Chance Berthiaume

Please see the attached PDF for complete comments

Electronic comments (PSNRP): https://wq.ecology.commentinput.com/?id=9ruD7M5ie

Jeremy Reiman
Department of Ecology, Water Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Subject: Draft Puget Sound Nutrient Reduction Plan Comments

Dear Mr. Reiman:

Thank you for the opportunity to comment on Washington Department of Ecology's draft Puget Sound Nutrient Reduction Plan (PSNRP). While we support Ecology's intent to improve water quality, we must convey significant, ongoing concerns regarding the scientific foundation, cost implications, and technical feasibility of limits suggested by the draft PSNRP.

Scientific Foundation

Fundamentally, the City expresses reservations about the means and methods used to evaluate dissolved oxygen (DO) conditions in Puget Sound and establish the foundation for proposed nitrogen/nutrient removal requirements. This concern is amplified for the City, which faces the lowest effluent nitrogen limits proposed in the PSNRP. Due to the City's discharge to Sinclair Inlet, the PSNRP suggests a year-round effluent limit of 3 mg/L total inorganic nitrogen (TIN) or total nitrogen (TN). The City's concerns about the basis for nitrogen removal requirements are discussed below.

Ecology's use of the natural condition standard is based upon a hypothetical construct of pre-development conditions. It is a theoretical natural condition based on a Salish Sea Model simulation that cannot be measured by physical DO monitoring in Puget Sound. The natural reference condition cannot be validated by DO measurements made by water quality monitoring because it does not exist. Ecology's characterization of DO impairment is based upon post-processing model results to count the number of days a model cell falls below the DO standard to calculate the number of days of DO noncompliance. However, Salish Sea Model error exceeds the tiny 0.2 mg/L human use allowance for DO depression from natural conditions. It is unlikely that any model could reduce uncertainty to less than 0.2 mg/L. Alternatively, establishment of a DO standard based on aquatic life would allow water quality monitoring to assess actual conditions and determine the level of beneficial use supported by direct measurement of DO concentrations.

Furthermore, the PSNRP appears to assume completion and EPA approval of the Natural Conditions Provision in Appendix D. While Ecology has published a Second Draft of a Performance Based Approach for Site Specific Natural Conditions Criteria, Ecology has not

completed the rulemaking process and submitted a final natural conditions standard to EPA for review.

Also, our consultants are unable to replicate the findings provided by Ecology from the Salish Sea Modeling, and Ecology has not modeled other scenarios of interest that could show that incremental approaches to nutrient reduction, and/or target reductions in specific locations, could provide equivalent DO improvements to Ecology's Phase 2 Salish Sea Modeling Update. Since the basis for Ecology's Phase 2 Salish Sea Modeling Update in 2014 is outdated by more than a decade, it does not represent current conditions. For further transparency and repeatability, access to the Salish Sea Model should be provided with the ability to use updated model inputs and simulate sensitivity analysis scenarios that have not been considered in Ecology's Phase 2 Salish Sea Modeling Update.

Cost and Feasibility

The City also expresses concern regarding Ecology's comprehension of the magnitude of the cost impacts for the proposed nitrogen removal requirements, technical implications of changes a basis of TIN along with the inclusion of a new implied carbonaceous biochemical oxygen demand (CBOD) limit, and practical feasibility of plant-specific considerations for our utility.

In 2021, the City completed a simplified preliminary engineering study prior to the original PSNGP and lacking the full rigor of the Nitrogen Removal Evaluation (NRE). The study estimated the cost of upgrades to achieve 3 mg TIN/L during dry weather flow conditions and allowing for peak wet weather diversions around secondary treatment as per current treatment plant design and permitted operation at Bremerton's West WWTP. The study estimated the 20-year net present value of upgrades to be $200 million total (April 2021 dollars). This includes implementing sidestream treatment as an interim upgrade. Estimated current costs are anticipated to be significantly higher due to rampant cost escalation in recent years, higher debt service rates, as well as the more stringent limits suggested in the draft PSNRP. Peak wet weather diversion may no longer be viable if TIN or TN limits of 3 mg/L must be achieved year-round. The de-facto need to treat "every drop" of influent flow for nitrogen removal to the limits of conventional treatment technologies will exacerbate cost impacts for marginal gains in nitrogen removal. These nitrogen removal requirements alone could result in unaffordable sewer rates in the City and ignores other financial demands that must be met for the City's collection system, wet weather CSO control, biosolids management, and asset management renewal and replacement costs to sustain existing levels of treatment.

Ecology has confused the characterization of effluent nitrogen in future scenarios with the change from TIN to TN in the draft PSNRP. It appears that Ecology may not have accounted for the soluble organic nitrogen (SON) present in all municipal wastewater in the range of 1 to 3 mg/L that cannot be removed in nutrient removal treatment because it is not biodegradable and it may not be bioavailable in receiving waters. If Ecology's shift to TN does not account for effluent SON, a year-round 3 mg TN/L limit that the City appears to be facing may be technically infeasible short of molecular removal with reverse osmosis. This would increase costs exorbitantly above the already-high costs for nitrogen removal and require improvements at the limit of conventional treatment technologies.

The draft PSNRP makes reference to the 2011 Tetra Tech Report (June 2011 "Technical and Economic Evaluation of Nitrogen and Phosphorus Removal at Municipal Wastewater Treatment Facilities", Ecology Publication 11-10-060). This publication is far out of date and was created

for a generalized review and characterization of nutrient removal treatment and costs. It does not reflect the site-specific aspects of existing Puget Sound wastewater facilities, such as the City of Bremerton, and it doesn't consider the site-specific constraints that present challenges to adapting facilities designed for secondary treatment to nutrient removal. Two specific issues for the City of Bremerton are high peak wet weather flows that the City's West WWTP receives and manages for CSO control, as well as the sudden and dramatic variability in the City's population and thus wastewater flows and loads driven by US Navy vessel activity at Naval Base Kitsap-Bremerton. Those site-specific details that inform the actual potential for nutrient removal at existing facilities establish the need for the Nutrient Reduction Evaluation (NRE) and AKART analysis that was called for in the original Puget Sound Nutrient General Permit. The NRE and AKART evaluations that wastewater dischargers are invested in preparing should be the basis that Ecology uses to determine the feasible levels of effluent nitrogen performance and the potential feasible costs for those facilities. That information should supersede reliance on the 2011 Tetra Tech report that is referenced and should supersede the assumptions about effluent nitrogen limitations selected by Ecology for the Phase 2 Salish Sea Modeling Update which may not be attainable.

Ecology's association of an annual effluent quality of 8 mg/L CBOD with nitrogen limits does not appear to be supported by the 2011 Tetra Tech report. Typically, an 8 mg/L CBOD limit becomes a de-facto requirement for secondary effluent filtration to reliably meet the limit. Conversely, a marginally higher CBOD limit, combined with TIN rather than TN limits, could avoid extra facility costs for adding tertiary filtration. This type of sensitivity analysis in Salish Sea Modeling scenario evaluation and integration of practical WWTP facility implications does not appear to be considered in development of the PSRNP.

Conclusion

The City remains committed to protecting the Puget Sound but are concerned with the scientific case and associated costs for nitrogen removal requirements suggested by the draft PSNRP. We believe the current version of the PSNRP requires further refinement and respectfully request that Ecology takes additional time to incorporate our feedback, which is likely shared by the broader utility community. We endeavor to work with Ecology toward viable, achievable, cost-effective strategies for management of nutrient discharges to Puget Sound.

Sincerely,

Chance W Berthiaume, WDM IV
Interim Director of Public Works and Utilities