Manure Irrigation
Wisconsin Rules and Regulations

Joe Baeten
WDNR – Nutrient Management Program Coordinator

March 3, 2016, Elkhart Lake, WI
What is Manure (Spray) Irrigation?

- NR 243.03(62): The application of liquid manure or process wastewater to cropland using equipment that discharges manure into the air via a single nozzle or multiple nozzles or hoses and disperses the manure over distances greater than could be achieved using typical moving vehicle or manure hauling equipment.
What is Manure Irrigation?

- Center Pivot Systems
What is Manure Irrigation?

- Center Pivot Systems

Photo by Mark Borchardt
What is Manure Irrigation?

- Center Pivot Systems
What is Manure Irrigation?

• Traveling Gun

Photo by Mark Borchardt
What is Manure Irrigation?

- Tanker with Nozzle(s)
Potential Benefits

• Timing of manure application
  – Surface and groundwater protection
    • Less risk for manure surface runoff
    • Reduce leaching below root zone
    • Reduce entry in drain tiles
    • Recycle water / manure treatment
  – More precise nutrient management
• Road safety and reduced road damage
• Farm management
• Economic benefits
Potential Concerns

- Public health risk from airborne pathogens and other contaminants
  - Inhalation
  - Deposition on surface
- Drift or overspray
- Odor and air emissions
- Surface and groundwater contamination
- Implementation and compliance issues
Prevalence of MI at CAFOs

- 7 Approved
- 4 Pending or Temporarily Revoked
- WDNR does not track or regulate manure irrigation at non-CAFO farms.
# 590 Manure Irrigation Requirements

<table>
<thead>
<tr>
<th>Restrictive Feature</th>
<th>Setback</th>
<th>Code Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Public Water Supply Well</td>
<td>50 feet**</td>
<td>NRCS 590 V.A.2.(3)</td>
</tr>
<tr>
<td>Non-Community Water Supply Well</td>
<td>50 feet**</td>
<td>NRCS 590 V.A.2.(3)</td>
</tr>
<tr>
<td>Inhabited Dwelling</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Depth to Groundwater &amp; Bedrock</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Direct Conduit to Groundwater*</td>
<td>200 feet**</td>
<td></td>
</tr>
<tr>
<td>Navigable Waters &amp; Conduits*</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Wetland*</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

*Manure shall not be spread on these features.

**200 foot setback only required for upslope areas unless effectively incorporated within 72 hours.
# CAFO Manure Irrigation Requirements

## Current Manure Irrigation Setbacks for CAFOs

<table>
<thead>
<tr>
<th>Restrictive Feature</th>
<th>Setback</th>
<th>Code Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Public Water Supply Well</td>
<td>1000 feet</td>
<td>NR 214.14(1)(a)</td>
</tr>
<tr>
<td>Non-Community Water Supply Well</td>
<td>250 feet*</td>
<td>NR 214.14(1)(a)</td>
</tr>
<tr>
<td>Inhabited Dwelling</td>
<td>500 feet*</td>
<td>NR 214.14(1)(b)</td>
</tr>
<tr>
<td>Depth to Groundwater &amp; Bedrock</td>
<td>5 feet*</td>
<td>NR 214.14(1)(c)</td>
</tr>
<tr>
<td>Direct Conduit to Groundwater</td>
<td>100 feet</td>
<td>NR 243.14(2)(b)8</td>
</tr>
<tr>
<td>Navigable Waters &amp; Conduits</td>
<td>25-100 feet</td>
<td>NR 243.14(4)(a)</td>
</tr>
<tr>
<td>Wetland</td>
<td>25 feet</td>
<td>NR 243.14(4)(a)</td>
</tr>
</tbody>
</table>

*Greater setback compared to conventional application method.*
CAFO Manure Irrigation Requirements

• Additional restrictions and limitations:
  – Ponding or runoff is prohibited,
  – Even distribution over the field,
  – Hydraulic application rate may not exceed 10,000 gallons per acre,
  – Operated in a load/rest cycle,
  – Annual soil testing requirements, and
  – Other conventional application requirements.
CAFO Manure Irrigation Requirements

• Other sections that give DNR authority:
  – Department may require reduced hydraulic application rates or grass buffer strips,
  – Department may restrict irrigation during times of the year (dormant or no crop established),
  – Department may require monitoring of BOD$_5$, TSS, forms of nitrogen, chloride, metals, or others pollutants,
  – Department may require the installation of a groundwater monitoring well system, and
  – Department may require more stringent requirements than what’s in section NR 243.14.
### Local Ordinances

<table>
<thead>
<tr>
<th>Local Government</th>
<th>County</th>
<th>Prohibited/CUP</th>
<th>Justification</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams County</td>
<td>Adams</td>
<td>CUP</td>
<td>Public Health</td>
<td><a href="http://www.adamscountylwcd.net/Ordinance_Spray_Irrigation.pdf">http://www.adamscountylwcd.net/Ordinance_Spray_Irrigation.pdf</a></td>
</tr>
<tr>
<td>Town of Bradford</td>
<td>Rock</td>
<td>CUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Town of Johnstown</td>
<td>Rock</td>
<td>Prohibited</td>
<td>Public Nuisance</td>
<td><a href="https://drive.google.com/viewerng/viewer?a=v&amp;pid=sites&amp;srcid=ZGVmYXVsGRvbWFpbnxob3duZgb2hu3Rvd24xGd4OJ3EzNme1ND1iNGQ5ODBiYyA">https://drive.google.com/viewerng/viewer?a=v&amp;pid=sites&amp;srcid=ZGVmYXVsGRvbWFpbnxob3duZgb2hu3Rvd24xGd4OJ3EzNme1ND1iNGQ5ODBiYyA</a></td>
</tr>
<tr>
<td>Town of Richmond</td>
<td>Walworth</td>
<td>CUP</td>
<td>Public Health</td>
<td><a href="http://www.codepublishing.com/wi/richmond/">http://www.codepublishing.com/wi/richmond/</a></td>
</tr>
</tbody>
</table>

This table is not all inclusive of local ordinances related to manure irrigation in the state of Wisconsin.
Manure Irrigation Plan (CAFO)

• If a CAFO wants to apply manure and/or process wastewater via irrigation they must develop a manure irrigation plan.

• The manure irrigation plan is part of the farm’s NMP.

• A manure irrigation plan consists of.....
Manure Irrigation Plan (CAFO)

• Narrative / Questionnaire
  – Initially developed in April 2013.
  – May be revised once the Manure Irrigation Workgroup and Research is complete.

• Narrative covers:
  – Fields
  – Restriction Maps
  – Manure / Process Wastewater Characteristics
  – Equipment Design
  – Operation, Timing and Methods
  – Drift and Runoff Prevention
  – Response Actions for Drift / Runoff
Manure Irrigation Plan (CAFO)

- Restriction Maps
# Manure Irrigation Plan (CAFO)

- **Drift Monitoring Log**

## Irrigation Application Record Sheet

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Pivot Operating Property</th>
<th>Wind Speed (mph)</th>
<th>Wind Direction</th>
<th>Sunlight Exposure (full, partial, none)</th>
<th>Temp. (°F)</th>
<th>Evidence of Surface Runoff</th>
<th>Evidence of Offsite Drift</th>
<th>Tile Outlets Inspected</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Monitoring of irrigation equipment will be completed at least every ______ hour(s) when in operation. Any deficiencies found during monitoring activities should be explained in the notes section.
Manure Irrigation Plan (CAFO)

• Equipment Specifications
  – Typically this information comes from the manufacture.
  – Specs include:
    • Size of nozzle,
    • Operating pressures,
    • Droplet size,
    • Ability to operate the system in changing weather conditions,
    • Etc.
Manure Irrigation Plan (CAFO)

• Other Information:
  – Manure and process wastewater test results,
    • For manure sources planned to be used for irrigation.
  – Soil test results,
    • For fields proposed for manure irrigation only.
  – Photos of irrigation equipment.
Manure Irrigation Plan (CAFO)

• Department Review
  – Complete Manure Irrigation Plan is submitted to the Department.
    • Currently all plans are reviewed by Nutrient Management Program Coordinator (Joe Baeten).
    • An irrigation request is not a substantial revision.
  – Department denies or approves plan.
    • Approval is conditional.
  – Reporting requirements are done with the Annual Report and/or NMP Update.
QUESTIONS?

Joe Baeten
WDNR NM Program Coordinator
Green Bay Service Center
(920) 662-5191
Joseph.Baeten@Wisconsin.gov