

Natural Resources Conservation & Manure/Mortality Management



Maple Leaf Farms Guidelines 2009



Table of Contents

I. Introduction.....	1
1. General Environmental Regulatory Oversight.....	2
2. Glossary of Common used terms and definitions	3
II. Manure Management	4
1. Types of Manure – dry/solid and liquid	4
2. Manure Storage Systems	4
a. Dry/Solid Manure Storage Structures	6
b. Liquid Manure Storage Structures	7
3. Nutrient Management Plan and Land Application	7
a. Nutrient Management Plan Requirements	7
b. Manure Application Criteria	8
c. Associated Recordkeeping	10
4. Manure Transfer	10
5. Spill Response Plan	11
III. Mortality Disposal	12
1. Composting	12
2. Incineration.....	13
3. Burial & Rendering	14
IV. Water Conservation.....	15
V. Appendix	
A. NRCS Guidelines – NR 590, 634 and 313	
B. Indiana Confined Feeding Regulation 327 IAC 16	
C. Example Nutrient Management Plans	
D. Manure Distribution Information Sheet	
E. Dead Animal Disposal Technical Bulletin LG-1.97	
F. IN NCR-530 Composting Poultry Carcasses	



I. Introduction

Maple Leaf Farms, Inc. is deeply committed to preserving our natural resources. As a family-owned company that works with more than 100 farm families who care for our ducks, we place great importance on protecting the communities in which we live and do business. We believe that our company, egg-producers and growers have the responsibility to implement environmental programs that will preserve the rights of future generations to enjoy Indiana's natural resources.

To that end, our company has developed the following environmental guidelines to assist operations affiliated with Maple Leaf Farms understand our expectations and comply with the many state and federal laws that govern the management of land, air and water. Our company will support this policy through education, communication, planning and monitoring so that company and contract operations can excel in aspects of environmental management.

Maple Leaf Farms will strive to have newly constructed contract farms designed around these current environmental standards. Our company will refer egg-producers and growers to these guidelines in support of their environmental stewardship efforts. By implementing these environmental practices on their own farms, producers can reduce the potential for harming the environment and facing a related loss of farm income due to regulatory fines, clean up costs or loss of contract.

Conserving our natural resources and protecting the environment is a key component of Maple Leaf Farms' Trident Stewardship Program. Because these goals may be shaped by technological advances or changing government regulations, our company may periodically update these environmental guidelines to reflect those changes.



1. General Environmental Regulatory Oversight:

Proper manure management, mortality disposal and water conservation are primary concerns for Maple Leaf Farms' egg producers and growers. There are two agencies, the federal Environmental Protection Agency (EPA) and the Indiana Department of Environmental Management (IDEM), which set environmental policies that may impact duck operations. The EPA has regulations governing Confined Animal Feeding Operations (CAFO), or large operations that must obtain a National Pollution Discharge Elimination System (NPDES) permit for discharges of water contaminants to waters of the state. IDEM has based state regulations on Federal EPA regulations.

IDEM defines a Confined Feeding Operation (CFO) as any farm having 30,000 ducks confined and fed on-site for a 45 day period or longer. A Concentrated Animal Feeding Operation (CAFO) is a very large CFO that requires a National Pollutant Discharge Elimination (NPDES) System permit. A CAFO may also be an operation with 5,000 ducks that generates liquid manure or a farm that plans to treat manure and discharge treated effluent that meets state water quality standards.

Maple Leaf Farms egg-producers and growers are **NOT** required to have an Indiana CFO permit because these operations have fewer than 30,000 ducks on-site in a 45-day period. However, our company encourages all duck operations to follow the standards for CFO's because any animal operation in Indiana that has a significant pollution discharge may be required to obtain a National Pollution Discharge Elimination System (NPDES) permit and will be defined as a CAFO.

The following guidelines will provide a basis for understanding and implementing the applicable CFO/CAFO regulations and manure management regulations for Indiana. Farms may also refer to IDEM 327 IAC 16 CFO/CAFO regulations and to the Natural Resource Conservation Service (NRCS) office NR 590, 634 and 313 guidelines for best practices of manure management. Copies of these documents are included in Appendices A, B, E and F.



2. Glossary of Commonly used terms and definitions:

- CFO = Confined Feeding Operation; 30,000 ducks or more on-site during any 45 day period; requires a permit.
- CAFO = Concentrated Animal Feeding Operation; 30,000 ducks or more on-site during any 45 day period, or 5,000 ducks generating liquid manure; requires a permit.
- EPA = Federal Environmental Protection Agency
- IDEM = Indiana Department of Environmental Management
- NMP = Nutrient Management Plan
- NPDES = National Pollution Discharge Elimination System; permit issued by IDEM to a CFO/CAFO
- NRCS = Natural Resource Conservation Service; US agency to assist farmers
- Dry/Solid Manure = manure with total solids greater than 12%. Bedding from litter barns.
- Liquid Manure = manure with total solids less than 12%. Has “wet” lots, swimming areas or uses water to flush the manure out of the barn.
- Other than liquid Manure = duck growers on wire/plastic raised flooring using scrapers to move manure out of the barns. **NO** water is used to move the manure out of the barn.
- Leachate = liquid runoff from dry/solid manure storage or compost areas.



II. Manure Management

1. Types of Manure – Dry/Solid and Liquid

Dry/solid or liquid manure must be stored in appropriate storage structures and then land applied. To minimize the quantity of manure to be managed and potential for spills, manure storage structures should be constructed, located and protected in such a way as to prevent rain fall or snow melt from running into the storage structure or onto adjacent ground.

Dry/solid manure is typically defined as having total solids greater than 12%. Dry/solid manure is generated in the shaving / litter barns, and the wire/plastic raised flooring barns where water is NOT used to flush or scrape the manure out of the barns. Although Maple Leaf Farms and our producers commonly refer to the manure from wire/plastic raised floor barns as “liquid manure”, Federal EPA defines this system as “other than liquid”.

Maple Leaf Farms producers are **NOT** defined as liquid manure operations because our farms:

- Have manure with total solids greater than 12%.
- Do not have “wet” lots or swimming areas.
- Do not use water to flush the manure from barns.

2. Manure Storage Systems

Indiana has design and operational criteria for the storage and management of dry/solid and liquid manure. Manure storage structures should be built so that they comply with Natural Resource Conservation Service (NRCS – 313, see Appendix A) regulations and Indiana’s Confined Feeding Operations regulations (327 IAC 16, see Appendix B). The following sections will identify some of these design and operational criteria for dry/solid and liquid manure storage systems.

a. Dry/Solid Manure Storage Structures

For new dry/solid manure storage structures, refer to IDEM regulations, NRCS policies and local ordinances for information regarding the design and siting of a new dry/solid manure storage structure. NRCS Code 313 - Waste Storage Facility, included in Appendix A, provides guidance on location and design criteria of manure waste storage structures for farms that are not a CFO or CAFO.

For existing dry/solid manure storage structures, the following general criteria are applicable:

- Storage period is the maximum length of time anticipated between manure land spreading or clean out events. The minimum storage period shall be based on the timing required for environmentally safe waste utilization considering the climate, crops, soil, equipment, and local, state, and federal regulations.



- IDEM defines the storage period for CFO / CAFO as:
 - 90 days for storage structures built prior to July 1, 1997.
 - 180 days for new or storage structures built after July 1, 1997.
- Storage capacity must be able to accommodate:
 - Manure, bedding, wash water, and other wastes accumulated during the storage period.
 - Normal precipitation, less evaporation, on the surface area of the facility during the storage period.
- Setback distances must be followed for stockpiling manure and for manure storage construction. The setback distances are shown in Table 1 below.
- Dry/solid manure storage structures should be designed and maintained so that stormwater run-on & precipitation is diverted away, unless the design includes a method of collection and management of the contaminated run-off.

Table 1
Minimum Setback Distances for Stockpiles and Storage Facilities

SETBACK DISTANCES (in feet)

Known Feature	Manure Stockpile <i>Includes: Application Site and at the Farm</i>	Manure Storage Facility
Public water supply wells and public water supply surface intake structures	500	500
Surface waters of the state, including water and sediment control basins	300	300
Sinkholes (measured from the surficial opening or the lowest point)	300	300
Wells	300	100
Drainage inlets	300	300
Property lines and public roads	100	100

To properly manage a dry/solid manure storage structure, you should do the following:

- Maintain the storage structure in good condition.
- Annually inspect the storage structure.
- Stage dry manure near the land application site and land apply within 72 hours. If land application cannot occur within 72 hours, the staging or stockpiling area must meet the following conditions:
 - The Stockpile manure storage area must be diked on at least 3 sides to prevent run-on and run-off of stormwater.
 - The dike must be a minimum of 1 foot high.
 - The manure must be placed a minimum of 1 foot away from the dike.



- The manure stockpile should be covered or otherwise protected from rain and snow.
- The manure must be land applied within 90 days of placement at the stockpile area.
- The manure cannot be placed on an area with a slope greater than 6%.
- The manure cannot be placed on any standing water or in a waterway.

b. Liquid Manure Storage Structures

For new liquid manure storage structures, refer to IDEM regulations, NRCS policies, and local ordinances for information regarding the design and siting of a new liquid manure storage structure. NRCS Code 313 - Waste Storage Facility, included in Appendix A, provides guidance on location and design criteria of manure waste storage structures for farms that are not a CFO or CAFO.

Liquid manure storage structure design criteria include:

- Storage period is the maximum length of time anticipated between land spreading or clean out events. The minimum storage period shall be based on the timing required for environmentally safe waste utilization considering the climate, crops, soil, equipment, and local, state, and federal regulations.
- IDEM defines the storage period for CFO / CAFO as:
 - 90 days for liquid lagoons or pits constructed prior to July 1, 1997
 - At least 180 days of storage capacity for the generated manure, process wastewater, net average rainfall, and if applicable, the storm water runoff from a 25-year, 24-hours storm event, for liquid lagoons and pits constructed after July 1, 1997.
 - Process wastewaters includes:
 - ◆ Spillage or overflow from poultry watering system;
 - ◆ Treated water flushed from poultry watering system;
 - ◆ Water used to wash, clean, or flush pens, barns, manure pits and other associated facilities;
 - ◆ Water used for direct contact swimming, washing or spray cooling of animals;
 - ◆ Water used for dust control.
- Uncovered / open storage structures should:
 - Capacity to store precipitation from a 25-year, 24-hour storm event that falls on the uncovered / open storage structure.
 - A 2 foot freeboard, or 2 feet of space between the top of the storage structure and top of the accumulated manure.
 - An emergency spillway, if the structure is designed to collect stormwater runoff.
- A covered storage structure may have a 1 foot freeboard.



All liquid, including stormwater, in a manure storage lagoon or pit is considered manure and must be managed as manure. To properly manage a liquid manure system, you must do the following:

- Maintain the storage structure in good condition.
- Annually inspect the storage structure.
- Maintain a 2 foot freeboard in an uncovered or open storage structure such as lagoons or pits.
- Maintain a 1 foot freeboard in the first lagoon of a 2-stage system and manage the solids to prevent the plugging of the overflow pipe from the first to the second lagoon or pit.
- Maintain a 1 foot freeboard in a covered storage structure such as a lagoon or pit.
- Maintain a full level stake or marker on an uncovered storage structure.
- Maintain earthen berms for visual inspection, control weed growth and control rodents.
- Remove trees as the root system can affect the integrity of the lagoon berms.
- Stabilize earthen berms with vegetation or alternative erosion control measures.

3. Nutrient Management Plan and Land Application

Land application of manure is the most common disposal in Indiana. Manure must be applied according to the agronomic nutrient needs of the intended crop.

A nutrient management plan is a tool used to manage and land apply manure onto fields, based on the soil nutrient levels, manure nutrient levels, and crop nutrient requirements, while protecting the environment from potential manure run-off and over-applying of nutrients to a field. Example nutrient management plans are located in Appendix C.

a. Nutrient Management Plan Requirements

Maple Leaf Farms contract producers are encouraged to develop and implement a nutrient management plan. The NRCS 590 and Indiana CFO regulations provide guidance on what data needs to be in a nutrient management plan (NMP).

A nutrient management plan contains the following:

- Aerial photograph or map and a soil map of the site, with field identification.
- Current and /or planned plant production sequence or crop rotation.
- Realistic yield goals for the crops in the rotation.
- Annual sampling of manure for nitrogen, phosphorus and potassium.
- Soil sampling once every 3 years, at a minimum.
- Soil sampling procedures and number of samples to be collected per field to provide adequate nutrient information to establish nutrient application rates.



- Estimate quantity of manure generated annually.
- Complete nutrient budget for nitrogen, phosphorus, and potassium for the rotation or crop sequence.
- Recommended nutrient rates, timing, form, and method of application.
- Nutrient application rates to include commercial fertilizer nutrients, as well as nutrients from manure.
- Location of designated sensitive areas or resources and the associated nutrient management restrictions.
- Guidance for implementation of operations, maintenance, and recordkeeping.
- Discussion about how the plan is intended to prevent the nutrients (N and P) supplied for production purposes from contributing to water quality impairment.
- Identification of 25% of the acreage needed for proper land application. The acreage may be owned or reserved through written agreements with other property owners.
- Set back distances from water ways, water wells (public and private), sink holes, property lines, and public roads.

In addition to the above, NRCS 590 recommends the following operations & maintenance activities:

- Annual review of the nutrient management plan to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be reviewed and revised with each soil test cycle.
- Calibrate application equipment to provide for even application of fertilizer and manure at intended rates.

b. Manure Application Criteria:

Manure land application must be done properly to protect the environment while providing the nutrients for crops. The NRCS guidance documents (see Appendix A) and confined feeding regulations (see Appendix B) should be referenced for proper set backs that shall be used during land application.

Some of the land application criteria include:

- All manure must be applied by an approved method. The following are not approved by the state of Indiana. Pumping, dumping, or discharging manure into a stream, ditch, standpipe, tile line, or water body. Pumping manure directly out of a storage pit or lagoon onto a field without the use of an approved application device (irrigation gun or manure tanker). Using an unapproved method for land application is illegal.
- Materials generated by the cleaning of nutrient application equipment shall be disposed of properly. Excess materials shall be collected and stored or field



applied as a nutrient source, in an appropriate manner. Excess material shall not be applied on areas with a high risk for runoff or leaching.

- All drains inside a barn must be diverted to a lagoon or a storage structure and spread as manure. It is illegal to run wastewater into a field tile or allow it to run out on the ground.
- All gallons or loads of manure that leave the farm should be recorded on the Manure Distribution Information Sheets or field application record sheets. The manure disposal sheets must be kept on the farm and should be readily available for review upon request by NRCS or IDEM. An example Manure Distribution Information Sheet is in Appendix D.
- Manure must not be over applied.
- Setback distance requirements must be followed during all types of manure application. See Table 2 below.
- Spray irrigation of liquid manure on snow covered or frozen ground is prohibited.
- Surface application of solid manure is allowed on snow covered or frozen ground onto fields with less than 2% slopes.
- Manure must not be applied on saturated ground.
- Manure must be applied according to agronomic rates for the crop that will be planted in the following crop year.
- Manure must not be applied in a manner that endangers waters of the state.

Table 2
Minimum Setback Distances for Land Application of Manure

SETBACK DISTANCES (in feet)

Known Feature	Liquid Injection or Single Pass Incorporation	Liquid Incorporation; Application to Pasture; or Solid or Composted Manure Application	Liquid Surface Application < 6 % Slope; or Residue Cover	Greater than 6 % Slope
Public water supply wells and public water supply surface intake structures	500	500	500	500
Surface waters of the state, including water and sediment control basins	25	50	100	200
Sinkholes (measured from the surficial opening or the lowest point)	25	50	100	200
Wells	50	50	100	200
Drainage inlets	5	50	100	200
Property lines and public roads	0	10	50	50



c. Associated Recordkeeping

As part of the nutrient management plan, it is important to maintain records of how manure is being managed and disposed. At a minimum, the records should include the following information:

- Documentation of the source, analyses and actual rate at which all nutrients were applied. When the actual rates used differ or exceed the recommended and planned rates, records will indicate the reasons for the difference.
- Soil test results and recommendations for nutrient application.
- Dates and methods of nutrient applications.
- Crops planted, planting and harvest dates, yields and crop residue removal.
- Results of water, plant, and organic by-product analysis.
- Dates of plan review and person performing the review, and recommendations that resulted from the review.
- For manure managed by another person/company, the following information is to be recorded:
 - Date manure is taken.
 - Quantity of manure taken.
 - Name of person and company that has taken the manure.
- In addition, the following information will be provided to the person or company taking the manure for disposal:
 - Copy of most recent manure nutrient test results.
 - Copy of most recent soil test results for farm owned fields being used for land application of manure.
 - Receipt of manure received, note guidelines stated on the manure handling form located in Appendix D.

It is recommended that these records be maintained by the producer for five years.

4. Manure Transfer

Proper management of manure transfer and general handling of manure limits the potential for spills and clean up activities. The following help with proper manure handling and transfers:

- Use proper equipment for manure type – liquid or solid.
- Inspect pumps and equipment each time they are used.
- Promptly repair and fix any malfunctioning pumps or equipment.
- Eliminate spills on or around the farm (including transfer sites in the field).



5. Spill Response Plan

MLF recommends that all producers develop a spill response plan. This plan should be used to immediately respond to spills that may occur and result in discharges to waters of the state or cross property lines. Having a working spill response plan could save a producer fines, permits, and clean-up costs that are associated with a discharge.

Any spill that has harmed or has the potential to harm the environment or public must be reported to Indiana Department of Environmental Management (IDEM). Especially any discharge to waters of the state and / or spills that cross property lines must be reported to the proper state agencies. Indiana includes groundwater as waters of the state, so a spill on a producer's property still requires reporting to the appropriate state agency. If the spill is confined to a contained area and cleaned up immediately, then the spill may not need to be reported.

A spill response plan will, at a minimum, identify the following:

- Control – protect yourself, stop the source, protect others and stay at the site.
- Contain – confine the spill, protect water sources, recover and / or absorb liquids, cover dry materials.
- Contact – call IDEM.
- Clean up – clean the spill site.

In addition, CFO regulations require:

- All employees to be familiar with the spill response plan.
- The spill response plan to be readily available at the farm.
- The names and phone numbers of persons who are responsible for implementing the emergency spill response plan.
- A list of areas where potential spills could occur and their associated drainage points
- Procedures to follow in the event of a spill, which include:
 - Actions to contain or manage any spill of manure.
 - Contact information to report the spill to proper agencies such as state spill hotline, county emergency management planner, and the county board of health.
 - Minimize the impact of the spill.
- Identify equipment and materials to be used to clean up the spill.
- Identify other companies that may provide additional equipment to clean up a spill, i.e. contractor with a vacuum tanker, backhoe, etc.



III. Mortality Disposal

Indiana state law requires “an animal owner to dispose properly of all remains within 24 hours of learning of an animal’s death.” – Tech Bulletin LG-1.97 Indiana Board of Animal Health (IBOAH). A copy is in Appendix E.

There are several methods to manage farm mortality. The methods include composting, incineration, burial or rendering. In view of increased biosecurity awareness, burial and rendering are the least acceptable methods available, but may be appropriate and approved as a result to implementation of the Emergency Disease Response Plan. The discussion presented below will focus on the other two methods of mortality management available.

1. Composting

Composting is a natural process to convert organic matter (poultry mortality) into a useful end product called compost. If done properly, there should be limited offensive odors and the compost product can be used as a fertilizer.

The following basics apply to compost operations:

- State guidelines recommend the composter be constructed on a permanent, sheltered site, complete with a roof and concrete floor.
- Composter should be located 100 feet from a ground water well, 300 feet from water ways.
- Liquid from the composting area, if generated, must be managed and not allowed to flow onto adjacent ground. Liquid can be put back into the compost operation or mixed with other liquid or solid manure.
- Mortality must be covered so that it will not attract rodents or scavengers.
- The compost should be a mixture of dry manure or litter, carcasses and / or bedding, and water or liquid manure added as needed.
- The compost should reach temperatures of 130 degrees F or more, within 2 to 4 days and should be at these temperatures for several days.
- Compost is complete when no carcasses are identifiable.
- After 14 days or more, the compost should be complete and can be stored or land applied in a similar manner as manure.

Loading a Compost Bin

The ideal way to load a compost bin is to start with a double layer of straw or grass clippings atop the concrete floor. This should be covered by a layer of manure/litter and then a layer of straw/grass clippings. Once you have established these beginning layers you may then add a layer of mortality, being careful to keep poultry 6 inches away from the compost bin edges. Keep repeating the layers of manure/litter, straw/grass clippings and mortality until the bin is full. Cap the bin with a layer of manure/litter. Refer to Diagram 1 below for an example of compost bin loading.



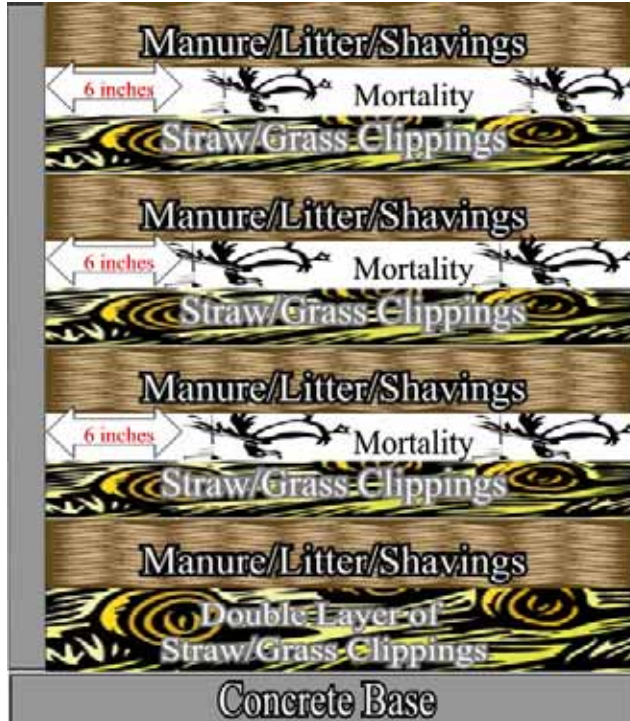


Diagram 1: Compost Loading

For basic composting troubleshooting, if the compost mixture fails to heat or has a lot of odor, it's typically a result of the compost mixture being too wet. If this is the case, add more dry manure, manure- litter mixture or straw and mix. If the compost mixture is too dry, it will fail to generate the heat. This is typically a result of adding too dry of manure or manure-litter mixture. To correct, add water, evenly distributed across the compost surface, a little bit at a time.

Additional information regarding the ideal design and operation of a composting operation for poultry carcasses, refer to Purdue University's document NCR-530 located in Appendix F.

2. Incineration

Incineration is a process that uses high heat to burn and reduce carcasses to inert ash material. Incinerators use diesel fuel, natural gas or propane as a fuel source. The following basics apply to incineration operations:

- Mortality must be disposed of in a fashion that will not attract rodents or scavengers.
- Incineration is accepted as long as the incinerator is properly constructed and maintained.

- Proper operation will provide thorough and complete incineration of the carcass.
- The ash by-product must be stored in a metal container until it can be land applied.
- Ash by-products must be spread in the same manner as manure.

3. Burial & Rendering

Burial or rendering of mortality is **NOT** a Maple Leaf Farms approved method of mortality disposal because burial has the potential to contaminate groundwater and rendering has the potential to introduce animal disease to the farm. However, as a result of implementation of the Emergency Disease Response Plan, Maple Leaf Farms may give approval for these disposal methods.

Should it be necessary to use burial, Indiana regulations require the following guidelines be followed:

- Carcass must be buried at least 4 feet below the natural surface of the ground.
- All body parts must lie under 4 feet of earth, not including other types of covering material (such as mulch).
- Avoid burying carcass near waterways, ponds and places with a high water table.

For rendering of mortality, a rendering company will come to the farm to collect the mortality and transfer to a rendering facility.

Effective July 1, 2009, MLF does not allow producers to use burial or rendering for mortality disposal without approval from a Maple Leaf Farms' Field Service Representative and /or Live Production Manager. Approval of the burial method or rendering will be allowed on a case by case basis as an exception for the Emergency Disease Response Plan.



IV. Water Conservation

Water conservation is a key factor in reducing the quantity of manure to be managed and the potential for manure spills. Water conservation is also utilized to protect Indiana's natural resources. Water conservation includes the following:

- Observe barn water lines and nipples daily for signs of leakage.
- Repair and fix leaking water lines and nipples in a timely manner.
- Adjust water pressure to assure delivery of water to the ducks for drinking while minimizing waste.
- Divert storm water from entering liquid or dry/solid manure storage facilities.



