Wisconsin Department of
Agriculture, Trade and Consumer Protection

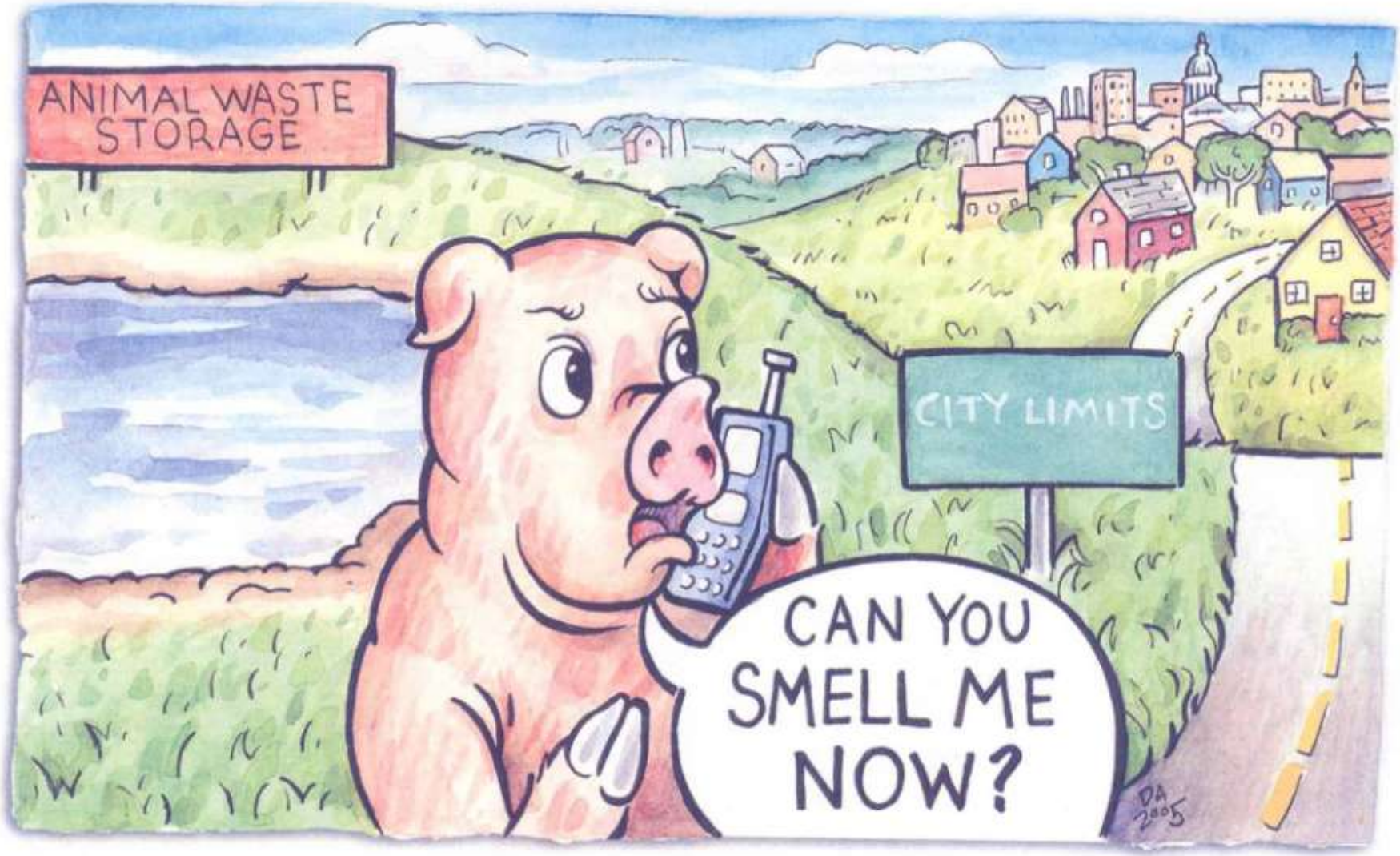
DATCP Update: Odor Study Results and Livestock Siting Revisions

Steve Struss

Midwest Manure Summit

Green Bay

February 15, 2011


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

Wisconsin Department of
Agriculture, Trade and Consumer Protection

Conservation Innovation Grant (CIG)

Livestock Air Monitoring & Odor Project

in cooperation with

WISCONSIN DEPT. OF NATURAL RESOURCES

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

Solid Separation / Aeration

Conservation Innovation Grant (CIG) Livestock Air Monitoring & Odor Project

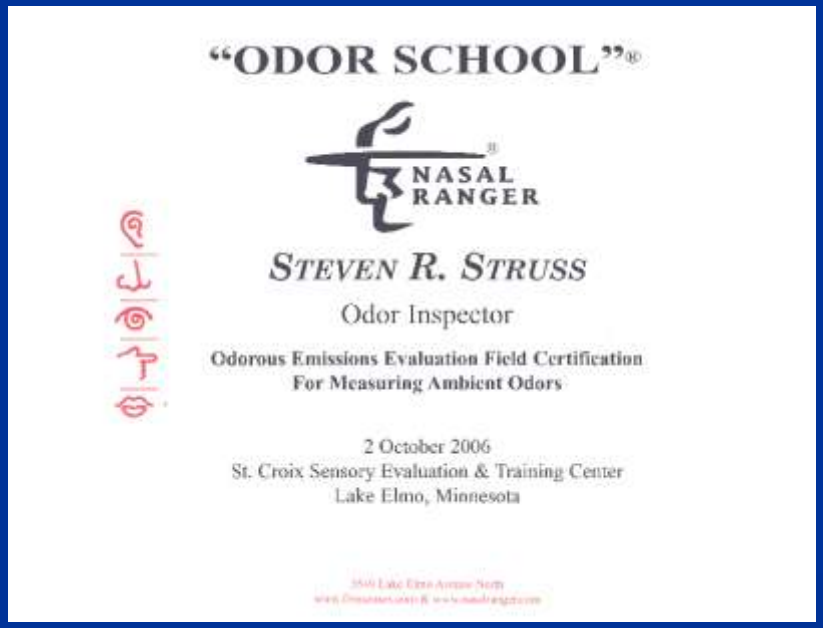
Project Objectives:

- 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"®

NASAL RANGER

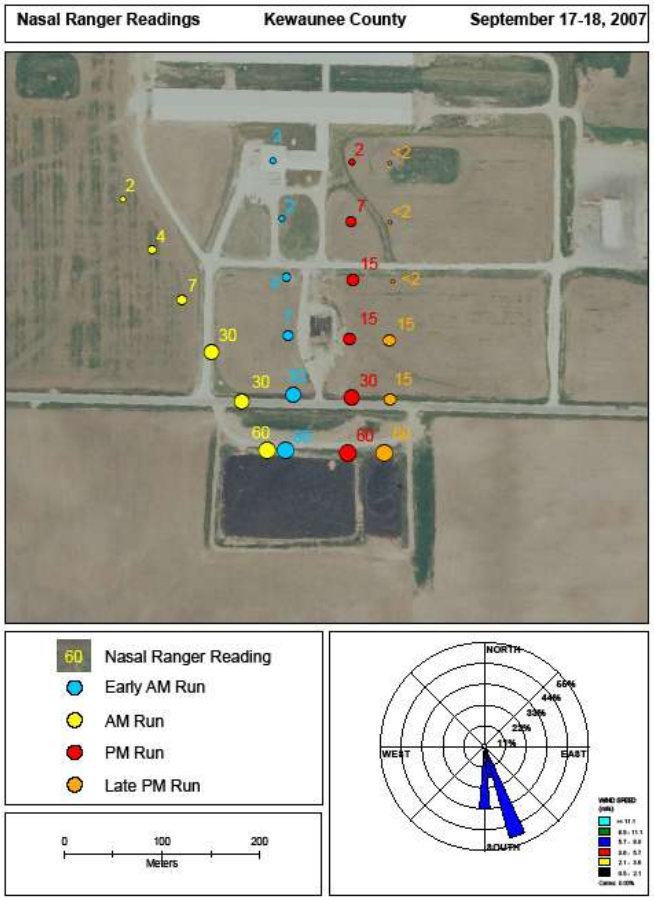
STEVEN R. STRUSS

Odor Inspector

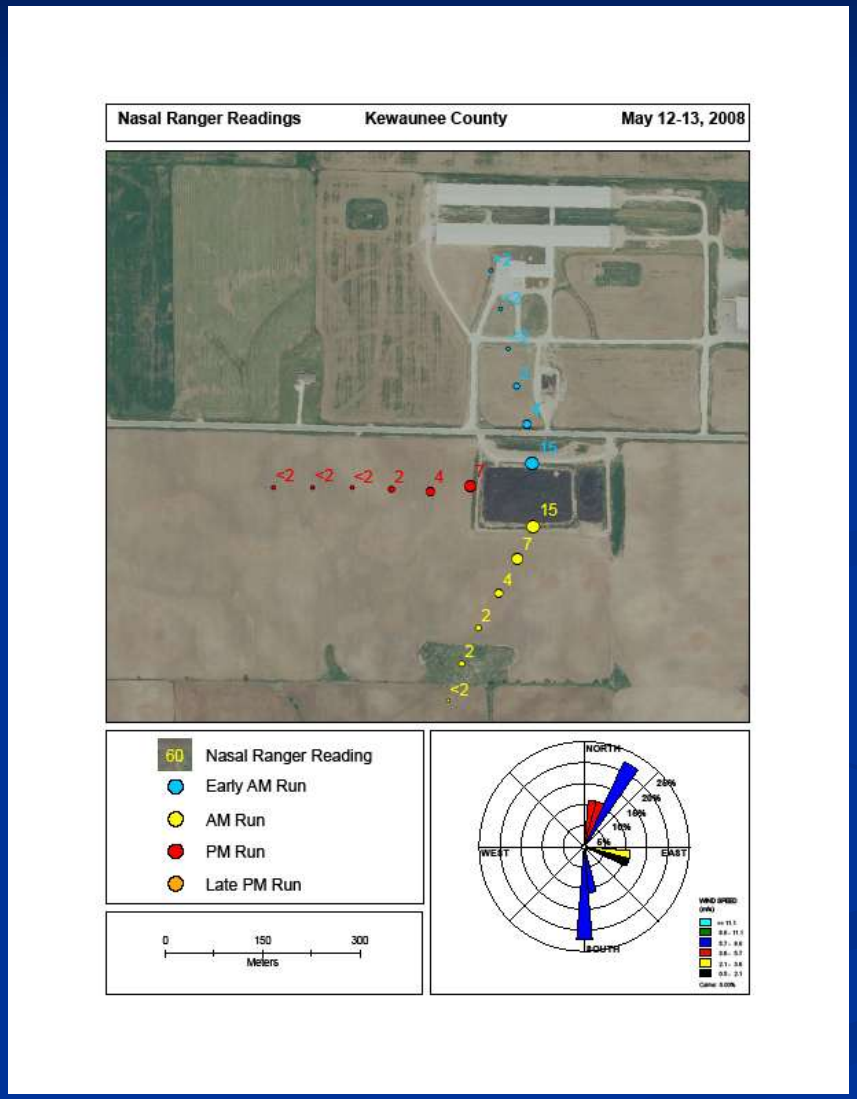
Odorous Emissions Evaluation Field Certification For Measuring Ambient Odors

2 October 2006
St. Croix Sensory Evaluation & Training Center
Lake Elmo, Minnesota

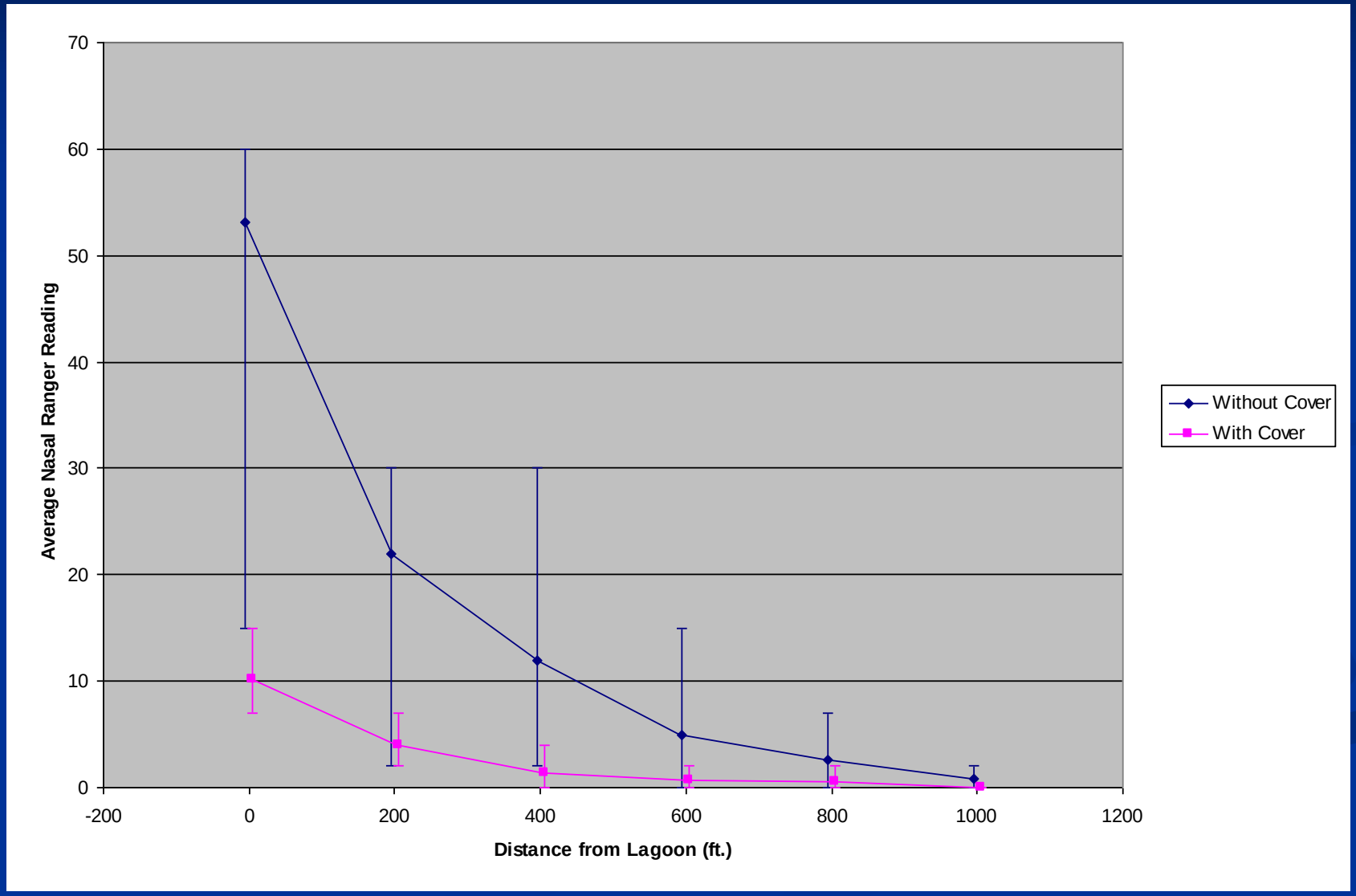
Sample Nasal Ranger™ Field Data (without cover)



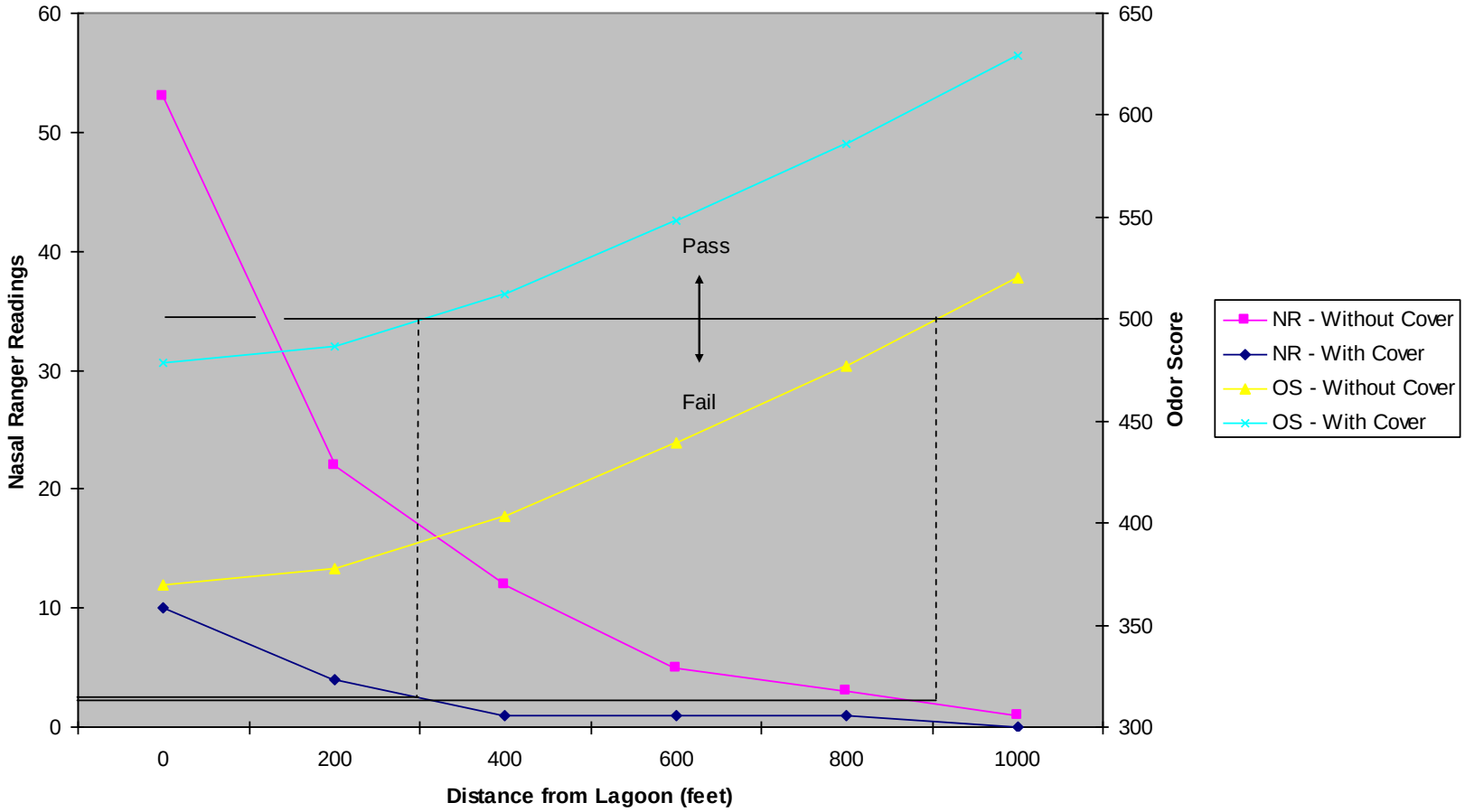
Sample Nasal Ranger™ Field Data (with cover)



Permeable Cover Results



Comparison of Nasal Ranger™ to Odor Score Permeable Cover



Ambient NH_3 and H_2S Monitoring

Sample Ambient NH_3 and H_2S Field Data (pre-cover)

Ambient Air Concentrations
Daytime Levels

Kewaunee County
September 17, 2007

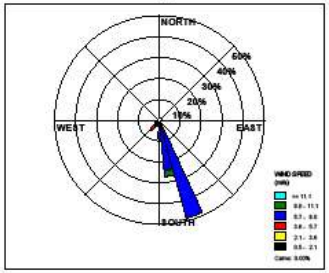
Field Sampling Measurements
(Micrograms per Cubic Meter)

Location	NH3	H2S
11	321	65
13	649	72
15	848	262
17	165	54
19	70	ND
22	ND	ND
24	ND	ND
26	ND	ND
28	36	ND
30	743	31
32	176	118

Note: ND = Non-Detect (detection limits vary with conditions)

Ammonia
Hydrogen Sulfide
10 Location Number

0 25 50
Meters



Sample Ambient NH_3 and H_2S Field Data (post-cover)

Ambient Air Concentrations
Daytime Levels

Kewaunee County
May 12, 2008

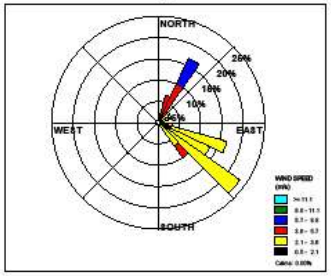
Field Sampling Measurements
(Micrograms per Cubic Meter)

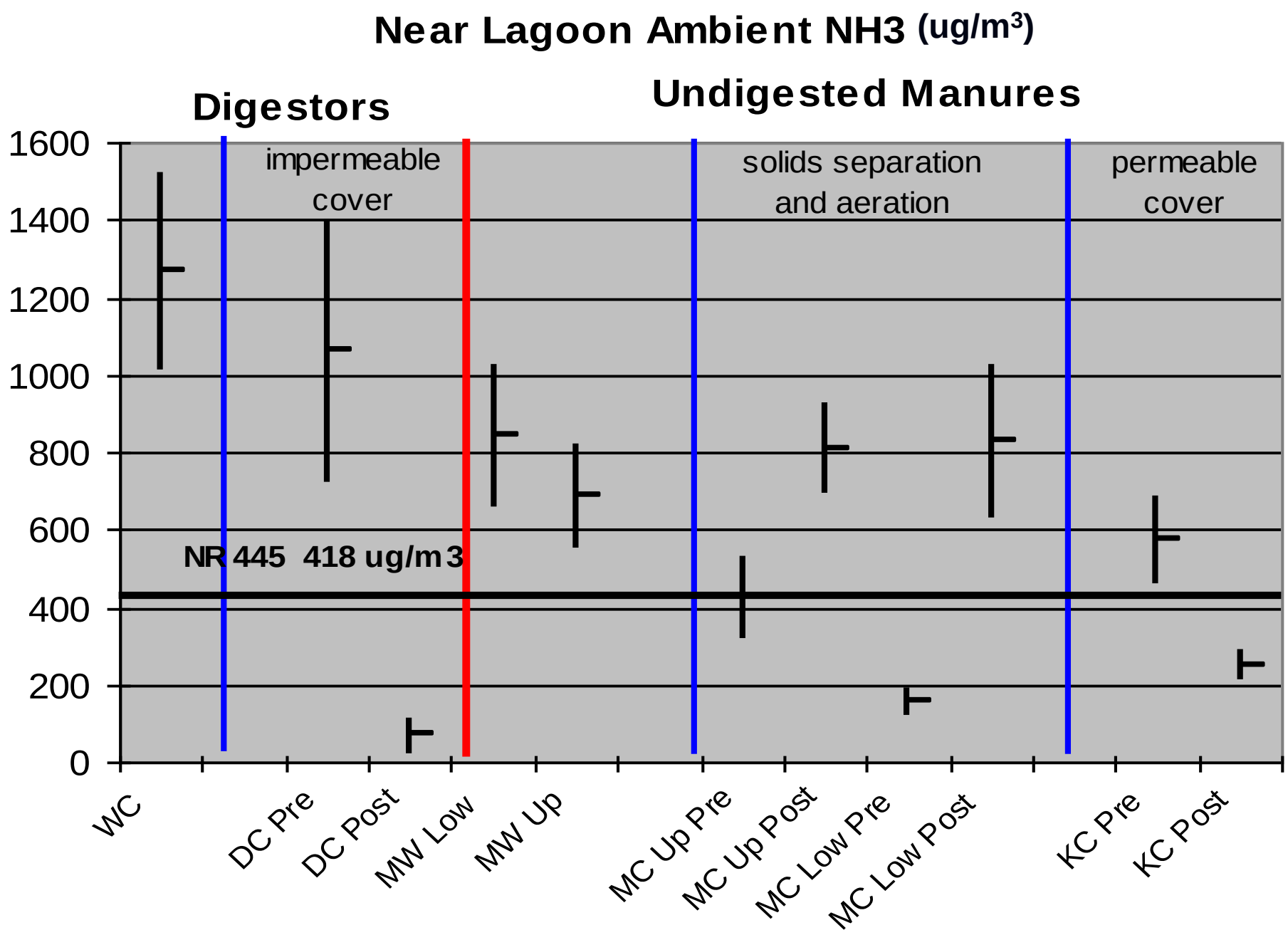
Location	NH3	H2S
10	256	ND
12	180	ND
14	115	ND
15	185	ND
16	ND	ND
18	ND	ND
20	ND	ND
22	46	ND
23	47	ND
24	53	ND
25	110	ND
26	92	ND
27	296	ND
29	328	ND
31	271	ND
32	246	ND
33	218	ND

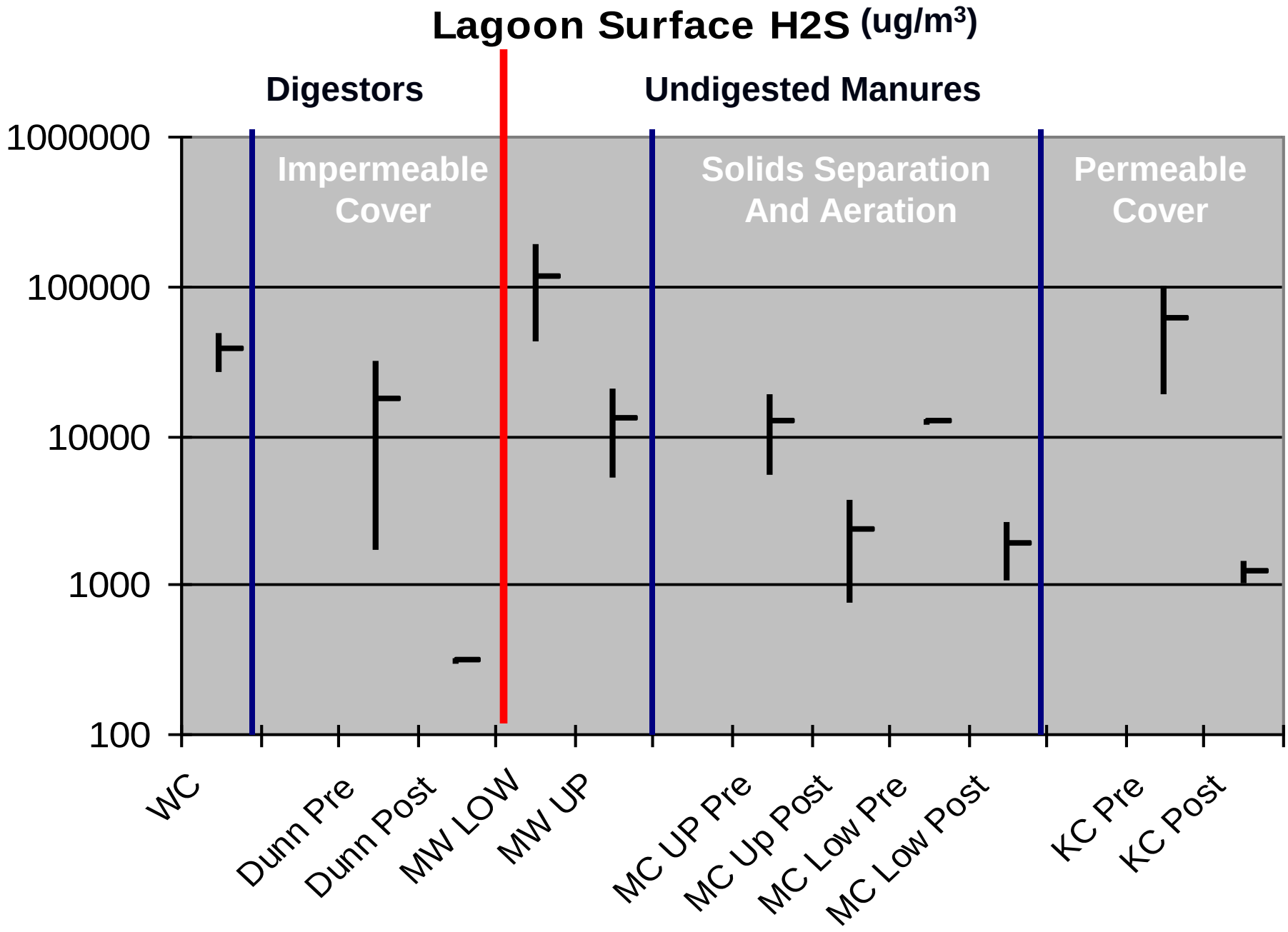
Note: ND = Non-Detect (detection limits vary with conditions)

Ammonia
Hydrogen Sulfide
10 Location Number

0 25 50
Meters




Near Lagoon Ambient NH3 (ug/m3)
Digestors
Undigested Manures
impermeable cover
solids separation and aeration
permeable cover
NR 445 418 ug/m3
1600
1400
1200
1000
800
600
400
200
0
WC
DC Pre
DC Post
MW Low
MW Up
MC Up Pre
MC Up Post
MC Low Pre
MC Low Post
KC Pre
KC Post


Lagoon Surface H2S (ug/m3)
Digestors
Undigested Manures
Impermeable Cover
Solids Separation And Aeration
Permeable Cover
1000000
100000
10000
1000
100
WC
Dunn Pre
Dunn Post
MW LOW
MW UP
MC UP Pre
MC Up Post
MC Low Pre
MC Low Post
KC Pre
KC Post

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

NH_3 Near Lagoon Concentrations:

Permeable cover < no cover

Impermeable cover << no cover

Digested manure > undigested manure

Aeration > no aeration

Air Monitoring Findings

H_2S 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

432 supported	431 wanted change
Predictable process	Restricts local control
Protective, uniform standards	Standards are weak
Setback distances work	No control over location
Allows for public input	Favors CAFOs over locals
Permitting process works	No enforcement, low fees
Small changes acceptable	Want major reform

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

Livestock

www.agriview.com/livestock_news

AGRI-VIEW

Section B • December 23, 2010

Livestock Roundup

Wisconsin FSA provides winter storm livestock loss assistance

Livestock producers who incurred eligible

Technical experts finalize committee recommendations on livestock siting

By Jeffrey Hoffat
Livestock Editor

The group of technical experts appointed by the Department of Agriculture, Trade and Consumer Protection (DATCP) met in Madison for the final time on Dec. 16. For more than five

"Individual recommendations range in specificity for a number of reasons, including the complexity of the subject matter and the current state of research," they wrote in the group's cover letter to DATCP. "Some recommendations suggest general guidance and point to factors that the department

Odgers summarized the committee's task as a balancing act – not only between technical and political, but between agriculture and community.

"Balance is one of the most difficult things in life to achieve," he said. "We need to find a balance between cost-effective expansion and a good

have completed its statutory responsibility to conduct a four-year review." Secretary of Agriculture Randy Romanski said in a letter to the committee. "Certain issues raised during the four-year review may now be managed within the rulemaking framework, which is governed by a different set of procedures and considerations."

Before the recommen-

nical sectors of livestock siting were present.

Peer review discrepancy

The first contentious discussion came over the necessity of peer reviewed science.

Some individual committee members felt that tested research was needed on technological advancements, including anaerobic digesters and manure storage liner types

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_2S Control

Beneficial Management Practices
for
Mitigating Hazardous Air Emissions
from Animal Waste in Wisconsin

December 13, 2010

The Future for Wisconsin Agriculture