Operation & Maintenance Plan
Composting Facility (Code 317)

Landowner/Operator: Date:

NRCS Service Center: Conservation District:

Practice Location: Tract/Field ID:

(Lat/Long or UTM Coord, or Sec/TS/R)

Expected Lifespan

The minimum expected lifespan of this practice is at least 15 years.

O and M requirements from CPS

A properly operated and maintained **Composting Facility** is an asset to your property. The purpose of this practice is to biologically treat manure to produce a stable soil amendment while minimize pollution from manure laden runoff, improved air quality, etc. The life of the practice can be assured and usually extended by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. The following are some requirements to help you develop a good operation and maintenance program.

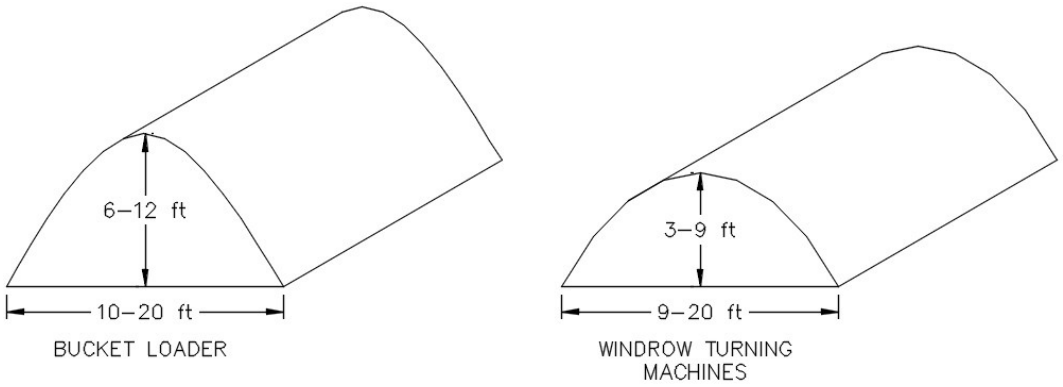
Safety

1. When necessary to exclude livestock and human access, provide fencing, gates and other barriers. Inspect fence and gates at least once a year. Repair and/or replace damaged fences and gates as soon as possible. Keep gates closed at all times.

Operation

1. Effective Composting:
   a. Compost in “windrows”. Windrows should be no wider than 10-12 feet. Windrows should be oriented so runoff can drain freely away. Runoff should be properly collected and treated or stored as part of a Comprehensive Nutrient Management Plan.
   b. 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 resources.
   c. Organic material shall be readily available and should be porous and not too wet. To reduce offensive odors increase the amount of carbon in the mix. A carbon to nitrogen ratio of 30:1 in the initial mix should have minimal odors. Minimize nitrogen loss by selecting carbonaceous material (wood chips, sawdust, etc.) that, when blended with the nitrogenous material (manure, etc.) provides the proper carbon nitrogen ratio and porous texture for aeration. Aeration is important as it also reduces odors. A chemical neutralizing agent or other additive agents should be used if structural components do not provide adequate odor reduction. Organic material can be wood chips, spoiled silage, composted manure, etc. Organic absorbent material shall also be available such as sawdust or cured compost.
   d. Do not adding frozen material to the composting mix. This will lengthen the time needed for composting and will require added management.
2. Building Windrows:
   a. Orient windrows to prevent ponding or runoff.
   b. First lay down a 24” layer of porous material, i.e. wood chips. Be careful not to compact material with equipment which will inhibit the flow of air into the pile.

Figure 1: Building Windrows



3. Monitoring
   a. Temperature – Monitor temperature on a weekly basis. Operating temperature of the composting material should be 131°F to 170°F. Ideal temperature of the compost should be around 140°F. 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. Compost managed at the required temperatures will favor destruction of pathogens, plant diseases and weed seeds.
   b. Closely monitor temperatures above 165o F. Take action immediately to cool piles that have reached temperatures above 185 degrees F.
   c. Moisture – maintain moisture in the compost within a range of 40-65% (wet basis).
   d. Collapse - If the windrow sinks or collapses, add more organic material to the windrow.
   e. Test compost material for carbon, nitrogen, moisture, and pH if compost fails to reach desired temperature or if odor problems develop. Test finished compost material for constituents that could cause plant phytotoxicity when applied to crops. Composted materials that are prepared for the retail market require testing for labeling purposes.
4. Turning
   a. 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.
5. Keeping Records:
   a. For each new windrow, record data such as date of pile construction and type/amount of material added.
   b. Check windrows weekly and note such data temperature, scavenging, leaching, moisture, odor and maintenance needs.
6. Troubleshooting
   a. The pile does not heat up:
      i. The pile is not getting enough airflow through it.
         1. Turn pile onto bed 2’ thick with larger size pieces of bulking agent.
      ii. The pile is either too wet or too dry.
         1. Moisture content should be 50-60%, and should feel like a damp sponge;
         2. If too dry, add water or liquid manure;

3. If too wet, protect the pile from rain and snow.

iii. The pile is too small to maintain heat.
   1. Winter may require mounded piles. Create a pile that is at least 4' x 4';
   2. Increase the top-dressing material thickness;
   3. Add fresh warm manure and re-cover the pile with a bulking agent.

iv. Scavengers and insects are invading the pile:
   1. Flies, rats and birds may be attracted to raw compost feedstocks.
   2. Mosquitoes may reproduce where standing water is present.
   3. Minimize vector problems, reduce exposed feedstock storage, turn piles frequently, eliminate standing water and keep the area clean.

v. The pile is not hot and active.
   1. Cover with thicker layer of bulking agent such as wood chips or compost;
   2. Prevent standing water: fill puddle holes and slope site slightly (1-2%);
   3. Add fresh warm manure and recover the pile with a bulking agent.

vi. Leachate is running off the site
   1. The pile is too wet.
      1. Prevent rain & meltwater from running into pile by diverting around site;
      2. Add more dry bulking agent;
      3. Cover the pile with a roof or specialized compost cover;
      4. Berm around pile with wood chips, finished compost to absorb leachate.
   2. The site has too much slope.
      1. Build a berm around the pile with wood chips or finished compost;
      2. Relocate the pile to a flatter area;
      3. If possible, collect the leachate for spreading on fields.

Maintenance

1. Gravel pad shall be graded as necessary to allow runoff to drain away from windrows.
2. Add more gravel to the wear surface of the pad as it is worn away and removed through the everyday use of the facility.
3. If required, keep fences, gates, and/or warning signs in good repair.
4. Repair any vandalism, vehicular or animal damage as soon as possible. Inspect and maintain runoff control practices.

Operation, Maintenance and Inspection Costs

1. It is estimated that the annual time to routinely inspect and make minor repairs to your Compost Facility will be:
   a. Inspection = 2 hours/month/2500 square feet
   b. Minor Repairs = 2 hours/month/2500 square feet
   c. Building windrows = 4 hours/day/2500 square feet
   d. Turning windrows = 4 hours/week/2500 square feet
   e. Gravel Replacement = 4 hours/year/2500 square feet
   f. Major repairs to gravel pad and other components caused by equipment and other uses will require extra time and materials.
2. Most maintenance, such as grading, gravel replacement, etc. can be accomplished using common farm machinery. Occasional damage, caused by major storm events may require heavy construction equipment to make.

Specific Site Requirements

Clear Form