DATCP Update: Odor Study Results and Livestock Siting Revisions

Steve Struss

Midwest Manure Summit
Green Bay
February 15, 2011
ANIMAL WASTE STORAGE

CITY LIMITS

CAN YOU SMELL ME NOW?
Conservation Innovation Grant (CIG)
Livestock Air Monitoring & Odor Project

in cooperation with

http://datcp.wi.gov/Farms/Livestock/Odor_and_Air_Emissions/index.aspx
Conservation Innovation Grant (CIG) Livestock Air Monitoring & Odor Project

Project Overview:

- $1.6 Million effort (USDA/DNR/DATCP) over a 3-year period
- Demonstration of four current control technologies, NOT basic research
- Focused on Ammonia, Hydrogen Sulfide, and Odors from CAFOs, primarily manure storage lagoons
Conservation Innovation Grant (CIG) Livestock Air Monitoring & Odor Project

Study Participants:

- A request went out State-wide for farmers willing to participate in the study
- Six farms were selected by a Steering Committee
- Criteria included type of operation and a favorable layout for air monitoring
Permeable Lagoon Cover
Impermeable Lagoon Cover
Anaerobic Digester

Mesophilic

Thermophilic
Project Objectives:

- Evaluate the ATCP 51 Odor Standard compared to measured ambient odors on operating farms
- Install control practices to reduce ambient air NH3 and H2S concentrations, and odors
- Evaluate the effectiveness of the control practices
Permeable Lagoon Cover – Case Study # 3
Nasal Ranger™
Field Olfactometer

“ODOR SCHOOL”®

STEVEN R. STRUSS
Odor Inspector
Odorous Emissions Evaluation Field Certification
For Measuring Ambient Odors

2 October 2006
St. Croix Sensory Evaluation & Training Center
Lake Elmo, Minnesota
Sample Nasal Ranger™ Field Data (without cover)
Comparison of Nasal Ranger™ to Odor Score Permeable Cover
Ambient NH$_3$ and H$_2$S Monitoring
Sample Ambient NH₃ and H₂S Field Data (pre-cover)
Sample Ambient NH$_3$ and H$_2$S Field Data (post-cover)
Near Lagoon Ambient NH3 (ug/m³)

**Digestors**

- impermeable cover

**Undigested Manures**

- solids separation and aeration
  - permeable cover

NR 445  418 ug/m³

<table>
<thead>
<tr>
<th>Digestors</th>
<th>Undigested Manures</th>
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<tbody>
<tr>
<td>WC</td>
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<tr>
<td>DC Pre</td>
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NR 445  418 ug/m³
Odor Study Findings

- Permeable covers: ~70% reduction in odors
- Impermeable covers: nearly 100% reduction in odors
- Anaerobic digesters: +/-15% impact on odors; however, operating conditions (retention time, substrate addition, etc.) can influence this
- Solids separation with aeration: ~25% reduction in odors
Air Monitoring Findings

\( \text{NH}_3 \) Near Lagoon Concentrations:

- Permeable cover \(<\) no cover
- Impermeable cover \(<<\) no cover
- Digested manure \(>\) undigested manure
- Aeration \(>\) no aeration
Air Monitoring Findings

H$_2$S Near Lagoon Concentrations:

- Permeable cover somewhat < no cover
- Impermeable cover somewhat < no cover
- Digested manure = undigested manure
- Aeration > no aeration
Implications for the Siting Rule (ATCP 51)

- The odor model correctly predicts odors from averaged sized manure storage facilities (2 - 4 acres)

- The odor model under predicts odors from small manure storage facilities (1/2 acre)

- The credit for manure storage covers is appropriate

- The credit for anaerobic digesters is too high

- The credit for solids separation and aeration is too high
## Listening Session Results

<table>
<thead>
<tr>
<th>432 supported</th>
<th>431 wanted change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictable process</td>
<td>Restricts local control</td>
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<tr>
<td>Protective, uniform standards</td>
<td>Standards are weak</td>
</tr>
<tr>
<td>Setback distances work</td>
<td>No control over location</td>
</tr>
<tr>
<td>Allows for public input</td>
<td>Favors CAFOs over locals</td>
</tr>
<tr>
<td>Permitting process works</td>
<td>No enforcement, low fees</td>
</tr>
<tr>
<td>Small changes acceptable</td>
<td>Want major reform</td>
</tr>
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Technical Advisory Committee
Recommendations for Odor

- Modify three, and create two new, odor generation numbers
- Increase one, and decrease six, odor control credits
- Create two new odor control practices
- Eliminate the 2,500’ odor standard exemption
- Require all management plans, and reduce points
Siting Rule – Revision Process

- Public Listening Sessions – Spring 2010
- Technical Advisory Committee – Fall 2010
- Scoping Statement – October 2010
- Proposed Rule Revisions – 2011
- Public Hearings – 2011/2012
- Possible Rule Changes – 2012
Advisory Group Recommendations for DNR’s 445 Rule

- 29 Beneficial Management Practices
- Both “Established” and “Demonstration” Practices
- Dairy, Beef, Swine, and Poultry Practices
- Definitions and Levels of NH$_3$ and H$_2$S Control
The Future for Wisconsin Agriculture