MANURE MANAGEMENT REQUIREMENTS FOR CONFINEMENT OPERATIONS

In this chapter on the regulation of manure mangement for confinement operations the topics of manure storage, manure application, manure sales, manure management plans, and manure applicator certification will be covered.

MANURE STORAGE

A confinement operation (an animal feeding operation where animals are confined to totally roofed areas) must retain manure produced by the operation between land applications. The confinement operation cannot discharge manure directly into a water of the state, including a tile line that drains to a water of the state. Iowa law defines a water of the state as any stream, lake, pond, marsh, watercourse, waterway (not a grassed waterway used as a conservation measure), well, spring, reservoir, aquifer, irrigation system, drainage system and any other body or accumulation of water, surface or underground. Direct discharge from any livestock operation into a sinkhole or an agricultural drainage well is specifically prohibited.

Confinement operations must have sufficient capacity to store the operation's manure between periods of manure application. Additional capacity must be provided if precipitation, manure, or wastes from other sources can enter the operation's manure storage structure.

Human waste cannot be stored in a manure storage structure or egg washwater storage structure. Human sanitary waste includes bathroom and laundry facilities such as toilets, baths, showers, sinks, and clothes washing.

NOTE: HUMAN WASTE

The county board of health regulates wastewater from human waste such as toilets, showers, and laundry. A separate county permit must be obtained and a separate waste treatment system must be constructed to treat such wastewater.

Manure must be removed from manure storage structures as necessary to prevent overflow or discharge of manure. Additional storage capacity, called freeboard, is required for unroofed manure storage structures to protect against possible discharges due to unforeseen precipitation events.

- A minimum of two feet of freeboard must be maintained in anaerobic lagoons, earthen manure storage basins, or earthen waste slurry storage basins, unless a greater level of freeboard is required to maintain the structural integrity of the structure or prevent overflow.
- A minimum of one foot of freeboard must be maintained in unroofed formed manure storage structures, unless a greater level of freeboard is required to maintain the structural integrity of the structure or to prevent overflow.

Additional requirements apply if the manure is stored above ground and the structure has an outlet or inlet below the manure liquid level. The additional requirements for this type of structure are as follows:

- Two or more shutoff valves on any external outlet or inlet below the liquid level. At least one shutoff valve must be located inside the structure and be operable if the external valve does not work.
- All external outlets or inlets below the liquid level must be barricaded, or otherwise protected to minimize accidental destruction.
- Construction must comply with the manufacturer's specifications.
- An emergency response plan for retaining and cleaning up manure at the site if the manure storage structure fails or there is any other type of accidental discharge. The plan must consist of telephone numbers to report a release and list of contractors, equipment, equipment technical support, and alternative manure storage or land application sites which can be used during inclement weather.

NOTE: REPORTING A RELEASE TO DNR

A release must be reported to the DNR as soon as possible but not later than six hours of discovery of the release by contacting the DNR at (515)281-8694. DNR suggests that the local DNR field office also be contacted directly, but this is not required by the rules. DNR's experience with responding to releases can be helpful in managing the situation.

If the spill involves a public roadway and public safety could be threatened, the local police department or the sheriff must also be contacted

Earthen basins granted a construction permit after May 31, 1995 must be emptied at least once a year. Earthen basins permitted before May 31, 1995 were required to be emptied at least twice a year; however, current law allows once a year removal for these basins if there is sufficient basin capacity for once-per-year removal and the required freeboard is maintained.

Iowa law requires the Department of Natural Resources (DNR) to conduct a routine inspection of all earthen manure storage structures, including structures built without a permit, at least once a year. The DNR must notify the owner or manager of the operation at least twenty-four hours before the routine inspection. The inspection must be limited to a visual inspection of the site. The visual inspection must include, at a minimum, freeboard level, manure seepage, berm erosion and vegetation cover, and the presence of any openings that would allow manure to escape from the structure. This routine inspection requirement for earthen structures does not limit DNR's authority to inspect livestock operations such as confinement operations with formed manure storage structure or open feedlots.

The DNR may establish different minimum level manure control requirements for a specific confinement operation or open feedlot if site topography, operation procedures, experience, or other factors indicate that a greater or lesser level of manure control is required to provide an adequate level of water pollution control. The DNR may allow the use of manure treatment or methods of manure control other than those required by law if it determines that an adequate level of manure control will result from the alternative methods.

Manure Stockpiling For Confinement Operations

In 2009 the Iowa Legislature passed two separate bills (House File 735 and Senate File 432) regulating the stockpiling of dry manure from confinement operations. Before that, confinement operations have been prohibited by Iowa DNR since 2006 from stockpiling manure outside of the barns unless the manure was stored in DNR approved manure storage structures or unless the manure was registered as dry animal

nutrient product with the Iowa Department of Agriculture under Iowa Code Chapter 200A. Before 2006, DNR did not prohibit stockpiling. Effective September 1, 2008, Iowa DNR issued a Program Implementation Guidance that expressly allowed stockpiling dry manure from confinement buildings if specific setback and covering requirements were met. HF 735 and SF 432, along with Chapter 200A, supersede the DNR guidances and specifically allow stockpiling.

House File 735

This bill went into effect on April 2, 2009 and applies to all confinement operations stockpiling dry manure (subject to exceptions discussed below), except those that can qualify for SF 432 (cattle and hog confinements that use dry bedding). When compared to the stockpiling provisions of SF 432 for dry bedded cattle and hog barns, the stockpiling regulation in HF 735 has several different requirements than SF 432 (for example, stockpiles that are in place for more than 15 days must be covered or if not covered, registered with DNR).

The specific provisions of HF 735 are:

Exception - Confinement Operations Constructed Before January 1, 2006.

Confinement operations that were built before January 1, 2006 (when DNR allowed stockpiling of manure) and have not expanded since that date are exempt from the requirements of HF 735. This exception applies only as long as there is no runoff from the stockpile.

Setback Distances**.**

Stockpiled dry manure from all confinement operations, no matter how many animals are confined in the operation unless otherwise noted, must meet all of the following requirements:

- The stockpile cannot be within 200 feet of a surface tile inlet, unless steps are taken to ensure runoff will not reach the tile inlet.
- The stockpile cannot be within 400 feet of a designated area, unless steps are taken to ensure runoff will not reach the designated area. A designated area is a creek, river, lake, designated wetland; known sinkhole; cistern, drinking water or abandoned well; or ag drainage well or surface inlet. Terrace tile or surface tile inlets and lakes or ponds with no outlet and which are entirely on one landowner's land are not designated areas.
- The stockpile cannot be within 800 feet of a high quality water resource, ag drainage well or known sinkhole. A list of these creeks and rivers designated by DNR as high quality water resources can be found at http://www.iowadnr.gov/portals/idnr/uploads/afo/fs_hqwr2.pdf
- The stockpile cannot be located in a grassed waterway.
- The stockpile cannot be on land with more than 3% slopes unless measures to contain runoff are implemented
- The stockpile cannot be within 1,250 feet of a residence (other than the confinement operation owner's residence), business, church, school or public use area (which includes cemeteries), unless the owner of the residence, etc. grants a waiver or the manure is from a small animal feeding operation (less than 500 animal units).
- Stockpiled manure must be removed and land applied within 6 months.

Requirements For Covering or Registering Stockpiles With DNR.

- Stockpiles in place for less than 15 consecutive days are not required to be covered and are not required to be registered with DNR.
- Stockpiles in place for more than 15 days but less than 6 months in a 2 year period must:

a. Be entirely covered with materials that are impermeable to precipitation; or
b. Be in a building or other roofed structure that is impermeable to precipitation; or
c. Be in an uncovered stockpile that is registered with the DNR. A monthly inspection statement must be sent to DNR documenting whether there is runoff from the stockpile and if so, the stockpile must be removed.

- Stockpiles in place for more than 6 months in a 2 year period must:
  a. Be entirely covered with materials that are impermeable to precipitation and be located on compacted soil, compacted granular aggregates, asphalt, concrete, or other similar materials; or
  b. Be in a building or other roofed structure that is impermeable to precipitation; or
  c. Be in an uncovered stockpile that is registered with the DNR. A monthly inspection statement must be sent to DNR documenting whether there is runoff from the stockpile and if so, the stockpile must be removed.

Requirements for Stockpiles on Karst Terrain

- There must be at least 5 feet between the bottom of the stockpile and the underlying limestone, dolomite, or other soluble rock.
- If the stockpile is in place for more than 15 consecutive days but less than 6 months in a 2 year period, the stockpile must either be in a building or other roofed structure or it must be covered. If the stockpile is in place for more than 6 months in a 2 year period, it must either be in a building or other roofed structure or it must be covered and on reinforced concrete at least 5 inches thick.

The Iowa DNR and Environmental Protection Commission are currently working on rules to implement this bill. These rules will likely be finalized in early 2010 and this Handbook will be updated to include the requirements of the rules. One of the key points of the proposed rules is a provision that would require the compacted soil for stockpiles in place for more than 6 months in a 2 year period to meet specific engineering type tests ("Standard Proctor") before the stockpile could be placed. For compacted granular aggregates, the proposed rules would require a minimum of 6 inches of flyash or compacted crushed limestone that is Iowa DOT gradation 4125.01B. Again, these standards are proposed rules and are not final as of this date.

SF 432 – Stockpiling from dry bedded cattle and hog confinement operations.

Division II of SF 432 establishes a new Iowa Code chapter regulating dry manure with bedding from confinement cattle and hog barns. Existing requirements for confinement operations in the Iowa Code (Chapter 459) still apply except those specifically regulated by this new Chapter 459B. Chapter 459B contains the following provisions for stockpiling dry bedded manure from cattle and hog confinement barns. Dry bedded manure must be stockpiled (defined as the storing of dry bedded manure outside of the confinement structure) as follows:

(1) At least 1,250 feet from a residence (other than the confinement operation owner's residence), business, church, school or public use area (which includes cemeteries), unless the owner of the residence, etc. grants a waiver or the manure is from a small animal feeding operation.
(2) If the stockpile is in Karst terrain or an alluvial aquifer area (both of these areas are marked on maps available from Iowa DNR), the stockpile must have concrete floor and any underlying soluble rock, sand or gravel must be at least 5 feet down.

(The following requirements are the same as for stockpiling manure from an open feedlot operation.)

(3) At least 400 feet from a designated area or 800 feet from a high-quality water resource unless steps are taken to ensure runoff will not reach the designated area or high quality water resource. A list of these creeks and rivers designated by DNR as high quality water resources can be found at http://www.iowadnr.gov/portals/idnr/uploads/afo/fs_hqwr2.pdf

(4) At least 200 feet from a surface tile inlet unless steps are taken to ensure runoff will not reach the tile inlet

(5) Not in a grass waterway, where water pools, or where surface water will enter the stockpile

(6) Not on more than 3% slopes unless measures to contain runoff are implemented

(7) All stockpiled dry bedded manure must be removed and land applied within 6 months.

A designated area is a creek, river, lake, designated wetland; known sinkhole; cistern, drinking water or abandoned well; or ag drainage well or surface inlet. Terrace tile or surface tile inlets and lakes or ponds with no outlet and which are entirely on one landowner's land are not designated areas.

Iowa Code Chapter 200A – dry animal nutrient product registered with the Iowa Dept. of Agriculture.

If the dry manure is sold under chapter 200A, Iowa Department of Agriculture and Land Stewardship (IDALS) rules govern stockpiling and the conditions under which manure may be stockpiled. Storing dry manure registered under chapter 200A cannot result in pollution of a water of the state. The manure cannot be stockpiled in the following areas:

- a grassed waterway,
- slopes greater than class "B,"
- within 200 feet of a shallow private water supply or 100 feet of a deep water supply well,
- within 500 feet of a surface intake, wellhead or cistern of agricultural drainage wells, or known sinkhole
- within 500 feet of a major water source or within 200 feet of water sources other than major water sources (excluding farm ponds, privately owned lakes or when a secondary containment barrier is provided)

MANURE APPLICATION

All livestock operations, including confinement operations and open feedlots, must apply manure in a manner that does not cause surface or groundwater pollution. Confinement operation manure applied in accordance with state law, DNR rules and DNR voluntary guidelines is deemed to have been applied in a manner which does not cause surface or groundwater pollution. In addition to manure storage and application requirements specific to livestock operations, all livestock operations, including confinement operations and open feedlots, are subject to the Iowa's general water quality protection law, which prohibits dumping, depositing, or discharging any material which will cause pollution into a water of the state (unless the DNR has issued a specific discharge permit).

If a livestock operation ceases production, manure should be removed as soon as possible. Manure must be removed from a discontinued livestock operation within six months of the date the operation ceased being used for livestock production or by the time ordered by the DNR, whichever is earlier. A livestock operation is discontinued if it is abandoned (structures removed, filled in with soil or converted to other uses), or all animals are removed and the owner or operator has no immediate plans to restock. The six-

month period does not begin until the operation qualifies as a discontinued operation.

Manure application separation distances.

There are two required separation distances for manure application:

1. All livestock operations regardless of size, including confinement operations and open feedlots, are prohibited from applying manure on cropland within 200 feet of a designated area (a known sinkhole, a cistern, abandoned well, unplugged agricultural drainage well, agricultural drainage well surface inlet, drinking water well, designated wetland, or water source) or 800 feet if it is a high-quality water resource unless:
   a. The manure is injected or incorporated on the same date as application; or,
   b. Permanent vegetation covers the area within 50 feet of the water source. Manure cannot be applied in the 50-foot area.

   A confinement operation that has an operating/NPDES that uses these exemptions must also show that that a setback or a buffer is not necessary because it has implemented alternative conservation practices or because there are field-specific conditions, which will provide pollutant reductions equal to or better than those that would be achieved by the 100-foot setback required by federal EPA regulations.

   Surface tile inlets, other than an agricultural drainage well surface tile inlet, are not included as designated areas and are therefore not subject to these distance restrictions.

NOTE: TILE LINES

Although not subject to the distance requirements, manure entering a tile line inlet could be a direct conduit a water of the state. Surface tile inlets should be covered during manure application and be avoided during application.

2. Liquid manure from a confinement operation cannot be surface applied within 750 feet of a neighboring residence, business, church, school, cemetery, or public use area. This distance does not apply if:
   a. The liquid manure is injected or incorporated within 24 hours after application. Injection is defined as applying manure beneath the soil surface and incorporation is defined as soil tillage which mixes manure into the upper four inches of the soil.
   b. The owner of the land where the residence, business, church, school or a public use area is located signs a written waiver with the owner of the land where the manure is applied.
   c. The liquid manure is from a small animal feeding operation.
   d. The liquid manure is applied by low-pressure spray irrigation system. (See discussion below for 250 feet separation distance for spray irrigation.)

DNR also has a summary of the separation distances on their web site.

NOTE: INCIDENTAL SPILLAGE

The DNR considers incidental spillage during manure application to be surface application. For example, spillage on the end rows or headlands when lifting up injection equipment would be considered surface application. Two options to avoid violating the separation distance from a residence are to shut off the applicator on the end rows or to incorporate the end rows on the same day.

NOTE: WRITTEN WAIVER NOT REQUIRED TO BE RECORDED

Generally, a written waiver of the separation distance requirement for surface manure application is not filed with the county recorder and it is therefore not necessary to have it notarized. If the waiver is a one-time application, it need not be recorded but should be kept with the producer's records. However, if the waiver is for multiple years, it should be notarized and recorded.

Manure application on frozen or snow covered ground.

Senate File 432 (discussed above under stockpiling and adopted by the 2009 Iowa Legislature) regulates the application of manure on frozen or snow covered ground. Manure (all manure, whether dry or liquid) from an animal feeding operation (both open feedlot and confinement operations) may be applied on frozen or snow covered ground except as provided in the law as detailed in this section. Frozen ground is defined as soil that is impenetrable due to frozen soil moisture, but it does not include ground frozen only in the top two inches or less. Snow covered ground is defined as ground covered with at least one inch of snow or one-half inch of ice.

Because SF 432 authorizes manure to be applied on frozen or snow covered ground except as restricted by the legislation, and because the restrictions in the legislation apply only to liquid manure from confinement operations, dry manure from either confinement or open feedlot operations can be applied on frozen or snow covered ground and is not subject to the restrictions in the legislation. However, all manure, including liquid manure applied under the emergency provisions in the legislation, must be applied so as to not cause water pollution. This legislation supersedes and therefore nullifies the DNR's proposed rule to regulate all manure application on frozen or snow covered ground.

Surface application of liquid manure from a confinement operation is prohibited on frozen ground from Feb. 1 to April 1 and on snow covered ground from Dec. 21 (first day of winter) to April 1 except when there is an emergency. An emergency is when there is an immediate need to apply manure due to unforeseen circumstances affecting the storage of liquid manure and which are beyond the farmer's control. These circumstances include natural disaster, unusual weather conditions, or equipment or structural failure. To apply liquid manure on frozen or snow covered ground due to an emergency, a farmer must do all of the following:

(1) Telephone the DNR before application.
(2) Apply the liquid manure on land identified in the manure management plan – either the original MMP or the next updated MMP submitted to DNR after the application.
(3) Apply the liquid manure on land with a Phosphorus Index of 2 or less.
(4) Block any surface tile intake on land in the MMP and down-grade from the application during application and for at least 2 weeks after.
(5) Properly manage the manure storage structure including properly accounting for the amount of manure to be stored.
(6) For structures constructed after the effective date of the legislation, construct the structure to have at least 180 days of storage.

Manure from small animal feeding operations (confinement operations with less than 500 animal units) is expressly exempted from the prohibitions in the legislation.

DNR must report to the Legislature's agriculture and environmental protection committees by February 15 in each of the next five years. The report must cover all emergency liquid manure applications under the legislation and include an assessment of any impact of the applications on water quality.

The Iowa DNR and Environmental Protection Commission are currently working on rules to implement this bill. These rules will likely be finalized in late 2009 or early 2010 and this Handbook will be updated to include the requirements of the rules. Several of the key points in the rules proposed by DNR are to require the telephone notice to DNR to include detailed information such as facility ID number and the legal description of the land where the manure will be applied or the notification will not be considered complete. In addition, DNR is proposing that if the emergency "is not easily confirmed by weather reports, the owner must make documentation of the emergency available to the field office upon request." Again, these standards are proposed rules and are not final as of this date.

Spray irrigation.

Application of manure using spray irrigation equipment is subject to additional regulation. Spray irrigation regulations apply to **all livestock operations**, including confinement operations and open feedlots, using spray irrigation.

NOTE: EQUIPMENT NOT CONSIDERED SPRAY IRRIGATION EQUIPMENT

Under the definition of spray irrigation equipment, tank wagons, manure spreaders, tractor-drawn injection systems, or other equipment not used with equipment customarily used for irrigation of crops are not considered spray irrigation equipment and therefore are not subject to spray irrigation requirements.

In addition to the manure application requirements explained above, other requirements for spray irrigation of manure are:

1. Manure applied by spray irrigation cannot be allowed to runoff onto adjoining property.
2. Spray irrigation equipment must be set up to allow at least 100 feet between the manufacturer's established wetted perimeter and the property boundary line. The actual wetted perimeter cannot exceed the property boundary line. For property which includes a road right of way, railroad right of way or an access easement, the property boundary line is the boundary line of the right of way or easement.
3. For low-pressure irrigation systems there is a reduced separation distance of 250 feet between the actual wetted perimeter and the residence, business, church, school or public use area.
4. The DNR may grant temporary or permanent variances to spray irrigation requirements if sufficient and proposed alternative information is provided to substantiate the need and propriety for such action. Variances must be requested in writing and include information regarding the type of manure storage structure, the spray irrigation equipment to be used, and any other information the DNR may request.

Manure application guidelines.

The DNR rules recommend but do not require the following manure application practices for confinement operations:

1. To minimize the potential for leaching to groundwater or runoff to surface waters, nitrogen application from all sources, including manure, legumes, and commercial fertilizers, should not exceed the nitrogen use levels necessary to obtain optimum crop yields for the crop being grown. (This recommendation is a requirement for confinement operations required to have a manure management plan. See below.)
2. To minimize phosphorous movement to surface waters, manure should be applied at rates not exceeding crop uptake of phosphorus when soil tests indicate adequate phosphorous levels.

Phosphorous application may be greater than crop removal for maximum crop production when soil tests indicate very low or low phosphorous levels.

3. Manure application on frozen or snow-covered cropland should be avoided where possible. If manure is spread on frozen or snow-covered cropland, application should be limited to areas on which:
   a. Land slopes are four percent or less, or
   b. Adequate erosion control practices exist. Adequate erosion control practices may include such practices as terraces, conservation tillage, cover crops, contour farming or similar practices.
4. Manure applied on cropland subject to flooding more than once every ten years should be injected or incorporated into the soil after application. Manure should not be spread on such areas during frozen or snow-covered conditions.
5. Unless adequate erosion controls are used and unless manure is injected or incorporated, manure should not be applied within 200 feet of land draining into a stream or surface intake for a tile line or other buried conduit. Manure should not be applied on waterways except for the purpose of establishing seedings.
6. Manure should not be applied on tilled cropland with greater than ten- percent (10%) slopes except where adequate soil erosion control practices are used. Injection or soil incorporation of manure is recommended where consistent with the established soil erosion control practices.

NOTE: RECOMMEND FOLLOWING THESE GUIDELINES

Following these guidelines is recommended whenever possible because it will reduce the potential for causing water pollution. Although these manure application guidelines are suggested practices and are not required by law, following these practices is deemed to comply with the requirement that manure be applied without causing surface or groundwater pollution. In addition, if a producer is sued in a nuisance action and there are allegations involving odor from manure application, following these guidelines may help rebut allegations of producer fault.

MANURE MANAGEMENT PLANS FOR CONFINEMENT OPERATIONS

NOTE: CONFINEMENT OPERATIONS

A confinement operation is a livestock farm where the animals are confined to areas that are totally roofed. Animals that are confined in outside areas are areas which are partially roofed should not be counted for purposes of state law.

MANURE MANAGEMENT PLANS

Manure management plans must be filed with the DNR annually for the following confinement operations:

1. Confinement operations with formed manure storage structures built or expanded after May 31, 1985 with an animal unit capacity of more than 500 animal units.
2. Confinement operations which obtained a construction permit after May 31, 1985.
3. Out-of-state confinement operations with an animal unit capacity of more than 500 animal units that apply manure in Iowa. A copy of the MMP must be filed with each of the following government offices:
   a. The appropriate DNR field office if the MMP is for a site that does not require a construction permit.
   b. The state DNR office in Des Moines if the MMP is for a new site that requires a construction permit (2 copies).
   c. The county supervisors or auditor where the operation is or will be located.
   d. The county supervisors or auditor where manure will be applied with the construction permit application.

NOTE: ANIMAL UNITS

"Animal Unit" is a number that is determined by multiplying the number of animals by the factors below for a given category of animals, the result of the calculation is the animal unit.

1. Slaughter and feeder cattle	1.000
2. Immature dairy cattle	1.000
3. Mature dairy cattle	1.400
4. Butcher or breeding swine weighing more than 55 pounds	0.400
5. Swine weighing 15 pounds or more but not more than 55 pounds	0.100
6. Sheep or lambs	0.100
7. Horses	2.000
8. Turkeys weighing 112 ounces or more	0.018
9. Turkeys weighing less than 112 ounces	0.0085
10. Chickens weighing 48 ounces or more	0.010
11. Chickens weighing less than 48 ounces	0.0025

Animal Species	(No. Head)	x (Factor)	= AUC
Slaughter or feeder cattle		1.0	
Immature dairy cattle		1.0	
Mature dairy cattle		1.4	
Gestating sows		0.4	
Farrowing sows & litter		0.4	
Boars		0.4	
Gilts		0.4	
Finished (Market) hogs		0.4	
Nursery pigs 15 lbs to 55 lbs		0.1	
Sheep and lambs		0.1	
Horses		2.0	
Turkeys 7lbs or more		0.018	
Turkeys less than 7 lbs		0.0085	
Broiler/Layer chickens 3 lbs or more		0.01	
Broiler/Layer chickens less than 3 lbs		0.0025	
TOTALS:	**a) Existing AUC:**		

Manure management plans submitted to the DNR must be submitted on the most current DNR form. A copy of the form must be kept within 30 miles of the operation. A signed verification of county receipt for MMP must also be submitted with the application to the DNR. DNR forms and appendices for completing an MMP can be found on the DNR's website at http://www.iowadnr.gov/Environment/LandStewardship/AnimalFeedingOperations/Confinements/ManureManagement.aspx.

DNR must approve or disapprove an original manure management plan within 60 days of receiving a completed plan. The department must approve or disapprove a manure management plan as part of the construction permit process when a construction permit is required. The plan must be filed 30 days before construction begins if a construction permit is not required. If the submitted plan is an annual update the department has 30 days to approve or disapprove the plan.

Is a Nitrogen or a Phosphorus Based Plan Required?

Beginning in 2004 and as a result of legislation passed in 2002, Phosphorus Index calculations were gradually phased in for confinement operations according to the following table:

Implementation Dates for P-index Based Plans	
Original MMP Submitted	**P-index Based MMP Update Due**
Prior to April 1, 2002	First update submitted after August 25, 2008
Between April 1, 2002 and October 24, 2004	First update submitted after August 25, 2006
On and after October 25, 2004	Upon submittal

As of August 1, 2009, all manure management plans are now required have a P Index. As will be covered in this chapter via the MMP form, an MMP with a P Index does not mean that the MMP is phosphorus based.

MANURE SALES

If a confinement operation is not required to have a manure management plan, if the seller is not registered under Iowa Code Chapter 200A, or if the manure is not processed in some way, the manure may be sold by the producer under terms the buyer and seller negotiate. There are no DNR regulations regulating the sale. However, the seller and purchaser must handle and apply the manure so as to not cause pollution.

For more information, see "Selling and Buying Manure in Iowa" at http://www.agronext.iastate.edu/immag/pubs/imms/vol10.pdf

MANURE SALES MANURE MANAGEMENT PLANS

A confinement operation required to submit a manure management plan may submit a manure management plan for "sales of manure" if the operation has a history of selling manure or if the operation houses an animal species for which selling manure is a common practice. Selling manure means the transfer of ownership of the manure for monetary or other valuable consideration. Selling manure does not include a transaction where the consideration is the value of the manure, or where an easement, lease, license or other agreement granting the right to use the land for manure application is executed.

There are three options for manure management plans for sales of manure:

A. Sale of Manure under Iowa Code Chapter 200A. Iowa Code chapter 200A provides for registration of sales of "dry animal nutrient product." To qualify under 200A:

1) A license must be obtained using forms available from the Iowa Department of Agriculture and Land Stewardship (IDALS). The license must be renewed each year.

2) The product must be registered with the IDALS on forms provided by the Department and be accompanied by a label listing the percent of N, P and K in the product. The application must also describe how the operator plans to obtain the acres necessary for proper application of the product which is not sold.

3) A distribution statement, on forms provided by IDALS, must be given to the purchaser. The purchaser must acknowledge receiving the statement by signature or initials. The statement must include the guaranteed analysis of the product; the name and address of the purchaser; notice to the purchaser of the number of acres required to apply the product based on county average yields; and a warning that the product should not be applied in excess of nitrogen levels necessary to obtain optimum crop yields.

NOTE: CONFIDENTIAL INFORMATION

The distribution statement must be provided to the purchaser and the producer should keep a copy for their records. This statement is not required to be filed with the Iowa Department of Agriculture.

4) A semi-annual report must be filed on forms provided by IDALS. The report must include the tons of products distributed in the state during the previous 6-month period. The report must list the tonnage by county and must list the grade of the distributed product. The report must also include the name and address of each purchaser and the tonnage purchased. An inspection fee based on the number of tons sold must be paid with each report.

NOTE: CONFIDENTIAL INFORMATION

The name and address of each purchaser and the tonnage purchased is confidential information and cannot be released by the Iowa Department of Agriculture.

B. Sales of Manure under Iowa Code Chapter 200.

Manure sold under the requirements of Iowa Code Chapter 200 must be processed in some way. A producer wishing to sell manure under Iowa Code Chapter 200 must also submit an application to IDALS. The application requires the producer to provide the net weight (if sold in packaged form), the name and address of the registrant, name of the product, brand, grade, and guaranteed analysis.

DNR Requirements in addition to IDALS

Once a producer has licensed the sale of manure under Chapter 200 or 200A the DNR requires the producer to submit a form for manure management plans for sales of dry manure. This form requires a copy of the permit issued by IDALS to be attached, a general description of the operation, a calculation of the animal unit capacity, and a fee to be submitted. The form also includes an agreement that the manure will be sold in accordance with Iowa Code Chapters 200 and 200A.

C. Other Sales of Manure.

For manure that will be sold, but not under Iowa Code Chapter 200 or 200A, a Manure Management Plan consists of the following:

1) Until a phosphorus index is required as part of the MMP, an estimate of the number of acres required for manure application shall be calculated by dividing the total nitrogen available to be applied from the confinement operation by the crop usage rate. Crop usage rates may be estimated by using corn crop usage rate factor and an estimate of the optimum crop yield for the property in the vicinity of the confinement feeding operation.

2) When the phosphorus index is required as part of the manure management plan an estimate of the acres required for manure application shall be calculated by one of the following methods.
   a. Dividing the total phosphorus available to be applied from the confinement feeding operation by the corn crop removal rate of phosphorus.
   b. Totaling the quantity of manure that can be applied to each available field based on application rates determined in conjunction with the phosphorus index, and ensuring that the total quantity that can be applied is equal to or exceeds the manure annually generated at the operation.

3) The total nitrogen available to be applied from the confinement feeding operation.

4) The total phosphorus available to be applied from the confinement feeding operation if the phosphorus index is required.

5) An estimate of the annual animal production and manure volume or weight produced.

6) A manure sale form. The manure sale form must contain the following:
   a. A place for the name and address of the buyer of the manure;
   b. A place for the quantity of manure purchased;

c. The planned crop schedule and optimum crop yield;
d. A place for manure application methods and the timing of manure application;
e. A place for the location (and number of acres) of the field where the manure will be applied;
f. A place for the manure application rate.

7) Statement of intent. The producer must have enough acres identified in their statements of intent to meet the required acres in the manure management plan. The number of acres indicated in the statements of intent shall be sufficient according to the MMP to apply the manure from the CONFINEMENT OPERATION. For an existing confinement feeding operation with a construction permit, past records of manure sales may be submitted instead of statements of intent. Statements of intent must include the following:
   a. The name and address of the person signing the statement.
   b. A statement indicating the intent of the person to purchase the manure.
   c. The location of the farm where the manure can be applied including the total number of acres available for manure application.
   d. The signature of this person who intends to purchase the confinement operation's manure.

8) Record keeping. The following records must be kept for five years:
   a. A copy of the current Manure Management Plan;
   b. All manure sales forms (completed and signed).

Once the confinement operation sells the manure, the statements of intent do not need to be kept current.

MANURE APPLICATOR CERTIFICATION

State law requires certain manure applicators in Iowa to be certified. Producers who remove and land apply manure from a confinement feeding operation with an animal unit capacity of more than 500 animal units must be certified or use a commercial manure applicator. Producers with small animal feeding operations (500 or less animal unit capacity) or open feedlots may land apply manure without being certified. A producer who does not produce the manure, but receives and applies manure from a confinement feeding operation with more than 500 animal units is also required to be certified to apply manure or hire a commercial applicator to apply the manure. A commercial manure applicator is someone who is engaged in the business of transporting, handling, storing, or applying manure for a fee. All manure applicators in Iowa, regardless of certification requirements, must follow state laws when land applying manure.

NOTE: LIVESTOCK FARMERS CHARGING FOR MANURE OR LAND APPLICATION - COMMERCIAL MANURE APPLICATORS?

DNR takes the position that livestock farmers who sell their manure to a neighbor or receive payment for the cost of land application are commercial manure applicators and must obtain the commercial license and meet the training requirements. This is required even though the livestock farmer is not in the manure application business. Even though DNR's interpretation is questionable and is not always enforced, to avoid the possibility of penalties, livestock producers who do this should carefully consider how they are certified.

A. Exams and Continuing Education

Commercial manure applicators are certified for one year and confinement site manure applicators are certified for three years. Commercial manure applicators must be certified each year by either passing an exam each year or participating in three hours of continuing educational

instruction each year. Confinement site manure applicators must be certified every 3 years by passing an exam every third year or participating in two hours of continuing educational instruction each year.

The exams are given by DNR and continuing educational instruction is given by Iowa State Extension Service at various times and locations throughout the state. Different exams and different educational instructions are given to commercial applicators than to confinement site applicators. Consult Iowa State University's web site or the local county extension office for more information about the times and locations of the courses. http://www.agronext.iastate.edu/immag/mac.html

Topics covered by the exams and continuing education include standards for handling, application, and storage of manure; potential effects of manure on surface and groundwater; and procedures for remediation.

An applicant must have photo identification at the time of the examination. A person who fails the examination may reapply. An applicant who has failed the written examination at least twice and who has shown difficulty in reading or understanding written questions may submit a written request to DNR to take an oral exam.

B. Renewals

A certification can be renewed after successfully passing the exam or completing the required continuing education and after submitting an application form and fee to the DNR. Generally, certifications must be renewed before the expiration date of the applicators current certification. Commercial certifications expire annually on March 1, and a confinement applicator's certification expires on December 31 of the third year. Renewal requests for confinement site applicators must be postmarked before March 1 to avoid paying the late fee.

C. Fees

A confinement site manure applicator must pay a $100 dollar certification fee and pay an additional $25 annual education fee. The certification fee for confinement site applicators is good for three years. Commercial applicators must pay a business license fee of $200 annually before March 1 to avoid paying the late fee. The commercial representatives fee of $75 along with an education fee of $25 are also due before March 1 to avoid the late fee.

Only one certification fee needs to be paid for confinement site applicators that are family members in the same agricultural operation. A family member is defined as a "spouse, parent, grandparent, child, grandchild or sibling." Adopted children do qualify as children under the statute. Spouses of parents, grandparents, children, grandchildren or siblings do not qualify under the statute even if they are involved in the same operation. The family member's application needs to be submitted to the DNR within a year of the first family member's certification or renewal. Family farm members exempt from paying the certification fee are still required to pay the annual education fee and to attend the annual training to maintain their certification.

D. Exemptions To Certification

The rules provide exemptions to certification requirements for both confinement site applicators and commercial applicators.

The exemptions to the certification requirements for "confinement site manure applicators" are:

1) Part-time employees or family members of a confinement site manure applicator acting under the instructions and control of a certified confinement site manure applicator who is:
   a. Physically present at the site where the manure is located; and
   b. In sight or hearing distance of the part-time employee or family member.
   c. Able to physically observe and communicate with the part-time employee at all times.

2) Employees of research colleges applying manure from a confinement operation used for research activities or experiments by the research college.

NOTE: NO EXEMPTION FOR FULL TIME EMPLOYEES

The exemptions for part-time employees of confinement operators do not apply to full time employees. There are no exemptions for full time employees of certified confinement site manure applicators who apply manure or assist in applying manure for the applicator. The law does not define "part-time employee."

Certification as a **"**commercial manure applicator**"** is not required if a person is:

1) Actively engaged in farming and trades work with another farmer.

2) Employed by a person actively engaged in farming not solely as manure applicator who applies manure as an incidental part of the person's general duties.

3) Engaged in applying manure as an incidental part of a custom farming operation.

4) Engaged in applying manure as an incidental part of a person's duties

5) Applying manure within a period of 30 days from the date of initial employment as a commercial applicator if the person applying the manure is acting under the instructions and control of a certified confinement site manure applicator who is:
   a. physically present at the site where the manure is located; and
   b. in sight or hearing distance of the part-time employee.

   c. The certified applicator must be able to physically observe and communicate with the part-time employee at all times.

6) Employed by a research college to apply manure from an operation that is part of the reseach activities or experiments of the college.

DNR MMP Form:
http://www.iowadnr.gov/Environment/LandStewardship/AnimalFeedingOperations/AFOResources/AFOForms.aspx

Below is a sample DNR form for confinement operations. DO NOT USE THIS FORM FOR YOUR PERMIT APPLICATION SUBMISSION, BUT DOWNLOAD THE CURRENT FORM FROM THE DNR WEBSITE. Below each section or table are the DNR footnotes that explain how to fill out the application. Commentary on the form has also been added to aid in the interpretation and completion of the form. The commentary will appear in text boxes and the official DNR footnotes will appear in normal type with corresponding footnote.

Manure Management Plan Form
Animal Feeding Operation Information

The information within this form, and the attachments, describes my animal feeding operation, my manure storage and handling system, and my planned manure management system. I (we) will manage the manure, and the nutrients it contains, as described within this manure management plan (MMP) and any revisions of the plan, individual field information, and field summary sheet, and in accordance with current rules and regulations. Deviations permitted by Iowa law will be documented and maintained in my records.

Signed: _____ **Date:** _____
(Signature) (Print name)

NOTE: PRODUCER SIGNATURE

The producer signature indicates that the information in the form is accurate and that the producer will follow the plan and Iowa law.

General Information

Name of operation: _____ **Facility ID No.** _____

Location of the operation*: _____
(911 Address)

_____
(Town) (State) (Zip Code)

_____ ¼ of the _____ ¼ of Sec _____ T _____ R _____ _____ _____
(¼ ¼) (¼) (Section) (Tier & Range) (Township Name) (County)

NOTE: VERIFY LEGAL DESCRIPTION

Double check legal descriptions to make sure they are accurate. The DNR has denied manure management plans if they find errors in the description. Both the county auditor and recorder's office should have an accurate description. A plan may be rejected and the waiting period may begin again when the correct information is submitted.

Owner and Contacts of the animal feeding operation:

Owner _____ Phone _____

Address _____

Email address (optional) _____ Cell phone (optional) _____

Contact person (if different than owner) _____ Phone _____

Address _____

Email address (optional) _____ Cell phone (optional) _____

NOTE: PUBLIC INFORMATION

Once this form is filed with DNR it is public information. Any optional information that the applicant does not want to be public should not be provided to DNR. However, when deciding what optional information to provide it is also important to consider the importance of DNR being able to contact the persons listed on the form as quickly and easily as possible so that the application may be acted on as soon as possible by DNR and the county.

NOTE: CONTACT PERSON

The contact person may be the manure management plan preparer, attorney, or the person who is responsible for environmental compliance on behalf of the owner.

Contract Company (if applicable) _____ Phone _____
Address _____

NOTE: CONTRACT COMPANY

If the livestock are being raised under a production contract, the "contract company" is the person who owns the animals in the confinement. Iowa law makes this person responsible for paying the compliance fee. In practice, the DNR bills the owner rather than the contract company; therefore, payment needs to accompany the form even if the contract company will reimburse the owner later. If the fee is submitted with the plan, the contract company information does not have to be provided.

This manure management plan is for: (check one)
__existing operation, not expanding __existing operation, expanding __existing operation, new owner __new operation

NOTE: NEW OWNERS

The DNR has taken the position that a new manure management plan is required upon sale or transfer of a livestock farm. The DNR requires new owners of a confinement operation to submit a new manure management plan within 30 days of the transfer or before applying manure, whichever is earlier. The DNR has taken the position that the new owner is also required to submit a new indemnity fee payment. If manure agreements are required for the new owner, he or she will be required to obtain an assignment of existing manure agreements or obtain new agreements.

NOTE: EXPANSIONS

Expansion under the DNR rules may mean physical expansion or modification of the structure that results in an increase in the amount of manure produced or it could mean an increase in the number of animals or animal unit capacity without any physical changes to the facilities. In addition to requiring a change in the manure management plan, any of these changes could result in a requirement to obtain a permit or permit amendment. For more information, see the Construction Requirements Chapter for Confinement Operations.

Construction and Expansion Dates: _____ date of initial construction
_____ _____ _____ and date(s) of all expansion(s)

Table 1. Information about livestock production and manure management system

1	2	3	4	5	6	7	8
Animal Type/ Production phase [a]	Max. Number of Animals Confined (head)	Manure Storage Structure [b]	N[c] lb/1000 gal or lb/ton	P_2O_5 [c]	gal/space/day or ton/space/year [d]	Days/yr Facility Occupied	Annual Manure Produced [e] (gal or tons)
						Total Gallons	
						Total Tons	

NOTE: MAXIMUM NUMBER OF ANIMALS CONFINED

DNR has taken the position that the number of animals cannot be reduced for regulatory purposes without a physical change, even if an operational change occurs which reduces the animal units of the operation. However, DNR considers these on a case by case basis so contact DNR with each individual situation.

DNR footnotes for the TABLE 1:

[a] Complete Appendix B1 Worksheet if a manure storage structure receives manure from several animal production phases and the manure and nitrogen production values given in Appendices A1 and A2 do not adequately represent the operation (such as with a farrow-to-finish swine operation where half the pigs produced are sold as feeders and the remainder held for finishing).

[b] For example, indoor or outdoor formed storage, earthen basin, or anaerobic lagoon; to simplify calculations similar manure storage structures that contain manure with essentially the same nutrient concentrations may be grouped together (for example, the manure storage structures for a 3-building finishing unit with below-building pits could be identified as "3 below-building finishing pits").

[c] From standard tables (Appendix A4), your own samples, or other sources – identify source in space provided below Table 1 on page 1. If your own samples are used, DNR requires submittal of laboratory reports supporting manure concentrations. If your own samples are used, the results may need to be converted from parts per million (ppm) to pounds/1000 gallons. The formula for making this conversion is: N or P_2O_5 concentration (lb/1000 gal) = N or P_2O_5 concentration in parts per million (ppm) X 0.00834. For solid manure the conversion is: N or P_2O_5 concentration (lb/ton) = N or P_2O_5 concentration in parts per million (ppm) X 0.002. If measured volume or weight of manure is used in the plan, actual N and P_2O_5 concentrations must also be used.

NOTE: HOW TO TAKE SAMPLES

Because every livestock manure management system and production facility are different, the best way to evaluate manure nutrients is by sampling and having the manure analyzed at a laboratory. Because nutrient content is not uniform throughout a storage structure mixing may be necessary to obtain a representative sample. It is recommended that manure samples be taken annually for the first three years for new facilities followed by samples every three to five years unless practices or storage methods change. These procedures may be required if the farmer participated in certain USDA-NRCS programs. It is important to get a sample that represents what nutrient content will actually be applied. Iowa State University has published a fact sheet that discusses sampling and nutrient analysis in depth. This publication can be found at http://www.extension.iastate.edu/Publications/PM1558.pdf

NOTE: TABLE VALUES & OTHER SOURCES

The DNR provides table values for volume and concentration of manure. If table values are used for one component, DNR requires that table values also be used for the other components. Experience has shown that volume and concentration determined from table values are sometimes different from manure samples taken from the individual operation. If numbers other than table values are used, documentation must be provided to the DNR of the source of the values. "Other sources" may include farm specific information, other state's values, values from similar operations, and standard values developed by contracting companies for similar types of operations.

DNR footnotes continued:

[d] From Appendix A1; adjust values if operation has data justifying use of different volumes or weights (e.g., operation uses large volume of clean up water, and thus its manure production volume per animal space is higher than that given in table). If actual volumes or weights are used, DNR may require submittal of supporting data. If actual manure N and P_2O_5 concentrations are used in the plan, measured volume or weight must also be used.

[e] Annual manure produced (**liquid** manure) = maximum number of animals confined (column 2) multiplied by (x) gal/space/day (column 6) x days/ year building occupied (column 7).

Annual manure produced (**solid** manure) = maximum number of animals confined (column 2) x tons/space/year (column 6).

Estimate of Annual Animal Production [f]: _____ animals/year

Source of Nutrient Content Data (columns 4, 5): standard tables, analysis of manure samples, other**:** _____

DNR footnote:

[f] Estimated Annual Animal Production = Maximum number of animals confined (column 2 of Table 1) x production cycles per year. If operation has no production cycles (e.g. sows) state only total maximum number confined.

Determining Maximum Allowable Manure Application Rates

A worksheet determining the maximum allowable manure application rates must be completed for each unique combination of the following factors (crop rotation, optimum crop yield, manure nutrient concentration, remaining crop N need, method of application) that occurs at the operation.

NOTE: ADDITIONAL COPIES

Include additional copies of this worksheet for each unique management ID. See footnote "g" below to determine how many unique management IDs will be used.

Management Identification (Mgt ID)[g]: _____

(identify this application scenario by letter)

DNR footnote:

[g] Use the management ID to identify each unique combination of the following factors (crop rotation, optimum crop yields, manure nutrient concentration, remaining crop N need, method of application) that occur. The idea behind the management ID is to group fields with identical management on the same page 2, to avoid the redundancy of doing the exact same calculations for multiple fields.

For example, if 8 fields in the plan are in a corn/bean rotation with yields of 160 and 50 bu/acre and all will receive injected manure with the same nutrient concentration and availability, then page two would only need to be filled out once for the 8 fields and the management ID (e.g. "A") would represent all 8 fields. The same management ID could be used to describe these fields even if they were in different phases of the crop rotation (i.e. some are in corn and some in beans each year).

Method used to determine optimum yield [h]**:** _____ **Timing of Application:** _____
Method of Application [i]**:** _____ **Application Loss Factor** [i]**:** _____
If spray irrigation is used, identify method [j]**:** _____

DNR footnotes:

[h] Yields can be used from any of the following:
- USDA Iowa ag statistics county yield averages
- Multi-peril insurance proven yields
- USDA Farm Service Agency proven yields
- Individual farm proven yields
- Soil survey interpretation records

[i] Use list of application methods and application loss factors provided in Appendix A7. If methods other than those listed in Appendix A7 are used, identify the methods and the nitrogen loss factors for those methods.

NOTE: METHODS OF MANURE APPLICATION

Many producers are direct injecting manure to conserve nitrogen and to minimize possible odors. However, weather and soil conditions may require manure to be surface applied with no incorporation. To maintain the flexibility to use the alternate methods of application, producers should do the calculations in this table for all methods of manure application that may likely be used. There must be sufficient acres available for manure application based on the method of application that will result in the least amount of nitrogen application loss.

DNR footnotes continued:

[j] Use of spray irrigation for manure application: Iowa law includes a number of requirements and restrictions on applying manure through spray irrigation. If spray irrigation is being used, the plan should identify the actions the operation will take to ensure compliance with these requirements and restrictions. In addition, the plan should identify any additional methods or practices the operation will use to reduce potential odor, if any additional methods will be used.

Table 2. Manure Nutrient Concentration

Manure Nutrient Content (lbs/1000gal or lbs/ton)					
Manure Storage Structure(s) [k]					
Total N		**P_2O_5**			
% **TN available 1st year**[l]		% **2nd year**		% **3rd year**	
Available N 1st year[m]		**2nd year** [n]		**3rd year** [o]	

Table 3. Crop Usage Rates [p]

	(lbs/bu or lbs/ton)	**N**	**P_2O_5**
	Corn	**See map**	0.375
	Soybean	3.8	0.8
	Alfalfa	50	12.5

* Use blank space above to add crop not listed.

DNR footnotes:

[k] From Table 1 column 3.

[l] Recent research by Iowa State University indicates 100 percent of the nitrogen contained in liquid manure from confinement swine operations is available for plant use in the first year after application. Prior research indicates this may not be the case for liquid manure from other animal species or for solid (dry) manure from confinement operations. A manure management plan may be developed based on the assumption that less than 100 percent of the nitrogen remaining in the manure after deducting application losses will be available for plant use in the first crop year after manure application. However, for planning purposes all nitrogen not considered available in the first crop year must be accounted for in subsequent crop years, and must be considered in determining allowable nitrogen applications (from all sources) during those years. Suggested availability values are: liquid swine manure – 100% in 1st crop year; other liquid manure – 75%, 15%, and 10% in 1st, 2nd, & 3rd crop years respectively; solid manure – 60-75% in 1st crop year, remainder split between 2nd and 3rd years.

NOTE: NITROGEN AVAILABILITY FOR LIQUID SWINE MANURE

Research by Iowa State University indicates that 100 percent of nitrogen contained in liquid manure from confinement swine operations is available for plant use in the first year after application. However, other research suggests that the availability of nitrogen in the first year after application may be less than 100 percent. Test labs may also recommend different nitrogen availability estimates. Reliance on other credible sources may be advisable in order to make the proper calculation of nitrogen available for crop use.

NOTE: OTHER SOURCES

Other credible sources may be used to document the crop availability of nutrients for other liquid manure or solid manure such as state university or extension services.

DNR footnotes:

[m] 1st year available N = Total N x Application loss factor x Percentage of TN available in the first year (e.g. for 95% N available in first year multiply by 0.95), Appendix B3 can be used to make the calculation.

[n] 2nd year available N = Total N x Application loss factor x Percentage of TN available in the second year. Appendix B3 can be used to make the calculation.

[o] 3rd year available N = Total N x Application loss factor x Percentage of TN available in the third year. Appendix B3 can be used to make the calculation.

[p] Appendices A5 and A6 list crop nitrogen and phosphorus requirements for various crops. These values, or crop use requirements from other credible sources, may be used to determine the crop nitrogen needs and phosphorus removal rates for the crops included in the crop schedule for the fields. For non-legume crops such as corn or grasses, the crop N need value represents the amount of nitrogen required to produce the optimum yield for that crop, and is determined by multiplying the crop nitrogen requirement (in lb/bu or lb/ton of yield) times the optimum crop yield. For legume crops such as soybeans or alfalfa, the crop utilization value represents the amount of nitrogen these legumes will utilize from the soil in producing the optimum crop yield, provided nitrogen is available at these levels in the soil. Again, this amount is determined by multiplying the crop utilization rate (in lb/bu or lb/ton of yield) times the optimum crop yield.

NOTE: CORN CROP USAGE OF NUTRIENTS

The corn crop usage rate varies from .9 to 1.2 depending on where the farm is located in the state. The usage rate map should be consulted to determine the appropriate rate. If the field where manure is going to be applied is located in an area that is close to any one of the boundary lines for a crop usage rate, soil types should be considered to determine the appropriate rate. Documentation of the selection may be helpful if the DNR questions the use of a higher crop usage rate for border fields.

NOTE: MANURE APPLICATION ON SOYBEANS

Under current DNR rules that went into effect on May 14, 2008, liquid manure applied to land that currently is or will be planted to soybeans cannot be applied at rates equal to more than 100 pounds of available nitrogen per acre. This 100 pounds per acre limitation does not apply on or after June 1 of each year, but the current 3.8 pounds of nitrogen per bushel of soybean yield would apply.

Under the rules as currently written, this 100 pounds per acre limitation may become a complete ban on May 14, 2013 if the Iowa EPC reviews research on the practice at that time and votes to implement a complete ban. Again, under the rule as currently written, if the EPC does not take any further action, a ban would not go into effect on May 14, 2013 and the current 100 pounds per acre limitation would remain in place.

Table 4. Calculations for rate based on nitrogen (always required).

1	**Applying Manure For** (crop to be grown)[q]					
2	**Optimum Crop Yield** [h]	bu or ton/acre				
3	**P_2O_5 removed with crop by harvest** [r]	lb/acre				
4	**Crop N utilization** [s]	lb/acre				
5a	**Legume N credit** [t]	lb/acre				
5b	**Commercial N planned** [u]	lb/acre				
5c	**Manure N carryover credit** [v]	lb/acre				
6	**Remaining crop N need** [w]	lb/acre				
7	**Manure rate to supply remaining N** [x]	gal/acre or ton/acre				
8	**P_2O_5 applied with N-based rate** [y]	lb/acre				

DNR footnotes:

[q] As a minimum, Table 4 should indicate the full crop rotation for the management ID (i.e. , for a corn, corn, soybean rotation, Table 4 should cover a minimum of three crop years).

NOTE: CROP SCHEDULES

If after manure has been applied crop schedules are altered because of weather, farm program changes, market factor changes, or other unforeseeable circumstances, there is no penalty for exceeding the nitrogen or phosphorus application rate for an unplanned crop for a confinement feeding operation that does not have an operating/NPDES permit.

[h] Documentation of the information used to determine optimum yields must kept with the plan (DNR may require submittal of yield documentation). Documentation may include copies of historical farm yield records, soil survey maps and average yields for the soils found, FSA yield data, etc... If Iowa Ag Statistics county average yields, Appendix A8, are used, documentation is not required to determine optimum yields for corn and soybean crops. The optimum yield for each crop may be set equal to either the average of the last 5-year county yields plus 10 percent or the average of the highest 4 out of the last 5-year county average. If crops other than corn or soybeans are grown, Iowa Ag Statistics yield data for those crops will need to be obtained and optimum yield levels calculated (both the yield data and the calculations should be kept with the plan). If proven yield methods are used to determine optimum yields, the Appendix B2 Worksheet should be used to calculate the optimum yields.

NOTE: CROP YIELDS

DNR encourages the use of county average yields rather than proven field yields. While this approach may simplify calculations and take less time, in some instances using the county yield rather than the proven yield could result in under fertilization of crops.

DNR footnotes:

[r] P_2O_5 removed with crop by harvest = P_2O_5 crop usage rate (Table 3) x Optimum crop yield (table 4, row 2)

[s] Crop N utilization = N crop usage rate (Table 3) x Optimum crop yield (table 4, row 2)

[t] Credit for nitrogen carryover from prior year legume crops should be determined as follows:

- last year's soybean crop: 1 lb nitrogen per bushel of yield, maximum of 50 lb nitrogen per acre credit
- legume forage crop:
  - ◊ last year's crop with 50 to 100% alfalfa or other legume in stand: 100 to 140 lb nitrogen per acre
  - ◊ last year's crop with 20 to 50% alfalfa or other legume in legume/grass mixture: 50 to 80 lb nitrogen per acre
  - ◊ two years ago crop with 50 to 100% alfalfa or other legume in stand: 30 lb nitrogen per acre
- last year's legume green manure crop: 100 lb nitrogen per acre

[u] Amount of N applied with commercial fertilizer (e.g. starter, with herbicide carrier, etc...).

[v] Manure N carryover credit represents the amount of nitrogen available for crop use due to manure applications made in prior crop years. The carryover N credit is determined by:

1. multiplying the amount of manure (in 1000 gal/acre or ton/acre) applied to the field in the previous crop by the 2nd Year Available N concentration for the applicable manure storage source and method of application;
2. multiplying the amount of manure (in 1000 gal/acre or ton/acre) applied to the field two crop years ago by the 3nd Year Available N concentration for the applicable manure storage source and method of application; adding the resulting N carryover credit values together.

[w] Remaining crop N need = Crop N utilization (row 4) minus (–) Legume N credit (row 5a) – Commercial N planned (row 5b) – Manure N carryover credit (row 5c)

[x] Manure rate to supply remaining N = Remaining crop N need (row 6) divided by (/) 1st year available N (Table 2) (x 1000 for liquid manure)

[y] P_2O_5 applied with N-based rate = Manure rate to supply remaining N need (row 7) x P_2O_5 concentration (Table 2) (Divide by 1000 for liquid manure)

NOTE: LIMIT ON RATES OF APPLICATION OF ALL NITROGEN AND PHOSPHORUS

Iowa law in effect places a limit on the amount of nitrogen and phosphorus from both manure and non-manure sources which can be applied on land which receives manure under a manure management plan. The nitrogen limit is the calculated crop usage rate and is based on the optimum crop yields established in the plan. Therefore, it is in the producers' best interest to ensure that optimum crop yields established in the plan reflect current yields so that a level of nitrogen necessary to achieve economically viable yields may be applied.

NOTE: WHEN THE MMP NITROGEN LIMIT CAN BE EXCEEDED

In addition to the exception for planting an unplanned crop (discussed above), the nitrogen limit in an MMP may be exceeded if soil or crop nitrogen test results indicate additional nitrogen is needed to obtain the optimum crop yield. However, the amount of manure applied could not exceed any applicable P Index limitations.

NOTE: P INDEX

The maximum manure application rate that may be applied on a field is determined after calculating the Phosphorus Index score. The Phosphorus Index is a formula that was developed by Iowa State University to predict the potential of erosion, surface runoff and subsurface drainage containing phosphorus. The Phosphorus Index score determines whether an N based or a P based rate applies to a particular field. It includes factors such as the RUSLE2 erodibility score, distance from the center of the field to the nearest stream, soil test results, soil types, rates and methods of phosphorus application, and the farm management system (tillage, conservation practices, crop rotation, etc.) For further information, go to DNR's fact sheet. Additionally, Iowa State University and the Iowa Manure Management Action Group have sponsored training session to assist consultants and producers to prepare Phosphorus based plans. More information on the NRCS Phosphorus Index and RUSLE2 may be found at http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_007643.pdf and http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/ia/technical/?cid=nrcs142p2_008161.

NOTE: IMPORTANT RUSLE2 AND P INDEX CONSIDERATIONS

When preparing RUSLE2 and the P Index, the farmer needs to provide current information about each field to the plan preparer concerning:

- Conservation practices, including contouring, terraces, buffers, grassed waterways, ponds
- Individual planting, tillage, manure application and harvest operations including timing of operations and type of equipment
- Crop rotations
- Field boundaries or field management zones
- Presence of tile lines in individual fields (yes/no)

For a list of information and factors needed to complete the RUSLE2 and P Index calculations please see PM 2021 *Data Collection Worksheet for RUSLE2 and the Iowa Phosphorus Index*, developed by Iowa State University http://www.extension.iastate.edu/Publications/Pm2021.pdf

Table 5. Calculations for rate based on phosphorus (fill out only if P-based rates are planned)

9	**Commercial P_2O_5 planned** [z]	lb/acre				
10	**Manure rate to supply P removal** [aa]	gal/acre or ton/acre				
11	**Manure rate for P based plan** [bb]	gal/acre or ton/acre				
12	**Manure N applied with P-based plan** [cc]	lb/acre				

DNR footnotes:

z Amount of P_2O_5 applied with commercial fertilizers.

aa Manure rate to supply P removal = (P_2O_5 removed with crop by harvest (row 3) – Commercial P_2O_5 planned (row 9))/ Manure P_2O_5 content (Table 2) (x 1000 for liquid manure).

bb Manure rates for a P based plan can apply up to the amount of P_2O_5 removed with harvest by the next 4 anticipated crops in a single application if the application rate doesn't exceed the N-based rate (row 7) and no additional P is applied for the period covered by the application. For example, in a corn/soybean rotation if the "manure rate to supply P removal" (row 10) was 2,000 gal/acre for the corn crop and 1,500 for the bean crop, then 3,500 gal/acre could be applied in a single application if the nitrogen rate was not exceeded. Phosphorus in addition to crop removal may be applied if soil tests are very low or low in phosphorus and additional phosphorus is recommended by Pm-1688 "General Guide to Crop Nutrient and Limestone Recommendations in Iowa."

cc Manure N applied with P-based plan = Manure rate for P based plan (row 11) x 1st year available N (Table 2) (divided by 1000 for liquid manure)

Table 6. Application rates that will be carried over to page 3.

13	**Planned Manure Application Rate** [dd]	gal/acre or ton/acre				

DNR footnote:

dd Manure application rate that is planned. Use these values for page 3 of the form.

When applicable, manure application rates must be based on the P index value as follows:

(0-2) N-based manure management.

(>2-5) N-based manure management but P application rate cannot exceed two times the P removal rate of the crop schedule.

(>5-10) Until December 31, 2008, P-based manure management while adopting practices to reduce P index to 5 or below.

(>10) No manure application until practices are adopted to reduce P index to 5 or below.

Manure Management Plan Form

Year by Year Manure Management Plan Summary

Instructions: Complete this form for each of the next four growing seasons, to demonstrate sufficient land base to apply manure over multiple crop years. If this page is identical for multiple years (e.g. every other year), submit only once for the identical years, and indicate which years the form represents. Footnotes are given on page 6.

Crop Year(s): _____

1	2	3	4	5	6	7	8	9	10	11
Field Designation[ee]	Field Location ___ ¼ of the ___1/4 Sec ___ T____ R____ Township Name _____ County Name _____	Mgt ID[ff]	Planned Crop	Acres receiving manure[gg]	Own, rent, or agreement (include length of agreement) [hh]	P Index Value [ii]	HEL (Y/N) [jj]	Planned Application: gal or tons/acre	Planned Application: gal or ton/field[kk]	Correct Soils Test for P [ll] (Yes or No)
Total acres available for manure application					***Total gallons that could be applied***					
					Total tons that could be applied					

DNR Footnotes for Summary Form

[ee] Field designation may be by Farm Services Agency (FSA) field number, landowner's name, or other suitable designation. A plat map showing the animal feeding operation and all application fields should be kept in the plan. In addition, aerial photos (e.g. FSA section photos) of the fields receiving manure should be in the plan with the boundaries of the individual application fields marked. Also marked on aerial photos should be areas of the fields that are unavailable or unsuitable for manure application, and areas where specific restrictions on manure application apply. DNR may require submittal of plat maps and aerial photos. Areas with specific restrictions on manure application include:

- **within 200 feet of a designated area: A designated area means a known sinkhole, or a cistern, abandoned well, unplugged agricultural drainage well, agricultural drainage well surface tile inlet, drinking water well, lake, or a farm pond or a privately owned lake as defined in Iowa Code Section 462A.2. A designated area does not include a terrace tile inlet or surface tile inlet other than an agricultural drainage well surface tile inlet. Iowa law requires manure from an animal feeding operation be injected or incorporated within the same day of application if applied within 200 feet of a designated area. However, this restriction does not apply if a 50-foot buffer of permanent vegetation surrounds the designated area and no manure is applied within the 50-foot buffer.**
- **within 750 feet of neighboring residence, church, school, business, or public use area: Iowa law requires liquid manure from a confinement feeding operation be injected or incorporated within 24 hours of application if applied within 750 feet of a neighboring residence not owned by the owner of the confinement feeding operation, a church, school, business, or public use area. However, this restriction does not apply if a written waiver is obtained from the owner of the property benefiting by this distance requirement.**
- areas where liquid manure is applied through spray irrigation systems: see footnote *"t"* for page 2.

[ff] Identify how the field will be managed using management IDs from page 2.

[gg] The number of acres of the field that will receive manure. Acres not available for manure application include areas where topography, soils, or other factors make manure application impossible; areas where manure will not be applied; areas where application is prohibited under a manure disposal agreement; and areas where Iowa law or DNR rules prohibit manure application. It may also include areas where Iowa law or DNR rules restrict manure application to methods different than those being used by the operation.

[hh] A copy of all written manure application agreements for all fields identified in the plan that are not owned or rented for crop production purposes by the owner of the animal feeding operation must be kept with the plan (agreements must be signed by the landowner). DNR requires submittal of manure application agreements. If manure is applied based on an agreement, also indicate in column 6 the length of the agreement (e.g. annual, 3-yr, 10-yr).

NOTE: MANURE AGREEMENTS

The law requires manure agreements to state the number of acres available for manure application and the length of the agreement. There is no required minimum length of the agreement. However, if land in the MMP becomes unavailable for manure application, different land must be designated in the plan before the next manure application period.

NOTE: AGREEMENT WITH LEGAL OWNER

The written agreement must be signed by the legal owner or owners of the property where the manure will be applied. In many cases, the legal owner may be different than the person who actually farms the land. Confirm the legal description and the legal ownership of the property with the county land records as the property may be owned by a family corporation, trust or by more than one person.

NOTE: SUGGESTED ADDITIONAL TERMS IN MANURE APPLICATION AGREEMENTS

Although the law requires manure application agreements to only indicate the number of acres available for manure application and the length of the agreement, the parties may want to include other terms in the agreement, such as whether the livestock farmer is required to provide a minimum amount of manure, whether the agreement is binding only on current landowners or binds subsequent landowners, liability, and timing and method of manure application. Also, because record keeping is an integral part of manure management plans, the parties will want to include provisions for the exchange of information on commercial fertilizer, other manure applications, and crop yield records.

For more information, see the example manure application agreements.

[ii] The MMP must be based on the P index in accordance with DNR rules as indicated in the table below. If the P index is required, submit a NRCS P index detailed report containing a P index for each field in the MMP. Additionally, when the P index is required, the manure management plan must include a document (e.g. NRCS RUSLE2 profile erosion calculation record) indicating the inputs and results of RUSLE2 for each field in the plan (These documents must be submitted to the DNR).

Implementation Date for P-index Based Plans	
Original MMP Submitted	**P-index Based MMP Update Due**
Prior to April 1, 2002	First update after August 25, 2008
Between April 1, 2002 and October 24,	First update after August 25, 2006
On and after October 25, 2004	Upon submittal

NOTE: NEW OWNERS

The DNR has taken the position that a new manure management plan is required upon sale or transfer of a livestock farm. The DNR requires new owners of a confinement operation to submit a new manure management plan within 30 days of the transfer or before applying manure, whichever is earlier. The DNR has taken the position that the new owner is also required to submit a new indemnity fee payment. If manure agreements are required for the new owner, new agreements or an assignment of existing manure agreements will be required. Iowa DNR has proposed a change in rules to implement this policy.

[jj] Identify if the field receiving manure is classified as Highly Erodible Land (HEL). Conservation plans are not required in the MMP for HEL if the plan is using the P Index.

[kk] gallons or tons / field = Acres receiving manure (column 5) x gallons or tons/acre (column 9)

[ll] Check "yes" if soil sampling meets minimum requirements. Refer to Rule 65.17(16) in the Iowa Administrative Code for minimum soil sampling requirements. This rule can be found in Appendix A of the MMP. If correct sampling was not used, fields must be resampled within one year.

Materials that must be submitted in addition to the MMP form

1. **Attachments to be submitted to the county and maintained with the current MMP within thirty miles of the site** (in addition to required forms): ***These items are not required to be submitted to DNR.***
   - A plat map which shows the location of the confinement feeding operation and of all fields being used for manure application;
   - Aerial photos (available from the county Farm Services Agency office) or similar photos of all fields being used for manure application. For each field, mark the field boundaries, areas not available or unsuitable for manure application, and areas where specific restrictions on manure application apply;
   - Information documenting the optimum yields calculated for the manure application fields (if required – see footnote "h");
   - Operations using irrigation to apply manure must provide information indicating how they will comply with applicable restrictions and requirements, and any additional methods or practices that will be used to reduce potential odors.

NOTE: COPIES OF ATTACHMENTS

Although DNR does not require the above items to be submitted to DNR, the law requires these items to be submitted to the county and in the applicant's records. To avoid the mistake of submitting an incomplete plan to the county or having incomplete records, it is recommended that these documents also be submitted to the DNR and allow DNR to discard unneeded items.

2. **Attachments to be submitted to DNR (in addition to required forms):**

With Annual Updates

- The Annual Compliance Fee form – Annual Compliance Fee (Form 542-8064) and a check for the amount due ($0.15 per animal unit);
- MMP Short Form 2 (Form 542-8162)

With an Original MMP (new construction or expansion) and with an Original P Index-Based MMP

- A plat map which shows the location of the confinement operation.
- Written manure application agreements for all fields identified in the plan that are not owned or rented for crop production purposes by the owner of the confinement feeding operation;
- Manure sampling results, if sample results were used to determine the manure's nutrient content for this plan;
- When the P index is required, the MMP must include the NRCS P index "detailed report" from the Iowa P index calculator (available at ftp://ftp-fc.sc.egov.usda.gov/IA/technical/pindex010307.xls) with a P index for each field and a document (e.g. RUSLE2 profile erosion calculation record) indicating the inputs and results of RUSLE2 for each field in the plan. The "detailed report" should be submitted with this form once every 4 years as the update.

NOTE: RUSLE2 DOCUMENT PRINTING

The DNR requires that the "RUSLE2 profile erosion calculation record" be included in the plan or it may be considered incomplete. The RUSLE2 program will generate several different outputs or worksheets during the printing process. Select "NRCS RUSLE2 Profile Record with SCI rev.pro" on the print screen to generate the "RUSLE2 profile erosion calculation record."

- For permitted sites only**:** The aerial photos of the manure application fields must be submitted for permitted sites.
- The Filing Fee form [for facilities filing an MMP for construction, expansion or modification or filing an original (first-time) MMP] and a check for the $250 filing fee and the indemnity fee if required:
  (No indemnity fee applies if the operation was constructed or expanded prior to May 31, 1995 and no construction permit was required.)
  - For non-permitted sites: Indemnity fee and MMP filing fee and form (Form 542-4021).
  - For permitted sites - please follow instructions in the Construction Permit Application form (Form 542-1428).
  - Verification form of county receipt for non-permitted sites, OR if applying for a construction permit, follow the instructions on the application (Form 542-4021).
- DNR may request submittal of the attachments listed in Section A that are maintained with the current MMP.

Record Keeping

Records are required to be maintained for three years following the year of application or for the length of the crop rotation, whichever is greater. However, effective August 25, 2006, records must be maintained five years following the year of application or the length of the crop rotation, whichever is greater. Records must be maintained at the site of the confinement operation or at a residence or office of the owner or operator within 30 miles of the site. DNR has a suggested recordkeeping form or an alternative form may be used.

The law requires the livestock farmer to keep records to demonstrate compliance with the manure management plan including the following:

a) Factors used to calculate the manure application rate including:
   i) Optimum yield for the planned crop.
   ii) Types of nitrogen credits and amounts.
   iii) Remaining crop nitrogen needed.
   iv) Nitrogen content and first-year nitrogen availability of the manure.
   v) If a P Index is required, the phosphorus content of the manure. If an actual manure sample is used, a copy of the sample test results must be provided.
b) If phosphorus-based application rates are used, the following must also be included:
   i) Crop rotation.
   ii) Phosphorus removed by crop harvest of that crop rotation.
c) Maximum allowable manure application rate.
d) Actual manure application information:
   i) Methods of application when manure from the confinement feeding operation was applied.
   ii) Date(s) when the manure from the confinement feeding operation was applied.
   iii) Location of the field where the manure from the confinement feeding operation was applied, including the number of acres.
   iv) The manure application rate.

e) Dates and application rates of commercial nitrogen and phosphorus on fields that received manure. If manure is applied on land which is not owned or leased for crop production by the livestock farmer and the crop farmer does not disclose commercial fertilizer application, the livestock farmer will not be found in violation of their manure management plan unless the livestock farmer knew or should have known about the commercial application.
f) If manure is applied on land which is not owned or leased for crop production by the livestock farmer, DNR requires the farmer to obtain a statement from the person who owns or rents the fields identifying the planned commercial nitrogen and phosphorus fertilizer rates to be applied on each field that is going to receive manure.
g) When a phosphorus index is required, a copy of the current soil test lab results for each field in the manure management plan must be included in the records.