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Rachel Schmeltz
Climate Change Division
Office of Atmospheric Programs
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460
Via Email: GHGInventory@epa.gov

RE: NACWA Comments on Wastewater Treatment Emissions Estimates in EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019, Draft for Expert Review

Dear Ms. Schmeltz:

The National Association of Clean Water Agencies (NACWA) appreciates this opportunity to comment on the U.S. Environmental Protection Agency's (EPA) draft *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 (Inventory)*, and specifically Section 7.2, *Wastewater Treatment (CRF Source Category 5D)*, as part of the expert review process. NACWA represents the interests of over 300 publicly owned wastewater treatment agencies nationwide, serving the majority of the sewered population in the US. NACWA members want to ensure that greenhouse gas (GHG) emissions from wastewater treatment facilities are characterized correctly in the *Inventory*, since the *Inventory* is a frequently cited reference for GHG information. The wastewater treatment category includes publicly owned treatment works (POTWs), septic systems, and industrial wastewater treatment systems. NACWA's review focused on emissions from POTWs.

NACWA has submitted comments on the wastewater treatment section since the 2005 *Inventory*, and we appreciate the clarifications that EPA has made over the years for the emissions calculations and the factors that are used in the calculations. Since EPA uses guidelines published by the Intergovernmental Panel on Climate Change (IPCC) to calculate emissions for the *Inventory*, the basis of EPA's estimates did not change between the 2005 and 2018 *Inventories*. However, with the publication of the *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC Refinements)*, EPA's calculations changed in the 2019 *Inventory*. This has resulted in significantly higher POTW emissions estimates for both methane and nitrous oxide.

NACWA offers the comments below as its preliminary comments on the *Inventory*. Because the methods and factors used for the 2019 *Inventory* are so different than in previous years, NACWA will continue to review the *Inventory*

and compare the results to available data. NACWA will submit additional comments during the public review period.

General Comments on Wastewater Emissions Estimates

The wastewater section of the *Inventory* is clearly written and demonstrates EPA's understanding of domestic wastewater treatment processes. This section defines the boundaries of the emissions estimates, with the sources and offsets that are included in the estimates. NACWA appreciates that EPA has followed the Association's previous recommendation that the calculation variables and data sources be presented in table form.

Two small errors should be corrected in the wastewater section. First, "biosolids" are distinct from "sludge," per EPA regulations. The term "sludge" should therefore not be placed in parentheses after "biosolids" on page 7-22. Second, the equation on page 7-25 showing the biogas production appears to be missing the term "population," which should be multiplied by the biogas generation rate.

EPA asked for comment on the disaggregation of national estimates and the availability of disaggregated data, such as at the state level. This would require emissions calculation methods other than the IPCC methods, since the IPCC methods are based largely on population and on estimates of nitrogen and biological oxygen demand (BOD) loading per capita. Some utility-level and state-level data is available, but there is a need for more data to be collected. Although consideration of data at a more granular level is preferable, it must also be used carefully when drawing conclusions at a broader level.

EPA Incorporation of IPCC Refinements

The calculations from the *IPCC Refinement* are based entirely on influent nitrogen loading and do not account for whether POTWs have nitrification/denitrification processes at the treatment plant. Nitrous oxide cannot form without nitrification and/or denitrification occurring. However, as the calculations are set up, the emission estimate is the same for a plant with nitrification/denitrification as for a plant without nitrification/denitrification.

Previous IPCC guidance used population as the basis for nitrous oxide calculations, as does the current *IPCC Refinement*. However, the previous IPCC guidance used different emissions factors depending on whether plants use nitrification/denitrification processes, with lower emissions resulting from plants without nitrification/denitrification. The IPCC calculations for nitrous oxide should account for the presence or absence of nitrification/denitrification processes at different treatment plants.

Actual nitrous oxide emissions are likely very process-specific, with factors such as consistency of dissolved oxygen levels, system upsets, and supplemental carbon addition sources potentially playing a large role in the quantity of nitrous oxide formed. Further refinements will be needed in the future with respect to treatment process type.

Input on Data Used in Emissions Estimates

NACWA will continue to review available resources on the data affecting wastewater emissions estimates. The Association will provide input during the public review period on the nitrogen content of sludge, amount

of sludge produced, sludge disposal practices, biogas generation and recovery operations, and estimates of the percent of BOD or nitrogen removed by aerobic, anaerobic, and other treatment systems.

Developing US-specific methods for estimating nitrous oxide emissions, rather than using IPCC methods, should be a priority for EPA. It would likely be more accurate to have different default factors for the type of treatment processes applied, such as nitrification/denitrification, rather than using the IPCC default factor for domestic wastewater of 0.005 kg N₂O-N/kg N. During the public comment period, NACWA will provide additional information on this factor, as well as the emission factor for nitrogen from industrial and commercial sources co-treated with domestic wastewater.

NACWA recommends that additional consideration be given to where wastewater discharges occur in the aquatic environment. The current emissions factors apply to “estuaries,” but further details describe “slow moving” aquatic systems. A large portion of wastewater discharges go to aquatic systems that are not “slow moving,” since discharge points for POTWs are usually selected to meet water quality objectives and to target dilution and movement of the receiving water – conditions that are not conducive for producing GHG emissions. A better understanding of how emissions depend on the discharge points would likely lead to more accurate emissions estimates.

Additional Comments

NACWA agrees with EPA’s planned improvements for the *Inventory* and encourages development of US-specific methodologies and emission factors when appropriate. NACWA also suggests that EPA provide diagrams showing emissions sources and offsets related to each process stage in the domestic wastewater treatment train. This would provide context of the function and objective of POTWs to protect public health and water quality through wastewater treatment.

Thank you for your consideration of these comments. Please contact me at 202-533-1836 or cfinley@nacwa.org if you have any questions.

Sincerely,



Cynthia A. Finley, Ph.D.
Director, Regulatory Affairs