

Ammonia Reasonable Potential Analysis Procedure for NPDES Permits¹

May 2017

40 CFR 122.44(d) requires delegated States to develop procedures for determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream violation above a narrative or numeric criteria within a State water. If such reasonable potential is determined to exist, the NPDES permit must contain pollutant effluent limits and/or effluent limits for whole effluent toxicity.

Georgia's Reasonable Potential Analysis Procedure (2003, as amended) provides guidance for chemical constituents or pollutants that have numeric and narrative in-stream water quality criteria. However, it specifically states, "Ammonia and total residual chlorine will be addressed based upon the existing EPD strategies for each of these chemical constituents." This document has been written to provide the reasonable potential procedures to implement EPD's Ammonia Strategy.

EPD uses EPA's Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (2013) and Ambient Water Quality Criteria for Ammonia (Saltwater) – 1989 to determine site-specific numeric criteria for ammonia toxicity. The applicable site-specific in-stream ammonia criteria is used for comparison and is based on the critical seasonal in-stream temperature and in-stream pH levels, which are determined after mixing of the effluent with the receiving stream. The upper allowable pH effluent limit and the receiving stream pH level based on available in-stream water quality data are used. In-stream salinity will also be used, if applicable, based on the GA EPD rules for Water Quality Control, which designate salt waters with a salinity of 0.5 parts per thousand and greater.

The permittee's calculated in-stream concentration of ammonia downstream from a discharge is based on a mass balance equation that assumes rapid and complete mix in the receiving stream. The equation uses the applicable critical stream flow (i.e. acute, chronic, low flow), upstream (background) ammonia concentration, effluent flow rate, and effluent concentration of ammonia. Upstream background ammonia concentrations are determined based on available in-stream water quality data that has been collected in Georgia streams throughout the State. If there is more than one effluent discharger to a receiving stream, the upstream discharger's impact to the stream will assume to be included in the upstream background ammonia concentration.

If permittee's calculated in-stream concentration indicates the presence of ammonia at levels of concern, EPD will include monitoring provision(s) and/or effluent limitation(s) in the NPDES permit to protect the receiving water body from ammonia toxicity.

Domestic Wastewater

Based on the influent characteristics of domestic wastewater from publically owned treatment works (POTWs) businesses, hotels, etc. with permitted flows greater than 0.5 MGD, there is a reasonable potential for the effluent discharge to cause or contribute to a violation of the in-stream toxicity criteria for ammonia. Therefore, larger wastewater treatment plants (≥ 0.5 MGD) will be given an ammonia effluent limit in the permit. Smaller wastewater treatment plants (< 0.5 MGD) will be required to monitor ammonia in the permit. Monitoring data will be used to determine the reasonable potential of the effluent to cause or contribute to a violation of the narrative water quality standard for toxicity.

Nondomestic Wastewater

The influent characteristics of nondomestic wastewater vary significantly based on the types of activities at the permitted facility. In addition, as of December 2016, as these procedures are being developed, many of these facilities have very limited data regarding their ammonia discharge. Therefore, EPD will follow the below steps to determine the reasonable potential of the effluent to cause or contribute to a violation of the narrative water quality standard for toxicity for these facilities.

Nondomestic Wastewater When Less than 10 Data Points are Submitted with the Permit Application

➤ Not a Pollutant of Concern

If less than 10 data points are available to calculate the permittee's in-stream concentration and if the permittee's calculated in-stream concentration(s) is less than 50% (ie. less than 49.4%) of the applicable site-specific in-stream ammonia criteria, then ammonia will be considered not to be present at levels of concern (no reasonable potential to cause or contribute to a violation of an in-stream water quality criteria) and EPD will not require additional monitoring or include a numeric effluent limit for ammonia in the permit.

➤ Pollutant of Concern (monitor)

If less than 10 data points are available to calculate the permittee's in-stream concentration and if the permittee's calculated in-stream concentration(s) is between 50% and 100% (ie. between 49.5% and 99.4%) of the applicable site-specific in-stream ammonia criteria, then ammonia will be considered present at levels of concern (there is

no reasonable potential to cause or contribute to a violation of the in-stream water quality criteria, but data is limited) and EPD will require the permittee to monitor for ammonia.

EPD will work individually with each permittee to establish a monitoring schedule in the permit, to obtain a minimum of 10 data points based on the type and frequency of discharges.

Upon submittal and review of the 10 data points, EPD will reevaluate the permittee's in-stream concentration and EPD may perform the reasonable potential analysis again using this document.

➤ Pollutant of Concern (effluent limit)

If less than 10 data points are available to calculate the permittee's in-stream concentration and if of the permittee's calculated in-stream concentrations are equal to or greater than 100% (ie. 99.5% or greater) of the applicable site-specific in-stream ammonia criteria, then ammonia will be considered present at levels of concern (there is a reasonable potential to cause or contribute to a violation of the in-stream water quality criteria) and a numeric effluent limit for ammonia will be included in the permit.

Nondomestic Wastewater When at least 10 or More Data Points are Submitted with the Permit Application

➤ Not a Pollutant of Concern

If at least 10 data points are available to calculate the permittee's in-stream concentration and if the permittees calculated maximum in-stream concentration is less than 100% (ie. less than 99.4%) the applicable site-specific in-stream ammonia criteria, then ammonia will be considered not to be present at levels of concern (no reasonable potential to cause or contribute to a violation of an in-stream water quality criteria) and EPD will not include an effluent limit in the permit.

➤ Pollutant of Concern (effluent limit)

If at least 10 data points are available to calculate the permittee's in-stream concentration and if the permittees calculated maximum in-stream concentration is greater than 100% (ie. greater than 99.5%) of the applicable site-specific in-stream ammonia criteria, then ammonia will be considered present at levels of concern (there is a reasonable potential to cause or contribute to a violation of the in-stream water quality criteria) and a numeric effluent limit for ammonia will be included in the permit.

Sufficiently Sensitive Analytical Test Method

EPD will evaluate ammonia data provided in the NPDES application, as well as any other available site-specific data that measures ammonia. A sufficiently sensitive analytical test method shall be used as required by 40 CFR 136 of the Federal Regulations and the detection limit shall be provided to EPD upon request. Data should be reported as mg NH₃-N/L.

Effluent Limit Calculation

The monthly average numeric effluent limits are calculated based on a mass balance equation to meet the applicable toxicity criteria determined by EPA's 2013 document. The daily maximum may be calculated by multiplying the monthly average by a factor of 1.5, however EPD may deviate from the daily maximum calculation if there is additional information regarding ammonia toxicity.

Effluent Limit Compliance Schedule

At the request of the permittee, a schedule to allow for the implementation of the site-specific effluent limit may be established by EPD and included in the permit per Chapter 391-3-6-.10. The schedule must be the shortest reasonable period of time necessary to achieve compliance.

Anti-backsliding

All modifications of limits and monitoring requirements will comply with the anti-backsliding requirements contained in Section 402(o) of the Clean Water Act.

¹ If there is an applicable Total Maximum Daily Load (TMDL) for an associated water body, EPD will implement the TMDL regardless of the reasonable potential procedures listed in this document