

# Wastewater Technical Advisory Group Report to Steering Committee

## High Rock Lake Stakeholder Process

The High Rock Lake Wastewater Technical Advisory Group met with representatives from the Division of Water Resources five times between December of 2022 and August of 2023. DWR Planning staff brought forward a proposal to implement point source nutrient reductions in the watershed that prioritizes significant early reductions of delivered phosphorus, with nitrogen improvements over time as facilities are able to plan for and acquire funding for treatment upgrades. To identify potential targets for end of pipe concentrations as reference points for plant performance needs, several steps were taken as follows:

- Point source discharge annual loads of P and N were quantified over the last 20 plus years including the baseline year of 2006 and current estimated loads.
- Delivery factors developed from the watershed model were used to estimate the delivered portion of these annual loads to High Rock Lake.
- Various technology endpoints for concentrations of P and N were evaluated to determine achievable reductions from the 2006 baseline loads.
- The reductions were compared to potential target reductions for P and N and used to develop a potential strategy for point source reductions.

Wastewater TAG members came to a consensus that limits should be based on discharge concentrations that achieve proportional load reductions from point and nonpoint sources over time. They also proposed that reductions beyond their proportion (their fair share of reduction) be made available for trading since DWR maintained that point source reductions were more cost-effective and easier to achieve than nonpoint source reductions. DWR Planning staff made the case that point source limits should instead be based on achievable, cost-effective performance levels, and their proposal reflected this premise. This report will present the consensus view of TAG members, as well as the alternative proposal from DWR Planning staff.

## Wastewater TAG Proposal

***Overarching Premise – All managed point and nonpoint source sectors should be responsible for the same proportions of nutrient reduction over time and that point source reductions beyond that fair share be available for trading***

Wastewater TAG members concur with the recommendation put forward by the Yadkin Pee Dee River Basin Association that phosphorus should be prioritized for load reduction in the High Rock Lake Watershed. Members also concur with the recommendation put forward by the Division of Water Resources that some level of nitrogen management will be important in order to avoid unintended consequences from nutrient load imbalances in future years.

Wastewater TAG members have approved the following recommended NPDES permit revision schedule for facilities in the High Rock Lake Watershed. The term, “equivalent concentration” as used in this

context means the single end-of-pipe concentration of a nutrient that would apply to all dischargers of a stated class at a stated flow regime to achieve a stated collective annual mass load reduction when delivered to the lake:

*At the 1st permit renewal after rule effective date, a collective 37% TP point source annual mass load reduction is proposed at the lake. This percentage reduction is expected to fall somewhere in the low to mid 50s when adjusted for unmanaged loads from forest and other sources. To achieve this, end-of-pipe annual mass loads will be assigned equating to the following:*

- *A 0.75 mg/L phosphorus equivalent concentration at permitted flow will be applied to all facilities with permitted flow larger than 0.99 MGD*
- *A 1.0 mg/L phosphorus equivalent concentration at permitted flow will be applied to all facilities larger than 0.10 MGD but equal to or smaller than 0.99 MGD*

*At the 2nd permit renewal after rule effective date, a collective 20% TN point source annual mass load reduction is proposed at the lake. To achieve this, end-of-pipe annual mass loads will be assigned equating to the following:*

- *A 6.0 mg/l nitrogen equivalent concentration at permitted flow will be applied to all facilities larger than 4.99 MGD*
- *A 10.0 mg/l nitrogen equivalent concentration at permitted flow will be applied to all facilities larger than 0.10 MGD but equal to or smaller than 4.99 MGD*

*Wastewater TAG members recommend adopting permitting, allocation and trading processes that mirror the Neuse Basin Nutrient Management Strategy and include the following:*

1. *Annual nitrogen and phosphorus mass limit allocations derived from the overall point source load allocation will be distributed to all existing dischargers and calculated based on a reasonable assumed level of treatment and facility size*
2. *Facilities smaller than 0.10 MGD will be assigned annual mass allocations, but permits will not include actual corresponding limits*
3. *DWR will include an adaptive management provision recommending action if the collective allocation for all facilities smaller than 0.10 MGD is exceeded*
4. *Facilities constructed after the rule effective date will be required to meet reasonable minimum performance standards and purchase their resulting annual allocation from existing facilities*
5. *Large dischargers will be allowed to regionalize smaller facilities and combine their existing allocation with the allocation of the facility being regionalized*
6. *A watershed-based group NPDES permit will be optional for facilities who enter a formal compliance agreement to abide by its terms*
  - a. *All dischargers who sign onto the compliance agreement will add their individual allocation to the group allocation*
  - b. *The compliance coalition's allocation will be reduced by the allocation of any discharger who voluntarily leaves the compliance coalition*
  - c. *All individual members of the compliance coalition will be deemed "in compliance" with the mandates of the point source management rule as long as the group remains in compliance with the watershed permit*

- d. Exceedance of the group permit will trigger NPDES Branch enforcement of individual permit limits, which includes options for treatment upgrade or offset credit acquisition*
- 7. Individual facilities will be allowed to trade allocation with other entities for rule compliance, and permits will be modified to reflect approved trades*
- 8. Individual facilities will be allowed to purchase allocation from an existing permitted facility if expansion is expected to result in an exceedance of current permit allocations*
- 9. Individual facilities will be allowed to purchase nitrogen or phosphorus offsets to add allowable load to their permitted allocation*
- 10. Individual facilities will be allowed to sell or lease allocation to any new or existing discharger*
- 11. Individual facilities will be allowed to sell allocation, term, or permanent credits to another regulated NPS entity for rule compliance*

TAG members agree that all major point and nonpoint sources should be held responsible for the same overall lake reduction goal percentages, and that cross-sector credit trading should be allowed to incentivize additional treatment and innovation. Given the relatively high and inherently volatile costs associated with wastewater facility upgrades, TAG members recommend that DWR continue to engage with point source stakeholders on the expected scale of preliminary reduction targets. Members also recommend that DWR prioritize adaptive management provisions that allow for flexibility as rules take effect and economic conditions change.

Given several important differences between Publicly Owned Treatment Works (POTW) and industrial wastewater treatment facilities, TAG members did not take a position on industrial permitting requirements under the nutrient strategy. DWR Planning staff have not determined a proposed course of action but have indicated an intention to pursue a separate discussion with industrial dischargers and agency permit writers which will help inform rulemaking. Additionally, Wastewater TAG members did not take a position on the need for additional on-site wastewater regulations in the High Rock Lake Watershed.

Approved by:

<b>TAG Member</b>	<b>Affiliation</b>
Bill Brewer	Winston-Salem/Forsyth County Utilities
Danica Heflin	Piedmont Triad Regional Council
Bill Kreutzberger	Independent Consultant
Andy Smith	City of Statesville
<b>Abstentions</b>	
Kevin Haynes	Tyson Foods Inc.
Doug Lassiter	NC Septic Tank Association

## **DWR Planning Staff Recommendations**

Planning staff understands the importance of distributing load reduction goals fairly across the various point and nonpoint sources in the watershed. In the decades since the first nutrient strategies took effect in North Carolina, the idea that reduction percentage goals should be mathematically proportional for all point and nonpoint sources has prevailed. However, implementation of other nutrient management strategies has demonstrated not only the difficulty, and even doubtful capability, of achieving and maintaining significant load reductions from nonpoint sources, but also the relatively high cost burden associated with each reduced pound of nutrient loading in nonpoint sectors. This cost burden is disproportionately high for nonpoint sources, in part, because nonpoint source pollution is generated across landscapes with significantly more complicated land and property ownership. Nonpoint source pollution control requires coordination with a large number of different landowners, and control practices must be implemented on private property, which in other watersheds has proven challenging. Additionally, the management of nonpoint source pollution on private property significantly complicates long-term maintenance, monitoring and enforcement.

In other nutrient sensitive watersheds, point sources have exceeded load reduction targets due to the relative cost efficiency of optimization and treatment improvements from large facilities with centralized controls and straightforward facility ownership. In addition, preliminary cost estimates from NPDES staff and independent consultants show similar capital cost and net present value between phosphorus limits of 1.0 mg/L and 0.50 mg/L. For this reason, Planning staff concludes that the additional cost burden on the largest dischargers in the watershed from compliance with a more stringent phosphorus limit would be relatively minor and help achieve a significant reduction in overall phosphorus loading to High Rock Lake.

Planning staff take the position that in order to implement a management strategy that has a meaningful hope of achieving long-term water quality improvement in areas with rapid land use change, load reductions must be quantifiable, measurable, and also cost effective. Given the limited scale of achievable nonpoint source load reductions, the inherent sensitivity of nonpoint sources to climate variability, in contrast to the demonstrated consistency of engineered point source improvements, staff support the idea that an equitable nutrient strategy must prioritize achievable and cost-effective improvements in the short term. A higher required load reduction from point sources in the watershed is therefore appropriate. TAG members do not agree with the Planning staff's conclusions or a proposal to hold point sources responsible for a higher reduction goal.

For the reasons stated above, DWR Planning staff propose the following NPDES permit revision schedule for facilities in the High Rock Lake Watershed, *in addition to* the aforementioned requirements recommended by the full Wastewater TAG:

*At the 1st permit renewal after rule effective date, a collective 50% TP point source annual mass load reduction is proposed at the lake. This percentage reduction is expected to fall somewhere in the mid 60s when adjusted for unmanaged loads from forest and other sources. To achieve this, end-of-pipe annual mass loads will be assigned equating to the following:*

- *A 1.0 mg/L phosphorus equivalent concentration at permitted flow will be applied to all facilities larger than 0.099 MGD but equal to or smaller than 0.99 MGD*
- *A 0.75 mg/L phosphorus equivalent concentration at permitted flow will be applied to all facilities with permitted flow larger than 0.99 MGD but smaller than 7.99 MGD*
- *A 0.50 mg/L phosphorus equivalent concentration at permitted flow will be applied to all facilities with permitted flow larger than 7.99 MGD*