Total Maximum Daily Load (TMDL) Guidance for Concentrated Animal Feeding Operations (CAFO)

The Department of Environment, Great Lakes and Energy (EGLE), is required to develop a TMDL when a waterbody does not meet designated uses. Once a TMDL is approved by the United States Environmental Protection Agency (USEPA), EGLE is required to implement applicable waste load allocations consistently across the National Pollutant Discharge Elimination System (NPDES) permit programs. The Department expects that full compliance with the conditions of the CAFO General Permit (MIG010000) will allow the permittee to meet the pollutant Loading Capacity (LC) set forth for nitrogen and phosphorus in an approved TMDL. For approved TMDLs set forth for nitrogen, phosphorus, *Escherichia coli*, biota and dissolved oxygen, the permittee's Certificate of Coverage (COC) will list the approved TMDLs that apply to the permittee's receiving water. Typical CAFO waste contains pathogens, excess nutrients and organic matter. Pathogens are directly harmful to human health through ingestion and direct contact. Excess nutrients that enter surface waters can result in algal blooms and reduce the oxygen content in water that aquatic organisms need to survive. Organic matter discharged to surface water can physically bury aquatic organisms and their habitat and may deplete oxygen content needed for healthy aquatic systems. A complete list of approved TMDLs can be found at Michigan.gov/TMDL.

General Permit Requirements

The language in the General Permit MIG010000 (Part I, Section C.9) states the following conditions related to TMDLs:

Nitrogen or Phosphorus TMDLs

The Department expects that full compliance with the conditions of this permit will allow the permittee to meet the pollutant allocations set forth for nitrogen or phosphorus in an approved Total Maximum Daily Load (TMDL). The permittee's COC will indicate if the permittee's production area or land application areas are located within a watershed(s) covered by an approved nitrogen or phosphorus TMDL.

Escherichia coli, Biota, Dissolved Oxygen TMDLs

The permittee's COC will indicate if the permittee's production area or land application areas are located within a watershed(s) covered by an approved *E. coli*, biota, or dissolved oxygen TMDL. The Department has developed the "Total Maximum Daily Load (TMDL) Guidance for Concentrated Animal Feeding Operations (CAFO)" regarding how to evaluate operations and determine additional pollutant control measures. The guidance for conducting a Comprehensive Evaluation of the operations and determine if additional pollutant control measures are necessary, is available on the internet, on the EGLE CAFO webpage at https://www.michigan.gov/egle (select 'Water', 'Permits', 'Surface Water', 'NPDES Permits', 'Concentrated Animal Feeding Operations (CAFO)'; Search under 'CAFO Guidance Documents'). The permittee shall complete the following actions within 24 months of receiving notification from the Department:

1. Conduct a comprehensive evaluation of the CAFO operations. A comprehensive evaluation shall identify sources of pollutants that have the potential to reach surface waters from production areas and/or land application areas.
2. Determine whether additional pollutant control measures need to be identified and implemented to meet the permittee's pollutant loading allocation (or "concentration" in the case of *E. coli*) set forth in the approved TMDL(s). Pollutant control measures, shall at a minimum, include those that prevent surface runoff and subsurface drainage of CAFO waste from land application areas.
3. Submit a written TMDL Evaluation Report via MiEnviro to the Department based on one of the following:
    a) If the permittee, based on the comprehensive evaluation, determines that the pollutant loading or concentration allocation(s) established in the approved TMDL(s) are being met, then the written TMDL Evaluation Report justifying that determination shall be submitted to the Department, or

b) If the permittee, based on the comprehensive evaluation, determines that the pollutant loading or concentration allocation(s) established in the approved TMDL(s) is being exceeded, then the written TMDL Evaluation Report submitted to the Department shall identify additional pollutant control measures that need to be implemented by the permittee to achieve compliance with the pollutant loading allocation(s) established in the approved TMDL. The permittee's written TMDL Evaluation Report shall also include an implementation schedule for each identified additional pollutant control measure.

Upon approval of the Department, and if the TMDL Evaluation Report identifies needed additional pollutant control measures, the permittee shall implement the additional pollutant control measures according to the implementation schedule. The approved TMDL Evaluation Report detailing the additional pollutant control measures and the associated implementation schedule shall be included in the Comprehensive Nutrient Management Plan (CNMP) for a period of 5 years from the date of creation and shall be an enforceable part of this permit.

Comprehensive Evaluation of CAFO Operations

The TMDLs developed by EGLE and approved by the USEPA, include Reasonable Assurance activities for CAFO permittees, and rely on the NPDES permit requirements to be consistent with the assumptions and requirements of allocation(s) in the TMDL. Best Management Practices required as part of the permittee's Nutrient Management Plan under Part I, Section B of General Permit MIG010000, will adequately address the TMDL requirements for nitrogen and phosphorus impairments. However, if the CAFO facility is located in an approved TMDL watershed(s) for *Escherichia coli*, biota, or dissolved oxygen impairments, additional activities may be required to effectively evaluate the permittee's contribution to the TMDL, and to restore water quality. The following is guidance for the permittee regarding how to evaluate operations and determine if additional pollutant control measures need to be identified and implemented to meet the pollutant loading requirements in an approved *Escherichia coli*, biota, or dissolved oxygen TMDL.

Operations under the control of a CAFO includes both production areas and land application areas. Guidance for the evaluation of both is outlined below and must be included in the written TMDL Evaluation Report required by the CAFO General Permit.

Production areas are those portions of a CAFO that includes all areas used for animal production activities. This can include, but is not limited to, animal confinement areas, manure storage areas, raw material storage areas, treatment systems, and waste containment areas. Animal confinement areas include open lots, housed lots, feedlots, confinement houses, stall barns, free stall barns, milk rooms, milking centers, cow yards, barnyards, medication pens, walkers, animal walkways (not within pasture areas), and stables. The manure storage area includes lagoons, runoff ponds, storage sheds, stockpiles, under-house or pit storages, liquid impoundments, static piles, and composting piles. The raw materials storage areas include feed silos, silage bunkers, and bedding materials, including new sand used for bedding. Waste containment areas include settling basins and areas within berms and diversions which separate uncontaminated storm water. Production areas also include egg washing and egg processing facilities, and any areas used in the storage, handling, treatment, or disposal of mortalities. Production areas do not include pasture lands or land application areas.

All production area waste must be collected and contained in CAFO waste storage structures as required by the General Permit. There can be no discharge from the production area except where authorized by the permit in Part I.A.1. Permittees should identify potential sources of pollutants that have the potential to reach surface waters either directly (i.e., tile, drain, etc.) or indirectly (i.e., swale, ditch, sheet flow, etc.) from production areas as defined above. At a minimum, the evaluation to identity potential sources of pollutants shall include the following areas:

- Feed bins
- Feed mixing areas
- Feed storage areas (commodity barn, silage pads, hay storage, etc.)

- Animal loading areas
- Animal travel lanes
- Manure pump-out/load-out areas
- Ventilation and pit fan outlet areas
- Mortality staging areas at the animal barns
- Employee entrances for animal care
- Raw product transfer areas (egg belts, milk loading, etc.)
- Animal bedding equipment track-out management areas
- Facility traffic management areas
- Nuisance animal/rodent management areas
- Sanitary waste management areas
- Solid waste management areas

If the Comprehensive Evaluation of CAFO Operations demonstrates that a potential exists for production area waste to leave the site either directly or indirectly, the evaluation must include a site map identifying and locating the following:

- Storm water flows
- Conveyances, gullies
- Outfalls/outlets
- Areas of vegetation (with a brief description such as lawn, old field, march, wooded area, etc.)
- Impervious surfaces (i.e., roof, asphalt, concrete)
- Areas of tire track out
- Areas of exposed and/or erodible soils and gravel lots
- Other areas that may contribute pollutants

Land application areas are those areas of land under the control of a CAFO owner or operator, whether it is owned, rented, leased, or subject to an access agreement where CAFO waste is or may be applied. Land application areas include land not owned by the CAFO owner or operator but where the owner or operator has control of the land application of waste.

Permittees should identify potential sources of pollutants that have the potential to reach surface waters either directly (i.e., tile, drain, etc.) or indirectly (i.e., swale, ditch, sheet flow, etc.) from land application areas as defined above. The evaluation at a minimum shall include the following:

- Identification of any fields being considered for land application of CAFO waste that are located within a TMDL watershed.
- Identification of any fields that are tiled and/or have surface runoff that has the potential to reach surface water.
- The inclusion of the above fields on a map showing the center of the field location using latitude and longitude Global Positioning System (GPS) units, and the name and location of the nearest surface waters.
- Identification and inclusion of surface waters and other sensitive areas on a map including rivers, streams, lakes, wetlands, gullies, swales, tile risers, roadside ditches, and locations of any previous discharges.

Additional Considerations

Pasture area is land that is primarily used for the production of forage upon which livestock graze. Heavy use areas within pastures adjacent to, or associated with, the CAFO are part of the pasture and are not part of the production area. Examples of heavy use areas include livestock travel lanes and smaller areas immediately adjacent to feed and watering stations. These types of areas have the potential to erode and develop gullies that can be a direct conduit to surface waters of the state.

Pasture areas at a minimum shall be evaluated and included in the TMDL Evaluation Report to ensure the following:

- Animals must be fenced out of, and excluded from, any surface waters of the state.
- A minimum permanent vegetated buffer width of 50 feet must be established and maintained between the pasture area and surface waters of the state.
- No concentrated flow of contaminated water shall be allowed to flow through the pasture area.
- Concentrated areas of water flow must be excluded from animal access.

Determination of Additional Pollutant Control Measures to Meet TMDL Requirements

The location, timing, and amount of CAFO waste applied to the landscape are important considerations in protecting water quality. Discharges to surface waters from land application areas must not violate water quality standards or further degrade already impaired surface waters. Discharges from land-application fields must meet permit conditions and the LAs of the applicable TMDL(s).

A facility can choose to install and operate a treatment system. Otherwise, additional pollutant control measures, that can be implemented to meet the TMDL requirements of the CAFO General Permit, should at a minimum, include all of the following best management practices:

1. To prevent surface runoff from either solid or liquid CAFO waste applications, the following pollutant control measures shall be used:

    a. Install a permanent vegetative buffer along the perimeter of the field (a minimum of 50 feet) and/or increase the setback of CAFO waste application to 150 feet from a surface water of the state. - OR - If the vegetative buffer option is not used, restrict application of CAFO waste (i.e., liquid and solid) to fall months only (i.e., October, November).

    b. If liquid CAFO waste is being applied, limit application rate of CAFO waste at one time to a rate not to exceed one quarter (¼) inch of liquid manure equivalent.

    c. Wait 48 hours between additional liquid CAFO waste applications.

    d. Or, implement other best management practices approved by the Department.

2. Fields or areas of fields that are subsurface drained (i.e., tiled) require additional precautions to protect water quality in an approved TMDL area. For tiled fields that receive liquid CAFO waste, the following inspections and pollutant control measures shall be used:

    a. Visual inspections of tile outlets, fields for cracks, fissures, and root channels shall be made prior to and after the land application of CAFO waste.

    b. For existing water drainage control structures, visual inspections shall be completed for all existing tile risers, collection boxes and outflow locations located within or down gradient of land application areas.

    c. Conduct proper drainage water management practices by installing in-line tile flow control structures that can mechanically stop tile flow prior to application of CAFO waste to prevent the discharge of CAFO waste to surface waters of the state.

        i. If flow from a tile outlet is not present at the time of the application,
            1) Limit application of liquid CAFO waste at one time to a rate not to exceed one quarter (1/4) inch of liquid manure equivalent.
            2) Wait 48 hours between CAFO waste applications to the same field.

ii. If flow from a tile outlet is present at the time of application,
    1) Limit the application of liquid CAFO waste at one time to a rate not to exceed one eighth (1/8) inch of liquid manure equivalent.
    2) Wait 48 hours between CAFO waste applications.

d. Or, implement other best management practices approved by the Department.

Given the information within this document, if there are any questions regarding TMDLs as they relate to the CAFO Program, or what is required by the NPDES CAFO General Permit, contact your EGLE, WRD District CAFO Program compliance staff.