

COMPOSTING FACILITY (MANURE OR OTHER ORGANIC WASTE)

OPERATION AND MAINTENANCE PLAN

OPERATOR _____ DATE _____

ADDRESS _____

A properly operated and maintained composting structure is an asset to your farm. This composting structure was designed and installed to compost the normal daily mortality from your operation. The practice must be maintained for the life span of the practice which is 15 years. The life of the structure can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This structure will require you to perform periodic maintenance and may also require operational items to maintain satisfactory performance. The following actions shall be carried out to insure that the practice functions as intended throughout its life span.

Operation

1. **Carbon-Nitrogen Ratio.** The initial compost mix shall result in a Carbon to Nitrogen ratio between 25:1 and 35:1. Compost with a greater carbon to nitrogen ratio can be used if nitrogen immobilization is not a concern.
2. **Carbon source.** A dependable source of carbonaceous material shall be stored and available to mix with nitrogen-rich waste materials. Minimize odors and nitrogen loss by selecting carbonaceous material that, when blended with the nitrogenous material, provides a balance of nutrients and porous texture for aeration.
3. **Bulking Materials.** Add bulking materials to the mix as necessary to enhance aeration. The bulking material may be the carbonaceous material used in the mix or a non-biodegradable material that is salvaged at the end of the compost material. If a non-biodegradable material is used, provisions should be made for its salvage.
4. **Moisture Level.** Provisions should be made for maintaining adequate moisture in the compost mix throughout the compost period. Moisture content should be within the range of 40 to 65 percent (wet basis). Care shall be taken to prevent excess moisture from accumulating in the compost. Facility covers may be required to provide a suitable product.
5. **Temperature.** Manage the compost to attain and then maintain the internal temperature for the duration required to meet management goals. To produce compost that can be safely stored without undesirable odors, the temperature of the compost must be maintained above 104°F for five days with at least four hours above 130°F during that time period, Operating temperature of the composting material should be 130°F to 145°F once the process has begun. Operating temperature should be reached in about seven days and remain elevated for up to 14 days. The pile should remain at or

above 110°F for the remainder of the designated composting period. See the temperature requirements in Item 7 below, when the management goal is pathogen reduction.

Document the daily temperatures of the compost to ensure that adequate heat has been achieved and maintained for the compost period. Never allow temperatures to get above 165°F. Take action immediately to cool piles that have reached this temperature.

If temperature falls significantly during composting period, odors develop, or if material does not reach operating temperature, investigate piles for moisture content, porosity, and thoroughness of mixing. Compost managed at the required temperatures will favor destruction of pathogens, plant diseases and weed seeds.

6. **Aeration.** Heat generated by the process causes piles to dehydrate. As the process proceeds, material consolidates, and the volume of voids decreases, restricting airflow. Select materials for the composting mix that will insure adequate air movement throughout the composting process. Periodically turning the pile and maintaining proper moisture levels for windrows and static piles will normally provide adequate aeration. Appropriate equipment must be available for initial mixing, turning, and hauling composted material and carbonaceous material.
7. **Pathogens.** When using the in-vessel or static aerated pile type of composting, temperature of the active pile must be maintained at 130°F or higher for three consecutive days to achieve pathogen reduction. The total compost period shall include time for the initial primary stage of composting and time for secondary stage composting. To achieve pathogen destruction when composting with aerated windrows, the temperature must be maintained at 130°F or higher for 15 consecutive days and the windrow must be turned at least five times during the high temperature period.
8. **Vectors.** Flies, rats and birds may be attracted to raw compost feedstocks. Mosquitoes may reproduce where standing water is present. To minimize vector problems, reduce exposed feedstock storage, turn piles frequently, eliminate standing water and keep the area clean.
9. **Nutrients.** Keep compost well aerated to maintain nitrogen loss by denitrification. Keep pH at neutral or slightly lower to avoid nitrogen loss by ammonification. High amounts of available carbon will aid in nitrogen immobilization.

Include compost nutrients in nutrient management plans. Prevent loss of nutrients and pollutants to surface and ground water.
10. **Testing Needs.** Test compost material for carbon, nitrogen, moisture, and pH if compost fails to reach desired temperature or if odor problems develop. The finished compost material should be periodically tested for constituents that could cause plant phytotoxicity (poisoning) as the result of application to crops. Composted materials that are prepared for the retail market require testing for labeling purposes.
11. **Finished Compost.** Utilization of finished compost shall be in accordance with federal, state, local and tribal laws. Compost will be applied to land at rates outlined in the Nutrient Management Plan and in accordance with state law.

Inspection and Maintenance

1. The compost facility should be inspected regularly when the facility is empty. Replace deteriorated wooden materials or hardware. Patch concrete floors and curbs as necessary to assure water tightness. Roof structures should be examined for structural integrity and repaired as needed
2. Exposed metal components should be inspected for corrosion. Corroded metal should be wire brushed and painted as necessary.

3. All fences, railings, and/or warning signs shall be maintained to provide warning and/or prevent unauthorized human or livestock entry.
4. Do not compact the material by driving over it or packing it with equipment. Do not allow any equipment that exceeds design load limits on or within ten feet of the structure.
5. Poison gasses are often heavier than air and may be trapped in closed waste storage structures. Do not allow human entry into any closed structure without safety equipment, including ladders and breathing apparatus. Maintain all lids, grates and shields on openings to enclosed structures.
6. Maintain all electrical and mechanical equipment in good operating condition by following electrical codes and manufacturer's recommendations. Inspect and repair ground rods, switches, and wiring.
7. To prevent erosion, a good vegetative cover should be established and maintained around facilities. Clipping twice a year should kill noxious weeds and ensure a vigorous stand. Traffic accesses shall be maintained and/or replaced as necessary.
8. Check backfill areas around structure for excess settlement. Make necessary repairs. Positive drainage shall be maintained around the structure. Inspect and maintain runoff control structures and practices.
9. Immediately repair any vandalism, vehicular or animal damage to the structure, earthen areas surrounding the structure, or any appurtenances.

SPECIFIC RECOMMENDATIONS FOR YOUR INSTALLATION

CONTACT YOUR LOCAL NATURAL RESOURCES CONSERVATION SERVICE OFFICE FOR ANY ADDITIONAL TECHNICAL ASSISTANCE YOU MIGHT NEED FOR IMPLEMENTATION OF THIS OPERATION AND MAINTENANCE PLAN FOR YOUR STRUCTURE.

New Castle Field Office
(302) 832-3100

Kent Field Office
(302) 741-2600

Sussex Field Office
(302) 856-3990

Landowner Signature: _____ Date: _____

Operator Signature: _____ Date: _____

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