

# Joint Adaptive Management Plan (AMP)

Submitted by the following members of the Municipal Alliance for Adaptive Management (MAAM)

Dover, Epping, Milton, Newington, Portsmouth,  
Rochester and Rollinsford

(Exeter, a member of MAAM, will report separately)

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Prepared by the municipal members of the Municipal Alliance for Adaptive Management (MAAM), with assistance from NH Department of Environmental Services (NHDES), the consulting firm Brown & Caldwell, the University of New Hampshire Stormwater Center (UNHSC) and the Piscataqua Region Estuaries Partnership (PREP).

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# Adaptive Management Update

The Municipal Alliance for Adaptive Management (MAAM) was formed in the winter and spring of 2021 to facilitate and enhance community collaboration, stakeholder input, resource sharing, expertise, and efficient use of investment to better understand the factors influencing water quality in the Great Bay Estuary. MAAM's formation recognized the need to develop and implement an adaptive management approach in response to the Total Nitrogen General Permit (TNGP) issued for 12 regulated communities in New Hampshire that discharge either directly or indirectly to the Great Bay. MAAM's membership currently includes eight of the twelve regulated communities including Rochester, Dover, Portsmouth, Exeter, Epping, Newington, Rollinsford and Milton. MAAM holds regular public meetings providing a venue for presentations, project updates and general conversations and encourages all communities, state and federal regulators, researchers and other stakeholders, whether or not they are MAAM members, to attend and participate.

Over the last three years, MAAM communities have invested heavily in point source and non-point source reduction strategies to lessen Total Nitrogen (TN) loading to the Great Bay. Based on available data, MAAM community improvements since 2021 resulted in TN reductions of tens of thousands of lbs/yr from WWTF point sources and 9,956 lbs/yr from non-point sources. Though not specifically regulated under the TNGP, these improvements also resulted in substantial improvements to other water quality stressors including Total Suspended Solids (TSS) and Total Phosphorus (TP) loadings. These improvements are the direct result of the adaptive management approach implemented by MAAM's member communities and represent many millions of dollars of investments from those communities, with many more millions of dollars allocated toward future, pending projects.

MAAM communities have not only invested in the individual infrastructure improvement projects to address both point and non-point sources, but collectively MAAM substantially funded and actively participated in numerous initiatives and research collaborations with the Piscataqua Regional Estuaries Partnership (PREP) to further the goals of the adaptive management approach outlined in the TNGP. To date, MAAM directly funded \$1,428,240 towards these joint research initiatives, secured a \$1,000,000 Congressionally Directed Spending Grant for research of oyster bed and eelgrass health, and lead/supported several additional grant funded programs like the Great Bay 2030 water quality improvement projects. These initiatives are outlined in further detail in the MAAM's annual updates to its Adaptive Management Plan (AMP), that have been reviewed in meetings and submitted to the EPA.

The EPA's TNGP provides for and promotes an adaptive management framework to include ambient water quality monitoring, pollution tracking, and reduction planning/implementation along with creating a mechanism to review and revise approaches as we continue to develop a better understanding of the watershed. This review and adaptation process is essential for refining and advancing watershed-level water quality protection programs focusing on key stressors impacting the health of the Great Bay and supporting appropriate investments to advance those goals. Consistent with the concept of adaptive management, MAAM communities along with technical advisors and project partners, are reviewing the water quality monitoring, pollution tracking, and scientific research that has come from these efforts over the last three years. As outlined in the following AMP update, MAAM will seek to interpret findings and revise approaches as appropriate to further address the key stressors in the Great Bay watershed.

## a) Monitor Ambient Water Quality in Great Bay

In accordance with Part 3-1.a. of the General Permit, this section of the joint AMP outlines the approach to monitor the ambient water quality and eelgrass in the Great Bay Estuary as part of the evaluation of factors affecting eelgrass health.

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### a.1 Statement of Responsibilities

The Piscataqua Regional Estuaries Partnership (PREP), part of the School of Marine Science and Ocean Engineering at the University of New Hampshire, is currently the organization relied upon by MAAM (and presumably other agencies and stakeholders given PREP's existing responsibilities and capabilities) for ambient water quality monitoring. Through the MAAM, the members are addressing Part 3-1.a. of the General Permit by funding an equitable and proportional amount of the PREP ambient monitoring in the estuary. To date, MAAM has directly funded \$1,316,128 towards this work, as well as secured a \$1,000,000 Congressionally Directed Spending Grant for continued efforts and is committed to continue funding monitoring efforts. Note that this far surpasses contributions by other non-MAAM affiliated regulated communities. Appendix A of this report details the PREP work that has been directly funded by the MAAM communities.

To fully implement the research initiatives, it is the hope that all regulated communities participate in proportional and equitable funding. MAAM understands that other communities are participating at some level, however, it is not at an equitable amount based on contributed flow. MAAM is also funding the work of its consultants, Brown and Caldwell, who have been working with the PREP team on the continued development of the monitoring program. See Appendix D of this report to see Intermunicipal Agreement and funding contribution structure.

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### a.2 Summary of Plan

This plan covers the monitoring of water quality and eelgrass to support interpretation of and potential physical and biological stressors that may be affecting eelgrass health in the estuary. The starting point for this plan was PREP's [2020 Draft Integrated Research and Monitoring Plan](#) and the [Piscataqua Region Monitoring Collaborative's 2020 Research/Monitoring Prospectus](#). Since 2020, PREP and MAAM have conducted an annual planning exercise to identify and prioritize research and monitoring needs for MAAM funding.

Workplans for ongoing monitoring activities led by PREP and UNH are available online at <https://scholars.unh.edu/prep/>. All monitoring data described in this section, including the underlying information used to calculate nutrient loads, will be made publicly available by the entity that leads the monitoring activity. The following list of data collection and analysis activities describe key components of the monitoring program.

## Data Collection

- Nutrient load estimating
  - o Calculated for point and non-point sources on an annual basis.
- Water quality monitoring<sup>1</sup>.
  - o These are ongoing monitoring programs conducted by PREP/UNH. Results are generally available by summer of the following year.
  - o Head of tide water quality is collected in seven tributaries to Great Bay Estuary. Monthly grab samples are collected between March and December for each year of the permit period.
  - o Estuarine water quality monitoring is conducted at approximately 12 stations in the Great Bay Estuary, including the same parameters monitored in the rivers, as well as light penetration, plankton and chl-a. Monthly grab samples are collected between April and December for each year of the permit period. In addition, datasondes will automatically collect certain data every 15 minutes.
  - o Beginning in 2023, for both tributary and estuarine monitoring, sampling has been extended into the winter months for all stations that are accessible during these months.
- Eelgrass (and other seagrass)
  - o Eelgrass monitoring is a combination of ongoing, long-term and newly developed studies. These studies are conducted by PREP/UNH. Results are generally available by summer of the following year.
  - o Eelgrass Distribution: Aerial monitoring of eelgrass coverage (“Tier 1” monitoring) has been conducted annually or biennially. The MAAM communities have seen value in having annual coverage data and have prioritized funding this work if other funds are not available to cover it.
  - o Eelgrass Abundance and “health”: Monitoring of seagrass metrics such as percent cover, canopy height, biomass, density, epiphyte load, and other environmental variables starting in 2021 at 25 sites (“Tier 2” monitoring) and continuing at 3 long-term monitoring sites (SeagrassNet/”Tier 3” monitoring).
- River discharge
  - o MAAM has engaged with PREP to study and identify a path forward for obtaining tributary discharge measurements or estimates in three tributaries to Great Bay: Bellamy River, Great Works River, Salmon Falls River.
    - The first step in the study, funded in 2023, was to a review methods used in other tributaries and assess whether the same methods are appropriate for the three new locations.
    - The second step may include working with USGS to deploy stage height sensor and build a rating curve to relate water level to flow.
  - o MAAM has also engaged UNH researchers (through PREP) to begin data collection for a study of storm-related river inputs to Great Bay. Storm

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<sup>1</sup> The complete list of water quality analytes will be specified in related monitoring documents and will include factors that potentially cause or contribute to conditions that many affect eelgrass health as well as other general water quality parameters.

events may have a significant impact on eelgrass distribution, survival, health, and resilience

- Seaweed
  - Seaweed monitoring would include compilation and synthesis of previous seaweed monitoring data; continuation of existing PREP or UNH monitoring efforts; and, potentially, implementation of new monitoring efforts dedicated to identifying the potential role of seaweeds on eelgrass health.
  - Synthesis and Recommendations: MAAM has engaged with PREP to (1) conduct a review of seaweed data collected to date, (2) prepare a report synthesizing the results and identify data gaps; (3) make recommendations about monitoring needs.
  - Ongoing monitoring: Measures of seaweed abundance (e.g., percent cover, biomass, ID of species) are incorporated into the Tier 2 eelgrass monitoring program mentioned above.
- Sediment quality
  - Ongoing PREP monitoring programs (e.g. Tier 2 eelgrass monitoring) include measurement of percent organic matter and grain size.
  - Measurement of toxic chemicals in Great Bay sediment is periodically conducted as part of the NOAA's National Coastal Condition Assessment and Mussel Watch programs. These programs are not funded as part of this Plan, but the data will be leveraged as needed to determine whether sediment toxics are a major eelgrass stressor in Great Bay. Additional data collection on sediment toxics may be included in this Plan in the future if warranted.

### **Special Studies and Data Analysis /Accessibility**

- External advisors: Engagement of subject matter experts to provide important perspectives on Piscataqua Region issues and help guide future study development.
- Light attenuation synthesis report: Support for PREP to compile, review, and summarize work done to date related to major controls on light dynamics in GBE.
- Light monitoring and biooptical model: Support to PREP/UNH for data collection and preliminary development of a biooptical model to quantify the relative contribution of light-attenuating components.
- Green crabs
  - Recent studies have confirmed the continued presence of green crabs in Great Bay Estuary, as reported in the 2023 State of Our Estuaries: Extended Version (<https://scholars.unh.edu/prep/466/>).
  - To date, studies dedicated to investigating potential role of green crabs as an eelgrass stressor in Great Bay Estuary have been part of this Plan. However, further investigation into the potential role of green crabs as an eelgrass stressor may be warranted in the future.
- Other data analysis
  - The monitoring data described in the prior section is being evaluated to assess relationships between potential eelgrass stressors and the metrics of eelgrass health. Monitoring data is appended to prior monitoring data collected by PREP to contribute to the long-term data collection effort already underway.
  - Preliminary assessments are conducted as needed to inform upcoming research and

- monitoring activities. Preliminary evaluations have been conducted by PREP for other endeavors, such as the SOOE Reports and the Eelgrass Resilience Project.
  - Temporal and spatial trends in the data will be assessed as new data become available. In addition, relationships among variables and between eelgrass and potential stressors will be assessed as new information is gained.
- Data Accessibility
  - PREP provides broad access to all data collected, so that the data will be available to the municipalities, EPA, NHDES, and stakeholders for their own analyses.
  - PREP intends that all data will be accessible to the public through PREP's new data management system. This system can be accessed through the Piscataqua Watershed Data Explorer (<http://data.preestuaries.org/data-explorer/>).

### **Stakeholder Engagement**

- The PRMC, meets periodically to coordinate monitoring and science for the Great Bay Estuary. Participation in the PRMC is open to all municipalities in the Piscataqua Watershed.
- Technical recommendations on science activities come from the PREP Technical Advisory Committee (TAC) process, which is open and transparent and consensus based.
- MAAM has hired Brown and Caldwell to consult and advise MAAM on current and future PREP ambient water quality monitoring and to make recommendations for both short-term and long-term efforts suited to informing the AMP and future efforts by the communities. In particular, Brown and Caldwell will be advising on the studies necessary to broaden our review of the stressors on eelgrass beyond simply measuring nitrogen levels in the estuary.
- A Stakeholder Committee has been convened by CLF to provide insight and recommendations on activities and efforts of MAAM, and to track progress on commitments made in the Settlement Agreement. The Stakeholder Committee includes technical experts as well as representatives from Dover, Portsmouth and Rochester.
- MAAM representatives participated in the Project Advisory Committee (PAC) of the Great Bay Eelgrass Resilience Project, a three-year NOAA-funded research project led by the University of New Hampshire, the Great Bay National Estuary Reserve System, and PREP.
- MAAM and the respective municipalities invite and encourage broad participation by interested parties in the stakeholder engagement process to provide insight and recommendations on activities and efforts of MAAM. MAAM meetings are publicly noticed and generally open to the public. Public MAAM meetings provide an opportunity for public input by those in attendance.

See Appendix A of this AMP for full list of monitoring activities funded by MAAM and additional ongoing studies and monitoring programs that are related to this AMP.

## **b) Methods to track reductions and additions of total nitrogen**

In accordance with Part 3-1.b. of the General Permit, this section of the joint AMP outlines the method(s) to track reductions and additions of TN loads over the course of the permit.

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### **b.1 Statement of Responsibilities**

The municipalities are coordinating with NHDES, UNHSC, EPA Region 1, other permitted communities and other stakeholders to participate in the Pollution Tracking and Accounting Program (PTAP). The PTAP program has been developed by NHDES in response to the request for assistance by the regulated communities and is intended to provide a cost-effective means by which communities can effectively address the tracking and accounting requirements of this General Permit while also providing the flexibility and ability to track other potential water quality stressors. To date, NHDES has been the lead on implementing PTAP using resources developed by EPA Region 1 for this purpose. The MAAM members are addressing Part 3-1.b. of the General Permit through continued participation and equitable funding of PTAP efforts through MAAM as well as implementing the tracking and accounting program within the municipality. As with other aspects of this AMP, the proposed tracking and accounting program, PTAP, is reviewed annually and, if appropriate, updated to take into account the latest information. The PTAP program also has the ability to track other pollutants such as Total Phosphorus, Total Suspended Solids, metals and runoff volume within the same program.

PTAP has been funded primarily by NHDES, with \$50,000 annually approved from the MAAM communities intended to provide additional technical assistance and assist in one-on-one community support for any municipality that needs it in the watershed regardless of their affiliation with MAAM. In future years, additional appropriations would be needed to fund and operate this program.

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### **b.2 Summary of Plan**

PTAP is a comprehensive sub-watershed based tracking system for quantifying the nitrogen load reductions and additions through implementation activities that include, but are not limited to:

- a. Land use conversions
- b. New or modified structural stormwater control measures
- c. New or modified non-structural activities
- d. New, modified or removed septic systems

Tracking elements include parcel/treatment area identification information that document the municipality, land use, hydrologic unit code (HUC-10), hydrologic soil group or estimated infiltration rate, drainage area, and impervious cover area.

Additional information regarding structural stormwater control measures collected from each community include structural control measure type, runoff volume storage at design capacity (also known as design storage volume), and runoff depth from impervious cover.

Additional information regarding non-structural implementation measures for each community is also collected, including catchbasin cleaning, street sweeping, leaf litter collection and fertilizer control



programs. Units and metrics to track these efforts more effectively are still being developed. In keeping with the EPA Region 1 letter of endorsement dated August 15, 2022 and signed by Melville Cote, Chief Surface Water Protection Branch Water Division, the current accounting for sweeping includes use of the credits developed under the Clean Sweep Panel Process. Additional technical assistance may be required to update the EPA BMP Accounting and Tracking Tool (BATT) with these methods once a final determination on future accounting metrics is made.

MAAM has also funded in-depth literature reviews of other promising nonstructural control measures such as catch basin cleaning and fertilizer control programs. MAAM will share research findings with EPA, CLF and other interested entities as they emerge. These assessments are being conducted in good faith with all relevant parties ensuring that municipalities are implementing the most cost-effective methods first so as to engender a supported culture of stewardship that everyone can get behind.

Additional nonstructural practices for tracking include outreach and education, wetland buffer protection/conservation land, pet waste collection and oyster bed restoration along with other efforts, with the intent of identifying promising future water quality improvement activities. It should be noted that there are no existing approved nitrogen load reduction credits that exist for these important efforts and future collaborations to create them are anticipated. Metrics for additional nonstructural controls are constantly being collected and evaluated for future credit potential.

Finally, wastewater management approaches planned for tracking include installation of innovative septic systems and enhanced treatment technologies and connection of septic systems to public sewer. Another area for technical assistance from the region is the determination of appropriate credits for these methods, particularly elimination of NPS loads through sanitary sewerage. This year PTAP developed a draft crediting method for sewerage projects that is reflected in this year's reporting. This method was completed with assistance from the cities of Rochester and Portsmouth which are the only municipal entities reporting these credits this year. Many methods to credit this exist, we anticipate a collaborative effort will be necessary to standardize attendant load reduction credits.

### **Accounting**

Preliminary accounting metrics that include changes in nitrogen, phosphorus and TSS loads attributable to changes in effective impervious area are currently included in the PTAP database. NHDES along with UNHSC use the input information to import into the EPA Region 1 BMP Accounting and Tracking Tool (BATT). The BATT provides automated reporting features to credit tracked structural and nonstructural implementation measures and provide reduction estimates consistent with the methodologies used to develop the reduction estimates presented in Appendix F of the MA and NH MS4 permits.

<https://www3.epa.gov/region1/npdes/stormwater/nh/2017-appendix-f-attach-3-sms4-nh-mod.pdf>

Results from permit year 2-3 are included for all participating communities in Appendix C.

This is the first year that PTAP is reporting load reduction trends from participating MAAM communities. This trend line demonstrates the growing commitment from member communities to increasing nitrogen reductions from both structural and nonstructural SCMs.

### **Long-term tracking of nitrogen loads from land use conversions**

In combination with local tracking and accounting, MAAM expects to track changes to TN loadings as well as other nutrient and pollutant changes due to land use, through Geographic Information Systems (GIS) analysis. MAAM will continue to support regional methods for accounting for land use changes demonstrated through local, state and national GIS layers. MAAM will support preliminary assessments

of various GIS protocols to accurately track regional trends. Changes to nitrogen loads associated with land use changes over the permit term will use EPA provided NLERs and other local and national GIS datalayers. A summary of land use changes has been developed through the efforts currently being led by EPA Region 1 on the hydrologic response unit and opti-tool project. MAAM communities anticipate a collaborative effort to distill and standardize these changes will occur over the next permit year. Determination of positive or negative pollutant loading due to land use change requires collaboration and agreement between all parties involved in the GBTNGP.

### **Municipal Participation: Program Development and Technical Assistance for Tracking Activities**

Community participation in PTAP is supported through regular workgroup meetings to provide opportunities for end users to offer input on PTAP tracking database functionality, reporting units for tracking, accounting methods, and more. To date, the PTAP workgroup has met 23 times over the course of several years and has a strong record of collaborative PTAP tool development. MAAM member communities will continue to participate in these work groups. Work group meetings are typically facilitated by UNHSC and NHDES staff and have clear outcomes that are intended to further PTAP tracking tool development. Additionally, UNHSC and NHDES staff offer technical assistance for PTAP database use, as needed. Assistance includes one-on-one trainings, focused workshops, expert panel reviews, and resources made available on the internet on UNHSC, GRANIT, and NHDES platforms.

Tracking of activities is accomplished through the addition of PTAP filing as part of a land development permitting requirement. Much of these tracking elements are already part of both state and local permitting requirements for many land development projects, such as changes in impervious cover, land use conversion, area and volume treated, treatment measures, etc. PTAP is a central repository where this information can be uploaded by project permittees and stored for later use by the municipality for annual reporting requirements.

## **c) Overall Source Reduction**

In accordance with Part 3-1.c. of the General Permit, this section of the joint AMP provides an outline for overall source reductions of TN over the course of the permit.

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### **c.1 Statement of Responsibilities**

The MAAM members intend to address Part 3-1.c. of the General Permit by creating and maintaining an updated list of current and anticipated capital improvement projects, non-structural best management practices, stand-alone projects with structural best management practices, and municipally owned properties with high nitrogen removal potential, as well as diverse initiatives intended to address water quality improvement in the Great Bay Estuary.

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### **c.2 Summary of Plan**

The lists of projects, practices, properties and initiatives is intended as a non-binding statement of present intent by the MAAM members. Completion of these projects is dependent on the continued validity of the General Permit, technical study and feasibility, purchasing approvals from governing bodies of the respective municipalities and/or other public officials, funding appropriations of the respective Municipalities (which funding appropriations are at the sole discretion of the governing body of the respective municipalities), any other requirements of law, potentially including federal/state/local permitting, and general public support. The MAAM members may select projects that are likely to improve water quality, including those for which nitrogen removal is one of multiple benefits.

See Appendix B of this AMP for Current Source Reduction Plans for each MAAM member community.

## **d) Process for Comprehensively Evaluating Significant Scientific and Methodological Issues**

In accordance with Part 3-1.d. of the General Permit, this section of the joint AMP outlines an inclusive and transparent process for comprehensively evaluating any significant scientific and methodological issues relating to the permit, including the choice of a load-based threshold a concentration-based threshold, or continued adaptive implementation until such thresholds can be developed. This submission shall include detailed milestones culminating in submission of a report to EPA for inclusion in the administrative record for permit renewal. That report shall be completed prior to expiration of the permit term and shall indicate whether NHDES concurs with the findings.

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### **d.1 Statement of Responsibilities**

The municipalities participate in a collaborative process building upon the research and monitoring efforts of PREP described above. Both non-regulatory and regulatory monitoring components of this plan are being implemented. The regulatory component encompasses the monitoring activities that are required by the General Permit. The municipalities expect that permit-related activities, including future modifications to discharge limits or loading targets, if applicable, will be undertaken cooperatively with NHDES, using data collected through this plan, which will be accessible to all parties. The non-regulatory component encompasses all other monitoring described in this plan. The non-regulatory components are facilitated by PREP through its Technical Advisory Committee and PRMC processes, both of which are open to the public, are transparent, and use consensus-based decision making

The MAAM members are addressing Part 3-1.d. of the General Permit by funding an equitable and proportional amount of the PREP work and other research initiatives through MAAM and by participating in both components individually or through MAAM representatives. To date MAAM has funded \$1,316,128 towards this work, as well as secured a \$1,000,000 Congressionally Directed Spending Grant for continued efforts and is committed to continue funding monitoring efforts which feeds data into the modeling and analysis components of Section d.

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### **d.2 Summary of Plan**

Through this plan, MAAM will collaborate with partners to evaluate potential eelgrass stressors in the Estuary and, when practical, identify levels of potential stressors that are protective of water quality and eelgrass health. This plan includes an evaluation of latest scientific data and information described above in this AMP, which is necessary to understand how various levels potential stressors affect eelgrass health and improve water quality.

Monitoring and research performed to date has helped characterize the water quality dynamics of the estuary and identify stressors on eelgrass. The configuration and physical characteristics of the Great Bay cause multiple stressors to be relevant, including hydraulic shear stress,

sediment loading/resuspension, nitrogen/algal effects, and grazing. A mid-to-long term goal of the partnership is to develop a quantitative understanding of the relative importance of these stressors, sufficient to predict water clarity or eelgrass responses to specific loading/concentration targets or management actions. That modeling framework is in development and is expected to include following elements:

- A bio-optical model to quantify the relevant contributions of different light-attenuating constituents (e.g., inorganic turbidity, chlorophyll-a, colored dissolved organic matter) on photosynthetically active radiation.
- A recently developed 3D hydrodynamic model that can be used to predict water movement in the estuary over short and long-time scales.
- A water quality and sediment transport model (i.e., a “translator”) to simulate water quality responses to internal and external sediment and nutrient loading.

Although the load-concentration translator model is not expected to be ready for full application this general permit term, some version of this tool is expected to be available the following permit term. MAAM anticipates that this work will contribute to refining the scientific understanding on the factors affecting eelgrass health in the estuary. Depending on the capabilities of the model, it might be used directly to establish appropriate water quality goals that promote eelgrass restoration and improved water quality.

### **External Review Panel**

Support of an expert review panel is an element of this plan. The panel meets with stakeholders to understand the issues, reviews the data and other study outcomes, and shares scientific interpretations. Currently, an expert panel comprised of four external scientists is advising PREP and partners with regard to the Research and Monitoring Plan (RAMP) and the NOAA-funded “Eelgrass Resilience Project”: Jud Kenworthy, Simon Courtenay, Michael van den Heuvel, and Lora Harris. These advisors have also been engaged on matters related to the monitoring program presented in Section a.2 of this Plan. The composition of the expert panel may need to change as the focus shifts to specific scientific/regulatory topics, modeling, or the development an advance restoration plan (ARP) or TMDL.

### **Pollutant Reduction Progress as Modeling Framework Develops**

MAAM emphasizes that the availability of a water quality model or quantitative watershed-wide load or concentration targets has not been a prerequisite to significant and steady progress at reducing pollutant loading to the GBE. MAAM already operates under stringent point nitrogen loading caps, and has also pursued a variety of structural and non-structural practices to reduce sediment and nutrient loading from stormwater runoff (See Appendix B and Appendix C). These public investments will continue as the scientific/modeling framework develops and the partnership moves closer to an ARP or TMDL.

## **Inclusivity and Transparency**

Using the information gathered in that project, MAAM plans to complete a report prior to the permit term as required by Part 3 of the General Permit. This report will include status of technical activities and interpretations of stressor-response, including the current understanding of the role of nitrogen and associated loading or concentration thresholds. It will also outline a path forward for refinement of technical tools and completing a TMDL or ARP. At this time, the MAAM members anticipate submitting a report to EPA for inclusion in the administrative record.

The processes outlined above includes periodic discussion and review by MAAM members and/or its Executive Board. MAAM continues to consult its members, non-MAAM members, state and federal regulators, and other stakeholders throughout the process for their input. Additionally, the MAAM's Stakeholder Committee, led by Conservation Law Foundation, attends MAAM meetings to provide input, perspective, and any data or other information to be considered. Finally, as outlined above, the technical work will be completed by PREP and will consider input from any interested party.

Engagement with NHDES is an important component of this Plan. MAAM members coordinate with NHDES periodically and at critical decision-making intervals on plan components, monitoring procedures and goals, and analysis and interpretation approaches. The goal of this coordination is that the NHDES will either concur with the submission entirely or to the maximum extent of possible consensus, with any areas lacking consensus called out and the parties' respective views explained. Because NHDES would ultimately take the lead on establishment of a TMDL (or ARP), MAAM will consult with NHDES when determining how to assess what has been done in the first permit cycle and identifying next steps for permit renewal.

## e) Timeline for Completion of TMDL or ARP

In accordance with Part 3-1.e. of the General Permit, this section of the joint AMP outlines a proposed timeline for completing a Total Maximum Daily Load (TMDL) or advance restoration plan (ARP) for water quality in Great Bay and for submitting it to EPA for review and approval.

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### e.1 Statement of Responsibilities

The MAAM members are strongly committed to supporting appropriate efforts to establish a scientifically-sound, cost-effective approach to determining appropriate TN threshold targets for the Great Bay Estuary and recognize that establishing a TMDL and/or ARP. The currently proposed timeline for completion of a TMDL (or ARP) is set forth in section e.2. below. As with other aspects of this AMP, the proposed timeline will be reviewed annually and, if appropriate, updated to take into account the latest information. Ultimately, NHDES will take the lead on the establishment of a TMDL (or ARP), and will dictate the final timeline.

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### e.2 Summary of Plan

As described in previous sections, this AMP includes new monitoring, pollution tracking, reduction planning, scientific investigation and analysis, and related decision-making elements for the Great Bay Estuary. These elements will improve our scientific understanding of the Great Bay estuary, the role of nitrogen, and the role of other stressors. Toward the end of the first permit term, it is anticipated that sufficient new information will become available to support thoughtful selection of potential regulatory and non-regulatory planning and implementation approaches, including potentially a TMDL or ARP to be completed over the subsequent permit term(s).

As discussed in section d, existing information supports actions in advance of a TMDL for addressing water quality actions that are necessary for eelgrass protection. Many of those actions are already underway as part of the General Permit and this AMP. Regarding the next stage watershed planning approach, an ARP may be a more immediately beneficial and practicable approach than a TMDL<sup>2</sup> for Great Bay Estuary. The ARP would be a near-term plan that includes specific actions, with a schedule and milestones, for restoring water quality.

With this background, and with the support of NHDES, the MAAM communities are currently envisioning a TMDL or ARP completion timeline of Year 5 of the Second Permit Term (or at the end of 10 years in the event that the EPA is delayed in issuing a second permit term). This is an expeditious timeline that supports municipal investment in data monitoring, data analysis, related studies, computer modeling, and long-term management plans. Pursuant to the General Permit and this AMP, TN reductions will occur in parallel with these important activities.

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<sup>2</sup> USEPA. 2024. Information Concerning 2024 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. Memo from Brian Frazer to Water Division Directors. [https://www.epa.gov/system/files/documents/2023-03/2024IRmemo\\_032923.pdf](https://www.epa.gov/system/files/documents/2023-03/2024IRmemo_032923.pdf)





## **Appendix A**

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MAAM funded work by year

Year	Study Name	Study Description	MAAM Funding
2021	Light Array Deployment and Monitoring	Full deployment of new light monitoring equipment necessary to develop linkages between stressors and eelgrass communities.	\$6,500
2021	Estuarine Water Quality Monitoring	Continuation of the ongoing estuarine water quality monitoring for a variety of stressors. Additional funding will be used to expand spatial coverage and increase frequency of data collection.	\$123,845
2021	External Advisors	Engagement of subject matter experts (e.g., Jud Kenworthy, Brad Peterson, Brian Howes) to provide important perspectives on Piscataqua Region issues and help guide future study development.	\$14,000
2021	Tier 1 Eelgrass Monitoring	Additional funds for higher resolution imagery during aerial eelgrass monitoring.	\$10,000
2021	Tier 2 Seagrass Monitoring	Assessing seagrass health and condition. Includes 50 sites for: percent cover, canopy height, number of shoots, epiphyte loads, seaweed percent cover, biomass, type, and species. 25 sites will get enhanced monitoring: seagrass biomass, reproductive condition, sediment samples (organics and grain size).	\$21,357
<b>2021</b>	<b>Total</b>		<b>\$175,702</b>
2022	Tier 1 Seagrass Monitoring	Continuation of annual aerial imagery mapping of seagrass in GBE.	\$75,000
2022	Estuarine Water Quality Monitoring	Funding of ongoing estuarine water quality monitoring program for a more comprehensive understanding of water quality patterns.	\$41,000
2022	Light Array Program	Continuation of work that started in 2021 and will continue annually. Provides high resolution data on the light environment in the estuary and fills an important data gap.	\$29,000
2022	External Advisors: Monitoring Program Review	Funding for engaging external advisors to review and provide guidance on the Eelgrass Resilience Project, Bio-Optical Model, and overall monitoring program.	\$25,000
2022	Tier 2 Seagrass Monitoring	Continuation of work that started in 2021. Annual study that includes characterization of seagrass density and morphology, macroalgal abundance and type, and sediment characteristics.	\$53,000
2022	Light Monitoring and Bio-optical Model (Formerly "Turbidity")	This study will collect important data on non-nutrient stressors and light dynamics. Funding is for continuation of field data collection and for completion of the first version of a bio-optical model.	\$60,000
2022	Storm Add-On to Eelgrass Stressor Project	Implementation of a study to investigate the impacts of storm events and inputs on water quality in GBE. This study would collect data to help fill an important data gap.	\$5,000
2022	Mussel Watch	Collection and analysis of bivalve tissue as a measure of toxic constituents in the water column. This study may help identify potential non-nutrient eelgrass stressors.	\$7,300
2022	5% Contingency		\$14,765
<b>2022</b>	<b>Total</b>		<b>\$310,065</b>
2023	Tier 1 Seagrass Monitoring	Continuation of annual aerial imagery mapping of seagrass in GBE.	\$75,000
2023	Estuarine Water Quality Monitoring	Funding of ongoing estuarine water quality monitoring program for a more comprehensive understanding of water quality patterns.	\$64,000
2023	Light Array Program	Continuation of work that started in 2021 and will continue annually. Provides high resolution data on the light environment in the estuary and fills an important data gap.	\$42,000
2023	External Advisors: Monitoring Program Review	Funding for engaging external advisors to review and provide guidance on the Eelgrass Resilience Project, Bio-Optical Model, and overall monitoring program.	\$10,000
2023	Light Monitoring and Bio-optical Model (Formerly "Turbidity")	This study will collect important data on non-nutrient stressors and light dynamics. Funding is for continuation of field data collection and for completion of the first version of a bio-optical model.	\$67,000
2023	Storm Add-On to Eelgrass Stressor Project	Implementation of a study to investigate the impacts of storm events and inputs on water quality in GBE. This study would collect data to help fill an important data gap .	\$91,000
2023	Tributary Discharge Measurements	Estimating river discharge measurements on the Bellamy, Great Works, and Salmon Falls Rivers. This study is part of a stated commitment in MAAM AMP.	\$5,000

2023	Macroalgal Dynamics Synthesis and Recommendations	Work will focus on compiling, reviewing, and synthesizing work done to date related to green and red macroalgae in GBE, identifying data gaps related to macroalgae as potential stressors to eelgrass, and development of a monitoring plan to close data gaps (if needed).	\$25,000
2023	Shoreline Hardening Survey	A survey to determine the location and extent of hardened shoreline in GBE. Results of this survey could help inform the analysis and interpretation of the water quality and hydrodynamic studies, and may be useful in identifying and management of non-point source stressors.	\$15,000
2023	Estuarine Water Quality Monitoring Equipment	Funding would be used to buy new sondes for continuous data collection at the estuarine water quality locations.	\$20,000
2023	5% Contingency	Budget for additional unanticipated costs. Discretionary contingency not included.	\$20,700
<b>2023</b>	<b>Total</b>		<b>\$434,700</b>
2024	Tier 1 Seagrass Monitoring	Continuation of annual aerial imagery mapping of seagrass in GBE.	\$77,500
2024	Estuarine Water Quality Monitoring	Funding of ongoing estuarine water quality monitoring program for a more comprehensive understanding of water quality patterns.	\$66,000
2024	Light Array Program	Continuation of work that started in 2021 and will continue annually. Provides high resolution data on the light environment in the estuary and fills an important data gap.	\$43,400
2024	External Advisors: Monitoring Program Review	Funding for engaging external advisors to review and provide guidance on the Eelgrass Resilience Project, Bio-Optical Model, and overall monitoring program.	\$25,000
2024	Tier 2 Seagrass Monitoring	Continuation of work that started in 2021. Annual study that includes characterization of seagrass density and morphology, macroalgal abundance and type, and sediment characteristics.	\$55,000
2024	Light Monitoring and Bio-optical Model (Formerly "Turbidity")	This study will collect important data on non-nutrient stressors and light dynamics. Funding is for continuation of field data collection and for completion of the first version of a bio-optical model.	\$79,920
2024	Non-Structural BMP Expert Panel	Perform a literature review of nitrogen reduction credits from non-structural BMPs. To be performed by Jamie Houle of the UNH Stormwater Center.	\$30,000
2024	5% Contingency	Budget for additional unanticipated costs. Discretionary contingency not included.	\$18,841
<b>2024</b>	<b>Total</b>		<b>\$395,661</b>

## **Appendix B**

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Source Reduction Plans for MAAM communities

## Dover

**Planned and Completed Structural BMPs** – The following list includes projects that are planned in CIP, design phase, etc. and updated to indicate what projects were completed between September 2023 and August 2024. Completed projects have been uploaded into PTAP where estimated load reductions are available.

Year	Project	Description	2023/2024 Update
2023	Hough Street Culvert Replacement	Emergency repair to old and undersized culvert network that conveyed Berry Brook.	<b>Complete</b>
2022-2025	Fifth and Grove Streets	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	The project would implement improvements to Fifth Street from Central Avenue to Fourth Street and to Grove Street from Sixth Street to Fourth Street. Improvements include pedestrian, drainage, and street tree improvements. By improving the existing drainage, the project will provide water quality benefits within the Great Bay watershed. The project would be a Complete Streets update, as per the City's Complete Street and Traffic Calming policy. This project is under construction and anticipated to be completed by Spring 2025.
2022-2038	Oak, Broadway, Central neighborhood reconstruction	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions within the Broadway neighborhood.	A stormwater master plan for the Broadway neighborhood was completed in 2023 with recommendations for improvements being provided from the City's design consultant. The recommendations included an opinion of cost for a total street reconstruction that is north of \$35 million in 2024 dollars and divided up over 8 phases. Funding for the individual phases has been added to the CIP which is up for approval in fall 2024. This neighborhood drains to the Cochecho St outfall that is located below Portland Ave and runs through the Chapel St Ravine.
2024-2026	Court, Union, and Middle Streets	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	Improvements include pedestrian, drainage, and street tree improvements. By improving the existing drainage, the project will provide water quality benefits within the Great Bay watershed. The project would be a Complete Streets update, as per the City's Complete Street and Traffic Calming policy. Going out to bid in Fall 2024 with planned construction in 2025 and 2026.
2025-2026	Retaining Wall Reconstruction – Portland Avenue	The retaining wall along Portland Avenue, near the intersection with Cochecho Street and adjacent to the private marina, is showing signs of distress.	FY22 CIP, funds were approved to evaluate the wall for repair or replacement. The City hired a consultant, to evaluate the wall and concluded the wall required replacement in its entirety. The wall was constructed in 2024 and will be completed by the start of 2025. This wall is located adjacent to, and over, the Cochecho St outfall.

Year	Project	Description	2023/2024 Update
2025	Henry Law and River Street Reconstruction	The design for this project will incorporate the elements and principles laid out in the City of Dover <a href="#">Complete Streets &amp; Traffic Calming Guidelines</a> to ensure the design of streets and sidewalks will be safe and accessible for all users regardless of age, physical ability or mode of transport. The design is to also incorporate innovative and easily maintainable low impact development stormwater management practices as part of the roadway improvements where feasible.	Drainage improvements throughout the project area, including a subsurface stormwater best management practice (BMP) in Henry Law Park; the BMP design is federally funded, and Kleinfelder Northeast, Inc., has partnered with the UNH Stormwater Center to prepare an innovative design to provide stormwater treatment, flood resiliency, and improve water quality in the Cochecho River and the Great Bay. Construction is anticipated in 2025.
2025-2026	Drainage System Improvement – Cochecho St. Outfall	Reconstructing and improving existing failing outfall near Cochecho Street into the Cochecho River south of the dam.	Project is in the preliminary design stage as additional negotiations were required between the City, Eversource and property Owners. An MOU detailing the responsibilities of all parties has been signed and the design is proceeding in 2024/2025. Construction is anticipated for winter 2025 at the earliest but depends on soil remediation by Eversource.
2025 - 2029	Lower Central Ave Street Reconstruction	This street reconstruction project will implement improvements to Central Ave from Silver St to Stark Ave (the main gateway to the southern portion of the City). Improvements include bicycle & pedestrian accommodations, intersection improvements, lighting, drainage upgrades, and full reconstruction of the roadway. The existing drainage is in poor condition, a section of pipe has collapsed and been temporarily repaired. Green infrastructure components will be implemented. The design for this project will incorporate the elements and principles laid out in the City of Dover <a href="#">Complete Streets &amp; Traffic Calming Guidelines</a> to ensure the design of streets and sidewalks will be safe and accessible for all users regardless of age, physical ability or mode of transport.	The design of this project is approx. 80% completed. CDS funding has been secured which will require some additional design effort. The design consultant and City are expected to meet in October to discuss requirements to use federal funding. Project needs to be out to bid by Fall 2026. Construction is expected to take 2 years.
2025-2026	Sixth Street Bridge Replacement	Replace an existing undersized bridge that is restricting flow under Sixth Street.	RFP for analysis and design is going out in fall 2024 for anticipated 2025 permitting and construction.
2025	Reyners Brook Bridge Reconstruction	Capital Improvement work to improve and widen an existing culvert to remove flow restrictions.	RFP for analysis and design is going out in fall 2024 for anticipated 2025 permitting and construction.
2026	Bellamy Culvert	The City of Dover was recently selected for FEMA grant funding to improve an existing culvert and dam abutment restriction in the Bellamy River which will enable approximately 11 miles of new fish passage.	The project is currently underway with the design effort being lead by the NHDES and their consultant in conjunction with the City.

Year	Project	Description	2023/2024 Update
2026	Chapel Street Ravine	Using NHDES SRF loan program to design a plan to incorporate water quality treatment and flood management downstream of substantial stormwater culvert	The City has hired a consultant, and the study is currently underway to determine the value of the land based on an analysis completed in 2021. If the property can be secured construction would be completed in 2026 or beyond. NHDES funding for the acquisition is in hand.
2026	Jenness Street Reconstruction	Capital Improvement Plan to improve Jenness Street including drainage system.	Jenness Street has been repaved in 2024. Major upgrades to this gateway are planned for 2026-2027 from Silver to Stark. Drainage in Jenness will be addressed as part of that design.
2028	Crosby Road Industrial Area	Capital Improvement Plan to improve flooding in low lying area	An analysis is being conducted by VHB. It is expected to be completed by February 2025 and identify stormwater management improvements to address flooding.
2032	Atlantic Avenue	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	
2032	Horne St	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	
2032	Tanglewood	Capital Improvement work to improve drainage to include BMP's	Completed drainage outlet; however, stormwater best management practice will be completed. Paving of this road was completed in 2024. Larger project will be needed in future CIP for drainage upgrades.
2032	Central Ave Drainage (Old Rollinsford to 6 <sup>th</sup> street)	Capital Improvement Plan to improve drainage along Central Ave.	A water main project in this area is almost 100% designed and funding is being provided by CIP. Drainage improvements will need to follow in a subsequent CIP beyond 2032.
Planning	Rutland Street Reconstruction	Capital Improvement Plan to improve Rutland Street including drainage system.	

**Non-structural BMPs** – The following list includes existing ongoing and future planned efforts:

Year	Project	Description	2023/2024 Update
Ongoing	Stormwater and Flood Resilience Utility	City is looking to adopt a Stormwater and flood resilience utility which will incentivize implementation and maintenance of Best Management Practices including reduced nitrogen fertilizer.	City voted to implement a stormwater utility in December 2023; however, the vote failed due to a need for additional outreach and education to property owners. Therefore, the City will focus on public education and outreach and revisit a vote in the future.
Ongoing	Street Sweeping	Mechanically sweep downtown area (50 miles) once a week for 9 months of the year	City is currently working on the Clean Sweep Program with Woodward and Curran.
Ongoing	Leaf Litter Management	Leaf pick up for 6 weeks in the fall  Provide location for residents to drop off leaf and yard waste year-round  Enhanced street leaf pick up in fall	City continues to provide curb side pickup of leaves from residents. Approximately 700 tons of leaf and yard waste were collected in Fall/Spring.  City has not conducted enhanced street leaf pickup as the material cannot be disposed of since it is wet, full of sand, and trash. City is waiting on additional information from NHDES on how this material can be reused.
Ongoing	Catch Basin Cleaning	CB's are cleaned in accordance with MS4 requirements	State needs to permit the facility, pre and post cleaning for use before facility can become fully operational.
In Place	Wetland Buffer	Ordinance has increased wetland buffers (see credit for going green project)	Ordinance is in place
In Place	Stormwater Regulations	Site Plan Regulations include SWA recommendations for development and redevelopment (reduction = 0.012 * baseline)	Private projects are continuing to comply with the site plan and subdivision regulation updates. Projects are being entered into PTAP and approved by City staff upon completion.
In Place	Slow Release nitrogen requirement for all new projects	As part of Site Plan approval, a maintenance plan shall be in place and <i>"Best practices to minimize environmental impacts, such as the use of low-phosphorus fertilizer and slow-release nitrogen, shall be included in the management plan."</i>	
Ongoing	Atmospheric Deposition	Assumes a 14% reduction off the baseline for TN	
Ongoing	City Organic Fertilizer Program	The city is committed to using only organic, slow- release fertilizers on city owned and maintained properties (1,000,000 sf and 80% reduction).	



Year	Project	Description	2023/2024 Update
Ongoing	Fertilizer Bans and Reductions	Including a credit in the Stormwater Utility	
Ongoing	Fertilizer Outreach and Education Program	Provide and promote landscaping for water quality initiatives and programs	
Ongoing	Pet Waste Outreach and Education Program	Provide pet waste management educational materials with every dog license.	6 new waste stations, signs have been installed
Ongoing	Leaf and Yard Waste Outreach and Education Program	Promote proper leaf and yard waste management.	
Ongoing	Septic System Outreach and Education Program	Participate and promote NHDES Septic Smart Week. Send septic smart information to private septic system owners.	
Ongoing	Outreach and Education	<p>The City outreach and education exceeds what is required by the MS4. Staff regularly hold tours or presentations of the innovative BMP's being implemented.</p> <p>Additionally, completed and shared a video for the installation of a filtering catch basin BMP. Staff also regularly speak at conferences about technologies and particularly focus on maintenance and long- term performance.</p>	
Planning	Septic System Performance Requirements	Advocate for a state-wide requirement to remove nitrogen in septic systems.	A handful of conversions from septic to sewer (2 – 5 that have connected). Projects sewer extension In the coming years, soils are poor – North End Sewer extension.

**Other Efforts** – The following list includes innovative efforts

Anticipated Year	Project	Description	2023/2024 Update
2021 and ongoing	Inflow/Infiltration	Inflow and infiltration into the sewer collection system resulting elevated peak flows through the WWTP biological system which can affect the nutrient reduction capacity during those events.	Ongoing efforts include lining of sewers and disconnection of flat roofs. The City is currently looking to hire an environmental project manager who would be a champion for inflow/infiltration projects.
2025	Citywide Drainage Model & Master Plan	Develop a strategic plan for stormwater improvements	In progress, expected completion in
Ongoing	Extending sewer to existing areas serviced by septic systems	Continually assessing opportunities	
Ongoing	Commitment to exploring new BMP's and participating in innovative initiatives	Berry Brook and the continuation of bringing new BMP's into urban redevelopment settings and working with UNHSWC to test the effect, Volunteering to work with the NHDES/Prep Fellowship team to investigate SAFE strategies for Stormwater Funding, Volunteer to work with SRPC to analyze urban trees and innovative tree box filters, Volunteer to work with SRPC to look at BMP's v/s socioeconomic disparities, participating in the PTAP program, participating in multiple credit for going green projects lead by PREP	City invests approximately \$350,000 per year to identify retrofit and upgrade opportunities. City is focusing efforts on re-ditching, water quality reduction, and water quality treatment.
Ongoing	Training and Commitment to Innovation	Leadership in NEWEA/ Biological Nutrient Removal Classes - Our WWTP staff are at the forefront of discussions for WWTP practices.	Continuing these efforts.
Ongoing	Professional Staff	The City has created an Environmental Project Manager Position. This positions focus is dedicated entirely to environmental improvements, including a commitment to the protection and improvement of the Great Bay. This person is taking an active role in organizing regional commitment and implementation of the MS4 permit and the new NGP permit.	
Ongoing	Intern Work	Additional Staff to meet MS4 outfall testing requirements. Wet weather testing in particular is dangerous.	

Anticipated Year	Project	Description	2023/2024 Update
Ongoing	Water Quality BMP's as standard practice for city reconstruction projects	This is the language from our standard RFQ for design of reconstruction projects: <i>"As part of the drainage improvements, the City wishes to enhance the drainage system and incorporate easily maintainable, low impact development strategies to provide conveyance, treatment, and infiltration where practical. The Consultant shall make recommendations for an improved drainage system."</i> The commitment to implementing the water quality work is demonstrated in several recent redevelopment projects.	City continues to include this language on all RFQs to ensure that when projects are implemented low impact development strategies to provide conveyance, treatment, and infiltration are incorporated.

**Pilot Projects** – The following list includes pilot projects:

Anticipated Year	Project	Description	2023/2024 Update
2021	Stakeholder Committee Project	MAAM communities fund \$45,000 towards Great Bay water quality- related project as selected by the Stakeholder Committee (CLF)	A project has not been selected by CLF yet however, Dover contributed \$15,000 for this effort.
Ongoing	Catch Basin Spoils Facility	Remove decant water from sump and treat at WWTF to 5-8 mg/l	Spoils facility is currently up and running.

**Initiatives at WWTFs** – The following list includes efforts aimed at reducing TN output from WWTFs during the eelgrass growing season. Such efforts may include optimization of plants, projects aimed at reducing inflow/infiltration, facility upgrades, or similar measures.

Anticipated Year	Project	Description	2023/2024 Update
Nutrient Load Reduction	New aeration and secondary settling tank.	The City has just bid out and funded a project to improve the aeration in the WWTF treatment stream. Additionally, the city is about to receive bids for the construction of a third secondary settling tank. These two improvements will result enhanced nutrient reduction, particularly improving treatment during rain events.	Construction will begin in 2025 and will create additional capacity at the WWTF.
Nutrient Load Reduction	Reductions below 167 lb/day during non-growing season	The growing season improvements will also improvement conditions in off season.	

**Co-Benefits of Nonpoint Source Reductions** – Though beyond the scope of the submission called for in Part 3-1.c. of the General Permit, the MAAM communities feel it is important to plan and account for the removal of other pollutants or stressors of eelgrass coincident to the TN source reductions listed above. This dovetails with the monitoring efforts undertaken by MAAM and its partners, which is expected to include study of confounding factors and stressors. PTAP tracking and accounting has been created to also calculate phosphorus and total suspended solid reductions.

## **EPPING - MAAM AMP STATEMENT**

The Town of Epping, NH, is actively addressing nitrogen pollution in the Great Bay. As part of this commitment, Epping has joined the Municipal Alliance for Adaptive Management (MAAM) and, in August 2024, selected an engineering firm to help develop an Adaptive Management Plan. This plan will identify targeted projects to reduce nitrogen pollution in our community. In 2025, Epping will also participate in the Pollutant Tracking and Accounting Program (PTAP) to monitor and measure our progress in reducing nitrogen levels.

## **Milton - MAAM AMP STATEMENT**

*In 2022, the Town of Milton, in collaboration with the Strafford Regional Planning Commission (SRPC) submitted a preapplication and was authorized to borrow \$100,000 as part of a Clean Water State Revolving Fund (CWSRF) loan through the New Hampshire Department of Environmental Services (NHDES) to develop a nitrogen control plan. Prior to final work scope and loan approval, a qualifications-based selection procurement process must be conducted through a formal Request for Qualifications (RFQ) to choose a consulting firm.*

*With this funding, SRPC, in coordination with Geosyntec Consultants, will develop a plan for total nitrogen source reductions, from both point source and non-point sources, for the duration of the Great Bay Total Nitrogen General Permit. This nitrogen source reduction plan would outline specific actions or projects (locations, concept ideas, etc.) with estimates of load reduction potential and cost to implement these actions or projects. The plan will serve as a planning tool for Milton to best allocate funding for investment and implementation to reduce total nitrogen into Milton Three Ponds/Salmon Falls River which feeds the Great Bay. The plan would help Milton understand how much total nitrogen they might expect to reduce in the next 4+ years. A project deliverable would also include a nitrogen source identification planning template that could be used by other towns within the Great Bay Estuary.*

## **Newington - MAAM AMP STATEMENT**

*The Town of Newington has invested heavily in the Wastewater Treatment Plant, which is currently operating at around 2mg/l of TN in effluent discharges. Additionally, the town is not a MS4 regulated community, however, many of the best management practices required in the MS4 permit have been implemented including a street sweeping and catchbasin cleaning program. The town has adopted a stormwater ordinance based on the Southeast Watershed Alliance model ordinance, requiring stormwater management for all new and redevelopment projects that come to the Newington Planning Board. Newington has many areas of the community with large swaths of privately owned pavement. Redevelopment has already begun, and it is anticipated that redevelopment will continue in the next few years resulting in load reductions.*

## **Portsmouth**

The City of Portsmouth (City) is a historic community located in southeastern New Hampshire at the mouth of the Piscataqua River. The City has a population of approximately 22,000 people and is a frequently visited tourist destination due to its restaurants, historic past, geographic location, and other amenities. The overall land area of the City is approximately 16.8 square miles (15.6 square miles of land and 1.2 square miles of water). Downtown Portsmouth is densely developed with mixed commercial and residential properties with intermixed industrial development. Outside the downtown, land use is still urban in nature and primarily residential and multi-unit residential with mixed commercial zones. The City has within its boundaries the Pease International Tradeport and NH Air National Guard. The primary land area of the City is private property (~71%) with the remaining land area comprised of Department of Transportation roadway right-of-way (~6%), City roadway right-of-way (7%) and City owned properties (16%). Growth in the City is controlled through land use and zoning ordinances and approval of proposed development through the Planning Board, Zoning Board of Adjustment, Historic District Commission and Conservation Commission as applicable. The City is compliant with its MS4 permit effective July 1, 2018 and NPDES permits for its two wastewater treatment facilities, Pease Tradeport WWTF and Peirce Island WWTF.

The City's Department of Public Works is organized into multiple utility groups overseeing the stormwater collection system, sewer collection system, combined sewer overflows, and water distribution system. The sewer group oversees the treatment of sewerage at the Pease Tradeport WWTF and Peirce Island WWTF. The water group oversees treatment at the Madbury Water Treatment Plant and the Pease Water Treatment Plant. This water group is primarily responsible for the day-to-day operations and long-term projects associated with stormwater best management practices, points source discharge points of nitrogen (e.g. WWTFs), and water source protection and water conservation.

The City has long been a regional leader in environmental stewardship and innovation. In 2007 the City Council voted on a resolution to become an Eco-Municipality and use the four principles of The Natural Step (<https://thenaturalstep.org/approach/>) to guide sustainable decision-making. The City's commitment to sustainability and environmental stewardship shows up in its many proactive efforts to curb pollution, support science, and minimize impacts on the Estuary. These items cannot always be quantified as specific nitrogen reduction actions but are important to support the nitrogen control and reduction efforts and include the following:

- **Professional Staffing and Organizational Structure:** The City has developed a Stormwater Specialist Position and reorganized personnel to establish a Stormwater Division within the Public Works Department. The City has also hired seasonal interns for the past ten years who's primary work is associated with stormwater field data collection, sampling, and GIS updates. In 2020, the City sponsored a University of New Hampshire Capstone project where four engineering students assisted in field work and data input to evaluate stormwater Best Management Practices (BMPs) throughout the City. They utilized the UNH Stormwater Center's Pollution Tracking and Accounting (PTAP (Pollutant Tracking and Accounting Program)) methodology in this project. At the Planning Department there are staff dedicated to site plan regulation compliance for private property and developments. Wastewater operations staff are trained licensed professionals who participate in professional organizations including New Hampshire Water Pollution Control Association, New England Water Environment Association/WEF, and others. Staff participate in these associations to maintain training and stay in front of the most recent industry trends and to optimize treatment operations. NH Department of Environmental Services joined the New Hampshire Water Pollution Control Association to present the 2023 NDES Wastewater Plant of the Year Award to the City's Peirce Island WWTF at the August 21, 2023 City Council meeting.
  - **Incorporation of Stormwater BMPs:** The City incorporates stormwater controls and other BMPs into City projects. Staff continue to work on developing new BMPs by working with consultants
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and the UNH Stormwater Center. Some examples include Community Campus Athletic Fields gravel wetland and bio retention stormwater treatment, State Street sand filtration and tree box filters, use of compost tea and incorporation of pervious pavement and other LID (Low Impact Development) type projects within the City. The City has and will continue to work with private and public entities in the installation of rain gardens, tree box filters and other stormwater controls.

- Consulting Services: The City is continuing to work with its stormwater consultant and rate modelling team to identify projects and to initiate a stormwater utility depending on the regulatory landscape.
- Regulations and Ordinance Adjustments: The City Site Plan Review Regulations promote the use of Low Impact Development to the maximum extent practical and set limits more restrictive than the MS4 permit for redevelopment projects. Ordinance changes have increased wetland buffers with credit for going green projects that show added nitrogen removal. Recent efforts include further strengthening controls in the wetland buffers to protect water quality.
- Outreach and Education: City staff work with the Seacoast Stormwater Coalition to develop BMP implementation and regular operation and maintenance requirements for private properties.
- Address the Future: Working with stakeholders, the City seeks to address stormwater, sea level rise, and coastal resiliency issues that impact Portsmouth. This includes addressing the overlap in project needs to address coastal resiliency and impact of tidal changes on stormwater controls in areas like Prescott Park. The City also held a City Council work session to discuss future stormwater management options, including the potential to develop a stormwater utility.

These are some of the efforts put forth by Portsmouth toward supporting improvement of water quality for the Great Bay Estuary. The greatest and most impactful, however, is the recently completed upgrade of the Peirce Island WWTF. Over the last 5 years the Peirce Island WWTF underwent a significant upgrade converting the once primary level treatment facility to a tertiary level nitrogen removal facility with biological treatment. This \$92 Million project has decreased the amount of nitrogen discharged to the estuary by over 84%, total suspended solids by over 86%, and biochemical oxygen demand by over 90%.

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## Portsmouth

The following narratives and tables describe on-going and planned nitrogen reduction activities for the City of Portsmouth. This list is a snapshot of the ongoing and planned activities funded through the City's annual operating budget and Capital Improvement Plan (CIP). The City will update and adjust this list as needed based on changes in anticipated funding, adjustments to achieve the highest efficiencies for nitrogen reduction and other conditions or technical reasons that may not be known or anticipated at this time.

**Innovative WWTF Operations:** In 2020 the City completed a major facility upgrade at the Peirce Island Wastewater Treatment Facility, an investment of over \$92 million, which has resulted in significant nitrogen load reductions based on the reported effluent data in 2020. The facility began startup in Jan 2020 and which has resulted in a treatment system that produces more stable and lower concentrations of total nitrogen. The load reduction calculations in the following paragraphs incorporate data from the Pease WWTF as well as the Peirce WWTF since the Great Bay Total Nitrogen General Permit limits nitrogen for the combined effluent.

In 2022, the Peirce Island WWTF had a 7-month rolling average (April 1 - Oct 31) TN load of 133.5 lbs./day and the Pease WWTF had 30.1 lbs./day. This equates to 163.6 lbs. TN/day and is 177.4 lbs. TN/d less than the permitted effluent limit of 341 lbs. TN/day. This equates to a TN load reduction of 37,778 lbs. for the 7-month growing season period.

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During the non-growing season, a conventional WWTF configured and properly sized for nitrogen removal would achieve a total nitrogen effluent concentration in the range of 10 to 12 mg/L. The Peirce Island WWTF is configured and has been operated in a manner to achieve concentrations that are substantially lower than conventional treatment. See the summary table below of nitrogen load reductions. The City anticipates continuing to run the PI WWTF in this configuration for continued substantial nitrogen removal.

Significant nitrogen load reductions have been achieved when comparing the observed average daily loads of 708 lbs. and 204 lbs. TN /day for the 7-month growing seasons of 2019 (prior to biological treatment) and 2020 (startup/operation of biological treatment), respectively, based on effluent data. This data represents pre and post-conditions of the Peirce Island WWTF upgrade. The observed 504 lbs. TN/day difference in the average daily loads between these two years translates to an overall annual nitrogen load reduction of approximately 106,000 lbs. As anticipated the data for 2023 growing season continued to show TN to be well below the permitted amount as operations have been further stabilized.

**Summary of WWTF Recent Nitrogen Load Reductions (2023-2024)**

<b>WWTF Facility</b>	<b>Season</b>	<b>Description</b>	<b>Load Reduction (lbs. TN)</b>
Peirce Island & Pease	7-month growing season	Total Lbs. TN = Permitted Daily (341 lbs./d) – Observed (163.6 lbs./d) = 177.4 lbs./d x 213 days (Apr 1 – Oct 31)	~38,800 lbs.
Peirce Island & Pease	5-month non-growing season	Total Lbs. TN = Ave Conc Decrease = 5 mg/L x avg. daily flow (3.81 MGD) x 8.345 x 150 days	~19,665 lbs.
		<b>Annual Total</b>	<b>~58,465 lbs.</b>

## Stormwater and Other Nutrient Reduction BMPs

The following describes several major drainage capital improvement projects where potential structural stormwater BMPs will be evaluated. Two structural BMPs were recently completed behind the DPW facility. Various nonstructural measures are also highlighted including good housekeeping, regulation updates, organic fertilizer use, land protection efforts, and a proposed sewer extension, to name a few. The total annual nitrogen load reduction for these efforts is estimated at 5,700 lbs./year.

**Structural BMPs:** The following projects are included in the City’s FY24-FY29 CIP

Project	Original Anticipated Year and Costs	Description	Approx. Load Reduction (lbs. TN/yr.)
Islington Street Compete Streets – Phase II	2022  Preliminary Design: ~\$250,000 Final Design: \$289,900 Bidding and Construction Engineering: \$700,000 Construction: ~\$9.2M	This project will include full roadway reconstruction (sidewalk, curb, grass strip, roadway and utilities) from the Dover Street intersection to the intersection with Congress/Maplewood Streets (5,000 linear feet). The work will include sewer separation with separated stormwater being redirected through water quality units upstream of the Brewster and Cabot Streets stormwater outfalls to North Mill Pond. The project may cause a net increase in the volume of stormwater discharged to the North Mill Pond but will reduce volume and # of combined sewer overflow events during wet weather. Nitrogen levels and overall loads are generally higher in CSO discharges than in stormwater. Opportunities to treat roadway runoff are being incorporated including tree box filters. The overall stormwater catchment area served by this project is approximately 18 acres. Estimated completion 2025	1.5 See Note 2
Peeverly Hill Road Reconstruction	2024  Engineering Study & Preliminary Design: \$412,000 Permitting and ROW: TBD Final Design and Bidding: TBD Construction Engineering: TBD Construction: TBD	This project will include full roadway reconstruction from the intersection with Middle Road to the intersection with West Road (5,000 linear feet). The work will include construction of a new sidewalk from Middle Road to Mirona Road on the north side of the roadway (3,600 linear feet) and construction of a new 8 to 10-ft wide shared use path from Middle Road to Banfield Road on the south side of the roadway (3,400 linear feet). Curbs will be added to the roadway and stormwater will be re-routed through a planned stormwater gravel wetland that will discharge to the headwaters of Sagamore Creek. The overall stormwater catchment area served by this project is approximately 17 acres.	See Note 1

Project	Original Anticipated Year and Costs	Description	Approx. Load Reduction (lbs. TN/yr.)
Willard Ave Sewer Separation	2023  Preliminary Design: \$200,750 Final Design: ~\$400,000 Bidding and Construction Engineering: \$600,000 Construction: ~\$5.4M	This project will include full roadway reconstruction (sidewalk, curb, grass strip, roadway and utilities) along Willard Avenue from the intersection with Marston Street to the intersection with Lafayette Road, Ash Street from the intersection with Willard Avenue to Orchard Street and Orchard Street (2,000 linear feet). The work will include sewer separation with separated stormwater being redirected through water quality units near Parrott Avenue upstream of the stormwater outfall to South Mill Pond. The project may result in a net increase in overall stormwater discharge to the South Mill Pond but will reduce the volume and frequency of combined sewer overflow events during wet weather. Nitrogen levels and overall loads are generally higher in CSO discharges than in stormwater. The overall stormwater catchment area served by this project is approximately 3.4 acres.	See Note 1
Union Street Sewer Separation	2023  Preliminary Design: \$200,750 Final Design: ~\$400,000 Bidding and Construction Engineering: \$360,000 Construction: ~\$3.24M	This project will include full roadway reconstruction (sidewalk, curb, grass strip, roadway and utilities) along Union Street from the Middle Street intersection to the State Street intersection (1,000 linear feet). The work will include sewer separation with separated stormwater being redirected to the stormwater system on Middle Street that discharges through water quality units near Parrott Avenue upstream of the stormwater outfall to South Mill Pond. The project may increase the overall stormwater discharge to the South Mill Pond but will remove stormwater from the combined sewer collection system thus reducing combined sewer overflow events during wet weather. Nitrogen levels and potential overall loads are generally higher in CSO discharges than in stormwater. The overall stormwater catchment area served by this project is approximately 1.9 acres.	See Note 1

Project	Original Anticipated Year and Costs	Description	Approx. Load Reduction (lbs. TN/yr.)
Fleet Street Sewer Separation	<p>2023</p> <p>Preliminary Design: \$288,350 75% Final Design: \$242,000 100% Final Design: TBD</p> <p>Bidding and Construction Engineering: ~\$600,000 Construction: ~\$11M</p>	<p>This project will include full roadway reconstruction (sidewalk, curb, roadway, and utilities) along Fleet Street from the Court Street intersection to the intersection with Hanover Street (1,000 linear feet). The work will include sewer separation with separated stormwater being redirected through an upsized existing outfall and a new water quality unit near Maplewood Avenue upstream of the stormwater outfall to North Mill Pond. The project may result in a net increase in overall stormwater discharge to the North Mill Pond but will remove stormwater from the combined sewer collection system thus reducing combined sewer overflow events during wet weather. The overall stormwater catchment area served by this project is approximately 38 acres.</p> <p>The project limits have been expanded to include an area of Congress Street from Fleet Street to Maplewood Avenue (540 linear feet) and Vaughan Mall from Congress Street to Hanover Street (450 linear feet). The scope of work and ultimate discharge of separated stormwater is the same as described above for the Fleet Street work. The overall stormwater catchment area served by this additional area is approximately 1.6 acres.</p> <p>Given the complexity of the work the project has been broken into 3 phases. The first phase included the installation of a new drain line from the intersection of Fleet and Hanover. The second phase being the Vaughan Mall, the third phase being Fleet Street and Congress. Estimated Completion 2028</p>	<p>280 See Note 1</p>

Project	Original Anticipated Year and Costs	Description	Approx. Load Reduction (lbs. TN/yr.)
Corporate Drive Road & Drainage Upgrade	2022  Phase 1 Preliminary Design: \$60,000 Phase 1 Final Design: \$75,300 Phase 1 Bidding and Construction Engineering: ~\$60,000 Phase 1 Construction: ~\$600,000 Phase 2 Preliminary Design: \$101,300 Phase 2 Final Design: \$71,800 Phase 2 Construction: \$4.98 M	The City is working on two phases of work to improve drainage on Corporate Drive. The first phase which is currently being constructed seeks to improve the drainage flow through swales adjacent to Corporate Drive through swale improvements and culvert modifications. The second phase includes roadway reconstruction, stormwater quality unit installation and selective drainage improvements along Corporate Drive from Rye Street to Grafton Road (6,000 linear feet). The overall stormwater catchment area served by this project is approximately 5 acres. Estimated completion 2025	14.2 See Note 2
Gravel wetland /Bioretention System at DPW/Recreation Fields	Complete  Design: \$70,000 Construction: \$630,000	New gravel wetland treating ~ 25 acres of 2021 existing IC area with WQv = 0.18” N Rem Eff = 33%; Bioretention system w/ internal storage reservoir treating ~ 51.8 acres of existing IC	412
<b>&gt;707</b>	<b>Estimated Annual N Load Reduction Total (lbs./yr.)</b>		

**Notes:**

1. Engineering design for these planned road/drainage system improvements are in the early phase or have not yet begun. As a result, the potential stormwater nitrogen discharge cannot be determined. The feasibility for stormwater treatment will be evaluated as part of the design efforts.
2. Construction of these project is ongoing with the completion dates as indicated. Estimates are provided based on the final design and a final estimate of annual total nitrogen load reduction will be provided for the as-built condition.

**Non-Structural BMPs:** Annual nitrogen load reductions due to ongoing operation and maintenance activities and recent connected impervious (IC) area disconnection included in this plan. The effect of the program on homeowners or commercial applicators' behavior could be measured through pre and post random surveys.

<b>Annual non-structural BMP efforts</b>	<b>Project</b>	<b>Description</b>	<b>Approx. Load Reduction (lbs. TN/yr.)<sup>1</sup></b>
Street Sweeping	Ongoing Maintenance	City sweeps all streets monthly, 8 months of the year with High Efficiency Regenerative Vacuum Sweeper on estimated 345 acres of area. FY2024: Fall = 137 tons; Non-fall = 413 tons.	1034 <sup>2</sup>
Leaf Litter Management	Ongoing Maintenance	City provides curbside leaf litter pickup for Residential Areas (~80% of City)	250
Catch Basin Cleaning	Ongoing Maintenance	City cleans approx. 25% of the total CB's each year	24
Regulations	New Regulations adopted Jan. '21	City adopted new stormwater treatment requirements for new & redevelopment disturbing 15,000 sq ft or more area. Load reduction is based on current inventory of private stormwater BMPs.	314
Impervious Disconnection	Recent IC disconnection	City has installed at least 18 tree filters, 4 rain gardens, converted ~ 0.5 mile of road shoulder and 0.3-acres of parking lot at Four Tree Island to porous pavement; IC disconnect ~ 3 acres	81
Organic Fertilizer Program	Ongoing Maintenance	City switched to an organic compost tea to fertilize its recreational fields; Results in an application rate of 0.7 lbs. N /1000 sf or ~30% less than a more typical application rate of at least 1 lb. /1000 sf	570
<b>Estimated Annual N Load Reduction Total (lbs./yr.)</b>			<b>2,273</b>

**Notes:**

1. The nitrogen load reduction values represent general estimates based on the methods and assumptions included in the generic load reduction template spreadsheet provided by the UNH Stormwater Center for municipal use in preparing Element C of the Adaptive Management Plan with some minor adjustments to reflect City specific conditions especially with respect to fertilizer use and IC disconnection.
2. The nitrogen load reduction values represent general estimates based on the methods and assumptions included in the "Credit Calculation from Tech Memo Measured Method" provided by UNH Stormwater Center for municipal use in preparing Element C of the Adaptive Management Plan.

**Potential Future BMPs on Municipal Lands:** The following is a list of potential BMP locations derived by analyzing hot spots data from the UNH Stormwater Center for parcels with high TN loads

Anticipated Year	Project	Description	Load Reduction (lbs. TN/yr.)
By 2025	Raingarden at DPW for Parking Lot & Facility Expansion	The Department of Public Works is undergoing a facility expansion. New and existing roofs and parking areas will have drainage directed to a proposed gravel wetland.	To Be Determined
Ongoing	Nitrogen Source Identification Report	The City has initiated a City-wide analysis to identify potential feasible stormwater BMP retrofit locations on City owned property for planning purposes. The results of this ongoing study will be used to assess the potential feasibility and cost-effectiveness of constructing stormwater BMP retrofits to achieve additional nitrogen load reductions as either standalone projects or as part future facility upgrades of municipal properties. This study may also review certain select private properties that have a high amount of impervious cover and available space. This information will be utilized for outreach as applicable to private property owners.	To Be Determined

**Other Efforts: Summary of Other Innovative Efforts/Pilot Programs**

Anticipated Year	Project	Description	Approx. Load Reduction (lbs. TN/yr.) <sup>1</sup>
2022	Sewer Extension to Sagamore Creek Area (approx. 88 homes)	As of September 2024, 51 homes have connected.	5,230
Ongoing	Atmospheric Load Reduction based on more current air quality data	UNH SC/NHDES suggests atmospheric N load has decreased by ~14%; GBNNPS study estimated delivered atmospheric N Load for Portsmouth = 18,618 lbs./yr.	2,610
Ongoing	Land Protection in Bellamy Reservoir	The City has partnered with Southeast Land Trust (SELT) to establish a conservation easement on an approximately 45-acre portion of a property known as the 'Fernald Parcel' in order to benefit the protection of the City's primary water supply. In June 2023, a purchase and sale agreement for this conservation easement was executed. This agreement is contingent upon City Council approval.	To Be Determined
Complete	Land Protection in Bellamy Reservoir	City purchased conservation easement for ~180 acres of land adjacent to Bellamy Reservoir targeted for development – prevents additional stormwater and septic load from ~ 32 homes	1,010
<b>Estimated Annual N Load Reduction Total (lbs./yr.)</b>			<b>8,850</b>

Notes:

1. The N load reduction values represent general estimates based on the methods and assumptions provided by the UNH Stormwater Center for municipal use in developing Element C of the Adaptive Management Plan.



**Outreach and education:** In addition to using an organic compost tea produced from yard waste compost to fertilize City fields as well as updating the Site Plan Regulations to include language that encourages new development to minimize the creation of new managed turf, the City would support a statewide or regional effort to ban or limit the use of lawn fertilizer and/or a collaborative regional education and outreach effort that engages homeowners and commercial applicators to minimize its use and/or apply only when necessary.

The NHDES Great Bay Nitrogen Nonpoint Source Study (GBNNPSS) estimated an annual N load of just under 90,000 lbs/yr contributed from lawn fertilizer usage within the 12 communities subject to this GBTN GP, which represents approximately 25% of the total estimated N load from these communities. Published data from the Chesapeake Bay Network suggests that developing a comprehensive education and outreach campaign designed to change homeowner behavior and commercial applicator practices could reduce fertilizer usage by anywhere from 5% to 15% depending in the program elements. If such a program could reduce fertilizer use by event 5%, this could result in a significant benefit relative to the load reduction estimates for the other activities

**Explore Long Term Sustainable Funding Mechanisms:** The City previously conducted a stormwater utility feasibility study that was completed in 2011 but it did not gain approval by City Council to move forward at that time. The City plans to revisit the feasibility of stormwater utility. In 2022 the City contracted with two engineering firms to explore the feasible options for creating a stormwater utility. These options were presented to City Council in October 2022. Staff continued to work on this project through 2023 but work was suspended due to the Conservation Law Foundation's filing of a petition with the Environmental Protection Agency requesting that the EPA exercise its residual designation authority in the Great Bay Estuary. The City continues to evaluate with EPA, CLF and MAAM communities how and to what extent the filing of the petition may impact stormwter utility efforts.

**Tracking Post-Development Stormwater Treatment BMP Inspection and Maintenance (I&M) Activity:** The City is taking the lead in managing and administrating a project being funded by and in collaboration with various communities that are part of the Seacoast Stormwater Coalition to develop methods to assist communities in tracking post-development I&M activity for stormwater BMPs on private property that were approved through local site plan regulations and related ordinances. The goal is to ensure that the long-term stormwater treatment performance is maintained through I&M activity and the potential pollutant load reduction credits particularly for redevelopment projects can be tracked and accounted for through the NHDES/UNH SC PTAP system or an equivalent process. This project builds off an initial pilot study conducted by a student Capstone project done in conjunction with the UNH Engineering Department and UNH Stormwater Center.

**Think Blue Outreach:**

- Postcards and video campaigns have been developed by the stormwater division that focus on: Lawn care, Yard waste and Pet waste, with consistent "Think Blue" branding and web page links for more information.
- Household Hazardous Waste Collection Days are held each May and October. They are hosted by the City of Portsmouth at our DPW facilities and include Newington and Greenland.
- Safe Water Advisory Group (City Council Advisory Committee) meets quarterly in collaboration with the Water/Stormwater Division to raise public awareness of the Great Bay Watershed and residents' impact.

Following up on the collaboration with Strawberry Banke Museum, UNH and the City's Planning and Public Works Department (who created the exhibit: "Water Has a Memory: Preserving Strawberry Banke and Portsmouth from Sea Level Rise" the city was a co-host of the national Keeping History Above Water conference in 2023. Talks included efforts to manage stormwater and spread the city's "Think

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Blue” message. Site visits included a tour to the City’s “Think Blue” exhibit at Strawberry Banke as part of their “Water Has a Memory” exhibit.



## Rochester

The City of Rochester reserves the right to update the project year/start dates, estimated load reductions, estimated costs or items listed as “TBD” in the columns below either annually or as appropriate.

**Planned Structural BMPs** – The following list includes projects that are already planned in CIP, design phase, etc.

Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
2021-25	Colonial Pines Sewer Extension - Phase 4	Phase 4 of a neighborhood sewer extension project with drainage infrastructure improvements	TBD	\$3,700,000	Project is under construction.	Complete Phase 4.
2022-25	Woodman Area Infrastructure Improvements	Neighborhood Complete Streets project with drainage infrastructure improvements including improved outfalls and new BMPs	TBD	\$7,000,000	Construction continues.	Construction is anticipated to be wrapping up in 2025.
2025	Union Street Municipal Parking Lot	Parking lot reconstruction with drainage infrastructure improvements including new BMPs	7.14	\$1.5M+	Conceptual design is being reviewed. Final design began in fall 2022.	Final design is anticipated to be completed in 2023. Construction 2024-25.
TBD	Wakefield Street Reconstruction	Complete Streets project with drainage infrastructure improvements including new BMPs	16.54	TBD	Design consultant has been selected by the City.	Other infrastructure priorities have superseded this project.

Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
2023 – 25	Columbus Ave/Summer St. Intersection Improvements	Includes stormwater treatment prior to discharge to Cocheco River.	TBD	\$2M+	In preliminary design	Final design.
2023-	Water St. Redevelopment Project	Borders Cocheco River. Design to include pollutant reductions.	TBD	TBD	Continues design- project lead by Economic Development	Continue design
2026-	Summer Street Drainage Improvements	Fix drainage and roadway in Summer Street and Olde Farm Road	TBD	1,200,000	Design start in 2026	
2024	Portland St Culvert	Fix undersized and failing culvert, project to include a new BMP	TBD	100,000	Permitting	Anticipate construction
Ongoing	Corrective Drainage	Unforeseen Drainage improvements	TBD	\$150,000/yr	Ongoing	Ongoing
2026	Granite Ridge	Phase 2 of development – coordinated with private development	TBD	>\$8,000,000	Ongoing	Ongoing
2026	Milton Road/Amarosa intersection	Round about associated with SIG	TBD	>\$3,000,000	In Design	Ongoing
2026	Tebbets Rd / Old Dover intersection	Intersection improvements	TBD	>\$1,500,000	Preliminary Design	
2026	Gonic Dam Removal	Remove Dam from Cochecho River	TBD	ARPA & SRF funded	Design & Design Review	Ongoing
2026	Salmon Fall School	New Elementary School	TBD	School Funded	Under Construction	Completed in 2025
2026	Community Center BMP work	Install BMP's at the Community Center	TBD	>\$1,000,000	Preliminary design	Design & Outreach
2026	Rochester Hill Neighborhood	Neighborhood improvements	TBD	\$2,300,000	-	-
2025	City BMP Maintenance	Major improvements to older BMP's	TBD	\$5,250,000	Bidding	Construction
2026	Winter Street Neighborhood	Neighborhood improvements	TBD	\$2,300,000		
2028	North Main Street	Roadway improvements	TBD	\$275,000	-	

**Non-structural BMPs** – The following list includes existing ongoing and future planned efforts:

Anticipated Year of initial implementation (ongoing work)	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
Ongoing	MS4 Compliance	The City of Dover uses MS4 permit compliance as a baseline from which additional work is completed	TBD	\$300,000/yr	Ongoing – special effort on catchment investigations	Ongoing
Ongoing	Street Sweeping	Sweep curbed streets monthly (Apr-Nov); sweep Downtown weekly (Apr-Nov)	See PTAP	TBD	Ongoing	Ongoing
Ongoing	Leaf Litter Management	Collect leaf litter monthly (Apr-May, Oct-Nov); collect bagged organic waste for 2 wks in spring and fall	See PTAP	TBD	Ongoing	Ongoing
Ongoing	Leaf Litter Management	Provide location for residents to drop off leaf and yard waste year-round	See PTAP	TBD	Ongoing	Ongoing
Ongoing	Catch Basin Cleaning	Ensure CB sumps are no more than 50% full at any time	See PTAP	TBD	Ongoing	Ongoing
Ongoing	Fertilizer Program	Exclusively use slow release fertilizer on municipal property; advocate for and work with State RE: nitrogen fertilizer restrictions	TBD	TBD	Continued stated fertilizer practices on municipal property.	Continue fertilizer practices and advocate with the State.

**Other Efforts** – The following list includes innovative efforts

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
Ongoing	Existing Municipal Structural BMPs	77 existing municipal structural stormwater BMPs have been catalogued in the City's Asset Management Program.	1,080	TBD	BMPs inspected and begun to track for improved maintenance.	Entry of BMPs into PTAP complete. Start to scope maintenance and plan for work 2024.
2023-25	Colonial Pines Sewer Extension	Extension of public sewer collection system to connect homes on septic systems	2,560		150 homes removed to date	Last Phase is under construction
Ongoing	Nitrogen Source Identification Report	Identify catchment areas with potentially high nitrogen loading and BMP potential, including primarily municipal properties.	TBD	TBD	Draft report was finalized in June 2022. Report was updated in June 2023 to include planned retrofit date, estimated cost & feasibility.	Review potential catchments with high loading and BMP potential ongoing.
Ongoing	Nitrogen Source Reduction Report	As part of the AOC, Rochester has hired Weston & Sampson to look at sewer and drainage to see where nutrient reductions can be improved	TBD	-	Investigation underway	Finalize report
Ongoing	Public Education/ Outreach	Distribute targeted messaging regarding grass clippings/ fertilizer (Apr-May), pet waste (Jun-Jul), and leaf litter (Aug-Oct)	TBD	TBD	Grass clippings/ fertilizer, pet waste, and leaf litter messages delivered.	Continue messaging to target audiences during seasonally appropriate time periods.
Ongoing	Public Education/ Outreach	Distribute targeted messaging regarding septic system maintenance and LID development	TBD	TBD	Septic system and LID messages delivered.	Continue messaging to target audiences.
Ongoing	Existing Private BMPs: Quantify nutrient load	City to catalog inventory of existing privately owned BMPs, quantify	TBD	\$22,000	New	Complete

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
	reductions	nutrient load reductions and enter into PTAP				
Ongoing	Private Development/ Redevelopment	Enforce City's updated Chapter 218 Stormwater Ordinance requiring treatment	100-300 <sup>1</sup>	TBD	June 7, 2022 Stormwater Ordinance revision requires pollutant accounting information by developers.	Continued enforcement of Stormwater Ordinance/use of PTAP for pollutant tracking.
Ongoing	Staffing/Resources	City has a strong team of engineers reviewing all proposed construction projects for stormwater compliance, additionally larger projects are subject to a third party review with Geosyntec	TBD	TBD	Ongoing	Ongoing
Ongoing	Septic System Programs	Advocate for and work with State RE: advanced septic system treatment for nitrogen and enforcement of connection to public sewer law within 100'	TBD	TBD	NHDES met with certain communities	Continue to advocate for amendments to the septic system requirements.
Ongoing	Water Pollution and Flooding Reduction Study	Through a public workgroup and broader public outreach the City will consider a dedicated stormwater funding source.	TBD	TBD	Presentation was made to city council end of 2023	Continued outreach and education about importance of water pollution and flood reduction

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<sup>1</sup> The City's estimates for load reductions of 100 to 300 lbs. N/year were estimated to occur as a result of structural BMP retrofits through redevelopment on commercial properties as required by revised City stormwater ordinance. These estimates were based on an assumption that 10 to 50 acres of impervious area are redeveloped and retrofitted with BMPs, which depends upon actual development activity.

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**Pilot Projects** – The following list includes pilot projects:

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
2025	Stakeholder Committee Project	MAAM communities fund \$45,000 towards Great Bay water quality- related project as selected by the Stakeholder Committee (CLF)	TBD	\$45,000	No progress	Rochester continues to encourage CLF to select a project that has measurable TN reductions and requires work on private property. This is the most difficult thing for communities and would be helpful for us to see a successful pilot project that could be successfully expanded.



**Initiatives at WWTFs** – The following list includes efforts aimed at reducing TN output from WWTFs during the eelgrass growing season. Such efforts may include optimization of plants, projects aimed at reducing inflow/infiltration, facility upgrades, or similar measures.

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2023 Progress Update	2024 Anticipated Progress
2023 -	Septage Receiving Facility Upgrade	Construct new septage receiving facility at a location more favorable for nitrogen treatment at the WWTF	TBD	\$600,000+	Completed pilot evaluation and received federal funding for construction of the Septage Receiving Facility Upgrade.	Anticipated design, bid and construction by December 31, 2024.
2021-26	Sewer System Master Plan	Evaluate sewer collection system for sources of Inflow/ Infiltration	TBD	TBD	Scope of work submitted to EPA and NHDES in fall 2021. Ongoing efforts for data collection and monitoring including smoke testing during Summer 2023.	City anticipates continuing the master planning effort over the next several years, culminating in a final Master Plan.

**Co-Benefits of Nonpoint Source Reductions** – Though beyond the scope of the submission called for in Part 3-1.c. of the General Permit, the MAAM communities feel it is important to plan and account for the removal of other pollutants or stressors of eelgrass coincident to the TN source reductions listed above. This dovetails with the monitoring efforts undertaken by MAAM and its partners, which is expected to include study of confounding factors and stressors. PTAP tracking and accounting has been created to also calculate phosphorus and total suspended solid reductions.

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## **Rollinsford - MAAM AMP STATEMENT**

*The Town of Rollinsford continues to monitor effluent at the Wastewater Treatment Facility as required by the Total Nitrogen General Permit. Additionally, the town is implementing the best management practices required in the MS4 permit including a street sweeping and catchbasin cleaning program. The town has adopted a stormwater ordinance based on the Southeast Watershed Alliance model ordinance, requiring stormwater management for all new and redevelopment projects that come to the Planning Board. Rollinsford is committed to continuing to participate in MAAM and the Total Nitrogen General Permit.*

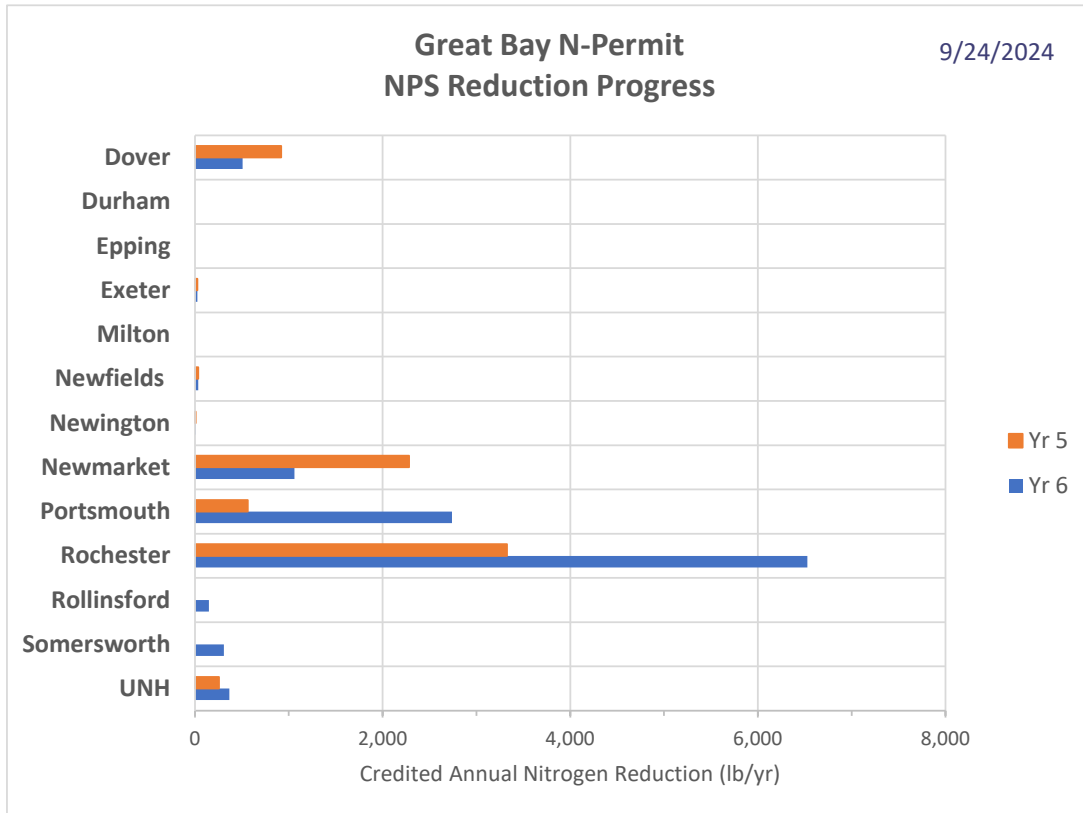
## **Appendix C**

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Pollutant Load Reduction Reports

# PTAP Nitrogen NPS Reduction Report

Updated 9/24/2024



	Yr 5 Reductions (lb/yr)	Yr 6 Reductions (lb/yr)
Dover	918	509
Durham	0	0
Epping	0	0
Exeter	25	25
Milton	0	0
Newfields	33	33
Newington	7	7
Newmarket	2,282	1,059
Portsmouth	562	2,739
Rochester	3,326	6,529
Rollinsford	0	147
Somersworth	0	308
UNH	257	366

Updated                      8/15/2023                      9/24/2024

Note that only PTAP entries with the status of "Accepted and Implemented" are given credit.

<b>State</b>	NEW HAMPSHIRE
<b>Municipality</b>	DOVER
<b>Permit Type</b>	MS4
<b>Permit Number</b>	
<b>Major Watershed</b>	N/A
<b>TP Load Reduction Target</b>	N/A
<b>TN Load Reduction Target</b>	N/A
<b>TSS Load Reduction Target</b>	N/A

**Table 1. Project Summary Credit for DOVER, NEW HAMPSHIRE**

<b>Project Type</b>	<b>Removed Phosphorus Load (lb/yr)</b>	<b>Removed Nitrogen Load (lb/yr)</b>	<b>Removed Sediment Load (lb/yr)</b>
<b>Structural</b>	73.5	508.72	24772.97
<b>Non-Structural</b>	0.01	0.16	0
<b>Land Use Conversion</b>	0	0	0
<b>Total</b>	73.51	508.88	24772.97

**Table 2. Structural Project Summary for DOVER, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity (ft <sup>3</sup> )/ Filter Depth (in.)	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Run off Depth (in.)
2. Circle K #7264	BIORETENTION	6209.45	63	40	100	0.94	5.07	317.01	0.84	2.04
3. American Durafilm Co. Inc.	BIORETENTION	8440.53	63	40	100	0.89	4.77	298.14	0.79	2.94
4. American Durafilm Co. Inc.	GRASS SWALE (CONVEYANCE)	345	6.94	4.26	52.25	0.04	0.21	63.09	0.32	0.3
5. Community Trail	INFILTRATION TRENCH	1230	89.88	97.97	98.98	0.71	4.7	147.73	0.34	1
6. Innovative Tree Box Filter - City Design	BIORETENTION	380	14.52	9.33	45.17	0.26	1.41	170.47	1	0.1
7. Chelsey Street	BIORETENTION	1146	42.73	27.09	95.91	0.47	2.14	235.76	0.56	0.56
8. Central Ave - Gravel Wetland	GRAVEL WETLAND	23707	48.67	54.91	88.91	10.22	97.7	3959.15	11.8	0.55

<b>9. Upper Horne Street</b>	INFILTRATION BASIN	3220	53.58	70.27	81.03	4.32	40.72	1461.83	4.11	0.22
<b>10. Cemetery - F&amp;G Facility</b>	INFILTRATION TRENCH	546	28.85	64.23	48.01	0.77	10.42	242.33	1.15	0.13
<b>11. Woodman Park School</b>	INFILTRATION TRENCH	3415	52.4	81.6	76	4.08	38.66	1120.89	3.36	0.28
<b>12. Richardson Drive</b>	INFILTRATION TRENCH	14302	92	98	100	8.41	54.44	1729.46	3.94	1
<b>13. Roosevelt Ave</b>	BIORETENTION	1836	42.24	26.74	95.49	0.76	3.47	385.63	0.92	0.55
<b>14. Lowell Ave</b>	BIORETENTION	970	26.25	16.73	71.29	0.62	2.85	378.66	1.21	0.22
<b>15. Building Addition Q LLC.</b>	EXTENDED DRY DETENTION POND	9217	13.6	21.38	48.2	0.34	4.55	256.5	1.41	1.8
<b>16. STONE1-035-RG</b>	BIORETENTION	1682.4	63	40	100	0.01	0.06	3.77	0.01	46.35
<b>17. Snow Ave</b>	GRASS SWALE (CONVEYANCE)	495	1.59	1.11	22.99	0.05	0.27	173.58	1.72	0.08

<b>18. Glencrest Ave</b>	BIORETEN TION	2262	28.02	17.76	74.53	1.37	6.24	814.5 8	2.49	0.2 5
<b>19. ELM001-010-FCB</b>	BIORETEN TION	15.6	38.04	23.74	91.89	0.01	0.04	3.47	0.01	0.4 3
<b>20. HELLM1-010-RG</b>	BIORETEN TION	1788 .36	63	40	100	0.06	0.3	18.87	0.05	9.8 5
<b>21. CENTR1-046-BRS</b>	BIORETEN TION	583. 8	57.62	36.62	99.92	0.11	0.61	41.48	0.11	1.4 6
<b>22. SILVE1-022-RG</b>	BIORETEN TION	60	18.15	11.64	53.44	0.04	0.21	24.2	0.12	0.1 4
<b>23. GLENC1-010-BRS</b>	BIORETEN TION	743. 4	25.29	16.17	69.53	0.45	2.44	262.3 9	1	0.2
<b>24. LOWEL1-050-BRS</b>	BIORETEN TION	603	63	40	100	0.01	0.06	3.77	0.01	16. 61
<b>25. HAMIL1-010-FCB</b>	BIORETEN TION	27.6	14.95	9.6	46.15	0.02	0.1	12.19	0.07	0.1 1
<b>26. BELLA1-010-RG</b>	BIORETEN TION	1049 .4	63	40	100	0.01	0.06	3.77	0.01	28. 91
<b>27. Middleton Chiropractic</b>	BIORETEN TION	3390 .78	63	40	100	0.26	1.39	86.8	0.23	4.0 6
<b>28. CHESL1-010-RG</b>	BIORETEN TION	78.8 3	31.61	19.86	81.13	0.04	0.21	21.43	0.07	0.3 1
<b>29. MOUNT2-020-FCB</b>	BIORETEN TION	42	8.53	5.48	26.79	0.03	0.16	19.21	0.19	0.0 6



<b>30. MOUNT2-010-FCB</b>	BIORETEN TION	36	21.18	13.57	60.32	0.02	0.12	13.66	0.06	0.1 7
<b>31. ROBER1-010-FCB</b>	BIORETEN TION	38.1	53.5	32.5	99.1	0.01	0.05	3.74	0.01	1.0 5
<b>32. ROBER1-020-FCB</b>	BIORETEN TION	28.8	47.87	30.9	97.97	0.01	0.05	3.7	0.01	0.7 9
<b>33. ROBER1-030-FCB</b>	BIORETEN TION	28.8	47.87	30.9	97.97	0.01	0.05	3.7	0.01	0.7 9
<b>34. ROOSE1-010-FCB</b>	BIORETEN TION	23.5 2	44.96	28.72	97.24	0.01	0.04	3.67	0.01	0.6 5
<b>35. ROOSE1-015-FCB</b>	BIORETEN TION	25.1 2	45.84	29.38	97.46	0.01	0.04	3.68	0.01	0.6 9
<b>36. HORNE1-010-RG</b>	BIORETEN TION	2076	63	40	100	0.01	0.06	3.77	0.01	57. 19
<b>37. Lundy Point LLC - Transfer of Development Rights Subdivision</b>	BIORETEN TION	1509 1	63	40	100	0.99	4.51	351.1 6	0.8	5.2
<b>38. Lundy Point LLC - Transfer of Development Rights Subdivision</b>	BIORETEN TION	3068	58.09	37.06	100	0.64	2.93	245.8 1	0.56	1.5 1
<b>39. Little Bay Marina</b>	BIORETEN TION	1728	58.87	37.52	100	0.35	1.59	131.6 8	0.3	1.5 9
<b>40. Little Bay Marina</b>	POROUS PAVEMEN T	3348 0	78	79	97	1.83	13.37	510.9 4	1.2	7.6 9
<b>41. Little Bay Marina</b>	EXTENDE D DRY	1688	12.16	13.74	46.16	0.1	0.83	87.13	0.43	1.0 8

	DETENTION POND									
<b>42. 1795 Gundalow Landing, residential apartments, portland avenue dover nh</b>	EXTENDED DRY DETENTION POND	32736	14	23.13	49	0.25	2.97	195.73	0.91	9.91
<b>43. Locust Street Inn &amp; Locust Common</b>	BIORETENTION	8200	63	40	100	0.46	2.71	210.7	0.48	4.71
<b>44. Locust Street Inn &amp; Locust Common</b>	BIORETENTION	18960	63	40	100	0.79	4.62	359.94	0.82	6.37
<b>45. Pointe Place - Mixed Use Development - Phase 4</b>	INFILTRATION BASIN	17185	98.98	100	100	7.37	53.58	1668.01	3.8	1.25
<b>46. Pointe Place - Mixed Use Development - Phase 4</b>	INFILTRATION BASIN	5750	98.8	100	100	0.97	7.05	219.48	0.5	3.17
<b>47. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETENTION	6472	58.5	37.3	100	1.32	6.05	504.79	1.15	1.55
<b>48. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETENTION	5375	60.84	38.7	100	0.99	4.53	364.33	0.83	1.78
<b>49. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETENTION	13080	61.11	38.86	100	2.38	10.9	873.51	1.99	1.81
<b>50. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETENTION	6746	56.66	35.66	99.73	1.51	6.84	595.38	1.36	1.37
<b>51. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETENTION	2089	53.46	32.46	99.09	0.58	2.52	239.23	0.55	1.05

<b>52. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETEN TION	588	47.43	30.57	97.86	0.2	0.91	90.2	0.21	0.7 7
<b>53. Pointe Place - Mixed Use Development - Phase 4</b>	BIORETEN TION	1385 8	63	40	100	1.79	8.18	636.4 8	1.45	2.6 3
<b>54. ROOSE1-010-RG</b>	BIORETEN TION	747. 78	63	40	100	0.01	0.06	3.77	0.01	20. 6
<b>55. Dover III</b>	INFILTRATI ON BASIN	2630	100	100	100	1.14	8.18	254.5 9	0.58	1.2 5
<b>56. 19034 Crosby Road</b>	GRASS SWALE (CONVEYA NCE)	3833	36	23.13	90	0.22	1.19	115.4 8	0.34	3.1 1
<b>57. 19003 White Birch Armory</b>	GRASS SWALE (CONVEYA NCE)	2581 1	36	23.13	90	0.94	5.13	499.2 9	1.47	4.8 4
<b>58. 29 Littleworth Road Dover</b>	BIORETEN TION	9485 .8	63	40	100	1.35	7.24	452.8 7	1.2	2.1 8
<b>59. Hanson Court Apartments</b>	INFILTRATI ON TRENCH	1866	100	100	100	0.43	3.1	96.57	0.22	2.3 4
<b>60. Broadview Urgent Care Animal Hospital</b>	EXTENDE D DRY DETENTIO N POND	1220	8.24	6.38	38.48	0.11	0.72	108.9 2	0.75	0.4 5

<b>61. Leathers Lane</b>	WET POND/CREATED WETLAND	15684	62.03	39.42	85.42	2.76	12.62	851.14	2.27	1.9
<b>62. Leathers Lane</b>	WET POND/CREATED WETLAND	56784	63	40	86	4.99	22.79	1525.09	4.04	3.87
<b>63. Leathers Lane</b>	INFILTRATION BASIN	1184	49.18	66.75	78.63	2.2	21.46	786.89	2.28	0.14
<b>64. SILVE1-010-RG</b>	BIORETENTION	131.52	55.08	34.08	99.42	0.03	0.15	11.26	0.03	1.21
<b>65. SILVE1-020-RG</b>	BIORETENTION	180.23	6.32	4.06	19.86	0.12	0.67	82.44	1.1	0.05
<b>66. SILVE1-022-RG</b>	BIORETENTION	255.77	53.07	32.07	99.01	0.07	0.34	26.16	0.07	1.01
<b>67. SILVE1-030-RG</b>	BIORETENTION	129.67	63	40	100	0.01	0.06	3.77	0.01	3.57
<b>68. SILVE1-040-RG</b>	BIORETENTION	95.53	63	40	100	0.01	0.06	3.77	0.01	2.63
<b>69. Storage Barn (Lot 12-2)</b>	WET POND/CREATED WETLAND	2849	50.55	31.51	75.53	0.78	4.13	247.99	0.87	0.9
<b>70. L&amp;T Dental</b>	BIORETENTION	1388	63	40	100	0.19	1.03	64.16	0.17	2.25

<b>71. L&amp;T Dental</b>	POROUS PAVEMENT	162	78	79	97	0.24	2.03	62.23	0.17	0.26
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**Table 3. Non-Structural Project Summary for DOVER, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Runoff Depth (in.)
<b>21. Storage Barn (Lot 12-2)</b>	CATCH BASIN CLEANING	N/A	2	6	0	0.01	0.16	0	0.18	N/A

**Table 4. Land Use Conversion Project Summary for DOVER, NEW HAMPSHIRE**

There are no land use conversion projects.

<b>State</b>	NEW HAMPSHIRE
<b>Municipality</b>	NEWINGTON
<b>Permit Type</b>	MS4
<b>Permit Number</b>	
<b>Major Watershed</b>	N/A
<b>TP Load Reduction Target</b>	N/A
<b>TN Load Reduction Target</b>	N/A
<b>TSS Load Reduction Target</b>	N/A

**Table 1. Project Summary Credit for NEWINGTON, NEW HAMPSHIRE**

<b>Project Type</b>	<b>Removed Phosphorus Load (lb/yr)</b>	<b>Removed Nitrogen Load (lb/yr)</b>	<b>Removed Sediment Load (lb/yr)</b>
<b>Structural</b>	1.79	6.87	535.54
<b>Non-Structural</b>	0	0	0
<b>Land Use Conversion</b>	0	0	0
<b>Total</b>	1.79	6.87	535.54

**Table 2. Structural Project Summary for NEWINGTON, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity (ft <sup>3</sup> )/ Filter Depth (in.)	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Runoff Depth (in.)
85. Shackford Point	BIORETENTION	11245	63	40	100	0.47	1.8	140.46	0.32	9.68
86. Shackford Point	BIORETENTION	2837	63	40	100	0.1	0.39	30.73	0.07	11.16
87. Shackford Point	BIORETENTION	13056	63	40	100	0.72	2.76	215.09	0.49	7.34
88. Shackford Point	BIORETENTION	9668	63	40	100	0.12	0.45	35.12	0.08	33.29
89. Shackford Point	BIORETENTION	4912	63	40	100	0.12	0.45	35.12	0.08	16.91
90. Shackford Point	BIORETENTION	5484	63	40	100	0.13	0.51	39.51	0.09	16.79
91. Shackford Point	BIORETENTION	4261	63	40	100	0.13	0.51	39.51	0.09	13.04

**Table 3. Non-Structural Project Summary for NEWINGTON, NEW HAMPSHIRE**

There are no non-structural BMPs.

**Table 4. Land Use Conversion Project Summary for NEWINGTON, NEW HAMPSHIRE**

There are no land use conversion projects.

<b>State</b>	NEW HAMPSHIRE
<b>Municipality</b>	PORTSMOUTH
<b>Permit Type</b>	MS4
<b>Permit Number</b>	
<b>Major Watershed</b>	N/A
<b>TP Load Reduction Target</b>	N/A
<b>TN Load Reduction Target</b>	N/A
<b>TSS Load Reduction Target</b>	N/A

**Table 1. Project Summary Credit for PORTSMOUTH, NEW HAMPSHIRE**

<b>Project Type</b>	<b>Removed Phosphorus Load (lb/yr)</b>	<b>Removed Nitrogen Load (lb/yr)</b>	<b>Removed Sediment Load (lb/yr)</b>
<b>Structural</b>	90.64	807.85	40268.9
<b>Non-Structural</b>	1.15	24.97	0
<b>Land Use Conversion</b>	0	0	0
<b>Total</b>	91.79	832.82	40268.9



**Table 2. Structural Project Summary for PORTSMOUTH, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity (ft <sup>3</sup> )/Filter Depth (in.)	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Imperious Area Treated (ac)	Run off Depth (in.)
<b>1. Watson's Landing</b>	BIORETENTION	5793	46	29.5	97.5	2.06	9.48	975.78	2.28	0.7
<b>2. Parson Woods Condominium LU-21-74</b>	ENHANCED BIORETENTION	37400	89	86	100	3.21	28.74	1040.31	2.37	4.35
<b>3. Parson Woods Condominium LU-21-74</b>	ENHANCED BIORETENTION	15700	89	86	100	0.99	8.85	320.43	0.73	5.92
<b>4. Parson Woods Condominium LU-21-74</b>	INFILTRATION BASIN	4000	98.8	100	100	0.32	2.96	92.18	0.21	5.25
<b>5. Parson Woods Condominium LU-21-74</b>	GRAVEL WETLAND	21000	66	79	99	1.97	21.83	851.74	1.96	2.95

<b>6. Monarch Village - 3548 Lafayette Road</b>	INFILTRATION TRENCH	7923	100	100	100	3.38	28.65	717.04	1.9	1.15
<b>7. Monarch Village - 3548 Lafayette Road</b>	INFILTRATION TRENCH	470	99.05	100	100	0.28	2.41	60.38	0.16	0.81
<b>8. Collins - 77 Meredith Way LU-22-61</b>	INFILTRATION BASIN	1738	98.8	100	100	0.11	0.99	30.73	0.07	6.84
<b>9. Collins - 77 Meredith Way LU-22-61</b>	INFILTRATION BASIN	1842	91.5	98	99	0.1	0.97	30.42	0.07	7.25
<b>10. Proposed Multi-Family Residential Development - 960 Sagamore Avenue</b>	POROUS PAVEMENT	1201.5	78	79	97	0.11	0.95	29.29	0.08	4.14
<b>11. Proposed Multi-Family Residential Development - 960 Sagamore Avenue</b>	INFILTRATION BASIN	588	94.79	98.53	100	0.32	2.82	71.7	0.19	0.85
<b>12. Islington Street Corridor Improvements - Phase 2</b>	BIORETENTION	31.2	14.82	9.52	45.86	0.03	0.11	16.1	0.08	0.11
<b>13. Islington Street Corridor Improvements - Phase 2</b>	BIORETENTION	31.2	38.04	23.74	91.89	0.02	0.07	8.07	0.02	0.43
<b>14. Islington Street Corridor Improvements - Phase 2</b>	BIORETENTION	31.2	8.6	5.53	27.01	0.03	0.11	16.6	0.14	0.06
<b>15. Islington Street Corridor Improvements - Phase 2</b>	BIORETENTION	31.2	13.37	8.6	42.02	0.03	0.11	16.6	0.09	0.1

<b>16. Islington Street Corridor Improvements - Phase 2</b>	BIORETE NTION	31.2	14.82	9.52	45.8 6	0.03	0.11	16.1	0.08	0.1 1
<b>17. Islington Street Corridor Improvements - Phase 2</b>	BIORETE NTION	31.2	4.46	2.87	14.0 1	0.03	0.11	16.6	0.27	0.0 3
<b>18. Islington Street Corridor Improvements - Phase 2</b>	BIORETE NTION	31.2	12.03	7.74	37.8 2	0.03	0.11	16.6	0.1	0.0 9
<b>19. 2454 Lafayette Road - Portsmouth Green - Multi-Family Development</b>	INFILTRA TION BASIN	235 0	62.52	77.7 2	81.5 6	6.21	65.4	1717 .58	5.58	0.1 2
<b>20. 2454 Lafayette Road - Portsmouth Green - Multi-Family Development</b>	INFILTRA TION BASIN	150 33	100	100	100	7.16	60.6 2	1517 .11	4.02	1.0 3
<b>21. Four Tree Island Parking Lot</b>	POROUS PAVEME NT	280 0	78	79	97	0.55	5.12	195. 86	0.46	1.6 8
<b>22. Sagamore Bridge</b>	SAND FILTER	106 5	50.23	31.4 5	98.4 5	0.32	1.46	142. 6	0.33	0.8 9
<b>23. Plains Park</b>	INFILTRA TION TRENCH	315	50.77	79.5 4	71.8 1	0.37	5.38	151. 3	0.48	0.1 8
<b>24. Plains Park</b>	POROUS PAVEME NT	247 6	78	79	97	0.3	2.78	106. 45	0.25	2.7 3
<b>25. Coakley Road - Hodgdon Brook</b>	BIORETE NTION	742	35.71	22.2 5	88.6 4	0.38	1.69	210. 1	0.54	0.3 8

<b>26. Coakley Road - Hodgdon Brook</b>	BIORETE NTION	574	19.26	12.3 4	55.9 5	0.4	1.86	262. 76	1.07	0.1 5
<b>27. Portsmouth Rec Fields and Regional Stormwater BMP's</b>	ENHANC ED BIORETE NTION	290 78	45.44	52.4 3	82.2 5	17.27	184. 81	9025 .48	25	0.3 2
<b>28. Portsmouth Rec Fields and Regional Stormwater BMP's</b>	GRAVEL WETLAN D	344 99	24.85	31.2	58.8 7	19.55	227. 68	1337 5.25	51.76	0.1 8
<b>29. State Street</b>	BIORETE NTION	147	16.1	10.3 4	48.7 8	0.1	0.53	62.5 9	0.34	0.1 2
<b>30. State Street</b>	SAND FILTER	350 6	10.02	6.44	31.4 8	2.41	13.1 1	1603 .79	13.5	0.0 7
<b>31. Sagamore Ave</b>	POROUS PAVEME NT	154 2	78	79	97	0.61	4.46	170. 31	0.4	1.0 6
<b>32. 85 NH Avenue</b>	GRASS SWALE (CONVEY ANCE)	115 50	23.79	14.8 4	82.4 4	1.26	5.67	980. 64	2.71	1.1 7
<b>33. 67, 73, 121 Corporate Drive</b>	SAND FILTER	794 57	63	40	100	4.7	25.2 7	1581 .26	4.19	5.2 2
<b>34. 67, 73, 121 Corporate Drive</b>	SAND FILTER	420 20	63	40	100	2.48	13.3 3	834. 03	2.21	5.2 4
<b>35. 67, 73, 121 Corporate Drive</b>	SAND FILTER	326 41	63	40	100	1.93	10.3 8	649. 11	1.72	5.2 3

<b>36. 67, 73, 121 Corporate Drive</b>	SAND FILTER	789 4	63	40	100	0.46	2.47	154. 73	0.41	5.3
<b>37. 67, 73, 121 Corporate Drive</b>	SAND FILTER	128 33	63	40	100	0.75	4.04	252. 85	0.67	5.2 8
<b>38. Sanderson Drive</b>	BIORETE NTION	144 4	53.75	32.7 5	99.1 5	0.39	1.71	161. 03	0.37	1.0 8
<b>39. Sanderson Drive</b>	ENHANC ED BIORETE NTION	265 9	89	86	100	0.63	4.37	158. 02	0.36	2.0 3
<b>40. Laurel Court</b>	INFILTRA TION BASIN	335 86	98.8	100	100	4.78	34.8 3	1084 .21	2.47	3.7 5
<b>41. Bioretention Systems for Hodgson Brook. Colonial Drive and Schurman Avenue, Portsmouth, NH.</b>	BIORETE NTION	587. 88	25.15	16.0 9	69.2 7	0.39	1.81	243. 24	0.8	0.2
<b>42. Maplewood Avenue Project Pocket Pond</b>	WET POND/C REATED WETLAN D	293 59	63	40	86	1.31	5.98	400. 15	1.06	7.6 3
<b>43. Bioretention Systems for Hodgson Brook. Greenside and Sutton Ave, Portsmouth, NH.</b>	BIORETE NTION	495. 8	32.51	20.3 8	82.7 7	0.27	1.21	152. 6	0.42	0.3 3
<b>44. 145 Lang Road - Arbor View Apartments</b>	BIORETE NTION	290 0	53.65	32.6 5	99.1 3	0.93	3.45	326. 35	0.75	1.0 7
<b>45. 145 Lang Road - Arbor View Apartments</b>	BIORETE NTION	815	53.21	32.2 1	99.0 4	0.27	1	95.6 4	0.22	1.0 2

<b>46. 1169 &amp; 1171 Sagamore Avenue - Sagamore Avenue Condominiums</b>	BIORETENTION	688	58.79	37.48	100	0.16	0.63	52.67	0.12	1.58
<b>47. 1169 &amp; 1171 Sagamore Avenue - Sagamore Avenue Condominiums</b>	BIORETENTION	1237	63	40	100	0.22	0.85	65.84	0.15	2.27
<b>48. 1169 &amp; 1171 Sagamore Avenue - Sagamore Avenue Condominiums</b>	INFILTRATION TRENCH	5489	93.3	97	99	0.95	6.02	191.21	0.44	3.44
<b>49. 1169 &amp; 1171 Sagamore Avenue - Sagamore Avenue Condominiums</b>	INFILTRATION TRENCH	288	95	98	100	0.04	0.28	8.78	0.02	3.97
<b>50. 1169 &amp; 1171 Sagamore Avenue - Sagamore Avenue Condominiums</b>	INFILTRATION TRENCH	190	93.3	97	99	0.04	0.27	8.69	0.02	2.62

**Table 3. Non-Structural Project Summary for PORTSMOUTH, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Runoff Depth (in.)
<b>3. Good Housekeeping 2024</b>	CATCH BASIN CLEANING	N/A	2	6	0	1.11	23.85	0	28.19	N/A
<b>5. 145 Maplewood Avenue</b>	CATCH BASIN CLEANING	N/A	2	6	0	0.02	0.58	0	0.64	N/A

<b>9. Route 33 Skate Park and Recreational Facility</b>	CATCH BASIN CLEANING	N/A	2	6	0	0.03	0.54	0	0.64	N/A
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**Table 4. Land Use Conversion Project Summary for PORTSMOUTH, NEW HAMPSHIRE**

There are no land use conversion projects.

Cell Legend:

Required User Input
Automatic Calculations
Calculated Credit

Credit Calculation from Tech Memo Measured Method	
Equations	
Equation 1	$Dry\ mass\ (lb) = Wet\ Mass\ (lb) \times (1 - Average\ Moisture\ Content)$
Equation 2	$TN\ or\ TP\ removed\ (lb) = Dry\ Mass\ lb \times TN\ or\ TP\ concentration\ mg/kg \times 1 \times 10^{-6}$
Equation 3*	$Wet\ Mass\ (lb) = Volume\ (ft^3) \times Average\ Wet\ Bulk\ Density\ (lb/ft^3)$

\*in development

Town
Portsmouth

Nutrient and Moisture Content from Tech Memo Measured Method				
Season	Average Wet Bulk Density*	Average Moisture Content	TP per dry sample	TN per dry sample
	<i>lb/ft<sup>3</sup></i>		<i>mg/kg</i>	<i>mg/kg</i>
Fall (Sept-Dec)	8.61	48%	857	2,762
Non-fall (Jan-Aug)	57.73	22%	414	994

\*in development

Measured Credit									
This method requires <b>undried weight or volume</b> of sweepings collected as well as the <b>season</b> in which they were collected									
ID	User Entry				Calculations		Credit Received		
	Wet Weight of Sweepings (lb)	Volume of Sweepings (yd <sup>3</sup> )*	Season	Date	Notes	Wet Weight (kg)	Dry Weight (kg)	TP removed (lb)	TN removed (lb)
1	274,000		Fall (Sept-Dec)	7/30/2024	1. Good Housekeeping 2024	124,545	64,764	122.1	393.5
2	826,000		Non-fall (Jan-Aug)	7/30/2024	2. Good Housekeeping 2024	375,455	292,855	266.7	640.4
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<b>TOTAL</b>	<b>1,100,000</b>					<b>500,000</b>	<b>357,618</b>	<b>388.8</b>	<b>1,033.9</b>



## Summary of Nitrogen Reduction Calculations

The example calculations were shown starting from a single residence and ending with the annual TN reduction (lb/yr) by shifting the TN load from point-of-use septic to sewer to the WWTP. The assumptions in the calculations were: 2.46 persons/household, current level of conservation, a peaking factor of 6, an average TN concentration of 40 mg/L of the untreated domestic wastewater, and a treated effluent concentration at the WWTP of 8 mg/L. If these assumptions remain true, the calculations can be simplified by combining the above assumptions to a conversion factor. Calculations of the annual TN reduction (lb/yr) are shown below for two common cases with different starting parameters.

Starting with the number of households converted from point-of-use septic to sewer

$$\text{Annual TN Reduction } \left(\frac{\text{lb}}{\text{yr}}\right) = 17.10 \frac{\text{lb}}{\text{yr}} \times \text{Number of Households}$$

Starting with the maximum daily flow switched from point-of-use septic to sewer

$$\text{Annual TN Reduction } \left(\frac{\text{lb}}{\text{yr}}\right) = 0.09746 \frac{\text{day-lb}}{\text{gal-yr}} \times \text{Maximum Daily Flow switched (GPD)}$$

### Portsmouth

2024-09-18

Number of Households converted:	51
Point of Use Change (GPD):	8,950
<b>Annual TN Reduction (lb/yr):</b>	<b>872</b>

<b>State</b>	NEW HAMPSHIRE
<b>Municipality</b>	ROCHESTER
<b>Permit Type</b>	MS4
<b>Permit Number</b>	
<b>Major Watershed</b>	N/A
<b>TP Load Reduction Target</b>	N/A
<b>TN Load Reduction Target</b>	N/A
<b>TSS Load Reduction Target</b>	N/A

**Table 1. Project Summary Credit for ROCHESTER, NEW HAMPSHIRE**

<b>Project Type</b>	<b>Removed Phosphorus Load (lb/yr)</b>	<b>Removed Nitrogen Load (lb/yr)</b>	<b>Removed Sediment Load (lb/yr)</b>
<b>Structural</b>	660.35	3658.68	279195.47
<b>Non-Structural</b>	2.73	49.8	0
<b>Land Use Conversion</b>	0	0	0
<b>Total</b>	663.08	3708.48	279195.47

**Table 2. Structural Project Summary for ROCHESTER, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity (ft <sup>3</sup> )/ Filter Depth (in.)	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Run off Depth (in.)
<b>155. SWT0182</b>	INFILTRATION BASIN	35828.1	90	96	99	26.35	238.14	6145.98	16.45	0.6
<b>156. SWT0183</b>	INFILTRATION BASIN	1372.14	90	96	99	1.01	9.12	235.38	0.63	0.6
<b>157. SWT0184</b>	INFILTRATION BASIN	174.24	90	96	99	0.13	1.16	29.89	0.08	0.6
<b>158. Woodman Street Bioretention BMPs</b>	BIORETENTION	4356	63	40	100	0.67	3.62	226.43	0.6	2
<b>159. Woodman Street Bioretention BMPs</b>	BIORETENTION	943.8	63	40	100	0.15	0.78	49.06	0.13	2
<b>160. Woodman Street Bioretention BMPs</b>	BIORETENTION	508.2	63	40	100	0.08	0.42	26.42	0.07	2
<b>161. 400 North Main Street - Proposed Auto Dealer</b>	BIORETENTION	36333	63	40	100	1.63	8.75	547.22	1.45	6.9
<b>162. 400 North Main Street - Proposed Auto Dealer</b>	INFILTRATION BASIN	17524	98.8	100	100	3.59	30.76	769.88	2.04	2.37

<b>163. 400 North Main Street - Proposed Auto Dealer</b>	ENHANCED BIORETENTION	16040	89	86	100	1.19	9.73	283.04	0.75	5.89
<b>164. 400 North Main Street - Proposed Auto Dealer</b>	INFILTRATION BASIN	31619	98.8	100	100	3.41	29.26	732.14	1.94	4.49
<b>165. SWT0031</b>	WET POND/CREATED WETLAND	32452.2	44	28	68	12.85	58.83	4447.44	14.9	0.6
<b>166. SWT0095</b>	WET POND/CREATED WETLAND	51183	44	28	68	20.27	92.78	7014.42	23.5	0.6
<b>167. SWT0053</b>	EXTENDED DRY DETENTION POND	4726.26	9	8.56	40	0.38	2.62	381.01	2.17	0.6
<b>168. SWT0091</b>	WET POND/CREATED WETLAND	44932.14	44	28	68	17.79	81.45	6157.77	20.63	0.6
<b>169. SWT0097</b>	WET POND/CREATED WETLAND	20298.96	44	28	68	9.51	36.8	2781.89	9.32	0.6
<b>170. SWT0108</b>	WET POND/CREATED WETLAND	8886.24	44	28	68	3.52	16.11	1217.82	4.08	0.6

	TED WETLAND									
<b>171. SWT0185</b>	INFILTRATION BASIN	87.12	90	96	99	0.06	0.58	14.94	0.04	0.6
<b>172. SWT0186</b>	INFILTRATION BASIN	370.26	90	96	99	0.27	2.46	63.51	0.17	0.6
<b>173. SWT0188</b>	INFILTRATION BASIN	2134.44	90	96	99	1.57	14.19	366.14	0.98	0.6
<b>174. SWT0187</b>	INFILTRATION BASIN	566.28	90	96	99	0.42	3.76	97.14	0.26	0.6
<b>175. SWT0065</b>	EXTENDED DRY DETENTION POND	2047.32	9	8.56	40	0.17	1.13	165.05	0.94	0.6
<b>176. SWT0068</b>	EXTENDED DRY DETENTION POND	1219.68	9	8.56	40	0.12	0.68	98.32	0.56	0.6
<b>177. SWT0139</b>	EXTENDED DRY DETENTION POND	5728.14	9	8.56	40	0.46	3.17	461.78	2.63	0.6
<b>178. SWT0144</b>	GRAVEL WETLAND	92303.64	51	57	91	38.47	364.28	14554.35	42.38	0.6
<b>179. SWT0030</b>	INFILTRATION BASIN	2809.62	90	96	99	2.28	17.46	560.58	1.29	0.6

<b>180. SWT0069</b>	INFILTRATIO N BASIN	22476.9 6	90	96	99	16.53	149.4	3855.7 2	10.32	0.6
<b>181. SWT0041</b>	WET POND/CREA TED WETLAND	63423.3 6	44	28	68	22.81	122.9 6	7472.9 3	29.12	0.6
<b>182. SWT0175</b>	GRASS SWALE (CONVEYAN CE)	225902. 16	13	8.56	70	26.43	125.1 4	31869. 53	103.72	0.6
<b>183. SWT0175</b>	GRASS SWALE (CONVEYAN CE)	225902. 16	13	8.56	70	26.43	125.1 4	31869. 53	103.72	0.6
<b>184. SWT0059</b>	GRASS SWALE (CONVEYAN CE)	98075.3 4	13	8.56	70	11.47	54.33	13836. 14	45.03	0.6
<b>185. SWT0003</b>	WET POND/CREA TED WETLAND	22498.7 4	44	28	68	8.91	40.78	3083.3 6	10.33	0.6
<b>186. SWT0008</b>	WET POND/CREA TED WETLAND	36198.3 6	44	28	68	13.02	70.18	4265.1 1	16.62	0.6

<b>187. SWT0013</b>	WET POND/CREATED WETLAND	8820.9	44	28	68	3.49	15.99	1208.87	4.05	0.6
<b>188. SWT0020</b>	WET POND/CREATED WETLAND	179358.3	44	28	68	64.5	347.71	21133.09	82.35	0.6
<b>189. SWT0026</b>	WET POND/CREATED WETLAND	120748.32	44	28	68	47.81	218.88	16548.06	55.44	0.6
<b>190. SWT0027</b>	WET POND/CREATED WETLAND	283.14	44	28	68	0.11	0.51	38.8	0.13	0.6
<b>191. SWT0028</b>	WET POND/CREATED WETLAND	103433.22	44	28	68	40.96	187.49	14175.1	47.49	0.6
<b>192. SWT0029</b>	WET POND/CREATED WETLAND	1350.36	44	28	68	0.53	2.45	185.06	0.62	0.6
<b>193. SWT0043</b>	WET POND/CREATED WETLAND	588.06	44	28	68	0.28	1.07	80.59	0.27	0.6

<b>194. SWT0045</b>	WET POND/CREATED WETLAND	2940.3	44	28	68	1.16	5.33	402.96	1.35	0.6
<b>195. SWT0046</b>	WET POND/CREATED WETLAND	27159.6 6	44	28	68	10.75	49.23	3722.1 2	12.47	0.6
<b>196. SWT0047</b>	WET POND/CREATED WETLAND	24132.2 4	44	28	68	9.56	43.74	3307.2 2	11.08	0.6
<b>197. SWT0048</b>	WET POND/CREATED WETLAND	914.76	44	28	68	0.36	1.66	125.36	0.42	0.6
<b>198. SWT0049</b>	WET POND/CREATED WETLAND	3550.14	44	28	68	1.41	6.44	486.53	1.63	0.6
<b>199. SWT0054</b>	WET POND/CREATED WETLAND	8385.3	44	28	68	3.32	15.2	1149.1 7	3.85	0.6
<b>200. SWT0056</b>	WET POND/CREATED WETLAND	22629.4 2	44	28	68	8.96	41.02	3101.2 7	10.39	0.6



<b>201. SWT0057</b>	WET POND/CREATED WETLAND	4791.6	44	28	68	1.9	8.69	656.67	2.2	0.6
<b>202. SWT0058</b>	WET POND/CREATED WETLAND	5488.56	44	28	68	2.17	9.95	752.18	2.52	0.6
<b>203. SWT0060</b>	WET POND/CREATED WETLAND	12806.6 4	44	28	68	5.07	23.21	1755.1	5.88	0.6
<b>204. SWT0061</b>	WET POND/CREATED WETLAND	24001.5 6	44	28	68	9.5	43.51	3289.3 2	11.02	0.6
<b>205. SWT0062</b>	WET POND/CREATED WETLAND	8668.44	44	28	68	3.43	15.71	1187.9 7	3.98	0.6
<b>206. SWT0063</b>	WET POND/CREATED WETLAND	28205.1	44	28	68	11.17	51.13	3865.3 9	12.95	0.6
<b>207. SWT0066</b>	WET POND/CREATED WETLAND	4595.58	44	28	68	1.82	8.33	629.81	2.11	0.6

<b>208. SWT0067</b>	WET POND/CREATED WETLAND	12610.6 2	44	28	68	4.99	22.86	1728.2 3	5.79	0.6
<b>209. SWT0071</b>	WET POND/CREATED WETLAND	54297.5 4	44	28	68	25.45	98.42	7441.2 6	24.93	0.6
<b>210. SWT0080</b>	WET POND/CREATED WETLAND	34804.4 4	44	28	68	13.78	63.09	4769.8 1	15.98	0.6
<b>211. SWT0092</b>	WET POND/CREATED WETLAND	6751.8	44	28	68	2.67	12.24	925.31	3.1	0.6
<b>212. SWT0098</b>	WET POND/CREATED WETLAND	40249.4 4	44	28	68	15.94	72.96	5516.0 2	18.48	0.6
<b>213. SWT0129</b>	WET POND/CREATED WETLAND	4573.8	44	28	68	1.81	8.29	626.82	2.1	0.6
<b>214. SWT0131</b>	WET POND/CREATED WETLAND	6098.4	44	28	68	2.41	11.05	835.76	2.8	0.6

<b>215. SWT0133</b>	WET POND/CREATED WETLAND	13960.9 8	44	28	68	5.53	25.31	1913.3	6.41	0.6
<b>216. SWT0134</b>	WET POND/CREATED WETLAND	17685.3 6	44	28	68	7	32.06	2423.7 1	8.12	0.6
<b>217. SWT0135</b>	WET POND/CREATED WETLAND	10606.8 6	44	28	68	4.2	19.23	1453.6 3	4.87	0.6
<b>218. SWT0136</b>	WET POND/CREATED WETLAND	21453.3	44	28	68	8.49	38.89	2940.0 9	9.85	0.6
<b>219. SWT0147</b>	WET POND/CREATED WETLAND	18447.6 6	44	28	68	7.3	33.44	2528.1 8	8.47	0.6
<b>220. SWT0150</b>	WET POND/CREATED WETLAND	3528.36	44	28	68	1.27	6.84	415.73	1.62	0.6
<b>221. SWT0151</b>	WET POND/CREATED WETLAND	1698.84	44	28	68	0.61	3.29	200.17	0.78	0.6

<b>222. SWT0004</b>	WET POND/CREATED WETLAND	67626.9	44	28	68	24.32	131.11	7968.21	31.05	0.6
<b>223. SWT0180</b>	INFILTRATION BASIN	2003.76	90	96	99	1.62	12.45	399.8	0.92	0.6
<b>224. SWT0064</b>	WET POND/CREATED WETLAND	2700.72	44	28	68	1.07	4.9	370.12	1.24	0.6
<b>225. Strafford Square Roundabout</b>	INFILTRATION BASIN	4860	98.03	99.68	100	5.69	35.14	1097.38	2.5	0.54
<b>226. Ten Rod RD</b>	EXTENDED DRY DETENTION POND	6926	9.36	9.04	40.72	0.65	3.83	536.22	3	0.64
<b>227. Ten Rod RD</b>	BIORETENTION	2287	44.6	28.45	97.15	1.03	4.01	426.44	1	0.63
<b>228. 160 Washington St</b>	EXTENDED DRY DETENTION POND	2877	10.93	11.16	43.85	0.19	1.68	165.49	1	0.79
<b>229. Chestnut Hill Rd</b>	EXTENDED DRY DETENTION POND	32670	9	8.56	40	2.4	19.36	2264.34	15	0.6

<b>230. 102 AIRPORT DR</b>	EXTENDED DRY DETENTION POND	6389	8.93	8.37	39.87	0.48	3.78	451.36	3	0.59
<b>231. Farmington Rd</b>	EXTENDED DRY DETENTION POND	24569	9.15	8.76	40.31	1.79	14.54	1673.2 2	11	0.62
<b>232. Farmington Rd</b>	EXTENDED DRY DETENTION POND	1938	8.67	7.61	39.34	0.15	1.15	148.46	1	0.53
<b>233. 15 Oak St</b>	EXTENDED DRY DETENTION POND	7798	8.69	7.66	39.37	0.53	4.32	691.27	4	0.54
<b>234. 20 INDUSTRIAL WAY</b>	INFILTRATION BASIN	1954	87.22	94.77	98.07	1.55	14.29	370.12	1	0.54
<b>235. 20 INDUSTRIAL WAY</b>	BIORETENTION	4443	44.24	28.18	97.06	1.57	8.5	732.59	2	0.61
<b>236. 21 FARMINGTON RD</b>	INFILTRATION BASIN	1504	96.21	99.07	100	1.71	14.94	377.39	1	0.41
<b>237. 248 North Main St</b>	EXTENDED DRY DETENTION POND	1097	7.02	4.33	34.58	0.12	0.65	130.49	1	0.3

<b>238. 280 NO MAIN ST</b>	EXTENDED DRY DETENTION POND	32670	9	8.56	40	2.4	19.36	2264.34	15	0.6
<b>239. 301 North Main St</b>	GRAVEL WETLAND	3570	45.59	52.13	86.13	1.62	15.72	650.08	2	0.49
<b>240. 49 INNOVATION DR</b>	GRAVEL WETLAND	1471	41.26	48.24	82.24	0.73	7.27	310.35	1	0.41
<b>241. 49 INNOVATION DR</b>	INFILTRATION BASIN	8734	90.03	96.02	99.01	6.41	57.92	1494.58	4	0.6
<b>242. 49 INNOVATION DR</b>	INFILTRATION BASIN	1437	80.57	91.69	95.96	1.43	13.83	362.14	1	0.4
<b>243. Country Brook Est</b>	EXTENDED DRY DETENTION POND	3604	8.48	7.07	38.96	0.39	1.99	342.07	2	0.5
<b>244. 83 Farmington Rd</b>	EXTENDED DRY DETENTION POND	3954	8.72	7.76	39.45	0.31	2.34	297.73	2	0.54
<b>245. 88 AIRPORT DR</b>	EXTENDED DRY DETENTION POND	7488	9.88	9.74	41.75	0.53	4.41	472.7	3	0.69

**Table 3. Non-Structural Project Summary for ROCHESTER, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Runoff Depth (in.)
41. CB cleaning 2023-2024	CATCH BASIN CLEANING	N/A	2	6	0	2.73	49.8	0	58.86	N/A

**Table 4. Land Use Conversion Project Summary for ROCHESTER, NEW HAMPSHIRE**

There are no land use conversion projects.

Cell Legend:

Required User Input
Automatic Calculations
Calculated Credit

Credit Calculation from Tech Memo Measured Method	
Equations	
Equation 1	$Dry\ mass\ (lb) = Wet\ Mass\ (lb) \times (1 - Average\ Moisture\ Content)$
Equation 2	$TN\ or\ TP\ removed\ (lb) = Dry\ Mass\ lb \times TN\ or\ TP\ concentration\ mg/kg \times 1 \times 10^{-6}$
Equation 3*	$Wet\ Mass\ (lb) = Volume\ (ft^3) \times Average\ Wet\ Bulk\ Density\ (lb/ft^3)$

\*in development

Town
Rochester

Nutrient and Moisture Content from Tech Memo Measured Method				
Season	Average Wet Bulk Density*	Average Moisture Content	TP per dry sample	TN per dry sample
	lb/ft <sup>3</sup>		mg/kg	mg/kg
Fall (Sept-Dec)	8.61	48%	857	2,762
Non-fall (Jan-Aug)	57.73	22%	414	994

\*in development

Measured Credit									
This method requires <b>undried weight or volume</b> of sweepings collected as well as the <b>season</b> in which they were collected									
ID	User Entry				Calculations		Credit Received		
	Wet Weight of Sweepings (lb)	Volume of Sweepings (yd <sup>3</sup> )*	Season	Date	Notes	Wet Weight (kg)	Dry Weight (kg)	TP removed (lb)	TN removed (lb)
1		70	Fall (Sept-Dec)	7/22/2024	39. Street Sweeping 2023-202	7,401	3,848	7.3	23.4
2		196	Non-fall (Jan-Aug)	7/22/2024	40. Street Sweeping 2023-202	138,865	108,315	98.7	236.9
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<b>TOTAL</b>		<b>266.0</b>				<b>146,266</b>	<b>112,163</b>	<b>105.9</b>	<b>260.2</b>



## Summary of Nitrogen Reduction Calculations

The example calculations were shown starting from a single residence and ending with the annual TN reduction (lb/yr) by shifting the TN load from point-of-use septic to sewer to the WWTP. The assumptions in the calculations were: 2.5 persons/household, current level of conservation, a peaking factor of 6, an average TN concentration of 40 mg/L of the untreated domestic wastewater, and a treated effluent concentration at the WWTP of 8 mg/L. If these assumptions remain true, the calculations can be simplified by combining the above assumptions to a conversion factor. Calculations of the annual TN reduction (lb/yr) are shown below for two common cases with different starting parameters.

Starting with the number of households converted from point-of-use septic to sewer

$$\text{Annual TN Reduction } \left(\frac{\text{lb}}{\text{yr}}\right) = 17.10 \frac{\text{lb}}{\text{yr}} \times \text{Number of Households}$$

Starting with the maximum daily flow switched from point-of-use septic to sewer

$$\text{Annual TN Reduction } \left(\frac{\text{lb}}{\text{yr}}\right) = 0.09746 \frac{\text{day-lb}}{\text{gal-yr}} \times \text{Maximum Daily Flow switched (GPD)}$$

### Rochester

2024-09-16

Number of Households converted:	150
Point of Use Change (GPD):	26,300
Annual TN Reduction (lb/yr):	<b>2,560</b>

<b>State</b>	NEW HAMPSHIRE
<b>Municipality</b>	ROLLINSFORD
<b>Permit Type</b>	MS4
<b>Permit Number</b>	
<b>Major Watershed</b>	N/A
<b>TP Load Reduction Target</b>	N/A
<b>TN Load Reduction Target</b>	N/A
<b>TSS Load Reduction Target</b>	N/A

**Table 1. Project Summary Credit for ROLLINSFORD, NEW HAMPSHIRE**

<b>Project Type</b>	<b>Removed Phosphorus Load (lb/yr)</b>	<b>Removed Nitrogen Load (lb/yr)</b>	<b>Removed Sediment Load (lb/yr)</b>
<b>Structural</b>	12.35	128.23	3778.73
<b>Non-Structural</b>	0.14	2.95	0
<b>Land Use Conversion</b>	0	0	0
<b>Total</b>	12.49	131.18	3778.73

**Table 2. Structural Project Summary for ROLLINSFORD, NEW HAMPSHIRE**

Project ID	BMP Type	BMP Storage Capacity (ft <sup>3</sup> )/ Filter Depth (in.)	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Runoff Depth (in.)
252. Hall Street	INFILTRATION BASIN	1960	50.6	67.6	77.8	2.7	30.58	880.79	3	0.18
253. Partridge Lane	INFILTRATION BASIN	4860	93.89	98.02	99.3	6.63	49.75	1569.12	3.6	0.37
254. Old Mill Lane / Fresh Creek	INFILTRATION TRENCH	3600	45.57	77.92	69.43	3.02	47.9	1328.82	4.36	0.23

Table 3. Non-Structural Project Summary for ROLLINSFORD, NEW HAMPSHIRE

Project ID	BMP Type	BMP Storage Capacity	Phosphorus BMP Efficiency (%)	Nitrogen BMP Efficiency (%)	Sediment BMP Efficiency (%)	Removed Phosphorus Load (lb/yr)	Removed Nitrogen Load (lb/yr)	Removed Sediment Load (lb/yr)	Impervious Area Treated (ac)	Runoff Depth (in.)
51. Annual Catch Basin Cleaning	CATCH BASIN CLEANING	N/A	2	6	0	0.14	2.95	0	3.49	N/A

Table 4. Land Use Conversion Project Summary for ROLLINSFORD, NEW HAMPSHIRE

There are no land use conversion projects.



## **Appendix D**

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Municipal Alliance or Adaptive Management (MAAM)  
Intermunicipal Agreement

**INTERMUNICIPAL AGREEMENT**  
**FOR DEVELOPMENT OF AN ADAPTIVE WATER QUALITY MANAGEMENT PLAN**  
**FOR GREAT BAY ESTUARY**

The parties to this Intermunicipal Agreement are the City of Rochester, the City of Dover and the City of Portsmouth and those additional municipalities and towns that have executed this Agreement in accord with its provisions below.

**WHEREAS**, the U.S. Environmental Protection Agency Region I (“EPA”) issued the Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) on November 24, 2020 (the “General Permit”);

**WHEREAS**, municipalities and towns that own or operate any of 13 certain municipal wastewater treatment facilities covered by the General Permit may choose to Opt-In to the General Permit by April 2, 2021 and become permittees (the “Permittees”);

**WHEREAS**, the Cities of Rochester, Dover and Portsmouth operate wastewater treatment facilities in the Great Bay Estuary plan to Opt-In to the General Permit;

**WHEREAS**, the Cities of Rochester, Dover and Portsmouth are seeking to collaborate with each other, with other Permittees, with other communities in the watershed as well as with all involved regulators and stakeholders in an adaptive management framework addressing water quality and overall TN source reductions to the Great Bay estuary as described in Part 3 of the General Permit;

**WHEREAS**, the General Permit envisions the elements of an adaptive management framework for the Great Bay estuary as including (1) ambient water quality monitoring (2) pollution tracking (3) pollution reduction planning and implementation, and (4) review of significant scientific, methodological, and protective target nitrogen load issues of importance to the Permittees;

**WHEREAS**, the General Permit describes adaptive management implementation as including collaboration between Permittees and EPA, the State of New Hampshire through its Department of Environmental Services, (“NHDES”), and public, private, commercial, and other stakeholders including the Conservation Law Foundation (“CLF”);

**WHEREAS**, Permittees are required by the General Permit to submit a detailed proposal on or before July 31, 2021; and

**WHEREAS**, through this Intermunicipal Agreement, the Permittees seek to implement the Intermunicipal Plan For Adaptive Water Quality Management In the Great Bay Estuary dated December 14, 2020 (“Plan”) and included as Attachment 1.

**WHEREAS**, RSA 53-A:1 permits “...municipalities and counties to make the most efficient use of their powers by enabling them to cooperate with other municipalities and

counties on a basis of mutual advantage and thereby to provide services and facilities in a manner and pursuant to forms of governmental organization that will accord best with geographic, economic, population and other factors influencing the needs and development of local communities”;

**THEREFORE**, pursuant to RSA 53-A:3, the Permittees enter into this Agreement for the purposes described above as follows:

**I. DEFINITIONS**

- A. “Contribution Formula” that mechanism for allocating costs among the Members who are Permittees.
- B. “Executive Board” that administrative and management body charged with the responsibilities described in paragraph V.
- C. “Member” that municipality or town in the Great Bay estuary watershed, whether located in New Hampshire or Maine, that has indicated its intent to be a part of this Agreement by executing Attachment 2.
- D. “Recommended Annual Contribution for Monitoring” that amount recommended annually by the Executive Board and adopted by the Members for water quality monitoring and analysis.

**II. PURPOSE OF THIS AGREEMENT**

The purpose of this Agreement is to implement the Plan to improve water quality in the Great Bay estuary and to take such other and further collaborative action which may be agreed upon to fulfill or assist Permittees’ compliance with the General Permit. No separate corporate entity is being created as this instrument is intended to assist with joint administrative and executive functions associated with implementation of the Plan and to generate and coordinate funding recommendations necessary to implement the Plan.

**III. DURATION OF AGREEMENT**

The term of this Agreement runs from March 1, 2021 to February 28, 2026. This Agreement may be renewed for an additional term to be determined by vote of the majority of the Members.

**IV. MEMBERS**

- A. Membership. The initiating Members to this Agreement are: the City of Rochester acting through its City Manager; the City of Dover acting through its City Manager and the City of Portsmouth acting through its City Manager. Additional Members may be added to this Agreement by

executing Attachment 2 and identifying the acting authority (such as Town Manager, Town Administrator, Sewer Commission) and providing an executed Attachment 2 to the Executive Board . Any municipality or town in the Great Bay estuary watershed, whether located in New Hampshire or Maine, is eligible to be a Member.

The Members for purposes of this Agreement shall be called the Municipal Alliance for Adaptive Management.

- B. Organizational Meeting There will be an initial meeting of Members after the Opt-in date of April 2, 2021 but before April 30, 2021 to be set by the City Manager of the City of Rochester. The purpose of the meeting will be to have the Members vote on appointing up to two At-Large Members to the Executive Board and setting the recommended 2021 Contribution Goal. The Executive Board is further defined in Section V. Meetings are discussed further in Section VI.

#### V. EXECUTIVE BOARD

- A. Purpose and Authority of Executive Board. The Executive Board has the authority to enter into contracts on behalf of the Municipal Alliance for Adaptive Management in order to implement the Plan, to receive and manage funds by way of the fiscal agent (defined below), to approve bills and disbursements, to make funding recommendations and to circulate documents necessary in order to keep Members informed, to set the annual meeting of the members, to participate in discussions with stakeholders, and to conduct such other activities as the Executive Board deems necessary and proper to carry out the purposes of this Agreement. The Executive Board does not otherwise have authority to acquire or hold items of personal or real property.
- B. Officers. Beginning with its first meeting and then annually thereafter, the Executive Board shall elect a Chair, Vice Chair and a Clerk from the members of the Executive Board.
- C. Membership of Executive Board. The Executive Board shall be composed of three Standing Members consisting of the city managers of the City of Rochester, the City of Dover, and the City of Portsmouth. The Members may select up to two additional At-Large Members of the Executive Board from other communities.

At-Large Members of the Executive Board members shall be nominated at the Members' Organizational Meeting and serve through the expiration of the term of this Agreement. If this Agreement is renewed by the Members for an additional term, the Members will elect/re-elect At-Large Executive Board members at the meeting in which an extension of the term of this



Agreement is made. At-Large Executive Board Members must be Permittees.

There are no term limits for Executive Board members. Executive Board members may appoint designees if that designee has decision-making authority.

In the event any vacancy occurs for At-Large Executive Board Members, the Executive Board shall within thirty (30) days of the vacancy call a meeting of the Members so that the Members may select a replacement.

In the event more than three Members are communities from Maine, those members from Maine may request that the Executive Board be expanded to include a Member from Maine, which request will be granted provided there is an agreement on a formula for contribution to the activities contemplated by this Agreement.

- D. No Personal Liability. Executive Board members and its officers shall not be personally liable for any debt, liability or obligation of the Municipal Alliance for Adaptive Management. All persons having any claim against the Municipal Alliance for Adaptive Management may look only to its funds for payment of any such contract or claim, or for the payment of any debt, damages, judgment or decrees, or of any money that may otherwise become due and payable to them from the Municipal Alliance for Adaptive Management.

## VI. MEETINGS

- A. Annual meetings of the Members. After the initial Organizational Meeting a meeting of the Members shall be held at least annually in the last quarter of each calendar year. At the Annual Meeting the Members shall vote on the Recommended Contribution for the following calendar year.

Annual meetings of the Members shall be subject to the requirements of public meetings as required by NH RSA 91-A. Members shall have the ability to participate telephonically and by video conference as may be permitted under NH RSA 91-A.

Each Member is afforded one vote in all matters that require action. A majority vote of those Members present and voting shall be needed to act upon any business associated with this Agreement. One third of the total Membership shall constitute a quorum.

- B. Executive Board Meetings. The Executive Board shall meet at least biannually or more frequently at the call of the Chair at such times and places that are mutually convenient. The meetings of the Executive Board are not public meetings as that term is defined by NH RSA 91-A.

Voting. If there are three Executive Board Members, a quorum is two (2) Members. If there are five or more Executive Board members a quorum is three Members. All votes will pass by simple majority.

Attendance. Attendance for purposes of quorum and voting may be by telephone or video conference. A record of the actions taken by the Executive Board shall be distributed to the Members within ten (10) calendar days of any meeting. Distribution may be by e-mail.

## VII. WORK AND COST -SHARING

- A. Initial Water Quality Work. The Cities of Rochester, Dover and Portsmouth identified an initial scope of work necessary to initiate the adaptive management opportunity identified in Part 3 of the General Permit. Water quality specialists within the engineering firm of Brown and Caldwell were solicited to submit a proposal to complete the scope of work. Due to the time constraints imposed by the Permit and the schedule of other stakeholders including PREP to develop a water quality monitoring plan for the upcoming sampling season, the three cities entered into a memorandum of agreement to share equally the costs of the work described. The Memorandum of Agreement and the Scope of Work is set forth at Attachment 3. This paragraph is for informational purposes only and will not form a part of a request for financial contribution from other Members.
- B. Participation in Water Quality Monitoring, Data Gathering and Analysis. Members are expected to participate in the planning and cost of ambient water quality monitoring, data gathering and water quality analysis along with other stakeholders ("Annual Contribution for Monitoring"). The recommended formula for such cost sharing for Members who are Permittees is set forth in Attachment 4 ("Contribution Formula"). The Contribution Formula may be amended by a majority vote of the Members who are also Permittees.
- C. Recommended Annual Contribution for Monitoring. The Annual Contribution for Monitoring, in the aggregate for all Members, shall be no less than \$200,000 and no more than \$500,000. The Executive Board shall develop a Recommended Annual Contribution for Monitoring to be presented to the Members at the Members Annual Meeting in the fall of each calendar year. The Members who are also Permittees shall vote on and set the Recommended Annual Contribution for Monitoring. Members shall make good faith efforts to budget and appropriate the funds in accord with the Recommended Annual Contribution for Monitoring and Contribution Formula adopted at the Members Meeting.

- D. Other Work. The Executive Board may make such additional recommendations to the Members to finance other work consistent with the Plan. Such other work if voted upon by the Members shall be financed according to the Contribution Formula.
- E. Fiscal Agent. The Members agree that the City of Rochester ("City") will be the fiscal agent for Municipal Alliance for Adaptive Management, with the authority to collect, hold, invest, disperse and pay funds held on behalf of the Municipal Alliance for Adaptive Management at the direction of the Executive Board.
- F. Accounting for Funds. The Executive Board with assistance from the Fiscal Agent shall provide to the Members an annual accounting of monies received, spent, and obligated, and a final accounting upon the termination of the Agreement.
- G. Funds upon Termination. Upon termination of this Agreement, no individual employee or member of the Executive Board shall be entitled to a share in the distribution of any funds upon dissolution. Upon termination, the funds shall be distributed to each Member at the time of distribution in proportion to the percentage of its contribution relative to the total contribution of all the Members made in the year of distribution.

## VIII POLLUTION TRACKING

The Executive Board anticipates making recommendations to Members to participate in certain pollutant tracking programs. Members agree to make good faith efforts to participate in such pollution tracking programs.

## IX. TERMINATION

- A. Mutual Agreement. This Agreement may be terminated prior to the end of the term upon mutual agreement of the Members.
- B. Withdrawal of a Member at the Conclusion of the Term . A Member wishing to withdraw from the Agreement at the end of the term and not interested in renewal shall give written notice to the Executive Board at least three months before the expiration of the term . The Executive Board will notify the other Members of any Member's withdrawal through their authorized agents who have executed this Agreement.
- C. Withdrawal of Member Prior to Expiration of Term. A Member wishing to withdraw from the Agreement before the end of the term shall be responsible for its share of any outstanding Recommended Annual Contribution for Monitoring for the year in which the terminating Member gives notice of termination . Notice of withdrawal shall be in writing from the Member to the Executive Board at least thirty (30) days prior to termination. The Executive Board will notify the other Members of any

Member's withdrawal through their authorized agents who have executed this Agreement.

- D. Appeal of General Permit. This Agreement is being entered into prior to the expiration of the period of appeal of the General Permit. In the event of any appeal of the General Permit, any Member may withdraw from this Agreement without penalty as described in paragraph C..

## X. **ISSUANCE OF BONDS**

The Members do not intend to issue bonds jointly as permitted by RSA 53-A:6. Should the Members decided to do so at a later time, an amendment to this Agreement shall be undertaken to specify those items required by RSA 53-A:6, II.

## XI. **OTHER**

- A. Amendment. This Agreement may be amended only by written Agreement signed by two-thirds of the Members.
- B. Authority. All Members undersigned represent and agree that they have the authority to enter into this Agreement.
- C. Notices. Notices for each party shall be in writing and mailed to the individuals listed in Exhibit B which is attached and incorporated hereto.
- D. Severability. If any provision of this Agreement is deemed invalid or unenforceable, the remaining provisions shall remain in full force and effect.
- E. Governing Law. This Agreement shall be governed by and interpreted in accordance with the provisions of the laws of the State of New Hampshire.
- F. Separate Document. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
- G. Compliance with RSA 53-A:
- Pursuant to RSA 53-A:3 IV, this Agreement does not relieve any of the Members of any obligation or responsibility imposed upon it by law except to the extent of actual and timely performance thereof by the Executive Board. Performance may be offered in satisfaction of the obligation or responsibility.
  - Pursuant to RSA 53-A:3 V, this Agreement shall be submitted to the NH Attorney General who shall determine whether the

April 8, 2021

agreement is in proper form and compatible with the laws of this state.

- Pursuant to RSA 53-A:4, this Agreement shall be filed with the clerk of each municipality and with the NH Secretary of State.
- Pursuant to 53-A:5, this Agreement shall be submitted to the NH Department of Revenue Administration as a condition precedent to its entry into force.

This Submission and approval shall be in addition to and not in substitution for the requirement of submission to and approval by the NH Attorney General.

[SIGNATURES FOLLOW]

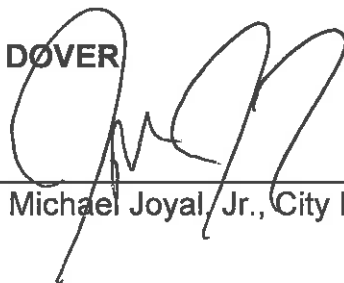
Dated this 8 day of April, 2021.

**CITY OF ROCHESTER**

By:   
Blaine Cox, City Manager

Dated this 8<sup>th</sup> day of April, 2021.

**CITY OF DOVER**

By:   
J. Michael Joyal, Jr., City Manager

Dated this 8<sup>th</sup> day of April, 2021.

**CITY OF PORTSMOUTH**

By:   
Karen S. Conard, City Manager

Dated this 8<sup>th</sup> day of April, 2021.

**TOWN OF NEWINGTON**

By:   
Denis Mercier, Wastewater Treatment  
Plant Manager

Dated this 8<sup>th</sup> day of April, 2021.

**TOWN OF MILTON**

By:   
Julius Peel, Interim Town Administrator

**INTERMUNICIPAL PLAN FOR ADAPTIVE WATER QUALITY MANAGEMENT  
IN THE GREAT BAY ESTUARY**

**DECEMBER 14, 2020 DRAFT**

This plan outlines a collaborative effort by and among municipalities in furtherance of their mutual interests in appropriate management and protection of water quality in the Great Bay estuary and, for those that opt for coverage under NPDES Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) issued by U.S. Environmental Protection Agency Region I (“EPA”) on November 24, 2020 (the “General Permit”), in the coordinated, cost-effective implementation of the permit’s adaptive management framework.

**BACKGROUND**

A. General Permit Overview. The General Permit was recently established as an available permitting option for eligible municipal permittees (the “Permittees”) that own or operate any of 13 certain municipal wastewater treatment facilities (“WWTFs”). Its optional approach for the limitation and control of total nitrogen (“TN”) discharges from covered WWTFs combines relatively less stringent TN effluent limitations (as compared to those EPA would otherwise anticipate imposing under individual permits) with the opportunity for the Permittees to collaborate in an adaptive management framework addressing overall TN source reductions to the Great Bay estuary.

B. Adaptive Management Opportunity. As set forth in Part 3 of the General Permit, EPA envisions the elements of an adaptive management framework for the Great Bay estuary as including the General Permit, ambient monitoring, pollution tracking, reduction planning, and review of significant scientific, methodological, and protective target nitrogen load issues of great importance to the Permittees. The General Permit also describes adaptive management implementation as including collaboration between or among EPA, the State of New Hampshire (including the Department of Environmental Services, “NHDES”), and public, private, commercial, and other stakeholders (including the Conservation Law Foundation (“CLF”) with which the Permittees desire to increase coordination to achieve mutual goals). For Permittees that opt for coverage, the General Permit contemplates that the Permittees will participate in this collaboration by submitting a detailed proposal on or before the associated July 31, 2021 deadline.

C. Consistency with Municipal Goals. The adaptive management framework of the General Permit provides an approach to advancing mutual water quality protection interests while also correcting and improving the scientific and technical basis for proper water quality management and protection of the Great Bay estuary. This framework generally has the potential to meet important goals identified by the Permittees during the NPDES permitting process such as improving and protecting water quality based on sound science and public policy, increasing collaboration, resolving significant municipal concerns, aligning governmental authorities on near-term actions and investments, supporting wastewater and stormwater nitrogen removal, supporting ambient monitoring efforts, adopting measurable and achievable TN reductions protective of ecosystem health and resilience, laying a solid foundation for appropriate future investments, and avoiding disputes and delays. This framework is also generally consistent with

certain guiding principles that the Permittees identified during the permitting process, including timely issuance of the first watershed-scale TN General Permit for Great Bay, effectiveness and cost-effectiveness of wastewater and stormwater controls, and steady progress and true adaptive management building on significant WWTF nitrogen reductions already made.

D. Acknowledgment of Common Interests. The Permittees acknowledge and share certain interests with EPA, NHDES, and key stakeholders such as CLF in successful implementation of the adaptive management framework. The Permittees desire to fully and effectively participate in the adaptive management process, not only to meet their own goals and interests, but also to address the scientifically-defensible reasonable interests of these governmental and non-governmental stakeholders in a fiscally responsible manner.

Therefore, in furtherance of mutual interests of the Permittees in continuing to be good stewards of the Great Bay estuary, appropriately protecting water quality, and meeting the needs of the citizens of their communities, the Permittees have established this intermunicipal plan for the development of a joint adaptive management framework proposal in accordance with the General Permit.

## **JOINT ADAPTIVE MANAGEMENT FRAMEWORK PROPOSAL DEVELOPMENT PROCESS**

1. Collaborative Development Process. The Permittees recognize and support the collaborative nature of the adaptive management framework and welcome the opportunity to work in partnership with EPA, NHDES, Piscataqua Region Estuaries Partnership (“PREP”), CLF and other relevant entities to advance nitrogen management in the Great Bay estuary.

a. Municipal Cooperation and Coordination. The Permittees intend to confer and coordinate with one another on all relevant aspects of developing an approvable joint proposal addressing the adaptive management framework elements specified by the General Permit (the “Joint Proposal”) as generally described herein. Although it assumed that most if not all Permittees will prefer to opt for coverage under the General Permit, Permittees that instead opt for individual permit coverage may still participate in this watershed-level process.

b. Consultation with Interested Third Parties. In the course of developing the Joint Proposal, the General Permit’s adaptive management framework encourages, and the Permittees intend to engage in, consultation from time to time as appropriate with EPA, NHDES, PREP, and CLF, , which the Permittees consider to be key governmental partners or stakeholders that share certain goals and interests in common with the Permittees. In addition, significant public participation is anticipated and welcomed by the Permittees. Without limiting the foregoing overarching intent, certain specific opportunities for consultation with identified partners and stakeholders are identified below.

2. Planned Scope of Joint Proposal. The scope of the Joint Proposal is expected to be developed in a manner that meets or exceeds the minimum requirements of Part 3 of the General Permit summarized below and further organized on the basis of priority Nitrogen Reduction Efforts (Paragraph 3 below) and concurrent Endpoint Planning Efforts (Paragraph 4 below).



3. Nitrogen Reduction Efforts. The Permittees intend to prioritize planning and implementation of the following Nitrogen Reduction Efforts during the 2021-2025 permit term, without delay, concurrent with Endpoint Planning Efforts useful for determining long-term water quality goals.

a. Nitrogen Source Reduction Plans. The General Permit (Part 3, Paragraph 1.c.) seeks a proposed outline or plan for overall source reductions of TN over the course of the permit term. The Joint Proposal will address a process and timeline for developing and implementing such TN control measures, including specific short-term control measures for various sources of TN loadings as well as the identification, design, installation, operation and maintenance of specific projects to reduce TN loads. Without limiting the foregoing measures, consideration will be given to the feasibility of regional fertilizer regulation and potential oyster restoration projects. The Joint Proposal will also address pollutant reduction estimations for other pollutants of concern such as TSS/sediment in addition to TN.

b. Consultation with CLF on Nitrogen Project Planning. For purposes of this prioritized nitrogen source reduction planning efforts, the Permittees intend to consult with key stakeholders that possess the technical resources and capability to provide relevant assistance such as on identification of potential projects and opportunities to optimize pollutant reduction benefits through consideration of project types, locations, and costs. The Permittees specifically envision consulting with CLF, assuming CLF interest, during the Joint Proposal development phase as well as during the Joint Proposal implementation phase.

c. Nitrogen Load Tracking Methods. The General Permit (Part 3, Paragraph 1.b.) seeks a proposed method(s) to be used to track reductions and additions of TN over the course of the permit term. The Joint Proposal will address such method(s) with specific consideration being given to potentially using NHDES’s Pollution Tracking and Accounting Program (“PTAP”) as tracking/accounting system for quantifying the nitrogen loading changes to the Great Bay estuary associated with activities within each municipality such as new/modified septic systems, decentralized wastewater treatment facilities, changes to the amount of effective impervious cover, changes to the amount of disconnected impervious cover, conversion of existing landscape to lawns/turf, and any new or modified structural or non-structural best management practices.

4. Endpoint Planning Efforts. Concurrent with Nitrogen Reduction Efforts, the Permittees intend to support the following Endpoint Planning Efforts useful for determining long-term water quality goals and the basis for future permit renewals.

a. Ambient Water Quality Monitoring. The General Permit (Part 3, Paragraph 1.a.) seeks a proposed approach to ambient water quality monitoring in the Great Bay estuary to determine progress and trends. The Permittees recognize that PREP, as part of EPA’s National estuary Program, has benefited the region by tracking environmental trends through long-term monitoring. The Permittees anticipate making additional contribution toward a portion of the overall cost of an expanded, coordinated, non-duplicative, properly-designed ambient monitoring program that the Permittees participate in developing. The Permittees envision the resulting enhanced monitoring effort as being designed to better understand the role of nitrogen, including other factors affecting eelgrass such as sediment characteristics, suspended sediment

concentrations and loads, bioturbation, epiphytic growth, and macroalgal community abundance. In developing the Joint Plan, the Permittees intend to consult with PREP and key partners and stakeholders regarding the design, implementation, cost, and financial and in-kind contributions to an enhanced monitoring effort. The Permittees further intend that their respective individual contributions to their total contribution will be allocated by and among themselves in a fair and equitable manner to be agreed upon.

b. Significant Scientific and Methodological Issue Evaluation. The General Permit (Part 3, Paragraph 1.d.) provides the opportunity for, and the Joint Proposal will include, an inclusive and transparent process for comprehensively evaluating any significant scientific and methodological issues relating to the permit, including the choice of a load-based threshold of 100 kg ha<sup>-1</sup> yr<sup>-1</sup> (a longstanding concern of the Permittees for reasons memorialized in formal public comments in the administrative record for the General Permit) versus any other proposed threshold, including a concentration-based threshold. The Joint Proposal will include detailed milestones culminating in submission of a report to EPA, prior to expiration of the permit terms, for inclusion in the administrative record for permit renewal. That report will indicate whether the NHDES concurs with the findings.

c. Loading Capacity Determination. The General Permit (Part 3, Paragraph 1.e.) seeks a proposed timeline for completing a Total Maximum Daily Load (“TMDL”) for TN in Great Bay and for submitting it to EPA for review and approval. The Joint Proposal will include such a timeline and may include alternative approaches to identifying Great Bay’s assimilative capacity for TN as a scientifically-defensible and reasonable basis for permit renewal and for implementation activities.

5. Administrative Matters. The Permittees desire to implement this plan and, for those opting for coverage under the General Permit, to develop and implement the Joint Proposal, all in a timely, coordinated, and cost-effective manner.

a. Joint Resources & Cost-Savings. The Permittees’ development and, if approved, implementation of the Joint Proposal will benefit from the assistance of highly-specialized experts such as consultants with substantial expertise in the field of water quality science or knowledge of the Great Bay system. To obtain such expertise, avoid duplication, and minimize total costs, such resources may be secured on a cost-sharing basis as mutually agreed by the Permittees.

b. Intermunicipal Agreement. To facilitate the development and implementation of appropriate aspects of the Joint Proposal on a group basis, including the joint selection and cost-sharing of expert resources, the Permittees or a subset of the Permittees may enter into an intermunicipal agreement pursuant to RSA 53-A:3 (Joint Exercise of Powers). Among other requirements, any such agreement will address the duration, purpose, financing, budget, and administration of such endeavor.

c. Further Efforts. This plan is a non-binding working document that provides a preliminary framework for promptly advancing the important endeavors described herein consistent with the short timeline established in the General Permit, including for submittal of a

Notice of Intent to opt for coverage (by April 2, 2021) and for submittal of the Joint Proposal (by July 31, 2021). This plan does not represent a funding commitment or require any appropriation by any governmental body, nor does it fix the terms and conditions of the anticipated intermunicipal agreement, which is intended to be developed jointly by the participating Permittees. Consistent with the foregoing deadlines, the goal for executing the intermunicipal agreement is March 31, 2021.

***\*\*\****

Election to Join  
Intermunicipal Agreement  
for Development of an Adaptive Water Quality Management Plan  
for Great Bay Estuary

City/Town: \_\_\_\_\_

Election Date: \_\_\_\_\_

The Acting Authority (City Manager, Town Administrator, Town Manager or Sewer Commissioner) for purposes of this Intermunicipal Agreement is identified below with contact information:

By signing below I, \_\_\_\_\_, in my capacity as \_\_\_\_\_, affirm that I am authorized to enter into this Agreement on behalf of the City/Town.

\_\_\_\_\_

AGREEMENT FOR CONSULTING SERVICES  
BETWEEN CITY OF ROCHESTER, NH  
AND BROWN AND CALDWELL  
FOR PREP ENGAGEMENT

THIS AGREEMENT is made and entered into on this 26th day of January, 2021 by and between the City of Rochester, NH, hereinafter referred to as "Client," and Brown and Caldwell, a California corporation, its affiliates and subsidiaries, hereinafter referred to as "Consultant."

RECITALS:

WHEREAS, Client is authorized to and desires to retain Consultant to engage with the Piscataqua Region Estuaries Partnership (PREP), DES, and other stakeholders, as PREP develops the research and monitoring initiative required by the National Discharge Elimination System Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire.

WHEREAS, Consultant has available and offers to provide personnel and facilities necessary to perform the desired services within the required time; and

WHEREAS, Client desires to retain Consultant to perform the services in the manner, at the time, and for the compensation set forth herein;

NOW, THEREFORE, Client and Consultant agree as follows:

I. DESCRIPTION OF PROJECT

Client and Consultant agree that Project is as described in Exhibit A, entitled "Description of Project," dated January 4, 2021. If, during the course of Project, Client and Consultant agree to changes in Project, such changes shall be incorporated in this Agreement by written amendment.

II. SCOPE OF CONSULTANT SERVICES

Consultant agrees to perform those services described hereafter. Unless modified in writing by both parties, duties of Consultant shall not be construed to exceed those services specifically set forth herein.

A. Basic Services

Consultant agrees to perform those basic services described in Exhibit B entitled "Scope of Services," dated January 4, 2021 (the "Services"). Any tasks not specifically described in Exhibit B are Additional Services.

B. Additional Services

Client shall pay Consultant all fees and costs incurred in performing Additional Services provided the services were either (a) authorized by Client, or (b) required to be performed due to emergency conditions at the project site. Client will be deemed to

have authorized the Additional Services if Consultant provides Client with notification that the Additional Services will be performed and Client does not object within five (5) working days after notification. Unless otherwise agreed in writing, Additional Services shall be performed in accordance with Consultant's standard billing rates at the time the Additional Services are performed.

C. Litigation Assistance

Unless specifically stated therein, the Scope of Services does not include assistance to support, prepare, document, bring, defend, or assist in litigation undertaken or defended by Client. All such services required or requested of the Consultant by Client or any third party (except claims between Client and Consultant) will be reimbursed at Consultant's applicable rates for such litigation services.

D. Document Productions

In the event Brown and Caldwell is requested pursuant to subpoena or other legal process to produce its documents or any other information relating to Brown and Caldwell's services under this agreement in judicial or administrative proceedings to which Brown and Caldwell is not a party, Client shall reimburse Brown and Caldwell at standard billing rates for its time and expenses incurred in responding to such requests.

III. RESPONSIBILITIES OF CLIENT

In addition to payment for the Services performed under this Agreement, Client shall:

1. Assist and cooperate with Consultant in any manner necessary and within its ability to facilitate Consultant's performance under this Agreement.
2. Designate in writing a person to act as Client's representative with respect to this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define Client's policies, make decisions and execute documents on Client's behalf.
3. Furnish Consultant with all technical data in Client's possession including, but not limited to, maps, surveys, drawings, soils or geotechnical reports, and any other information required by, or useful to, Consultant in performance of its Services under this Agreement. Consultant shall be entitled to rely upon the information supplied by Client.
4. Notify Consultant of any known or potential health or safety hazards existing at or near the project site.
5. Provide access to and/or obtain permission for Consultant to enter upon all property, whether or not owned by Client, as required to perform and complete the Services.
6. If Consultant's scope of work includes services during construction, Client will require the construction contractor to indemnify and hold harmless Consultant, its officers, employees, agents, and consultants against claims, suits, demands, liabilities, losses, damages, and costs, including reasonable attorneys' fees and all other costs of defense, arising out of the performance of the work of the contractor, breach of contract, or willful misconduct of the contractor or its subcontractors, employees, and agents.

Client will require the contractor to name Consultant, its directors, officers and employees as additional insureds on the contractor's general liability insurance and/or

Owner's and Contractor's Protective policy (OCP), and any builder's risk, or other property insurance purchased by Client or the contractor to protect work in progress or any materials, supplies, or equipment purchased for installation therein.

Client will furnish contractor's certificates of insurance evidencing that Consultant, its officers, employees, agents, and consultants are named as additional insureds on contractor's general liability and property insurance applicable to the Project. Contractor's policies shall be primary and any such insurance carried by the Consultant shall be excess and noncontributory. The certificates shall provide that Consultant be given 30 days' written notice prior to any cancellation thereof.

#### IV. AMERICANS WITH DISABILITIES ACT

Any other provision of this Agreement to the contrary notwithstanding, unless otherwise specified in the Scope of Services, Client shall have sole responsibility as between Client and Consultant for compliance with the Americans With Disabilities Act ("ADA") 42 U.S.C. 12101 et. Seq. and the related regulations.

#### V. AUTHORIZATION AND COMPLETION

In signing this Agreement, Client grants Consultant specific authorization to proceed with work specified in Exhibit B. The estimated time for completion is within 120 calendar days of the date Consultant receives authorization to proceed with the work from Client. Consultant shall use its best efforts to perform the work specified in Exhibit B within the estimated time.

#### VI. COMPENSATION

##### A. Amount

For the Services described in Exhibit B, Client agrees to pay, and Consultant agrees to accept compensation in accordance with Exhibit C, which shall not be exceeded without the consent of the Client. Where Consultant has provided Client with a breakdown of the total compensation into subtasks, such breakdowns are estimates only. Consultant may reallocate compensation between tasks, provided total compensation is not exceeded without the approval of Client. Consultant will provide Client with an updated estimate of the cost to complete this work s once approximately 75% of the work is completed.

##### B. Payment

As long as Consultant has not defaulted under this Agreement, Client shall pay Consultant within 30 days of the date of Consultant's invoices for services performed and reimbursable expenses incurred under this Agreement. If Client has reason to question or contest any portion of any such invoice, amounts questioned or contested shall be identified and notice given to Consultant, within 30 days of the date of the invoice. Any portion of any invoice not contested shall be deemed to be accepted and approved for payment and shall be paid to Consultant within 30 days of the date of the invoice. Client agrees to cooperate with Consultant in a mutual effort to resolve promptly any contested portions of Consultant's invoices.

In the event any uncontested portions of any invoice are not paid within 30 days of the date of Consultant's invoice, interest on the unpaid balance shall accrue beginning with the 31st day at the maximum interest rate permitted by law, and Consultant shall have the

right to suspend work per Article XV, Suspension of Work.

VII. RESPONSIBILITY OF CONSULTANT

A. Standard of Care—Professional Services

Subject to the express provisions of the agreed scope of work as to the degree of care, amount of time and expenses to be incurred, and subject to any other limitations contained in this Agreement, Consultant shall perform its Services in accordance with generally accepted standards and practices customarily utilized by competent engineering firms in effect at the time Consultant's Services are rendered. Consultant does not expressly or impliedly warrant or guarantee its Services.

B. Reliance upon Information Provided by Others

If Consultant's performance of services hereunder requires Consultant to rely on information provided by other parties (excepting Consultant's subcontractors), Consultant shall not independently verify the validity, completeness, or accuracy of such information unless otherwise expressly engaged to do so in writing by Client.

VIII. ASSIGNMENT OF TASKS TO AFFILIATES

A. If the authorized scope of work includes construction activities or the oversight of construction, Consultant may, at its discretion and upon notice to Client, assign all of its contractual rights and obligations with respect to such activities or services to Brown and Caldwell Constructors, its wholly owned affiliate.

B. If the authorized scope of work requires professional services to be performed in a jurisdiction in which Consultant renders professional services solely through a locally registered engineering affiliate for purposes of compliance with professional licensing requirements in that jurisdiction, Consultant may, in its discretion, upon notice to Client, and with Client's written consent, assign its contractual rights and obligations with respect to such activities or services to such locally registered engineering affiliate.

IX. CONSULTANT'S WORK PRODUCT

A. Scope

Consultant's work product which is prepared solely for the purposes of this Agreement, including, but not limited to, drawings, test results, recommendations and technical specifications, whether in hard copy or electronic form, shall become the property of Client when Consultant has been fully compensated as set forth herein. Consultant may keep copies of all work product for its records.

Consultant and Client recognize that Consultant's work product submitted in performance of this Agreement is intended only for the project described in this Agreement. Client's alteration of Consultant's work product or its use by Client for any other purpose shall be at Client's sole risk.

B. Electronic Copies

If requested, solely as an aid and accommodation to Client, Consultant may provide copies of its work product documents in computer-readable media ("electronic copies," "CADD"). These documents will duplicate the documents provided as work product,



but will not bear the signature and professional seals of the registered professionals responsible for the work. Client is cautioned that the accuracy of electronic copies and CADD documents may be compromised by electronic media degradation, errors in format translation, file corruption, printing errors and incompatibilities, operator inexperience and file modification. Consultant will maintain the original copy, which shall serve as the official, archived record of the electronic and CADD documents.

X. INDEMNIFICATION

A. Indemnification of Client

Consultant agrees to indemnify and hold Client harmless from and against any liability to the extent arising out of the negligent errors or negligent omissions of Consultant, its agents, employees, or representatives, in the performance of Consultant's duties under this Agreement.

B. Consequential Damages

Regardless of any other term of this Agreement, in no event shall either party be responsible or liable to the other for any incidental, consequential, or other indirect damages.

XI. CONSULTANT'S INSURANCE

Consultant shall procure and maintain the following minimum insurance:

1. Commercial general liability insurance, including personal injury liability, blanket contractual liability and broad-form property damage liability coverage. The combined single limit for bodily injury and property damage shall be not less than \$1,000,000.
2. Automobile bodily injury and property damage liability insurance covering owned, non-owned, rented, and hired cars. The combined single limit for bodily injury and property damage shall be not less than \$1,000,000.
3. Statutory workers' compensation and employer's liability insurance as required by state law.
4. Professional liability insurance. The policy limit shall be not less than \$1,000,000.

Client shall be named as additional insured on policies 1 and 2 above. Upon request, a certificate of insurance will be provided to Client with a 30-day written notice in the event the above policies are cancelled.

XII. CONFIDENTIALITY

Consultant agrees it will maintain the confidentiality of material it receives from Client which Client has clearly identified as "Confidential" and will not disclose, distribute, or publish to any third party such confidential information without the prior permission of Client. Notwithstanding the foregoing, Consultant shall have no confidentiality obligation with respect to information that:

- 1) becomes generally available to the public other than as a result of disclosure by Consultant or its agents or employees;
- 2) was available to Consultant on a non-confidential basis prior to its disclosure by Client;
- 3) becomes available to Consultant from a third party who is not, to the knowledge of

Consultant, bound to retain such information in confidence.

In the event Consultant is compelled by subpoena, court order, or administrative order to disclose any confidential information, Consultant shall promptly notify Client and shall cooperate with Client prior to disclosure so that Client may take necessary actions to protect such confidential information from disclosure.

### XIII. SUBCONTRACTS

Consultant shall be entitled, to the extent determined appropriate by Consultant, to subcontract any portion of the services to be performed under this Agreement with the written consent of Client. Subconsultant markup will be five (5) percent of subcontract cost.

### XIV. SUSPENSION OF WORK

Work under this Agreement may be suspended as follows:

1. By Client. By written notice to Consultant, Client may suspend all or a portion of the Work under this Agreement if unforeseen circumstances beyond Client's control make normal progress of the Work impracticable. Consultant shall be compensated for its reasonable expenses resulting from such suspension including mobilization and demobilization. If suspension is greater than 30 days, then Consultant shall have the right to terminate this Agreement in accordance with Article XVI, Termination of Work.
2. By Consultant. By written notice to Client, Consultant may suspend the Work if Consultant reasonably determines that working conditions at the Site (outside Consultant's control) are unsafe, or in violation of applicable laws, or in the event Client has not made timely payment in accordance with Article VI, Compensation, or for other circumstances not caused by Consultant that are interfering with the normal progress of the Work. Consultant's suspension of Work hereunder shall be without prejudice to any other remedy of Consultant at law or equity.

### XV. TERMINATION OF WORK

- A. This Agreement may be terminated by Client as follows: (1) for its convenience on 30 days' notice to Consultant, or (2) for cause, if Consultant materially breaches this Agreement through no fault of Client and Consultant neither cures such material breach nor makes reasonable progress toward cure within 15 days after Client has given written notice of the alleged breach to Consultant.

B. This Agreement may be terminated by Consultant as follows: (1) for cause, if Client materially breaches this Agreement through no fault of Consultant and Client neither cures such material breach nor makes reasonable progress toward cure within 15 days after Consultant has given written notice of the alleged breach to Client, or (2) upon five days' notice if work under this Agreement has been suspended by either Client or Consultant for more than 30 days in the aggregate.

C. Payment upon Termination

In the event of termination, Consultant shall perform such additional work as is reasonably necessary for the orderly closing of the Work. Consultant shall be compensated for all work performed prior to the effective date of termination, plus work required for the orderly closing of the Work, including: (1) authorized work performed up to the termination date plus termination expenses, including all labor and expenses, at Consultant's standard billing rates, directly attributable to termination; (2) all efforts necessary to document the work completed or in progress; and (3) any termination reports requested by Client.

XVI. ASSIGNMENT

This Agreement is binding on the heirs, successors, and assigns of the parties hereto. This Agreement may not be assigned by Client or Consultant without prior, written consent of the other. Notwithstanding the foregoing, this Agreement may be assigned by Client to the Municipal Alliance for Adaptive Management.

XVII. NO BENEFIT FOR THIRD PARTIES

The services to be performed by Consultant are intended solely for the benefit of Client, and no benefit is conferred on, nor contractual relationship established with any person or entity not a party to this Agreement. No such person or entity shall be entitled to rely on Consultant's services, opinions, recommendations, plans, or specifications without the express written consent of Consultant. No right to assert a claim against the Consultant, its officers, employees, agents, or consultants shall accrue to the construction Contractor or to any subcontractor, supplier, manufacturer, lender, insurer, surety, or any other third party as a result of this Agreement or the performance or nonperformance of the Consultant's services hereunder. Notwithstanding the foregoing, the Cities of Dover and Portsmouth are third-party beneficiaries with full access to Consultant's work product, data and communications.

XIII. FORCE MAJEURE

Consultant shall not be responsible for delays caused by circumstances beyond its reasonable control, including, but not limited to (1) strikes, lockouts, work slowdowns or stoppages, or accidents, (2) acts of God, (3) failure of Client to furnish timely information or to approve or disapprove Consultant's instruments of service promptly, and (4) faulty performance or nonperformance by Client, Client's independent consultants or contractors, or governmental agencies. Consultant shall not be liable for damages arising out of any such delay, nor shall the Consultant be deemed to be in breach of this Agreement as a result thereof.

XIX. INTEGRATION

This Agreement represents the entire understanding of Client and Consultant as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties. Any purchase order issued by Client, whether or not signed by Consultant, and any terms and conditions contained in such purchase order which are inconsistent with this Agreement shall be of no force and effect.

XX. SEVERABILITY

If any part of this Agreement is found unenforceable under applicable laws, such part shall be inoperative, null, and void insofar as it conflicts with said laws, but the remainder of this Agreement shall be in full force and effect.

XXI. CHOICE OF LAW/JURISDICTION

This Agreement shall be administered and interpreted under the laws of the State of New Hampshire. Jurisdiction of litigation arising from the Agreement shall be in that state.

XXII. NOTICES

All notices required under this Agreement shall be delivered by facsimile, personal delivery or mail and shall be addressed to the following persons:

Mark Allenwood, PE  
Project Manager  
Brown and Caldwell  
One Tech Drive Suite 310  
Andover, MA 01810-2435

Michael Bezanson, PE  
City Engineer  
City of Rochester  
45 Old Dover Road  
Rochester, NH 03867

Notice shall be effective upon delivery to the above addresses. Either party may notify the other that a new person has been designated by it to receive notices, or that the address or Fax number for the delivery of such notices has been changed, provided that, until such time as the other party receives such notice in the manner provided for herein, any notice addressed to the previously-designated person and/or delivered to the previously-designated address or Fax number shall be effective.

XXV AUTHORIZATION

The persons executing this Agreement on behalf of the parties hereto represent and warrant that the parties have all legal authority and authorization necessary to enter into this Agreement, and that such persons have been duly authorized to execute this Agreement on their behalf.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

Brown and Caldwell

Signature 

Printed Name Deborah Mahoney

Title Senior Director Client Services

City of Rochester, NH

Signature 

Printed Name Blaine Cox

Title City Manager

Federal Tax ID number: 94-1446346

EXHIBIT A

DESCRIPTION OF PROJECT

The Environmental Protection Agency (EPA) has issued the *National Pollutant Discharge Elimination System Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire*, Permit Number NHG58A000. This NPDES permit includes an Adaptive Management Framework Voluntary Submittal, which will require ambient water quality monitoring, ~~nitrogen~~ pollution tracking and reporting these findings to the EPA. These efforts related to the Adaptive Management Framework will be undertaken by the Piscataqua Region Estuaries Partnership (PREP), DES and other stakeholders with active participation by the GBE municipalities.

Deborah Mahoney  
1-27-21

The Project will be BC's engagement with PREP and others regarding the research and monitoring plan currently being developed for the Great Bay Estuary (GBE). BC's tasks specific to the Project include Project Management and Administration, Existing Document Review, PREP Meeting Participation, Technical Support for Monitoring and Study Plans and Technical Support for Adaptive Management Framework.

These tasks will be completed by the BC team of Mark Allenwood, Clifton Bell, Dan Hammond, Stacy Villanueva, Kirk Westphal and Andrew Goldberg. Mark Allenwood will serve as project manager, assisted by Andrew Goldberg. Clifton Bell will serve as the lead scientist, and specifically lead project components that involve communication of technical positions to PREP, regulatory agencies, and other stakeholders. Clifton Bell, Dan Hammond, Stacy Villanueva and Kirk Westphal will provide technical support on individual tasks as needed.

## EXHIBIT B

### SCOPE OF SERVICES

The following tasks will be performed to engage with the Piscataqua Region Estuaries Partnership (PREP) regarding the research and monitoring plan currently being developed for the Great Bay Estuary (GBE).

#### Task 1 –Project Management and Administration

BC shall perform project management and administration while performing Engineering Services throughout the project. Project management and administration shall include:

- i) Preparation of monthly invoices;
- ii) Preparation of monthly summaries of work;
- iii) Routine project management.

A total of 16 hours has been budgeted for Task 1.

#### Task 2- Existing Document Review

The initial task will involve review and comment on the existing documentation related to the recently issued Great Bay Total Nitrogen General Permit and the PREP monitoring initiative. The specific documents to be reviewed as a part of this task are:

- Great Bay Total Nitrogen General Permit
- EPA Response to Comments on the Great Bay General Permit
- PREP – RAMP document
- PREP Prospectus
- McDowell Pre-Proposal

Review of these documents is necessary to understand the current status of the PREP initiative, the intersection(s) between the General Permit and the PREP effort, and prepare action items in the best interests of the affected municipalities. Following review of these documents, BC will prepare a tech memo summarizing the current plan to date and providing recommended action items for involvement with PREP.

A total of 64 hours has been budgeted for Task 2.

#### Task 3 – PREP meeting participation

BC will participate in upcoming PREP working group meetings regarding the research and monitoring initiative. This scope assumes all meeting participation will occur virtually and no travel is included in this scope. Based on PREP's previous schedule, meetings are generally assumed to occur quarterly. Additional meetings with participating municipalities, DES, or other stakeholders might take place. Therefore, this scope assumes participation in five meetings between January and June 2021. This task

January 4, 2021



includes prep for each meeting, meeting participation, and an email summary of meeting notes and any proposed action items submitted to Rochester, Dover, and Portsmouth within seven working days of the meeting.

A total of 74 hours has been budgeted for Task 3.

Task 4 – As-Needed Technical Support for Monitoring and Study Plans

BC anticipates new documents or revised versions of current documents will be developed by PREP and/or EPA as this process continues. The number of documents or level of review needed cannot be anticipated at this time. Therefore, BC has included an as-needed task to cover additional technical support that may arise during our engagement with PREP and their research and monitoring initiative. Examples of activities that could be accomplished under this task include additional literature reviews, independent data analyses, reviews of PREP/agency documents, and drafting of letters or other communications to advocate technical positions.

A total of 120 hours has been budgeted for Task 4.

Task 5 - As Needed Technical Support for Adaptive Management Framework

The general permit provides the option for permittees to submit an adaptive management framework within 180 days of the effective date. This task includes technical activities to make progress on the adaptive management framework through June 1, 2020. This could include the development of recommendations for monitoring, tracking nitrogen reductions, developing water quality endpoints, or modeling. As with Task 3, Task 4 is limited by the available labor hours and will be managed accordingly. This task does not include the complete development of an adaptive management framework document, which it is assumed will occur after June 2020.

A total of 56 hours has been budgeted for Task 5.

EXHIBIT C  
COMPENSATION

For the work described in Exhibit B, compensation shall be a not to exceed fee of \$65,530.00, including labor and expenses.



DRAFT - INTERMUNICIPAL AGREEMENT - COST ALLOCATION SHARE RANGES (Comparison)

FACILITY NAME	DESIGN FLOW		Annual Cost Ranges					
	DESIGN FLOW	SHARE	\$	100,000.00	\$	250,000.00	\$	500,000.00
<b>Large (&gt; 2 MGD)</b>								
Rochester	5.03	18.65%	\$	18,652.43	\$	46,631.07	\$	93,262.14
Portsmouth	6.13	22.73%	\$	22,731.49	\$	56,828.72	\$	113,657.43
Dover	4.70	17.43%	\$	17,428.71	\$	43,571.77	\$	87,143.55
Exeter	3.00	11.12%	\$	11,124.71	\$	27,811.77	\$	55,623.54
Durham	2.50	9.27%	\$	9,270.59	\$	23,176.47	\$	46,352.95
Somersworth	2.40	8.90%	\$	8,899.77	\$	22,249.42	\$	44,498.83
<b>Subtotal</b>	<b>23.76</b>	<b>88.11%</b>	<b>\$</b>	<b>88,107.69</b>	<b>\$</b>	<b>220,269.22</b>	<b>\$</b>	<b>440,538.44</b>
<b>Small (&lt;2 MGD)</b>								
Pease ITP	1.20	4.45%	\$	4,449.88	\$	11,124.71	\$	22,249.42
Newmarket	0.85	3.15%	\$	3,152.00	\$	7,880.00	\$	15,760.00
Epping	0.50	1.85%	\$	1,854.12	\$	4,635.29	\$	9,270.59
Newington	0.29	1.08%	\$	1,075.39	\$	2,688.47	\$	5,376.94
Rollinsford	0.15	0.56%	\$	556.24	\$	1,390.59	\$	2,781.18
Newfields	0.12	0.43%	\$	433.86	\$	1,084.66	\$	2,169.32
Milton	0.10	0.37%	\$	370.82	\$	927.06	\$	1,854.12
<b>Subtotal</b>	<b>3.21</b>	<b>11.89%</b>	<b>\$</b>	<b>11,892.31</b>	<b>\$</b>	<b>29,730.78</b>	<b>\$</b>	<b>59,461.56</b>
<b>TOTAL DESIGN FLOW</b>	<b>26.97</b>	<b>100.00%</b>						

FACILITY NAME	Total Permit Nitrogen Load		Annual Cost Ranges					
	Total Permit Nitrogen Load	SHARE	\$	100,000.00	\$	250,000.00	\$	500,000.00
<b>Large (&gt; 2 MGD)</b>								
Rochester	198.00	18.17%	\$	18,165.14	\$	45,412.84	\$	90,825.69
Portsmouth	248.00	22.75%	\$	22,752.29	\$	56,880.73	\$	113,761.47
Dover	167.00	15.32%	\$	15,321.10	\$	38,302.75	\$	76,605.50
Exeter	106.00	9.72%	\$	9,724.77	\$	24,311.93	\$	48,623.85
Durham	59.00	5.41%	\$	5,412.84	\$	13,532.11	\$	27,064.22
Somersworth	92.00	8.44%	\$	8,440.37	\$	21,100.92	\$	42,201.83
<b>Subtotal</b>	<b>870.00</b>	<b>79.82%</b>	<b>\$</b>	<b>79,816.51</b>	<b>\$</b>	<b>199,541.28</b>	<b>\$</b>	<b>399,082.57</b>
<b>Small (&lt;2 MGD)</b>								
Pease ITP	93.00	8.53%	\$	8,532.11	\$	21,330.28	\$	42,660.55
Newmarket	30.00	2.75%	\$	2,752.29	\$	6,880.73	\$	13,761.47
Epping	43.00	3.94%	\$	3,944.95	\$	9,862.39	\$	19,724.77
Newington	15.00	1.38%	\$	1,376.15	\$	3,440.37	\$	6,880.73
Rollinsford	12.00	1.10%	\$	1,100.92	\$	2,752.29	\$	5,504.59
Newfields	16.00	1.47%	\$	1,467.89	\$	3,669.72	\$	7,339.45
Milton	11.00	1.01%	\$	1,009.17	\$	2,522.94	\$	5,045.87
<b>Subtotal</b>	<b>220.00</b>	<b>20.18%</b>	<b>\$</b>	<b>20,183.49</b>	<b>\$</b>	<b>50,458.72</b>	<b>\$</b>	<b>100,917.43</b>
<b>TOTAL Permit Load</b>	<b>1,090.00</b>	<b>100.00%</b>						

FACILITY	Percentage Contribution Comparison	
	Design Flow	Permit N Load
<b>Large (&gt; 2 MGD)</b>		
Rochester	18.65%	18.17%
Portsmouth	22.73%	22.75%
Dover	17.43%	15.32%
Exeter	11.12%	9.72%
Durham	9.27%	5.41%
Somersworth	8.90%	8.44%
<b>Subtotal</b>	<b>88.11%</b>	<b>79.82%</b>
<b>Small (&lt;2 MGD)</b>		
Pease ITP	4.45%	8.53%
Newmarket	3.15%	2.75%
Epping	1.85%	3.94%
Newington	1.08%	1.38%
Rollinsford	0.56%	1.10%
Newfields	0.43%	1.47%
Milton	0.37%	1.01%
<b>Subtotal</b>	<b>11.89%</b>	<b>20.18%</b>
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>

**DRAFT DESIGN FLOW BASED COST ALLOCATION**

FACILITY NAME	DESIGN		Annual Cost Range		
	FLOW	SHARE	\$ 100,000.00	\$ 250,000.00	\$ 500,000.00
<b>Large (&gt; 2 MGD)</b>					
Rochester	5.03	18.65%	\$ 18,652.43	\$ 46,631.07	\$ 93,262.14
Portsmouth	6.13	22.73%	\$ 22,731.49	\$ 56,828.72	\$ 113,657.43
Dover	4.70	17.43%	\$ 17,428.71	\$ 43,571.77	\$ 87,143.55
Exeter	3.00	11.12%	\$ 11,124.71	\$ 27,811.77	\$ 55,623.54
Durham	2.50	9.27%	\$ 9,270.59	\$ 23,176.47	\$ 46,352.95
Somersworth	2.40	8.90%	\$ 8,899.77	\$ 22,249.42	\$ 44,498.83
<b>Subtotal</b>	<b>23.76</b>	<b>88.11%</b>	<b>\$ 88,107.69</b>	<b>\$ 220,269.22</b>	<b>\$ 440,538.44</b>
<b>Small (&lt;2 MGD)</b>					
Pease ITP	1.20	4.45%	\$ 4,449.88	\$ 11,124.71	\$ 22,249.42
Newmarket	0.85	3.15%	\$ 3,152.00	\$ 7,880.00	\$ 15,760.00
Epping	0.50	1.85%	\$ 1,854.12	\$ 4,635.29	\$ 9,270.59
Newington	0.29	1.08%	\$ 1,075.39	\$ 2,688.47	\$ 5,376.94
Rollinsford	0.15	0.56%	\$ 556.24	\$ 1,390.59	\$ 2,781.18
Newfields	0.12	0.43%	\$ 433.86	\$ 1,084.66	\$ 2,169.32
Milton	0.10	0.37%	\$ 370.82	\$ 927.06	\$ 1,854.12
<b>Subtotal</b>	<b>3.21</b>	<b>11.89%</b>	<b>\$ 11,892.31</b>	<b>\$ 29,730.78</b>	<b>\$ 59,461.56</b>
<b>TOTAL DESIGN FLOW</b>	<b>26.97</b>	<b>100.00%</b>			

## DRAFT PERMIT NITROGEN LOAD BASED COST ALLOCATION

FACILITY NAME	Total Permit		Annual Cost Range	
	Nitrogen Load	SHARE		
			\$ 100,000.00	\$ 250,000.00
<b>Large (&gt; 2 MGD)</b>				
Rochester	198.00	18.17%	\$ 18,165.14	\$ 45,412.84
Portsmouth	248.00	22.75%	\$ 22,752.29	\$ 56,880.73
Dover	167.00	15.32%	\$ 15,321.10	\$ 38,302.75
Exeter	106.00	9.72%	\$ 9,724.77	\$ 24,311.93
Durham	59.00	5.41%	\$ 5,412.84	\$ 13,532.11
Somersworth	92.00	8.44%	\$ 8,440.37	\$ 21,100.92
<b>Subtotal</b>	<b>870.00</b>	<b>79.82%</b>	<b>\$ 79,816.51</b>	<b>\$ 199,541.28</b>
<b>Small (&lt;2 MGD)</b>				
Pease ITP	93.00	8.53%	\$ 8,532.11	\$ 21,330.28
Newmarket	30.00	2.75%	\$ 2,752.29	\$ 6,880.73
Epping	43.00	3.94%	\$ 3,944.95	\$ 9,862.39
Newington	15.00	1.38%	\$ 1,376.15	\$ 3,440.37
Rollinsford*	12.00	1.10%	\$ 1,100.92	\$ 2,752.29
Newfields	16.00	1.47%	\$ 1,467.89	\$ 3,669.72
Milton*	11.00	1.01%	\$ 1,009.17	\$ 2,522.94
<b>Subtotal</b>	<b>220.00</b>	<b>20.18%</b>	<b>\$ 20,183.49</b>	<b>\$ 50,458.72</b>
<b>TOTAL Permit N Load</b>	<b>1,090.00</b>	<b>100.00%</b>		

\*Permit requires Rollinsford & Milton to monitor & report only for 1st 24 month (14 growing)  
 These values are calculated from the January 2020 Draft Permit.

\$ 500,000.00

\$ 90,825.69

\$ 113,761.47

\$ 76,605.50

\$ 48,623.85

\$ 27,064.22

\$ 42,201.83

\$ **399,082.57**

\$ 42,660.55

\$ 13,761.47

\$ 19,724.77

\$ 6,880.73

\$ 5,504.59

\$ 7,339.45

\$ 5,045.87

\$ **100,917.43**

season months).



## **Appendix E**

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Great Bay Settlement Agreement  
Dover, Rochester, Portsmouth, CLF

**SETTLEMENT AGREEMENT BY AND BETWEEN CONSERVATION LAW  
FOUNDATION AND CITIES OF DOVER, ROCHESTER, AND PORTSMOUTH**

The Cities of Dover, Rochester, and Portsmouth (collectively “the Municipalities”) and the Conservation Law Foundation, Inc. (“CLF”), for good and valuable consideration mutually exchanged and acknowledged, hereby enter into this Settlement Agreement (“Agreement”) by and between as follows:

**WHEREAS**, in January 2020, the United States Environmental Protection Agency (Region 1) (“EPA”) issued the “Draft National Pollutant Discharge Elimination System (NPDES) Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire” (NPDES Permit No. NHG58A000) (hereinafter “Draft General Permit”);

**WHEREAS**, the Municipalities, CLF, and other interested parties submitted extensive written comments on the Draft General Permit;

**WHEREAS**, on November 24, 2020, EPA issued the final Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) (the “General Permit”) along with EPA’s Fact Sheet and Response to Public Comments, each *available at* <https://www.epa.gov/npdes-permits/great-bay-total-nitrogen-general-permit>;

**WHEREAS**, Part 2 of the General Permit contains final effluent limitations and monitoring requirements for each Permittee’s wastewater treatment facility (“WWTF”) similar to those in the draft permit, although with more recent (updated) flow data and, in keeping with scientific knowledge and past EPA permitting practice, a total nitrogen load limit based on the growing season of eelgrass;

**WHEREAS**, Part 3 of the General Permit provides for the voluntary submission of a proposal, within 180 days of the effective date of the permit, outlining: (1) an approach to ambient water quality monitoring to determine progress and trends; (2) a method of tracking total nitrogen reductions and additions over the course of the permit; (3) an outline/plan for overall source reductions of total nitrogen over the course of the permit; (4) an inclusive and transparent process for comprehensively evaluating significant scientific and methodological issues relating to the permit, including the assumption of a load-based threshold of 100 kg ha<sup>-1</sup> yr<sup>-1</sup> versus any other proposed threshold that might be used for future permitting or planning purposes, including a concentration-based threshold of .32 mg/L;

**WHEREAS**, the Municipalities may choose to Opt-In to the General Permit and become permittees (the “Permittees”);

**WHEREAS**, EPA’s Responses to Comments accompanying the General Permit state that the “assessment of progress on nonpoint source reductions could lead EPA to reissue an adaptive management permit if reasonable grounds exist to do so, or to abandon that approach in

favor of a more traditional one insofar as insufficient progress is being made on necessary nonpoint source reductions”;

**WHEREAS**, the Municipalities have opted, or are expected to opt, into the General Permit;

**WHEREAS**, the Municipalities, along with other permittees, have begun the work of developing an Adaptive Management Plan for submission to the EPA by July 31, 2021;

**WHEREAS**, CLF has considered appealing EPA’s final agency action to issue the General Permit;

**WHEREAS**, CLF, Dover, Rochester, and Portsmouth have, in good faith, engaged in a facilitated process to reach a negotiated resolution of the General Permit and its administration;

**WHEREAS**, this Agreement is a resolution of a dispute between the parties relative to the value of the General Permit to achieve a measurable environmental benefit.

**NOW THEREFORE**, the Parties, for themselves, their successors and assigns, enter into this Agreement for the purposes described above on the terms set forth below:

1. Recitals: The above recitals are incorporated herein by reference.
2. Definitions:

“Consult” or “consultation”: Any requirement in this Agreement to “consult” or engage in “consultation” means that the party actor solicits non-binding input, information, or commentary. “Consult” or “consultation” does not in any way mean or imply an approval authority is needed from the party who is being consulted. A party required to “consult” or seek “consultation” with another party retains sole discretion concerning the matter for which consultation is made.

“Eelgrass growing season”: The eelgrass growing season refers to that period of each calendar year from April 1 to October 31.

“IMA” or “IMA Group”: IMA or IMA group refers to those municipalities who have or are expected to formally execute the Intermunicipal Agreement for Development of an Adaptive Water Quality Management Plan for Great Bay Estuary. Dover, Rochester, Portsmouth, Milton, Newington, and Exeter, so far, have indicated a willingness to execute the IMA, while others have the IMA under consideration.;

“Structural Best Management Practices”: A measure or facility intended to treat, prevent, and/or reduce water pollution through installation of a permanent or semi-permanent structure that is either stand-alone or part of a larger construction project.

“Nonstructural Best Management Practices”: A measure, facility, practice, or action intended to treat, prevent, and/or reduce water pollution through any means other than a structural best management practice.

3. Purpose: The overriding purpose of this Agreement is to collaboratively implement a plan and set forth commitments between the Municipalities and CLF to improve water quality in the Great Bay Estuary and to take such further collaborative actions in compliance with, and furtherance of, the General Permit and the goals stated in the General Permit and associated Fact Sheet and Response to Comments. For purposes of clarity, this Agreement is solely entered into by Dover, Rochester, and Portsmouth in their capacity as individual communities, and not on behalf of the IMA group of municipalities, and this Agreement does not bind the unincorporated association of Permittees forming the IMA group.
4. Term: This Agreement is effective on the date last signed by all parties and will expire on February 28, 2026. However, any individual Municipality shall no longer be subject to this Agreement if and when that individual Municipality withdraws from or otherwise loses coverage under the General Permit.
5. IMA Executive Board Meetings:
  - a. RSA 91-A: The Municipalities agree that, in conducting any and all meetings of the Executive Board of the IMA, the Municipalities will ensure that the requirements of New Hampshire RSA chapter 91-A are observed and followed, so long as not inconsistent with applicable law.
  - b. Participation by Stakeholder Committee: The Municipalities agree to specifically invite one designated representative of the Stakeholder Committee (discussed below) to attend and speak at all Executive Board and IMA Member meetings, unless such meeting, or portion thereof, is a non-meeting and/or non-public meeting within the meaning of New Hampshire RSA chapter 91-A. In appropriate circumstances determined by the Executive Board of the IMA, the designated representative of the Stakeholder Committee may be permitted to enter into a non-disclosure agreement to enable the Stakeholder Committee’s representative to attend an otherwise non-public meeting. Nothing within this provision is intended to limit the Executive Board’s ability to adopt reasonable time, place, and manner requirements concerning the public’s right to speak or participate in public meetings of the Executive Board.
  - c. Meeting Frequency: Dover, Rochester, and Portsmouth agree to use best efforts to ensure that meetings of the IMA Executive Board and meetings of IMA Members occur at least twice per calendar year, beginning in calendar year 2022.

6. Stakeholder Committee: CLF agrees to establish a Stakeholder Committee separate from the IMA (and not a committee, sub-committee or subsidiary body of the IMA) consisting of organizations and entities with a demonstrated interest in the health, sustainability, and resilience of the Great Bay ecosystem. CLF will engage in best efforts to include one or more members of the business and real estate community. The role of the Stakeholder Committee will be to provide input, perspective, information, review, and monitoring of the IMA activities. The Stakeholder Committee may submit a request for funding or particular cost items as part of the annual IMA budget, though the Municipalities do not hereby guarantee or make any representation herein that such a budget provision will be approved.
  
7. Tracking Nitrogen Reductions/Additions:
  - a. PTAPP: The Municipalities expect that participation in the NHDES Pollutant Tracking and Accounting Pilot Project (“PTAPP”) or an equivalent methodology/system will comprise the Municipalities’ system and methodology for tracking total nitrogen additions and reductions, an identified part of the adaptive management plan in Part 3 of the General Permit. The Stakeholder Committee may submit any information it deems relevant to the Municipalities’ forthcoming submittal of a proposed system and methodology for the aforesaid tracking.
  
  - b. Periodic Consultation: After submitting the adaptive management plan due to EPA by July 31, 2021, the Municipalities or their designee shall thereafter consult with the Stakeholder Committee’s designated representative to discuss the Municipalities’ planning and execution of ambient water quality monitoring, data gathering, and water quality analysis.
  
  - c. Annual Reporting to IMA: At least two weeks prior to the annual IMA Member meeting each year, and at least two weeks prior to any second meeting of the IMA that takes place in a given year, the Municipalities shall develop a report (to be publicly presented at said IMA Member meeting) on the following:
    - i. Structural & Non-structural BMPs planned for the next year including, as applicable, location, estimated cost, and estimated reductions in total nitrogen and/or other pollutants to the extent known or capable of being estimated.
  
    - ii. Structural & Non-structural BMPs implemented during past year including, as applicable, location, cost, and estimated or known reductions in total nitrogen and/or other pollutants to the extent known or capable of being estimated.

The Municipalities shall encourage other IMA Members to provide the information described in subparts i. and ii. of this subparagraph for inclusion in the report. To facilitate this reporting, the Municipalities will work with the Stakeholder Committee to develop a standardized dashboard to compile and present the data in a manner enabling consistent and uniform reporting of implemented and planned progress by the Municipalities individually and collectively. The Stakeholder Committee and CLF may utilize the nitrogen reductions from implementation of the structural and non-structural BMPs reported on the dashboard and Annual Reports as a measure of performance by the Municipalities.

8. Funding Sustainability: Recognizing that sustainable funding is imperative for ongoing water quality efforts, the Municipalities shall consider the adoption (by local ordinance or act) of a stormwater utility by December of 2023. The Stakeholder Committee may provide input or information to the Municipalities by way of either submitting written comments or providing verbal comments, if permitted, during any public speaking forum held by any public body of the Municipalities, and shall be provided notice of such comment opportunities.
  
9. Total Nitrogen Source Reductions: With respect to voluntary submission of an outline/plan for overall source reductions of total nitrogen over the course of the permit (as called for in Part 3 of the General Permit), the Municipalities and CLF recognize that such submissions are voluntary and are not due to EPA until July 31, 2021. Moreover, CLF and the Municipalities recognize that true adaptive management depends on flexibility and the ability to adapt as more information becomes available. The Municipalities agree to make a submission to EPA as envisioned in Part 3 of the General Permit, to be updated and refined at least annually from the date of first submission and thereafter resubmitted annually to EPA after each annual update. Moreover, the Municipalities also agree to the following features of their overall source reduction plan, as drawn from (i) the “Feasibility Analysis for USEPA’s Draft Great Bay Total Nitrogen General Permit” dated May 8, 2020 and drafted by Robert M. Roseen<sup>1</sup>, and (ii) letter from NHDES Commissioner Robert Scott to Dennis Deziel dated July 27, 2020<sup>2</sup>:
  - a) WWTF Effluent Measures: The Municipalities agree, as part of an overall source reduction plan for nitrogen, to consider, plan for, and implement measures, as funded by the governing bodies of each Municipality, that reduce nitrogen in the effluent from their respective WWTFs during the eelgrass

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<sup>1</sup> In drawing from this study for purposes of settlement, the Municipalities do not indicate agreement with conclusions and assertions in that study, and reserve the right to disagree in part or in full with said study.

<sup>2</sup> The NHDES letter provides very helpful information and vision for forthcoming water quality project planning and ideas, though by referencing the NHDES letter here, the Municipalities do not adopt said letter, and reserve their rights and the flexibility accorded to them as outlined in Part 3 of the General Permit.

growing season. For example, the Municipalities may develop optimization plans and/or projects aimed at reducing inflow/infiltration, as selected by the Municipalities in their sole discretion.

- b) Funding Opportunities: As recognized by NHDES, “[k]ey to many of the actions in the NGP is funding.” NHDES Letter of July 27, 2020, at 3. The Municipalities’ agree to work with NHDES and others to identify and pursue applicable state, federal, or private grants, subsidies, or other measures aimed at water quality improvements, subject to prior approval of the governing body of Dover, Rochester, and Portsmouth to accept and expend such funding.
  
- c) Structural Best Management Practices: The Municipalities shall plan for and undertake structural best management practices (“BMPs”), as either part of other projects or as stand-alone projects, which improve water quality in the Great Bay Estuary through removal of nitrogen and other pollutants. The structural BMPs shall be the same or similar to those identified or exemplified within Dr. Roseen’s report. The structural BMPs undertaken by the Municipalities may include one or more of the following features:
  - i. Low Impact Development (LID) Structural BMPs that effectively disconnect impervious surfaces through the use of enhanced infiltration and/or that provide area-wide stormwater treatment.
  
  - ii. Low maintenance designs with an emphasis on pretreatment.
  
  - iii. Regular inspections and maintenance.
  
- d) Non-Structural Best Management Practices: The Municipalities shall plan for and undertake non-structural BMPs as part of the overall total nitrogen source reduction plan submitted to EPA and updated at least annually. Non-structural BMPs may include measures such as the following:
  - i. Adoption of stormwater ordinances (or site regulations) that require LID site planning and design strategies to reduce the discharge of stormwater from new development or re-development of private property;
  
  - ii. Leaf and yard waste collection;
  
  - iii. Street sweeping;
  
  - iv. Catch basin cleaning and support programs;
  
  - v. Agricultural strategies;
  
  - vi. Buffer protection;

- e) Pilot Testing of Structural or Nonstructural BMPs: The Municipalities agree to collectively fund and undertake pilot testing of innovative structural or non-structural BMPs, such as septic retrofit technology, as selected by the Municipalities in their sole discretion. The pilot testing shall be to determine the cost, feasibility, and efficacy of structural and nonstructural BMPs that the Municipalities have not, to date, attempted or utilized. The pilot testing, if successful, will improve future refinement of the overall source reduction plans and efforts by the Municipalities (and, presumably, other permittees).
  
  - f) Other Efforts: The Municipalities also agree to consider and, if authorized by their governing bodies, to undertake other efforts aimed at reducing total nitrogen loads to the Great Bay estuary, such as:
    - i. Urban fertilizer reduction efforts, including limiting the use and nitrogen content of fertilizers, voluntary incentive programs for residential and commercial properties to reduce fertilizer use, and advocacy for legislation as detailed in the NHDES letter of July 27, 2020 (p. 4);
    - ii. Oyster restoration, wetlands restoration, salt marsh restoration, and eelgrass restoration;
    - iii. Septic system retrofit programs;
    - iv. Septic system legislation, including statewide legislation as detailed in the NHDES letter of July 27, 2020 (p. 4).
10. Identified Water Quality Improvement Opportunities: In addition to the foregoing, the Municipalities have individually identified non-structural best management practices beyond current MS4 obligations; anticipated capital improvement projects and stand-alone projects with structural best management practices; as well as diverse initiatives intended to address water quality improvement in the Great Bay Estuary. These lists of water quality improvement opportunities are attached and incorporated to this Agreement as non-binding statements of present intent by the Municipalities. CLF understands and agrees that completion of these projects is dependent on the continued validity of the General Permit, purchasing approvals from governing bodies of the Municipalities and/or other public officials, funding appropriations of the respective Municipalities (which funding appropriations are at the sole discretion of the governing body of the respective Municipalities), and any other requirements of law, potentially including federal/state/local permitting. The parties recognize that the Municipalities may select projects that are likely to improve water quality, but for which nitrogen removal is only a partial benefit.



11. Petition(s) for Individual Permits: The Municipalities and CLF anticipate that the petition process under EPA’s general permit regulations may be used by CLF to request that any owner or operator authorized by the General Permit, including one or more of the Municipalities, be covered instead by an individual permit, *see* 40 C.F.R. § 122.28(b)(3)(i). The Municipalities and CLF expect such petition or possibility thereof will function as a continuing check and incentive to ensure that reasonable further progress is being made by the Municipalities to identify and implement total nitrogen source reductions under the General Permit over its 5-year term. Implementation of these reductions is recognized as a principal assumption of the General Permit. In order to conserve limited resources, and to facilitate speedy resolution of disputes, the Municipalities and CLF agree that any such petition may be concise, briefly setting forth material facts relevant to EPA’s consideration of the petition. Any petition shall provide a time-limited opportunity for the Municipality to cure any alleged defect in nonpoint source reduction planning and implementation and, if timely cured to CLF’s satisfaction, CLF agrees to withdraw such petition. If the alleged defect is not timely cured to the CLF’s satisfaction, CLF will request that EPA promptly act on the petition on the record before it (including any information that may be supplied by the Municipalities and CLF in a reasonably timely manner) and the Municipalities will assent to said request of EPA for prompt action to approve or disapprove the petition. CLF may file a petition for failure of the Municipalities to make reasonable progress towards nitrogen reductions as measured by Paragraph 10. The Municipalities’ continued and timely implementation of the lists referred to in the paragraph above, or substantially equivalent efforts in terms of nitrogen reductions (including but not limited to total nitrogen load outputs falling below that permitted by the General Permit for Dover and Portsmouth), during the first three years of the permit term constitute prima facie evidence of reasonable progress towards nitrogen reductions during such time period for the purposes of any petition filed by CLF under 40 CFR § 122.28(b)(3)(i) (“Prima Facie Benefit”). By February 1, 2024, each Municipality shall separately submit to CLF an updated list of water quality improvement opportunities as described in the paragraph above, premised on their respective nitrogen reduction planning efforts that each Municipality is in the process of developing or updating. Based on these updated lists CLF may, in its discretion, extend the Prima Facie Benefit for up to the remaining duration of the permit term on a municipality-specific basis.
12. Additional Great Bay Water Quality Projects: The Municipalities agree to fund, collectively, the total amount of forty five thousand dollars (\$45,000) for one or more not-for-profit Great Bay water quality-related projects or initiatives in calendar year 2021, as selected by the Stakeholder Committee and approved by the Municipalities. The Municipalities’ approval of the aforesaid water quality projects shall not be unreasonably withheld. The payment and use of the \$45,000, or any portion thereof, shall be subject to a mutually satisfactory grant agreement to be drafted by the parties

and executed by the Municipalities, CLF, and the recipient(s) of the \$45,000 or any portion thereof.


13. Covenant not to appeal the General Permit: CLF hereby agrees and covenants not to appeal, contest, or otherwise assert any legal challenge to the General Permit. Nothing within this provision affects CLF's ability to timely appeal any final agency action on the petitions described in the preceding paragraph above. Nothing within this provision affects CLF's ability to comment on, appeal, contest, or otherwise challenge any future General Permit re-issuance, modification, or the issuance of an individual permit to Dover, Rochester, and/or Portsmouth. Nor does this provision in any way limit CLF's ability to engage in advocacy or any legal challenge with respect to municipalities that are not a party to this Agreement.
14. Enforceability/Binding/Fees: This Agreement shall be binding on all parties, including their corporate or entity parents, affiliates, successors and assigns. With the exception of petitions for individual permits discussed above (to be filed with EPA) or Clean Water Act citizen suits (to be filed in federal court), the exclusive venue for any disputes arising out of this Agreement shall be the Superior Courts of the State of New Hampshire, in either Rockingham County or Strafford County Superior Court. Each party shall bear their own litigation costs, attorney's fees, and/or expert fees in any such litigation. Prior to filing any action in Superior Court alleging a breach of this Agreement, the filing party shall provide the prospective defendant(s) with prior written notice of the alleged breach and a 30-day opportunity to cure any alleged violation.
15. Force Majeure. No party is considered in breach of this Agreement to the extent performance of their respective obligations is prevented by a force majeure event. "Force majeure event," for purposes of this Agreement, is defined as any event arising from causes beyond the control of the party that delays or prevents timely performance of any obligation under this Agreement despite the party's best efforts to fulfill the obligation. The requirement that the party exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any such event (i) as it is occurring, and (ii) after it has occurred to prevent or minimize any resulting delay to the greatest extent possible.
16. Municipal Reservation of Rights: The General Permit includes an adaptive management framework at Part 3, which provides for an ongoing collaborative process. The adaptive management framework includes nitrogen monitoring and reductions elements as well as elements for comprehensively evaluating significant scientific and methodological issues and related load capacity determinations. Through the permitting process, the EPA has published data, analysis, and conclusions through fact sheets and response to comments related to elements subject

to review and revaluation through the adaptive management process. In entering into this Agreement, the Municipalities are not accepting such data, analysis, and conclusions or waiving their objections thereto. Without affecting the Municipalities' obligation to comply with the General Permit during its term, the Municipalities hereby reserve the right to contest any such data, analysis, and conclusions in future proceedings to the extent that ongoing collaboration and the adaptive management process do not satisfactorily resolve such matters.

17. Other Municipalities: This Agreement may be amended by mutual agreement of the parties to include other municipalities who would like to join it for purposes of paragraphs 10 and 11.
  
18. Other:
  - a. This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire agreement and understanding between the parties and supersedes all prior agreements and understandings relating hereto.
  - b. This Agreement may be amended only by written Amendment signed by the Parties
  - c. If any provision of this Agreement is deemed invalid or unenforceable, the remaining provisions shall remain in full force and effect.
  - d. This Agreement shall be governed by and interpreted in accordance with the laws of the State of New Hampshire.
  - e. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
  - f. This Agreement shall be deemed to have been jointly drafted by the parties.
  - g. The signatories below expressly represent and warrant that they are authorized and empowered to enter into this Agreement.
  - h. This Agreement shall be a public record on file with the City Clerk of each of the Municipalities.

[SIGNATURES FOLLOW]

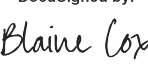
**City of Dover**

By:  J. Michael Joyal, Jr.  
City Manager  
2021.03.25 18:40:48  
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Dated: \_\_\_\_\_

*J. Michael Joyal, Jr., City Manager*

**City of Rochester**

By:  DocuSigned by:  
Blaine Cox  
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Dated: 3/26/2021

*Blaine Cox, City Manager*

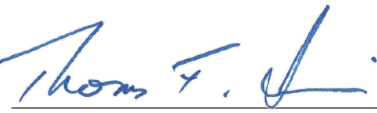
**City of Portsmouth**

By: 

Dated: 3/26/2021

*Karen Conard, City Manager*

**Conservation Law Foundation, Inc.**

By: 

Dated: 3/26/2021

*Thomas F. Irwin, Vice President, Director CLF New Hampshire*

3.24.2021

**Attachment**

**Dover Overall Source Reduction Projected Project List<sup>1</sup>**

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<sup>1</sup> This list is a statement of present intent, is illustrative, and is non-binding. The estimated costs and estimated nitrogen reduction stated below are based on current best estimates and assumptions, and are not intended as binding commitments or as performance guarantees.

**Structural Best Management Practices**

Fiscal Year	Project	Description	Projected Reduction (lb/yr)	Estimated Cost
Ongoing	I/I	Inflow and Infiltration into the sewer collection system results in elevated peak flows through the WWTP biological system which can affect the nutrient reduction capacity during those events. The City continues to invest heavily in reducing I/I from the collection system	6,008 <sup>2</sup>	
2022-2026	Court, Union, and Middle Streets	Capital Improvement Plan work to improve drainage to include BMPs	45 <sup>3</sup>	\$1,125,000
2022-2024	Fifth and Grove Streets	Capital Improvement Plan work to improve drainage to include BMPs	26 <sup>4</sup>	\$275,000
2022-2025	Oak Streets	Capital Improvement Plan work to improve drainage to include BMPs	412 <sup>5</sup>	\$250,000
2026	Atlantic Ave.	Capital Improvement Plan work to improve drainage to include BMPs	17 <sup>6</sup>	\$375,000
2026	Horne Street	Capital Improvement Plan work to improve drainage to include BMPs	35 <sup>7</sup>	\$62,500
Planning	Henry Law Park	City is currently looking for funding opportunities to design	568 <sup>8</sup>	

<sup>2</sup> Assumption: A storm event causes the effluent to peak to 14 mg/l - assume storm event happens 12 times per year for 2 days each - assume I/I work reduces peak to 8 mg/l - assume during this peak time the flow rate is 5 mg. Equation: LB/YR=6mg/l\*5MGD\*8.345\*24 day/yr

<sup>3</sup> Assumption: Ability to treat approximately 50% of the length of street (5000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area \* NLER\*0.6

<sup>4</sup> Assumption: Ability to treat approximately 50% of the length of street (3000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area \* NLER\*0.6

<sup>5</sup> Assumption: Ability to treat approximately 50% of the neighborhood area (87 acres) use residential rate. Equation: LB/YR = Area \* NLER\*0.6

<sup>6</sup> Assumption: Ability to treat approximately 50% of the length of street (2000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area \* NLER\*0.6

<sup>7</sup> Assumption: Ability to treat approximately 50% of the length of street (4000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area \* NLER\*0.6

<sup>8</sup> Assumption: Ability to treat approximately 50% of the neighborhood area (120 acres) use residential rate. Equation: LB/YR = Area \* NLER\*0.6

3.24.2021

		and construct an innovative, Nitrogen focused Water Quality BMP in the Henry Law Park area. This would be able to capture and provide treatment for approximately 120 acres of highly urbanized commercial and residential areas in the City's Downtown.		
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Non-Structural Best Management Practices

Fiscal Year	Project	Description	Projected Reduction (lb/yr)	Estimated Cost
Ongoing	Street Sweeping	The City sweeps the downtown streets approximately 1 time a week. The MS4 permit only requires cleaning twice per year.	43 <sup>9</sup>	
Ongoing	Catch Basin Cleaning	Catch Basins are cleaned semi-annually regardless of whether they have reached the MS4 triggering thresholds of 1/2 full sump.	17 <sup>10</sup>	
Ongoing	Slow Release nitrogen requirement for all new projects	As part of Site Plan approval, a maintenance plan shall be in place and <i>"Best practices to minimize environmental impacts, such as the use of low-phosphorus fertilizer and slow-release nitrogen, shall be included in the management plan."</i>	350 <sup>11</sup>	
Ongoing	Water Quality BMP's as standard practice for city reconstruction projects	This is the language from our standard RFQ for design of reconstruction projects: <i>"As part of the drainage improvements, the City wishes to enhance the drainage system and incorporate easily maintainable, low impact development strategies to provide conveyance, treatment, and infiltration where practical. The Consultant shall make recommendations for an improved drainage system."</i> The commitment to implementing the water quality work is demonstrated in several recent redevelopment projects.		

<sup>9</sup> Assumption: mechanical, weekly, 9 months, estimate of swept area (50 miles, 30' wide average) use Highway NLER = 10.5. Equation: LB/YR = IA\*NLER\*0.03\*9/12

<sup>10</sup> Assumption: Per Hot Spot Map info, there is 108 ac of city owned impervious area. Assume 1/4 of that area drains to a CB that is cleaned regularly use highway NLER 10.5. Equation: lb/yr = IA\*NLER\*.06

<sup>11</sup> Assumption: Impact 10 acers of development with reduction assumptions same as above. Equation: lb/yr = Turf Area \*1/1000\*.9



3.24.2021

<b>Ongoing</b>	Ordinances	Threshold for stormwater implementation with 50% nitrogen limits is set at 20,000 square feet or creates more than 4,000 square feet of new impervious area. This is much more stringent than the MS4 requirements which only pertain to disturbance over an acre	75 <sup>12</sup>	
<b>2021</b>	Catch Basin Spoils Facility	Capital Improvement plan work to create a facility to clean and treat the liquid/debris from the catch basin maintenance program. Potential to open for other communities to use in the future.		\$3,500,000
<b>2021</b>	SRF Loan for Chapel St. Ravine	Working to incorporate water quality treatment and flood management downstream of substantial stormwater culvert		
<b>Ongoing</b>	Buffers	Ordinance has increased the wetland buffers gaining credit for going green project that shows added nitrogen removal.		
<b>Ongoing</b>	Yard Waste Program	Leaf pick up 6 times annually	95 <sup>13</sup>	
<b>Planning</b>	Leaf Pick Up	Bulk leaf pick up program	766 <sup>14</sup>	

<sup>12</sup> Assumption: 10 acres of redevelopment a year that fall within the delta between what is required per MS4 and what is included per City of Dover. Assume Commercial Runoff rates apply to all. Equation:  $LB/YR = Area * NLER * 0.5$

<sup>13</sup> Assumption: the folks using the leaf removal program are the ones who own residential for 100' along to the 50 miles of city roadway. Assume 10% use the services. Equation:  $LB/YR = Area * NLER * 0.05$

<sup>14</sup> Assumption: Increases the area to 80% using service. Equation:  $LB/YR = Area * NLER * 0.05$

Innovative Efforts/ Pilot Programs

Fiscal Year	Project	Description	Projected Reduction (lb/yr)	Estimated Cost
Ongoing	Professional Staff	The City has created an Environmental Project Manager Position. This positions focus is dedicated entirely to environmental improvements, including a commitment to the protection and improvement of the Great Bay. This person is taking an active role in organizing regional commitment and implementation of the MS4 permit and the new NGP permit. Just this year, this person participated and was acceded through the NOFA Organic Land Care Program. Additionally, other staff members, particularly Bill Boulanger, is regularly recognized for contributions to innovative stormwater quality improvements and environmental stewardship.		
Ongoing	Training and Commitment to Innovation	Leadership in NEWEA/ Biological Nutrient Removal Classes - Our WWTP staff are at the forefront of discussions for WWTP practices. Ray Vermette acts as president of NEWEA and has traveled around the world looking at innovative technologies and bring them to Dover.		
Ongoing	Organic Fertilizer Program	The city is committed to using only organic, slow-release fertilizers on city owned and maintained properties.	800 <sup>15</sup>	
Ongoing	Commitment to exploring new BMP's and participating in innovative initiatives	Berry Brook and the continuation of bringing new BMP's into urban redevelopment settings and working with UNHSWC to test the effect, Volunteering to work with the NHDES/Prep Fellowship team to investigate SAFE strategies for Stormwater Funding, Volunteer to work with SRPC to analyze urban trees and innovative tree box filters, Volunteer to work with SRPC to look at BMP's v/s socioeconomic disparities, participating in the PTAP program, participating in multiple		

<sup>15</sup> Assumption: City maintains 1,000,000 sf of turf. Assume regular application rate for nitrogen of 1 lb/1,000 sf. Assume organic cuts the runoff by 80%. Equation: lb/yr = Turf Area \*1/1000\*.8

3.24.2021

		credit for going green projects lead by PREP		
<b>Summer 2021</b>	Fertilizer Bans and Reductions	Supporting a statewide ban of high nitrogen synthetic fertilizers		
<b>Ongoing</b>	Outreach and Education	The City outreach and education exceeds what is required by the MS4. Staff regularly hold tours or presentations of the innovative BMP's being implemented. Additionally, we are working on a video for the installation of a filtering catch basin BMP. Staff also regularly speak at conferences about technologies and particularly focus on maintenance and long-term performance.		
<b>2021</b>	Climate Adaptation Grant	As part of Climate Adaptation work with the SRPC, city committed to installing a new catch basin filtering device with a tree - similar to a tree-box filter but with improved maintenance capacity	5	
<b>Planning</b>	Sewer System	Advocate for a state-wide requirement to remove nitrogen in septic systems.	381 <sup>16</sup>	
<b>Planning</b>	Extending Sewer to Septiced areas	Continually assessing opportunities		

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<sup>16</sup> Assumes 20 new septic a year - 60% reduction achieved.

PRIVILEGED AND  
CONFIDENTIAL

## PRIVILEGED &amp; CONFIDENTIAL DRAFT

## ROCHESTER, NH - Nitrogen Stormwater and Non-Point Source Reduction Projects

Project Type	Project / Activity	Project Description	Estimated Load Reduction (lbs/N/yr)	Notes / Additional Benefits
<b>Structural BMPs</b>				
1	Structural SW BMPs	City installs structural water quality best management practices (BMPs) in highway capital improvement projects, with a goal of treating 100% of the impervious cover. The City also maintains stormwater BMPs installed as part of private development when the City takes ownership of the road/utilities. Upcoming projects that will include stormwater structural practices include: 1. Colonial Pines Drainage Improvements - (project related to sewer extensions, below) 2. Woodman Area Infrastructure Improvements 3. Stafford Square Roundabout Installation 4. Union Street Parking Lot Reconstruction <sup>2</sup> - will incorporate water quality treatment practices. 5. Wakefield Street Reconstruction <sup>2</sup> - rehabilitation of infrastructure on Wakefield Street from Union Street to Chestnut Hill Road - rehabilitation of sidewalks, pavement and drainage improvements.	TBD	City is currently calculating the estimated nitrogen reductions for each of these projects which will be supplemented.
2	Sewer Extensions	City is in the middle of a sewer extension project (Colonial Pines) that could connect up to 225 homes, currently serviced by septic system, to sewer in an area of the City with high groundwater and a history of failed septic systems. To date 90 homes have been connected through Phase 2. Phase 3 is ongoing and could connect up to another 70 homes. Phase 4 could connect up to 65 homes to the sewer. <sup>2</sup>	1,154	Assumes nitrogen reductions for 225 homes @ 5.13 lbs/prop/yr.
3	Stormwater Outfall Restoration	Construct outfall improvements associated with Woodman Area Infrastructure Improvements. Review capital improvement projects to identify locations where erosion occurs at outfalls and/or where storm water quality improvements can be made.	N/A	Improvements will have secondary reductions in TSS.
<b>Non-Structural BMPs</b>				
4	Catch Basin Cleaning	City will clean catch basins to ensure that sumps are no more than 50% full at any time. City collects leaf litter and organic waste along curbed streets, once per month as part of the street sweeping program, in the months of April, May, October and November. City/Waste Management also provides curb side collection of bagged leaves/organic waste for two weeks in the fall and two weeks in the spring.	290	CB cleaning also reduces TSS, P, oils/grease and other pollutant discharges
5	Organic Waste and Leaf Litter	City will collect leaf litter and organic waste along curbed streets, once per month as part of the street sweeping program, in the months of April, May, October and November. Provide curb side collection of bagged leaves/organic waste for two weeks in the fall and two weeks in the spring.	690	
6	Street and Pavement Cleaning	City sweeps all curbed streets once per month between April and November. City sweeps all downtown streets at a minimum of once per week between April and November. Sweeps directly connected impervious cover at least <u>two times per year</u> (once in Spring and once in Fall). Conduct a sweeping study to determine areas where additional optimized sweeping should be conducted to reduce curbed sediment load and catch basin loads.	250	Street Sweeping / Cleaning also reduces TSS, P, oils/grease, and other pollutant discharges
7	Fertilizer Program	Advocate for and work with the State to develop a Great Bay watershed total nitrogen fertilizer ordinance/regulation that would ban or control the sale of lawn fertilizer containing nitrogen in the watershed. City of Rochester already exclusively uses slow release fertilizer for its properties.		City anticipates nitrogen reductions if enacted, adopted and implemented.
<b>Other Projects</b>				
8	Sewer System Master Plan	City has selected a contractor and is currently negotiating a scope of work for a Sewer System Master Plan. Once finalized, the City anticipates the Sewer System Master Plan study will be conducted over the next two to three years that will include flow metering and modelling efforts to fully evaluate and reduce sources of inflow and infiltration in the POTW.		The City anticipates the completed Sewer System Master Plan will identify priority projects for the City to implement for the reduction of infiltration and inflow to the POTW with anticipated nitrogen reductions.
9	Private Redevelopment	Enforce the Chapter 218 - Stormwater Ordinance (in place by June 30, 2021) governing new development and redevelopments by reviewing and inspecting private redevelopment in the City and requiring stormwater treatment.	100-300	Structural and non-structural BMPs required by the updated site plan regulations will also reduce other pollutants including TSS, P, oils/grease and other pollutants by disconnecting and treating impervious area.
10	Staffing / Resources	DPW has included in its proposed budget funding for another Assistant Engineer position to focus on stormwater related projects and ordinance enforcement.		
11	Septic System Programs	Advocate for and work with the State and region to develop a Great Bay watershed advanced septic system ordinance/regulation that would encourage advanced nitrogen treatment for private septic systems. Advocate for and work with the State to enforce its requirement for private septic systems to connect to public sewers within 100 feet of waterbodies.		City anticipates nitrogen reductions if enacted, adopted and implemented.
	Total Estimated Cost for SW and NPS Projects	~at least \$2 million (excluding sewer extension costs)		

<sup>1</sup>These are estimates only and may not reflect the actual nitrogen loads resulting from the proposed projects and practices.

<sup>2</sup>These projects are planned but subject to City Council approval and funding.

<sup>3</sup>This list is not an exclusive list and is subject to further update and expansion on an annual basis by the City.

## Attachment

## City of Portsmouth Anticipated Source Reduction List

Note: This list is a statement of present intent, is illustrative, and is non-binding. The estimated nitrogen reduction stated above are based on current best estimates and assumptions, and are not intended as binding commitments or as performance guarantees.

Category	Project/Activity	Description	Reduction (lb TN/yr)
Non-structural	Professional Staff	The City has developed a Stormwater Specialist Position and reorganized personnel to establish a Stormwater Division within the Public Works Department. At the Planning Dept there are staff dedicated to site plan regulation compliance for private property and developments. The majority of the team has completed the Stormwater Management Certificate program offered by UNH Professional Development Training.	Note 1
Non-structural	Professional Consultant	The City has contracted with VHB to conduct past studies specific to stormwater and non-point source projects and planning. This work is ongoing and overlaps with multiple other items in this list.	Note 1
Non-structural	Training/Commitment To Innovation	City wastewater operations staff are trained licensed professionals who participate in professional organizations including New Hampshire Water Pollution Control Association, New England Water Environment Association/WEF, and others. Staff participate in these associations to maintain training and stay in front of the most recent industry trends and to optimize treatment operations.	Note 1
Non-structural	Commitment To New And Innovative BMPs	Commitment to developing new BMPs by working with consultants and the UNH Stormwater Center. Projects and BMP examples include: Community Campus Athletic Fields stormwater treatment, State Street sand filtration and tree box filters, use of compost tea and incorporation of pervious pavement and other LID type projects within the City. The City has and will continue to work with private and public entities in the installation of rain gardens, tree box filters and other stormwater controls.	Note 1
Non-structural	Continuous nutrient load reduction at WWTP	The City recently completed construction of the Peirce Island Wastewater Treatment Facility and are completing the first year of continuous operation. The upgraded facility is performing well and the City will continue to optimize performance moving forward. Recent results can be provided.  The City has committed to a baseline monthly average of no more than 8 mg/L Total Nitrogen in addition to any permitted load under the GBTN GP. Operating the facility at 7.5 mg/L (0.5 mg/L reduction) of total nitrogen will result in 6,088 lbs TN/year removed when at a flow of 4.0 million gallons per day or 9,132 lbs TN/year removed when at a flow of 6.0 million gallons per day.	greater than 9,132
Non-structural	Street Sweeping	The City sweeps the downtown streets (weather permitting, 5 nights/week). All streets (100miles) in the City are swept once a month from April through November, well in excess of the MS4 required frequency of 2 times per year.	76
Non-structural	CB Cleaning	The City cleans catch basins bi-annually regardless of whether they have reached the MS4 triggering thresholds of 1/2 full sump.	73
Non-structural	Liquid Biological Soil Amendment Program	The City has restrictions fertilizer use within the limits of wetlands and wetland buffers. The City has switched from conventional fertilizers to using compost tea: this is a fully organic liquid biological soil amendment brewed with compost and amended with organic soluble kelp, humic acid, soluble fish and an organic 15-0-0 amino acid.	961
Non-structural	School Organic Fertilizer Program	Portsmouth Public Schools use only organic fertilizers on athletic fields.	522
Non-structural	Reduced Fertilizer Use Requirement For All New Projects	As part of Site Plan approval, a maintenance plan shall be in place and " <i>Minimizes the need for fertilizer and pesticide usage and the introduction of pollutants to the environment</i> " & " <i>Landscaped areas shall consist of a combination of large and small trees, shrubs, perennial and/or annual flowers, and groundcover. Managed turf areas should be kept to a minimum to reduce mowing and fertilizer needs.</i> "	Note 1
Non-structural	Fertilizer Bans or Reductions	The City is generally supportive of a statewide ban of high nitrogen synthetic fertilizers.	Note 2
Non-structural	Include Water Quality BMPs As Standard Practice	The City incorporates stormwater controls and other BMPs into City projects. Examples of projects that implemented BMPs include: Brewster Street Reconstruction, Maplewood Ave Reconstruction, Sagamore Ave Reconstruction, Four Tree Island Parking Lot, State Street Reconstruction, Lincoln Avenue Area Drainage Basin Sewer Separation, amongst others.	Note 3
Non-structural	Outreach and Education	Working with stakeholders in the City to address stormwater, sea level rise, and coastal resiliency issues that impact Portsmouth. Addressing the overlap in project needs to address coastal resiliency and impact of tidal changes on stormwater controls in areas like Prescott Park.	Note 1
Non-structural	Pollutant Removal/Outreach and Education	The City outreach and education exceeds what is required by the MS4. Staff regularly hold tours or presentations of the innovative BMP's being implemented. Staff also regularly speak at conferences about technologies and particularly focus on maintenance and long-term performance.	Note 1
Non-structural	Ordinances	Regulations updated with a threshold for stormwater implementation with 50% nitrogen limits set at 15,000 square feet. This is much more stringent than the MS4 requirements which only pertain to disturbance over an acre. Calculation assumes 10 acres of development per year.	75
Non-structural	Ordinances	The City Site Plan Review Regulations promotes the use of Low Impact Development (LID). Low "Applicants shall incorporate Low Impact Development (LID) site planning and design practices to the maximum extent practical (MEP) to reduce stormwater runoff volumes, maintain predevelopment site hydrology, and protect water quality in receiving waters. LID practices may include site design techniques (e.g., maintenance of vegetated buffers, minimizing of disturbance footprint) and structural measures to promote infiltration such as porous pavement, rain gardens or the capture / reuse of stormwater to reduce the stormwater volume discharged from the site.	Note 1

## Attachment

## City of Portsmouth Anticipated Source Reduction List

Note: This list is a statement of present intent, is illustrative, and is non-binding. The estimated nitrogen reduction stated above are based on current best estimates and assumptions, and are not intended as binding commitments or as performance guarantees.

Category	Project/Activity	Description	Reduction (lb TN/yr)
Non-structural	Development Of Water Quality improvement Recommendations	The City completed extensive water quality testing in the Sagamore Creek in 2018 and 2019. This data was used by the DES to evaluate 303(d) listing and will be a baseline for a Watershed Master Plan.	Note 1
Non-structural	IDDE Follow-up	The City is conducting follow-up testing to the water quality monitoring work completed in Sagamore Creek where pollutants were found to be high.	Note 1
Non-structural	Outreach and Education & Regional Coordination	The City sponsors twice annual Hazardous Household Waste days and collect materials from neighboring towns. Stormwater education and outreach materials are distributed at these events.	Note 1
Non-structural	Regional Coordination of Stormwater O&M	Coordinate with the Pease Development Authority on stormwater related activities, assisting them with their stormwater requirements	Note 3
Non-structural	Operation & Maintenance	Culvert lining at West Road and Edmond Ave which will prevent operational and water quality issues. Systematic video inspection and cleaning of stormwater collection system.	Note 1
Non-structural	Outreach and Education & Regional Coordination	Working with Seacoast Stormwater Coalition to develop BMP implementation and regular operation and maintenance requirements for private properties.	Note 1
Non-structural	Pollutant Tracking	Working with UNH graduate students to assess feasibility and effort to track land use change for the City of Portsmouth. Will assess the efficacy of BMP use for private and public projects.	Note 1
Non-structural	Stormwater Master Plan	Working with VHB to update the City's 2007 Stormwater Master Plan and review of stormwater utility funding option.	Note 1
Non-structural	Buffers	Ordinance has increased wetland buffers with credit for going green projects that show added nitrogen removal	Note 1
Non-structural	Yard Waste & Leaf Pick-up Program	Weekly yard/leaf waste pickups April - December. In 2020 over 1,300 tons of material were collected. Leaf collection requires the use of bags which maximizes the effect of the BMP.	1,608
Structural	Infiltration and Inflow Reduction	While Inflow and Infiltration (I/I) is often considered to be a collection system problem, the extraneous flows end up at the WWTF and can impact the performance of the biological treatment system. The City conducted an sewer system evaluation to identify infiltration and inflow in 2018. This project resulted in four contracts for sewer rehabilitation. The City will be completing the first of those four contracts by October 2023.	Note 3
Structural	Capital Improvements Plan	The City has a 6-year capital improvement plan that includes many projects that will address structural type stormwater and non-point source improvements including, but not limited to the following: Islington Street Phase 2 Complete Street Reconstruction, Pevery Hill Complete Street Reconstruction, Union Street & Willard Avenue Sewer Separation, Fleet Street Sewer Separation, Market Square Upgrade, and Corporate Drive Swales and Roadway.	Note 3

## Notes:

1. While these items/projects do not have readily quantifiable nitrogen reduction, the function provided is critical to execution of best management practices, planning and engineering associated with nitrogen reduction.
2. These items will provide the City with additional support when implementing ordinance adjustments and other control and enforcement provisions.
3. The nitrogen reductions for these items will be calculated at a later date.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

5 Post Office Square, Suite 100  
Boston, MA 02109-3912



March 25, 2021

J. Michael Joyal, Jr.  
Dover City Manager  
288 Central Ave  
Dover, NH 03820

Blaine Cox  
Rochester City Manager  
31 Wakefield St  
Rochester, NH 03867

Karen Conard  
Portsmouth City Manager  
1 Junkins Ave  
Portsmouth, NH 03801

Tom Irwin  
Vice President  
Director, CLF New Hampshire  
27 North Main Street  
Concord, NH 03301-4930

**Re: Great Bay Total Nitrogen General Permit**

Dear Mr. Joyal, Mr. Cox, Ms. Conrad and Mr. Irwin:

EPA Region 1 is writing this letter in connection with the Great Bay Total Nitrogen General Permit, issued November 24, 2020. This permit represents a great stride forward in regulating nutrient loads into Great Bay by establishing effluent limitations on all 13 New Hampshire wastewater dischargers, in almost all cases for the first time. These limits will act to prevent any future increases in nitrogen load from these dischargers even in the midst of rapid population increases. EPA expects that all eligible dischargers will opt into the General Permit. Due to the mix of nitrogen loading into Great Bay, which is predominated by nonpoint sources of nitrogen, the permit provides a framework and incentive for covered dischargers to pursue nonpoint source reductions that will be necessary if designated uses are to be fully restored. For the reasons explained in the Response to Comments accompanying the General Permit, if these nonpoint source reductions are not diligently pursued, EPA has concluded that timely reissuance of a permit with more stringent effluent limitations will be critical to the

expeditious achievement of uses. In furtherance of this goal, EPA also intends to act promptly on any petition for an individual permit under 40 C.F.R. § 122.28(b)(3)(i), for the reasons set forth in Section 11 (“Petition(s) for Individual Permit(s)”) of the Settlement Agreement by and between Conservation Law Foundation and the Cities of Dover, Portsmouth and Rochester, dated March 25, 2021.

Ken Moraff

KENNETH MORAFF  
Digitally signed by  
KENNETH MORAFF  
Date: 2021.03.25  
16:49:00 -04'00'

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Water Division Director  
EPA, Region 1

cc: Ted Diers, NHDES



## **Appendix F**

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Total Maximum Daily Loads (TMDLs) and  
Advanced Restoration Approaches

Section e of the joint AMP proposes a timeline for completing a TMDL for total nitrogen for the Great Bay or an advance restoration plan. According to that schedule, the participating communities will make a recommendation to either pursue a TMDL or an advance restoration plan in the second general permit term. The development of the TMDL or advance restoration plan will be a major activity of the second permit term. This appendix describes the TMDL process and advance restoration planning approaches under the Clean Water Act framework. It also provides examples of TMDLs and advance restoration planning approaches.

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## Total Maximum Daily Loads

The USEPA provides the following basic information on its webpage entitled “Overview of Total Maximum Daily Loads”<sup>1</sup>:

“A TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant.

Pollutant sources are characterized as either point sources that receive a wasteload allocation (WLA), or nonpoint sources that receive a load allocation (LA). For purposes of assigning WLAs, point sources include all sources subject to regulation under the National Pollutant Discharge Elimination System (NPDES) program, e.g. wastewater treatment facilities, some stormwater discharges and concentrated animal feeding operations (CAFOs). For purposes of assigning LAs, nonpoint sources include all remaining sources of the pollutant as well as natural background sources. TMDLs must also account for seasonal variations in water quality, and include a margin of safety (MOS) to account for uncertainty in predicting how well pollutant reductions will result in meeting water quality standards.

Expressed mathematically, the TMDL equation is:

$$\text{TMDL} = \Sigma \text{WLA} + \Sigma \text{LA} + \text{MOS}$$

Where **WLA** is the sum of wasteload allocations (point sources), **LA** is the sum of load allocations (nonpoint sources and background) and **MOS** is the margin of safety.

Each pollutant causing a waterbody to be impaired or threatened is referred to as a waterbody/pollutant combination, and typically a TMDL is developed for each waterbody/pollutant combination. For example, if one waterbody is impaired or threatened by three pollutants, three TMDLs might be developed for the waterbody. However, in other cases, a single TMDL document may be developed to address several waterbody/pollutants combinations. Neither the CWA nor EPA’s regulations define or limit the scale of TMDLs. Some states have been developing TMDLs on a watershed-scale basis. Such state TMDLs may also cover multiple watersheds.”

TMDLs are inherently quantitative, and developing TMDLs assumes the ability to identify in-stream water quality targets associated with use attainment and the pollutant loads to achieve those in-stream targets. Determining the appropriate water quality targets can be challenging if the stressors on uses are

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<sup>1</sup> <https://www.epa.gov/tmdl/overview-total-maximum-daily-loads-tmdls>

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not well understood or cannot be expressed as quantitative targets. Similarly, determining appropriate pollutant reduction targets and load allocations is not always straightforward because there can be a variety of potential point and non-point sources of pollutants in watersheds. Because of this, the analysis of historic water quality data, collection of field data, scientific interpretation, and the use of various modeling techniques is often needed prior to establishing TMDLs.

Under federal guidance (40 CFR § 122.44(d)(1)(vii)), water quality-based effluent limits in NPDES permits must be consistent with the assumptions and requirements of approved TMDL WLAs. After appropriate TMDL thresholds and allocations have been determined for a waterbody, an implementation plan can be developed to help jurisdictions or other stakeholders reach their numeric load reduction goals. Typically a plan achieves this by providing schedules, management goals, projects, partners, and priorities, as well as outlining monitoring and re-evaluation processes. The USEPA has developed guidance<sup>2</sup> for developing watershed management plans, and this guidance identifies nine key requirements of such plans:

1. Identify causes and sources. Identification of causes of impairment and pollutant sources that need to be controlled to achieve needed the needed load reductions.
2. Pollution reductions needed. An estimate of the load reductions expected from the planned management measures, and the load reductions needed to meet water quality standards.
3. Actions needed. A description of the management measures planned to achieve load reductions.
4. Costs and authority. Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon.
5. Outreach and education. An information and education component used to enhance public understanding of the project and participation.
6. Schedule. A schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.
7. Milestones. A description of interim measurable milestones for determining whether management measures or other control actions are being implemented.
8. Success indicators and evaluation: A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.
9. Monitoring. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item 8 immediately above.

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## Examples of TMDLs

New Hampshire has 550 bacteria TMDLs, 31 lake phosphorus TMDLs, and statewide TMDLs that cover pH and mercury. These TMDLs not only include specific pollutant reduction targets, but also allocate necessary load reductions depending on the source. For stationary, point sources, allocations are characterized as a wasteload allocation (WLA) and for widely distributed, nonpoint sources, they are characterized as a load allocation (LA). Below are excerpts and summaries from several TMDL implementation plans developed for complex estuarine environments.

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<sup>2</sup> U.S. Environmental Protection Agency. 2008. Handbook for Developing Watershed Plans to Restore and Protect Our Waters. EPA 841-B-08-002. 400 p. [https://www.epa.gov/sites/production/files/2015-09/documents/2008\\_04\\_18\\_nps\\_watershed\\_handbook\\_handbook-2.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/2008_04_18_nps_watershed_handbook_handbook-2.pdf)

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### **Wild Harbor Total Nitrogen TMDL (Massachusetts)**

<https://www.epa.gov/sites/production/files/2018-10/documents/wild-harbor-tn-tmdl-report.pdf>

The Wild Harbor estuarine system is located within Town of Falmouth on Cape Cod, Massachusetts. In order to restore and protect this estuarine system, N loadings, and subsequently the concentrations of N in the water, must be reduced to levels below the thresholds that cause the observed environmental impacts. This concentration will be referred to as the target threshold N concentration. It is the goal of the TMDL to reach this target threshold N concentration, as it has been determined for each impaired waterbody segment. The MEP has determined that a N concentration of 0.35 mg/L for this estuarine system at a sentinel station will restore eelgrass habitat in the main Wild Harbor basin. In addition, restoration of benthic habitat for infaunal animals will occur as management alternatives are implemented for eelgrass. To meet the TMDL, a 32% reduction of the total watershed nitrogen load for the entire system will be required.

### **Chesapeake Bay Nutrient and Sediment TMDL (Maryland and Virginia)**

<https://www.epa.gov/chesapeake-bay-tmdl>

The Chesapeake Bay receives drainage from 64,000 mi<sup>2</sup> in six states. The Bay experiences “dead zones” of low dissolved oxygen and has also lost much of its historical coverage of submerged aquatic vegetation. In the early 2000s, the USEPA and states developed Bay-specific water quality criteria and use definitions. In 2010, the USEPA and states developed a TMDL for nitrogen, phosphorus, and sediment loads to the Bay, intended to achieve the Bay-specific dissolved oxygen and water clarity goals. A sophisticated modeling framework was used to identify nutrient loads that are expected to achieve dissolved criteria. The states have since developed watershed implementation plans to guide restoration.

### **Neuse River Basin Total Nitrogen TMDL (North Carolina)**

<https://files.nc.gov/ncdeq/Water%20Quality/Planning/TMDL/FINAL%20TMDLS/Neuse/Neuse%20TN%20TMDL%20II.pdf>

The Neuse River basin encompasses nearly 6,000 square miles over 19 counties in eastern North Carolina. At New Bern, the Neuse takes on estuarine characteristics as it widens but remains shallow, frequently resulting in minimal discharge and long hydraulic residence times. The Neuse River Basin TMDL seeks to address chlorophyll-*a* exceedances in the estuary by managing total nitrogen levels. A sophisticated modeling framework was employed to predicted nutrient reductions needed to attain the in-stream chlorophyll-*a* target. North Carolina has also adopted nutrient offset and credit trading program to support implementation.

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## **Advance Restoration Approaches**

The TMDL is one approach for developing water quality restoration goals. However, EPA and New Hampshire recognize that other approaches are sometimes viable or even preferred under the Clean Water Act framework. USEPA has encouraged the use of “...alternative approaches, in addition to

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TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state...<sup>3</sup> More recently, USEPA has favored the term “advance restoration plan” over “alternative restoration plan”, and encouraged states to make the same change in terminology<sup>4</sup>. The intention with this change is to emphasize that TMDLs remain the primary tool for addressing impaired waters, and other planning approaches may precede rather than replace a TMDL. MAAM has made this change in terminology in the AMP. The term “alternative” is still used in this appendix to refer to examples of past plans that carry that label. Regardless of the exact label, alternative or advance plans are based on the similar concept that, in some settings, non-TMDL restoration approaches are the most effective way to improve water quality in the near term.

The EPA describes an advance restoration plan as a “near-term plan, or description of actions, with a schedule and milestones, that is more immediately beneficial or practicable to achieving water quality standards [than a TMDL]”<sup>5</sup>. Because advance restoration plans are created and executed locally, they offer more flexibility for communities during the restoration process. They are especially well-suited for adaptive management efforts in which the understanding of stressors and responses is evolving based on iterative implementation and monitoring. In the past, many alternative restoration plans were categorized as 4b or 5r plans, corresponding to those sections of states’ integrated reports. USEPA currently recommends the following elements of an advance restoration plan<sup>5</sup>:

- Identification of specific impaired water segments or waters addressed by the ARP and identification of all sources contributing to the impairment.
- Analysis to support why the state, territory, or authorized tribe believes that the implementation of the ARP is expected to achieve WQS.
- A description of the actions to address all sources (both point and nonpoint sources, as appropriate) necessary to achieve WQS and a schedule of actions designed to meet WQS with clear milestones and dates, which includes interim milestones and target dates with clear deliverables.
- Identification of available funding opportunities to implement the ARP.
- Identification of all parties committed, and/or additional parties needed, to take actions that are expected to meet WQS.
- An estimate or projection of the time when WQS will be met.
- Plans for effectiveness monitoring to demonstrate progress made toward achieving WQS following implementation, identify needed improvement for adaptive management as the project progresses, and evaluate the success of actions and outcomes.
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<sup>3</sup> U.S. Environmental Protection Agency. 2013. A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program. [https://www.epa.gov/sites/production/files/2015-07/documents/vision\\_303d\\_program\\_dec\\_2013.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/vision_303d_program_dec_2013.pdf)

<sup>4</sup> U.S. Environmental Protection Agency. 2023. Information Concerning 2024 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. Memorandum from Brian Frazer to Water Division Directors. 44 p. [https://www.epa.gov/system/files/documents/2023-03/2024IRmemo\\_032923.pdf](https://www.epa.gov/system/files/documents/2023-03/2024IRmemo_032923.pdf)

<sup>5</sup> U.S. Environmental Protection Agency. 2024. “Advance Restoration Plans”. <https://www.epa.gov/tmdl/advance-restoration-plans>

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## Examples of Alternative or Advance Watershed Restoration Plans

In New Hampshire, organizations and communities have worked with the NH Department of Environmental Services to produce 25 watershed-based plans, many of which represent alternatives to the traditional TMDL-based planning approach. As of August 2024, EPA has accepted 114 advance restoration plans from 27 states<sup>4</sup>. Below are several examples watershed-based restoration plans developed in New Hampshire and other states.

### **5R Plan for the Savannah River Basin, Georgia and South Carolina:**

<https://epd.georgia.gov/document/publication/savannahharbor5rplan09152015pdf/download>

The Savannah River, including the Harbor, serves as the boundary between Georgia and South Carolina. The Savannah Harbor is located at the mouth of the Savannah River where it discharges to the Atlantic Ocean. This 5R plan documents the total pollutant loading of oxygen-demanding substances (5-day Carbonaceous Biochemical Oxygen Demand [CBOD5] and ammonia) that can assimilate and still prevent excessive exceedances of dissolved oxygen criteria. The 5R process allowed the major municipal and industrial point sources to cooperatively determine how the assimilative capacity would be divided among them, subject to state and USEPA approval.

### **Winnicut River Watershed Restoration and Management Plan, New Hampshire**

<https://nhrivers.org/wp-content/uploads/2019/10/WinnicutRiverWRMP.pdf>

The Winnicut River is one of seven major tributaries to Great Bay. The water quality and habitat of the Winnicut River and several of its tributaries have been degraded by increased nonpoint source (NPS) pollution resulting from rapid land development in the watershed over the past 20 years. Impacts associated with NPS pollutants have led to impairments included on the NHDES 2014 303(d) list for Aquatic Life Use, Primary Contact Recreation, and Secondary Contact Recreation, due to low levels of dissolved oxygen and elevated levels of *E. coli* bacteria. The primary goal of this watershed management plan is to assess the Winnicut River watershed and identify actions that will improve in water quality and aquatic habitat.

### **Reedy River 5R Plan (South Carolina):**

<http://cleanreedy.org/>

The Reedy River has headwaters near Greenville, SC, and is listed as impaired for excessive nutrients. Efforts at developing a TMDL in the 2010s were hampered by insufficient data and model calibration challenges. Local stakeholders chose the 5R process to take leadership in the monitoring, modeling, and restoration efforts. The Reedy River Water Quality Group includes a wide range of stakeholders from local governments and utilities to environmental groups and regional planning agencies. The South Carolina Department of Environmental Health Control and USEPA are active participants with approval authority of the 5R plan. The group is currently in the modeling stage.

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