SENT VIA EMAIL

October 22, 2021

Elizabeth S. Biser, Secretary
N.C. Department of Environmental Quality
217 W. Jones Street
Raleigh, NC 27603

Dear Secretary Biser:

The Environmental Justice and Equity (EJE) Advisory Board was chartered to assist the Department of Environmental Quality (DEQ) in ensuring fair and equal treatment and meaningful involvement of all North Carolinians, regardless of race, color, national origin, or income, in the development, implementation, and enforcement of environmental laws and policies. In this role, we strive to ensure access to clean air, clean water, and clean soil, and the opportunity to live in safe and healthy communities for all North Carolina families.

Today, we write to you about pollution from hog operations, a long-standing environmental justice issue that has affected thousands of North Carolina families for decades. We respectfully request that DEQ take steps to protect these families, their health, and the environment.

Under the 2021 North Carolina Farm Act, N.C. Sess. L. 2021-78, DEQ must develop a general permit for hog operations that will produce swine waste-to-energy (biogas) by July 2022. As we expressed in our August 26, 2021 letter to you, the EJE Advisory Board has significant concerns about the pollution and public health implications of this general permitting scheme.

In addition to the procedural recommendations we provided in our August 26, 2021 letter, we advise DEQ to ensure the new general permit include robust substantive protections against hog waste pollution and its disparate impacts on surrounding communities. Cleaner technologies and practices that reduce water and air pollution—and that are compatible with biogas production—are available and practicable. In fact, some of these technologies are used by Smithfield Foods, the nation's largest pork producer, in other states. North Carolinians deserve the same protections.

In North Carolina, biogas is produced by capturing methane from hog waste lagoons using covered anaerobic digesters. To date, DEQ has allowed hog operations to dispose of waste from these digesters by transferring the digester waste to open "secondary" lagoons, and spraying the digester waste on fields.[1] The biogas is sent off-site for processing and eventually used to produce energy. Biogas produced using the lagoon and sprayfield system is not a clean source of energy.

[1] *See, e.g.*, Permit No. AWI310039 Benson Farm (Mar. 31, 2021) (authorizing the use of a Waste-to-Energy system, which includes a covered anaerobic digester; a clay-lined lagoon; pumps, pipes, and other equipment to transfer waste; and sprayfields).

The lagoon and sprayfield waste management system used at industrial hog operations pollutes waterways,[2] contaminates drinking water,[3] and dirties the air people breathe.[4] This pollution and the resulting harms to human health have burdened neighbors—mainly people of color and low wealth communities--for decades.[5] As such, this is one of the most significant and well-studied environmental injustices in North Carolina; public health and environmental experts agree on the harm that this system causes for people and the environment.

Producing biogas from hog waste using anaerobic digesters, open secondary lagoons, and sprayfields does *not* address many of the longstanding, serious pollution problems of using open lagoons and sprayfields to store and dispose of hog waste. The use of digesters is likely to *increase* ammonia emissions when the digester waste is stored in open secondary lagoons and sprayed on fields.[6] Airborne ammonia from hog operations deposits in surrounding waterways, causing

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[2] Michael A. Mallin et al., *Industrial Swine and Poultry Production Causes Chronic Nutrient and Fecal Microbial Stream Pollution*, 226 WATER, AIR, SOIL & POLLUTION 407 (2015), *available at* https://link.springer.com/article/10.1007/s11270-015-2669-y; Christopher D. Heaney et al., *Source Tracking Swine Fecal Waste in Surface Water Proximal to Swine Concentrated Animal Feeding Operations*, 511 SCI. TOTAL ENV'T 676 (2015), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4514616/; JoAnn M. Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, 115 ENVT. HEALTH PERSP. 308 (2007), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1817674/.

[3] Wendee Nicole, *CAFOs and Environmental Justice: The Case of North Carolina*, 121 ENVT. HEALTH PERSP A182, A186 (2013), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3672924/ ("Even without spills, ammonia and nitrates may seep into groundwater, especially in the coastal plain where the water table is near the surface."); M.E. Anderson & M.D. Sobsey, *Detection and Occurrence of Antimicrobially Resistant E. coli in Groundwater on or near Swine Farms in Eastern North Carolina*, 54 WATER SCI. & TECH. 211, 217 (2006), *available at* https://pubmed.ncbi.nlm.nih.gov/17037155/ ("Overall, the results of this study demonstrated that antibiotic-resistant E. coli were present in groundwaters associated with commercial swine farms that have anaerobic lagoons and land application systems for swine waste management."); Kenneth Rudo, *Groundwater Contamination of Private Drinking Well Water by Nitrates Adjacent to Intensive Livestock Operations (ILOs)*, N.C. DEP'T OF HEALTH AND HUMAN SERV., 414, 418 (June 1999).

[4] Nina G.G. Domingo et al., *Air quality-related health damages of food*, 118 PROCEEDINGS OF THE NAT'L ACAD. SCIS. 1 (May 2021), *available at* https://www.pnas.org/content/118/20/e2013637118; Leah Schinasi et al., *Air Pollution, Lung Function, and Physical Symptoms in Communities Near Concentrated Swine Feeding Operations*, 22 EPIDEMIOLOGY 208, 208 (2011), *available at* https://pubmed.ncbi.nlm.nih.gov/21228696/; Sacoby M. Wilson & Marc L. Serre, *Examination of Atmospheric Ammonia Levels Near Hog CAFOs, Homes, and Schools in Eastern North Carolina*, 41 ATMOSPHERIC ENV'T 4977, 4985 (2007), *available at* https://www.researchgate.net/publication/223777299_Examination_of_atmospheric_homes_and_schools_ammonia_levels_near_hog_CAMS_in_Eastern_North_Carolina

[5] Steve Wing & Jill Johnston, *Industrial Hog Operations in North Carolina Disproportionately Impact African-Americans, Hispanics and American Indians* 2 (2014), *available at* https://www.ncpolicywatch.com/wp-content/uploads/2014/09/UNC-Report.pdf (finding that industrial hog operations are disproportionately located near communities of color and low-wealth communities in eastern North Carolina); Dana Cole et al., *Concentrated Swine Feeding Operations and Public Health: A Review of Occupational and Community Health Effects*, 108 ENVTL. HEALTH PERSPECTIVES 685 (2000), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1638284/; Kendall M. Thu, *Public Health Concerns for Neighbors of Large-Scale Swine Production*, 8 J. AGRIC. SAFETY & HEALTH 175, 176 (2002), *available at* https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.410.1811&rep=rep1&type=pdf; Steve Wing & Susanne Wolf, *Intensive Livestock Operations, Health, and Quality of Life Among Eastern North Carolina Residents*, 108 ENVTL. HEALTH PERSP. 233 (2000), *available at* https://www.jstor.org/stable/3454439.

[6] Baines, R. (Edited), *Reducing greenhouse gas emissions from livestock production*, Taylor & Francis Group, London, 145 (2021), *available at* https://www.taylorfrancis.com/books/edit/10.1201/9781003048213/reducing-greenhouse-gas-emissions-livestock-production-richard-baines (finding that the potential for ammonia emissions when storing digested hog waste increases); Viney Aneja, et. al, *Characterizing Ammonia Emissions from Swine Farms in North Carolina: Part 2—Potential Environmentally Superior Technologies for Waste Treatment*, 58 J. AIR

pollution that can lead to algae blooms and fish kills.[7] Airborne ammonia also deposits on the ground, where it can seep into the soil and cause nitrate pollution in drinking well water, which can harm infants and pregnant women.[8] Airborne ammonia also forms fine particulate pollution that causes serious health problems and premature deaths in surrounding communities.

In fact, a recent study published by the National Academy of Sciences attributes an astounding 95 premature deaths in Sampson County and 83 premature deaths in Duplin County to the emissions from hog operations every year.[9] This is already an unacceptable situation that must be stopped. And the prospect of *increasing* the rates of sickness or death, resulting from sending more ammonia and fine particulate pollution into the surrounding environment, is simply unacceptable. DEQ must not allow hog waste pollution to continue harming more people in our most vulnerable communities.

Communities in eastern North Carolina have been complaining about pollution from industrial hog operations for decades. Since DEQ began considering permits for the first large-scale biogas project almost two years ago, hundreds of people across eastern North Carolina and beyond participated in public hearings, submitted comments, and appealed to DEQ to protect their communities and the environment from pollution from lagoons and sprayfields. To date, DEQ has failed to heed these calls.

In developing the conditions of the biogas general permit, DEQ must address this environmental injustice and protect families and the environment in eastern North Carolina. To start, DEQ's environmental justice analysis must be more than a formality intended to inform agency outreach. Instead, DEQ must conduct a comprehensive environmental justice analysis that translates into substantive permit conditions to minimize disparate impacts from cumulative impacts of the general permit and other DEQ-permitted operations on surrounding communities, including

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& WASTE MGMT. ASS., 1145, 1156 tbl. 4 (2008), *available at* https://www.tandfonline.com/doi/pdf/10.3155/1047-3289.58.9.1145 (finding more than an 11 percent increase in ammonia emissions from an open secondary lagoon storing digester waste as compared to an open lagoon storing hog waste that has not been in a digester); Kupper et al., *Ammonia and greenhouse gas emissions from slurry storage—A Review*, 300 AGRICULTURE, ECOSYSTEMS, & ENV'T 1, 9 (2020) *available at* https://www.sciencedirect.com/science/article/pii/S0167880920301481; Lowry A. Harper et al, *The Effect of Biofuel Production on Swine Farm Methane and Ammonia Emissions*, 39 J. ENVT. QUAL. 62 (2010), *available at* https://pubmed.ncbi.nlm.nih.gov/21284295/ (noting that because of the reduction of methanogenesis and its reduced effect on the chemical conversion of ammonium to dinitrogen gas, ammonia emissions from operations generating biogas increased by 46 percent compared to operations that did not produce biogas).

[7] Jennifer K. Costanza et al., *Potential geographic distribution of atmospheric nitrogen deposition from intensive livestock production in North Carolina, USA*, 398 SCI. OF TOTAL ENV'T 76, 77 (2008) http://jencostanza.com/docs/Costanza_et_al_2008_STOTEN.pdf; John T. Walker et al, *Atmospheric transport and wet deposition of ammonia in North Carolina*, 34 ATMOSPHERIC ENV'T, 3407, 3416 (2000), *available at* http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.557.3074&rep=rep1&type=pdf (detecting deposition of ammonia and ammonium upwards of 80 km from the source of that pollution).

[8] Mary Berg et al, *Nitrogen Behavior in the Environment*, N.D. AGR. EXTENSION SERV. 3 (2017), https://www.ag.ndsu.edu/publications/environment-natural-resources/nitrogen-behavior-in-the-environment; Dennis Keeney & Robert Olsen, *Sources of nitrate in groundwater*, 16 CRITICAL REVIEWS IN ENV'T SCI. & TECH. 257 (1986), https://www.tandfonline.com/doi/abs/10.1080/10643388609381748; Mary Ward, et al, *Drinking Water Nitrate and Human Health: An Updated Review*, 15 INT'L J. ENV'T RESEARCH & PUBLIC HEALTH 1 (July 23, 2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6068531/.

[9] Nina G.G. Domingo et al., *Air quality-related health damages of food*, 118 PROCEEDINGS OF THE NAT'L ACAD. SCIS. 1 (May 2021), https://www.pnas.org/content/118/20/e2013637118.

communities of color and low-wealth communities that are already overburdened by pollution from multiple industries.[10] To be clear, it is not enough for DEQ to evaluate the cumulative effects of permitting decisions on water quality, as required under state environmental law; the agency, as a recipient of federal funding, also has obligations under Title VI of the Civil Rights Act of 1964, which require the agency to address harm to vulnerable North Carolinians.

In addition, as part of the general permit, we strongly advise DEQ to require the following:

- Cleaner technology and practices that are compatible with biogas production *and* address water and air pollution caused by the lagoon and sprayfield system, particularly given the increased ammonia pollution associated with open storage of biogas digester waste;

- Robust groundwater and surface water monitoring at every hog operation to identify pollution to rivers, streams, and groundwater, which is a source of drinking water for many rural residents;

- Updated nutrient management plans that account for the changes in the land-applied waste after digestion; and

- More protective freeboard requirements, such as automated lagoon/storage pond waste-level monitors and recorders, to reduce the likelihood that flooding or inundation of lagoons due to increasing frequent and severe storms will result in the discharge of the more harmful digester waste.

Thank you for your attention to this important matter.

Respectfully submitted by the EJE Advisory Board

James H. Johnson, Jr., Chair
Marian Johnson-Thompson, Vice Chair

[10] DEQ must scrutinize the environmental impact of the poultry industry as part of this analysis, as poultry operations with 30,000 or more birds are deemed permitted under state law, are often co-located in communities hosting swine operations, and have proliferated most rapidly in recent years in communities of color.