Pollution Solutions While CAFOs Exist

It's clear to most participants in the EPA Office of Water, though not often acknowledged, that our streams and lakes will never meet the water quality goals of the Clean Water Act until something is done to rein in pollution from concentrated animal feeding operations (CAFOs). Two memos to state and federal environmental authorities, eleven years apart, issued by assistant administrators in the Office of Water addressing the need to significantly reduce nutrient pollution, demonstrate the long-standing failure of EPA's existing regulatory structure to achieve that goal more than 50 years after the Clean Water Act.[1,2]

For better water, as well as air and soil protections across America's farmland, the following manure application requirements must be added to the current CAFO regulatory regime. It is the overabundance of animal excrement produced by large numbers of confined animals that saturate soil and run-off, untreated and poorly regulated into waterways and wells creating problems for neighbors and the environment. Whether a CAFO has an approved permit or nutrient management plan, these improvements on pollution solutions are necessary.

1. CAFO waste shall not be applied within 100 feet of any surface water of the state, open tile line intake structures, sinkholes, agricultural well heads, included but not limited to roadside ditches that are conduits to surface waters of the state (with the exception of surface waters of the state that are up-gradient of the land application);
2. All surface water must be protected from waste runoff by 35-foot-wide vegetative barriers;
3. The condition of these barriers must be assessed, at least annually, during routine inspections by state regulatory agencies;
4. CAFO operators may never use end-guns on their center pivots to spray wastewater;
5. CAFO waste shall only be applied when waste can be incorporated immediately following application, or injected;
6. CAFO waste shall not be applied upon frozen or snow-covered ground;
7. CAFO waste shall not be applied upon saturated ground defined by a period of measurable rainfall and 24 hours after the end of the measurable rainfall event;
8. State agencies must be required to acknowledge in their Total Maximum Daily Load (TMDL) studies that CAFOs potentially discharge to streams when applying wastewater to their crop fields. If the soil phosphorus (P) content Bray P1 soil test result is 120 ppm P or more, and the fields are located in a watershed(s) covered by an approved phosphorus or nitrogen TMDL, then CAFO waste applications shall be discontinued until nutrient use by crops reduces the soil test result to less than 120 ppm P;
9. State agencies must establish limits to numbers of animal populations allowed in vulnerable, impaired watersheds as measured by animal unit capacity;

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1. Nancy K. Stoner, Acting Asst. Administrator, Office of Water, "Working in Partnership with States to address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions", Mar. 16, 2011.
2. Radhika Fox, Asst. Administrator, Office of Water, "Accelerating Nutrient Pollution Reductions in the Nation's Waters, April 5, 2022

10. Wastewater storage structures (lagoons) may not be constructed over streamway aquifers;
11. EPA must close the manure export loophole that allows CAFO operators to give away or sell their waste to other producers or farmers with the sole requirement that they provide a manure nutrient analysis to the recipient. All entities that accept waste from CAFO operators should provide on their grounds the same nutrient run-off barriers and other surface water protections that apply to a CAFO operator;
12. Finally, EPA must require any entity that processes CAFO waste in a manure digestor must meet the above requirements for the application of the digestate to crop fields.

Some of the changes recommended above come from the Michigan 2020 NPDES CAFO Permit, as put forth by that state's water quality/CAFO regulator. Digestate application rates are in the process of being addressed by EPAs representative regulator in Michigan because of the *higher content* of nutrients in digestate that is applied to fields. The regulator is being challenged by Big Ag and certain Michigan legislators who want to encourage the spread of manure methane digesters, without regard to the greater runoff risk associated with digestate nutrients that remain after manure digestion.

Air pollution, too. Note that CAFOs also pollute nearby streams through local air deposition of ammonia and manure related particles.[3] This should be addressed by requiring large setbacks of CAFO barns, lagoons and waste piles from surface water. Also, large amounts of ammonia are emitted from surfaces inside animal confinement barns and from liquid waste impoundments, as well as from the external grounds and manure piles of cattle feedlots, dairies and poultry operations. This ammonia enters the regional atmosphere and combines with other chemicals to form fine particulate. The ammonia can dissolve in rainfall and pollute surface water as "wet deposition" while the particulate eventually falls mostly as dry deposition.[4,5] This source of pollution can only be significantly addressed through reduction or elimination of the industrial model of meat, dairy and egg production.

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3. Z. Liu, W. Powers, J. Murphy, & R. Maghirang, *Ammonia and hydrogen sulfide emissions from swine production facilities in North America: A meta-analysis*, J. Anim. Sci. 2014.92:1656–1665.
4. John T. Walker, Viney P Aneja, David A. Dickey, *Atmospheric transport and wet deposition of ammonium in North Carolina, Atmospheric Environment*, 34 (2000) 3407-3418.
5. Katie E. Wyer, David B. Kelleghan, Victoria Blanes-Vidal, Günther Schauberger, Thomas P. Curran, *Ammonia emissions from agriculture and their contribution to fine particulate matter: A review of implications for human health*, Journal of Environmental Management 323 (2022) 116285.