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## City of Dover, New Hampshire

COMMUNITY SERVICES DEPARTMENT

May 5, 2020

Mr. Michael Cobb  
U.S. EPA, Water Division  
Municipal Permits Section  
5 Post Office Square, Suite 100 (06-1)  
Boston, MA 02109-3912

Re: City of Dover, New Hampshire's Estimated Cost Impacts of  
Great Bay Total Nitrogen General Permit

Dear Mr. Cobb:

Thank you for the opportunity to provide comments on the proposed Great Bay Total Nitrogen General Permit (GP). The purpose of this letter is to provide an estimate of the City of Dover's anticipated cost impacts. I provide these estimates in my capacity as Director of Community Services for the City of Dover. I was also previously the Director of City Services for Rochester, NH, and prior to that had experience working as a design engineer for a water & wastewater consulting firm. In my roles for both Dover and Rochester, I oversaw the development of annual Capital Improvements Program projects, as well as the regular Operations & Maintenance Budgets. While I was in Rochester, the City retained the partnership of Geosyntech and VHB to prepare a detailed Nutrient Control Plan. I also co-presented Rochester's evolving nutrient control plan work at the American Society of Civil Engineers Low-Impact Development Conference.

### NPS Cost Implications

Dover has been a leader in stormwater management and the implementation of emerging best management practices (BMP's), both structural and non-structural. The restoration of the City's Berry Brook Watershed has been the recipient of local and national innovative stormwater awards, and the focus of numerous tours. The project was an intensive collaborative effort with the University of New Hampshire's Stormwater Center.

The Berry Brook restoration work was immensely successful in reducing the watershed's effective impervious cover from over 30% down to 10%. That resulted in theoretical removal of something in excess of 40,000 pounds of total suspended solids annually. But conversely, the restoration work had very little impact on total nitrogen (TN) removal. So, through 7 to 8 years of active installation and management of NPS measures, we were only able to remove a theoretical TN loading rate of about 2.27 pounds/day, which would be somewhere around 800 pounds per year.

Although Dover hasn't completed a formal City-wide nutrient control plan, we can extrapolate and project that we would have to implement measures commensurate with 40 Berry Brook restoration projects in order to achieve our targeted NPS TN reductions. Dover was able to very cost-effectively implement BMP's in

Berry Brook by installing measures with our own crews. Overall restoration costs were in the vicinity of \$1.5 million.

We have met with representatives of other neighboring communities such as Rochester and Exeter, that both developed detailed Nutrient Control Plans (NCP). We understand that Rochester's consultants have projected costs for their NCP at \$400 million over 20 years and they cannot achieve NPS reductions of 45%. We further understand that Exeter's consultant for their NCP estimated \$102 million in NPS related costs over 20 years, with an acknowledgement that the highest level of NPS reductions they might achieve would be around 19% at best.

Extrapolating the Berry Brook restoration costs, combined with our regular program of BMP installations for ongoing City CIP projects, we expect our required BMP installation costs might be as high as \$200,000,000. This is just based on a theoretical exercise of cost projections to achieve Dover's projected NPS removal of about 89 pounds per day of TN, which we don't believe is feasible, or tenable, given how little land area is publicly controlled by the City. The City has about 27.5 square miles of land within the City limits. Of this amount, about 25.1 square miles is actually land area, after water features are subtracted. The City only owns or controls about 2.1 square miles, or less than 8.4% of the total area. The remaining land is either privately owned or controlled by the New Hampshire Department of Transportation.

### **WWTP Cost Implications**

The City of Dover is considered the fastest growing community in New Hampshire. The GP could trigger 3 different upgrade scenarios at our WWTP, as we've documented that we won't be able to achieve a 45% TN NPS reduction. Therefore, the expectation is that WWTP performance will need to be upgraded to limits-of-technology to remove micro levels of TN.

During the growing season of 2019, at current flows the WWTP consistently achieved an effluent TN of 5.0 mg/L or better. But process upsets due to significant inflow & infiltration, mechanical failures, or cold weather can severely disrupt the TN removal efficiency. The engineering firm of Wright-Pierce has been our engineer of record for recent WWTP facility master plan and upgrades to the plant. They have proposed the following upgrade scenarios to maintain compliance with the GP.

- **\$8 million to accept "hold the load" and allow minor growth.** The GP establishes a baseline flow of 2.46 mgd for Dover. The hold the load requirement assumes an effluent discharge of 8.0 mg/L. In order to accommodate continued residential growth, as our current average daily flows are now closer to 2.7 to 2.8 mgd, the effluent TN numbers have to decrease. In order to hold the load at our projected flows, we expect to have to install another Modified Ludzack-Ettinger process train, along with another clarifier. This should provide sufficient TN removal capacity to "hold the load" and accommodate our current pace of growth, for perhaps the next 5 years.
- **\$13 million to meet "growing season" seasonal average of 5 mg/L of TN at max design flow.** In response to both anticipated residential growth, and the inability to achieve 45% TN NPS reductions, we project having to convert our MLE process to a 4-Stage Bardenpho. This would require the increased capacity upgrades as outlined above, and also include a supplemental carbon source, likely methanol, to enhance TN removal.
- **\$24 million required to meet "limits of technology".** This upgrade option would meet the full requirements for limits of technology. It would provide for TN removal down to 3.0 mg/L (max) at full current design capacity of 4.7 mgd. TN removal would be via a 4-Stage Bardenpho process, and we would need to construct 2 additional treatment trains, another clarifier, more storage capacity, supplemental carbon feed, and likely a tertiary particulate filter off the discharge.

One thing that is unclear and concerning is that we expect to immediately be out of compliance with the hold the load mandate at the WWTP. Our current average daily flows are approaching 2.80 mgd, which would result in required annual average effluent TN of about 7.0 mg/L. It is unlikely we can achieve this annual average TN target considering how cold weather inhibits our TN removal during the non-growing season. This could immediately halt all growth in the City of Dover, such that we couldn't take any additional flow at the WWTP until upgrades were installed. At this point, the fiscal impacts of a complete growth moratorium are not fully understood or identified.

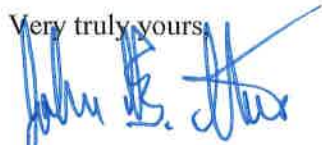
**Ambient Monitoring Program Cost Implications**

The GP indicates each WWTF will need to pay a percentage of the overall ambient monitoring program based a percentage of their design flow compared to the cumulative design flow of only the WWTF's cover by the GP. So this excludes significant contributions from Maine-based WWTP's such as Kittery, Berwick, North Berwick and South Berwick.

It appears Dover's pro-rata contribution would be 17.5% of the overall monitoring costs. Based on an understanding of current data sonde deployment costs, along with discussions with representatives of the Piscataqua Region Estuaries Partnership (PREP), and a review of PREP's prior sampling cost estimates, we are projecting the total annual program might run about \$1.5 million. This is a realistic estimate for budgeting purposes, which would result in an initial annual contribution from Dover of almost \$263,000. Using the pro-rata methodology, omitting the Maine-based WWTF's from participating in the monitoring program creates an additional cost of about \$43,000 annually to the City of Dover.

Thank you for your consideration of Dover's comments on this important proposed regulatory decision. Please do not hesitate to contact me with any questions at 603-516-6462 or by email at [j.storer@dover.nh.gov](mailto:j.storer@dover.nh.gov).

Very truly yours,



John B. Storer  
Director of Community Services