of the Great Bay Estuary as a resource for New Hampshire seacoast communities. The Town has been working diligently to improve water quality to the receiving waters and ultimately to the Great Bay. The Town is committed to continuing these efforts and is looking for additional opportunities to further improve water quality from point and nonpoint sources. As summarized in this section, the Town is very familiar with nitrogen control plans (NCPs), tracking and accounting, and monitoring water quality, which are all parts of the voluntary AMF. As part of the development of an NCP in 2018, the Town included an AMF that the Town has been working under since the development of the plan. The Town hopes to build upon the efforts completed to date and to gain a better understanding on how these efforts have and will continue to affect water quality.

Since 2003, the Town has been regulated under the NPDES municipal separate storm sewer system (MS4) permit. The MS4 permit regulates stormwater point source discharges in the urbanized area of the town (as defined by the US Census). The Town has submitted Annual Reports¹ under the 2003 permit from 2004 through 2018. In 2017, a new MS4 permit was issued to replace the 2003 permit, with an effective date of July 1, 2018. The Town has been complying with this permit and submitting Annual Reports² to USEPA since 2019.

Under the MS4 program, the Town conducts public education and outreach, illicit discharge detection and elimination, and construction site plan review and inspections. The Town also regulates post-construction stormwater management on private development and conducts catch basin cleaning, street sweeping, and collects yard debris, organic waste, and leaf litter. As part of the Town's catch-basin cleaning program, the Town hires a subcontractor to clean catch basins annually. The goal of the catch basin cleaning program is to ensure that sumps are no greater than 50% full. Under the street sweeping program, the Town sweeps all curbed streets at least twice per year. The Town provides enhanced street sweeping on a weekly basis in the downtown area (approximately 4.4 miles). The Town also provides enhanced sweeping of public parking lots and parking lots at municipal buildings monthly. These parking lots include the municipal parking lots on Bow Street, 36 Water Street, Center Street, Front and Railroad Square, and 58 Lincoln Street. Parking lots are swept at municipal facilities, including the surface water treatment plant, public library, parks and recreation complex, waterfront park, town offices, senior citizens center, Department of Public Works, safety complex, Swasey pavilion, and the parks and recreation shed.

In 2012, the Town was issued a NPDES Wastewater Discharge permit³ to establish minimum effluent discharge requirements at the WWTF. The NPDES permit required a seasonal rolling average effluent total nitrogen of 3.0 mg/L. In June 2013, USEPA issued an Administrative Order on Consent (AOC),⁴ which provides the Town with an interim seasonal rolling average effluent total nitrogen limit of 8.0 mg/L and provides a compliance schedule to achieve numerous specific tasks, as summarized below:

- *"...the Town shall begin tracking all activities [that the Town should reasonably be aware of, e.g., activities that involve a Town review/approval process or otherwise require a notification to the Town] within the Town that affect the total nitrogen load to Great Bay Estuary. This includes, but is not limited to, new/modified septic systems, decentralized wastewater treatment facilities, changes to the amount of effective impervious cover, changes to the amount of disconnected impervious cover [including pavement and buildings], conversion of existing landscape to lawn/turf and any new or modified Best Management Practices." (Article D.1)*
- *"...the Town shall begin coordination with the NHDES, other Great Bay communities, and watershed organizations in NHDES's efforts to develop and utilize a comprehensive subwatershed-based tracking/accounting system for quantifying the total nitrogen loading changes associated with all activities within the Town that affect the total nitrogen load to the Great Bay Estuary." (Article D.2)*

¹ [2003 MS4 Permit Annual Reports](#)

² [2017 MS4 Permit Annual Reports](#)

³ [2012 Final NPDES Permit](#)

⁴ [2013 Administrative Order on Consent](#)

- *“...the Town shall begin coordination with the NHDES to develop a subwatershed community-based total nitrogen allocation.” (Article D.3)*
- *Nitrogen Control Plan: “By September 30, 2018, submit to USEPA and the NHDES a total nitrogen non-point source and point source stormwater control plan (“Nitrogen Control Plan”), including a schedule of at least five years for implementing specific control measures as allowed by state law to address identified non-point source and stormwater Nitrogen loadings in the Town of Exeter that contribute total nitrogen to the Great Bay Estuary, including the Squamscott River. If any category of de-minimis non-point source loadings identified in the tracking and accounting program are not included in the Nitrogen Control Plan, the Town shall include an explanation of any such exclusions. The Nitrogen Control Plan shall be implemented in accordance with the schedules contained therein.” (Article D.4)*
- *Engineering Evaluation: “By September 30, 2024, the Town shall submit an engineering evaluation that includes recommendations for the implementation of any additional measures necessary to achieve compliance with the NPDES Permit, or a justification for leaving the interim discharge limit set in place (or lower the interim limit to a level below 8.0 mg/l but still above 3.0 mg/l) beyond that date. Such justification shall analyze whether:*
 - a) Total nitrogen concentration in the Squamscott River and downstream waters are trending towards nitrogen targets (Footnote 3: The Town shall account for precipitation in the trend analysis and baseline measurement.).*
 - b) Significant improvements in dissolved oxygen, chlorophyll a, and macroalgae levels have been documented; and*
 - c) Non-point source and stormwater point source reduction achieved are trending towards allocation targets and appropriate mechanisms are in place to ensure continued progress.” (Article E.2)*

In 2013, the Town began developing a Wastewater Facilities Plan to identify the most cost-effective on-site solution for the Town to meet their permit obligations and design an upgrade to its 3.0-million-gallon-per-day WWTF, which discharged approximately 300 pounds (lb) of total nitrogen per day into the Squamscott River. The upgrade focused on improved treatment performance and nitrogen reduction to meet the interim seasonal rolling average effluent total nitrogen limit of 8.0 mg/L, with the potential to achieve an effluent total nitrogen limit between 3.5 and 5 mg/L with the use of supplemental carbon.

Since 2013, in accordance with the AOC, the Town has prepared Total Nitrogen Reports⁵ that summarize how activities affect the total nitrogen load to the Great Bay Estuary. The Town began tracking in 2014, as required by the AOC. Initially, the Town developed its own tracking and accounting system, which was used for the 2014 to 2018 Annual Report submittals. But, since 2018, the Town has been coordinating with the New Hampshire Department of Environmental Services (NHDES) and other municipalities to track and account for total nitrogen using the Pollutant Tracking and Accounting Program (PTAP). PTAP started in 2015 and was developed by NHDES and University of New Hampshire (UNH), with significant input from USEPA, the Town, and other Great Bay municipalities. Per the PTAP

⁵ [Total Nitrogen Reports](#)

website, PTAP “will result in the creation of guidelines and recommendations for tracking and accounting systems and identify potential tools that will enable municipalities to perform a quantitative assessment of pollutant load reductions associated with nonpoint source management activities in the Great Bay region.” (<https://www.unh.edu/unhsc/ptapp>). The Town began using the PTAP system in February 2018, once it was completed by NHDES/UNH.

From 2013 to 2015, the Town participated in an integrated planning effort with the Towns of Stratham and Newfields. As part of this integrated planning effort, the *Water Integrated for the Squamscott Exeter (WISE) Preliminary Integrated Plan*⁶ was developed to establish a more cost-effective and sustainable means to meet future permitting compliance needs and improve water quality in the watersheds of the Squamscott and Exeter Rivers, and ultimately the Great Bay. This proposed approach, which is consistent with the *USEPA Integrated Municipal Stormwater and Wastewater Planning Approach Framework*,⁷ provided implementation strategies that balanced upgrades to the WWTF with nonpoint and point source stormwater control measures in an effort to reduce existing and future nitrogen loads to the watersheds of the Squamscott and Exeter Rivers and achieve other water quality objectives.

In 2015, the Town began the preliminary design phase for the WWTF and Main Pump Station. In January 2016, the final design phase began.

In 2018, the Town prepared an NCP⁸ to comply with its AOC. The NCP established the land uses and sources of total nitrogen from nonpoint sources from the town. These land uses and sources are summarized in **Table 1** below. The Town developed these specific load-based estimates for the town, to allow the Town to track and account for changes in land use and application of best management practices. Understanding the developed land uses and sources of total nitrogen to the Great Bay helps the Town target what management practices and strategies would be most appropriate at improving water quality. The NCP outlined a series of point source and nonpoint source strategies that the Town would implement to improve water quality. The Town envisions that this AMF proposal will build upon the NCP and strategies to improve water quality.

Table 1. Total Nitrogen Delivered Load by Land Use/Source (Wright-Pierce & Horsley Witten, 2018)

Land Use/Source	Delivered TN Load from Pervious Surfaces (lb/yr)	Delivered TN Load from Impervious Surfaces (lb/yr)	Total Delivered TN Load (lb/yr)
Developed Land Uses/Sources			
Agriculture	822	0	822
Commercial, Services, and Institutional	797	1,569	2,367
Industrial	73	244	318
Industrial and Commercial Complexes	152	274	426
Mixed Development Uses	0	2	2
Outdoor	704	30	734
Residential	4,836	354	5,190

⁶ [2015 WISE Preliminary Integrated Plan](#)

⁷ June 2012, USEPA Memo: Integrated Municipal Stormwater and Wastewater Planning Approach Framework

⁸ [2018 Nitrogen Control Plan](#)

Land Use/Source	Delivered TN Load from Pervious Surfaces (lb/yr)	Delivered TN Load from Impervious Surfaces (lb/yr)	Total Delivered TN Load (lb/yr)
Transportation, Communications, and Utilities	1,043	1,422	2,464
Septic	-	-	8,898
Groundwater (Non-septic)	-	-	15,559
SUBTOTAL			36,780
Undeveloped Land Uses/Sources			
Barren	138	20	158
Forest	2,524	0	2,524
Transitional	151	1	152
Water	0	0	0
Wetland	873	0	873
SUBTOTAL			3,707
TOTAL (lb/yr)			40,487
TOTAL (tons/yr)			20.2

lb/yr: pounds per year

TN: total nitrogen

In June 2019, the Town completed construction of the WWTF upgrade, Main Pump Station, and dual force mains for a total project cost of approximately \$54 million. The WWTF upgrade included a four-stage Bardenpho process with a supplemental carbon storage and feed system. Through operation and optimization at the WWTF, the Town has been able to achieve average effluent nitrogen concentration less than 5 mg/L (approximately 66 lb of total nitrogen per day) through the permitted growing season. This improvement in effluent total nitrogen represents a significant reduction (~ 80%) in total nitrogen loading to the Great Bay, accounting for reducing the load reduction of total nitrogen to Great Bay by approximately 240 lb per day, which equates to an approximately 87,000 lb per year.

The Town remains authorized to discharge under an expired 2012 Individual Permit, which has been administratively continued, at the WWTF. The Town will remain covered under this permit until USEPA issues an individual permit for the other water quality parameters not covered under the General Permit. At such time, the Town will receive an authorization to discharge under the General Permit.

Even though the Town is not covered under the General Permit, they have elected to join the Municipal Alliance for Adaptive Management (MAAM) and participate on the Executive Board as an at-large member. In an effort to better understand and accomplish water quality monitoring and improvement in the Great Bay watershed, MAAM was formed in the winter and spring of 2021 in order to facilitate and enhance community collaboration, stakeholder input, resource sharing, expertise, and efficient use of investment.

The Town is preparing this voluntary AMF to show their commitment to reducing total nitrogen and to ensure that when they are authorized to discharge, they will continue to make improvements in water quality.

Asset Management Program

In 2015, the Town worked with stakeholders to develop a Climate Adaptation Plan for Exeter (CAPE).⁹ The CAPE project modeled potential future flooding impacts for various storm events (25-, and 100-year storms) with and without storm surge along the town's freshwater and tidal rivers. As part of the project, the storm drain network was modeled using the best available data and each major outfall drainage area was delineated. The results demonstrated the potential impacts of those storm events on road flooding and storm drain network performance, as well as the economic impact on infrastructure and loss of wetland and salt marsh habitat.

Since the development of this model, the Town has hired an independent consultant to evaluate the 10-year storm event to identify areas of town where infrastructure is undersized. The Town has also used the model to assess areas where infrastructure improvements are being proposed to determine if excess capacity is needed in the storm drain system to accommodate current and future storm events. The Town also updates their storm drain network to fill in data gaps as they evaluate and upgrade areas of the town.

In December 2020, the Town completed a Wastewater and Stormwater Asset Management Program,¹⁰ which was funded by a \$60,000 Clean Water State Revolving Fund loan. As part of this project, the Town updated and expanded the storm drain network inventory files, created an ArcGIS-based system that allows the Town to integrate various sources of data to allow more efficient planning and analysis, and developed an asset-replacement schedule to serve as a template for capital improvement planning.

Inflow and Infiltration Efforts

Reducing inflow and infiltration (I/I) reduces the amount of total nitrogen load from the WWTF to the Squamscott River and reduces the dilution of the waste, which makes it easier to denitrify. In 2013, the Town completed a *Phase III Inflow and Infiltration Evaluation* (Phase III report) that identified a \$26 million allowance needed to address I/I peak flows and sewer deficiencies. This plan also served at the Town's Combined Sewer Overflow (CSO) Long-Term Control Plan (LTCP). The Phase III report built on previous I/I work (Phase I and II) and focused on investigating the sanitary sewer system to reduce flow/CSO volume. The plan recommends that the Town periodically reassess and update the program performance and reassess prior to upgrading the WWTF.

One recommendation in the Phase III plan included investigation work in the Jady Hill area of town. It was the first project recommended by the LTCP to remove extraneous I/I from the sewer collection system. Flow monitoring prior to the project estimated that annual I/I volume of 43 million gallons. To reduce public and private I/I source, the Town replaced 7,600 linear feet of sewer mains, 2,700 linear feet of sewer services within the right-of-way (ROW), and 3,200 linear feet of private sewer services outside the ROW. The costs to the sewer fund equated to \$3.4 million. Based on post-construction flow monitoring, annual I/I was reduced by 79% resulting in the removal of 34 million gallons yearly. The Jady Hill project finished construction in August 2013.

In 2017, the Town created a LTCP update to simplify, condense, and update the CSO LTCP portion of the Phase III plan. The plan was updated to reflect work the Town had completed to reduce flow/CSO

⁹ [2015 CAPE](#)

¹⁰ [2020 Wastewater and Stormwater Asset Management Program](#)

volume, including WWTF planning, Jady Hill, improved sewer/CSO flow metering, and removal of inflow connections.

A few of the I/I projects that the Town is currently working on are summarized below.

Salem Street Area Utility Improvement Project

In 2010, the Town established a water and sewer main rehabilitation program as part of its annual Capital Improvement Program (CIP). One example of a project completed through this program includes the water main improvements for Washington Street, which were approved in 2016 and construction completed in 2018. The water and sewer mains in the Salem Street area neighborhood are some of the oldest in town. The mains on Forest, Hale, Locust, Oak, Park (partial), Salem, Wadleigh, Walnut, and Warren Streets require significant improvements. Some of the water mains in this neighborhood were identified as being undersized and in poor condition in the 2015 Water Asset Management Plan prepared for the Town by an independent consultant. In 2014 the drain lines were televised and found to be in good condition but many of the catch basins in poor condition and needing to be replaced. The sewers in the neighborhood are old clay pipes with joint separations and tree root intrusions, subject to occasional blockages that require jetting and cleaning by Town forces.

This project has been in the planning stage for several years and is listed in the Town's current 2020-2025 CIP. The project will replace approximately 5,600 feet of water mains, upgrading them from 4" and 6" to 6" and 8" mains, based on the hydraulic analysis. Approximately 2,825 feet of sewers will be replaced with PVC pipe sized to meet projected sewer flows in the area. Catch basins will be replaced, as needed, based on prior inspections and additional investigations completed in the spring of 2020. The design will be completed in fiscal year 2020 with construction planned in fiscal year 2021.

Westside Drive Area Utility Improvement Project

The Westside Drive neighborhood was identified in the CSO LTCP as a high contributor of I/I. The Town is in the conceptual design phase to develop a plan for municipal infrastructure improvements within the Westside Drive neighborhood. This work is part of the Town's ongoing work to provide reliable utility services to residents.

Manhole and Pipe Rehabilitation

The Town allocates funding for manhole and pipe rehabilitation to replace infrastructure with hydraulic issues. Since 2017, the Town has relined approximately 4,300 linear feet of pipe and 7 manholes.

Septage Receiving

As part of the 2015 Wastewater Treatment Facilities Plan, the Town explored acceptance of septage flows. Septage is highly concentrated sludge from septic tanks or boat pump-outs. It was estimated that the non-sewered buildings in town generate approximately 650,000 gallons per year of septage, which was being disposed of at the Hampton WWTF. The Wastewater Treatment Facilities Plan identified septage as a possible revenue source for the Town.

Currently, the Town accepts approximately 250,000 gallons of septage per month from the town, Stratham, Newfields, Brentwood, East Kingston, and Kensington. The septage is used as a carbon source to improve denitrification at the WWTF. Prior to receiving septage from these communities, the septage went to Epping or Hampton.

Sump Pump Redirection Program

The Town developed and implemented a Sump Pump Redirection Program targeted at educating residents about the need to disconnect sump pumps discharging to the sewer system and direct them to vegetated areas on their properties. Residents had five years from the start of the program to redirect sump pumps away from the sewer system network.

Monitoring Efforts

Instream monitoring is an important element in the AMF. The following discusses three programs that can be integrated into the AMF program.

WISE Water Quality Monitoring Program

In 2015, The Town collaborated with the WISE project team, UNH and Piscataqua Regional Estuaries partnership (PREP) regarding scoping, budgeting, and implementing a Great Bay water quality monitoring program. Sampling data, including total nitrogen, was collected at 15 locations (8 watershed and 7 estuarine locations) in the Great Bay watershed.

Exeter River Watershed Association Volunteer River Assessment Program (VRAP)

The Town Planning Department staff regularly participate in VRAP. Bimonthly sampling is conducted at 9 locations throughout town. Further, in the past the Town has purchased equipment to assist VRAP in their efforts.

Piscataqua Regional Estuaries Partnership (PREP)

Since 2016, the Town has provided funding (approximately \$87,000) to PREP, which is part of USEPA's National Estuary Program. The National Estuary Program is a joint local/state/federal program established under the Clean Water Act with the goal of protecting and enhancing nationally significant estuarine resources. PREP receives funding from USEPA and is hosted and administered by the School of Marine Science and Ocean Engineering at the UNH.

The Town Public Works Director is an active member and co-chair of the Piscataqua Region Monitoring Collaborative. The purpose of this group is to discuss existing environmental monitoring programs in the Great Bay and Hampton-Seabrook estuaries and watersheds, sharing upcoming opportunities and challenges. The Town Public Works Director is also an active member on PREP's Management Committee. The Management Committee is PREP's principle governing body with the primary function of developing and implementing the Comprehensive Conservation and Management Plan.

The Town has been active and participated in discussions with the other seacoast communities about watershed scale efforts, including nonpoint source pollution tracking and this AMF proposal. The Town will continue to collaborate with the other seacoast communities to ensure that planning and implementation efforts are based on science, forward thinking, and what's best for the Great Bay.

Seacoast Stormwater Coalition

The Assistant Town Engineer is an active participant in the Seacoast Stormwater Coalition. The Coalition is made up of regulated communities under the Phase II MS4 Permit. Communities use this platform to collaborate and share resources to effectively work together to comply with the MS4 Permit.

Stormwater Regulations

The Town has Site Plan and Subdivision Regulations¹¹ that were revised in 2018 to include updates to the post-construction stormwater management requirements to be consistent with the State, MS4 Permit, and AOC requirements. Under these regulations, applicants for both new and redevelopment projects are required to provide treatment of runoff from impervious surfaces to achieve at least 80% removal of total suspended solids and at least 60% removal of both total nitrogen and total phosphorus.

These regulations ensure that as private development moves forward in the town, water quality improvements are being made to existing impervious cover through the redevelopment process and new development projects are providing water quality treatment for changes in land cover.

Fertilizer Efforts

In 2018, the Town formed the Healthy Lawns – Clean Water Initiative.¹² The initiative is supported by members from the Planning Board, Water/Sewer Committee, Conservation Commission, and the public. The initiative was formed to educate the public of ways they can reduce nitrogen pollution in our water ways by managing for healthy lawns with less impact to our water quality. The committee also worked to develop zoning ordinance amendment that limit fertilizer use in the shoreland protection district and aquifer protection district. These amendments were supported by the voters of the town and adopted in 2019.

The Town created “Water Quality Friendly Lawn Care” magnets, which were handed out at the Town Clerk’s office window. Approximately 70 were handed out to residents.

Further, New Hampshire State Statute (RSA: 431) as modified in 2013 states that no turf (lawn) fertilizer sold at retail shall exceed 0.9 lb per 1,000 square feet of total nitrogen per application when applied according to the instructions on the label. Furthermore, no turf fertilizers sold at retail shall exceed 0.7 lb per 1,000 square feet of soluble nitrogen per application when applied according to the label. This new law applies to synthetic (manufactured) fertilizers, natural inorganic fertilizers (from a mineral nutrient source), and natural organic fertilizers (derived from either plant or animal products). The guaranteed analysis of a lawn fertilizer is listed on the product label. Nitrogen sources and their solubility are listed individually.¹³

Under the New Hampshire Shoreland Protection Act, fertilizer cannot legally be applied to vegetation or soils located within 25 feet of the reference line of any public waters. Adjacent to any public water beyond 25 feet, slow or controlled release fertilizer may be used, but must be applied by horticultural

¹¹ [2021 Site Plan and Subdivision Regulations](#)

¹² [Exeter’s-healthy-lawns-clean-water-initiative](#)

¹³ [unh-nh-turf-law-fact-sheet.pdf](#)

professionals who have a pesticide application license issued by the New Hampshire Department of Agriculture.¹⁴

Slow or controlled release fertilizer means fertilizer that is guaranteed, as indicated on the package label, to contain the following:

- At most 2% phosphorous
- A nitrogen component which contains at least 50% slow release nitrogen

Structural Stormwater Best Management Practices

In 2017, the Town conducted a study in the Lincoln Street subwatershed¹⁵ (Phase I), the largest storm drainage network in the Town, to identify locations for installing stormwater best management practices (BMPs) to provide water quality treatment from existing impervious cover. In 2018, the Town completed Phase II¹⁶ in the Lincoln Street subwatershed. The studies identified a suite of 18 BMPs at 8 locations with a potential to remove 900 lb per year of total nitrogen by treating 125 acres.

Since the development of the Lincoln Street subwatershed studies, the Town has been conducting additional investigation and design work to take the conceptual designs to final design and construction. After additional investigations, not all conceptual BMPs identified in the Lincoln Street subwatershed studies were found to be viable options due to on-site constraints. The Town is currently preparing a 319 Grant to design and construct a structural stormwater BMP to treat stormwater from portions of Winter and Front Streets.

In 2018, during the reconstruction of Lincoln Street, the Town installed 3 media filters and 144 linear feet of perforated pipe between catch basins to promote infiltration. These practices provide water quality treatment of existing impervious cover along Lincoln Street.

Further, the Town continues to use the model developed as part of the CAPE project to inform locations where further investigations should be conducted. These areas reflect locations where infrastructure may be undersized for conveying current and future storm events.

Septic Systems

Periodically, the Town sends an annual letter to its residents reminding them about proper maintenance of septic systems. Included with that annual letter is a flyer from NHDES on septic system maintenance.

The Town also sets up an annual informative display about the Septic Smart program in town offices and at the library. The display includes flyers and septic maintenance information for residents.

Pet Waste Station Program

The Town operates a Pet Waste Station Program (bags and disposal containers). The Town supplies pet waste bags and maintains the disposal containers at 19 locations throughout Town. The Town maintains a map of these locations¹⁷

¹⁴ [Protected Shoreland FAQ | NH Department of Environmental Services](#)

¹⁵ [2017 Lincoln Street Subwatershed Plan Phase I](#)

¹⁶ [2018 Lincoln Street Subwatershed Plan Phase II](#)

¹⁷ [Think Blue Pet Waste](#)

PROPOSAL

This AMF Proposal describes the steps, activities, and measures that the Town will take to improve water quality from nonpoint sources into Great Bay from the town during this General Permit term. As outlined in the General Permit, this AMF Proposal is broken up into five areas (A through E):

- A. Ambient Water Quality Monitoring
- B. Track Reductions and Additions of Total Nitrogen
- C. Overall Source Reduction
- D. Load Based Threshold
- E. Completion of a total nitrogen TMDL

The Town's proposed approach for each of these categories is outlined in the sections below. This proposal will be a living document that will be reviewed, updated, and modified (as needed) annually to reflect the current understanding of the Great Bay and the progress made by the Town and other relevant parties. The updates and modifications will be informed based upon the outcomes from implementing the efforts outlined in this proposal and collaborating with MAAM, the other seacoast communities, and key stakeholders (PREP, NHDES, and USEPA). The Town believes that the collaborative approach will provide the most efficient and streamlined use of limited resources (time and money) and avoid unnecessary duplication of efforts.

A. AMBIENT WATER QUALITY MONITORING IN GREAT BAY

Part 3-1.a. of the General Permit recommends an outline of an approach to monitor the ambient water quality in the Great Bay estuary to determine project trends.

Under this AMF Proposal, the Town will continue to fund and work closely with PREP to support PREP's annual and long-term monitoring initiatives. The Town will continue to participate on PREP's Management Committee for elected term as well as co-chair the Piscataqua Regional Monitoring Collaborative. The Town will review and provide comments on PREP's ambient water quality monitoring program to ensure that the monitoring program meets regulatory compliance needs of the Town. The Town will work with PREP to gather a better understanding of the direct outcomes from the monitoring program including annual raw data output, annual summary reports and long-term trend reports.

B. TRACK REDUCTIONS AND ADDITIONS OF TOTAL NITROGEN

Part 3-1.b. of the General Permit recommends an outline of the method(s) to track reductions and additions of the total nitrogen over the course of the permit.

The Town has been tracking reductions and additions of total nitrogen since 2014, as required by the AOC. Initially, the Town developed its own tracking and accounting system, which was used for the 2014–2018 Annual Report submittals. However, since 2018, the Town has been coordinating with NHDES and other municipalities to track changes in land use and quantify implementation of nonpoint source BMPs through PTAP.

Under this AMF Proposal, the Town will continue to track the implementation of nonpoint and point source efforts to reduce total nitrogen loads. The Town will estimate the reductions and additions of total nitrogen from developed lands and present this information annually. The Town anticipates tracking the efforts outlined in **Section C** below.

The Town will continue to work with NHDES, UNH, other Great Bay communities, and consultants to develop a tracking and accounting system to perform a quantitative assessment of pollutant load reductions. Currently, PTAP does not have the capability to estimate nitrogen loads. If PTAP does not have these capabilities before the first annual report is due, the Town is committed to calculating estimates in the reductions in total nitrogen using methods provided by USEPA in the 2017 New Hampshire MS4 Permit and using the best available load reduction estimates.

C. OVERALL SOURCE REDUCTION

Part 3-1.c. of the General Permit recommends an outline or plan for overall source reductions of total nitrogen over the course of the General Permit.

Under this AMF Proposal, the Town will implement point and nonpoint source reduction strategies to reduce total nitrogen. Annually, the Town will review the strategies implemented and update the list to reflect progress.

Point Source Reduction Strategies

A variety of measures to reduce wastewater point source nitrogen will be evaluated as part of this AMF Proposal. The strategies evaluated and a description of how the Town will implement these strategies is summarized in **Table 2**.

Table 2. Proposed Point Source Reduction Strategies

STRATEGY	DESCRIPTION OF IMPLEMENTATION
WWTF Optimization	The Town will continue to evaluate WWTF modification and process optimization techniques for additional reduction of total nitrogen from the WWTF effluent.
Inflow and Infiltration	<p>The Town will implement recommendations from the 2013 Phase III I/I Plan and 2017 CSO LTCP. Projects will include Westside Drive and Salem Street.</p> <p>The Town will continue to fund pipe and manhole rehabilitation projects aimed at reducing inflow and infiltration.</p>
Sump Pump Redirection Program	The Town will revisit the Sump Pump Redirection Program and re-educate residents about the program and develop potential enforcement measures. The Town will evaluate if the program needs to be implemented in other areas of town.
Septage Receiving	The Town will continue to receive septage from the town, Stratham, Newfields, Brentwood, East Kingston, and Kensington to assist with the denitrification process at the WWTF.

Nonpoint Source Reduction Strategies

A variety of measure to reduce nonpoint source (stormwater and groundwater) nitrogen will be evaluated as part of this AMF Proposal. The strategies evaluated, the targeted land use/source, and a description of how the Town will implement these strategies is summarized in **Table 3**.

Table 3. Proposed Non-point Source Reduction Strategies

STRATEGY	TARGET LAND USE/SOURCE	DESCRIPTION OF IMPLEMENTATION
Fertilizer and Turf Management Program	Pervious Developed Land	The Town will develop and implement a fertilizer outreach and education program targeted at reducing the application of fertilizer and using turf management best practices. The Town will apply this outreach program to both Town staff and departments as well as to the public. The Town will develop education materials as well as conduct workshops for the public.
Post-Construction Regulations	Impervious	<p>The Town recently updated their Site Plan and Subdivision regulations to incorporate post-construction stormwater controls optimized for the removal of nitrogen. All private development stormwater projects that require a Site Plan or Subdivisions approval will be required to reduce total nitrogen by 60%.</p> <p>The Town will ensure during the Site Plan and Subdivision Review process that applicants are meeting the regulatory requirements. The Town currently uses a third-party consulting firm to review applications and provide the Town and applicants specific comments regarding the stormwater post-construction requirements.</p> <p>The Town will track and account for the implementation of post-construction stormwater BMPs on private development.</p>
Land Use Regulation Review	Impervious	<p>The Town will review current land use regulations and explore changes that will result in less nitrogen loading into the environment. These strategies may include, but not limited to, providing incentives for redeveloping existing parcels, requiring advanced septic systems in areas not serviced by municipal sewer, and increasing the required nutrient removal rates by stormwater BMPs.</p> <p>The Town will review current land use regulations to determine barriers to low impact develop in street design, parking lot guidelines and green infrastructure best management practices.</p>
Pet Waste Station Program	Pervious Developed Land Impervious	Continue to implement Pet Waste Station Program by supplying pet waste bags and removing pet waste from disposal containers.
Infrastructure Maintenance Program	Impervious	<p>The Town will develop and implement a program detailing the activities and procedures to maintain storm drainage infrastructure in a timely manner. The program will include routine inspections, cleaning, and maintenance of catch basins to maintain 50% free-storage capacity in the catch basin sump.</p> <p>The Town will continue to operate and maintain a vacuum truck and clean catch basins.</p>
Catch Basin Replacement Program	Impervious	<p>The Town will develop a program to replace catch basins in the Town with sumps that are less than the recommended 3-foot sump to provide water quality pretreatment. The Town has a significant number of catch basins in the town with inadequate sumps.</p> <p>This program would provide additional sediment storage capacity in these catch basins and allow the Town to effectively remove sediment prior to discharging to the receiving water.</p> <p>The Town anticipates replacing on average 25 catch basins per year, during the General Permit term.</p>

STRATEGY	TARGET LAND USE/SOURCE	DESCRIPTION OF IMPLEMENTATION
Organic Waste and Leaf Litter Collection Program	Developed Pervious Impervious	<p>The Town will gather, remove, and properly disposal of landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots. The gathering and removal will occur immediately after any landscaping activities.</p> <p>The Town will dispose of these materials at the Town Transfer Station.</p>
Enhanced Street/Pavement Cleaning Program	Impervious	<p>The Town will continue implementing its enhanced sweeping program to clean all curbed impervious cover (i.e., directly connected impervious cover) and parking lots, at least two times per year (spring and fall), with targeted weekly sweeping in the downtown area and monthly sweeping of parking lots.</p> <p>The Town will use a high-efficiency, regenerative air-vacuum sweeper to implement the program.</p>
Septic System Program	Septic	<p>The Town will investigate the feasibility of an incentive-based private septic system replacement/upgrade program. The Town anticipates developing a loan forgiveness program, where private property owners could borrow the cost difference between a traditional system and an advanced treatment system for targeted nitrogen removal.</p> <p>As part of the program, the Town will develop a map of locations of current septic systems within 250 feet of a receiving water. The Town will incorporate outreach and education to the property owners in these areas and make them aware of this program. The Town will also conduct outreach during the Site Plan and Subdivision review process for new development or redevelopment projects.</p> <p>Following development of the program, the Town will evaluate next steps for implementation of the program.</p>
Stormwater Structural BMP Construction	Impervious	<p>The Town will continue to investigate conceptual BMPs identified as part of the Lincoln Street subwatershed studies. The Town will implement the structural stormwater BMP in the Winter Street/Front Street area. Following the construction of this project, the Town will evaluate the process for selection, design, and construction of additional structural stormwater BMPs and determine next steps based on lessons learned.</p> <p>The Town will also evaluate capital improvement projects and identify locations where stormwater retrofits could be implemented to improve water quality from Town-owned impervious cover.</p>
Evaluate Town-Owned and Right-of-Way Properties for Stormwater Structural BMP Sites	Impervious	<p>The Town will conduct a town-wide assessment, like the one conducted in the Lincoln Street subwatershed, for implementation of structural stormwater BMPs to reduce the frequency, volume, and pollutant loads of stormwater discharges.</p> <p>The Town will develop a town-wide plan that identifies conceptual BMP locations and designs for retrofitting existing impervious cover. The Town may use this plan to systematically retrofit and treat existing impervious cover.</p>

STRATEGY	TARGET LAND USE/SOURCE	DESCRIPTION OF IMPLEMENTATION
Atmospheric Deposition	Pervious Impervious	<p>The Town will work with USEPA and NHDES to understand how levels of nitrogen from atmospheric deposition are changing over time.</p> <p>The Town will account for changes in the atmospheric load as part of the tracking and accounting framework on an annual basis (or as data becomes available).</p>

D. LOAD-BASED THRESHOLD

Part 3-1.d. of the General Permit recommends an inclusive and transparent process for comprehensively evaluating any significant issues regarding the science and methods relating to the permit, including the choice of a load-based threshold of 100 kilograms per hectare per year (kg ha⁻¹ yr⁻¹) versus any other proposed threshold, including a concentration-based threshold of 0.32 mg/L.

The Town will allocate funds for an independent consultant to attend collaborative meetings to discuss the development of a load-based threshold. Town will review monitoring initiatives; implement nonpoint and point source projects targeted at reducing total nitrogen in the Great Bay; track and account implementation efforts; and revise this AMF Plan to ensure that the efforts the Town is taking will have the greatest benefit to water quality. The Town is committed to working with MAAM, USEPA, NHDES, PREP, and watershed stakeholders to ensure that the science and recommended next steps for continued improvement in water quality of the Great Bay and its tributaries are understood.

E. COMPLETION OF TMDL

Part 3-1.c. of the General Permit recommends a proposed timeline for completing a TMDL for total nitrogen in Great Bay and for submitting it to USEPA for review and approval.

The Town will allocate funds for an independent consultant to attend collaborative meetings to discuss the develop of a timeline for completion of a TMDL or an alternative approach. Town will review monitoring initiatives; implement nonpoint and point source projects targeted at reducing total nitrogen in the Great Bay; track and account implementation efforts; and revise this AMF Plan to ensure that the efforts the Town is taking will have the greatest benefit to water quality. The Town is committed to working with MAAM, USEPA, NHDES, PREP, and watershed stakeholders to ensure that the science and recommended next steps for continued improvement in water quality of the Great Bay and its tributaries are understood.