

Nebraska Odor Footprint Tool

Odor Risk Assessment & Separation Distance Estimation for Livestock & Poultry Facilities

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What is the NOFT?

The Nebraska Odor Footprint Tool is:

- A planning tool
 - Used to determine minimum separation distances at various levels of odor risk
- A 'simple tool'
 - Excel® spreadsheet
 - Worksheet, tables, and set of curves
 - In development! Web-based platform
- Based upon results of dispersion modeling

Objectives behind the NOFT

- Increase the use of objective, science-based information in decision-making related to livestock odor
- Encourage voluntary implementation of proven odor control technologies



Risk-Based Odor Assessment

Odor risk may be expressed as the projected percentage of hours over an extended period of time during which odor:

- Exists at annoying levels
 - 'Odor annoyance frequency'
 - e.g. values from 1 to 10%

OR

- Is not present at annoying levels
 - 'Odor annoyance-free frequency'
 - e.g. values of 90 to 99%

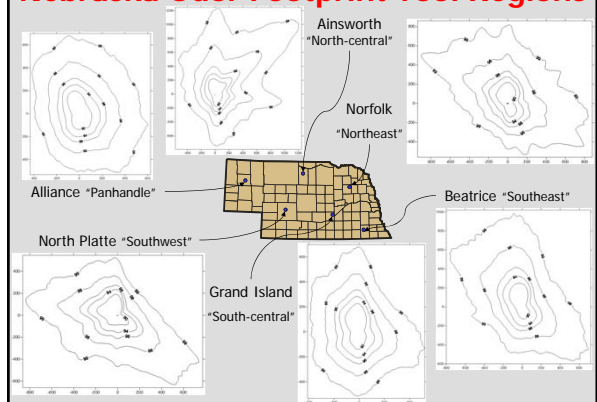


— wording utilized within the NOFT

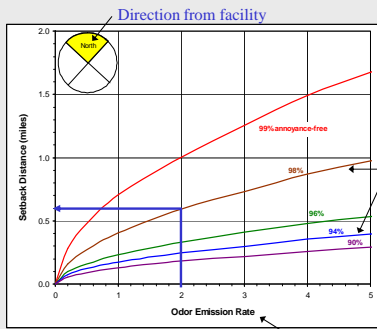
NOFT Results: Spreadsheet View

NEBRASKA ODOR FOOTPRINT TOOL					
Setback Distance Results					
Project title:	Example	Prepared for:			
Site location:	Northeast, NE	Date prepared:			
Location for weather data:	Norfolk, Neb. (Northeast Neb.)				
Type of facility:	Source Facility 1: Swine, Finishing Bldg. Shallow pit (out-pit)	Source Facility 2: Manure Storage Earthed basin	Source Facility 3:	Source Facility 4:	
Total plan area: (sq. ft.)	32,000	70,000			
Total number of animals:	5,000	4,000			
Base odor control:	No supplemental odor control implemented	No supplemental odor control implemented			
Alternate odor control:	Biocover: Cool weather ventilation	Straw 2" thick			
New Percentage of total odor:	31%	69%			
Terrain:	Northeast: Flat terrain	Southeast: Flat terrain	Southwest: Uncultivated, low-lying area	Northwest: Flat terrain	
BASE PLAN	Setback Distance (miles)				
Odor Annoyance-Free Frequency	90%	0.32	0.37	0.33	0.31
	95%	0.43	0.38	0.34	0.42
	99%	0.53	0.48	0.38	0.52
ALTERNATE PLAN	90%	0.24	0.13	0.11	0.24
	95%	0.30	0.17	0.16	0.31
	99%	0.36	0.28	0.27	0.37
	90%	0.27	0.09	0.16	0.19
	99%	0.32	0.37	0.34	1.18

Nebraska Odor Footprint Tool Regions



Directional Setback Distance Curves



Lincoln, NE, data. Each region has a unique set of graphs

Annoyance-free criteria. "Bar" established for planning purposes.

Should reflect the rural community's view of animal production and tolerance for livestock odor.

Parameter has a large effect on setback.

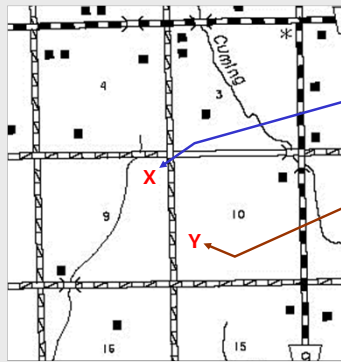
Emission number is based upon facility type, size, scaling factor, and odor control.

Common Uses for NOFT Results:

Develop simple odor footprints that:

- Check and/or improve siting of proposed livestock facilities
- Illustrate impacts of utilizing odor control technologies
- Help inform zoning policy-making

Check Siting of Livestock Facilities

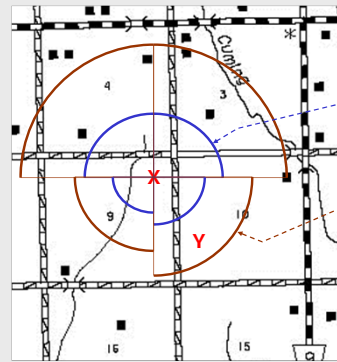


X indicates preferred site for livestock facility of given size

Y indicates an alternative site for the livestock facility

Objective: Assess odor risk of site X and compare to Y

Check Siting of Livestock Facilities

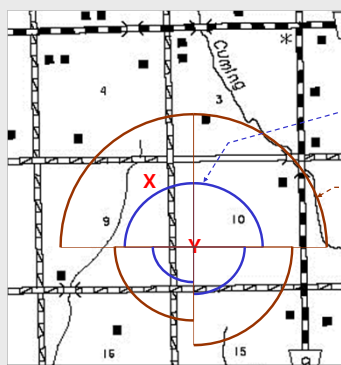


No residences within 94% annoyance-free setbacks for site X

Four or five within 98% annoyance-free setbacks for site X

Seems site Y may have advantage.

Improve Siting of Livestock Facilities

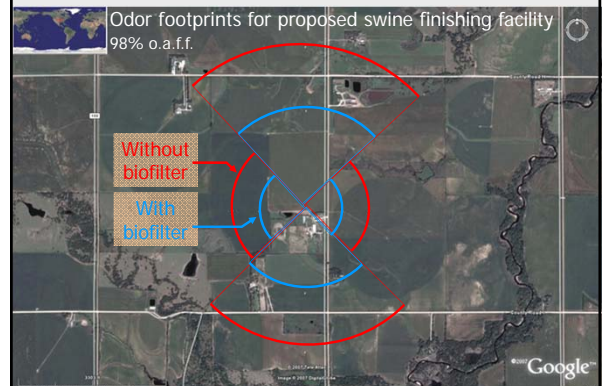


No residences within 94% annoyance-free setbacks for site Y

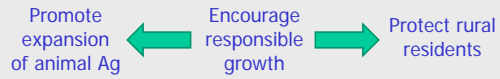
Two within 98% annoyance-free setbacks for site Y

Shows site Y's advantage over X.

Show Effect of Odor Control



What is main objective?



For using the NOFT
What odor annoyance-free frequency is selected?

Different tools exist for different goals



Thank You!

For more information:

Nebraska Odor Footprint Tool

[Manure.unl.edu](http://water.unl.edu/web/manure/odor-footprint-tool)

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