

# **Title VI: Increasing Equity, Transparency, and Environmental Protection in the Permitting of Swine Operations in North Carolina**

## **Attachment C: Updated Odor Control Checklist**



# Swine Farm Waste Management – Odor Control Checklist

Permit No.: \_\_\_\_\_

Date: \_\_\_\_\_

Owner Signature: \_\_\_\_\_

## INSTRUCTIONS FOR USE

- ◆ Odor Control Checklist is required by General Statute 143-215.10C(e)(1)
- ◆ Check any/all the BMPs you will implement on this facility. Items checked/selected become a requirement of the CAWMP.
- ◆ Items in bold or pre-selected are required.
- ◆ Add any site-specific details related to the selected BMPs
- ◆ Include any other odor control measures not listed
- ◆ **NOTE:** Not all BMPs may be cost-effective for every facility. Evaluate each BMP prior to selecting for your facility.

Cause/Source	BMP Option to Minimize Odor	Comments	Site Specific Practices
<b>FARMSTEAD</b>			
◆ Swine Production	<input type="checkbox"/> Maintain vegetative or wooded buffers at or near property boundary	<ul style="list-style-type: none"> <li>• Traps dust and gases, provides dilution and visual screening</li> </ul>	
◆ Improper drainage	<input type="checkbox"/> Grade and landscape so water drains away from facilities and prevent ponding <input type="checkbox"/> Maintain farm access roads and prevent traffic in waste application area <input type="checkbox"/> Other BMPs – please describe	<ul style="list-style-type: none"> <li>• May require third party input/approval</li> <li>• Reduce odors and vectors that occur with stagnant conditions</li> <li>• Prevents spillage during transport and tracking of waste onto public roads</li> </ul>	
<b>MORTALITY MANAGEMENT</b>			
◆ Carcass Decomposition	<input checked="" type="checkbox"/> <b>Dispose of mortality using method approved by NCDA&amp;CS State Veterinarian. Manage According to CAWMP (Mortality Management Checklist) and permit(s).</b> <input type="checkbox"/> Put carcasses in refrigerated (or freezer) dead boxes within 24 hours for short-term mortality storage.	<ul style="list-style-type: none"> <li>• <b>Required by statute and permit</b></li> <li>• May require third party input/approval</li> </ul>	
◆ Incomplete Incineration	<input type="checkbox"/> Use incinerators with secondary burners for complete combustion. <input type="checkbox"/> Other BMPs – please describe	<ul style="list-style-type: none"> <li>• Reduce odors by complete incineration</li> </ul>	

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Cause/Source	BMP Option to Minimize Odor	Comments	Site Specific Practices
<b>HOUSE / BARN – WASTE HANDLING</b>			
◆ Flush tanks	<input type="checkbox"/> Install flush tank covers	• Pit-flush systems	
◆ Odorous Gases	<input type="checkbox"/> Flush pits at least 4 times per day	• Pit-flush systems	
◆ Partial microbial decomposition	<input type="checkbox"/> Empty pits at least once every 7 days <input type="checkbox"/> Underfloor flush with pit ventilation	• Pit-recharge or “pull-plug” systems	
◆ Agitation of wastes	<input type="checkbox"/> Install/extend fill lines to near bottom of tanks with anti-siphon vents <input type="checkbox"/> Install covers on outside waste collection or junction box		
◆ Ammonia	<input type="checkbox"/> Install sump tank covers for lift stations <input type="checkbox"/> Flush/recharge with treated effluent <input type="checkbox"/> Treat waste in pits with proven biological or chemical additive <input type="checkbox"/> Other BMPs – please describe	• Monitor for any solids accumulation in pit	
<b>HOUSE / BARN – FLOOR AND INDOOR SURFACES</b>			
◆ Manure covered floors	<input type="checkbox"/> Scrape manure from alleys into pens daily <input type="checkbox"/> Install fully slotted floor system <input type="checkbox"/> Install waterers over slotted floor area <input type="checkbox"/> Install feeders at high end of solid floors	• Will move with other manure via pits	
◆ Odorous Gases	<input type="checkbox"/> Scrape manure buildup from floors and walls <input type="checkbox"/> Keep floors dry <input type="checkbox"/> Install underfloor ventilation for drying <input type="checkbox"/> Replace bedding/scrape at frequency to keep bedding dry <input type="checkbox"/> Other BMPs – please describe	• Where applicable • Aids in animal cleanliness • Aids in animal cleanliness  • Solid floor/bedding systems	

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## HOUSE / BARN – VENTILATION

◆ Dust	<input type="checkbox"/> Clean fans regularly – specify frequency		
◆ Volatile/odorous gases	<input type="checkbox"/> Efficient air movement <input type="checkbox"/> Install temperature and humidity sensors to control ventilation <input type="checkbox"/> Treat barn exhaust	<ul style="list-style-type: none"> <li>• Examples: biofilters, wet scrubbing, windbreaks</li> <li>• May reduce ventilation rate depending on method</li> </ul>	
	<input type="checkbox"/> Other BMPs – please describe		

## HOUSE / BARN – FEED

◆ Dust	<input type="checkbox"/> Install feed covers		
◆ Adsorbed Gases	<input checked="" type="checkbox"/> <b>Keep outdoor feed storage covered except When necessary to add/remove feed</b> <input type="checkbox"/> Minimize free-fall height of dry feed <input type="checkbox"/> Install feed delivery downspout extenders to the feed covers <input type="checkbox"/> Remove spoiled/unusable feed on regular basis	<ul style="list-style-type: none"> <li>• <b>Required by rule 15A NCAC 02D .1802</b></li> </ul>	
	<input type="checkbox"/> Feed pellets instead of dry meal <input type="checkbox"/> Use feed additives	<ul style="list-style-type: none"> <li>• May require third party input/approval</li> <li>• May require third party input/approval</li> </ul>	
◆ Ammonia	<input type="checkbox"/> Use feed-reduced crude protein diet <input type="checkbox"/> Other BMPs – please describe	<ul style="list-style-type: none"> <li>• May require third party input/approval</li> </ul>	

## HOUSE / BARN – GENERAL

◆ Dust	<input type="checkbox"/> Install temperature and humidity sensors to control ventilation	<ul style="list-style-type: none"> <li>• Maintain relative humidity at 40 to 65%</li> </ul>	
◆ Odorous Gases	<input type="checkbox"/> Use ultraviolet light to treat indoor air <input type="checkbox"/> Use indoor or outdoor electrostatic space charge system <input type="checkbox"/> Other BMPs – please describe	<ul style="list-style-type: none"> <li>• Can be used to treat exhaust air</li> </ul>	

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<b>LAGOON / WASTE STORAGE STRUCTURE</b>			
◆ Volatile Gases	<input checked="" type="checkbox"/> <b>Maintain proper lagoon volume</b>  <input type="checkbox"/> Minimize free-fall height of waste from discharge pipe to lagoon surface <input type="checkbox"/> Extend discharge point of pipe to below lagoon liquid level <input type="checkbox"/> Maintain proper surface area-to-volume ratio <input type="checkbox"/> Use correct lagoon start-up procedures <input type="checkbox"/> Aerate for odor control <input checked="" type="checkbox"/> <b>Manage sludge levels based on annual sludge survey as required by permit</b> <input type="checkbox"/> Keep spilled feed or foreign debris out of lagoon to prevent excess sludge accumulation <input type="checkbox"/> Install/use solids separation system <input type="checkbox"/> Use proven biological or chemical additives <input type="checkbox"/> Use permeable lagoon covers (not a digester) <input type="checkbox"/> Use impermeable lagoon cover or anaerobic digester <input type="checkbox"/> Other BMPs – please describe	<ul style="list-style-type: none"> <li>• Sufficient liquid volume/depth is required for proper anaerobic treatment</li> <li>• Use caution not to scour or damage lagoon liner</li> <li>• Monitor for any increase in rate of solids accumulation</li> <li>• Methane can be flared if not utilized</li> </ul>	

## LAND APPLICATION

◆ Odorous gases	<input checked="" type="checkbox"/> <b>Perform land application in accordance with CAWMP</b>		
◆ Wind drift	<input checked="" type="checkbox"/> <b>Pump intake near lagoon surface</b> <input type="checkbox"/> Pump from second stage lagoon <input type="checkbox"/> Follow good neighbor policy  <input type="checkbox"/> Operate at minimum recommended pressure <input type="checkbox"/> Increase setbacks beyond those required by statute, rule, or permit	<ul style="list-style-type: none"> <li>• Required by rule 15A NCAC 02D .1802</li> <li>• Avoid application on known weekends, special days, or holidays/eves if possible</li> </ul>	

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Cause/Source	BMP Option to Minimize Odor	Comments	Site Specific Practices
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## LAND APPLICATION (CONTINUED)

- |  |   |
|--|---|
| <input type="checkbox"/> <b>Apply during favorable wind conditions,</b> (especially for traveling guns or impact sprinklers) | <ul style="list-style-type: none"> <li>• Recommend checking predicted average hourly wind speed within 24 hours prior to anticipated start</li> </ul> |
| <input type="checkbox"/> When practical, apply waste on sunny days rather than cool, overcast days                           | <ul style="list-style-type: none"> <li>• Allows for vertical dissipation of odor</li> </ul>   |
| <input type="checkbox"/> When possible, apply waste mid-morning to late-afternoon  | <ul style="list-style-type: none"> <li>• Allows for better vertical dissipation of odor</li> </ul>  |
| <input type="checkbox"/> For traveling guns, use taper-ring or taper-bore nozzles  | <ul style="list-style-type: none"> <li>• Less odor and drift than ring nozzles</li> </ul>   |
| <input type="checkbox"/> For traveling guns, use largest-available nozzle that provides acceptable application uniformity    |   |
| <input type="checkbox"/> Replace impact sprinklers with low-drift nozzles on center pivots and linear move systems.          |   |
| <input type="checkbox"/> Use hose-drag system  |   |
| <input type="checkbox"/> Use injection method for waste application  |   |
| <input type="checkbox"/> Other BMPs – please describe  |   |

## SLUDGE DISPOSAL

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>◆ Odorous gases</li> </ul> | <input type="checkbox"/> Transport sludge in covered vehicles or tankers  | <ul style="list-style-type: none"> <li>• Speeds drying and prevents ponding</li> </ul>  |
|   | <input type="checkbox"/> Apply in thin, uniform layers  |   |
|   | <input type="checkbox"/> Incorporate land-applied sludge as soon as practical after application, and in accordance with permit. | <ul style="list-style-type: none"> <li>• <b>Required within 48 hours or prior to next rain event, whichever is first, for conventionally tilled bare soils</b></li> </ul> |
|   | <input type="checkbox"/> Use injection method for sludge application  |   |
|   | <input type="checkbox"/> Dewater sludge prior to application  |   |
|   | <input type="checkbox"/> Use alternatives to land application, such as compost, gasification, energy generation, etc.           |   |
|   | <input type="checkbox"/> Other BMPs – please describe   |   |

**ADDITIONAL INFORMATION****AVAILABLE FROM:**

Air Management Practices Assessment Tool (AMPAT)  
AHG-538-A Certification Training for Animal Waste Management Systems: Type A  
EBAE 103-83 – Lagoon Design and Management for Livestock Manure Treatment and Storage  
EBAE 128-88 – Swine Production Facility Manure Management: Pit Recharge-Lagoon Treatment  
EBAE 129-88 – Swine Production Facility Manure Management: Underfloor Flush-Lagoon Treatment  
EBAE Fact Sheet – Calibration of Manure and Wastewater Application Equipment  
EBAE Fact Sheet – Swine Production Farm Potential Odor Sources and Remedies  
NC NRCS Standard 359 – Waste Treatment Lagoon  
NC NRCS Standard 380 – Windbreak/Shelterbelt Establishment  
NC NRCS Standard 422 – Hedgerow Planting  
NC NRCS Standard 442 – Sprinkler System  
Nuisance Concerns in Animal Manure Management: Odors and Flies; PRO107 1995 Conference Proceedings  
Options for Managing Odor: A Report from the Swine Odor Task Force

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