Livestock Siting Odor Standard Background and BMPs

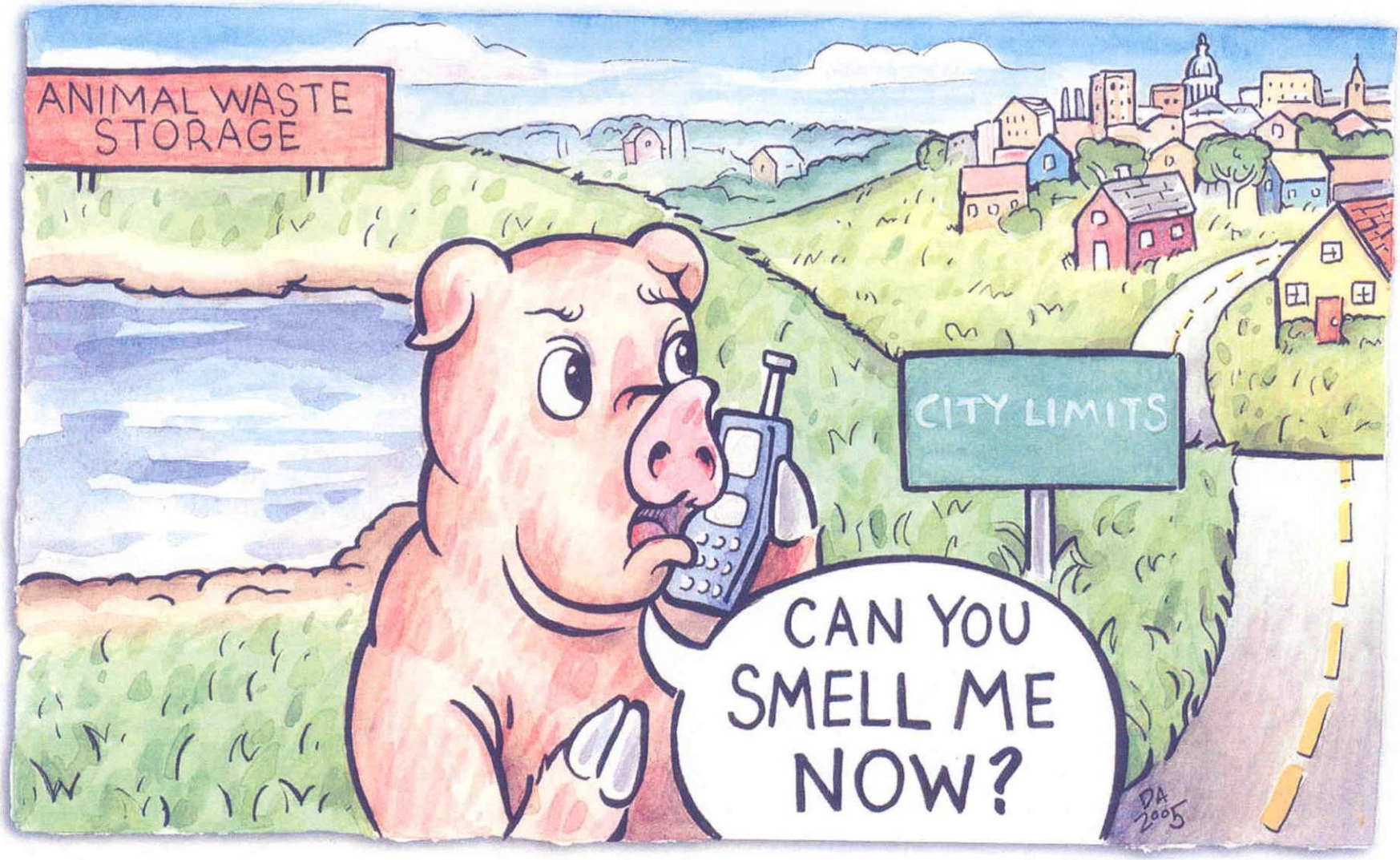
Steve Struss, P.E.

Livestock Facility Siting Engineer

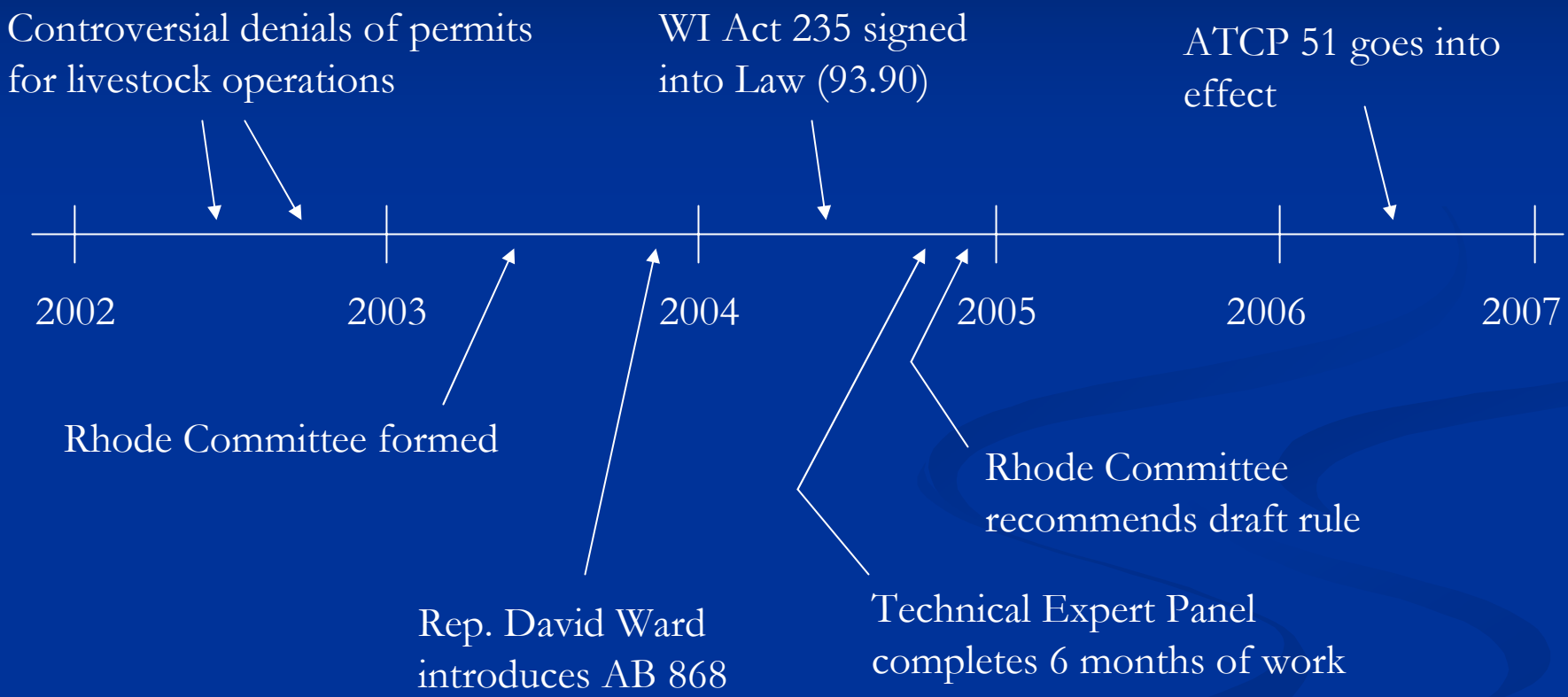
Ag Waste BMP Advisory Group

2nd Meeting

May 11, 2010


ANIMAL WASTE STORAGE
CITY LIMITS
CAN YOU SMELL ME NOW?
DA 2005

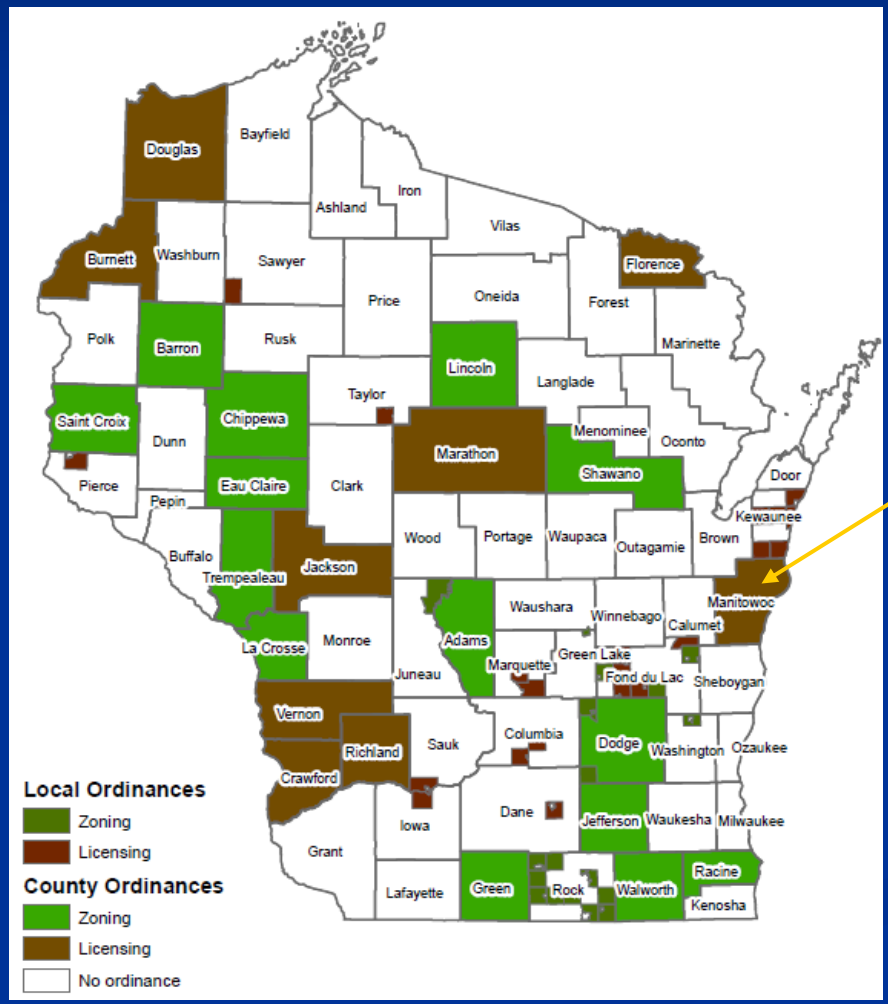
History/Timeline



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

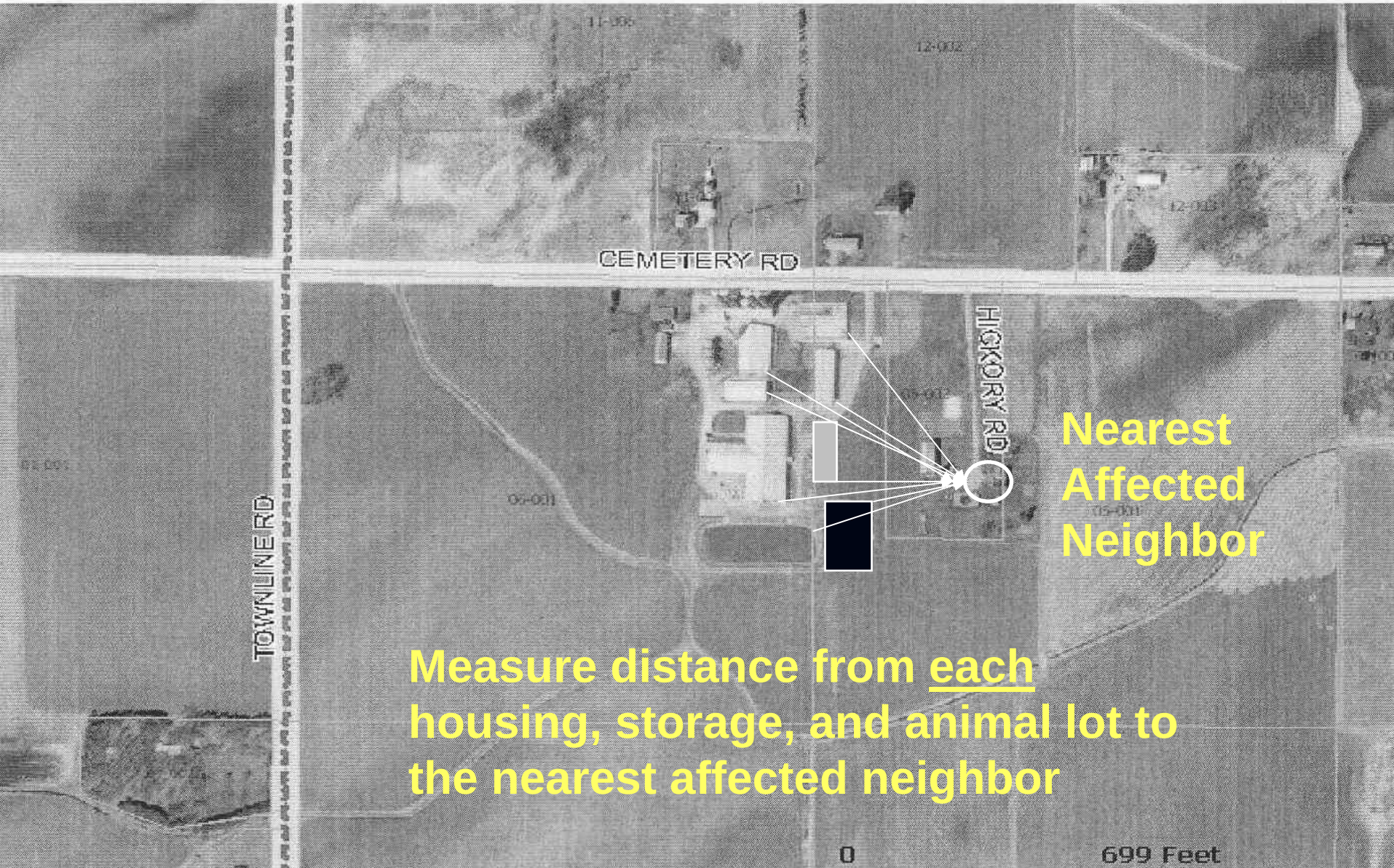
OPTIONAL

- 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



BMP Development Process

- Technical Expert Panel Formed
- Comprehensive Literature Search Conducted
- U. of M. OFFSET Model Chosen
- Model Customized for Wisconsin Farms

FO-07680 2001

To Order

OFFSET
Odor From Feedlots Setback Estimation Tool

Larry Jacobson, David Schmidt, and Susan Wood

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?

Figure 1. Prediction of odor problems is important as rural and non-rural areas converge.

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

Table 2. Odor emission numbers for animal housing with average management level.*

Species	Animal Type	Housing Type	Odor Emission Number/ft.^{2}
Cattle	Beef	Dirt/concrete lot; Free stall, scrape	4
	Dairy	Free stall, deep pit; Loose housing, scrape Tie stall, scrape	6 2
Swine	Gestation	Deep pit, natural or mechanical Pull plug, natural or mechanical	50 30
	Farrowing	Pull plug, natural or mechanical	14
	Nursery	Deep pit, natural or mechanical; Pull plug, natural or mechanical	42
	Finishing	Deep pit, natural or mechanical Pull plug, natural or mechanical Hoop bar, deep bedded, scrape; Cargill (open front), scrape Loose housing, scrape; Open concrete lot, scrape	34 20 4 11
Poultry	Broiler	Litter	1
	Turkey	Litter	2

Table 3. Odor emission reference rate for manure storage.

Storage Type	Odor Emission Number/ft.$_2$
*Earthen basin, single or multiple cells	13
Steel or concrete tank, above or below ground	28
Crusted stockpile	2

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

Table 4. Odor control factors.

Odor Control Technology	Odor Control Factor
No odor control technology	1
Biofilter on 100% of building exhaust fans	0.1
Geotextile cover (≥2.4 mm)	0.5
Straw or natural crust on manure 4" 8"	 0.5 0.3
Impermeable cover	0.1
Oil sprinkling	0.8

Predicting Odor Events

OFFSET BMP List

Biofilter

Geotextile Cover

Natural Crust

Impermeable Cover

Oil Sprinkling

DATCP 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

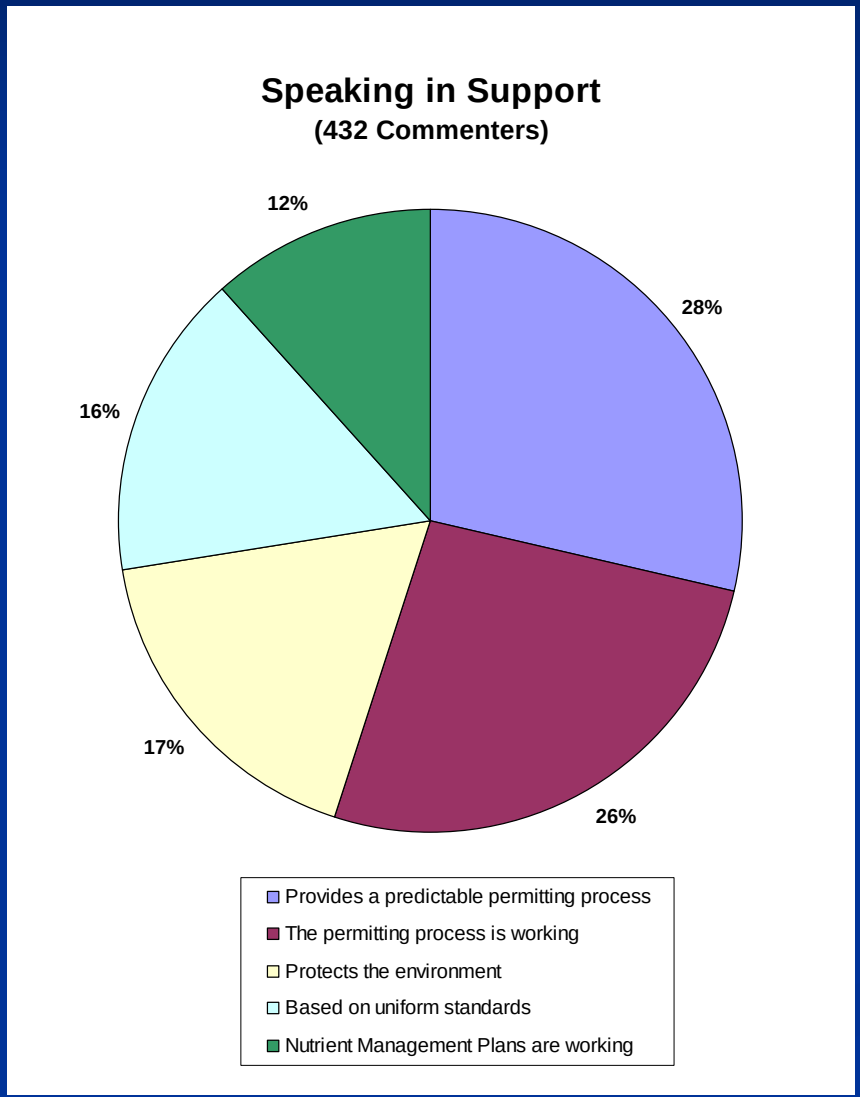
1. Producer or manufacture applies for credit
2. DATCP assesses control effectiveness using
   - Performance data
   - Field observations
3. DATCP assigns odor control credit

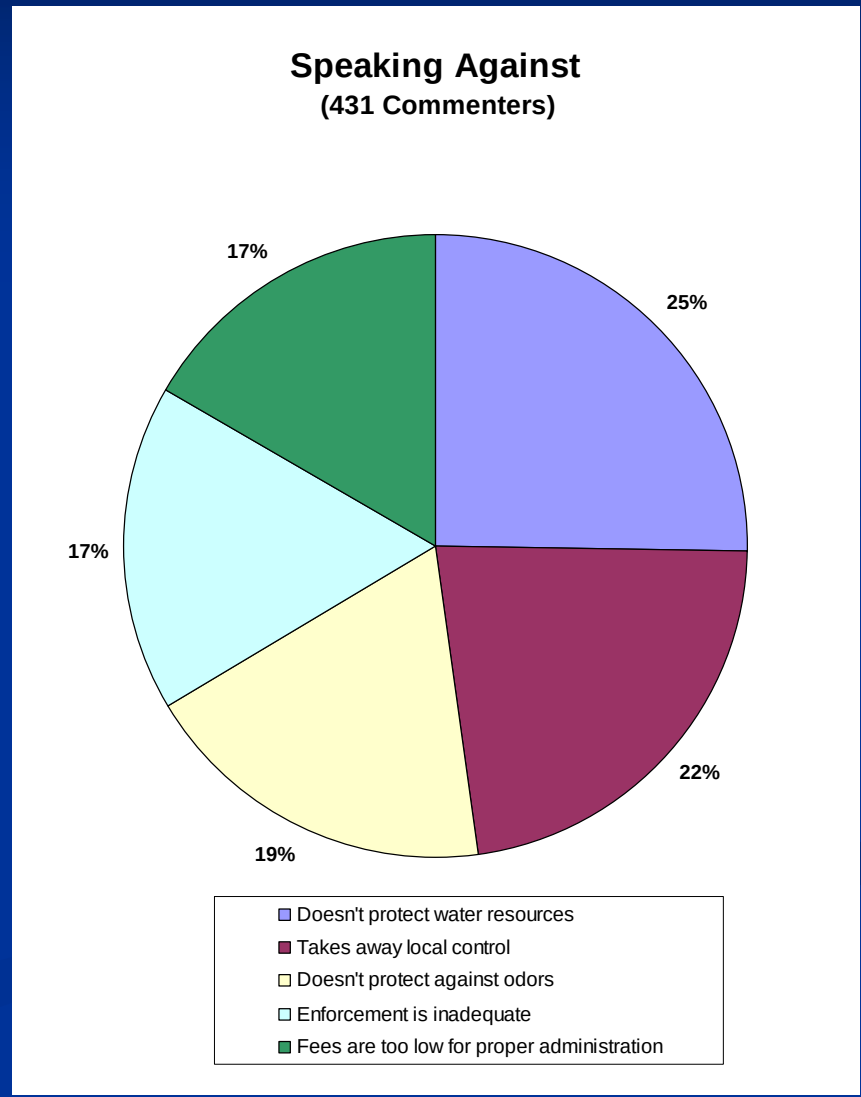
(Note: only 1 case to date)

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





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