

APPENDIX A

Environmental Stewardship Assessment: Manure Storage

The goal of this assessment is to help you confidentially evaluate environmental issues that relate to outdoor air quality. For each issue listed in the left column of the worksheet, read across to the right and circle the statement that best describes conditions on your farm. If any categories do not apply, leave them blank.

Potential Odor Risk	High Risk	Moderate Risk	Low Risk
Relative risk associated with alternative types of manure storage systems	Formed manure storage, earthen storage basin, or undersized anaerobic lagoon	Properly sized anaerobic lagoon OR Partially covered manure storage OR Open lot runoff holding OR Dry manure storage where liquids are separated and drained to separated storage or absorbed by bedding.	Anaerobic digester or other treatment system is included with manure storage. OR Purple anaerobic lagoon OR Composted manure storage OR Manure is stored for less than one week before land application. Properly covered manure storage
Location of storage or lagoon relative to confinement animal housing (Dusty ventilation air moving across storage or lagoon surface picks up and transports additional odors.)	Prevailing winds or ventilation fans direct building ventilation air across storage or lagoon surface.		Manure storage or lagoon is remotely located from animal housing. OR Prevailing winds or ventilation fans DO NOT direct building ventilation air across storage or lagoon surface.
Manure storage or earthen basins only			
Manure surface	Manure surface is exposed and does not form a crust.	Storage is loaded below liquid surface, AND crust forms over only part of storage surface due to top loading, regular agitation, wind, or other factors. OR Crop residue cover is in place at least six months of year during periods of greatest odor concerns. OR Manure surface is partially covered by crop residue, plastic membrane, or other type of cover.	Storage is loaded below liquid surface, AND stored manure forms undisturbed crust over the entire surface. OR Manure is held in enclosed manure storage tank or completely covered year-round with crop residue, plastic membrane, or other type of cover. Surface aeration maintains oxygen concentration of 1 mg/liter or greater.
Agitation during emptying	Storage is aggressively agitated by manure stream directed above manure surface.	Storage is aggressively agitated by manure stream directed below manure surface.	No agitation use during storage emptying.



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Environmental Stewardship Assessment: Manure Storage (continued)

Potential Odor Risk	High Risk	Moderate Risk	Low Risk
Anaerobic lagoon only			
Signs of improved treatment for reducing odors... Active lagoons stabilize odors.	Lagoon is dark brown or black in color and shows few signs of active bubbling during warm weather.	Lagoon is dark brown or black and is actively bubbling from spring through fall.	Lagoon is maintained in aerobic state (1 hp of aeration capacity/150 finish hogs, 50 beef, or 30 dairy animals) OR Deep purple or red-colored lagoon
Permanent pool (or first stage of two-stage lagoon) Size...Large permanent pools dilute incoming manure and provide a better stabilization of odors.	Sizing of permanent pool is unknown or not sized according to standard engineering. OR Animal numbers have increased above designed capacity for lagoon.	Permanent pool is sized following standard engineering recommendations.	Permanent pool is sized for odor control (twice standard engineering recommendation).
Permanent pool management...	A permanent pool of 1/3 of the total volume or less is maintained.	A permanent pool is maintained that is at least 50% of the overall storage volume.	Markers are used to identify "Stop Pumping Point" for maintaining permanent pool, AND permanent pool never drops below marker.
Lagoon loading... Frequent feeding is preferred to infrequent feeding.	Lagoon is loaded less frequently than weekly. OR Manure loading rates are highly variable.	Lagoon is loaded weekly with fairly similar quantities of manure.	Lagoon is loaded daily with fairly similar quantities of manure.
Lagoon unloading... Infrequent pumping causes buildup of salts and ammonia that can become toxic to anaerobic bacteria.	Lagoon is pumped infrequently or not at all due to evaporation and seepage generally matching liquid additions.	Lagoon is pumped annually to permanent pool marker.	Lagoon is pumped annually to permanent pool marker, AND in dry years, lagoon is pumped below permanent pool marker, and fresh water is added to marker.
Electrical conductivity...	No measurement OR Readings > 12 mmho/cm	Infrequent measurements OR Reading between 8-12 mmho/cm	Quarterly measurements OR readings < 8 mmho/cm

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Environmental Stewardship Assessment: Manure Storage (continued)

Potential Odor Risk	High Risk	Moderate Risk	Low Risk
Open lot runoff holding pond/Settling basins/Filter strips			
Holding pond unloading	Holding pond is regularly more than half full.		Liquid is dispersed through a grass filter strip. OR When ground is not frozen, liquid is pumped out when ever ground will accept liquid without runoff. Pond is kept dry or with minimal liquid pools.
Draining of settling basins or channels	Liquid pools in settling basin often remain for multiple weeks.	Liquid pools in settling basin often remain for multiple days.	Liquids drain from settling basin, and a dry solid surface is observed within a few days after a storm event.
Drainage of open channels for transporting runoff	Liquid pools in open channels remain for multiple weeks.	Liquid pools in open channels often remain for multiple days.	All liquids drain from open channels.
Solid Manure			
Stockpiling	Stockpiling often occurs near public roads or neighbors. OR Precipitation and seepage pools in vicinity of stockpile.		Stockpiling is avoided for most of year and harvested manure is directly land applied. OR Stockpiling is done in remote locations away from neighbors, AND all precipitation and seepage drains away from stockpile.
Composting	Wet manure is commonly stockpiled and never turned.	Crop residue is mixed with stockpile manure, but stockpile is not turned.	Only dry manure (< 45% moisture) is stockpiled. OR Crop residue is mixed with stockpiled manure to achieve < 45% moisture. OR Stockpiled manure is turned weekly to encourage composting until no additional heating occurs.