



City of Rochester, New Hampshire

PUBLIC WORKS DEPARTMENT

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INTEROFFICE MEMORANDUM

TO: City Council

FROM: Peter C. Nourse, Director of City Services

DATE: 19 March 2024

SUBJECT: Background and Current Status of the EPA's Permitting of the Wastewater Treatment Facility

CC: Katie Ambrose, City Manager
Terence O'Rourke, Cit Attorney
Mark Sullivan, Director of Finance
Shanna Saunders, Director of Planning
Michael Scala, Director of Economic Development

The City of Rochester has a long history of advocating for sound science in the regulation of its wastewater treatment plant and discharges to the Cocheco River, while also ensuring the goals of maintaining an effective and efficient treatment system for the benefit of its residents.

The recently culminated wastewater permitting process with the Environmental Protection Agency (EPA) has a 15-year history. This overview is provided to familiarize the Council and the public of this background, Rochester's and EPA's actions, understand the impacts of permitting decisions made by EPA Region 1 and the New Hampshire Department of Environmental Services (NHDES), and understand how those decisions will impact sewer rates.

The City's wastewater and stormwater discharges to the Cocheco River are governed by the Clean Water Act (33 U.S.C. §1251 et seq.) (CWA) that allows for permitted discharges of treated wastewater and stormwater to water bodies of the United States. In New Hampshire, EPA Region 1 (Boston, MA) has primary authority over issuance of permits for both stormwater and wastewater systems through its National Pollutant Discharge Elimination System (NPDES) permit program. The CWA gives EPA broad authority to make scientific determinations and set permit conditions.

Under the EPA NPDES program, the City must reduce pollutants in its wastewater discharge from its Wastewater Treatment Facility (WWTF) by complying with the requirements of two EPA NPDES permits: 1. an Individual Permit, unique to Rochester, to regulate multiple pollutants in its discharge including phosphorus and, 2. a Nitrogen General Permit for discharges to the Great Bay Estuary. The City must also reduce pollutants in stormwater through the EPA's Municipal Separate Storm Sewer System (MS4) permit, a third NPDES permit, which regulates stormwater discharges from the City's municipal stormwater systems. The discharges of the WWTF and municipal stormwater system are received by the Cocheco River at a location approximately 12 miles upstream from the Great Bay Estuary. This summary focuses on the City's two WWTF NPDES permits, the Nitrogen General Permit and the Individual Permit.

The City's WWTF is an activated sludge wastewater treatment facility that serves approximately 17,000 residents, with a design flow of approximately 5 million gallons per day and an average flow of approximately 4 million gallons per day. The City has a sanitary sewer system and most of the sewage treated at the WWTF is residential, but the WWTF also receives flows from several industrial and commercial dischargers.

Recently the City of Rochester received two permits for its WWTF to discharge into the Cocheco River. On November 24, 2020, Rochester was one of 12 NH communities around the Great Bay Estuary watershed having WWTF's to be a permittee of the Nitrogen General Permit. In Rochester's case the permit requires the City to significantly limit its Total Nitrogen (TN) discharges to the Cocheco River from the WWTF and it strongly encourages participation in collaborative adaptive management strategies with other watershed communities and Great Bay Estuary stakeholders. These strategies include reduction of TN from over-land stormwater sources¹, monitor ambient water quality, and participate in scientific research to determine the water quality stressors in the Great Bay. EPA's intent of the permit is to improve water quality in the tidal estuary, specifically looking for improvements in eelgrass population which is seen as a major indicator of the overall health of the estuary. Recent science indicates that TN is one of many confounding factors that may be contributing to the decline of the health of the eelgrass in the Great Bay Estuary. Though the level to which TN levels directly impact eelgrass health is debated, it is one of the few influences that can be regulated by law and as such has been the focus of EPA permitting.

On March 20, 2023, EPA Region 1 issued a final Individual Permit that imposes a very low 0.12 milligrams per liter (mg/l) Total Phosphorus (TP) limit.

¹ EPA has no authority under the CWA to regulate pollutants in over-land stormwater runoff. EPA may only regulate pollutants in stormwater that emanate from a "point source" which is a WWTF or stormwater discharge pipe. It is known that most nitrogen entering Great Bay Estuary emanates from over-land stormwater entering waterbodies leading to the Estuary, and this is why EPA strongly encouraged this action.

The intent of the stringent TP limit is to protect the ecological health of the fresh water portion of the Cocheco River. The City's previous Individual Permit did not contain TN or TP nutrient limits. Phosphorus and nitrogen are nutrients that can adversely affect the water quality of a waterbody by promoting excessive algae growth and as such, these nutrients can be regulated by EPA in wastewater discharges.

The current configuration of the WWTF is not capable of meeting these exceedingly low nutrient discharge limits, so a costly upgrade is needed to comply with these permits. The combined estimated cost of these WWTF upgrades is in excess of \$35+ million (\$18+ million for TP upgrades and \$17+ million for TN upgrades, and \$1 million+ in annual operating costs). Additionally, and exclusively, due to the current and future growth of Rochester, WWTF treatment capacity upgrades must be considered.

While the City supports efforts to protect the health of the Great Bay Estuary and the Cocheco River, for more than a decade it has actively worked to demonstrate to EPA Region 1 that these exceedingly low nutrient limits are not based on sound science. The City's scientific consultants conducted field studies and monitoring of the Cocheco River between 2015 – 2017, and data analysis in 2020, determining that the Cocheco River has specific characteristics that aid in the natural assimilation of nitrogen and phosphorus. Its conclusion was (and is) that the Cocheco River is *not impaired* for nutrients, and is not causing nutrient impairment of the Great Bay Estuary (the Cocheco River waters ultimately flow into the Great Bay, 12 miles downstream from the WWTF discharge point).

EPA disagreed with the City's analysis, or at least differed in its view of the "reasonable potential" of the City's WWTF to cause nutrient impairment of the River and the Great Bay. EPA's reasonable potential analysis is a CWA process used to determine whether a permittee's discharges have the potential to exceed a water quality standard using set conditions for flow and pollutant concentrations. EPA's analysis and findings can be generalized and tend to be quite conservative in support of EPA's position, as is the case for Rochester.

The City spent years of discussions and appeals with EPA Region 1, meetings with NHDES, meetings with two NH Governors and meetings with its Congressional Delegation, outlining the serious impacts these costs would have on the City and questioning the scientific basis for such low limits. Nevertheless, EPA Region 1 issued its final NPDES permits imposing a low TN limit and a very low TP limit on the Rochester WWTF.

NH is one of only three States where EPA, and not the State regulatory agency, issues the final NPDES permits. For example, the Maine Department of Environmental Protection issues the NPDES permits for the Maine communities discharging to the Great Bay Estuary. Those Maine communities are not subject to the Nitrogen General Permit and do not have such low nutrient limits in their

individual permits. In 2018, the City and others lobbied the NH Legislature to fund a study to transfer delegation authority to the State of NH for administration of the NPDES permitting program. That effort failed, primarily because of the perceived costs of the program.

EPA, NHDES, the Conservation Law Foundation (CLF), and other Great Bay Estuary stakeholders felt that nitrogen was impacting the health of the GBE and eelgrass health. Eelgrass health and density in the estuary is used as an indicator of a healthy estuary, although nitrogen's role in adversely affecting eelgrass health has been strongly debated.

In 2009, NHDES commissioned a report that found that TN was the key factor impairing eelgrass health in the estuary and that TN levels should be significantly reduced. After litigation and legislative efforts by the City and other communities that formed the Great Bay Municipal Coalition, NHDES agreed to commission a 2014 Peer Review Report to evaluate the 2009 Report. The 2014 Peer Review Report authored by renown national estuary experts concluded that the nitrogen levels set in the 2009 Report were not scientifically supported by the data and that further research was needed to develop an appropriate TN criteria. The Report also found that NHDES did not adequately analyze other confounding factors affecting eelgrass health.

Despite the findings of the 2014 Peer Review Report, in January 2020, EPA issued a draft Nitrogen General Permit that set the TN limit at 3 mg/L for TN. The City, working with its scientific consultants, submitted over 500 pages of extensive public comments challenging the draft permit. The City made its position clear that before it incurred significant economic and societal costs to meet these proposed stringent nutrient limits, EPA and NHDES needed to provide a scientific basis for those limits.

Ultimately, on November 24, 2020, EPA issued the final Nitrogen General Permit that set a higher TN limit for the City (equivalent to 8.0 mg/l). Notably, EPA did not recognize any TN reduction credit to Rochester for its discharge being 12 miles upstream. Such a distance scientifically allows assimilation of a portion of nitrogen into the environment prior to its arrival in Great Bay Estuary. Its permitted TN limit was very similar to those of Portsmouth and Dover, whose discharges are much closer to the Great Bay Estuary.

Since Rochester did not yet have on-line the facilities to reduce nitrogen to the permitted limit, the City negotiated an Administrative Order on Consent (AOC) with EPA to provide a higher TN interim limit until October 31, 2025 of 262 pounds per day to be followed by the permitted 198 pounds per day thereafter. This AOC also required the City to implement ongoing sewer and stormwater pollution reduction projects.

To date, the City has completed an aeration automation project, a carbon storage feed building, and secured Congressional funding to complete construction of the permanent septage receiving facility by the end of September 2024. The City's Sewer System Master Plan is ongoing, and it is working to develop a Nitrogen Reduction Report by October 31, 2024. The City has been in compliance with the interim TN limit and has significantly lowered its TN discharges. Nevertheless, additional WWTF TN upgrades may be required, particularly in light of expected future growth of the City or in the event that EPA lowers the TN limit in the future, if eelgrass density does not increase.

In addition to the AOC agreement, and per EPA's encouragement to reduce nutrients from over-land stormwater into Great Bay Estuary, the Cities of Rochester, Dover and Portsmouth entered into a settlement agreement with the Conservation Law Foundation (CLF) to develop an intermunicipal agency to coordinate efforts for adaptive management, including research into the health of the Great Bay Estuary and impacts of TN and other factors on eelgrass, and the reduction of TN in stormwater runoff coming off of land and into water bodies. These actions were in exchange for CLF not filing an appeal of the Nitrogen General Permit. If CLF had petitioned for an individual TN permit for Rochester, the limits could have been more stringent than the Nitrogen General Permit. As a result of this agreement, the cities formed the Municipal Alliance for Adaptive Management (MAAM) which pools resources among the communities of Rochester, Portsmouth, Dover, Milton, Newington, Rollinsford, Exeter and Epping

The MAAM Group funds research conducted in coordination with the Piscataqua Region Estuaries Partnership (PREP) and the University of New Hampshire (UNH) to evaluate the confounding factors influencing eelgrass health and water quality in the GBE. The City has been an Executive Member of the MAAM since inception, functions as Chair of the group leading discussions and coordinating with all participants and partners, and plays a key role in managing the MAAM Group and its finances.

On April 19, 2022, EPA Region 1 issued a new draft Individual Permit to the City for the WWTF containing lower ammonia limits, flow limits, and a new TP limit of 0.12 mg/L which is set at almost the lowest limits reduction technology can achieve. The new draft permit also contained new monitoring and reporting requirements, including monitoring industrial discharges, inflow, sludge and effluent discharges for Per- and polyfluoroalkyl (PFAS) compounds. A new TP limit of 0.12 mg/L would require an upgrade to the existing WWTF of approximately \$18M+, as well as increased annual spending on staffing and chemical treatment of approximately \$300,000 per year (in current dollars).

On June 17, 2022, the City filed extensive public comments challenging the EPA's draft permit terms, especially the new low TP limit because the City did not believe the limit was supported by sound science. The Cocheco River was not listed as impaired for phosphorus or impaired for nutrients by the State of New Hampshire.

The City's scientific studies had concluded that the site-specific conditions of the river did not support a finding of reasonable potential of impairment. The studies specifically reviewed 10 years' worth of data and determined the river had: 1) favorable dissolved oxygen concentrations; 2) no pH impacts; 3) low chlorophyll-a; 4) no nutrient-related impacts to benthic macroinvertebrates in the River; and 5) moderate algal levels consistent with the conceptual strong light limitations due to the Cocheco's color and shading that allow for moderate levels of algal growth and assimilation of phosphorus. The City also requested it be allowed to conduct additional monitoring to develop a site specific model to develop a more accurate final TP limit.

EPA Region 1 issued a final individual permit for the WWTF on March 20, 2023, that contained essentially the same requirements as the April 2022 draft permit, including a 0.12 mg/L TP effluent limit. In EPA's response to the City's comments, it essentially rejected them all and relied instead upon its discretion to evaluate and determine permit limits.

On April 19, 2023, the City filed an appeal of the final permit with the EPA Environmental Appeals Board (EAB). The parties entered into mediation over the permit terms, and the permit is currently stayed until the appeal is resolved. The City is currently negotiating with EPA an Administrative Order on Consent (AOC) designed to provide the City with adequate time to design, construct and operate an upgraded WWTF to meet the stringent TP limit.

In its upgrade design, the City is also looking ahead as to other needs, including potentially increasing treatment capacity to meet current and future growth. The timeframe given by EPA for the WWTF planning, design and construction to become operational is approximately 8 years. The AOC will also provide for interim TP limits until the WWTF upgrade is completed.

The City has begun planning for the financial impacts to the City, its residents and its businesses. By 2030 the sewer user rates will need to reach a range of \$15-\$20 per unit of water discharged (one unit equals 748 gallons of water). The current sewer user rate is \$8.17 per unit. The obvious driver to the user rate increase will be the debt service associated with the capital improvements needed to comply with the EPA mandates. In order to lessen spikes in debt service, a 30-year bond will be explored as a funding source. These capital upgrade investments may potentially result in City General Fund contributions to the Sewer Fund at some point. The City will also be exploring avenues of grants, congressional funding, and other capital and operating cost reductions to mitigate the financial impacts.

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