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***Via email and U.S.P.S.***

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Mr. Risgaard and Ms. Lawson:

Thank you for the opportunity to comment on the draft for Permit Number AWG10000, the Swine Waste Management General Permit (“draft General Permit”), which was released to the public in November 2018. The Southern Environmental Law Center and Waterkeeper Alliance submit these comments on behalf of Sound Rivers, Cape Fear River Watch, Winyah Rivers Foundation, Crystal Coast Waterkeeper, Crystal Coast Riverwatch, White Oak-New Riverkeeper Alliance, Haw River Assembly, Yadkin Riverkeeper, Catawba Riverkeeper Foundation, Broad River Alliance, and MountainTrue.

The undersigned commend the N.C. Department of Environmental Quality (“DEQ”) – Division of Water Resources’ (“DWR” or “the Agency”) for its proposal to make substantive changes to the General Permit. While the following will include commentary on specific provisions, generally speaking, DWR’s proposed changes to the General Permit are a step in the right direction, which will better protect North Carolina natural resources and communities living near industrial hog operations.

The chief failure of the draft General Permit is that it endorses the continuation of the lagoon and sprayfield system, which is at the root of the environmental threats posed by the swine industry in North Carolina. A Blue Ribbon Commission declared over 20 years ago that the extended and exclusive reliance on the lagoon and sprayfield system is “not prudent” and threatens North Carolina waterways.<sup>1</sup> To that end, we recommend that the term of the General Permit be two years rather than the typical five years. DWR and the undersigned have proposed additional monitoring, sampling, and recordkeeping requirements in the draft General Permit. In addition, DWR has committed to finalizing and implementing the use of an equity tool to better inform its permitting decisions under the General Permit. When DWR finalizes the General

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<sup>1</sup> Blue Ribbon Study Commission on Agricultural Waste, *Report to the 1995 General Assembly of N.C. 1996 Regular Session* 29 (May 16, 1996), <https://ncleg.net/Library/studies/1996/st10736.pdf> (emphasis added).

Permit with the proposed amendments, DWR will have access to additional data that will better inform the Agency about how to protect water quality and neighboring communities. DWR should not wait to act on that data. Both the regulated community and general public deserve to know that DWR is prepared to respond when the latest evidence suggests the need for additional protection.

As discussed in more detail below, we request that DWR incorporate the following changes to the draft General Permit before it goes out for notice and public comment in 2019:

- Mandate the use of the North Carolina Phosphorus Loss Assessment tool for all permittees;
- Increase transparency and accountability by requiring the monthly submission of certain records to DWR;
- Require additional groundwater monitoring of permittees;
- Make clear that installation of a cover or anaerobic digester over a lagoon is *not* authorized by the General Permit;
- Adjust design parameters to account for climate change and the best available data regarding floodplain mapping and resiliency; and
- Clarify the timeline for compliance for several provisions.

## **I. Factual Background**

As outlined below, changes in the nature of pork production heightened risks to the environment posed by the industry. Executive branch officials and the North Carolina legislature have taken steps intended to mitigate industry impacts on communities and the environment. Those actions, however, have proven inadequate. The industry continues to rely on a primitive waste management system, and recent events underscore the need for additional protection of North Carolina citizens and natural resources.

### **a. Changes in North Carolina's hog industry created a waste management crisis**

The hog industry in North Carolina changed dramatically in the 1980s and 1990s, as a sharp decrease in the number of producers coincided with an increase in statewide production.<sup>2</sup>

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<sup>2</sup> In 1982, more than 11,000 hog farms raised approximately 2 million animals in North Carolina. *Census of Agriculture*, U.S. DEP'T OF AGRIC. 30 tbl. 32 (1987), <http://usda.mannlib.cornell.edu/usda/AgCensusImages/1987/01/33/3/Table-32.pdf>. By 1997, there were approximately 2,900 hog farms and the state's hog population had ballooned to nearly 10 million. *1997 Census of Agriculture, North Carolina, Historical Highlights: 1997 and Earlier Census Years*, U.S. DEP'T OF AGRIC. <http://usda.mannlib.cornell.edu/usda/AgCensusImages/1997/01/33/1599/Table-01.pdf>. Much of the animal inventory increase occurred from 1991-1997, during which the "inventory of swine in the state of North Carolina increased by approximately 300%." C.M. Williams, *Future of Manure Management in North Carolina*, 50th Annual

Smaller diversified operations gave way to massive ones primarily engaged in swine production.<sup>3</sup> During this period of significant transformation, the industry also regionally concentrated production. In 1982, with one exception, every county in North Carolina had a commercial hog operation; by 1997, 95 percent of hog operations were located in the eastern counties of the coastal plain.<sup>4</sup>

A number of factors contributed to this industry consolidation and concentration. Among them was the rise of concentrated animal feeding operations, which eschewed pastured production of smaller herds in favor of confining and raising more animals.<sup>5</sup> The proliferation of these larger operations coincided with the rise of contract livestock production, in which producers do not own the hogs, but rather raise them for a corporate entity, called an integrator, often after absorbing considerable debt to construct facilities to the company's specifications.<sup>6</sup> Integrators often own the feed, hogs, and processing facilities to maximize efficiencies in the growth, production, and processing stages. The integrator controls when and where hogs are delivered for production but the contract leaves waste management responsibility, and liability, to the individual growers.<sup>7</sup>

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N.C. Pork Conference (Feb. 2006),

[https://projects.ncsu.edu/project/swine\\_extension/ncporkconf/2006/generalsessions/williams.htm](https://projects.ncsu.edu/project/swine_extension/ncporkconf/2006/generalsessions/williams.htm).

<sup>3</sup> In 1982, more than 57 percent of farms in North Carolina produced fewer than 25 pigs each year, and only 4 percent produced more than 1,000. *Census of Agriculture*, U.S. DEP'T OF AGRIC., 30 tbl. 32 (1987), <http://usda.mannlib.cornell.edu/usda/AgCensusImages/1987/01/33/3/Table-32.pdf>. By 1995, one third of the hog operations in the country producing 50,000 or more head were located or headquartered in North Carolina. James Rhodes, *The Industrialization of Hog Production*, 17 REVIEW OF AGRICULTURAL ECONOMICS 107, 109 (1995). In 1997, less than 32 percent of operations in the state produced fewer than 25 pigs annually, and 49 percent produced more than 1,000. *1997 Census of Agriculture: North Carolina*, U.S. DEP'T OF AGRIC. tbl. 32, <http://usda.mannlib.cornell.edu/usda/AgCensusImages/1997/01/33/1599/Table-31.pdf>

<sup>4</sup> Wendee Nicole, *CAFOs and Environmental Justice: The Case of North Carolina*, 121 ENVTL. HEALTH PERSPECTIVES 6 (June 2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3672924/pdf/ehp.121-a182.pdf>. This concentration persisted into this century. An analysis conducted by Environmental Working Group and Waterkeeper Alliance showed that the 47 counties in the state's Atlantic coastal plain are home to 96 percent of the hog operations in North Carolina. *Exposing Fields of Filth*, ENVT'L WORKING GROUP (June 21, 2016), <https://www.ewg.org/research/exposing-fields-filth>.

<sup>5</sup> A full accounting of factors contributing to this shift, including favorable tax policies and the growing dominance of contract production, is beyond the scope of these comments, which are focused on the waste management technology employed by this industry before 1997. Sadly, despite the development of technological alternatives, the lagoon and sprayfield system is currently used by the vast majority of operations covered under the state's general permit.

<sup>6</sup> Joby Warrick & Pat Stith, *Hundreds of contract farmers make up a franchise system run by a few big companies. Meanwhile, traditional hog farming is fading*, NEWS & OBSERVER (1995) (identifying contract livestock production as "the force behind the swine industry's explosive growth in North Carolina"), <https://www.pulitzer.org/winners/news-observer-raleigh-nc>.

<sup>7</sup> See *A Look At Concentrated Animal Feeding Operations in North Carolina: The Problems with Animal Waste & A Framework to Solve Them* 6 (2016), [https://sustainability.duke.edu/sites/default/files/cafos\\_nc\\_paper.pdf](https://sustainability.duke.edu/sites/default/files/cafos_nc_paper.pdf) ("The farmers raise and care for the livestock, but do not own the animals. The farmers provide buildings and land, manage manure, hire and manage labor, and repair and supply the farm itself. The integrators typically provide the

These dramatic changes in the industry led to a higher number of animals at grower operations, and the need to manage larger volumes of waste than produced at a traditional farm.<sup>8</sup> Enter the lagoon and sprayfield system: in this primitive and inexpensive system, hog waste is periodically flushed from hog-confinement structures into unlined, earthen pits and then sprayed, using what amount to industrial sprinklers, onto nearby cropland. The waste is not treated before it is land applied.

Decades of research have since demonstrated flaws with this method of waste disposal. Groundwater resources are threatened by waste leaching from unlined lagoons or poorly maintained land application sites. During rain events, land applied waste often runs off into nearby streams and rivers. Airborne waste drifts to neighbors' yards and odors permeate the air nearby these facilities. The risks posed by the lagoon and sprayfield system are heightened because of where the swine industry chose to focus production.

b. The topography and climate of eastern North Carolina make the region's water ways and communities especially vulnerable to contamination and natural disaster

Hog waste storage and disposal is concentrated in parts of the State where the people and environment are most vulnerable. The North Carolina coastal plain is poorly suited for concentrated land application of waste because of higher water tables, poorly-drained soil, and increasing vulnerability to major weather events. Moreover, the communities surrounding industrial hog operations are disproportionately comprised of African-Americans, Latinos, and Native-Americans.<sup>9</sup>

i. *Topography of eastern North Carolina*

The coastal plain is characterized by a shallow depth to groundwater. The depth to the water table ranges from a few inches to 13 feet below the surface; this variability depends on several factors including location, rainfall, and evapo-transpiration. The greatest depth to the water table is in western Beaufort, Craven and Carteret Counties.<sup>10</sup> Liquid waste storage lagoons are usually eight to fifteen feet deep, meaning that there is a high likelihood, particularly in the flood plain, that lagoons are dangerously close to the water table. Indeed, it is likely that many operations located in the flood plain do not meet the current Natural Resources Conservation

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animals, feed, medication, and veterinary support. The integrator then pays the farmer for the meat produced, usually per head.”).

<sup>8</sup> Today, swine operations in North Carolina produce almost 10 billion gallons of waste annually.

<sup>9</sup> Steve Wing, *et al.*, *Environmental Injustice in North Carolina's Hog Industry*, 108 ENVTL. HEALTH PERSPECTIVES vol. 3 at 225 (Mar. 2000), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637958/> .

<sup>10</sup> J.F. Lautier, *Hydrogeologic Framework and Ground Water Conditions in the North Carolina East Central Coastal Plain*, N.C. DEP'T OF ENV'T AND NAT. RES. (2009), [https://www.researchgate.net/publication/260400573\\_Hydrologic\\_Framework\\_and\\_Ground\\_Water\\_Conditions\\_in\\_the\\_North\\_Carolina\\_East\\_Central\\_Coastal\\_Plain](https://www.researchgate.net/publication/260400573_Hydrologic_Framework_and_Ground_Water_Conditions_in_the_North_Carolina_East_Central_Coastal_Plain).

Service (“NRCS”) Waste Storage Facility Pond Criteria (313-Practice Standard), which requires that all ponds have a bottom elevation that is a minimum of 2 feet above the seasonal high groundwater table.

A number of studies in North Carolina indicate that groundwater, thought to be derived mostly from shallow aquifer systems, commonly contributes about 50 to 60 percent of the average annual streamflow to streams in the North Carolina Coastal Plain.<sup>11</sup> Therefore, swine waste that reaches groundwater through leaching or is transported with surface water recharge is potentially a major contributor of surface water pollution.

*ii. Increasing frequency and intensity of storms*

There is a consensus among researchers that climate change will continue to make storms and the floods that follow more intense, as warmer air can hold more moisture and add more fuel to storm systems.<sup>12</sup> Extreme rainfall has already become more frequent and more damaging throughout the Southeast.<sup>13</sup> This trend will continue into the future even in a scenario with emissions reductions.<sup>14</sup> The Southeast, in particular, has experienced a significant increase in extreme rainfall from 2-day storms, which form in the region 50 percent more often than they did last century.<sup>15</sup> Before the end of this century throughout the Southeast, extreme summer thunderstorms that are typically 100-year flood events are expected to drop between 40 percent and 80 percent more rain than they do today.<sup>16</sup>

With Hurricanes Matthew in 2016 and Florence in 2018, the State’s coastal plain suffered the effects of two 1,000-year storms in only two years.<sup>17</sup> Hurricane Florence dumped about 8 trillion gallons of rain on North Carolina according to National Weather Service radar

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<sup>11</sup> See, e.g., McMahon, G., and Lloyd, O.B., Jr., *Water-quality assessment of the Albemarle-Pamlico drainage basin, North Carolina and Virginia—Environmental setting and water quality issues: U.S. Geological Survey Open-File Report 95-136*, U.S. GEOLOGICAL SURVEY (1995). <https://pubs.usgs.gov/of/1995/0136/report.pdf>.

<sup>12</sup> <https://www.gfdl.noaa.gov/global-warming-and-hurricanes/> and <https://nca2018.globalchange.gov/chapter/19/>

<sup>13</sup> Easterling, D. R., J. R. Arnold, T. Knutson, K. E. Kunkel, A. N. LeGrande, L. R. Leung, R. S. Vose, D. E. Waliser, and M. F. Wehner, 2017: *Precipitation Change in the United States. Climate Science Special Report: Fourth National Climate Assessment*, Volume I. [Wuebbles, D. J., D. W. Fahey, K. A. Hibbard, D. J. Dokken, B. C. Stewart, and T. K. Maycock, Eds.]. U.S. GLOBAL CHANGE RESEARCH PROGRAM, <https://nca2018.globalchange.gov/>.

<sup>14</sup> Carter, L., A. Terando, K. Dow, K. Hiers, K.E. Kunkel, A. Lascrain, D. Marcy, M. Osland, and P. Schramm, 2018: Southeast. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. GLOBAL CHANGE RESEARCH PROGRAM, 734-799 (201), <https://nca2018.globalchange.gov/>.

<sup>15</sup> Easterling, *supra* note 13, at 207-30.

<sup>16</sup> Prein, A.F., Liu, C., Ikeda, K., Trier, S.B., Rasmussen, R.M., Holland, G.J., Clark, M.P. 2017. *Increased rainfall volume from future convective storms in the US*. NATURE CLIMATE CHANGE 7, 880-884.

<sup>17</sup> *Exceedance Probability Analysis for Selected Storm Events*, NAT’L OCEAN & ATMOSPHERIC ADMIN WEATHER SERVICE (Apr. 21, 2017), [http://www.nws.noaa.gov/oh/hdsc/aep\\_storm\\_analysis/](http://www.nws.noaa.gov/oh/hdsc/aep_storm_analysis/).

estimates.<sup>18</sup> North Carolina ranks second among states for the number of tropical storms and hurricanes that have affected its shores.<sup>19</sup> Atlantic coast geography and currents<sup>19</sup> make eastern North Carolina especially exposed and prone to tropical storm and hurricane strikes.<sup>20</sup>

Climate change will make it easier for tropical systems to grow stronger, resulting in more large hurricanes. The Atlantic basin has already seen an increase in the number of Category 4 and 5 hurricanes since the 1980s.<sup>21</sup> Because climate change alters wind circulation patterns, storms and other extreme weather events are more commonly stalling and unleashing more damage as a result.<sup>22</sup>

c. State leaders take incremental steps to address the crisis in the late 1990s

Though problems with the lagoon and sprayfield system are exacerbated by increasingly severe weather in the region, they persist under sunny skies as well. The risks inherent in the lagoon and sprayfield system drew national attention in 1995 when a lagoon breach spewed 25 million gallons of untreated hog waste into the New River.<sup>23</sup> Then-Governor Jim Hunt assembled a Blue Ribbon Commission to propose policy solutions after studying the impacts of livestock waste management on North Carolina's environment. In 1996, the Commission reported that:

Animal waste management systems utilized by intensive livestock operations are both potential point sources of pollution as well as contributors of nonpoint source pollution. Failure to properly construct and manage lagoons and related storage and treatment structures can result in point source pollution as was seen by the failure of several lagoons in eastern North Carolina during the summer of 1995.

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<sup>18</sup> NWS Raleigh (Sep. 18, 2018), <https://twitter.com/NWSRaleigh/status/1042003250881482752> (“Here's the unofficial, radar-estimated storm total rainfall from #Florence over all NC (actual gauge-measured amounts not included). Using the average rainfall over the state, Florence dropped about 8.04 TRILLION gallons of rain on NC. #newx.”).

<sup>19</sup> Brian Donegan, *North Carolina Second Only to Florida for U.S. Tropical Storms and Hurricanes*, THE WEATHER CHANNEL (Sep. 11, 2018), <https://weather.com/storms/hurricane/news/2018-06-05-map-shows-how-many-tropical-storms-hurricanes-struck-each-state>.

<sup>20</sup> Keim, B.D., Muller, R.A., Stone, G.W., *Spatial and temporal variability of coastal storms in the North Atlantic Basin*, MARINE GEOLOGY 210, 7-15 (2004).

<sup>21</sup> Webser, P.J., Holland, G.J., Curry, J.A., Chang, H.R., *Changes in tropical cyclone Number, Duration, and Intensity in a Warming Environment*, SCIENCE 309, 1844-1846 (2005).

<sup>22</sup> Mann, M.E., Rahmstorf, S., Kornhuber, K., Steinman, B.A., Miller, S.K., Coumou, D., *Influence of Anthropogenic Climate Change on Planetary Wave Resonance and Extreme Weather Events*. SCIENTIFIC REPORTS 7 (2017).

<sup>23</sup> *Huge Spill of Hog Waste Fuels an Old Debate in North Carolina*, N.Y. TIMES (June 25, 1995), <https://www.nytimes.com/1995/06/25/us/huge-spill-of-hog-waste-fuels-an-old-debate-in-north-carolina.html>.

Failure to properly manage the land application of wastes may result in excess nutrients reaching surface water through means such as runoff.<sup>24</sup>

Ultimately, the Commission stated that “[i]n the intermediate to long run, exclusive reliance upon lagoon technology as the permitted method of animal waste disposal is not prudent.”<sup>25</sup>

Acting on Commission recommendations, the North Carolina legislature took steps to improve animal waste management practices. In 1996, the legislature required the development of a general permit program to prevent the discharge of waste from animal operations.<sup>26</sup> But simply regulating the operation of a broken system was not enough. In 1997, the legislature enacted a moratorium on the use of the lagoon and sprayfield system by any new or expanded hog operation<sup>27</sup> and directed the North Carolina Department of Agriculture & Consumer Services to “develop a plan to phase out the use of anaerobic lagoons and sprayfields as primary methods of disposing of animal waste at swine farms.”<sup>28</sup>

To incentivize technological progress, the following year the legislature created an exception to the moratorium, allowing the construction or expansion of an animal operation that implemented an animal waste management system that met environmentally superior performance standards and did not “employ an anaerobic lagoon as the primary method of treatment.”<sup>29</sup> Despite this call for innovation, the industry continued to rely on the lagoon and sprayfield system to manage animal waste, a dangerous decision that predictably placed North Carolina in national news headlines following several more preventable environmental disasters.

While the Oceanview Farms spill showed the vulnerability of the lagoon and sprayfield system outside of a major weather event, the impacts of the 1999 hurricane season underscored the dangers of using this system to manage waste in the coastal plain.<sup>30</sup> Most notably, flooding from Hurricane Floyd damaged 45 hog waste lagoons, ruptured 26 more, and drowned more than

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<sup>24</sup> Blue Ribbon Study Commission on Agricultural Waste, *Report to the 1995 General Assembly of N.C. 1996 Regular Session* 23 (May 16, 1996), <https://ncleg.net/Library/studies/1996/st10736.pdf>.

<sup>25</sup> Blue Ribbon Study Commission on Agricultural Waste, *Report to the 1995 General Assembly of N.C. 1996 Regular Session* 29 (May 16, 1996), <https://ncleg.net/Library/studies/1996/st10736.pdf>.

<sup>26</sup> N.C. Sess. Law 1996-626, sec. 1 (codified as amended at N.C. Gen. Stat. §§ 143-215.10A through .10I) (eff. as provided at sec. 19). <https://www.ncleg.net/EnactedLegislation/SessionLaws/HTML/1995-1996/SL1995-626.html>.

<sup>27</sup> N.C. Sess. Law 1997-458, sec. 1.1 (1997). <https://www.ncleg.net/EnactedLegislation/SessionLaws/HTML/1997-1998/SL1997-458.html>.

<sup>28</sup> *Id.* at sec. 12.4.

<sup>29</sup> N.C. Sess. Law 1998-188, sec. 1.1 (1998), <https://www.ncleg.net/EnactedLegislation/SessionLaws/HTML/1997-1998/SL1998-188.html>.

<sup>30</sup> Hurricanes Dennis, Floyd, and Irene struck North Carolina within a six-week period between September 4 and October 17, 1999. Hurricane Floyd, which dumped 10-15 inches of rain on parts of the coastal plain already saturated by the 6 inches of rain 10 day prior Hurricane Dennis, proved particularly devastating.

30,000 hogs.<sup>31</sup> Untreated hog feces spilled into the Neuse, Tar, and Cape Fear rivers and multiple studies documented the widespread contamination of floodwaters by animal waste.<sup>32</sup>

In 2003, then-Attorney General Michael Easley brokered a groundbreaking agreement with Smithfield Foods, under which company and its subsidiaries agreed, *inter alia*, to invest in the development and implementation of new waste management technology that: (a) met statutory performance standards; and (b) was “economically feasible” as defined in the agreement.<sup>33</sup> Multiple technologies tested on hog operations in North Carolina met the performance standards, but quibbling about economic feasibility prevented widespread installation of new technologies. Still, in 2018, environmentally superior technologies have not been widely adopted, and economic feasibility has not been re-evaluated despite a changing market and additional revenue streams for these facilities.

Despite the existence of cleaner, more sustainable technology that is affordable for the multi-billion pork industry and despite the incentives available to support growers in transitioning to this technology, the industry refuses to move away from the primitive lagoon and sprayfield system. As a result, the people and natural resources of North Carolina continue to suffer.

d. State regulators repeatedly fail to address pollution from hog operations

Hog operations across eastern North Carolina are polluting rivers and streams and air quality every day.<sup>34</sup> Ignoring a mountain of evidence to the contrary, state regulators continue to consider hog operations in North Carolina nondischarge facilities for the purposes of permitting.

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<sup>31</sup> J.D. Bales, *Effects of Hurricane Floyd Inland Flooding, September-October 1999, on Tributaries to the Pamlico Sound, North Carolina*, 26 ESTUARIES No.5, 1324 (Oct. 2003), [https://www.jstor.org/stable/pdf/1353406.pdf?casa\\_token=tpXRm5muLKAAAAA:-p2CTsBfyAOZp8IEyw6-DbprtkmOQTFRMt75x-RIN-GtLqDLT44DtRy1bNf40hUvTjBju6OHtvoI9MEVvytfYGXJ4FkSOckOkxW4\\_IcLKltagO6suvj3](https://www.jstor.org/stable/pdf/1353406.pdf?casa_token=tpXRm5muLKAAAAA:-p2CTsBfyAOZp8IEyw6-DbprtkmOQTFRMt75x-RIN-GtLqDLT44DtRy1bNf40hUvTjBju6OHtvoI9MEVvytfYGXJ4FkSOckOkxW4_IcLKltagO6suvj3).

<sup>32</sup> See, e.g., J.D. Bales *et al.*, USGS, *Two Months of Flooding in Eastern North Carolina, September-October 1999*, Water-Resources Investigations Report 00-4093 (2000); Steve Wing *et al.*, *The potential impact of flooding on confined animal feeding operations in eastern North Carolina*, 110 ENVTL. HEALTH PERSPECTIVES 4 at 387 (2002), <https://ehp.niehs.nih.gov/doi/10.1289/ehp.02110387>. Even soils impacted by floodwaters showed last impacts. See MJ Casteel *et al.*, *Fecal contamination of agricultural soils before and after hurricane-associated flooding in North Carolina*, 41 J. ENVTL. SCI. & HEALTH, Part A, Toxic/Hazardous Substances & Env'tl. Engineering, vol. 2, 173 (2006) (showing that levels of *C. perfringens* spores were significantly higher in flooded soil after Hurricane Floyd compared to pre-flood soil, suggesting widespread fecal contamination).

<sup>33</sup> Agreement between Michael F. Easley, Att’y General of N.C. and Smithfield Foods, Inc.; Brown’s of Carolina, Inc.; Carroll’s Foods, Inc.; Murphy Farms, Inc.; Carroll’s Foods of Virginia, Inc.; and Quarter M Farms, Inc. (July 25, 2000), Sect. II(c), III(B)(4), [https://projects.ncsu.edu/cals/waste\\_mgt/smithfield\\_projects/agreement.pdf](https://projects.ncsu.edu/cals/waste_mgt/smithfield_projects/agreement.pdf).

<sup>34</sup> JoAnn M. Burkholder *et al.*, *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, 115 ENVTL. HEALTH PERSPECTIVES 308, 309 (2007), <http://dx.doi.org/10.1289/ehp.8839>.

The agency has long known that these “nondischarge” permits fail to protect the environment from mismanaged swine waste. Basin planners within DWR have repeatedly emphasized the need to better understand and mitigate the impact of industrial livestock operations on water quality. For instance, in the Neuse basin, where nutrient pollution has been an issue for decades,<sup>35</sup> DWR basin planners recently observed:

The land application of waste (wet and dry) is contributing to runoff of nutrients to the nutrient sensitive waters of the Neuse as well as from contaminated groundwater. Many of the facilities and land application fields are in an area of the coastal plain where the groundwater table is high which requires ditching or tile drains in order to allow for crop harvesting and waste application. These are direct conveyances for the highly nutrient laden water to reach surface waters. These operations are having a significant negative impact on the Neuse River water quality.<sup>36</sup>

The Tar-Pamlico basin plan similarly acknowledges the role of hog operations in contributing to nutrient loading: “[e]levated nutrients levels occur . . . from stormwater runoff from pastures, feedlots, barnyards and fertilized fields.”<sup>37</sup> Of particular relevance to the General Permit, the plan also notes “[n]umerous environmental hazards” resulting from the storage of animal waste in lagoons, including “ammonia emissions, overflows into surface waters, and groundwater contamination.”<sup>38</sup> Likewise, the Cape Fear basin is similarly plagued by excessive nutrient loading due to runoff from livestock operations in the watershed, and the most recent basin plan states that “nonpoint sources that pollute water and cause habitat degradation need to be addressed to further improve water quality in North Carolina’s streams and rivers.”<sup>39</sup>

As discussed in more detail below, a growing body of scientific research demonstrates that hog operations and their animal waste management system are causing or contributing to surface water quality impairment in North Carolina, particularly in the Eastern Coastal Plain.<sup>40</sup>

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<sup>35</sup> In 1998, the Environmental Management Commission adopted a nutrient management strategy for the Neuse Basin, with a target of reducing nitrogen loading in the estuary by 30 percent. Despite implementation of the rules, water quality has not measurably improved.

<sup>36</sup> *Final Neuse River Basinwide Water Quality Plan*, DIV. OF WATER RES. § 17.1.4 (2009), <https://deq.nc.gov/about/divisions/water-resources/planning/basin-planning/water-resource-plans/neuse-2009>.

<sup>37</sup> *Tar-Pamlico River Basinwide Water Quality Management Plan*, DIV. OF WATER RES § 7.3. (2010), <https://deq.nc.gov/about/divisions/water-resources/planning/basin-planning/water-resource-plans/tar-pamlico>.

<sup>38</sup> *Id.*

<sup>39</sup> *2005 Cape Fear River Basin Water Quality Plan*, DIV. OF WATER RES § 27.2.1 (2005).

<sup>40</sup> See UNC Chapel Hill, Dep’t of City & Reg’l Planning, Econ. Dev. Workshop, *Identifying Opportunities and Impacts for New Uses of Hog Waste in Eastern North Carolina*, 12-13 (2013), [www.ncgrowth.unc.edu/wp-content/uploads/2014/06/OpportunitiesAndImpactsOfHogWasteInEasternNC.pdf](http://www.ncgrowth.unc.edu/wp-content/uploads/2014/06/OpportunitiesAndImpactsOfHogWasteInEasternNC.pdf); see also Christopher D. Heaney

Despite the evidence, historically DEQ has done little to evaluate the impacts of industrial livestock production on water quality. Poorly informed decision making often results from inadequate evaluation or understanding of those impacts, as demonstrated by the recent reclassification of part of the lower Cape Fear River as swamp waters. Since 1998, the State has recognized water quality impairments in the segment of the lower Cape Fear River flowing past Wilmington.<sup>41</sup> Yet, instead of taking measures to restore water quality, DWR chose to reclassify the portion of the river as “swamp waters.” Low dissolved oxygen and pH levels are allowed in swamp waters when these conditions are caused by “natural conditions.”<sup>42</sup> But DEQ failed to account for pollution from livestock operations when proposing to reclassify the lower Cape Fear River.<sup>43</sup> As DEQ could not credibly determine that the impairments were attributable to “natural conditions” without examining the impacts of primitive animal waste management practices upstream in the watershed,<sup>44</sup> the EPA rejected the reclassification proposal.<sup>45</sup>

e. DWR’s failure to adopt and enforce necessary water quality standards exacerbates the problem

Part of the Agency’s failure to respond to the problems caused by hog operations stems from the failure to adopt and implement appropriate water quality standards. Bacteria and nutrients are common indicators of pollution associated with animal waste; yet, North Carolina has outdated bacteria standards and no nutrient standards designed to protect water bodies threatened by agricultural pollution.

North Carolina currently uses fecal coliform as a pathogen indicator to measure the suitability of freshwaters for recreational use.<sup>46</sup> The State’s reliance on this standard is out of date and not based on the best available science.<sup>47</sup> More than three decades ago, EPA

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et al., *Source Tracking Swine Fecal Waste in Surface Water Proximal to Swine Concentrated Animal Feeding Operations*, 511 SCI. TOTAL ENV’T, 676–83 (2015), [www.ncbi.nlm.nih.gov/pmc/articles/PMC4514616/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4514616/).

<sup>41</sup> DWR has identified dissolved oxygen, arsenic, copper, nickel, and pH impairments. DWR, 1998 N.C. 303(d) List T-6 (May 15, 1998)(noting that 5,000 of the 7,500 acres in the estuarine areas of the Cape Fear basin were impaired as a result of low dissolved-oxygen levels—and that 5,561 of the acres were burdened with nonpoint pollution, including from “ag” sources); DWR, 2014 N.C. 303(d) List 2-4 (Dec. 19, 2014).

<sup>42</sup> 15A N.C. Admin. Code 02B .0220(5)(12) (stating tidal salt water quality standards for Class SC waters); *see also* 15A N.C. Admin. Code 02B .0211(6)(14) (stating fresh surface water quality standards for Class C waters).

<sup>43</sup> As one academic noted, “Livestock manures as waste inputs were not even mentioned” by DEQ in its justification for the reclassification. *See Report of Proceedings on the Proposed Reclassification of a Cape Fear River Segment a-105*, DIV. OF WATER RES (2015).

<sup>44</sup> 15A N.C. Admin. Code 02B .0220(5), (12).

<sup>45</sup> Letter, Trey Glenn, EPA, to Linda Culpepper, DWR (July 24, 2018).

<sup>46</sup> 15A N.C. Admin. Code 02B .0219(3)(b). The Clean Water Act defines a “pathogen indicator” as “a substance that indicates the potential for human infectious disease.” 33 U.S.C. § 1362(23).

<sup>47</sup> More than a decade ago, DWR noted, in the Cape Fear basin plan:

recommended that *E. coli* or *enterococci* replace fecal coliform as a pathogen indicator in state water quality standards.<sup>48</sup> North Carolina has adopted an *enterococci* standard for saltwater to protect coastal recreation areas, but continues to rely on fecal coliform as a freshwater standard.

Worse still, DWR concedes that ambient water quality monitoring conducted by DWR is inadequate to assess compliance with the outdated fecal coliform standard. The sampling methods used to evaluate ambient water quality do not provide actionable results for fecal coliform because state agency analysis occurs after the prescribed sample holding time.<sup>49</sup> In addition, although the water quality standard for fecal coliform contemplates “five consecutive samples examined during any 30-day period,”<sup>50</sup> DWR only collects samples once each month.<sup>51</sup> Still, while the bacteria standard is outdated and rarely enforced, it is better than no standard at all.

The State’s failure to adopt nutrient standards also suggests an unwillingness to address the problems associated with industrial livestock production. Ironically, hog producers operating under the General Permit must complete a nutrient management plan to prevent water pollution, but DWR has yet to establish standards by which to measure acceptable nutrient levels in our waterways. DWR assesses compliance with the General Permit based on inputs to a waste management system without requiring demonstration that the outputs of that system are protecting our water quality.

In 2001, the EPA asked all states to develop nutrient management plans to address growing concerns with nutrient pollution across the country.<sup>52</sup> In 2004, North Carolina developed a nutrient criteria implementation plan in response to EPA’s request; the 2004 plan set out to establish region-specific nutrient criteria coupled with site-specific “nitrogen and phosphorus control mechanisms.”<sup>53</sup> Ten years later, with little progress to show, DWR updated the 2004 plan with a new plan – the Nutrient Criteria Development Plan—which established a

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Although fecal coliform standards have been used to indicate the microbiological quality of surface waters for swimming for more than 50 years, the value of this indicator is often questioned. Evidence collected during the past several decades suggests that the coliform group may not adequately indicate the presence of pathogenic viruses or parasites in water.

2005 *Cape Fear River Basin Water Quality Plan*, DIV. OF WATER RES 261 (2005).

<sup>48</sup> EPA, *Bacteriological Ambient Water Quality Criteria for Marine and Fresh Recreational Waters* (1986).

<sup>49</sup> *Ambient Monitoring System (AMS) Program Quality Assurance Project Plan*, DIV. OF WATER RES § 1.6.4.2 (Feb. 2017). Notably, research studying the effect of holding time on fecal coliform counts suggests they remain the same or decreased with storage time. See Ariamalar Selvakumar et al., *Effects of Sample Holding Time on Concentrations of Microorganisms in Water Samples*, 76 *Water Env’t Research*, vol. 1., at 67 (2004), <https://www.jstor.org/stable/25045746>.

<sup>50</sup> 15A N.C. Admin. Code 02B .0219(3)(b).

<sup>51</sup> *Ambient Monitoring System (AMS) Program Quality Assurance Project Plan*, *supra* note 49 § 2.1.2.

<sup>52</sup> 66 Fed. Reg. 1,671 (Jan. 1, 2001).

<sup>53</sup> See *North Carolina Nutrient Criteria Implementation Plan*, STATE OF N. CAROLINA, 1 (June 1, 2004).

schedule for adopting nutrient criteria by 2021.<sup>54</sup> For almost 18 years, DWR has delayed implementation of desperately-needed nutrient standards for the State's waterways. In the absence of numeric standards for phosphorus and nitrogen, the State relies on chlorophyll-a standards to identify nutrient-related impairment.<sup>55</sup> But the chlorophyll-a standards—indeed, any standard keyed to a response and not a causal variable—cannot provide proactive protection. Meanwhile, excess phosphorus and nitrogen continue to enter our waterways, causing eutrophication and fish kills.

f. Mounting evidence shows the substantial adverse impacts of hog operations on water quality and nearby communities

The dearth of monitoring by permittees, and agency's failure to collect actionable data, results in over-reliance on third parties to evaluate impacts of permitted operations. Unfortunately, until recently, DWR has proven unable or unwilling to conduct targeted monitoring to better understand the fate of land-applied hog waste. When the Agency does look, it finds predictable and preventable problems.

Swine waste can contaminate groundwater sources through seepage from lagoons.<sup>56</sup> Swine waste nutrients can also enter surface waters through atmospheric deposition following manure spraying or spreading.<sup>57</sup> In addition to these conventional pathways, swine waste lagoons can become flooded or suffer structural failure. Studies of the failure that occurred at Oceanview Farms in 1995 showed substantial impacts on the New River.<sup>58</sup> Conventional and storm-related discharges from animal waste management systems have devastating effects on surface water quality, the ecosystem, and public health—causing or contributing to river eutrophication, algal blooms, fish kills, and drinking water contamination.<sup>59</sup> In watersheds with high concentrations of

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<sup>54</sup> *North Carolina Nutrient Criteria Development Plan*, N.C. DEP'T OF ENV'TL QUALITY (June 2014), [https://files.nc.gov/ncdeq/Water\\_percent20Quality/Environmental\\_percent20Sciences/ECO/NutrientCriteria/North\\_percent20Carolina-NCDP-June-2014.pdf](https://files.nc.gov/ncdeq/Water_percent20Quality/Environmental_percent20Sciences/ECO/NutrientCriteria/North_percent20Carolina-NCDP-June-2014.pdf).

<sup>55</sup> See 15A N.C. Admin. Code 02B .0211(4), 02B .0220(3).

<sup>56</sup> See Steve Wing, Stephanie Freedman & Lawrence Band, *The Potential Impact of Flooding on Confined Animal Feeding Operations in Eastern North Carolina*, 110 ENVTL. HEALTH PERSP. 387(2002), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240801/pdf/ehp0110-000387.pdf> (noting that seepage from waste pits and spray areas can contaminate ground water sources over long periods of time).

<sup>57</sup> See JoAnn Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, 115 ENVTL. HEALTH PERSP. 308, 309 (2007), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1817674/pdf/ehp0115-000308.pdf> (“Inorganic N forms are added to the atmosphere during spray practices, and both ammonia and phosphate can also adsorb to fine particles (dust) that can be airborne ... [A] significant proportion of the total ammonium from uncovered swine effluent lagoons and effluent spraying ... reenters surface waters as local precipitation or through dry fallout.”).

<sup>58</sup> See generally Burkholder, J. M., Mallin, M. A., Glasgow, Howard B., Jr., Larsen, M., & al, e. *Impacts to a coastal river and estuary from rupture of a large swine waste holding lagoon*. 26 JOURNAL OF ENVTL. QUALITY, 1451 (1997).

<sup>59</sup> See generally Michael Mallin, *Impacts of Industrial Animal Production on Rivers and Estuaries*, 88 AM. SCIENTIST 26 (Jan.–Feb. 2000).

swine and poultry operations like Stocking Head Creek, surface water pollution by fecal contamination is a chronic condition.<sup>60</sup>

In April 2018, DWR commenced monthly surface water sampling in Duplin County, which has the highest concentration of permitted hog operations in the State, to assess the impacts of hog waste management on water quality in Stocking Head Creek, Murpheys Creek, Muddy Creek, and Sikes Mill Run.<sup>61</sup> While the study will continue for a total of twelve months, initial results show elevated levels of bacteria and nutrients in sampled water bodies.<sup>62</sup> Unfortunately, other than emergency response efforts or facility-specific investigations, this is the only recent attempt by the Agency to evaluate the surface water impacts of hog operations covered by the General Permit.

While we lament the scarcity of data collected by permittees or the Agency, information available from other sources highlights the need for improvement in animal waste management. Indeed, decades of scientific research is available to the Agency and should embolden DWR to take additional steps to improve the General Permit.<sup>63</sup> Research continued through the current permit term, and notable publications have underscored the need for better protection of communities and natural resources. For instance, shortly after the permit renewal, a study published by the U.S. Geologic Survey showed significantly higher concentrations of total nitrogen, nitrate, ammonium, and various other ions in surface waters impacted by industrial livestock operations than in waters at control sites.<sup>64</sup> Additional studies have documented fecal

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<sup>60</sup> See Michael Mallin, M.A., McIver, M.R., Robuck, A.R. et al. *Industrial Swine and Poultry Production Causes Chronic Nutrient and Fecal Microbial Stream Pollution*, 226 WATER AIR SOIL POLLUT 407 (2015). (“fecal coliform pollution of Stocking Head Creek was not rain dependent; rather, fecal coliform pollution was a chronic condition.”).

<sup>61</sup> Settlement Agreement, NCEJN v. DEQ, EPA File No. 11R-14-R4 (May 3, 2018), [https://waterkeeper.org/wp-content/uploads/2018/05/Final-Settlement-Agreement\\_attachments-and-sig.pdf](https://waterkeeper.org/wp-content/uploads/2018/05/Final-Settlement-Agreement_attachments-and-sig.pdf).

<sup>62</sup> *Stocking Head Creek Watershed Study*, DIV. WATER RES., <https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/shc-study> (last visited Dec. 11, 2018).

<sup>63</sup> For instance, a study published in 2003 reported that the Cape Fear and White Oak New River Basins are severely impaired by nutrients and bacteria resulting from industrial livestock facility discharges. Michael A. Mallin and Lawrence B. Cahoon, UNC Wilmington, *Industrialized Animal Production - A Major Source of Nutrient and Microbial Pollution to Aquatic Ecosystems*, 24(5) POPULATION AND ENV'T (May 2003). Unprecedented toxic algal blooms in 2009 and 2012 on the Cape Fear River were partially attributed to nearby livestock production throughout the Cape Fear Basin. Justin D. Issacs et al., UNC Wilmington Center for Marine Science, *Microcystins and Two New Micropeptin Cyanopeptides Produced by Unprecedented Microcystis aeruginosa Blooms in North Carolina's Cape Fear River*, 31 HARMFUL ALGAE 82 (2014). Though illustrative examples of scientific publications noting water quality problems arising in North Carolina due to industrial livestock production, these studies join countless others available to inform and justify agency action to better protect water quality.

<sup>64</sup> Harden, S.L., U.S. Geological Survey, *Surface-water quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations*, U.S. GEOLOGICAL SURVEY SCIENTIFIC INVESTIGATIONS REPORT 2015-5080 (2015), <http://pubs.usgs.gov/sir/2015/5080>.

bacteria contamination in surface waters adjacent to swine operations.<sup>65</sup> And this fall, a multi-year study conducted by Duke University concluded that North Carolinians who live near large hog operations have higher death and disease rates from a variety of causes than residents who live farther away.<sup>66</sup> Specifically, the study showed a correlation between proximity of residence to industrial hog operations and higher rates of all-cause mortality, infant mortality, mortality from anemia, kidney disease, tuberculosis, and septicemia.<sup>67</sup>

In addition to academic research, local environmental nonprofits conduct regular water quality monitoring to assess the impacts of industrial livestock operations in North Carolina's watersheds. The public is left to fill in gaps created by the Agency's failure to collect or require permittee collection and submission of water quality data. DWR has historically rejected third party data, however, and, though increasingly willing to accept data collected under established protocols, the Agency still refuses to consider third-party data for enforcement purposes.

g. Recent events justify a more protective permit

Successful legal action has increased public awareness of, and agency commitments to mitigate, the impacts of swine operations. Increasingly severe and frequent weather events continue to increase the vulnerability of communities and natural resources. Pressure placed on water supplies by other sources of contamination make protecting each source from every threat more important than ever before. Meanwhile, the legislature targeted nuisance lawsuits and limited citizens' abilities to protect their property from the impacts of hog operations.

i. *DWR fails to account for racial disparities in permitting hog operations*

Under the previous administration, DEQ disregarded pleas for the Agency to assess the racial and ethnic impact of the permitting program and adopt measures to protect vulnerable communities from pollution from permitted operations. When the General Permit was renewed without any attempt to address documented racial disparities, community members living close

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<sup>65</sup> See generally, e.g., 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), <http://link.springer.com/article/10.1007/s11270-015-2669-y> (detailing this contamination).

<sup>66</sup> Julia Kravchenko et al, *Mortality and Health Outcomes in North Carolina Communities Located in Close Proximity to Hog Concentrated Animal Feeding Operations*, 79 N.C. MEDICAL JOURNAL, No. 5 at 278 (2018), <https://www.ncbi.nlm.nih.gov/pubmed/30228132>. Over the years, numerous studies have evaluated the impacts of industrial livestock operations on public health. See, e.g., Michael Greger & Gowri Koneswaran, *The Public Health Impacts of Concentrated Animal Feeding Operations on Local Communities*, 33 FARM CMTY. HEALTH 11, 13 (2010); Carrie Hribar, Nat'l Ass'n of Local Bds. of Health, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities*, Environmental Health 4 (2010), [http://www.cdc.gov/nceh/ehs/docs/understanding\\_cafos\\_nalboh.pdf](http://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf). Lamentably, scant research has been conducted by the N.C. Department of Health and Human Services.

<sup>67</sup> *Id.*

to hog operations filed an administrative complaint with EPA’s Office of Civil Rights.<sup>68</sup> The complaint alleged renewal of the General Permit without adequate measures to control, monitor, and dispose of animal waste from hog operations subjected African-Americans, Latinos, and Native Americans to discriminatory impacts, in violation of federal law.<sup>69</sup>

After an extensive investigation, EPA expressed “grave concern” regarding the disparate impact of permitted operations on communities of color<sup>70</sup> and recognized that “industrial hog operations have a negative impact on nearby residents, particularly with respect to objectionable odors and other nuisance problems that can affect their quality of life.”<sup>71</sup> Ultimately community members and DEQ reached a settlement under which DEQ re-committed to “carrying out its responsibilities in a nondiscriminatory manner, in accordance with the requirements of Title VI and EPA implementing regulations.”<sup>72</sup>

*ii. The 2016 and 2018 hurricane seasons resulted in historic flooding*

Just as DWR should consider the demographic vulnerability of residents neighboring permitted operations, it should account for the geographic vulnerability of permitted operations to increasingly frequent and severe weather events. During the current permit cycle, multiple hurricanes and tropical storms exposed the problems of storing and disposing of billions of gallons of hog waste in the coastal plain using the lagoon and sprayfield system. Most notable were the two 1,000-year storms, Hurricanes Matthew and Florence, which struck during the current 5-year permit term.

Hurricane Matthew struck North Carolina in early October 2016, dumped more than 18 inches of rain, and caused widespread, record-setting, flooding in the coastal plain.<sup>73</sup> Eight of the counties producing the most pork received more than 10 inches of rain during the storm. Aerial monitoring by local Waterkeeper organizations working in the coastal plain, including Sound Rivers, Cape Fear River Watch, Winyah Rivers Foundation, White Oak-New Riverkeeper

<sup>68</sup> Compl., NCEJN v. DEQ, EPA File No. 11R-14-R4 (Sept. 3, 2014), <https://earthjustice.org/sites/default/files/files/North-Carolina-EJ-Network-et-al-Complaint-under-Title-VI.pdf>.

<sup>69</sup> See Title VI of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000d *et seq.*; 40 C.F.R. pt. 7 (codifying EPA’s nondiscrimination regulations).

<sup>70</sup> Letter from Lilian S. Dorka, EPA, to William G. Ross, Jr., DEQ (Jan. 12, 2017), <http://waterkeeper.org/wp-content/uploads/2017/01/Letter-to-Complainants-in-Case-11R-14-R4-Forwarding-Letter-of-Concern-to-NC-DEQ-1-12-2017.pdf>.

<sup>71</sup> Letter from Lilian S. Dorka, EPA, to William G. Ross, Jr., DEQ, at 5 (Jan. 12, 2017).

<sup>72</sup> Settlement Agreement, NCEJN v. DEQ, EPA File No. 11R-14-R4 (May 3, 2018), [https://waterkeeper.org/wp-content/uploads/2018/05/Final-Settlement-Agreement\\_attachments-and-sig.pdf](https://waterkeeper.org/wp-content/uploads/2018/05/Final-Settlement-Agreement_attachments-and-sig.pdf).

<sup>73</sup> See Weather Channel, *Hurricane Matthew Brings Record River Flooding to North Carolina* (Oct. 15, 2016), <https://weather.com/storms/hurricane/news/matthew-river-flooding-carolina-records>. Chico Harlan & Angela Fritz, *In North Carolina, some flood waters crest while others remain on rise*, WASH. POST (Oct. 13, 2016), [https://www.washingtonpost.com/news/capital-weather-gang/wp/2016/10/10/thousands-of-people-are-stranded-in-north-carolina-city-as-flood-waters-rise/?utm\\_term=.ed28aa85c453](https://www.washingtonpost.com/news/capital-weather-gang/wp/2016/10/10/thousands-of-people-are-stranded-in-north-carolina-city-as-flood-waters-rise/?utm_term=.ed28aa85c453).

Alliance, Crystal Coast Waterkeeper, and Coastal Carolina Riverwatch documented the flooding documented the flooding of 10 hog operations (39 barns) and 14 hog waste lagoons.<sup>74</sup> The impacts of Hurricane Matthew persisted long after floodwaters receded.<sup>75</sup> In 2017, American Rivers ranked the Neuse and Cape Fear Rivers among the ten most endangered rivers in the United States, citing the risk of water contamination posed by industrial livestock operations.<sup>76</sup>

In September 2018, Hurricane Florence made landfall and exceeded flooding records set less than two years earlier by Hurricane Matthew. Several parts of eastern North Carolina received more than 20 inches of rain during the storm.<sup>77</sup> Multiple lagoon breaches and countless inundated sprayfields, lagoons, and confinement barns were documented through aerial monitoring. Once again, North Carolina made national news because of water pollution stemming from hog operations.<sup>78</sup>

As decades of catastrophes and observations demonstrate, the lagoon and sprayfield system is ill-suited to withstand the severe tropical weather that is increasingly common in the coastal plain.

*iii. Neighbors of hog operations file suit exposing industry harm and regulatory failure*

In 2014, approximately 500 North Carolinians, most of whom are African-American, filed common-law nuisance suits against Smithfield Foods, whose wholly-owned or contracted

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<sup>74</sup> Soren Rundquist, *Exposing Fields of Filth*, EWG (Nov. 4, 2016), <https://www.ewg.org/research/exposing-fields-filth-hurricane-matthew>. These impacts would have been worse but for the state-funded buyout of hog operations in the floodplain; of the 43 operations closed under this program, 34 would have flooded in Hurricane Matthew had they remained in the 100-year floodplain.

<sup>75</sup> DWR, *Survey of Surface Water Quality Associated with Hurricane Matthew, October 2016* (May 5, 2017), [https://files.nc.gov/ncdeq/Water%20Quality/Water\\_Sciences/Effects%20of%20Hurricane%20Matthew%20on%20NC%20Surface%20Waters%20Final.pdf](https://files.nc.gov/ncdeq/Water%20Quality/Water_Sciences/Effects%20of%20Hurricane%20Matthew%20on%20NC%20Surface%20Waters%20Final.pdf) (showing elevated nitrate/nitrite and fecal coliform bacteria concentrations persisted for at least four months after the storm). DWR inspectors also encountered a large number of freeboard violations after Hurricane Matthew. DEQ, *Annual Report on Animal Waste Operations Permitting, Inspection and Compliance Activities July 1, 2016 through June 30, 2017* tbl. 4 (2017) (stating that inadequate freeboard was among the most common type of violation or deficiency uncovered by inspectors and that the “high number of freeboard violation [sic] is mainly attributed to Hurricane Matthew”), [https://www.ncleg.net/documentsites/committees/BCCI-6658/Reports/FY%202017-18/DEQ/DWM\\_Animal\\_Feeding\\_Operations\\_%20FY\\_2016-17\\_Annual\\_Report-2018-06-13.pdf](https://www.ncleg.net/documentsites/committees/BCCI-6658/Reports/FY%202017-18/DEQ/DWM_Animal_Feeding_Operations_%20FY_2016-17_Annual_Report-2018-06-13.pdf).

<sup>76</sup> American Rivers, *America’s Most Endangered Rivers 2017* (2017), [https://s3.amazonaws.com/american-rivers-website/wp-content/uploads/2017/04/11121018/MER2017\\_FinalFullReport\\_04062017.pdf](https://s3.amazonaws.com/american-rivers-website/wp-content/uploads/2017/04/11121018/MER2017_FinalFullReport_04062017.pdf).

<sup>77</sup> *Map: Florence Drenched Thousands of North Carolina CAFOs and Animal Waste Pits*, EWG <https://www.ewg.org/release/map-florence-drenched-thousands-north-carolina-cafos-and-animal-waste-pits> (last visited December 13, 2018).

<sup>78</sup> See, e.g., Charles Bethea, *After Florence, Manure Lagoons Breach, and Residents Brace for the Rising Filth*, THE NEW YORKER (Sep. 21, 2018), <https://www.newyorker.com/news/dispatch/after-florence-manure-lagoons-breach-and-residents-brace-for-the-rising-filth>

operations constitute a majority of those covered under the General Permit.<sup>79</sup> Plaintiffs in these twenty-six cases alleged that the company continued to operate, or contract for the operation of, a waste management system known to unreasonably interfere with the use and enjoyment of their property.

As of this writing, plaintiffs have won each of the four trials.<sup>80</sup> Moreover, juries have awarded plaintiffs damages totaling almost \$550 million, most of which was awarded as punitive damages.<sup>81</sup> Punitive damages are available under North Carolina law “to punish a defendant for egregiously wrongful acts and to deter the defendant and others from committing similar wrongful acts.”<sup>82</sup>

*iv. The legislature deprived citizens and the Agency of critical means to address problems*

Recent developments have also limited the ability of DWR to enforce the General Permit. As conceded by DWR staff during testimony delivered in recent nuisance trials, a permitted operation may be noncompliant for 364 days out of the year and the Agency would not know.<sup>83</sup> While this stems in part from the Agency’s reliance on brief annual inspections and on-site recordkeeping, we recognize that the Agency has been crippled by repeated budget cuts.

Since 2011, the legislature has not only moved programs and divisions out of the DEQ,<sup>84</sup> it has dramatically reduced the Department’s budget. Thus, the environmental programs remaining in DEQ face daily challenges in providing timely permit reviews, performing

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<sup>79</sup> *In Re North Carolina Swine Farm Nuisance Litigation*, 2017 WL 5178038 (E.D.N.C. 2017).

<sup>80</sup> Even in the two cases with plaintiffs hand-picked by Smithfield’s lawyers, juries have found the company guilty of violating neighbors’ property rights.

<sup>81</sup> Alexandria Hyers, *Murphy-Brown Goes 0 for 3 in Hog Nuisance Trials, Slapped with \$473 Million Verdict*, INDY WEEK (Aug. 3, 2018) (discussing verdicts involving contracted operations), <https://indyweek.com/news/archives/murphy-brown-goes-0-3-hog-nuisance-trials-slapped-473-million-verdict/>. Craig Jarvis & Josh Shaffer, *Jury finds in favor of NC neighbors in fourth hog-waste trial*, NEWS & OBSERVER (Dec. 12, 2018), <https://www.newsobserver.com/news/local/article222946485.html>. The awards were subsequently reduced due to statutory limits on the availability of punitive damages. See N.C. Gen. Stat. § 1D-25(b).

<sup>82</sup> N.C. Gen. Stat. § 1D-1 (stating the purpose of punitive damages). The court ruled that punitive damages were unavailable to plaintiffs who prevailed in the fourth trial.

<sup>83</sup> Lisa Sorg, *The case against Murphy-Brown: Inside North Carolina’s latest blockbuster hog trial*, N.C. POLICY WATCH (Dec. 13, 2018) <https://www.ncpolicywatch.com/2018/12/13/the-case-against-murphy-brown-inside-north-carolinas-latest-blockbuster-hog-trial/> (“As DEQ’s Christine Lawson, program manager for the Animal Feeding Operations, acknowledged on the stand, a farm could be non-compliant for 364 days of the year and the state would never know.”).

<sup>84</sup> See, e.g., N.C. Sess. Laws 2011-145 §§ 13.22A, 13.25 (June 15, 2011)(moving the Forestry Division and the Division of Soil and Water Conservation from the Department of Environment and Natural Resources to the Department of Agriculture and Consumer Services). This agency reorganization deprived the state environmental agency of much of the federal funding provided under the 319 Program to address nonpoint sources pollution.

inspections, and offering compliance assistance to permittees. Staffing levels are simply inadequate to enable necessary enforcement, oversight, and technical assistance.

Over the last seven years, the North Carolina legislature has targeted specific positions for elimination or focused budget cuts on particular programs. Many of these reductions have affected water quality programs in general, and have specifically and intentionally reduced staffing in DEQ's seven regional offices. Between 2011 and 2016, DEQ suffered an 18 percent reduction in water resources staff overall, amounting to approximately 70 positions. The seven DEQ regional offices suffered a 41 percent reduction in water quality staff. Regional office staff conduct critical initial site visits for permit applications, provide technical assistance to permittees, and inspect permitted facilities.<sup>85</sup> The largest cuts to regional offices came in 2011. These cuts have continued, however; in 2013 the legislature cut 17 more positions from the already hemorrhaging regional offices. Between 2015 and 2018, the water resources budget was cut further, and in 2017, the legislature cut the regional offices budget again, by \$500,000 and eliminated another position in each regional office. While exact budget comparisons are difficult because of program shifts and organizational restructuring, it is clear that money directed to environmental regulation has dropped by millions of dollars over the last decade, even as the state budget has grown significantly.

This loss of important staff has reportedly lengthened some permitting times. Additionally, these staff reductions have affected DEQ's ability to provide technical assistance and enforce environmental regulations and laws. Indeed, there has been a noticeable drop in water quality and air quality penalties assessed in recent years. As such, it is important that before this permit is finalized that DEQ receives adequate funding and staffing to fulfill its statutory obligations.

In addition to cutting critical funding for DEQ, the legislature has repeatedly enacted legislation in response to ongoing nuisance suits. The legislature has, twice in two years, fundamentally altered nuisance law, depriving residents similarly-situated to those who prevailed in federal court of centuries-old legal remedies.<sup>86</sup> The legislature also moved to exempt livestock operations from the odor rule previously adopted by the Environmental Management Commission which outlines the Agency's obligations in responding to odor complaints.<sup>87</sup>

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<sup>85</sup> *Regional Offices*, N.C. DEP'T OF ENV'T'L QUALITY, <https://deq.nc.gov/about/divisions/air-quality/regional-offices>.

<sup>86</sup> N.C. Sess. Laws 2017-11 (May 11, 2017) (codified at N.C. Gen. Stat. § 106-701); N.C. Sess. Laws 2018-113 (June 27, 2018) (codified at N.C. Gen. Stat. § 106-701, 702). This industry favoritism stands in stark contrast to the 1996 recommendation of the Blue Ribbon Study Commission that "differential treatment for agriculture be eliminated where it cannot be justified." Blue Ribbon Study Commission on Agricultural Waste, *Report to the 1995 General Assembly of N.C. 1996 Regular Session 23* (May 16, 1996).

<sup>87</sup> N.C. Sess. Laws 2017-108 § 2 (July 12, 2017).

Because the legislature stripped North Carolinians of legal tools and resources to address hog waste mismanagement on their own, it is even more important the DEQ afford adequate protection to the neighbors of permitted operations.

## II. Statutory and Regulatory Background

North Carolina law obligates DEQ to “provide for the conservation of [the State’s] water and air resources . . . and to maintain for the citizens of the State a total environment of superior quality.”<sup>88</sup> Moreover, the legislature declared that it is the public policy of the State to “maintain, protect, and enhance water quality” in the State.

In 1996, the North Carolina legislature required that the State develop a permit program to prevent the discharge of waste from animal operations, including hog operations, with the objective of “protect[ing] water quality and promot[ing] innovative systems” for animal waste management.<sup>89</sup> The legislature explicitly authorized DEQ to develop an individual permit regime if doing so “is necessary to protect water quality, public health, or the environment.”<sup>90</sup> Facilities that intend to discharge into surface waters must operate under a federal permit.<sup>91</sup>

In 1997, DEQ chose to develop a general permit program rather than an individual permitting scheme for hog facilities and began issuing general permits for hog waste management systems that year.<sup>92</sup> The Department has since issued revised general permits in 2004, 2009, and, most recently in 2014. The current General Permit regulates animal waste management systems at hog facilities in North Carolina that house 250 or more hogs.<sup>93</sup> Animal waste management systems are defined by statute as the “combination of structures and nonstructural practices serving a feedlot that provide for the collection, treatment, storage, [and] land application of animal waste.”<sup>94</sup> Animal waste management systems control waste from the

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<sup>88</sup> N.C. Gen. Stat. § 143-211 (a).

<sup>89</sup> N.C. Gen. Stat. § 143-215.10A; *See also* N.C. Sess. Law 1995-626, sec. 1 (codified as amended at N.C. Gen. Stat. §§ 143-215.10A through .10I) (eff. as provided at sec. 19), <http://www.ncga.state.nc.us/EnactedLegislation/SessionLaws/HTML/1995-1996/SL1995-626.html>.

<sup>90</sup> N.C. Gen. Stat. §143-215.10C(a).

<sup>91</sup> *See* N.C. Gen. Stat. §§ 143-215.1(a); *id.* § 143-215C(a1); *see also* 40 C.F.R. 122.23(e).

<sup>92</sup> Senate Bill 1217 Interagency Group, Ninth Senate Bill (SB) 1217 Interagency Group Guidance Document 7-1 (Sep. 25, 2009), [http://www.ncagr.gov/SWC/tech/documents/9th\\_Guidance\\_Doc\\_100109.pdf](http://www.ncagr.gov/SWC/tech/documents/9th_Guidance_Doc_100109.pdf).

<sup>93</sup> 15A N.C. Admin. Code § 2T.1304; N.C. Gen. Stat. § 143-215.10B(1).

<sup>94</sup> N.C. Gen. Stat. § 143-215.10B(3). Under North Carolina law, the term feedlot “means a lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising, or holding of animals and either specifically designed as a confinement area in which animal waste may accumulate or where the concentration of animals is such that an established vegetative cover cannot be maintained. A building or lot is not a feedlot unless animals are confined for 45 or more days, which may or may not be consecutive, in a 12-month period. Pastures shall not be considered feedlots for purposes of this Part.” N.C. Gen. Stat. § 143-215.10B(5).

time the waste is produced until it is land-applied or otherwise utilized.<sup>95</sup> Animal waste may not be applied at “greater than agronomic rates.”<sup>96</sup> To operate legally in North Carolina, hog facilities must obtain a certificate of coverage to operate under the General Permit. The certificate of coverage binds the operator to terms and conditions in the General Permit.<sup>97</sup> The current General Permit covers approximately 2,200 hog facilities.<sup>98</sup>

Due to the existing moratorium on new and modified hog facilities, the number of covered facilities is unlikely to change significantly under the renewed permit.<sup>99</sup> Animal waste management systems at *new or modified* hog operations are not covered under the General Permit, as DWR makes clear in Condition I.7. Such operations must instead meet or exceed the following statutory performance standards:

- (1) Eliminate the discharge of animal waste to surface water and groundwater through direct discharge, seepage, or runoff.
- (2) Substantially eliminate atmospheric emission of ammonia.
- (3) Substantially eliminate the emission of odor that is detectable beyond the boundaries of the parcel or tract of land on which the swine farm is located.
- (4) Substantially eliminate the release of disease-transmitting vectors and airborne pathogens.
- (5) Substantially eliminate nutrient and heavy metal contamination of soil and groundwater.<sup>100</sup>

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<sup>95</sup> Natural Res. Conservation Serv., USDA, Pt. 651: Agric. Waste Mgmt. Field Handbook 9-1 (2011), <http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=31493.wba> (defining animal waste management systems as “planned system[s]” designed “to control and use by-products of agricultural production in a manner that sustains or enhances the quality of air, water, soil, plant, animal, and energy resources”)

<sup>96</sup> 15A N.C. Admin. Code 02T .1304(b)(3) (requiring animal waste management plans to ensure “[t]he waste shall not be applied at greater than agronomic rates”).

<sup>97</sup> 15A N.C. Admin. Code 02T .0111(a).

<sup>98</sup> DWR, *List of Permitted Animal Facilities* (Jan. 26, 2018), <https://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/animal-feeding-operation-permits/animal-facility-map>.

<sup>99</sup> See N.C. Sess. Law 1997-458, sec. 1.2 <http://www.ncga.state.nc.us/EnactedLegislation/SessionLaws/HTML/1997-1998/SL1997-458.html>. The moratorium was extended and changed over the years. See, e.g., N.C. Sess. Law 1998-188, sec. 3 (amending N.C. Sess. Law 1997-458 § 1.2) (eff. Oct. 12, 1998), <http://www.ncga.state.nc.us/EnactedLegislation/SessionLaws/HTML/1997-1998/SL1998-188.html>; N.C. Sess. Law 1999-329, sec. 2.1 (amending N.C. Sess. Law 1997-458 § 1.2) (eff. July 20, 1999), <http://www.ncga.state.nc.us/EnactedLegislation/SessionLaws/HTML/1999-2000/SL1999-329.html>. Under the current law, DEQ “shall not issue or modify a permit to authorize the construction, operation, or expansion of an animal waste management system that serves a swine farm that employs an anaerobic lagoon as the primary method of treatment and land application of waste by means of a sprayfield as the primary method of waste disposal.” N.C. Gen. Stat. § 143-215.10I(b).

<sup>100</sup> N.C. Gen. Stat. § 143-215.10I(b).

The general permitting scheme is based on the fiction that these facilities do not discharge into surface waters. As described in detail above, substantial research, visual observation, and the industry’s own reporting data demonstrate that these facilities do in fact discharge into surface waters of the State.<sup>101</sup> These discharges have substantial and adverse impacts to waterways, downstream users, and neighboring communities.

All operators must “establish and maintain adequate water and air quality monitoring systems and report the data” to the Environmental Management Commission.<sup>102</sup> Monitoring systems must be designed to evaluate “the effects of the discharges or emissions upon the waters and air resources of the State.”<sup>103</sup> These requirements apply to persons “[c]onstruct[ing] or operat[ing]” an “animal waste management system.”<sup>104</sup>

Moreover, where the permittee exceeds the groundwater quality standards at or beyond the compliance boundary, the permittee “must undertake corrective action, without regard to the date that the system was first permitted, to restore the groundwater quality by assessing the cause, significance, and extent of the violation of standards and submit the results of the investigation and a plan and proposed schedule for corrective action to the Secretary.”<sup>105</sup>

State regulations emphasize repeatedly the necessity of groundwater quality standards and monitoring requirements.<sup>106</sup> DEQ has the express authority to “deny a permit application if necessary to effectuate ... rules on groundwater quality standards[.]”<sup>107</sup> Finally, it is expressly within DEQ’s discretion to “require monitoring and reporting requirements, including of groundwater, surface water or wetlands, waste, wastewater, residuals, soil, treatment processes, lagoon or storage ponds, and plant tissue, if necessary to determine the source, quantity, and quality of the waste and its effect upon the surface water, ground waters, or wetlands”<sup>108</sup> as part of the General Permit.

In making permitting decisions, the Agency must evaluate the “cumulative effects” thereof, and “act on all permits so as to prevent violation of water quality standards due to the

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<sup>101</sup> Precipitation-related discharges from CAFO sprayfields qualify as “agricultural stormwater” only where the CAFO has applied the manure in accordance with nutrient management practices that ensure “appropriate agricultural utilization” of the waste. *See* 40 C.F.R. § 122.23(e).

<sup>102</sup> N.C. Gen. Stat. § 143-215.66.

<sup>103</sup> *Id.*

<sup>104</sup> N.C. Gen. Stat. § 143-215.1(a)(12).

<sup>105</sup> *Id.* at (k).

<sup>106</sup> *See, e.g.*, 15A N.C. Admin. Code 02T. 0111(c) (“No provisions in any general permit issued under this Rule shall be interpreted to allow the permittee to violate state surface water standards, groundwater standards outside a Compliance Boundary[.]”); 15A N.C. Admin. Code 2T.0105(m).

<sup>107</sup> 15A N.C. Admin. Code 02T. 0108(b)(2)(C).

<sup>108</sup> 15A N.C. Admin. Code 02T .0108(c).

cumulative effects of permit decisions.”<sup>109</sup> These cumulative effects include the “collective effects of a number of projects and include the effects of additional projects similar to the requested permit in areas available for development in the vicinity.”<sup>110</sup> Facilities “deemed permitted” by agency rules are operating by virtue of “permit decisions” within the meaning of the statute, and the water quality impacts of such decisions must be included in a “cumulative effects” analysis.<sup>111</sup> DWR’s decision to issue certificates of coverage constitutes a permitting decision for which cumulative effects must be evaluated.

### **III. The Draft General Permit is a Critical Tool for Addressing Pollution from Hog Waste in the State**

We commend DWR for proposing meaningful changes to the General Permit for the first time in almost two decades.<sup>112</sup> The General Permit is perhaps the Agency’s most important tool to protect the State’s rivers and streams, neighboring communities, and downstream users from substantial pollution from industrial hog operations. As such, the renewal of the General Permit is likely the most substantial action the Department will take in the next five years to address water quality in coastal North Carolina. As discussed in more detail below, we support several of the Agency’s proposed amendments to the General Permit. DWR should make additional changes in the General Permit to ensure better protection of surface waters and ground water, more transparency and accountability, and clear direction to permittees and the public about the permittees’ obligations under the General Permit.

#### **a. The undersigned support several proposed amendments to the General Permit**

We support DWR’s amendment to Condition III.9(f), which would reduce the window of time within which operators must take a waste sample following first knowledge of a discharge of waste into surface waters. Operators should be required to take a waste sample as quickly as possible following the discovery of a discharge into surface waters. DWR must have this information in order to mitigate the risk of environmental harm and public health impacts. We

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<sup>109</sup> N.C. Gen. Stat. § 143-215.1(b)(2).

<sup>110</sup> *Id.*

<sup>111</sup> See Attorney General Advisory Opinion: Water Quality Permitting; G.S. 143-215.1 (April 24, 1996), <http://www.ncdoj.gov/About-DOJ/Legal-Services/Legal-Opinions/Opinions/Water-Quality-Permitting.aspx> (finding that the Environmental Management Commission was authorized to request information from hog processing facilities regarding the cumulative effects of issuing a water quality permit in order to fully evaluate the cumulative effects of the facility). As such, we encourage DWR to consider the effects of colocation of deemed permitted poultry operations near permitted swine operations, as well as the cumulative effects of other swine permitting decisions.

<sup>112</sup> The Condition numbers cited herein refer to the condition numbers in draft General Permit circulated to the public ahead of the November 27, 2018 stakeholder meeting. See *Animal Feeding Operations*, N.C. DEP’T OF ENV’T’L QUALITY, <https://deq.nc.gov/about/divisions/water-resources/water-quality-regional-operations/af0> (last visited Dec. 21, 2018) [hereinafter Draft General Permit].

support DWR’s proposal to reduce this window of time from 72 hours to 48 hours, and would support an even shorter window of time within which permittees must take waste samples. We appreciate the need to standardize protocols for the collection and analysis of water quality samples, and support DWR’s proposal requiring waste sample collection to comply with the Certification Training Manual for Operators of Animal Waste Management Systems. DWR should adopt a consistent policy for accepting sampling results from permittees and third parties such that all sampling meet the similar quality assurance/quality control requirements and adhere to the same or substantially similar sampling protocols.

DWR’s proposed amendment to Condition III.16 would require operators to disclose the name of the facility, location of the discharge, volume of the waste discharged, time and date of the discharge, the duration of the discharge, the surface waters into which waste was discharged, any mitigating actions taken by the operator, and a facility contact person in the press release informing the public that an operation discharged more than 1,000 gallons of waste into surface waters. This information is not currently required under the General Permit, preventing the public and regulators from taking swift and effective action to mitigate environmental and public health risks. DWR has the statutory authority to request this information from operators, and we fully support DWR’s proposal to include this information in a press release.<sup>113</sup>

We support DWR’s proposal to allow unannounced inspections of operations under Condition IV.1. DWR has clear statutory authority to inspect facilities in its discretion to “determine whether the [facility] is causing a violation of water quality standards and whether the [facility] is in compliance with its animal waste management plan or any other condition of the permit.”<sup>114</sup> We acknowledge that operators may maintain records in different formats (e.g., electronic and paper) and in various locations, and may engage consultants to assist with the collection and completion of records. Importantly, however, the General Permit requires that all records be “readily available at the facility” for inspection by DWR staff during inspection. As discussed in more detail below, we support the transition to a fully electronic records retention policy, which would ease the record-keeping burden on operators and streamline records review for DWR during annual inspections.

Finally, we support DWR’s inclusion of Condition V.12 in the draft General Permit, which incorporates the 2D odor rules by reference. Operators are bound to these rules by regulation. The inclusion of this condition is appropriate in the General Permit: compliance with the odor rules is critical for protection of water quality as well as air quality. Odor-causing constituents of waste from hog operations may be atmospherically deposited into surface waters,

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<sup>113</sup> N.C. Gen. Stat. § 143-215.10C(h)(1) (requiring the press release issued in the event of discharge of 1,000 gallons or more to “set out the details of the discharge); 15A N.C. Admin. Code 02T .0108(c) (authorizing DWR to impose “reporting requirements . . . if necessary to determine the source, quantity, and quality of the waste and its effect upon the surface water, ground waters, or wetlands”).

<sup>114</sup> N.C. Gen. Stat. § 143-215.10F(a).

degrading water quality and impacting users downstream.<sup>115</sup> The General Permit should encompass all requirements on these operations relevant to water quality protection, and thus, the odor rules are appropriate for inclusion in the permit.

b. The undersigned share several concerns expressed by industry

Industry stakeholders and the undersigned agreed on several issues during the stakeholder meeting facilitated by DWR on November 27, 2018. First, we agree with industry representatives who objected to the new proposed requirement in Condition II.28 that may be “fed by the end of the first winter after cutting.” It is unclear why the permit would obligate operators to use harvested hay for a specific purpose, i.e., feeding, when alternative uses may be preferable for the permittee and present no additional environmental risk. For instance, we would support a requirement to cover hay stored outside, and to store it without direct soil contact, as both practices would help both avoid environmental problems and preserve forage quality.<sup>116</sup> We would also support a provision capping storage outside at 24-months. In short, while we support parts of the proposed changes to Condition II.28, we believe permit requirements should correspond to the mitigation of environmental risk.

Uncovered bales are too often seen lining the edges of sprayfields for years, slowly decomposing and delivering additional nutrient loading to soils. The primary concern that we have with harvested hay is not what it *is* used for, but rather that it is too often *not* used. Rather than prescribe the way in which hay is used, DWR should instead require measures that mitigate the threat of runoff or leaching of excess nutrients from the hay.

In addition, we join industry stakeholders in questioning the utility of deleting the term “amendment” from the General Permit. This proposed change is discussed in more detail below.

c. The draft General Permit language must be unambiguous about permittees’ obligations

DWR made many substantive changes to the draft General Permit. Several new provisions, however, contain ambiguous language that should be clarified in the next iteration of the draft General Permit.

i. *Clarify timeline for compliance with new requirements*

First, as an overarching matter, we believe the General Permit should clarify, particularly when imposing new operational, monitoring, or recordkeeping requirements, when and how

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<sup>115</sup> See, e.g., Viney Aneja et al., *Agricultural ammonia emissions and ammonium concentrations associated with aerosols and precipitation in the southeast United States*, 108 JOURNAL OF GEOPHYSICAL RESEARCH D4 (Feb. 2003), <https://doi.org/10.1029/2002JD002271>.

<sup>116</sup> N.C. Coop. Extension, *Hay Storage and Feeding Losses* (May 9, 2018), <https://duplin.ces.ncsu.edu/2018/04/hay-storage-and-feeding-losses/> (last visited Dec. 13, 2018).

these new provisions will take effect. We support DWR's proposals to address flaws in the lagoon and sprayfield system through technological supplementation, and we have long sought additional transparency regarding permitted operations. At the same time, however, we believe it is important for the regulated community and the public to know how and when proposed changes will be effectuated.

For instance, we endorse the proposal to amend Condition III.12 to extend records retention requirements from three to five years. However, we recognize that many operators may only have three years' worth of records available when the new permit takes effect, as that has been the retention requirement for multiple permit cycles. As such, we recommend that the General Permit clarify that existing records should be maintained in addition to those created during the first two years of operation under the current permit, after which time all permittees must have on file a full five years' worth of records readily available for review.

Similarly, while, as explained below, we oppose the proposal to require use of the North Carolina Phosphorus Assessment Tool only after receiving "high P-index soil analysis results,"<sup>117</sup> if DWR retains that triggering mechanism, it should clarify Condition I.9 to specify when an operator must run PLAT to avoid ambiguity. The draft General Permit provides that "PLAT must be run within twelve (12) months of receiving the high P-index soil analysis results." However, elsewhere the permit only requires soil sampling "at least once every three years."<sup>118</sup> As such, the draft General Permit implies that, on the first day of coverage under the renewed permit a permittee could be noncompliant if, say, she received high P-index soil analysis results two years ago. While we believe the threat of phosphorus loss should be promptly assessed, we also understand operators may need some time to come into compliance. As such, we recommend that the Agency clarify that a permittee with existing soil sampling results indicating a high P-index value will have one year after initial coverage under this permit to run PLAT. Otherwise, permittees may avoid the PLAT requirement for the majority of the permit term by delaying soil sampling.

DWR should also make consistent the compliance timeline for Conditions II.18 and II.20. Both contemplate the required installation of new equipment upon written notification from the Director of DWR. However, while Condition II.18 states "[t]he equipment must be in place no later than ninety (90) days following receipt of notice from the Director," Condition II.20 is silent as to the timing of implementation. We support a 90-day installation window when either technology is mandated by DWR. In addition, we recommend that the operator be required to submit written certification to DWR that the equipment has been installed.

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<sup>117</sup> See Draft General Permit, *supra* note 112, Condition I.9.

<sup>118</sup> *Id.* at Condition III.4.

ii. *Clarify triggers for installation of automated equipment*

DWR makes several amendments to the General Permit which may require the installation of automated equipment in order to improve compliance with the Permit, including rain breakers, flow meters, lagoon monitors and recorders, and technology that reduces drift potential. DWR has authority, and in some cases the obligation, to require such equipment installation. We support the inclusion of automated technology in the Permit and request that DWR clarify the conditions under which this technology may be required and the entity with the authority to require the installation of such technology.

Waterkeeper organizations patrolling the coastal plain—including Sound Rivers, Cape Fear River Watch, Winyah Rivers Foundation, White Oak-New Riverkeeper Alliance, Crystal Coast Waterkeeper, and Coastal Carolina Riverwatch—have observed first-hand violations of the General Permit provisions prohibiting land application during precipitation events and the prohibiting land application more than four hours after the issuance of a relevant warning/watch by the National Weather Service. In advance of Hurricane Florence, but well after the issuance of applicable Flood Warnings/Watches, local Riverkeepers observed twelve hog operations disregarding the permit and land applying waste despite imminent risk of runoff. Similar observations were made when previous storms approached North Carolina.<sup>119</sup>

As such, we support Condition II.24 as amended, which would require all permittees to install equipment “designed to automatically stop irrigation activities during precipitation” under certain circumstances. We also support DWR’s allowance of a transition period to give permittees time to install and operate this equipment.

For the most part, the draft General Permit notes that DWR has authority to require the installation of automated equipment but stops short of requiring the installation of this equipment. Such is the case for “automatic flow meters with flow totalizers” (Condition II.18), equipment to reduce wind drift potential (Condition II.19), “automated lagoon/storage pond waste-level monitors and recorders” (Condition III.2.c), and an “automated rain gauge and recorder” (Condition III.3.b). DWR appropriately lists circumstances that “may” lead the Agency to exercise its discretion to require necessary technological improvements.<sup>120</sup> DWR should make clear that the list of circumstances provided in the General Permit is not exhaustive. To that end, we recommend that DWR include language that automated technology may be required “as determined necessary by the Director”; this language is currently included in Condition III.2.c.

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<sup>119</sup> See, e.g., e-mail from Christian Breen, Waterkeeper Alliance, to David May & Jim Gregson, DWR (Sept. 2, 2016) (reporting violation of the prohibition of land application triggered in advance of Tropical Storm Hermine).

<sup>120</sup> See, e.g., *supra* note 112, at Condition II.18 (notification of the requirement “may be based on the facility’s violations, incomplete or incorrect record keeping events, or if the Division determines that flow estimation techniques do not effectively quantify volumes of waste applied”); Condition II.20 (notification of the requirement “may be provided if the Division determines violations for application of waste outside of the land application area as specified in the facility’s CAWMP due to wind drift”).

We also believe the General Permit should clarify the performance requirements of technological additions to animal waste management systems. For instance, we support the proposed Condition II.20, which could require a permittee to “install/utilize application equipment or methods that reduce drift potential.” The draft General Permit is ambiguous about how technology should be used to address drift potential. We recommend clarifying that requisite equipment include wind sensors that automatically prevent application of wastewater at a pre-set wind speed, e.g., 10 mph.<sup>121</sup> Such technology would address the type of noncompliance DWR is ill-suited to detect or correct during annual inspections, but which directly threatens neighboring communities and natural resources.<sup>122</sup> Notably, Smithfield Foods agreed to install such technology on its wholly-owned hog operations more than a decade ago.<sup>123</sup>

*iii. Clarify triggers and quality assurance requirements for groundwater monitoring*

We support DWR’s addition of Condition III.11, which would require groundwater monitoring under specific conditions. It is critical to require monitoring (and immediate action to cease discharge) any time there is evidence of groundwater contamination that could affect public health or the environment. As DWR recognizes, groundwater monitoring is the only way to obtain information necessary to protect groundwater resources in accordance with state law.<sup>124</sup> Therefore, it is imperative that groundwater monitoring be a mandatory condition in the General Permit. This language is especially critical to protecting rivers and streams in eastern North Carolina given the hydrologic connection between groundwater and surface water in the part of the State where the swine industry is concentrated.

DWR proposes to require groundwater monitoring when “evidence” of specific circumstances exist. However, the term “evidence” is not defined by the draft General Permit. It would be helpful if the General Permit provided a non-exhaustive list of the type and quantity of

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<sup>121</sup> Research discussing the application of agricultural chemicals suggests risk of wind drift is particularly heightened above 10 mph. S Elwynn Taylor, *Spray-Wind-Inversion*, Proceedings of the Integrated Crop Management Conference 7 (1992) (“At 5 mph, small particles can drift significantly. At 10 mph, medium and large particles will also be affected.”). We believe the equipment should prevent land application, at a minimum, when wind speeds exceed 15 mph. This is especially relevant for operators discharging waste water using center pivot end guns, solid set systems, hard-hosed travelers, or center pivots that discharge wastewater above the supply boom.

<sup>122</sup> As such, we object to the language that would prevent the requirement unless the “Division determines violations for application of waste outside of the land application area as specified in the facility’s CAWMP due to wind drift.”

<sup>123</sup> *Waterkeeper Alliance v. Smithfield Foods*, Consent Decree Sect. VII (Mar. 22, 2006) (discussing the company’s obligation to install a “wind drift limitation system”).

<sup>124</sup> *North Carolina Division of Water Resources Ground Water Management Branch 2018 Annual Report*, DIV. OF WATER RES. (Oct 2018), [https://www.ncwater.org/files/publications/gwms/annual/fy2017-18\\_network\\_ann\\_report.pdf](https://www.ncwater.org/files/publications/gwms/annual/fy2017-18_network_ann_report.pdf) (“The North Carolina Department of Environmental Quality (DEQ), Division of Water Resources (DWR), and preceding agencies have operated, installed, and monitored a statewide monitoring well network from the 1960s to the present. The operation of this monitoring well network is an essential part of DWR’s mission to ensure that the State has an adequate water supply for its citizens.”).

evidence necessary to demonstrate “groundwater impacts to public or private water wells are occurring off-site;” “migration of contaminated groundwater to off-site property or properties”; and “evidence of surface water impacts via groundwater.”<sup>125</sup> While we support the adoption of the proposed condition without that specificity, we believe providing it will provide clear direction to permittees.

While we fully support DWR’s proposal, we believe there are circumstances in which factors other than proven groundwater or surface water impacts suggest a heightened need for groundwater monitoring. Indeed, industry has acknowledged that evidence other than groundwater monitoring may indicate the presence of groundwater contamination.<sup>126</sup> For instance, we suggest that DWR further amend Condition III.11 to require groundwater monitoring whenever:

- An operation employs burial as a mortality management method;
- An operation has a lagoon within the 100-year floodplain;
- An operation employs a lagoon that does not meet the current NRCS Waste Storage Facility Pond Criteria (313-Practice Standard). Specifically, any operation that has a lagoon with a bottom elevation that is not a minimum of 2 feet above the seasonal high water table;<sup>127</sup> or
- An operation includes a land application field where any of the following conditions exist:
  - 30 ppm average of nitrate based on a 1 ft sampling depth,<sup>128</sup> or
  - Estimated mass of soil nitrate for 1-ft sample above 55 lbs./N/acre.<sup>129</sup>

Moreover, we recommend that the General Permit specify state that groundwater monitoring must meet clear and uniform quality assurance standards.<sup>130</sup> We recommend that

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<sup>125</sup> Draft General Permit, *supra* note 112, at Condition III.11.

<sup>126</sup> *Waterkeeper Alliance v. Smithfield Foods, Inc.*, (March 24, 2006), Consent Decree Sect. IX.

<sup>127</sup> Lagoons located below the seasonal high water table, even with a single liner, are not a viable option to comply with the law because they threaten “a direct discharge of untreated manure into groundwater, since all liners leak.” R. Hermanson *et al.*, *Nitrogen Use by Crops and the Fate of Nitrogen in the Soil and Vadose Zone – A Literature Search*, Pub. No. 00-10-015 at 131 (2000), <https://fortress.wa.gov/ecy/publications/SummaryPages/0010015.html>.

<sup>128</sup> Melanie Redding, *Manure and Groundwater Quality Literature Review*, Environmental Assessment Program: Washington State Department of Ecology, 43-44 (June 2016 ) (stating that “[r]isk to groundwater is a function of soil nitrate concentration, precipitation and irrigation, manure application rates, timing of application and soil properties,” but when soil nitrate exceeds 30 ppm, the risk of groundwater contamination is very high.).

<sup>129</sup> While “[r]esearchers agree that soil nitrate tests are not a surrogate for groundwater monitoring ... the majority of researchers also agree that residual soil nitrate can indicate when excess nitrogen has been land-applied and when there is a risk that groundwater may have been (or could be) impacted from nitrate leaching.” Most research agrees that once residual nitrate is below the root zone, it will eventually migrate to groundwater. R. Hermanson *et al.*, *Nitrogen Use by Crops and the Fate of Nitrogen in the Soil and Vadose Zone – A Literature Search*, Pub. No. 00-10-015 at 41 (2000), <https://fortress.wa.gov/ecy/publications/SummaryPages/0010015.html>.

DWR clarify how requisite monitoring should be designed and implemented. One option would be requiring a groundwater monitoring plan consistent with the National *Field Manual for the Collection of Water Quality Data* published by the U.S. Geological Survey.<sup>131</sup> This manual contains sampling procedures for the accurate assessment and management of surface water and groundwater resources. At a minimum, any quality assurance plan developed or approved by the Department should include the following elements:

- Installation of a sufficient number of upgradient and downgradient monitoring wells to determine groundwater flow direction and impacts from the CAFO on groundwater quality. These wells should be tagged with a DEQ-issued, unique well ID number, and they must be constructed according to 15A N.C. Admin. Code 2C .0108.
- Groundwater sampling should follow DEQ’s standard operating procedures for sampling monitoring wells and water supply wells.<sup>132</sup>
- A sampling plan should be developed which includes:
  - Well location and construction information;
  - Hydrogeologic description of the site;
  - Groundwater flow direction;
  - Identification of a background well;
  - Sample frequency;
  - Well purging criteria;
  - Sample collection procedures;
  - Sample analysis by state-certified laboratory;
  - Field measurements of groundwater temperature, pH, conductivity, and dissolved oxygen;
  - Static groundwater elevation; and
  - Quality assurance samples (field blanks, equipment blanks, duplicates).

Finally, groundwater quality data and water level data should be entered into DEQ’s GIS systems and made available to the public.

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<sup>130</sup> Notably, the Certification Training Manual for Operators of Animal Waste Management Systems does not indicate how groundwater monitoring should be conducted.

<sup>131</sup> *Collection of water samples (ver. 2.0): U.S. Geological Survey Techniques of Water-Resources Investigations*, U.S. GEOLOGICAL SURVEY, ch. A4 (Sept., 2006) at <http://pubs.water.usgs.gov/twri9A4/>.

<sup>132</sup> In proposed amendments to Condition III.9.f, DWR acknowledges the importance of uniform sampling procedure by requiring that surface water monitoring be conducted “in accordance with methods described in Certification Training Manual for Operators of Animal Waste Management Systems, Chapter 4.” Permittees should be similarly obligated to adhere to uniform, state-approved, protocol when conducting groundwater monitoring required under the permit.

iv. *Clarify submission and notification requirements for changes to on-site operations*

We also believe it would be prudent to clarify and distinguish the types of changes to animal waste management plans (“AWMPs”) that require DWR review and approval prior to implementation and those for which mere submission to DWR is required. In Condition VII, DWR proposes to delete the definition of “amendment,” which leaves the General Permit silent on changes to AWMPs other than those defined as either a “revision” or a “major change.”

Under the existing permit, while “major changes” and “revisions” must be submitted to DWR, and therefore become a public record, “[a]mendments are not required to be submitted to the [DWR] Regional Office unless specifically requested by the [DWR].”<sup>133</sup> We support any action by DWR that increases transparency and availability of this information to the public.

However, DWR can increase transparency without removing references to amendments. We recommend that the General Permit simply require timely submission of any AWMP “amendment” to DWR rather than eliminating the definition of “amendment” altogether. Submission to DWR would guarantee that the updated AWMP was accessible to the Agency and, upon request, to the public. Notably, almost one-fifth of the noncompliance discovered during annual inspections conducted between July 1, 2016 and June 30, 2017 stemmed from observations that the receiving crop “differ[ed] from that stated in [the permittee’s animal waste management plan].”<sup>134</sup> We believe the General Permit should allow for public awareness of on-site operational changes that impact nutrient management.

Notably, DWR proposes to not only eliminate the definition of “amendment” but also any reference to “amendment” throughout the General Permit.<sup>135</sup> Of particular concern, DWR proposes to eliminate the requirement to document, date, and include these “amendments” as part of the AWMP on file at the facility. This arguably could be interpreted to suggest that no documentation of change to an animal waste management plan is required unless the change rises to the level of a “revision” by constituting a “change to an entire [AWMP].”<sup>136</sup> We believe, however, it is important for the permittee to report any change or addition to the plan that will

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<sup>133</sup> Draft General Permit, *supra* note 112, Condition I.4.

<sup>134</sup> DEQ, *Annual Report on Animal Waste Operations Permitting, Inspection and Compliance Activities July 1, 2016 through June 30, 2017* tbl. 4 (2017), <https://www.ncleg.net/documentsites/committees/ERC/ERC%20Reports%20Received/2017/Dept%20of%20Environmental%20Quality/2017-Oct%20Animal%20Feeding%20Ops%20Rpt.pdf> (showing 19.2 percent of the “total problems identified” pertained to departure from the cropping described in approved waste management plans).

<sup>135</sup> As a notable exception, the word “amendment” remains in the definition of “Revision” in Condition VIII.

<sup>136</sup> N.C. Env’tl Mgmt. Comm’n Dep’t of Env’t and Nat. Res. Swine Waste Management System General Permit No. AWG100000 § VII (2014), <https://files.nc.gov/ncdeq/Water%20Quality/Aquifer%20Protection/AFO/Permits/AWG100000%20Signed%203-7-2014.pdf> (defining “revision”).

impact the operation’s ability to adhere to current applicable standards.<sup>137</sup> This is another reason to retain the definition of amendment.

Moreover, we are sympathetic to the concerns expressed by permittees that by removing the “amendment” option the General Permit may deprive them of necessary flexibility to make urgent changes in response to emergencies, weather events, or other conditions on-site. Under the current permit, any “major change” requires DWR review and approval, along with reissuance of a new or amended Certificate of Coverage, before the change can be made.<sup>138</sup> In contrast, a “revision” must be submitted “within 30 days” and does not require recertification.<sup>139</sup> However, the permit is silent as to what, if any, review DWR conducts of amendments. We recommend that amendments must be certified by a technical specialist and submitted to DWR, but need not be approved by the Agency prior to implementation. This approach would afford permittee flexibility without sacrificing transparency.

v. *Clarify operational and recordkeeping requirements in anticipation of a hurricane*

Conditions II.29 and II.23 both address operations before major storm events. Condition II.23 prohibits land application of waste in advance of an imminent storm. Condition II.29 allows operators to lower lagoon levels “to provide for additional temporary storage for excessive rainfall during the hurricane season.” We recommend that DWR clarify that pumping to provide for additional storage cannot occur more than 4 hours after the issuance of a watch or warning identified in Condition II.23.

We recognize that NRCS Standard No. 359 allows an operator to lower lagoon levels a maximum of 8 inches below the facility’s stop pump mark “during the period of June 15 through October 31,”<sup>140</sup> which overlaps with hurricane season. We are concerned that the draft General Permit only requires such compliance “prior to lowering lagoon levels below designed stop pump levels.” The General Permit should make clear that operators must comply with monitoring and recordkeeping requirements in NRCS NC Standard No. 359 that apply after initial pump down.<sup>141</sup>

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<sup>137</sup> See *id.* § VII (defining “amendment”).

<sup>138</sup> *Id.* (defining “major change”).

<sup>139</sup> *Id.* §§ I.4, VII.

<sup>140</sup> See NRCS, NC, Conservation Practice Standard No. 359, *Waste Treatment Lagoon 15* (Feb. 2009), <https://efotg.sc.egov.usda.gov/references/public/NC/NC359WTLFeb09.pdf>.

<sup>141</sup> See *id.* (requiring creation and maintenance of records detailing when the lagoon was “first pumped below the stop pump level,” the “date the pump down was completed,” and weekly measurements of the “depth of pump down below the stop pump level .. until the lagoon returns to the stop pump level.”).

d. DWR should require the use of the North Carolina Phosphorus Loss Assessment Tool (PLAT) for all operators

DWR proposed the mandatory use of the North Carolina Phosphorus Assessment Tool (“PLAT”) under limited circumstances in Condition I.9 of the draft General Permit. We fully endorse the required use of PLAT. However, we strongly recommend that DWR require that *all* permittees run PLAT in order to effectively protect water quality from excess nutrient pollution from hog operations.

Nutrients such as nitrogen and phosphorus influence plant growth in terrestrial and aquatic systems. Phosphorus is the nutrient most frequently responsible for eutrophication, however, and excess phosphorus loading leads to algae blooms, stimulates bacterial growth, increases biological oxygen demand, and alters aquatic community structure.<sup>142</sup> The buildup of phosphorus in agricultural soils and associated risk of off-field phosphorus loss is a major factor contributing to decreased water quality in North Carolina. Fortunately, a state-specific tool was developed, at significant taxpayer expense, to evaluate the risk of phosphorus loss and inform nutrient management strategies to better protect our waters.

PLAT evaluates phosphorus loss by evaluating particulate and dissolved phosphorus applied to soils and factoring in phosphorus losses through erosion, surface runoff, and subsurface drainage. The tool estimates total phosphorus loss and converts estimated values to an index used to rate the potential for edge-of-field phosphorus loss. When that risk is “high,” PLAT suggests phosphorus-based nutrient management; when it is “very high,” PLAT suggests no additional phosphorus applications.<sup>143</sup> Soil testing for phosphorus is an important, but incomplete, measure of the risk of phosphorus loss.<sup>144</sup> However, as PLAT recognizes, the risk of phosphorus loss is a function of the phosphorus content in the waste and the susceptibility of receiving soils to erosion, runoff, and leaching. DWR should not ignore these other factors by

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<sup>142</sup> L.B. Cahoon & S. H Ensign, *Spatial and temporal variability in excessive soil phosphorus levels in eastern North Carolina*, 69 *Nutrient Cycling in Agroecosystems*, Issue 2, 111 (June 2004).

<sup>143</sup> The current General Permit, which contemplates DWR’s authority to require permittees to run PLAT, recognizes these nutrient-management consequences when the PLAT index identifies an unreasonable risk of nutrient loss through N-based nutrient management.

<sup>144</sup> Johnson *et al.*, *Predicted Impact and Evaluation of North Carolina’s Phosphorus Indexing Tool*, 34 *JOURNAL OF ENV’T’L QUALITY*, vol. 5, at 1801 (Sept./Oct. 2005) (noting that soil test P is one factor informing the risk posed to surrounding waters, as it relates to the amount of dissolved P in leachate, particulate P transported through erosion, and dissolved P found in runoff); *See Soil Facts: The North Carolina Phosphorus Loss Assessment Tool (PLAT)*, N.C. COOP. EXTENSION, <https://content.ces.ncsu.edu/the-north-carolina-phosphorus-loss-assessment-tool-plat> (last visited Dec. 20, 2018). (observing that soils with higher P accumulation will have more P in eroded particles and higher dissolved P values in runoff or leachate); L.B. Cahoon & S. H Ensign, *Spatial and temporal variability in excessive soil phosphorus levels in eastern North Carolina*, 69 *NUTRIENT CYCLING IN AGROECOSYSTEMS*, Issue 2, 111, 112 (June 2004) (“Although other factors, including distance from water, precipitation/irrigation duration and intensity, water table depth, soil type, phosphorus sorption capacity, slope, tillage, phosphorus application rate and form, and plant cover, affect phosphorus export, the concentration of soil phosphorus in excess of plant needs usually determines the potential for phosphorus export.”) (citations omitted).

exclusively considering one variable—soil phosphorus levels—when evaluating the risk of phosphorus loss.<sup>145</sup>

Using PLAT to inform nutrient management is nothing new. In 2003, EPA revised regulations for concentrated animal feeding operations and required National Pollution Discharge Elimination System permittees to develop and implement nutrient management plans that include “site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process wastewater.”<sup>146</sup> North Carolina chose to use a P-index methodology to evaluate phosphorus loss and ultimately developed PLAT as a site-specific index “because both the agronomic soil test and environmental threshold approaches were too strict and not scientifically defensible.”<sup>147,148</sup> In short, experts in North Carolina have already rejected exclusive reliance on soil testing to evaluate risk of phosphorus loss.

Indeed, more than a decade ago, researchers opined that PLAT would be particularly informative for nutrient management in the coastal plain. In 2005, a team of researchers sampled agricultural fields in all 100 counties in an effort to predict which types of operations would need to adjust management practices based on the identified risk of phosphorus loss.<sup>149</sup> The researchers noted the coarse-textured soils, higher water tables, and more poorly drained soils in the coastal plain and observed that these characteristics, coupled with the intensity of hog production, increase the threat of phosphorus loss.<sup>150</sup> For example, over half of the fields sampled in Duplin County were predicted to pose a “high” or “very high” risk of phosphorus loss on the PLAT index.<sup>151</sup>

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<sup>145</sup> See *Soil Facts: The North Carolina Phosphorus Loss Assessment Tool (PLAT)*, N.C. COOP. EXTENSION, <https://content.ces.ncsu.edu/the-north-carolina-phosphorus-loss-assessment-tool-plat> (last visited Dec. 20, 2018).

<sup>146</sup> See 40 C.F.R. § 122.42(e). Additional requirements apply for large swine CAFOs regulated under 40 C.F.R. pt. 412 subpt. D. See 40 C.F.R. § 412.4. According to EPA, development of a site-specific nutrient-management plan is critical to ensure an animal feeding operation is land applying waste “in a manner that ensures the appropriate agricultural utilization of nutrients and, as a result, is not illegally discharging pollutants from land application areas.” 71 Fed. Reg. 37,744, 37,750 (June 30, 2006), <https://www.epa.gov/sites/production/files/2015-10/documents/epa-hq-ow-2005-0037-0001.pdf>. The 2003 rule change motivated a revision to NRCS Standard 590, which in turn required an evaluation of P-loss potential for many agricultural operations.

<sup>147</sup> See *supra* note 144.

<sup>148</sup> Many states chose to develop and implement a P index similar to PLAT. Individual states often modify the basic indexing concept to consider factors such as soil types, or physiographic and hydrologic factors informing the risk of P loss.

<sup>149</sup> See Johnson, *supra* note 144, at 1801.

<sup>150</sup> *Id.* at 1807; see also *id.* at 1809 (“Based on PLAT estimations, fields in the Coastal Plain represent a markedly higher risk of P loss from soil to water, and animal producers are more likely to be forced to adjust their management practices to comply with federal and state regulations.”).

<sup>151</sup> *Id.* at 1807.

The General Permit has long contemplated the use of PLAT to inform nutrient management, particularly in nutrient sensitive watersheds.<sup>152</sup> However, to date, DWR has not required many state permittees to conduct this evaluation. This deprives the Agency and permittees of useful information about the risk of additional nutrient loading from land application, prevents the Agency from ensuring permits allowing only land application at agronomic rates, and impedes public understanding of the relationship between permitted operations and water quality. We believe all permittees should run PLAT, and manage nutrients in a way that is informed by this analysis. We object to DWR’s proposal to limit its use this tool only for “fields with a soil analysis P-index of 400 or higher.”<sup>153</sup>

At minimum, DWR should set the numeric soil test P-threshold at a level that more reasonably approximates the threshold beyond which additional land application of phosphorus serves no agronomic benefit. After all, by rule, permits must be designed to ensure that “waste shall not be applied at greater than agronomic rates.”<sup>154</sup> Moreover the “agricultural stormwater” exemption from the definition of “point source” under the Clean Water Act only applies where waste is applied in accordance with nutrient management practices that ensure “appropriate agricultural utilization” of the waste.<sup>155</sup>

North Carolina Department of Agriculture & Consumer Services guidance supports this recommendation: when soil test phosphorus index is above 50, “crop response to fertilization is not generally expected” and when “soil-test indices are above 100, no fertilization is recommended, except for especially high value crops.”<sup>156</sup> The coastal plain is highly susceptible to over application of phosphorus. The N.C. Cooperative Extension notes that because “[m]uch of the land in the coastal plain has high P levels already and there may be no yield response from

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<sup>152</sup> The current permit states, “Facilities located in watersheds sensitive to nutrient management may be notified by the Division to conduct an evaluation of the facility and its CAWMP to determine the facility’s ability to comply with the NRCS nutrient management standard as it relates to phosphorus.” DWR, Permit No. AWG100000 § I.5 (2014). The same provision states, “For facilities located in watersheds sensitive to nutrient enrichment, all fields with a “HIGH” phosphorus-loss assessment rating shall have land application rates that do not exceed the established crop removal rate for phosphorus. There shall be no waste application on fields with a “VERY HIGH” phosphorus-loss assessment rating. “ *Id.*

<sup>153</sup> Draft General Permit, *supra* note 112, at Condition I.9.

<sup>154</sup> 15A N.C. Admin. Code 02T .1304(b)(3); 15A N.C. Admin. Code 02T .0103(1) (defining “agronomic rate” as “the amount of waste and other materials applied to soil to meet the nitrogen needs of the crop, but does not overload the soil with nutrients or other constituents that cause or contribute to a contravention of surface water or groundwater standards, limit crop growth, or adversely impact soil quality.”). *See also* N.C. Gen. Stat. § 143-215.10C(e)(6) (permitting either phosphorus or nitrogen to be “a rate-determining element” in an animal-waste-management plan).

<sup>155</sup> *See Waterkeeper Alliance v. EPA*, 399 F.3d 486, 508-09 (2d Cir. 2005) (upholding EPA’s regulatory implementation of the agricultural stormwater exemption from the definition of point source in 33 U.S.C. § 1362(14)).

<sup>156</sup> Hardy *et al.*, NCDA Agronomic Div., *Understanding the Soil Test Report* (Oct. 2013), <https://www.ncagr.gov/agronomi/pdffiles/ustr.pdf>.

a P application,” phosphorus should be applied to bermuda grass only “if indicated by a soil test.”<sup>157</sup> Given this, it is unclear why DWR sets a P-index of 400 as a trigger for PLAT.

In short, a tool developed specifically to protect North Carolina water quality from phosphorus loss could, if used by all permittees, substantially mitigate the risk of water pollution from hog operations throughout eastern North Carolina. The General Permit should require all permittees use PLAT.

e. DWR should require regular submission of records, not merely an annual summary

DWR does not require permittees to submit most records to the Agency, which impedes its ability to adequately enforce General Permit requirements, fails to ensure accountability for the industry, and prevents the public from accessing critical information about hog operations in the State. While copies of all records required by the General Permit must be maintained and “readily available” at the facility, the absence of a record submission requirement in the General Permit prevents these records from becoming public records. We recommend that DWR require the submission of additional records to the Agency as part of the General Permit.

Records submitted to DWR become public records unless they constitute confidential information under the North Carolina Public Records Act.<sup>158</sup> By law, records “made or received pursuant to law or ordinance in connection with the transaction of public business by any agency of North Carolina government or its subdivisions” are public records that must, upon request, be made available by the Agency for public inspection or reproduction.<sup>159</sup> Currently, however, DWR allows permittees to shield critical information from public scrutiny by allowing permittees to keep records on-site, rather than requiring submission to the Agency. DWR typically only reviews facility records during a brief annual inspections. The Agency has the authority to demand the submission of records from an individual operation, however, this is rarely done absent a facility-specific investigation. If the investigation arose from a citizen complaint, even records submitted to the Agency remain confidential under the public records law. This practice shrouds hog operations in secrecy and prevents use of relevant records in public education or research. It also limits DWR consideration of data about hog operations in between annual inspections and DWR’s understanding of the impacts of these facilities on water quality.

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<sup>157</sup> *Bermudagrass Production in North Carolina*, N.C. COOP. EXTENSION, 9 (2014), <https://duplin.ces.ncsu.edu/wp-content/uploads/2014/05/AgBermudagrassAG-493.pdf?fwd=no>.

<sup>158</sup> The current permit states, in Condition III.11, “Once received by the Division, all such information and reports become public information, unless they constitute confidential information under G.S. § 132-1.2, and shall be made available to the public by the Division as specified in Chapter 132 of the General Statutes.”

<sup>159</sup> N.C. Gen. Stat. § 132-1 (defining “public records”); *id.* § 132-6 (stating agency obligations in response to a public records request).

Rather than requiring only the submission of the annual certification form, Attachment A, which would be required by the proposed amendment to Condition III. 15, we recommend requiring monthly submission of records required by the General Permit, including but not limited to the following, all of which are required under Condition III.12: soil and waste analyses; rain gauge readings; freeboard levels; irrigation and land application events; stocking records; records of removal of nutrients; and records of additional nutrient application, where applicable. First, we see no reason to impose on permittees the requirement to create an entirely new and duplicative record, as proposed by Condition III.15. The utility of Attachment A is limited because its submission is required only once per year and the information requested is not detailed enough to provide a full picture of on-site operations. Second, monthly submission of the information in Condition III.12 would be more valuable to the Agency and the public given considerable seasonal variation in activity on hog operations.

DWR proposes amendments to Condition II.10 regarding mortality management, including a new requirement to maintain daily records of mortalities, disposal methods, and disposal location. DWR should require that operators clarify how mortality management is considered when developing site-specific AWMPs. In addition, DWR should require monthly submission of mortality information to the Agency to accompany the information required under Condition III.12.

To make the data easier for the Agency to review, store, and provide to the public, we suggest requiring electronic submission of these records.<sup>160</sup> We would support notice of this electronic submission requirement and a transition period prior to its effective date. This approach would be similar to that required of National Pollution Discharge Elimination System permittees in the transition to electronic submission requirements for various records. EPA announced this new requirement in 2015, but allowed time before it went into effect.<sup>161</sup> The transition period would allow permittees to adjust to the new requirement, overcome any technical difficulties, and benefit from ongoing efforts to improve internet connectivity in rural communities. In addition, it would allow permittees to reduce duplication of effort when collecting and compiling records.

- f. DWR should make additional amendments to the draft General Permit that address environmental performance standards, covered lagoons, and climate change

It is imperative that DWR clarify that the General Permit does not allow the installation of anaerobic digesters or covers over lagoons without additional permits from the Agency. As

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<sup>160</sup> CAFOs operating under an NPDES permit will be required to submit annual program reports electronically by December 21, 2020. 40 C.F.R. § 127.16(a).

<sup>161</sup> See 80 Fed. Reg. 64,063 (Oct. 22, 2015); 40 C.F.R. § 127.16 (addressing implementation of electronic reporting requirements).

amended, N.C. Gen. Stat. § 143-215.10I prohibits issuing or modifying permits to include digesters or covered lagoons.

The North Carolina legislature has worked to carefully restrict the impact of anaerobic lagoons from swine farms on the environment. “Anaerobic lagoon” is defined by statute as “a lagoon that treats waste by converting it into carbon dioxide, methane, ammonia, and other gaseous compounds; organic acids; and cell tissue through an anaerobic process.”<sup>162</sup> This statutory definition includes not just open-air lagoons, but covered lagoons and digesters as well.

North Carolina law prohibits issuing or modifying a permit to “authorize the construction, operation, or expansion of an animal waste management system that serves a swine farm that employs an anaerobic lagoon as the primary method of treatment and land application of waste by means of a sprayfield as the primary method of waste disposal.”<sup>163</sup> There are only two exceptions to this general rule. Operators can continue to operate under existing permits, or existing swine farm permits can be modified to replace lagoons. Under the first exception, it is the permit which is grandfathered, not the farm. In the second exception, the modification is allowed to completely replace a failing lagoon.<sup>164</sup> The exceptions to the moratorium as applied to anaerobic lagoons are limited to those two circumstances: an operator may renew its existing permit for its existing system, or an operator may modify its permit to accommodate a lagoon replacement under the specified criteria. Neither a digester nor a covered lagoon fits either exception. Adding a digester or a lagoon cover to an existing farm can *only* be permitted if the system meets the performance standards for animal waste management systems established in 1998 and made permanent in 2007. The General Permit and the processes it contemplates for amendments cannot authorize system changes which are prohibited by the moratorium.

This issue is especially relevant now, as Smithfield Foods recently announced plans to install covered lagoons that would generate more biogas – and more revenue—for the industry.<sup>165</sup>

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<sup>162</sup> N.C. Gen. Stat. § 143-215.10I(a)(1).

<sup>163</sup> N.C. Gen. Stat. § 143-215.10I(b).

<sup>164</sup> The first exception reads: “An animal waste management system that serves a swine farm for which a permit was issued prior to 1 September 2007 and that does not meet the requirements of G.S. 143-215.10I, as enacted by subsection (a) of this section, may continue to operate under, and shall operate in compliance with, that permit, including any renewal of the permit.” N.C. Sess. Laws 2007-523 Section 1(b)(2007). The second exception reads: “Notwithstanding G.S. 143-215.10I, as enacted by subsection (a) of this section, the Environmental Management Commission may modify a permit that was initially issued prior to 1 September 2007 for an animal waste management system that serves a swine farm to authorize the replacement of a lagoon that is a component of the animal waste management system if the Commission finds all of the following.” *See* N.C. Sess. Laws 2007-523 Section 1(c)(2007).

<sup>165</sup> *See* Greg Barnes, *Smithfield announces plans to cover hog lagoons*, N.C. HEALTH NEWS (Oct. 29, 2018) <https://www.northcarolinahealthnews.org/2018/10/29/smithfield-announces-plans-to-cover-hog-lagoons-produce-renewable-energy/>.

The North Carolina Renewable Energy Portfolio Standards in 2007 included a requirement that utilities in the State generate 0.2 percent of electricity from swine waste. Since that time, utilities, renewable energy developers, farmers, and universities have invested time and resources into expanding swine waste-to-energy capacity. Swine waste biogas production is an *incomplete* solution to the problems of hog waste management in eastern North Carolina. Swine waste biogas systems are largely independent of the statutory performance criteria in G.S. § 143-215.10I. It is entirely possible, and much less expensive, to develop biogas systems without any environmentally beneficial technology. The predominant biogas technology—anaerobic digesters—rely on the primitive lagoon and sprayfield system, which leads to extensive air and water pollution, odors, and other public health impacts.

While anaerobic digesters capture methane, they also produce methane at higher rates than uncovered swine waste lagoons.<sup>166</sup> Any methane leakage from a digester might rapidly diminish any associated climate benefits.<sup>167</sup>

In addition, the reduction in airborne pollution achieved by anaerobic digestion may be offset by other sources of pollution on the farm. Airborne pollutants can be emitted from three primary sources: buildings housing hogs; waste storage lagoons; and cropland sprayed with hog waste.<sup>168</sup> While calculating the emissions from these various sources is difficult,<sup>169</sup> scientists studying odor on North Carolina hog farms noted “under the conditions measured and modeled the swine housing plays a dominant role in odor downwind.”<sup>170</sup> Therefore, although anaerobic digestion can reduce some odors associated with land application,<sup>171</sup> and effectively eliminate

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<sup>166</sup> Darmawan Prasodjo *et al.*, *Spatial-Economic Optimization Study of Swine Waste-Derived Biogas Infrastructure Design in North Carolina*, NICHOLAS INST. ENV'T & POLICY SOLUTIONS, A-34 (2013).

<sup>167</sup> Researchers have calculated that “any leakage rate above about 1% of gross production negates the advantages of [using methane versus coal] with respect to mitigating climate change,” primarily due to the higher global warming potential of methane. William H. Schlesinger, *Natural Gas or Coal: It's All About the Leak Rate*, NATURE.ORG, June 24, 2016, <https://blog.nature.org/science/2016/06/24/natural-gas-coal-leak-rate-energy-climate>. Some studies have documented leakage rates as high as 3.1 percent from the anaerobic digester alone before any additional leakage associated with transport and storage. *See, e.g.*, Thomas K. Flesch, Raymond L. Desjardins, & Devon Worth, *Fugitive Methane Emissions from an Agricultural Biodigester*, 35 BIOMASS & BIOENERGY 3927, 3927 (2011).

<sup>168</sup> Kenneth D. Casey *et al.*, *Air Quality and Emissions from Livestock and Poultry Production/Waste Management Systems*, ANIMAL AGRICULTURE AND THE ENVIRONMENT 1, 1–2 (2006), <http://www.abe.iastate.edu/adl/files/2011/10//Air-Quality-White-Paper.pdf> (also noting that emissions can come from many sources, including “barns, feedlot surfaces, manure storage and treatment units, silage piles, dead animal compost structures, manure applied cropland, and a variety of other smaller emissions sources”).

<sup>169</sup> *Id.* at 2.

<sup>170</sup> Susan Schiffman and Breverick Graham, *Comparison of Odor Dispersion at Swine Facilities and a Waste Processing Center Using a Eulerian-Lagrangian Model*, DUKE UNIV. MEDICAL CENTER 29, [https://projects.ncsu.edu/cals/waste\\_mgt/smithfield\\_projects/phase1report04/A.10odor.pdf](https://projects.ncsu.edu/cals/waste_mgt/smithfield_projects/phase1report04/A.10odor.pdf) at 29.

<sup>171</sup> M.N. Hansen, P. Kai, H.B. Moller, *Effects of Anaerobic Digestion and Separation of Pig Slurry on Odor Emission*, 22(1) APPLIED ENG'G IN AGRIC. 135, 138–39 (2006).

smells emanating from waste lagoons,<sup>172</sup> biogas systems alone cannot completely address noxious odors inherent in hog waste management. Moreover, biogas production actually *increases* ammonia production,<sup>173</sup> which can cause detrimental environmental and public health effects.<sup>174</sup>

Biogas water quality benefits may also be illusory. Because anaerobic digestion can make nutrients more readily available for plants,<sup>175</sup> less digestate effluent will be needed to adequately fertilize crops. Whenever nitrogen is over-applied to soil, nitrate leaching into the water supply can result,<sup>176</sup> contaminating downstream or down-gradient waters and lead to eutrophication. Because biogas does not reduce the nutrient content of digestate—the same amount of nitrogen and phosphorus is present after digestion—if farmers continue to apply digestate as a fertilizer to agricultural fields (often in amounts that exceed the ability of the soil and plants to uptake these nutrients), it is difficult to see how any significant water quality benefits can be achieved with biogas production alone.

Finally, biogas production on its own also does not address many of the underlying structural issues that lead to environmental and public health problems. For example, covered lagoons are just as vulnerable to bursting, flooding, and leaking as uncovered lagoons. Large amounts of water are still required to supply waste management operations, and sprayfield systems will continue to be used in the absence of stringent management regulations. Any proposed modification to an animal waste management system—including the installation of lagoon covers—must require approval from the Agency prior to construction. Approval must not be granted by DWR when such a modification is contrary to law and threatens to exacerbate the threat of pollution caused by the continued operation of the lagoon and sprayfield system.<sup>177</sup>

g. The draft General Permit fails to account for increasingly intense and frequent weather events

While we cannot control the weather, we can control how we plan for and respond to major weather events. The draft General Permit falls far short in responding to increasingly

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<sup>172</sup> John P. Chastain, *Covers: A Method to Reduce Odor from Manure Storages* 1, CLEMSON COOP. EXTENSION (Feb. 2008), [https://www.clemson.edu/extension/camm/manuals/publications/manure\\_storage\\_covers.pdf/](https://www.clemson.edu/extension/camm/manuals/publications/manure_storage_covers.pdf/).

<sup>173</sup> L.A. Harper et al., *The Effect of Biofuel Production on Swine Farm Methane and Ammonia Emissions*, 39(6) J. ENV'T QUALITY 1984, 1984 (2010).

<sup>174</sup> See Robbin Marks, *Cesspools of Shame: How Factory Farm Lagoons and Sprayfields Threaten Environmental and Public Health*, NAT. RES. DEF. COUNCIL 4 (2001), <https://www.nrdc.org/sites/default/files/cesspools.pdf>.

<sup>175</sup> Joe H. Harrison et al., *Transformation and Agronomic Use of Nutrients from Digester Effluent*, EXTENSION.ORG (May 17, 2013), <http://articles.extension.org/pages/67900/transformation-and-agronomic-use-of-nutrients-from-digester-effluent>.

<sup>176</sup> *Id.*

<sup>177</sup> See Draft General Permit, *supra* note 112, at Condition V.8.

frequent and intense rain events across eastern North Carolina or the best available research on floodplain planning and resiliency. Floodplain lines were not drawn by nature-- storms do not follow these restrictions. The draft General Permit continues to support the use of a lagoon and sprayfield system for waste management, which risks North Carolina's waterways and public health by allowing waste to be stored in open-air, unlined pits. The risk to waterways and nearby communities is compounded by the fact that the design criteria mandated by the draft permit is outdated and inconsistent with the best available research. We recommend updating the 25-year, 24-hour storm design criteria to reflect the best available science and to adjust restrictions on construction in the floodplain to reflect the most up-to-date floodplain mapping information. We acknowledge that the North Carolina legislature may need to amend statutory provisions in order to effectuate the recommendations included in this section. We encourage DWR to advocate for an update to the 25-year, 24-hour storm design criteria and floodplain maps that reflect the best available science.

NRCS has long observed that "to minimize the potential for contamination of streams, lagoons should be located outside of floodplains."<sup>178</sup> Years ago, our legislature acknowledged the risk of industrial livestock production and waste management in the floodplain and prohibited construction of new animal waste management systems in the 100-year floodplain.<sup>179</sup> However, then-existing facilities were exempt from the siting requirements. Today, within the 47 counties in the coastal plain, 62 industrial hog operations house more than 235,000 hogs in the 100-yr floodplain.<sup>180</sup> These animals produce more than 201 million gallons of wet waste each year.<sup>181</sup> There are 166 lagoons within the 100-yr floodplain and another 366 located within 100 feet of the floodplain.<sup>182</sup> In light of climate change, these facilities are increasingly vulnerable to flooding during severe weather events.

According to the National Climate Assessment published this fall:

Extreme rainfall events have increased in frequency and intensity in the Southeast, and there is high confidence they will continue to increase in the future. The region, as a whole, has experienced increases in the number of days with more than 3 inches of precipitation and a 16 percent increase in observed 5-year maximum daily precipitation (the amount falling in an event expected to

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<sup>178</sup> See NRCS, NC, Conservation Practice Standard No. 359, *Waste Treatment Lagoon* 15 (Feb. 2009), <https://efotg.sc.egov.usda.gov/references/public/NC/NC359WTLFeb09.pdf>.

<sup>179</sup> See N.C. Gen. Stat. § 106-802(a2) ("No component of a liquid animal waste management system for which a permit is required under Part 1 or 1A of Article 21 of Chapter 143 of the General Statutes, other than a land application site, shall be constructed on land that is located within the 100-year floodplain.").

<sup>180</sup> Soren Rundquist, *Exposing Fields of Filth*, ENVT'L WORKING GROUP (Nov. 4, 2016), <https://www.ewg.org/research/exposing-fields-filth-hurricane-matthew>.

<sup>181</sup> *Id.*

<sup>182</sup> *Id.*

occur only once every 5 years). Both the frequency and severity of extreme precipitation events are projected to continue increasing in the region under both lower and higher scenarios (RCP4.5 and RCP8.5). By the end of the century under a higher scenario (RCP8.5), projections indicate approximately double the number of heavy rainfall events (2-day precipitation events with a 5-year return period) and a 21 percent increase in the amount of rain falling on the heaviest precipitation days (days with a 20-year return period). These projected increases would directly affect the vulnerability of the Southeast's coastal and low-lying areas.<sup>183</sup>

Condition I.1 of the draft General Permit requires that facilities be “designed, constructed, operated, and maintained to contain all waste plus the runoff from a 25-year, 24-hour rainfall event for the location of the facility” and shields facilities from liability if the facility discharges waste into surface waters “that results because of a storm event more severe than the 25-year, 24-hour storm.”<sup>184</sup> Condition I.8 prohibits the construction of “collection, treatment or storage facilities” in the 100-year floodplain.<sup>185</sup> DWR did not propose changes to these provisions of the permit.<sup>186</sup>

The concept of the “25-year” storm is deceptive, as rainfall of this magnitude can happen far more often than once every 25 years. A 25-year storm has 1 in 25, or 2.5 percent, chance of occurring in a given year, and such a storm in one year does not prevent another from hitting in even a few months. The statistical definition of 100-year storms and flooding in North Carolina has not been updated since 2006 and only includes data through December 2000.<sup>187</sup> This means the large storms seen across the State in the past eighteen years are not factored into today's floodplain maps and rainfall probabilities. Floodplain lines and rainfall recurrence intervals for all storms are based on statistics in the NOAA Atlas 14 analysis, and an update to this report has not been scheduled.

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<sup>183</sup> U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, Ch. 19 (2018), doi: 10.7930/NCA4.2018; see also *Global Warming and Hurricanes*, Geophysical Fluid Dynamics Laboratory (June 2018), <https://www.gfdl.noaa.gov/global-warming-and-hurricanes/>; *Fourth National Climate Assessment*, U.S. Global Change Research Program (2018), <https://nca2018.globalchange.gov/chapter/19/>.

<sup>184</sup> See N.C. Gen. Stat. § 143-215.10C.

<sup>185</sup> See N.C. Gen. Stat. § 106-803(a2).

<sup>186</sup> Condition I.13, *supra* note 112, of the draft General Permit allows dry swine lots in wetlands “as long as the wetlands uses are not removed or degraded as a result of the swine.” The protection of wetlands is critical to improving climate resiliency in the coastal plain region; DWR should prohibit any activity that would impact wetlands.

<sup>187</sup> See *Precipitation-Frequency Atlas of the United States*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (2006), [http://www.nws.noaa.gov/oh/hdsc/PF\\_documents/Atlas14\\_Volume2.pdf](http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas14_Volume2.pdf).

A 2018 update to Texas' NOAA Atlas 14 numbers found that Houston's rainfall probabilities had been underestimated by three inches for the 100-year, 24 -hour storm.<sup>188</sup> Although Texas was previously relying on numbers even more outdated than North Carolina's, large rain events since 2002 drove the upward shift in their numbers.<sup>189</sup> Events previously classified as 100-year storms are now classified as 25-year events under the new Texas analysis.

Until an update to North Carolina's rainfall statistics is conducted, the current probable 25-year storm should not be considered a reliable standard. Adopting a larger storm event for the hog operations design criteria would better prepare these facilities to withstand extreme rainfall, which is becoming more and more common. This could be achieved by adopting the 1,000-year, 24-hour storm as the waste lagoon design-storm standard.<sup>190</sup> Making the waste systems more resilient by adopting the 1,000-year, 24-hour storm as the standard would increase the lagoon capacity requirements from an average of 7.36 inches of rainfall to an average 16.2 inches of rainfall, as noted in Table 2 below. This additional capacity could help prevent lagoon overflows and breaches experienced in previous storms.

Hurricane Florence greatly exceeded the rainfall expected from a 1,000-year storm event in parts of the State. For example, the amount of rain dropped on Elizabethtown, Bladen County over 72 hours during Hurricane Florence does not even register on the NOAA Atlas 14 storm rainfall probabilities for North Carolina.<sup>191</sup> The most rainfall expected in Elizabethtown from a 1,000-year event over three days is 17.6 inches, and the scale does not go any further. Hurricane Florence poured just shy of *36 inches* on the town.

More conservative options would guard impacts extreme storms, though any increase from the current design standard would improve the long-term resilience of these systems.

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<sup>188</sup> See NOAA updates Texas Frequency Values, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Sept. 27, 2018) <https://www.noaa.gov/media-release/noaa-updates-texas-rainfall-frequency-values>.

<sup>189</sup> See Mihir Zaveri, NOAA study finds Houston's 100-year floods have been underestimated, Houston Chronicle (Nov. 27, 2017) <https://www.houstonchronicle.com/news/politics/houston/article/NOAA-study-could-redefine-100-year-storm-for-12387348.php>.

<sup>190</sup> Hurricane effects can last in an area for hours or days, depending on several factors, including storm speed, so 24 hours covers a substantial amount of probable rainfall risk while remaining consistent with the previous design standard time frame. See Table 2 for probable 1000-year storm rainfall totals in eastern North Carolina.

<sup>191</sup> Hurricane Florence, 13-18 September 2018: Annual Exceedance Probabilities (AEPs) for the Worst Case 72-hour Rainfall, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Sept. 19, 2018), [ftp://hdsc.nws.noaa.gov/pub/hdsc/data/aep/201809\\_Florence/201809\\_Florence\\_72h.pdf](ftp://hdsc.nws.noaa.gov/pub/hdsc/data/aep/201809_Florence/201809_Florence_72h.pdf).

**Table 1.** 24-hour rainfall totals (inches) for probable storms in North Carolina coastal plain localities chosen for high density of nearby hog CAFOs.<sup>192</sup>

	<b>25-year</b>	<b>100-year</b>	<b>500-year</b>
<b>Clinton, NC</b>	7.27	9.95	14
<b>Goldsboro, NC</b>	7.24	9.66	14.1
<b>Elizabethtown, NC</b>	7.21	9.85	13.8
<b>Willard, NC</b>	8.1	11.2	16
<b>Greenville, NC</b>	7.23	9.84	13.7
<b>Roper, NC</b>	7.68	10.3	14.1
<b>Lewiston, NC</b>	6.83	9.27	12.9

**Table 2.** Probable 1,000-year storm rainfall totals (inches) in North Carolina coastal plain localities.<sup>193</sup>

	<b>1,000-year, 12 hours</b>	<b>1,000 year, 24 hours</b>
<b>Clinton, NC</b>	13.4	16.1
<b>Goldsboro, NC</b>	12.7	16.3
<b>Elizabethtown, NC</b>	13.5	15.9
<b>Willard, NC</b>	15.3	18.6
<b>Greenville, NC</b>	12.7	15.7
<b>Roper, NC</b>	13.5	16.1
<b>Lewiston, NC</b>	11.8	14.7

Notably, immediately before and during a weather-related emergency, DWR can be pulled in many directions. While the Agency is understaffed year-round, the lack of capacity is particularly problematic during weather emergencies. After all, the Agency oversees numerous other operations, including permitted dischargers, and must be responsive to needs as they arise. Staff capacity, in addition to safety and access concerns, can limit the Agency’s ability to respond to emergencies, even when state resources are supplemented by federal assistance. The combination of heightened risk of adverse environmental impact and heightened demands on agency personnel underscores why the current permitting regime is not capable of protecting water quality when severe weather hits North Carolina.

h. Require the use of an equity tool for permitting decisions

Earlier this year, DEQ settled an administrative complaint filed under Title VI of the Civil Rights Act of 1964 and committed to a series of actions intended to meet the Agency’s

<sup>192</sup>See NOAA Atlas 14 Point Precipitation Frequency Estimates, NAT’L OCEANIC & ATMOSPHERIC ADMIN., [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html) (last visited Dec. 20, 2018).

<sup>193</sup> See *id.*

non-discrimination obligations. We do not believe DEQ can meet its obligations to mitigate the disparate racial impact of issuing this general permit without identifying, and ensuring more protection for, communities of concern. The aAgency is authorized to “conduct any inquiry or investigation it considers necessary before acting on an application.”<sup>194</sup> We urge DEQ to identify the areas of the State where additional mitigation of the impacts of operating a lagoon and sprayfield system is necessary to ensure equal treatment of North Carolinians. This should include considering the “cumulative effects”<sup>195</sup> of all permitted operations, including poultry operations “deemed permitted” by regulation, when making decisions regarding the issuance of certificates of coverage under the General Permit.

Adoption of more stringent permit standards across the board is an overdue step, but the Agency should more closely scrutinize applications for coverage under the General Permit and impose additional monitoring and performance requirements where necessary to track and mitigate disparate racial impacts.

i. Implement the violation points system, as required by statute

When the North Carolina legislature imposed the moratorium prompted by the Oceanview Farms disaster in 1997, it explicitly required creation of a graduated violation points system (“VPS”), which was intended to be fully developed by the EMC.<sup>196</sup> This statute remains in effect within an overall statutory framework that seeks to “achieve and to maintain . . . a total environment of superior quality.”<sup>197</sup> DEQ has the ultimate responsibility to “maintain, protect, and enhance” North Carolina’s water quality, and to preserve the public’s interest in water and air resources.<sup>198</sup> The North Carolina legislature required the creation of a VPS in 1997 in the spirit of these public policy goals, and DEQ must accordingly implement such a system. This is long overdue. The draft General Permit includes scant information regarding consequences for permit violations, and only references 15A N.C. Admin. Code 02T .0110 and 15A N.C. Admin. Code 02T .0108(b) as authority for penalizing violations of the General Permit.

The creation of a VPS would protect North Carolina’s water resources by requiring that DEQ hold serial violators accountable. Currently, DEQ may assess a civil penalty when a permit holder violates the conditions of its permit, and DEQ has the discretion to determine whether or not to revoke that permit.<sup>199</sup> However, this is not a sufficient enforcement mechanism.

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<sup>194</sup> N.C. Gen. Stat. § 143-215.10C(c).

<sup>195</sup> N.C. Gen. Stat. § 143-215.1(b)(2).

<sup>196</sup> 1997 N.C. Sess. Laws 458 (H.B. 515) at Part X. *See also* N.C. Gen. Stat. § 143-215.6E.

<sup>197</sup> N.C. Gen. Stat. § 143-211(a).

<sup>198</sup> *Id.* § 143-211(a), (b).

<sup>199</sup> N.C. Gen. Stat. § 143-215.6A; 15A N.C. Admin. Code 02T .0110.

The Environmental Management Commission is required to develop a VPS with specified point values for violations and a mechanism by which such violations could result in the mandatory revocation of a hog farm permit.<sup>200</sup> The statute grants the EMC discretion to assign point values to various violations and requires higher point values for “significant violations.” Significant violations can accrue in two ways. The first is when a permit violation results in great harm to North Carolina’s water quality, public health, or environment,<sup>201</sup> and this type of violation must receive the highest number of points.<sup>202</sup> The second is when a violation is committed willfully and intentionally<sup>203</sup>; in this instance, points are assigned based on the degree of negligence or willfulness.<sup>204</sup>

In addition to “significant violations,” the statute obligates the Environmental Management Commission to assign point values to “lesser violations” and dictates the number of points that can be accumulated before the permit is revoked. If within a time of not less than five years, a permit holder receives three significant violations, or a predetermined cumulative number of points from lesser violations, then the Environmental Management Commission *must* revoke the permit.<sup>205</sup>

The VPS contemplated by the statute preserves the Environmental Management Commission’s discretion to pursue particularly heinous actors: if one willful violation results in serious harm, then the regulator *may* revoke the permit, and the statute explicitly does not “alter the authority of the Commission to revoke a permit for an animal waste management system for a swine farm.”<sup>206</sup> This statutorily mandated VPS is less discretionary than the current penalty system so that DEQ and the Commission can adequately address the effect of serial violations on North Carolina’s environment. The requirement to hold polluters accountable will ensure that serial violations will not be allowed. DWR should encourage the Environmental Management Commission to move quickly to adopt and implement the VPS and incorporate this program into Condition VI of the General Permit.

j. DWR should modify the annual permit fee

The current annual inspection fee is inadequate to support the necessary review of all facilities covered under the General Permit. There are over 2,000 facilities covered under the

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<sup>200</sup> N.C. Gen. Stat. § 143-215.6E.

<sup>201</sup> *Id.* § 143-215.6E(1).

<sup>202</sup> *Id.*

<sup>203</sup> *Id.* § 143-215.6E(2).

<sup>204</sup> *Id.* § 143-215.6E(3).

<sup>205</sup> *Id.* § 143-215.6E(a)(4) (emphasis added).

<sup>206</sup> *Id.* § 143-215.6E(a)(5) (emphasis added); *id.* § 143-215.6E(a).

General Permit. The current annual permit fee starts at \$60 for a “small” animal operation.<sup>207</sup> This is the same fee as that of a single family residence that would require a NPDES permit.<sup>208</sup> A “small” animal operation is one with a design capacity between 38,500 and 100,000 pounds state steady live weight.<sup>209</sup> Without additional justification, it is reasonable to expect that inspection of a hog farm would require more staff time than inspection of a single family residence, and consequently warrant a larger annual fee. A fee increase would be a way for the regulated community to offset the aforementioned cuts to DWR’s budget.

“Medium” and “Large” sized hog facility annual permit fees are \$180 and \$360. These annual fees are far beneath those of fees for non-discharge minor permits, which are set at \$810 per year.

Seventeen states tie permitting fees to the cost of administering or supporting the state NPDES program.<sup>210</sup> The North Carolina statute on permit fee setting does not require that.<sup>211</sup> Our state permit fee setting scheme does not automatically adjust for inflation and the last fee adjustment occurred in 2007.<sup>212</sup> Forty percent of the programs permitting costs are covered by permit fees, and the remaining costs are funded through federal Clean Water Act funds and the state general fund.

DEQ should seek a legislative fix for setting fees for hog farms covered by the General Permit. By requiring permit fees more in line with the cost of administering and supporting the state program, DWR is better positioned to follow through on enforcement obligations and to assist growers in rectifying the circumstances that result in violations of the permit.

#### **IV. DWR must facilitate a meaningful stakeholder process when renewing the General Permit**

DWR is best-served by a meaningful and robust stakeholder process that invites input from *all* stakeholders impacted by the General Permit. We were pleased that DWR held a stakeholder meeting in Sampson County, one of the largest hog-producing counties in the State, and to see that DWR hired a facilitator to oversee the stakeholder engagement process. Generally speaking, the meeting was well-run and allowed in-depth discussions about all aspects

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<sup>207</sup> *NPDES Fees*, N.C. DEP’T OF ENV’T L QUALITY, <https://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/npdes-wastewater/fees> (last visited Dec. 20, 2018).

<sup>208</sup> *Id.*

<sup>209</sup> N.C. Gen. Stat. § 143-215.10G(a)(1).

<sup>210</sup> *Report on State NPDES Fee Permitting Program Structures*, ASS’N OF CLEAN WATER ADMINISTRATORS, 4 (June 2014) <https://www.acwa-us.org/wp-content/uploads/2017/05/ACWA-NPDES-Fee-Report-7-31-2014.pdf>.

<sup>211</sup> *Id.* at 34.

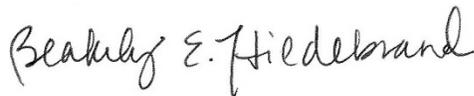
<sup>212</sup> *Id.*

of the draft General Permit. We were disappointed, however, in the last-minute change in venue. This last-minute change limited stakeholders' ability to offer meaningful feedback about the draft General Permit to DWR. Moreover, the format of the evening public forum, and failure of the facilitator to enforce ground rules established at the outset, particularly when attendees accosted a community member offering important feedback to the Agency, reinforced community concerns about intimidation by industry stakeholders.

## V. Conclusion

Thank you for consideration of these comments. Should you have any questions or wish to speak further, please contact us at [bhildebrand@selcnc.org](mailto:bhildebrand@selcnc.org) or [whendrick@waterkeeper.org](mailto:whendrick@waterkeeper.org).

Sincerely,



Blakely E. Hildebrand  
Staff Attorney  
Southern Environmental Law Center



Will Hendrick  
Staff Attorney & Manager, NC Pure Farms Pure  
Waters Campaign  
Waterkeeper Alliance

CC (via email):

Linda Culpepper, Interim Director, Division of Water Resources

Forrest English  
Pamlico-Tar Riverkeeper  
Sound Rivers

Katy Langley Hunt  
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Upper Neuse Riverkeeper  
Sound Rivers

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Kemp Burdette  
Cape Fear Riverkeeper  
Cape Fear River Watch

Cara Schildtknecht  
Waccamaw Riverkeeper  
Winyah Rivers Foundation

Jeff Currie  
Lumber Riverkeeper  
Winyah Rivers Foundation

Larry Baldwin  
Crystal Coast Waterkeeper  
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Robert Marsh  
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Tom Mattison  
White Oak-New Riverkeeper  
White Oak-New Riverkeeper Alliance

Emily Sutton  
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Haw River Assembly

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