Livestock Siting Odor Standard
Background and BMPs

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Ag Waste BMP Advisory Group
2nd Meeting
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ANIMAL WASTE STORAGE

CAN YOU SMELL ME NOW?
Controversial denials of permits for livestock operations

WI Act 235 signed into Law (93.90)

ATCP 51 goes into effect

2002
2003
2004
2005
2006
2007

Rhode Committee formed

Rep. David Ward introduces AB 868

Rhode Committee recommends draft rule

Technical Expert Panel completes 6 months of work
Livestock Facility Siting Standards

Statewide Standards

Locally Enforced
Who Must Meet the Odor Standard?

Only those applying for a siting permit

**REQUIRED** (within 2,500 feet of neighbor)
- Expanding operations over 1,000 AU
- New operations over 500 AU

**OPTIONAL**
- Expanding operations < 1,000 AU
- New operations < 500 AU
- Operations with > 2,500 feet from neighbor
Odor Standard Basics

- Predictive Standard
- Enforcement = practices, not “sniff tests”
- Allows some odor
- Considers odor from structures only
  - Distance to neighbors and density
  - Practices
  - Wind Direction
- Does not consider odor from landspreading
Odor Standard Basics

Nearest Affected Neighbor

Measure distance from each housing, storage, and animal lot to the nearest affected neighbor.
BMP Development Process

- Technical Expert Panel Formed
- Comprehensive Literature Search Conducted
- U. of M. OFFSET Model Chosen
- Model Customized for Wisconsin Farms
OFFSET
Odor From Feedlots Setback Estimation Tool

Larry Jacobson, David Schmidt, and Susan Wood

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Introduction

When discussing odor problems related to animal agriculture, the following questions often arise:

- How far does odor travel?
- Are animal numbers or animal species accurate predictors of nuisance odors?
- How much odor control is needed to solve an odor problem from an existing facility?
- Can the odor impact from a new facility be predicted?

Answers to these questions are as varied as the people having the discussion. Until now, scientific methods to predict odor impacts did not exist. This publication discusses a new tool that has been developed at the University of Minnesota to answer some of these questions. The tool, "Odor From Feedlots Setback Estimation Tool" (OFFSET), is the result of four years of extensive data collection and field testing. It is a simple tool designed to help answer the most basic questions about odor impacts from livestock and poultry facilities.

OFFSET is designed to estimate average odor impacts from a variety of animal facilities and manure storages. These estimations are useful for rural land use planners, farmers, or citizens concerned about the odor impact of existing, expanding, or new animal production sites. OFFSET is based on odor measurements from Minnesota farms and Minnesota climatic conditions. As such, the use of OFFSET for estimating odor impacts in other geographic areas should be done with caution.

Figure 1. Prediction of odor problems is important as rural and non-rural areas converge.
### Table 2. Odor emission numbers for animal housing with average management level.

<table>
<thead>
<tr>
<th>Species</th>
<th>Animal Type</th>
<th>Housing Type</th>
<th>Odor Emission Number/ft.²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>Beef</td>
<td>Dirt/concrete lot, Free stall, scrape</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Dairy</td>
<td>Free stall, deep pit, Loose housing, scrape</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Pork</td>
<td>Full stall, natural or mechanical</td>
<td>2</td>
</tr>
<tr>
<td>Swine</td>
<td>Gestation</td>
<td>Deep pit, natural or mechanical</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Farrowing</td>
<td>Full stall, natural or mechanical</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Nursery</td>
<td>Deep pit, natural or mechanical</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Finishing</td>
<td>Full stall, natural or mechanical, Pull plug, natural or mechanical</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hoop barn, deep bedded, scrape, Cesspit (open front), scrape</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose housing, scrape, Open concrete lot, scrape</td>
<td>11</td>
</tr>
<tr>
<td>Poultry</td>
<td>Broiler</td>
<td>Litter</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
<td>Litter</td>
<td>2</td>
</tr>
</tbody>
</table>

### Table 3. Odor emission reference rate for manure storage.

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Odor Emission Number/ft.²</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Earthen basin, single or multiple cells</td>
<td>13</td>
</tr>
<tr>
<td>Steel or concrete tank, above or below ground</td>
<td>22</td>
</tr>
<tr>
<td>Crusted scallop</td>
<td>2</td>
</tr>
</tbody>
</table>

*Earthen basins are designed for manure storage without any treatment. Properly designed lagoons may have far less odor.

### Table 4. Odor control factors.

<table>
<thead>
<tr>
<th>Odor Control Technology</th>
<th>Odor Control Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>No odor control technology</td>
<td>1</td>
</tr>
<tr>
<td>Biofilter on 100% of building exhaust fans</td>
<td>0.1</td>
</tr>
<tr>
<td>Geotextile cover (0.42 mm)</td>
<td>0.5</td>
</tr>
<tr>
<td>Straw or natural crust on manure 4&quot;</td>
<td>0.5</td>
</tr>
<tr>
<td>Impeasable cover</td>
<td>0.5</td>
</tr>
<tr>
<td>Oil sprinkling</td>
<td>0.8</td>
</tr>
</tbody>
</table>

### Predicting Odor Events
OFFSET BMP List

Biofilter
Geotextile Cover
Natural Crust
Impermeable Cover
Oil Sprinkling

DATTCP BMP List

Biofilter
Geotextile Cover
Natural Crust
Impermeable Cover
Oil Sprinkling
Diet Manipulation
Fresh Water Flush
Treated Water Flush
Air Dam (swine)
Frequent Cleaning
Anaerobic Digestion
Chemical or Biological Additives
Composting
Solids Separation and Reduction
Water Treatment
Aeration
Bio-cover
Bottom Fill
Drag Earthen Lots
Animal Lot Moisture Control
Windbreaks
BMP Odor Control Credits

- Best available literature
- Data supplied by industry
- Comparison to similar practices
- Consultation with experts (U. of M. and others)
- Field experience and “gut level intuition”
Legislative Intent

- Protective of public health and safety
- Practical and workable
- Cost-effective
- Objective
- Based on peer-reviewed science
- Promotes animal agriculture
- Balances farm economics with protecting natural resources and other community interests
- Useable by local authorities
Practical and Workable
Cost-Effective

- Based on limited available data
- Subjective by nature
- Costs vary between farms
- Benefits can vary widely
Procedure for Innovative Practices

1. Producer or manufacture applies for credit
2. DATCP assesses control effectiveness using
   - Performance data
   - Field observations
3. DATCP assigns odor control credit

(Note: only 1 case to date)
Technical Rule Updates

- Mostly to adopt changes in technical standards
- But also can be used to “fix” certain problems
- Cannot be used for policy changes
- Controversial standards require more process
Listening Session Key Comments

**Speaking in Support**
(432 Commenters)

- Provides a predictable permitting process: 28%
- The permitting process is working: 26%
- Protects the environment: 17%
- Based on uniform standards: 16%
- Nutrient Management Plans are working: 12%

**Speaking Against**
(431 Commenters)

- Doesn't protect water resources: 25%
- Takes away local control: 22%
- Doesn't protect against odors: 19%
- Enforcement is inadequate: 17%
- Fees are too low for proper administration: 19%
BMP’s – A Work in Progress

- Established based upon the best available information at the time
- Practices may be added or modified with future rule updates
- Odor control credits will be adjusted to reflect increased knowledge base