NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

ANIMAL MORTALITY FACILITY

(no.)
CODE 316

DEFINITION

An on-farm facility for the treatment or disposal of livestock and poultry carcasses.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

Decrease non-point source pollution of surface and groundwater resources;

Reduce the impact of odors that result from improperly handled animal mortality;

Decrease the likelihood of the spread of disease or other pathogens by predators;

To provide contingencies for normal and catastrophic mortality events.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where on-farm carcass treatment and disposal are permitted by federal, state, and local laws, rules, and regulations, and where animal carcass treatment or disposal is a component of a waste management system as described in the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH). Designs must account for the end use of products from the mortality facility. This practice includes disposal of both normal and catastrophic animal mortality; however, it does not apply to catastrophic mortality resulting from disease.

CRITERIA

Animal mortality facilities and processes must conform to all federal, state, and local laws, rules and regulations.

Laws and regulations of particular concern include those involving odor, water and drainage rights, zoning, land use, pollution control, property easements, wetlands, endangered species, and preservation of cultural resources. Applicable provisions for operating, closing, and/or removing the facility also must be carefully followed.

Animal mortality facilities must obtain approval of the South Dakota Animal Industry Board and South Dakota (SD) Department of Environment and Natural Resources (DENR) Waste Management Program.

All structural components shall meet the structural loads and design criteria in Natural Resources Conservation Service (NRCS) conservation practice standard Waste Storage Facility (313), unless otherwise designated.

Surface runoff must be diverted away from the animal mortality facility wherever feasible.

Location. The location shall minimize odors and other air quality issues affecting inhabited areas, and shall minimize impacts on surface and ground water resources.

Animal mortality facilities must be located at least 1,000 feet from existing public water wells, 250 feet from wells and drinking water sources not owned by the producer, and 150 feet from wells and drinking water sources owned by the producer. Where practical, the facility shall be down gradient from springs and wells.

Animal mortality facilities located in 100-year floodplains must be protected from inundation or damage from a 100-year frequency flood.

Location of the animal mortality facility shall be consistent with livestock, poultry, and other operations at and near the site.

Seepage Control. Where seepage from mortality facilities will create a potential water quality problem, use AWMFH, Appendix 10D, for clay liner design criteria, or other acceptable liner technology approved by the SD DENR.

ADDITIONAL CRITERIA FOR NORMAL MORTALITY

Facilities shall be located as close to the source of mortality as practical, considering bio-security and the need to keep the facility out of sight of the general public.

Composters. Design of facilities for composting animal mortality shall conform to conservation practice standard 317, Composting Facility. Guidance is available in National Engineering Handbook Part 637, Chapter 2 – Composting (NEH 637.0211, Dead Animal Composting).

Freezers. Freezer units shall be compatible with filling and emptying procedures and equipment. Protect freezer units from weather.

The freezer unit installation shall meet the manufacturer's recommendations. Freezers shall be constructed of durable materials having a life expectancy compatible with other aspects of the waste management system. The freezer container shall be leak proof to minimize odor and leachate pollution.

Freezer floors and work areas must be designed to withstand filling and emptying equipment loads.

Temperature. Freezers shall be designed to freeze animal carcasses before decomposition occurs. Carcass temperature shall be maintained below 26^0F.

Capacity. Freezer units shall be sized to accommodate normal maximum mortality volume expected between emptying events. Volume calculations shall include the weight and expected daily mortality of the animal, the period of time between emptying, and a conversion factor for weight to volume. For broiler operations, use a weight to volume conversion of at least 45 pounds per cubic foot. Capacity calculations shall be supported by a removal schedule supplied by an integrator or approved vendor.

Power Source. Where available, an alternative source of power to the freezer shall be provided. Where an alternative power source will not be available, the operation and maintenance plan shall contain contingencies for disposal of the poultry mortality.

Disposal Pit. Disposal pits shall not be located on sites with a seasonal high water table less than two feet from the bottom of the pit. Pits located in highly permeable soils, or within two feet of fractured or cavernous rock shall be lined with a liner approved by SD DENR.

Size and Capacity. Pits shall be sized to accommodate normal mortality and meet SD DENR and local regulatory agency criteria. Disposal pits shall be at least four feet wide and four feet long. Pit depth shall accommodate two feet of cover over the mortality. Multiple pits shall be separated by at least three feet of undisturbed or compacted soil.

Structural Loading and Design. Disposal pits shall be cased with masonry blocks, treated timber, or a pre-cast concrete septic tank conforming to American Society of Testing Materials (ASTM) C1227-00b Standard Specification for Pre-cast Septic Tanks. In all cases, the bottom of the pit shall remain exposed to the soil. Structural wall height shall not exceed four feet.

If the pre-cast septic tank is used, it shall be fabricated with three six-inch openings in each end, and five six inch openings in each side.

When masonry block are used, every fourth block in each course shall be laid sideways (openings toward the outside) except the top and bottom courses. The bottom course shall be on a reinforced concrete footing of at least one foot wide and six inches thick.

When treated timbers are used for walls, provide a one inch space between timbers.

Exterior soil backfill shall provide a minimum 18 inch horizontal bench at the top of the wall. For structural pits located in soil pits deeper than four feet, provide soil slopes one one-half horizontal to one vertical or flatter above the soil bench.

Disposal pits shall be covered with a slab constructed of reinforced concrete or treated timber having an appropriately sized drop chute hole. Pits over eight feet long shall have drop chutes spaced not more than five feet apart with a minimum of two drop chutes.

Drop chutes shall be covered and made of concrete, clay, PVC, or PE pipe.

A 10-inch drop chute opening is recommended for chickens, and a 12-inch opening for turkeys and suckling pigs.

Vehicular traffic shall not be allowed within four feet of pit structures.

Incinerators. Incinerators shall be dual burning Type 4 (human and animal remains) approved for use in SD.

Capacity. Minimum incinerator capacity shall be based on the average daily weight of animal mortality and the length of time the incinerator will be operated each day.

Location. The incinerator shall be located a minimum of 20 feet from any structure. The incinerator shall be placed on a concrete pad with the fuel source as distant as practical. At least six inches are required between the incinerator chimney and combustible materials.

ADDITIONAL CRITERIA FOR CATASTROPHIC MORTALITY

Processes addressed by this standard shall be limited to burial and composting. Catastrophic mortality shall be collected as soon as practical and moved away from the production facility.

Location. The facility shall be located as far away from inhabited areas and poultry, livestock and other operations as site conditions permit. Locate on sites with restricted percolation and a minimum of two feet between the bottom of the facility and the seasonal high water table unless special design features are incorporated that address seepage rates and non-encroachment of contaminants into the water table. Use AWMFH Appendix 10D for selection of sites where seepage will be restricted with normal construction techniques.

Burial Pit. Catastrophic mortality resulting from natural conditions such as temperature extremes shall be buried as directed by SD DENR and local regulatory agencies.

Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law, mortality shall remain uncovered or lightly covered until bloating has occurred, or methods employed to reduce or eliminate bloating. Topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is completed. Stockpiled soil shall be no closer than 20 feet from the edge of the burial pit.

Earthen walls of pits greater than four feet deep shall have side slopes one and one-half horizontal to one vertical or flatter.

Vehicular traffic shall not be allowed within four feet of the pit edge.

Size and Capacity. Pits shall be sized to accommodate catastrophic mortality using appropriate weight to volume conversions and at least two feet of soil cover. Capacity shall be in accordance with criteria acceptable to SD DENR and local regulatory agencies. The burial pit shall be a minimum of four feet wide with length necessary to accommodate mortality. Pit bottoms shall be relatively level. Lengths may be limited by soil suitability and slope. If more than one pit is required, they shall be separated by a minimum of three feet of undisturbed or compacted soil. The burial site shall be finish graded to slightly above natural ground elevation to accommodate settling.

Composting. Catastrophic mortality composting shall be in either passive piles or windrows as described in National Engineering Handbook Part 637, Chapter 2 – Composting (NEH 637.0210 and NEH 637.0211).

Composting mortality shall be protected from precipitation as necessary, or provisions made for collecting contaminated runoff. Static piles or windrows covered with sawdust, finished compost, or other benign material may not need further protection.

CONSIDERATIONS

Major considerations in planning animal mortality management are:

Equipment available at the operation,

Management capabilities of the operator,

The degree of pollution control required,

Economics of available alternatives, and

Effects on and responses of neighbors.

Consideration should be given to prevailing wind direction and neighbors when siting animal mortality disposal facilities. A minimum of 900 feet should separate the facility from the nearest residence.

Facility sizes for composting large animal carcasses should reflect the longer compost periods required.

The following table lists suggested minimum daily animal mortality for sizing incinerators:

TYPE OF ANIMAL	DAILY LOSS FACTOR (POUNDS/DAY/ANIMAL)
Chicken:	
Broilers	0.0024
Laying hens	0.0014
Breeding hens	0.0019
Breeder, male	0.0082
Turkeys:	
Hen	0.0081
Tom, light	0.0193
Tom, feather production	0.0286
Swine:	
Suckling pigs	0.0400

Poultry operations often experience higher mortality as birds reach maturity. Incinerator capacity should insure large bird mortality can be handled in a timely manner.

An alternative to prevent bloating of mortality could include opening thoracic and abdominal cavities and viscera prior to covering.

Include disposition of incinerator ash.

Vegetative screens and topography can reduce visual impacts.

Records should include global positioning system burial site location; type, quantity and probable cause of mortality; and burial details and date.

Safety devices such as fences, warning signs, and freezer locks may be necessary.

Bio-security concerns should be addressed in design, operation and maintenance O&M).

PLANS AND SPECIFICATIONS

Plans and specifications for animal mortality facilities shall meet this standard and achieve the purposes.

OPERATION AND MAINTENANCE

An O&M plan that includes the items listed below must be developed with the operator, and must become a part of the waste management system plan. The O&M plan must be consistent with practice purposes, intended life, and design criteria. Safety and bio-security concerns shall be prominently included.

NORMAL MORTALITY

Animal mortality facilities shall be regularly inspected to note any maintenance needs or indicators of operation problems.

CATASTROPHIC MORTALITY

Locations for catastrophic animal mortality facilities shall be specified for use as needed.

Where composting is used for catastrophic mortality disposal, identify the most likely compost medium, possible compost recipes, operational information, and equipment that must be readily available.

REFERENCES

Agricultural Waste Management Field Handbook (AWMFH)

National Engineering Handbook, Part 637, Chapter 2, Composting

NRCS GM 420 Part 401 – Cultural Resources

ASTM C1227-00b Standard Specification for Pre-cast Septic Tanks