



Institute for Agriculture and Trade Policy Comments on the 2021 General National Pollutant Discharge Elimination System (NPDES) Animal Feedlot Permit

The Institute for Agriculture and Trade Policy (IATP) thanks the Minnesota Pollution Control Agency (MPCA) for the opportunity to comment on the proposed 2021 General National Pollutant Discharge Elimination System (NPDES) Animal Feedlot Permit (referred to throughout this comment as the Proposed General Permit).

IATP is a 33-year-old organization based in Minneapolis. We work at the local, state, national and international levels to create fair and sustainable agriculture and trade systems. IATP was born in response to the family farm crisis of the 1980s and we continue to pursue policy solutions that benefit family farmers, rural communities and the environment.

As MPCA updates the Proposed General Permit, it's imperative to consider the damaging impacts of Concentrated Animal Feeding Operations (CAFOs) on water quality. CAFOs contribute to nitrate contamination of waterways through runoff from land application of manure, leaching from manure that has been improperly spread on land, or through manure lagoon leaks or breaks. In the southwestern region of the state, about 20% of the monitored wells have nitrate concentrations higher than the EPA allows for drinking water. Across southern Minnesota, most of the sand and gravel aquifers have nitrate concentrations that exceed EPA guidelines for human health.¹ And 27% of surface water in the state has nitrate levels that exceed EPA guidelines.² Much of this comes from agriculture.

The Proposed General Permit states that its goal is “to reduce pollutant levels in point source discharges and protect water quality in accordance with the U.S. Clean Water Act, Minnesota statutes and rules, and federal laws and regulations.”³ Yet, Minnesota's nitrate contamination increased under the previous 2016 General Permit. Although the Proposed General Permit includes requirements to address nitrate leaching, they are not stringent enough to adequately address the increasing nitrate contamination of Minnesota's waterways for the reasons outlined in this comment.

Farmers are facing the most difficult farm economy since the 1980s. Increases in farm debt, bankruptcies and land values have far outstripped farm assets and income, making it more

¹ MN Pollution Control Agency, *The state of groundwater*. <https://www.pca.state.mn.us/water/state-groundwater>

² MN Pollution Control Agency, *Report on nitrogen in surface water*. <https://www.pca.state.mn.us/featured/report-nitrogen-surface-water>

³ MN Pollution Control Agency, *Draft Permit of Intent to Issue State of Minnesota General Animal Feedlot NPDES Permit*. <https://www.pca.state.mn.us/sites/default/files/Draft%20Permit%20-%20MNG440000.pdf>

and more difficult for farmers to hold on to their land. According to data from the Minnesota Department of Agriculture, the state lost over 300 dairy farms in 2019 for the second year in a row.⁴ Much of this is a result of agricultural consolidation, which is putting many farmers out of business.

The financial stress caused by agricultural consolidation is most acute for small to mid-sized farms — the exact type of farm needed to build a resilient agricultural system. As CAFOs have increased production, prices paid to farmers have plummeted, often below the cost of production. Across the country and in Minnesota, small and mid-sized farms are struggling to operate with little to no farm income, often wiping out their savings and credit to stay in business, if they're able to stay in business at all.^{5 6} Increasing and expanding CAFOs in Minnesota will worsen the agricultural consolidation that is driving small and mid-sized farmers out of business.

MPCA should ensure an appropriately stringent permitting process for CAFOs. Not only are they harmful to the environment and our state's water resources, they are also undercutting the small and mid-sized farmers that we need on the land to restore our water resources, combat climate change, steward our land and support our rural communities. MPCA must include these considerations within the updated Proposed General Permit.

Rules must anticipate more extreme precipitation

Sections 16.3 and 21.2 of the Proposed General Permit are based on 25-year, 24-hour storm events as defined by the National Oceanic and Atmospheric Administration (NOAA). Many of NOAA's rainfall frequency values were last updated in the 1960s and 1970s, and precipitation has greatly increased in severity and frequency since then. Therefore, the Proposed General Permit should be revised to reflect these newer climate patterns.

Far more mega-rain events (defined by the Minnesota Department of Natural Resources as a storm in which at least 6 inches of rain fall over an area of 1,000 or more square miles and the core of the storm generates at least 8 inches of rain⁷) have hit Minnesota in recent years. For context, a **100-year** storm for most Minnesota communities is roughly 6 to 7 inches over 24 hours.⁸

⁴ MN Department of Agriculture, *Dairy Farm Activity Report*. 2020.

⁵ Justin Fox, *A Productivity Revolution is Wiping Out (Most) Dairy Farms*, (Bloomberg, 2019).

⁶ James MacDonald and Doris Newton, *Milk Production Continues to Shift to Large-Scale Farms*, (USDA Economic Research Service, December 2014).

⁷ MN Department of Natural Resources, *Historic Mega-Rain Events in Minnesota*.

https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html

⁸ MN Department of Natural Resources, *100-Year Rainstorms Defined*.

https://www.dnr.state.mn.us/climate/summaries_and_publications/100_year_rainstorms.html

From 1973-2019, Minnesota experienced 14 mega-rain events, with a sharp uptick since 2000. There were 2.5 times as many mega-rains from 2000-2019 as there were from 1973-1999. Notably, of the 14 mega-rain events since 1973, three of them were considered **1,000-year** storms and all took place in southern Minnesota, where many CAFOs are sited.⁹ These trends are consistent with predictions in the most recent National Climate Assessment that Minnesota will receive more precipitation, and more precipitation from large events, as a result of climate change.¹⁰

Due to increasing rainfall and flooding from climate change, the risk of an overflowed or breached manure lagoon is higher. In 2018, Hurricane Florence caused many manure lagoons to overflow in North Carolina, leading to contaminated water and severe public health impacts.¹¹ Similar manure lagoon spills occurred in Iowa last year during extreme flooding.¹² At home in Minnesota, heavy rains in 2018 left “livestock producers scrambling to stem the overflow from livestock manure storage basins,” according to MPCA staff.¹³ These disasters cause high levels of nitrate pollution in surrounding waterways.

The possibility of a breached or overflowing manure lagoon is especially scary for parts of Minnesota, including the sensitive karst region where surface water pollution very easily becomes groundwater contamination. In 2018, former MPCA Commissioner John Linc Stine said, “The karst region is subject to rapid seepage of contaminants from the land and overlying soils, making the groundwater of this region very vulnerable.”¹⁴

Section 16.3 of the Proposed General Permit reads, “For any facility that does not meet the definition of New Source, the Permittee shall ensure that the production area is designed, constructed, operated, and maintained to contain all manure, manure-contaminated runoff, or process wastewater, and the direct precipitation from a 25-year, 24-hour storm event as defined by the Precipitation - Frequency Atlas of the United States, National Oceanic and Atmospheric Administration.” Section 21.2 of the Proposed General Permit states that certain inspections must occur after 25-year, 24-hour storm events.

⁹ MN Department of Natural Resources, *Historic Mega-Rain Events in Minnesota*.

https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html

¹⁰ U.S. Global Change Research Program, *National Climate Assessment 14*. Chapter 5, Figure 18.6.

<https://nca2014.globalchange.gov/report/regions/midwest#graphic-17083>

¹¹ Shefali Sharma, *Hogwash and its Aftermath: Climate Change and Corporate Accountability after Hurricane Florence*, (Institute for Agriculture and Trade Policy, 2018).

¹² Erin Jordan, *Overflowing Manure Tanks Reported in Western Iowa, Eastern Iowa on Alert*, (The Gazette, Sioux City, March 2019).

¹³ MN Pollution Control Agency, *Livestock farms in southern Minnesota respond to heavy rains causing manure storage overflows*. <https://www.pca.state.mn.us/news/livestock-farms-southern-minnesota-respond-heavy-rains-causing-manure-storage-overflows>

¹⁴ Cathy Rofshus, *MPCA Commissioner denies permit to proposed feedlot, recommends study of nitrate-contaminated waters in the sensitive karst region of southeast Minnesota*, (MPCA, 2018).

Given that Minnesota has experienced 14 mega-rain events that are roughly equivalent to **100-year** storms and 3 mega-rain events considered **1,000-year** storms since 1973, it's clear that designing and constructing facilities to accommodate 25-year storms is not enough to protect Minnesota's water and a new standard must be used. MPCA recognizes this fact in the 2017 Interagency Climate Adaptation Team report that highlights the need to address "resilience to extreme precipitation."¹⁵

Based on climate data for Minnesota, outdated numbers from NOAA, and the enormous public health and environmental impacts that manure lagoon breaches pose, we recommend that the MPCA change sections 16.3 and 21.2 of the Proposed General Permit to use the more appropriate levels of 100-year, 24-hour storm events as defined by NOAA in their Precipitation Frequency Atlas.¹⁶

Rules for manure application rates are inadequate

Section 13.3 of the Proposed General Permit deals with manure application rates and relies on recommendations from the University of Minnesota Extension that are based on the Maximum Return to Nitrogen (MRTN). Economic risk and cost factors underpin the MRTN, making it inadequate as a tool to limit nitrate pollution.

The Proposed General Permit states that manure application rates cannot "exceed expected annual crop nitrogen needs." Yet, the MRTN relies on calculating the price ratio for the cost per pound of nitrogen divided by the value of corn per bushel.¹⁷ The price ratio used to calculate the MRTN varies based on the price of fertilizer; an Extension fact sheet on fertilizing corn in Minnesota gives this example:

An example calculation of the price/value is if N fertilizer costs \$.40 per lb N (or \$820 per ton of anhydrous ammonia), and corn is valued at \$4.00 per bushel, the ratio would be $0.40/4.00 = 0.10$.¹⁸

For CAFOs, manure is usually free and abundant. As a result, the MRTN suggests using a 0.05 price ratio, saying it is "relevant to those that have manure readily available at low (or no) cost." The recommendations go on to say, "For those that pay a premium, the 0.1 price ratio MRTN, or higher, may be more relevant and will result in a lower application rate."¹⁹

¹⁵ MN Pollution Control Agency, *Adapting to Climate Change in Minnesota 2017 Report of the Interagency Climate Adaptation Team*. <https://www.pca.state.mn.us/air/interagency-climate-adaptation-team>

¹⁶ NOAA Atlas 14 Point Precipitation Frequency Estimates: MN. https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=mn

¹⁷ Melissa Wilson, *New Manure Application Rate Guidelines for Minnesota*. (University of Minnesota Extension, 2019) <https://blog-crop-news.extension.umn.edu/2019/09/new-manure-application-rate-guidelines.html>

¹⁸ University of Minnesota Extension. *Fertilizing Corn in Minnesota*. Reviewed in 2020. <https://extension.umn.edu/crop-specific-needs/fertilizing-corn-minnesota>

¹⁹ Melissa Wilson, *New Manure Application Rate Guidelines for Minnesota*. (University of Minnesota Extension, 2019) <https://blog-crop-news.extension.umn.edu/2019/09/new-manure-application-rate-guidelines.html>

This essentially means that a farmer with free manure can apply more since it costs less than commercial fertilizer or purchasing manure.

The Proposed General Permit states that a farmer must apply manure based on expected crop nitrogen needs. Therefore, the MRTN is an inappropriate model to use since it is based on prices and maximizing profits, which have nothing to do with crop nitrogen needs. Actual crop nitrogen needs are determined by a complex set of variables, including timing, intensity and amount of precipitation; amount of sunshine; insect, weed and disease pressures; other nutrient deficiencies; the amount of soil organic matter; and soil type and texture. Section 13.3 of the Proposed General Permit should be revised to base manure application rates on these factors instead of the MRTN.

Soil testing is needed to determine manure application rates

Section 13.3 of the Proposed General Permit requires farmers to limit manure applications to “expected crop nitrogen needs” and also requires farmers to include in their calculations “all nitrogen sources,” which includes commercial fertilizer, soil organic matter, legumes, manure and more. There is no way for a farmer to limit manure application to expected crop nitrogen needs without knowing how much nitrogen is already in the soil. Although the Proposed General Permit requires soil testing for phosphorus, there are no stipulations to soil test for nitrogen.

The previous General Permit from 2016 included a requirement for soil nitrate testing, but it was removed in the 2021 Proposed General Permit. This requirement should be added back to ensure that manure is not overapplied.

Soil temperature requirements need more specificity

Sections 14.4 and 14.6 of the Proposed General Permit require soil temperatures of less than 50 degrees Fahrenheit for certain manure application scenarios. However, the Proposed General Permit lacks the specificity required to prevent nitrate pollution.

The language in the Proposed General Permit does not indicate how long the soil must be below 50 degrees, at what depth, or whether the soil temperature must remain below 50 degrees until spring. This makes it confusing for the farmer and opens up the possibility that manure could be applied after one 50 degree temperature reading, even if the weather warms back up after that. This scenario must be prevented because fall manure application when soil temperatures exceed 50 degrees is highly likely to cause nitrate pollution.

MPCA must add more specificity to the soil temperature stipulations in sections 14.4 and 14.6 of the Proposed General Permit. Soil temperatures should be anticipated to remain below 50 degrees until spring. One way to estimate this is to require temperature readings of less than 50 degrees for three consecutive days at a depth of 6 inches.

Land application timing requirements need more specificity

Section 14.8 of the Proposed General Permit states that winter application of solid manure is prohibited in the months of February and March, and section 14.10 states that winter application of liquid manure is prohibited except for emergency manure application. Winter restrictions should not be based on calendar month, but instead should be based on weather conditions.

According to an article by University of Minnesota Extension, “When manure is applied on the surface of frozen soils or on top of snow... it cannot seep into the ground, so if there is any runoff in your fields, it can carry the manure to low spots or away from the field entirely which may cause environmental issues.”²⁰

Applying manure on snow or frozen ground greatly increases risks of nitrate pollution. A comprehensive ban on manure spreading on frozen ground is necessary, and cannot be linked to arbitrary month constraints that disregard seasonal weather patterns. This is the only solution to truly limit nitrates entering Minnesota’s waterways.

If a total snow and frozen ground ban is impossible, MPCA should at least expand the months when solid manure cannot be applied. The MPCA should prohibit application of solid manure in December and January (in addition to February and March, which the Proposed General Permit already indicates), when Minnesota usually has snow cover and frozen ground. There is precedent for this; Michigan’s 2020 General Permit for CAFOs prohibits manure application during the months of January, February and March.²¹ Minnesota should follow suit and prohibit solid manure application from December through March, or implement a total snow and frozen ground ban not tied to month restrictions.

Emergencies must be approved and documented more stringently

The Proposed General Permit makes exceptions to the rules for emergency manure application in sections 10.3, 14.3, 14.4, 14.6 and 14.10. Emergency manure application is defined in section 30.19 as “instances of land application of manure that are the direct result of situations beyond the control of the Permittee, such as unusual weather conditions, unavoidable equipment failure, or other circumstances that could not have been avoided with proper planning and management and there is no opportunity to provide temporary storage within another approved manure storage area at the facility. In these situations, only the application of the volume of manure that is necessary to prevent manure storage overflow is considered to be emergency manure application.”

²⁰ Melissa Wilson, *Manure applied on frozen soil or snow – what will happen to my nitrogen?* (University of Minnesota Extension, 2019) <https://blog-crop-news.extension.umn.edu/2019/01/manure-applied-on-frozen-soil-or-snow.html>

²¹ State of Michigan NPDES General Permit for CAFOs. Permit Number MIG010000. https://www.michigan.gov/documents/egle/egle-wrd-CAFO-GP2020-MIG010000_691449_7.pdf



None of the rules in the Proposed General Permit will be effective if there are too many exceptions and emergencies. Yet, in email correspondence with MPCA staff, we learned that “There really isn’t a written approval system for [emergency manure application], just a notification to the MPCA that you are going to utilize this condition of the permit.” MPCA must implement a system to review and approve emergency applications.

If a farm uses the emergency manure application condition of the permit, a summary of the situation is required as part of the farm’s annual report. However, emergencies are not officially tracked, and MPCA staff only has information on how often the emergency provision was used from informal surveys of feedlot staff. Emergency manure application must be better documented and this information should be available to the public. It is critical that rural communities are aware of any emergencies that happen in their region and how they may be affected.

The definition of emergency manure application in section 30.19 of the Proposed General Permit includes “unusual weather conditions.” As climate change worsens, increasingly extreme and erratic weather will become the norm. Unless the Proposed General Permit is revised to account for climate impacts, emergency manure applications will become more common and nitrate pollution in our waterways will worsen.

Finally, section 14.6 of the Proposed General Permit states, “Nitrogen BMP implementation is not required for emergency manure application.” Yet, in some cases a farmer could implement BMPs despite an emergency. For example, a nitrogen stabilizing agent could be added to manure before spreading despite poor weather conditions or equipment failure. In such cases, farmers should not be excused from implementing BMPs. Better approval systems and verification of emergency manure application could ensure that BMPs are used whenever possible, even in cases of emergency.

IATP thanks MPCA for the opportunity to comment.

Sincerely,

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