

## Section 6

### Best Management Practices

*including regulatory provisions of:*

***Illinois Livestock Management & Facilities Act***  
and

***Illinois-NPDES Permit requirements.***

#### OVERVIEW:

This Nutrient Management Plan conforms to the Illinois Livestock Management and Facilities Act and the Illinois NPDES general permit requirements.

Liquid manure is planned to be applied in the fall after harvest with a tank wagon or umbilical injection system. Manure is planned to be injected with a tool bar knife attachment behind the tank wagon or a drag house system.

A contractor service will be used to apply the manure. Records will be kept of all manure and fertilizer applications. Individual field recommendations and record-keeping forms are located in Section 10 and arranged year by year.

**Phosphorous:** The soils in this area have relatively high Phosphorus supplying ability. Phosphorus build up is recommended up to 40 lb/acre. At Bray P1 soil tests above 40 lb/acre only maintenance (replacement) rates are recommended. All fields included in this plan have soil test P averaging greater than 40 lbs/acre Phosphorous. Maintenance only rates of Phosphorous are recommended for these fields.

**Potassium:** The soils in this area have relatively high Cation Exchange Capacity and high natural capacity to supply Potassium. Only maintenance (replacement) rates of K are recommended when K soil tests are above 300 lbs/acre. All fields included in this plan have soil test K averaging greater than 300 lbs/acre Phosphorous. Maintenance rates only of Potassium are recommended.

It is generally not considered economically justifiable to maintain soil test levels higher than 60 lbs/ac P1, and 400 lb/ ac K when buying commercial P and K fertilizers.

For maximum yields and soil fertility, it is recommended to maintain a soil pH of at least 6.0 for corn soybean rotations. If pH is less than 6.0, liming material should be applied at U of I recommended rates based on the CCE (Calcium Carbonate Equivalent) rating and the fineness of the limestone material. If alfalfa or clover is part of the rotation pH should be maintained near 6.5. Average pH values range from 5.8 to 6.9. It is recommended that field MCCF-2 (which has average pH of 5.8) receive 2-3 tons per acre of lime as soon as practical.

#### Soil Testing Plan

Soil test will be taken every 3 years. Soil tests should be taken in the fall after crops are removed, and before any manure or fertilizer would be applied. **See Section 7.**

The fields currently have a very good fertility levels for P and K as indicated by the soil tests. All fields in this nutrient management plan have current soil test results and can be found under each field tab.

#### Manure and Wastewater Testing/Analysis Plan

Manure shall be analyzed on an annual basis from each storage structure for:

% Solids, Total N, Organic N, NH<sub>3</sub>, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, and pH. **See Section 8.**

### **Considerations to reduce Odor Problems:**

Manure odors, manure and mud on the road, and concerns about manure runoff are leading causes of complaints against farmers. To maintain good farm neighbor relations:

- use manure management practices that minimize odors and protect against runoff.
- maintain open communication with neighbors about manure spreading schedules.
- be willing to modify spreading times and locations to accommodate neighbors.
- use transportation practices that keep public roadways free of mud and manure.
- manure odors worsen as a result of storage time.
- warm temperatures increase odors
- moisture content greater than 80 percent increase odors
- mixing of anaerobically stored manure with air during agitation and spreading increases odors.

The following practices can minimize neighbors' concerns associated with manure odors:

- Reduce or eliminate manure spreading on fields adjacent to residential areas, especially on weekends or holidays.
- Use spreading equipment that keeps the manure low to the ground.
- Incorporate manure during or soon after application.
- Spread manure in the morning when temperatures are cool. As air warms, rising air will help dissipate odors.
- Install tree buffers to absorb odors and prevent them from moving toward neighbors.
- Inform neighbors of manure application practices and schedules and provide information about nutrient management practices.

### **Considerations for choosing Manure application method.**

Incorporation of manure into the soil reduces the risk of nutrient or manure transport to lakes and streams. It also reduces odors associated with manure applications. Surface application of manure without plow-down or disking poses the greatest risk of nutrient loss and contamination of surface waters.

- The urea in the liquid portion is rapidly converted to ammonium, which may be lost through volatilization.
- Parasitic pathogens and soluble forms of nitrogen and phosphorus may be transported to surface water bodies through water runoff.

Incorporation of manure can pose risks to groundwater contamination on:

- sandy soils.
- soils that have fractured bedrock.
- soils that have preferential flow pathways such as root channels and wormholes.
- wet or cracked soils that are tile drained.

Ammoniacal nitrogen in manure, which is converted to nitrate, is available for plant uptake but may be leached into the subsoil or groundwater. Parasitic pathogens in

manure, such as *Cryptosporidium* and *Giardia*, can be transported to ground or surface water through preferential flow pathways in the soil.

### **Considerations for Timing of Manure applications in relation to plant growth.**

Manure applications will be most effective as nutrients if made close to the time of plant growth. Potential for nutrient losses is greater for fall and winter applications because nutrients are not being used for plant growth and frozen ground restricts infiltration. If daily spreading practices require manure applications in the fall and winter, apply manure to fields that will be planted to winter grains or cover crops or fields containing vegetation or crop residues. Apply manure only to fields that have a low potential for flooding, saturation, or runoff.

### **Hydrological conditions of the field and rainfall following manure application.**

Saturated field conditions increase the risk that nutrients and parasitic pathogens in manure will be transported through runoff or subsurface flows to lakes and rivers. Intense or high-accumulation rainfall following manure applications increases the risk of runoff and transport of manure to surface waters. Heavy rainfall can also increase risks of nutrient or pathogen leaching or transport through the soil into groundwater.

## **Recommended Management Practices to Reduce Phosphorus Losses**

1. Perform soil test regularly (minimum of every four years) and follow University of Illinois' recommendations for application rates.
2. Do not maintain excessively high phosphorus soil test levels, especially in areas prone to phosphorus transport.
3. Use variable rate applications to increase the precision of phosphorus applications and to maintain rates needed for optimal crop production.
4. In areas where phosphorus losses occur primarily from surface runoff, incorporate or inject phosphorus beneath the soil surface.
5. Control soil erosion to 'T' or less.
6. Utilize agronomic practices that optimize crop production to maximize phosphorus utilization.
7. Use filter strips or riparian forest buffers to reduce offsite transport or particulate phosphorus.
8. Avoid applying nutrients when soils are frozen or covered with ice or snow.
9. Fall applications of phosphorus that are not incorporated into the soil should not be applied on slopes greater than 5% unless runoff control measures such as heavy residue cover, contour mulch tillage, contour strip cropping, or terraces have been applied.
10. Minimize surface runoff of water by reducing compaction, maintaining high crop residue levels, installing runoff control structures such as terraces, etc.
11. Avoid stratification on soils that are susceptible to runoff and erosion.

## Recommended Management Practices to Reduce Nitrogen Losses:

1. Set realistic yield goals and follow University of Illinois' nitrogen recommendations.
2. Take credit for nitrogen from **all** sources: previous legume crop, incidental nitrogen contained in di-ammonium phosphate (DAP) and other fertilizers, manure applications, etc.
3. Determine nitrate loss potential using the table above. Use this as a guideline to determine application timing for fields with various soil textures. (More detailed information on total nitrogen loss potential is available in the University of Illinois Agricultural Experiment Station Bulletin 784, Nitrogen-Loss Potential Ratings for Illinois Soils.)
4. In fields where spring applications are not usually troublesome, apply the majority of the nitrogen shortly before or after planting.
5. For fall applications, use a nitrification inhibitor or wait until the soil had cooled down to 50°F. Even when applying a nitrification inhibitor, do not apply nitrogen until soil has cooled to 60°F. Probable dates when these soil temperatures are expected are contained in the Illinois Agronomy Handbook. In most cases, fall nitrogen and manure applications should not begin prior to the third week in October.
6. Use adequate levels of phosphorus, potassium, and other nutrients to ensure optimum yields and nitrogen use efficiency.
7. Conduct a post-harvest evaluation of the nitrogen program:
  - Compare actual yields vs. yield goal;
  - Evaluate factors affecting yields and nitrogen use efficiency;
  - Consider using plant tissue analyses and an end-of-season corn stalk nitrate test to evaluate plant nitrogen sufficiency;
  - Refine nitrogen rates for future years.
8. Review each nutrient management plan annually to determine if changes in the nutrient budget are needed.
9. Calibrate application equipment annually, at minimum, to ensure uniform distribution of material at planned rates.
10. Consider use of filter strips and riparian forest buffers to intercept nutrients transported surface runoff to the stream. (Note: These practices will have minimal effect in areas with extensive subsurface drainage.)
11. Avoid applying nitrogen around environmentally sensitive areas such as sinkholes, wells, gullies, ditches, surface inlets, or rapidly permeable areas.
12. Use cover crops, such as rye, to capture residual nitrogen after harvest and prevent nitrogen from being lost between harvest and planting of the next crop.
13. Utilize water table management to reduce artificial drainage when it is not needed for crop growth or field operations.
14. Outlet tiles into constructed wetlands to remove a portion of the nitrogen before tile effluent discharges into lakes or streams.

## Livestock Management Facilities Act Waste Application Provisions

The following provisions will be observed:

O) *Livestock waste applied within ¼ mile of any residence not part of the facility shall be injected or incorporated on the day of application. However, livestock management facilities and livestock waste handling facilities that have irrigation systems in operation prior to May 21, 1996, or existing facilities applying waste on frozen ground, are not subject to the provisions of this subsection.*

P) *Livestock waste may not be applied within 200 feet of surface water unless the water is upgrade or there is adequate diking and waste will not be applied within 150 feet of potable water supply wells*

Q) *Livestock waste may not be applied in a 10-year flood plain unless the injection or incorporation method of application is used.*

R) *Livestock waste may not be applied in waterways.* For the purposes of this Part, a grassed area serving as a waterway may receive livestock waste through an irrigation system if there is no runoff, the distance from applied livestock waste to surface water is greater than 200 feet, the distance from applied livestock waste to potable water supply wells is greater than 150 feet; the distance from applied livestock waste to a non-potable well, an abandoned or plugged well, a drainage well, or an injection well is greater than 100 feet; and precipitation is not expected within 24 hours;

S) *If waste is spread on frozen or snow-covered land, the application will be limited to land areas on which:*

- 1) land slopes are 5% or less; or*
- 2) adequate erosion control practices exist [510 ILCS 77/20(f) (9)];*

T) The owner, operator, or certified livestock manager shall inspect all bermtops, exterior berm sides, and non-submerged interior berm sides of earthen lagoon or earthen waste storage structures for evidence of erosion, burrowing animal activity, and other indications of berm degradation on a frequency of not less than once every two weeks.

U) Livestock waste will not be applied during a rainfall or to saturated soil and that conservative waste loading rates will be used in the case of a high water table or shallow earth cover to fractured bedrock. Caution should be exercised in applying livestock wastes, particularly on porous soils, so as not to cause nitrate or bacteria contamination of groundwaters.

## **IL- NPDES General Permit Provisions**

### **Storm Water Management Plan**

Surface Water drainage from the production site is controlled to prevent contact with manure, feed or other materials associated with production.

1. All manure is stored in under barn covered pits.
2. Methods of application may include the following:
  - A. Umbilical injection system.
  - B. Tank wagons.
3. Roof water runoff drains from the buildings through waterways and is not allowed to stand near the buildings where it might enter the manure storage pits.  
(See farmstead map, attached, that indicates storm water drainage plan).
4. Pit pump-outs are covered and secured at all times except when manure is being removed or transferred to the earthen basin.
5. Surface ditches are graded to prevent ponding and have established fescue grass to prevent erosion.
6. All feed is stored in metal bins and augured into the buildings as needed.
7. Load out chutes are cleaned immediately after use to remove manure and bedding from exposed areas to prevent storm water runoff of manure and soiled bedding.
8. Roads into the facilities for delivery of feed and for transporting livestock are graveled 'all-weather' roads. The roads are graded to prevent ponding and side slopes and waterways have established grasses to prevent erosion.
9. Storage and maintenance of manure handling equipment is provided by contracted manure handling service and/or housed in a machine shed that is located off-site.

### **Operation and Maintenance Procedures:**

The following activities are performed routinely to keep the storm water management plan functioning as designed.

1. Weekly inspections shall be conducted of the roofs, gutters, tile drains, surface ditches, waterways that drain surface water from the production site, mortality storage area and roofs over the load out areas.
2. Any deficiencies found shall be corrected as soon as possible and records shall be kept of the inspections and any corrective actions performed.
3. See attached Operation & Maintenance Records forms that will be maintained on site to record weekly inspections and corrective actions that are taken.

### **Additional Stated Intentions:**

The facility operator intends to manage this site according to a Nutrient Management Plan, Storm Water Plan, and Spill Control Plan that will meet the requirements of the general NPDES permit IL00A01 or, alternatively, an individual permit if issued by IL-EPA.

These permit provisions include discharge limitations, field application of livestock waste, monitoring and reporting requirements, and release provisions as contained in the NPDES permit that will be issued to this facility.



## ODOR AND PATHOGEN MANAGEMENT

It may not be practical or feasible to eliminate all odor emissions from the operation, but it is possible to manage or mitigate the odor. Some variables that effect odor are:

* Type of operation	* Building design
* Ventilation method	* Animal numbers
* Animal diets	* Manure treatment systems
* Season	* Topography
* Management skill or effort	*

1. **Animal Cleanliness**
  - a. Clean, dry, and healthy animals are less odorous. Dirty, manure-covered animals promote accelerated bacterial growth and the production of odorous gases.
  - b. Animal stress can also be correlated to an increase in odor production. Ventilation and environmental controls for the buildings must be properly designed and maintained to keep the animals healthy.
2. **Minimize Dust**
  - a. It has been established that there is a correlation between dust and odor emission. Dust particles absorb and concentrate odorous compounds. As the dust particles are carried by the wind, so is the odor.
  - b. Therefore, minimizing dust will reduce odor. Most farm dust comes from feed, fecal matter and, in the case of poultry, from feathers and litter. Dust also comes from animal skin, insects, and other sources.
  - c. Buildings should be cleaned of all dust between batches of animals (including fans, shutters, and screens.)
3. **Waste Storage Facility** – to reduce emissions of greenhouse gases, ammonia, volatile organic compounds, and odor:

Consider alternatives and additional practices including covered anaerobic digesters (365), and composting facilities (317).

Adjusting pH below 7 may reduce ammonia emissions from the waste storage facility but may increase odor when waste is surface applied.

Consideration should be also given to the separation of the solids from the waste mixture. This will dilute the liquid waste product being treated in the lagoon and cause less odor. The solid separated material can be composted and sold or land applied.
4. **Animal diets** can also be manipulated to produce less manure production and odors from the manure. Much of the odors from manure are from nitrogen, sulfur, and carbohydrate containing volatile compounds. Balancing the diet with proper amounts and forms of protein and reducing excess protein in the diet will reduce nitrogen excretion and odor emissions from the manure.
5. **Proper Disposal of Mortality** – Normal mortality for the animal feeding operation *must* be properly handled for both odor control and biological security of the operation. Composting, incineration, and rendering are acceptable methods for mortality disposal.
6. **Good Fly and Rodent Control Programs** – These programs must be a continuous process on the farm. When feed and waste products are properly handled, these problems are minimized.

7. **Utilize Trees** – While trees should not grow directly adjacent to facilities, wind breaks of trees correctly positioned near the facility not only create a visual barrier but can also provide a large filtration surface for dust and odorous compound removal. Trees can absorb odorous compounds and create turbulence that enhances odor dispersion and dilution. Trees also can create a cooler microclimate around the facility, which can reduce odors.
8. **Land Application**
  - a. Note wind direction and avoid spreading when the wind is blowing toward populated areas.
  - b. Avoid spreading on weekend/holidays when people are likely to be engaged in nearby outdoor and recreational activities.
  - c. Spread in the morning when air begins to warm and is rising, rather than in the afternoon.
  - d. Use available weather information to best advantage. Turbulent breezes will dissipate and dilute odors. Hot and humid weather tends to concentrate and intensify odors, particularly in the absence of breezes. Rain will remove the odor from the atmosphere.
  - e. Use natural vegetation barriers, such as woodlots or windbreaks, to help dissipate and filter odors.
  - f. Establish vegetated air filters in the field border area by planting conifers and shrubs as windbreaks and visual screens between cropland and residential developments.

#### Pathogen Management

Many of the same conservation practices used to prevent nutrient movement from this animal feeding operation, such as runoff and erosion control are likely to minimize the movement of pathogens. Pathogenic organisms occur naturally in animal wastes. Exposure to some pathogens can cause illness to humans and animals, especially for immune-deficient populations.

## **Normal Mortality Management**

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, proper and approved handling and utilization methods shall be implemented in the handling of normal mortality losses.

Discharge to waters of the State of pollutants from dead livestock or dead animals disposal facilities will be avoided by proper management of mortalities on this operation. Mortalities shall not be disposed of in the liquid livestock waste storage pits or any other manure that causes pollution of surface waters or ground waters.

### **Plan for Proper Management of Dead Animals**

The following paragraph describes normal animal mortality management for this operation in a manner that protects surface and ground water quality.

- Currently mortalities are managed by rendering. A steel container is provided by the rendering service and placed beside the driveway between the farmstead and Barn 1.
- All dead pigs are removed within 24 hours of discovery and placed in the mortality container. The rendering service makes regular pickups several times per week or if called will pickup on non-scheduled days.
- In the future, a new composter barn may be built as an alternative to rendering.
- Burial can be used as an alternative mortality management method if needed. Burial site selection should be at least 200 feet from surface waters or streams. Bottom of the burial pit should be at least 2 feet above groundwater and dead animals must have at least 6" of cover above the uppermost carcass in the pit or trench.
- Follow the Illinois Dead Animal Disposal Act regulations (included at end of section).

## Catastrophic Mortality Management

### Plan for Catastrophic Animal Mortality Handling

The following table describes how catastrophic loss of animals is planned to be managed in a manner that protects surface and ground water quality. All national, state and local laws, regulations will be followed and guidelines used that protect soil, water, air, plants, animals and human health.

A Rendering Service will be called as first choice to manage large quantities of mortalities. All mortalities should be removed from buildings within 24 hours of discovery the mortality event.

If a rendering Service is not available to haul sufficient numbers of mortalities in a timely manner, then composting or burial may be used as alternative methods.

Temporary composting may be allowed under direction of the State Veterinarian's office. A site must be chosen with impermeable surface to prevent leaching into groundwater. Sides of the compost bins may be temporarily made of round bales of hay or stalks. Sufficient composting material must be used. Finished compost must be spread at agronomic rates. Up to 50% of the compost may be mixed back into the composter to be reused as carbon source. Follow the Illinois Dead Animal Disposal Act regulations (included at end of section).

Burial: Burial in pits or trenches maybe used as a possible management option. Sites must be available for state inspection and are burials are limited to 1 lb per square foot and 3000 lbs per site. This may not be practical for catastrophic losses that might occur. Contact the Illinois State Veterinarian's office for more information specific to the locations where burial is proposed. Soils that do not have high water tables within 2 feet of the bottom of the trench or pit and are not with 200 feet of streams or pond or wells may be considered. At least 6 inches of cover of compacted soil must be placed over the uppermost carcass. Follow the Illinois Dead Animal Disposal Act regulations (included at end of section).

***Important!*** In the event of catastrophic animal mortality, contact the following authority before beginning carcass disposal:

**Authority name: Illinois State Veterinarian**

**Contact name: Mark J. Ernst, DVM**  
State Veterinarian  
Division of Food Safety and Animal Protection  
Bureau of Animal Health and Welfare  
Illinois Department of Agriculture

**Phone number: (217) 782-4944**

## **Fuel & Chemical Handling**

Detergents and disinfectants are stored in the swine barn offices and used for power washing and cleanup in between groups of pigs.

Rodenticides may be stored in the barn offices periodically prior to placement in the bait stations around the perimeter of the barns.

No gasoline or diesel fuel is stored on this site. Transfer tanks on trucks or small containers of fuel may be used to deliver fuel periodically to for mowing equipment, generators or power washing equipment.

No herbicides or insecticides are stored on this site.

No other hazardous chemicals are stored at this location.

### **Fuel handling:**

Small spills during fuel transfer should be avoided. Petroleum fuel evaporates rapidly at the land surface; however fuel readily seeps into the soil. Local geology and soil type determines how quickly fuel may reach groundwater supplies. Once in the groundwater environment, fuel is relatively stable, making it difficult to clean up. Even small spills or leaks in the same place over time are a potential threat to water resources.

To reduce potential leaks and spills during fuel transfer:

- Always supervise fuel transfer from storage to equipment to prevent spillover.
- Use a can to catch any drops that may follow after shutting off the fuel nozzle.
- Replace a leaking or defective nozzle promptly.
- Enforce a "no smoking" rule at the fuel handling and storage facility.
- Keep fuel pumps and nozzles secure from children or vandalism.
- Label each pump or nozzle as to the type of fuel dispensed.

## ASTs

Above-ground Storage Tanks (ASTs) may be used on this operation in the future observing the following guidelines.

Tanks will be protected from impact by farm equipment and personal vehicles. Proper placement of a new tank will greatly reduce any risks associated with an AST.

The following checklist will followed for ASTs:

- Comply with state-local rules for electrical safety and fire prevention. Keep a fire extinguisher in close proximity (e.g. within 75 feet) of ASTs.
- AST's should be located at least 50 feet from any building or combustible storage.
- Properly label tank contents, describe the health and physical hazards of the product.
- Secure against vandalism and tampering.
- If top-opening only, place on a stable base of timbers, blocks, concrete, etc. ASTs should not be in contact with bare soil.
- Display a "No Smoking" sign.
- Guard tank against impact. Choose a site where farm vehicles can easily maneuver for fueling.
- Enclose wiring in a conduit.
- Locate ASTs where soil strength is adequate to hold the weight of a full storage tank (or tanks).

**CHEMICALS:** *If other hazardous chemicals are stored on this site in the future, the following guidelines should be implemented.*

	<b>Measure</b>
X	<i>All chemicals should be stored in proper containers. Expired chemicals and empty containers are properly disposed of in accordance with state and federal regulations. Pesticides and associated refuse should be disposed of in accordance with the FIFRA label.</i>
X	<i>Material Safety Data Sheets (MSDS) on hazardous materials should be obtained and maintained in a location known to and accessible by everyone that could come into contact with the chemicals. These MSDS sheets provide guidance on proper handling and safety warnings in case of spills or releases, and should be part of the Emergency Action Plan for the operation.</i>
X	<i>Emergency procedures should be implemented and equipment in place to contain and clean up chemical spills.</i>
X	<i>Chemical handling and equipment wash areas should be designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems. <u>Furthermore, No chemicals should be disposed of in, the manure pits, wastewater, or waste management systems.</u></i>
X	<i>Equipment wash areas should be designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.</i>

TITLE 8: AGRICULTURE AND ANIMALS  
CHAPTER I: DEPARTMENT OF AGRICULTURE  
SUBCHAPTER b: ANIMALS AND ANIMAL PRODUCTS (EXCEPT MEAT  
AND POULTRY INSPECTION ACT REGULATIONS)  
PART 90

**ILLINOIS DEAD ANIMAL DISPOSAL ACT**

*Note: this document only includes on-farm disposal regulations. Contact the Department for text of the complete regulation.*

Section	
90.5	Definitions
90.105	Owner Transportation to Landfill
90.110	On-The-Farm Disposal

**AUTHORITY:** Implementing and authorized by the Illinois Dead Animal Disposal Act [225 ILCS 610].  
**SOURCE:** Regulations Relating to the Disposal of Dead Animals, filed January 17, 1972, effective January 27, 1972; filed December 6, 1972, effective December 16, 1972; codified at 5 Ill. Reg. 10458; amended at 7 Ill. Reg. 852, effective January 10, 1983; amended at 8 Ill. Reg. 5937, effective April 23, 1984; amended at 13 Ill. Reg. 3681, effective March 13, 1989; amended at 16 Ill. Reg. 11773, effective July 8, 1992; amended at 18 Ill. Reg. 14917, effective September 26, 1994; amended at 20 Ill. Reg. 294, effective January 1, 1996; amended at 28 Ill. Reg. 13415, effective October 1, 2004.

**NOTE:** In this Part, superscript numbers or letters are denoted by parentheses; subscripts are denoted by brackets.

**Section 90.5 Definitions**

For the purposes of this Part, the following definitions shall apply:

“Compost” means the humus-like product of the process of composting waste, which may be used as a soil conditioner.

“Composting” means the biological treatment process by which microorganisms decompose the organic fraction of waste, producing compost.

“Fish” means the bodies and parts of bodies of all animal aquatic life and the parts or waste thereof.

“Poultry” means chickens, turkeys, domestic game birds, and domestic water fowl.

“Poultry litter” means a nitrogen source such as manure or cake (i.e., the wet, compact crust that forms around feeders and waterers or litter such as found in layer operations and slatted-floor breeders).

“Straw” or “bulking agent” means straw or any alternative carbon source including, but not limited to, corn stover, soybean pods and trash, hay, sawdust, grass clippings, rice and peanut hulls, tomatoes, peat moss, pomace of grapes, wood chips, bark, shredded brush, and leaves.  
(Source: Added at 16 Ill. Reg. 11773, effective July 8, 1992)

**Section 90.105 Owner Transportation to Landfill**

When an owner or person employed by the owner is transporting a dead animal to a landfill that is open and willing to accept animals, the following guidelines shall be followed:

- a) The most direct route shall be utilized.
- b) The bed of the vehicle transporting the animal shall have covering to prevent leakage to the road surface (e.g., plastic covering or barrels).
- c) The animal shall be covered during transport.

(Source: Added at 20 Ill. Reg. 294, effective January 1, 1996)

**Section 90.110 On-The-Farm Disposal**

Persons disposing of animals, poultry, fish, or parts of bodies thereof, other than to a licensed renderer, shall comply with the following:

- a) Disposal by Burning
  - 1) No open burning will be permitted.
  - 2) Any disposal by burning must be performed with an incinerator that is in compliance with the Illinois Environmental Protection Act [415 ILCS 5].



- b) Disposal by Burying
  - 1) Burial shall be on the premises owned or operated by the owner of the dead animal.
    - A) Location shall be in an area where runoff will not contaminate water supplies or allow leachate to discharge into streams, ponds or lakes.
      - i) Dead animals shall not be buried less than 200 feet from a stream, private potable water supply well, or any other potable water supply source, except in accordance with Section 14.2(b) of the Illinois Environmental Protection Act.
      - ii) Dead Animals shall not be buried within the applicable 200 or 400 foot minimum setback zone of an existing community water supply well as established pursuant to Section 14.2 of the Illinois Environmental Protection Act.
    - B) Dead animals shall not be buried less than 200 feet from any existing residence not owned or occupied by the owner of the animal.
    - C) No more than a ratio of one pound of dead animals per one square foot of surface area shall be buried on an annual basis. No more than 3,000 pounds of dead animals shall be buried in each site location, and the same site shall not be used more frequently than once every two years for burial purposes. There shall be no more than three site locations within a radius of 120 feet.
  - 2) Burial depth shall be sufficient to provide at least a six-inch compacted soil cover over the uppermost part of the carcass. Precautions shall be taken to minimize soil erosion.
  - 3) The abdominal cavity of large carcasses shall be punctured to allow escape of putrefactive gasses.
  - 4) Lime or other chemical agent shall not be used to prevent decomposition.
  - 5) Precautions shall be taken at the site of burial necessary to prevent any disturbance by animal or mechanical means.
  - 6) Disease and nuisance vectors are to be minimized and controlled.
  - 7) Final cover or settling shall be limited to a 5% or less slope differential from the normal gradient of its general surroundings.
  - 8) Burial site locations shall be available for inspection by Department personnel during normal working hours.
- c) Disposal of poultry by composting. Persons disposing of poultry by means of composting shall comply with the following requirements:
  - 1) The composter shall meet the following criteria:
    - A) A roof shall cover the entire composting area.
    - B) An impervious, weight-bearing foundation such as concrete shall be used.
    - C) Rot-resistant building materials such as preservative-treated lumber shall be used.
    - D) The composter shall consist of primary and secondary bins.
    - E) The size of the composter shall be based on the farm's projected mortality rate of poultry, in which one pound of dead poultry per cubic foot of primary compost space per day is provided.
  - 2) Composting shall comply with the following guidelines:
    - A) A mixture of one part dead poultry (by weight), one and one-half part poultry litter, and one-tenth part of straw shall be used. For example: 400 pounds of dead poultry will require 600 pounds of poultry litter and 40 pounds of straw.
    - B) Layering shall be done in the following order, starting from the floor: (First layer) Straw, poultry litter, straw, birds, and poultry litter. Second and subsequent layers: straw, birds, and poultry litter.

- C) A 36-inch probe-type thermometer shall be inserted daily into the pile to check the temperature. Within two to four days, the temperature should peak between 135° F. and 150° F.
    - D) Once the temperature begins to fall from the peak (normally 7 to 10 days), the material shall be removed to the secondary treatment bin.
    - E) After 7 to 10 days in the secondary bin, the compost may be agronomically distributed over land under cultivation or reused in the composting process. For the purpose of this subsection (c)(2)(E), the agronomic rate is the annual application rate of poultry compost, either alone or in combination with other nutrient supplying materials, that is necessary to achieve a reasonable crop yield without exceeding crop nutrient requirements.
  - 3) The composted material may be substituted for up to one-half of the poultry litter and one-half of the straw.
- d) Disposal of fish by composting. Persons disposing of fish by means of composting shall comply with the following requirements:
  - 1) The composter shall meet the following criteria:
    - A) A roof shall cover the entire composting area.
    - B) An impervious, weight-bearing foundation such as concrete shall be used.
    - C) Rot-resistant building materials such as preservative-treated lumber shall be used.
  - 2) The base layer shall meet the following criteria:
    - A) Use 6 to 12 inches thick of a bulking agent.
    - B) Be no more than 6 to 8 feet wide, but as long as necessary to accommodate the day's supply of compost material.
  - 3) Composting shall meet the following guidelines:
    - A) Composting layer shall consist of a mixture of one part fish, three parts bulking agent and one part recycled compost (if available) or bulking agent and shall be mixed prior to use in the composting layer. The mixing of the materials for the composting layer shall be done in a manner to prevent leakage (e.g., stock tank, bucket, mixing drum).
    - B) The cover layer shall consist of two parts bulking agent and two parts recycled compost (if available) or two parts bulking agent and should reach a thickness of 6 to 12 inches.
    - C) Layering shall be done in the following order starting from the concrete: base layer, composting layer (fish, bulking agent and recycled compost), and cover layer. The composting and cover layers are piled on top of the base layer to form a trapezoid no higher than 4 feet.
    - D) Additions to the compost pile are done by adding new material to the end of the pile.
    - E) A probe-type thermometer shall be inserted daily into the pile to check the temperature. The temperature should peak between 140° F. and 165° F. The material can be recycled after it has composted for at least 2 to 3 weeks, and its temperature has dropped to air temperature.
    - F) After the temperature has dropped to air temperature (normally 2 to 3 weeks), the composted material may be used in the composting layer, or after one month, the composted material may be agronomically distributed over land under cultivation or reused in the cover layer. For the purpose of this subsection, the agronomic rate is the annual application rate of fish compost, either alone or in combination with other nutrient supplying materials that is necessary to achieve a reasonable crop yield without exceeding crop nutrient requirements.
- e) Disposal of swine by composting. Persons disposing of swine by means of composting shall comply with the following requirements:
  - 1) The composter shall be located entirely over impervious foundation materials.

- A) One of two foundations shall be used:
  - i) impervious soil (permeability equal to or less than  $1 \times 10^{-7}$  cm/sec. as defined in Section 651.0703 "Geotechnical considerations in waste facility siting", Agricultural Waste Management Field Handbook, Soil Conservation Service, U.S. Department of Agriculture, 1992). A 4 to 6 inch base of ungraded (varying particle size) field lime over the soil foundation is suggested as a runoff control measure.
  - ii) an impervious, weight-bearing foundation such as concrete or asphalt.
- 2) Surface water shall be diverted away from the composter.
- 3) Location shall be in an area where runoff will not contaminate water supplies or allow leachate to discharge into streams, ponds or lakes.
  - A) Composter shall not be constructed less than 200 feet from a stream, private potable water supply well, or any other potable water supply source, except in accordance with Section 14.2(b) of the Illinois Environmental Protection Act.
  - B) Composter shall not be constructed within the applicable 200 or 400 foot minimum setback zone of an existing community water supply well as established pursuant to Section 14.2 of the Illinois Environmental Protection Act.
- 4) The composter shall consist of primary and secondary bins. The size of the composter shall be based on the farm's projected mortality rate of swine during any three-month period. The primary and secondary bins shall each contain a minimum of 10 square feet of composting area for each 1000 pounds of carcass to be composted.
- 5) The composter shall be constructed of permanent rot-resistant wall materials, such as preservative-treated wood, concrete, or precast concrete such as highway lane dividers. Each composter bin shall be three sides of a rectangle or square. One side of the bin shall be left open for loading, unloading and mixing the compost. In emergency situations, hay bales of 48 inches or greater in diameter may be used on a temporary basis in the above configuration of side walls.
- 6) Composting shall comply with the following guidelines:
  - A) Coarse sawmill sawdust, shredded cornstalks, chopped straw, coarse-ground corn cobs, and other materials possessing like properties and having similar particle size are recommended for the carbon source.
  - B) It is expected that the carbon source will be required in the ratio of approximately one cubic foot of sawdust per ten pounds of carcass (3.7 cubic yards of carbon source per 1000 pounds of carcass). A supply of carbon source shall be stockpiled and maintained on the premises at all times when the composter is in operation.
  - C) Each compost bin shall have a layer of carbon source a minimum of 10 inches deep placed on the floor before the first carcass is placed in the bin. There shall be a minimum of 10 inches of carbon source between the carcass and each of the vertical walls of the bin. The carcass shall be covered with a minimum of 10 inches of carbon source. The carbon source shall be added to the pile as composting begins, daily or as frequently as needed to sustain a 10 inch cover of carbon source over all carcasses in the bin's uppermost layer.
  - D) A compost thermometer with a probe at least 36" long shall be obtained and used daily to measure the temperature of the compost in the middle of each bin. The compost temperature should reach 135 to 160° F. (57° to 71° C.) and be recorded daily. Compost temperature indicates microbial activity and stage of composting process. The composting process shall be managed in such a way that the heating and decomposition can proceed to completion. If aerobic composting does

not begin with 7 days, i.e., if temperatures do not rise above 135° F., the compost pile shall be turned and moisture content of the carbon source adjusted to allow the process to proceed. Temperature records shall be available for examination until the compost is disposed of as in subsection (e) (6) (G).

- E) The carbon source and carcasses may be placed in the bin until the bin is full.
  - F) All compost from the primary bin shall be allowed to undergo a second composting phase as follows:
    - i) When the temperature surrounding the last carcass placed in the composter drops below 130° F. (typically up to three months after the last carcass addition), the compost in that bin shall be transferred to a second bin and allowed to reheat, through a second composting cycle. Moisture shall be added to the compost as needed to promote further composting activity.
    - ii) Compost shall remain in the second bin for the duration of the secondary composting cycle (typically three months). Temperature of the compost shall be measured using the compost thermometer to monitor the composting process.
  - G) Finished compost shall be agronomically distributed over land under cultivation or reused in the composting process. Finished compost may be returned to the primary composting bin in the ratio of up to 50 percent finished compost to fresh carbon source. For the purpose of this subsection, the agronomic rate is the annual application rate of swine compost, either alone or in combination with other nutrient supplying materials that is necessary to achieve a reasonable crop yield without exceeding crop nutrient requirements.
- f) Disposal of cattle, sheep or goats by composting. Persons disposing of cattle, sheep or goats by means of composting shall comply with the following requirements:
- 1) Carcasses of those animals dying of suspect neurological causes shall not be composted.
  - 2) The composter shall be located entirely over impervious foundation materials. One of two foundations shall be used:
    - A) Impervious soil (permeability equal to less than  $1 \times 10^{-7}$  cm/sec., as defined in Section 651.0703 (Geotechnical considerations in waste facility siting) of the Agricultural Waste Management Field Handbook, Soil Conservation Service, U.S. Department of Agriculture, 1992). A 4 to 6 inch base of ungraded (varying particle size) field lime over the soil foundation is suggested as a runoff control measure.
    - B) An impervious, weight-bearing foundation such as concrete or asphalt.
  - 3) Surface water shall be diverted away from the composter.
  - 4) Location shall be in an area where runoff will not contaminate water supplies or allow leachate to discharge into streams, ponds or lakes.
    - A) The composter shall not be constructed less than 200 feet from a stream, private potable water supply well, or any other potable water supply source, except in accordance with Section 14.2(b) of the Illinois Environmental Protection Act.
    - B) The composter shall not be constructed within the applicable 200- or 400-foot minimum setback zone of an existing community water supply well as established pursuant to Section 14.2 of the Illinois Environmental Protection Act.
    - C) A composting site shall be located at least 1/4 mile from the nearest occupied residence (other than a residence located on the same property as the facility).
  - 5) The composter shall consist of at least two bins, allowing operation as primary and secondary composting sequences.

- 6) The composter shall be constructed of permanent rot-resistant materials, such as preservative-treated wood or concrete.
- 7) The size of the composter shall be based on the facility's greatest projected mortality rate of animals during any three-month period of the year.
- 8) The composter bin minimum width dimension shall be large enough to allow placement of the largest carcass with at least one foot of space all around the carcass for carbon source material, or at least one foot greater than the width of the loader bucket used for turning the compost, whichever is larger.
- 9) A composting thermometer with a minimum probe length of 36" shall be kept available at the facility for monitoring progress of the compost process.
- 10) Records of carcass additions, composter operation and land application of finished compost shall be maintained on the premises.
- 11) Composting shall comply with the following guidelines:
  - A) Coarse sawmill sawdust, shredded corn stalks, chopped straw, coarse-ground corn cobs, and other materials possessing like properties and having similar particle size are recommended as the carbon source.
  - B) A supply of carbon source materials shall be stockpiled and maintained on the premises at all times when the composter is in operation.
  - C) Finished compost from the carcass composting process (secondary bins) may be re-used in an amount appropriate to maintaining proper composting operation (up to 50% volume of re-used finished compost suggested).
  - D) Each carcass placed on the floor of a primary bin shall be underlain with at least 12 inches of absorbent carbon source material.
  - E) Carcasses weighing more than 300 lb. shall be processed prior to covering with carbon source material. Processing may consist of, but is not limited to:
    - i) opening the abdominal cavity to facilitate contact of carbon source material and reduce distention of carcass with gases; and
    - ii) incising the large limb muscles to facilitate contact of carbon source material and thereby hasten composting.
  - F) Each carcass placed in the primary composter bin shall be immediately covered with a layer of carbon source material to a depth of at least 12" on top and all sides. Carbon source material shall be added to the composter daily or as frequently as needed to sustain a cover of carbon source material over all parts of carcasses in the bin's uppermost layer.
  - G) Carcasses and carbon source material may be added to the primary bin until the bin is full.
  - H) The composting process shall be monitored and managed in such a way that heating and decomposition can proceed to completion (typically three months in the primary bin from the time the last carcass is placed in the bin and another three months in the secondary bin from the time the compost is moved into the secondary bin from the primary bin). Water shall be added as necessary to adjust the moisture content of the compost and promote further composting activity.
  - I) Finished compost shall be agronomically distributed over land under cultivation or reused in the composting process. Finished compost may be returned to the primary composting bin in a ratio of up to 50% finished compost to fresh carbon source material. For the purpose of this subsection (f)(11)(I), the agronomic rate is the annual application rate of the compost, either alone or in combination with other nutrient supplying materials, which is necessary to achieve a reasonable crop yield without exceeding crop nutrient requirements.
- g) Disposal of sheep and goat offal by composting. Persons disposing of sheep or goat offal by means of composting shall comply with the following requirements:

- 1) Offal of those animals dying of suspect neurological causes shall not be composted.
- 2) The composter shall be located entirely over impervious foundation materials. One of two foundations shall be used:
  - A) Impervious soil (permeability equal to less than  $1 \times 10^{-7}$  cm/sec., as defined in Section 651.0703 (Geotechnical considerations in waste facility siting) of the Agricultural Waste Management Field Handbook, Soil Conservation Service, U.S. Department of Agriculture, 1992). A 4 to 6 inch base of ungraded (varying particle size) field lime over the soil foundation is suggested as a runoff control measure.
  - B) An impervious, weight-bearing foundation such as concrete or asphalt.
- 3) Surface water shall be diverted away from the composter.
- 4) Location shall be in an area where runoff will not contaminate water supplies or allow leachate to discharge into streams, ponds or lakes.
- 5) The composter shall not be constructed less than 200 feet from a stream, private potable water supply well, or any other potable water supply source, except in accordance with Section 14.2(b) of the Illinois Environmental Protection Act.
- 6) The composter shall not be constructed within the applicable 200- or 400-foot minimum setback zone of an existing community water supply well as established pursuant to Section 14.2 of the Illinois Environmental Protection Act.
- 7) A composting site shall be located at least 1/4 mile from the nearest occupied residence (other than a residence located on the same property as the facility).
- 8) The composter shall consist of at least two bins, allowing operation as primary and secondary composting sequences.
- 9) The composter shall be constructed of permanent rot-resistant materials, such as preservative-treated wood or concrete.
- 10) The size of the composter shall be based on the greatest projected offal rate from animals during any three-month period of the year.
- 11) The composter bin minimum width dimension shall be at least one foot greater than the width of the loader bucket used for turning the compost.
- 12) A composting thermometer with a minimum probe length of 36" shall be kept available at the facility for monitoring progress of the compost process.
- 13) Records of offal additions, composter operation and land application of finished compost shall be maintained on the premises.
- 14) Composting shall comply with the following guidelines:
  - A) Coarse sawmill sawdust, shredded corn stalks, chopped straw, coarse-ground corn cobs, and other materials possessing like properties and having similar particle size are recommended as the carbon source.
  - B) A supply of carbon source materials shall be stockpiled and maintained on the premises at all times when the composter is in operation.
  - C) Finished compost from the offal composting process (secondary bins) may be re-used in an amount appropriate to maintaining proper composting operation (up to 50% volume of re-used finished compost suggested).
  - D) Offal placed on the floor of a primary bin shall be mixed in a 50/50 ratio to carbon source material and underlain with at least 12" of absorbent carbon source material.
  - E) Any offal placed in the primary composter bin shall be immediately covered with a layer of carbon source material to a depth of at least 12" on top and all sides. Carbon source material shall be added to the composter daily or as frequently as needed to sustain a cover of carbon source material over all parts of carcasses in the bin's uppermost layer.
  - F) Offal and carbon source material may be added to the primary bin until the bin is full.
  - G) The composting process shall be monitored and managed in such a way that heating and decomposition can proceed to completion (typically

three months in the primary bin from the time the last carcass is placed in the bin and another three months in the secondary bin from the time the compost is moved into the secondary bin from the primary bin). Water shall be added as necessary to adjust the moisture content of the compost and promote further composting activity.

- H) Finished compost shall be agronomically distributed over land under cultivation or reused in the composting process. Finished compost may be returned to the primary composting bin in a ratio of up to 50% finished compost to fresh carbon source material. For the purpose of this subsection (g)(14)(H), the agronomic rate is the annual application rate of the compost, either alone or in combination with other nutrient supplying materials, which is necessary to achieve a reasonable crop yield without exceeding crop nutrient requirements.

(Source: Amended at 28 Ill. Reg. 13415, effective October 1, 20