

Manure Treatment Systems


Trends, Permitting & Regulatory Considerations

2024 CAFO Workshops

Wisconsin Department of Natural Resources

Watershed Management Program

Manure Treatment and Discharge

- Manure treatment and discharge is not new for dairy and other livestock producers.
 - Treatment
 - Digesters
 - Reverse Osmosis (RO)
 - Ultra Filtration (UF)
 - Composting
 - Mechanical Vapor Recompression / Membrane Bioreactor
 - Discharge
 - Land spreading
 - Irrigation
 - Surface water discharge
- This is gaining interest along with enhanced treatment systems.
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Manure Treatment and Discharge

Manure Treatment with Surface Water Discharge

- 3 active sites in WI
 - BC Organics (Brown Co.), 11 farms
 - Springfield (Dane Co.), 3 farms
 - Ridge Breeze Dairy (Pierce Co.)
- ~9 dairy farms pursuing on farm treatment and discharge
 - All located in northeast Wisconsin



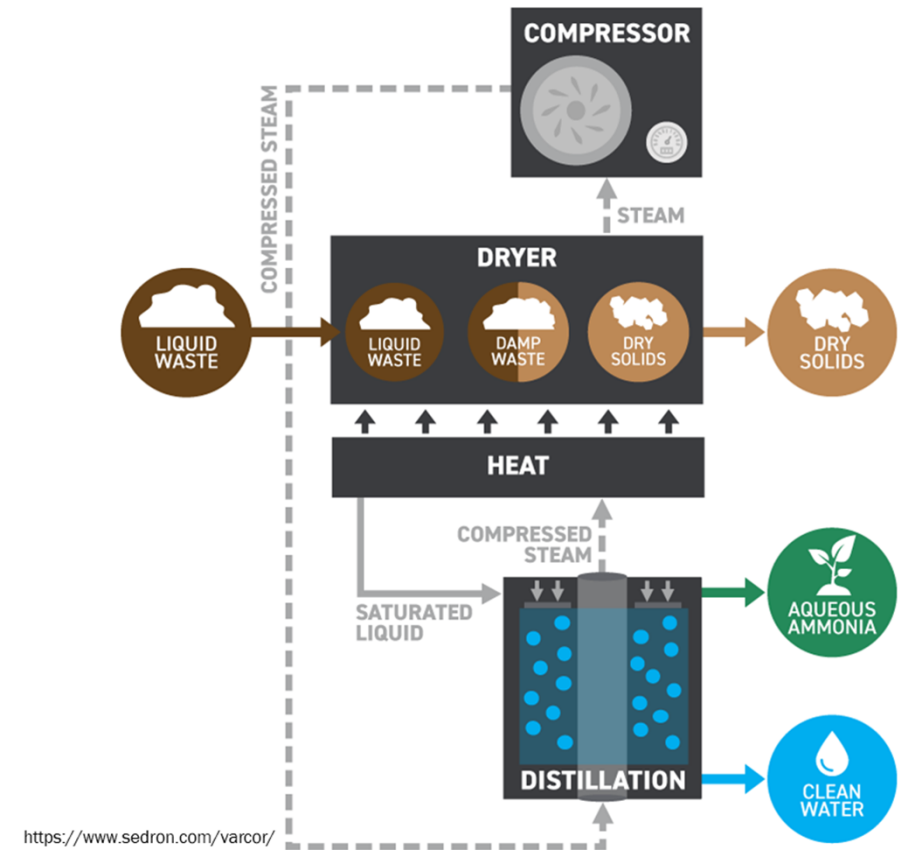
<https://www.dynamicgrp.us/bc-organics>

Manure Treatment and Discharge

- Types of Treatment Systems
 - ~1/3 discharge, 2/3 RO+UF Concentrate
 - Membrane bioreactor + RO & UF, 100% discharge



<https://www.aquainnovationsplus.com/>



Permitting Process

- Incorporate into CAFO WPDES permit or issue an Industrial Wastewater WPDES permit.
- ~15-month process
 - Multiple department programs involved
 - Reach out early!
 - Point of Contact:
 - Joe Baeten
 - Joseph.Baeten@Wisconsin.gov
 - (920) 366-2072

TASK	TIMELINE	ASSIGNED TO
Design & Technical Review		
Submit WW Pre-Application Form 3400-256	NA	Permittee
EITHER: Submit NOI to Conduct WQ Trading Form 3400-	NA	Permittee
OR: Reserve Capacity Availability Review	30 days	CAFO Specialist / TMDL
Conduct Stream Survey	May-Sept.	Water Resources
Develop Planning Limits Memo	30-60 days	Ben Hartenbower
Pre-Application Meeting	NA	All
Submit Modification/Re/Issuance Request	NA	Permittee
Plan Review (NR 108), WW 1. Cover/Transmittal Letter 2. WW System Approval Request Form 3400-205 3. Specifications signed and sealed by P.E. * Electronic and 2 paper copies (11x17)	90 days	Jason Knutson
Plan Review (NR 243), CAFO	90 days	Bernie Michaud
Industrial Waste Management Plan	90 days	CAFO Specialist / WW
EITHER: Water Quality Trading Plan Review	90 days	Laura Gerold / Matt Claucherty
OR: Notice of Interest for Reserve Capacity Review	90 days	WW / TMDL
Antidegradation/Backsliding NR 207.04(1) Review	90 days	CAFO Specialist / WW
ADL Analysis Review	90 days	Tyler Dix
Permitting		
Draft Permit	30-60 days	CAFO Specialist/WW Drafter
Permittee Review of Draft Permit	14 days	Permittee
Public Notice	30-60 days	CAFO Specialist
Public Hearing/Response to Comments	30 days	CAFO Specialist
Re/Issue Permit	30 days	CAFO Specialist
Operator Certification (NR 114)		
Obtain Operator Certification (Sub Class U)	NA	Permittee

Permitting Process

- Initial Application
 - Form 3400-256 (Wastewater Preapplication)
 - Point of discharge(s) map
 - Anticipated effluent concentrations
 - Form 3400-206 (Water Quality Trading) OR Reserve Capacity Availability Request (if applicable)
- Submit directly to Department
- Department conducts stream survey and develops planning limits memo

Permitting Process

- Final Permit Application (CAFO Hybrid Permit)
 - May be permit modification or incorporated into the permit re/issuance process
 - Need a complete application prior to plan review beginning
 - All documents submitted through the ePermitting site and the farm's permit manager will distribute plans to the appropriate reviewer (single, coordinated review)
 - Industrial Wastewater permit application will get a link to the electronic application through SWAMP Web after the initial application is processed.

Permitting Process

- Final Permit Application (CAFO Hybrid Permit) – ENGINEERING
 - NR 108 Engineering (Wastewater)
 - Submittal requirements:
<https://dnr.wisconsin.gov/topic/Wastewater/AdequateSubmittal.html>
 - Review focuses on the treatment system and the effluent pipeline.
 - NR 243 Engineering (CAFO)
 - Submittal requirements:
<https://dnr.wisconsin.gov/topic/CAFO/PlansSpecifications.html>
 - Reviews other designed structures (manure transfer lines, storage)
 - May be submitted for review at any time

Permitting Process

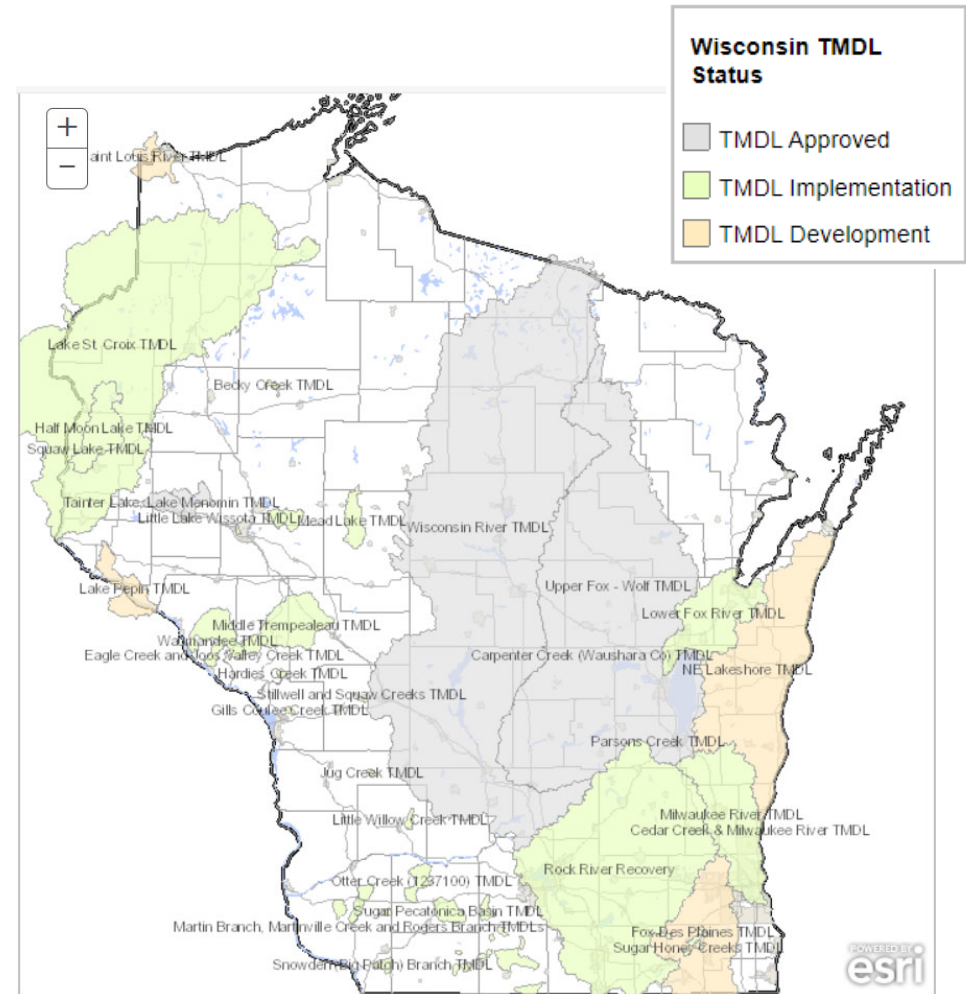
- Final Permit Application (CAFO Hybrid Permit) – MODELING
 - Water Quality Trading Plan and/or Reserve Capacity Request (If Applicable)
 - Must acquire environmentally equivalent (or superior) pollutant reduction credits to offset enough of the discharge load to demonstrate compliance with a water quality-based effluent limit.
 - Required in areas with an approved TMDL.
 - Antidegradation/Backsliding (NR 207.04(1))
 - Required for green site CAFOs with an end of pipe discharge.
 - Alternative Discharge Limits (ADL) Analysis (NR 243.13(2)(b))
 - Analysis based on site specific alternative technologies that will achieve a quantity of pollutants discharged from the production area that is equal to or less than the quantity of pollutants that would be discharged if the production area was designed, constructed, operated and maintained with the standards under NR 243.13(2)(a).
 - Model template available to assist with this process

Permitting Process

- Final Permit Application (CAFO Hybrid Permit) – OTHER
 - Nutrient Management Plan
 - May be required with a permit modification request
 - Permit Drafting & Notice
 - Process does not change
 - Draft Permit -> Public Notice -> Hearing/Respond to Comments -> Issue Permit
 - Operator Certification (Sub Class U)
 - All treatment systems are required to have certified operators.
 - [Wastewater operator certification | Wisconsin DNR](#)

Permitting Process

- Considerations - Permitting
 - Point of discharge: dry stream vs large, perennial stream (more dilution = less stringent standards in permit)
 - Pollutant limitations (ex. ammonia, temperature, BOD, hardness)
 - Increased sampling frequency in permit.
 - Daily, weekly and monthly sampling requirements.
 - TMDLs (Total Maximum Daily Loads)
 - Reserve Capacity
 - Water quality trading

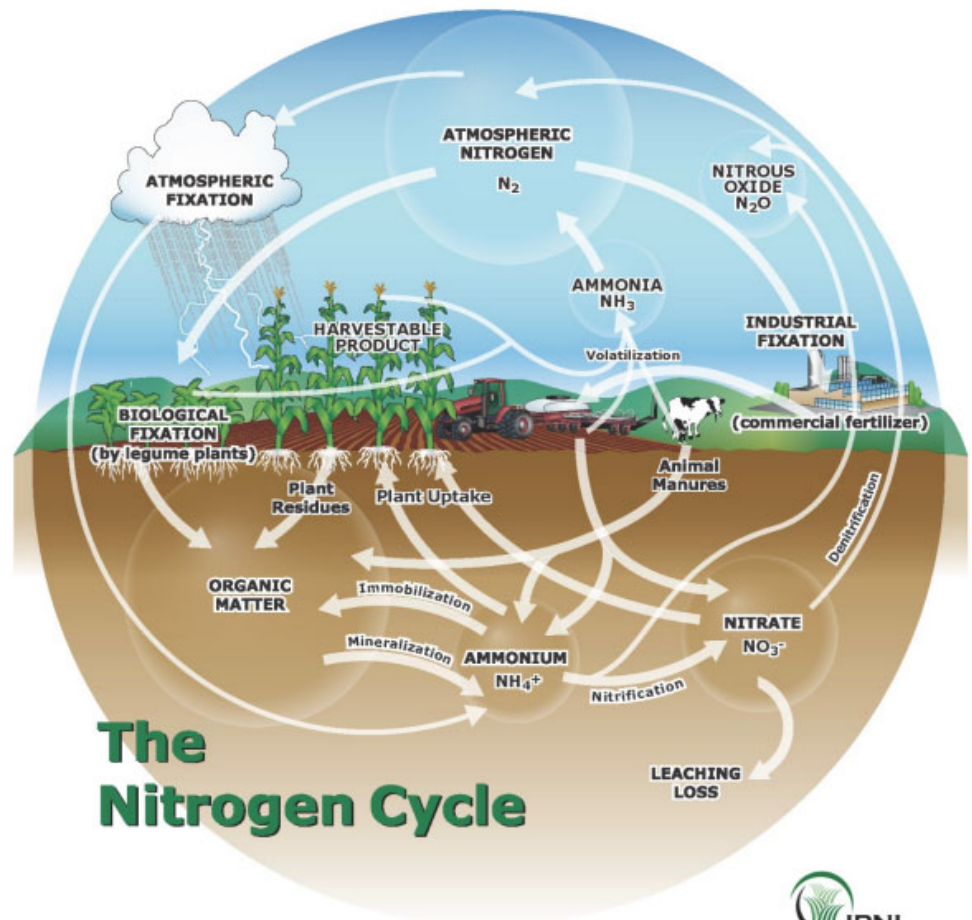


Permitting Process

- Considerations - Engineering
 - Less manure storage needed.
 - Must consider storage needs if system is down or not meeting effluent limits.
 - Farm must always maintain 180-days of storage.
 - Digester vs no Digester
 - Authorized discharges via overtopping events are no longer allowed if a CAFO incorporates an ADL

Permitting Process

- Considerations – Nutrient Management
 - Changes to nutrient management planning.
 - Organic N converted to inorganic N – more first year available N; acts more like a fertilizer than a manure.
 - Manure consistency will be different; how do current land application practices fit with this type of manure?



[NE_Lakeshore_Nitrogen_Analysis.pdf \(wisconsin.gov\)](#)



CONNECT WITH US

QUESTIONS

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"WILD WISCONSIN:
OFF THE RECORD"