

Guidance for new, expanding & significantly upgraded facilities

Phase 1 – Wastewater nitrogen reduction strategy

Implementation date: April 1, 2024

Purpose

The Minnesota Pollution Control Agency (MPCA) is planning to adopt new aquatic life toxicity nitrate (NO₃-N) water quality standards (WQS) and related total nitrogen (TN) state water discharge restrictions (SDR). Administrative procedures to adopt the proposed modifications of Minnesota Rule Chapters 7050 and 7053 are expected to begin in 2025. During the time period preceding rule adoption, the MPCA will work with project proposers to ensure that future nitrogen limits, based on the draft WQS criteria and proposed SDR, are known and design considerations for new, expanded and significantly upgraded wastewater treatment facilities (WWTFs) include nitrogen removal processes.

New, expanded, and upgraded municipal and industrial WWTFs require significant investments of public and private funds and are typically designed for a 20-year service life. In order to maximize future benefits from impending investments in WWTF design and construction, and to expedite the ability of newly constructed, expanded and upgraded WWTFs to attain future nitrogen effluent limits, the MPCA intends to ensure that WWTF designs prepared prior to the adoption of aquatic life toxicity NO₃-N WQSs and TN SDRs include consideration of the treatment units and hydraulic capacity necessary to achieve effluent denitrification. Additionally, nitrogen discharged from the proposed facilities will be evaluated and effluent limits will be developed if there is a need to protect an existing drinking water source or where biological stress to aquatic organisms exists as a result of high NO₃-N.

Implementation process

Effluent limit review process – new, expanding, and significantly upgraded WWTFs

All publicly funded new, expanded, and significantly upgraded (where biological treatment processes are being upgraded) municipal WWTF projects request completion of a preliminary effluent limits review at the beginning of their planning process. As part of the preliminary effluent limits review process MPCA will review all applicable existing and new effluent limits for the proposed facility. For all new, expanded, and significantly upgraded municipal and industrial WWTF projects that are not publicly funded this review will be completed during the permitting process.

Upon implementation of this guidance, any applicable nitrogen requirements will be reviewed and communicated back to the applicant/project proposer according to the following review processes:

1. Determine if WWTF discharge will cause or have a reasonable potential to cause or contribute to an exceedance of existing water quality criteria

- The exceedance of the NO₃-N drinking water standard in downstream waterbodies utilized as drinking water sources¹; or
- NO₃-N causing biological stress to aquatic organisms²

If reasonable potential is found, MPCA will develop a nitrogen limit that ensures the use(s) are protected. This limit will be included in the WWTF's NPDES/SDS permit and construction of all of necessary treatment units will be required to achieve effluent denitrification to levels sufficient to protect downstream uses.

2. All future projected nitrogen limits, based on the draft criteria for the NO₃-N WQS and/or TN SDR rulemaking as outlined in MPCA's Wastewater Nitrogen Reduction Strategy will be included in the preliminary effluent limits review results or communicated during the permitting process.

Facility planning process – new, expanding, and significantly upgraded WWTFs

1. Facility plans and other planning or design documents submitted by project proposers, including those for municipal and industrial WWTFs that are not seeking public funding, shall include design considerations for denitrification to levels sufficient to protect downstream uses and to achieve the future projected nitrogen limits; and
2. The MPCA wastewater engineers will work with the project proposer and their consultant to ensure they are incorporating current incentives such as regulatory certainty and that their analysis of all feasible treatment alternatives is capable of meeting the applicable effluent, water quality, and public health requirements for 20 years³.

Antidegradation – new and expanding WWTFs

Antidegradation analysis for new and expanding WWTFs must consider nitrogen in accordance with MPCA guidance: [Antidegradation Guidance \(state.mn.us\)](https://www.state.mn.us/antidegradation). The MPCA will require antidegradation assessments for all new and expanded WWTFs to include analysis of prudent and feasible prevention, treatment or loading offset alternatives necessary to avoid net increases in NO₃-N loading in downstream waterbodies.

¹ MN Rules 7050.0221, subp. 2, 3, & 4 Specific water quality standards for class 1 waters of the state; domestic consumption.

² MN Rules 7050.0150, subp. 3 determining water quality, biological and physical conditions, and compliance with standards.

³ MN Rules 7077.0272, subp. 2 d. Facilities plan for wastewater treatment systems.