



Nutrient Management Plan: Records Checklist and Samples for Animal Feeding Operations



EPA Region VII



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Nutrient Management Plan: Records Checklist and Samples for Animal Feeding Operations

Introduction

Records are a livestock or poultry operation's best tool for documenting environmental stewardship progress. They are critical for determining appropriate modifications to your farm's management plans to improve agronomic and environmental performance. They are absolutely essential to documenting your farm's environmental stewardship initiatives if regulatory agencies or concerned citizens question your stewardship record.

This document is designed to summarize the record keeping expectations of a nutrient management plan and provide the producer with a tool to review the completeness of current record keeping efforts. The document also provides sample record keeping sheets that might be used to meet an identified record keeping need. An electronic copy that you can modify to fit your farm's needs is available on the Web (see page 3).

Getting Started

1. The checklist (pages 4–10) is divided into eight sections. Review those sections that would appear to address the environmental issues most relevant to your livestock or poultry operations.
2. For each appropriate section, review the list of record keeping topics listed in the left column. Record topics are separated into *Strategic Plan/Records* and *Annual or Continuously Updated Records*. *Strategic Plan/Records* refers to records that, following their initial development, may remain fairly constant with time, possibly only changing when significant changes occur in farm facilities, land base or management practices. As the name suggests, *Continuously Updated Records* will require constant updates and maintenance to keep them current.
3. Identify which of the three right columns (MMP, NMP or CNMP) represents the type of nutrient planning you intend to implement (see next topic for discussion of MMP, NMP and CNMP). Use the boxes beneath the appropriate heading to identify those record keeping requirements or expectations most appropriate to your farm.
4. For record keeping topics that you have identified as important or required but which are not currently addressed on your farm, review the related sample records beginning on page 11 for possible forms that could be used to address a record keeping need.

MMP vs. NMP vs. CNMP

A producer will encounter a variety of terminology to describe a plan for managing manure and other nutrient sources on a livestock or poultry operation. These terms all refer to a management plan to address the environmental, agronomic, and engineering issues associated with management of nutrients (including those in manure) for a farm with a confinement animal facility. State and federal public policy encourages (or requires in many situations) a nutrient plan to accomplish these goals.

MMP (Manure Management Plan) is commonly the simplest nutrient planning procedure. It typically focuses on management plans that address manure storage and land application of manure and other nutrients. This plan is often applicable to animal feeding operations (AFOs) that are not regulated but are committed to the principles of environmental stewardship. This document identifies those record keeping topics that may be appropriate for an MMP. However, the individual producer with an MMP has significant latitude in identifying appropriate record keeping procedures to be implemented. There is no common definition of the expectations of an MMP among states or regions of the United States.

NMP (Nutrient Management Plan). The EPA Concentrated Animal Feeding Operation (CAFO) regulations have used NMP to describe the nine minimum elements or practices required of a livestock or poultry operation that has been classified as a CAFO and required to maintain a National Pollution Discharge Elimination System (NPDES) Permit. These nine elements address issues commonly associated with nutrient management (e.g. nutrient plan, soil and manure sampling) as well as elements less commonly associated with nutrient management (e.g. mortality management and chemical disposal). The minimum expectations of an NMP have been carefully defined by federal regulations. Some states may choose to expand upon these expectations. This document defines the minimum record keeping requirements of the federal regulations only (*Appendix A*).

CNMP (Comprehensive Nutrient Management Plan) is often used to refer to an all-inclusive planning procedure used to address most environmental issues associated with livestock or poultry production. The USDA Natural Resources Conservation Service has adopted the CNMP as the key element of environmental planning for all AFOs and a common expectation of the cost share assistance for AFOs. A CNMP includes six elements. Most states actively assist producers in at

least four of those planning elements (manure storage, land treatment for erosion and runoff control, cropping systems nutrient planning and record keeping). The two remaining elements (animal feed management and alternative uses of manure) are commonly less well defined among most state NRCS programs supporting CNMPs.

This document will identify those record keeping procedures for the three levels of nutrient planning described. Actual expectations and requirements commonly vary among states. This document's recommendations should be checked against local expectations or requirements.

Requirements vs. Voluntary Expectations

Livestock and poultry operations that are defined as Large CAFOs under federal or state rules are required to implement a Nutrient Management Plan. The NMP requirements of the CAFO regulations were used to assemble the checklist of record keeping expectations and sample record forms contained in this publication. Your own review of these regulations may lead to a different interpretation of record keeping requirements. We encourage those Large CAFOs required to maintain an NMP to compare our interpretation of required records against the expectations of your state's environmental quality agency that has responsibility for implementing CAFO regulations.

Some livestock and poultry operations will be classified as Medium CAFOs or Small CAFOs, based upon size and connection to surface water. States are given greater latitude as to the specific NMP expectations for medium and small CAFOs. The NPDES permit prepared for an individual operation should define the specific record keeping expectations. Some, but possibly not all, record keeping topics identified in the NMP column of the checklist are likely to be required for medium and small CAFOs.

Livestock and poultry operations not classified as a CAFO should consider nutrient planning to be a voluntary expectation that is fundamental to good stewardship of land and water resources. The MMP column in a checklist would be considered the minimum voluntary expectations for a producer committed to principles of environmental stewardship.

Many CAFOs and unregulated AFOs may voluntarily choose to implement a CNMP. CNMPs are an integral part of NRCS conservation initiatives, including cost share programs. Implementation of all aspects of a CNMP presents a significant challenge to agricultural producers. Producers striving to implement a CNMP may wish to consider this to be a long-term effort to be implemented over an extended number of years as part of a continuing environmental improvement program.

Recognizing this challenge, most current state NRCS support focuses only on certain aspects of the CNMP (manure storage, crop nutrient planning, and land treatment or runoff and erosion control). However, for many medium and large AFOs, the greatest environmental benefits will result from those components of a CNMP related to feed management and alternative use (e.g. manure transfer to off-farm uses). Implementing a true CNMP provides a producer the best assurance that the operation has met legal requirements and is achieving true environmental sustainability.

Access to MS Word Version of Sample Records

The Microsoft Word[®] version of these records is available online at www.heartlandwq.iastate.edu/manure; click on *Record Keeping*. Eventually, these same records will be accessible online at cnmp.unl.edu.

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Checklist of Record Keeping Topics for Nutrient Planning Processes

Section A. My Environmental Management System Overview.

Records Checklist	AFO MMP	NPDES NMP	CNMP ¹	Sample Form #
Strategic Plans/Records²				
1. File copy of all plan documentation relative to facilities siting, engineering and design, and nutrient management. This includes all permits such as an NPDES permit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Maps illustrating field boundaries and field name or identification number at a minimum. Additional valuable information may include field boundaries, available crop acres and planned setbacks or buffers. USGS topographic maps may be required for NPDES permitted facilities. Aerial photographs are generally acceptable for most other applications.	<input type="checkbox"/>		<input type="checkbox"/>	
3. Summarization of individual farm environmental plans including:				
a. Identification of performance measure(s) for judging plan success			<input type="checkbox"/>	Form 1
b. Summary listing of all records, checklists, standard operating procedures, and emergency action plans including most recent date reviewed (audited) by farm management or third party (e.g. permitting authority field inspector)			<input type="checkbox"/>	Form 2
c. Calendar illustrating timing of primary activities for implementing plan	<input type="checkbox"/>		<input type="checkbox"/>	Form 3
Annual or Continuously Updated Records³ (none)				

¹ CNMP Record Expectations: State NRCS-sponsored CNMP programs often focus on manure storage, crop nutrient management, and land treatment. These CNMP suggested records may not be an expectation within some states.

² Strategic Plans/Records: Plans and records that are completed once and updated only if significant changes have occurred (e.g. significant expansion in herd size).

³ Annual or Continuously Updated Records: Records that require regular updates or additions to maintain their accuracy or completeness.

Section B. Animal Management Including Feed Management.

Records Checklist	AFO MMP	NPDES NMP	CNMP ¹	Sample Form #
Strategic Plans/Records				
1. Environmental risk assessment of feed program for excess nutrient excretion and odor generation potential (sample provided as part of Advisor Version of Advisors Records Checklist for Animal Feeding Operations) 2. Estimate of manure production (mass or volume) and associated nutrients (nitrogen and phosphorus) that are recovered annually from animal housing or manure storage facility. (This may be a part of the engineering and management plans assembled for Part 1. It is a required part of an NPDES permit and the annual reporting requirements of an NPDES permit.)			<input data-bbox="1240 390 1297 447" type="checkbox"/> <input data-bbox="954 558 1011 615" type="checkbox"/>	
Annual or Continuously Updated Records				
3. Animal Inventory Record: Summary of animal populations, purchases, sales, and mortality numbers and disposal method 4. Record of all feed ingredient consumption by animals and ingredients purchased from off-farm sources 5. Most recent ration analysis results 6. Water System Checklist: a. Daily inspection of all water lines and animal waterers for excess spillage/leakage OR b. Daily recording of water meter readings with waterer/water line inspection triggered by pre-established increase in water use <i>A water meter reading may not be an acceptable option to direct visual inspections. Check with the permitting authority as to the acceptability of this option.</i>		<input data-bbox="1081 831 1138 888" type="checkbox"/> ² <input data-bbox="1081 1077 1138 1134" type="checkbox"/> ³	<input data-bbox="1256 842 1313 898" type="checkbox"/> <input data-bbox="1256 919 1313 976" type="checkbox"/> <input data-bbox="1256 997 1313 1054" type="checkbox"/> <input data-bbox="1256 1085 1313 1142" type="checkbox"/>	Form 4 Form 5, Option A Form 5, Option B

¹ CNMP Record Expectations: State NRCS-sponsored CNMP programs often focus on manure storage, crop nutrient management, and land treatment. These CNMP suggested records may not be an expectation within some states.

² NPDES NMP requirements do not include records of animal purchases and sales.

³ Some state permitting authorities interpret the regulation as requiring only a “visual” inspection with no “written” record required.

Section C. Manure and Wastewater Handling and Storage.¹

Records Checklist	AFO MMP	NPDES NMP	CNMP²	Sample Form #
Strategic Plans/Records				
<p>1. Storage facility design summary document including design solids accumulation volume, treatment volume, total capacity, days of storage capacity, and critical pumping levels. (This may be a part of the engineering plans or NPDES permit identified in Part 1.)</p> <p>2. Standard Operating Procedures for (sample form in <i>Section F</i>):</p> <p>a. Storage inspection</p> <p>b. Equipment and/or storage maintenance</p> <p>c. Sediment and sludge management</p> <p>d. Agitation and pump out procedures</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Annual or Continuously Updated Records				
<p>3. Storage inspection checklist and maintenance log:</p> <p>a. Level of liquid in all storage structures</p> <p>b. Inspection of all structures for handling manure and manure contaminated storm water</p> <p>c. Inspection of all structures for diverting clean water</p> <p>d. Inspection of liners (compacted earth, clay, or membrane) in all storage structures</p> <p>e. Inspection of earthen berm and containment wall integrity</p> <p>f. Pumping and transfer equipment inspection</p> <p>g. Log of corrective and preventative maintenance activities</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Form 6
<p>4. Storage pumping log</p> <p>a. Date of all pumping events including change in liquid levels, pumping rate, pumping start and stop times</p> <p>b. Storage liquid levels (duplication of storage inspection checklist – once is sufficient)</p> <p>c. All precipitation events</p> <p>d. Annual estimate of manure and runoff volume from storage facility pumping log</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Form 7, Option A Form 7, Option B
<p>5. Report of all manure spills to permitting authority (Provide phone notification in 24 hours and written report within 5 days. Check with your permitting authority for possible differences in reporting times for your individual state.) See <i>Section F</i> for sample report.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Form 8 See <i>Section F</i> for Sample Report.

¹ Assumes that engineering design plan has addressed 1) storage structural drawings and site plans; 2) sizing calculations for volumes generated and storage capacity; 3) seepage control and liner design; 4) manure and wastewater handling equipment and structures; and 5) construction quality assurance plan.

² CNMP Record Expectations: State NRCS-sponsored CNMP programs often focus on manure storage, crop nutrient management, and land treatment. These CNMP suggested records may not be an expectation in some states.

Section D. Land Treatment Practice.

Records Checklist	AFO MMP	NPDES NMP	CNMP	Sample Form #
Strategic Plans/Records				
1. Map of all application sites indicating (this may be a part of the engineering plans assembled for <i>Section A</i>): <ul style="list-style-type: none"> a. Areas of no manure application due to setbacks from waters of the state b. Other setbacks or restrictions on manure application c. Conservation practices installed or implemented for erosion or runoff control 2. Results of individual field Phosphorus Risk Assessment and estimates of erosion. P-Index should be updated with each soil phosphorus analysis if practices which impact erosion or runoff are changed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	Form 9 Form 10
Annual or Continuously Updated Records				
3. Record of setbacks maintained from surface waters maintained during land application. (This may be a part of nutrient application records discussed in <i>Section E</i>) 4. Maintenance log of conservation practice corrective and maintenance activities	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>	Form 11

Section E. Crop Nutrient Management Plan.

Records Checklist	AFO MMP	NPDES NMP	CNMP	Sample Form #
Strategic Plans/Records				
1. Standard operating procedures for (see <i>Section F</i> for sample SOP form): a. Soil testing b. Manure sample collection c. Application equipment calibration		<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Annual or Continuously Updated Records				
<p>Most items should be completed for each field or management area.</p> 2. Field Nutrient Balance: a. Crop available manure nutrient credit b. Annual pre-season plan for field-specific nitrogen and phosphorus balance summarizing planned crops, yields, nutrient credits for all nutrient sources c. Post-season summary of crops grown, actual yields and nutrient balance 3. Application Plan for equipment operator: a. Annual application plan identifying location, rate, form, method, and timing for manure and fertilizer b. Post season summary of manure and fertilizer application rate 4. Field specific nutrient application record: a. Date, rate, method and weather conditions (24 hours prior to and following application) for manure application b. Date and rate of fertilizer application c. Irrigation water use and nitrate analysis 5. Testing and monitoring a. Field specific soil test results b. Manure source specific test results c. In-season and post-season crop nutrient status test results (e.g. stalk nitrate tests, chlorophyll meter readings) 6. Application equipment records a. Application equipment calibration results b. Application equipment checklist c. Application equipment maintenance log 7. Report of all manure spills resulting from land application to permitting authority. (Provide phone notification in 24 hours and written report within 5 days. Check with your permitting authority for possible differences in reporting times for your state.) See <i>Section F</i> for sample report.		<input type="checkbox"/> <input type="checkbox"/> 3a only <input type="checkbox"/> 4a and b only <input type="checkbox"/> 5a and b only <input type="checkbox"/> 6a only <input type="checkbox"/> See <i>Section F</i> for Sample Report.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 5a and b only <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Form 12 Form 13, Options A and B, Form 14 Form 15 Form 16, Options A - D Form 17 Form 18, Options A - C Form 8

Section F. Record Keeping (General).

Records Checklist	AFO MMP	NPDES NMP	CNMP¹	Sample Form #
Strategic Plans/Records				
1. Standard Operating Procedures ² See other sections for specific SOP requirements or expectations.				Form 19
Annual or Continuously Updated Records				
See other CNMP sections for specific annual records.				
2. Report of all manure spills to permitting authority. (Provide phone notification in 24 hours and a written report within 5 days.)		<input type="checkbox"/>	<input type="checkbox"/>	Form 8
3. Staff Training Record: Record of staff training on SOPs, record keeping, and emergency response plans.			<input type="checkbox"/>	Form 20
4. Annual NPDES report		<input type="checkbox"/>	<input type="checkbox"/>	Form 21
5. Reports for incentive/cost share programs			<input type="checkbox"/>	
6. Record of neighbor odor and nuisance complaints and weather conditions at the time of complaint.			<input type="checkbox"/>	Form 22

Section G. Other Utilization Activities.

Records Checklist	AFO MMP	NPDES NMP	CNMP¹	Sample Form #
Strategic Plans/Records				
1. File copy of all plan documentation relative to alternative technology design, engineering and management.		<input type="checkbox"/>	<input type="checkbox"/>	
Annual or Continuously Updated Records				
2. Record of all third parties (name and address) receiving manure, including date and approximate quantity.		<input type="checkbox"/> ³	<input type="checkbox"/>	Form 23
3. Alternative technology specific record detailing inspection checklist(s), preventive and corrective maintenance log, and performance summary.		<input type="checkbox"/> ⁴	<input type="checkbox"/>	Form 24

¹ CNMP Record Expectations: State NRCS-sponsored CNMP programs often focus on manure storage, crop nutrient management, and land treatment. These CNMP suggested records may not be an expectation in some states.

² Consult your land grant university Extension for sample Standard Operating Procedures (SOP) for activities such as soil and manure sample collection, soil and manure lab testing methods, manure storage operating procedures, and application equipment calibration methods. Extension publications with clearly defined procedures may serve as a substitute for your own SOP.

³ All transfer of manure to a third part by a permitted CAFO must include providing this third party representative with a copy of the most recent manure analysis for the manure being transferred.

⁴ If alternative technology contributed to meeting the standards of an NPDES effluent limitation guideline, records specific to that technology may be required. Those record requirements would be identified in the NPDES permit.

Section H. Performance Review.

Records Checklist	AFO MMP	NPDES NMP	CNMP ¹	Sample Form #
Strategic Plans/Records (none)				
Annual or Continuously Updated Records				
1. Regular (possibly annual) review of performance based upon selected performance measures (see <i>Section A2</i>).		<input type="checkbox"/> ²	<input type="checkbox"/>	
2. Summary of all reviews, inspections or audits by third parties (e.g. NRCS, TSP, or regulatory agency) including date, recommendations made, and follow-up actions.			<input type="checkbox"/>	

¹ CNMP Record Expectations. State NRCS-sponsored CNMP programs often focus on manure storage, crop nutrient management, and land treatment. These CNMP suggested records may not be an expectation in some states.

² NPDES permit requires records documenting some performance measures, including results of P index assessment, annual summary of individual field summaries including actual yields and manure application rates, storage levels, and other performance measures. Maintenance of records (five-year history) for possible review by a regulatory inspector is sufficient for demonstrating performance.

Section A. My Environmental Management System Overview.**Form 1. Possible Standard Operating Procedures, Emergency Response Plan Topics and Performance Measures.**

Plan	Potential Standard Operating Procedures	Potential Emergency Response Plans	Potential Performance Measures
Animal Management, including Feed Management	Feed sampling Feed waste minimization Water line inspection Pathogen occurrence reduction	Handling of large mortality numbers	Manure nutrient excretion Pathogen occurrence
Manure Storage Management	Storage inspection Equipment and storage maintenance Pump out procedures (including agitation) Sludge and settled solids management	Overtopping of manure storage Signs of significant seepage or break in manure storage earthen berm Approaching storm when manure storage is full Break in transfer pipe, hose or related equipment	Liquid level relative to critical pumping levels Number of spills Number of equipment or structure failures Whether appropriate corrections were made when inspections revealed non-satisfactory item
Land Treatment Practices	Setbacks and off-limits to manure application		P index
Nutrient Management	Soil sampling Manure sampling Application equipment calibration In-season crop N status	Manure spill during slurry tank loading Slurry tanker overturn or highway accident Break in transfer pipe, hose or related equipment Pivot stops moving during application	Crop yield Soil P level Individual field nitrogen balance for single year P-balance summary (5 year average)
Manure Marketing or Export	Uniformity of product Hauling and stacking of manure on neighbor's property Land application	Transport accident, overturning, blow material	Total quantity of manure exported Does actual manure nutrient transfer match planned transfer?
Odor Control	Lagoon management Agitation of manure storage Maintenance of lagoon or storage covers Manure and feed cleanup and removal practices from animal housing Timing, site selection, and land application of manure		Number of complaints received Farm appearance (recorded in photos or similar)
Comprehensive Nutrient Management Plan	See all above	See all above	Whole Farm Nutrient Balance

Section A. My Environmental Management System Overview.

Form 2: List of Current Records, Standard Operating Procedures, and Emergency Response Plans.

Records

Person(s) Responsible for Records: _____

Permanent Storage Location of Records: _____

Name of Record	Date Last Updated	Date of Last Training

Standard Operating Procedures (SOP)

Person(s) Responsible for SOPs: _____

Name of SOP	Where is SOP Posted?	Date of Last Training

Environmental Response Plans (ERP)

Person(s) Responsible for ERPs: _____

Name of ERP	Where is ERP Posted?	Date of Last Training

Year: _____

Section A. My Environmental Management System Overview.

Form 3: Calendar of Nutrient Plan Implementation Activities for _____ farm.

Plan	Potential Standard Operating Procedures	J	F	M	A	M	J	Ju	A	S	O	N	D	Who Is Responsible?
Manure Storage	Storage inspection													
	Manure sampling													
	Pump out procedures (including agitation)													
	Sludge and settled solids management													

Crop Nutrient Management	Individual field crop nutrient plan													
	Manure sampling													
	Spreader calibration/inspection													
	Field nitrogen status check: _____													

Year: _____

Section B. Animal Management Including Feed Management.

Form 4: Animal Inventory and Mortality.¹

Farm Name: _____ Location of permanent records: _____

Mortality Disposal Method A: _____ Mortality Disposal Method B: _____

Date	Animal Facility:				Animal Facility:				Animal Facility:				Initials
	Total Number of Animals	Number Entering Herd (Flock) ²	Number Exiting Herd (Flock) ²	Number Mortalities/Method ²	Total Number of Animals	Number Entering Herd (Flock) ² S	Number Exiting Herd (Flock) ²	Number Mortalities/Method ²	Total Number of Animals	Number Entering Herd (Flock) ² S	Number Exiting Herd (Flock) ²	Number Mortalities/Method ¹	

¹ NPDES NMP requirements do not include records of animal purchases and sales.

² Since last report.

Year: _____

Section B. Animal Management Including Feed Management.

Form 5, Option A. Water System Inspection: Daily Check.

Month:	Location:		Location:		Location:		Location:		Initials
Day:	Water Line	Waterer	Water Line	Waterer	Water Line	Waterer	Water Line	Waterer	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
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21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									

Date	Problems Observed	Repairs Made	Initials

Section B. Animal Management Including Feed Management.

Form 5, Option B. Water System Inspection: Daily Log of Water Use.¹

Month: _____	Meter Location: _____		Meter Location: _____		Meter Location: _____		Initials
Day:	Meter Reading	Daily Use	Meter Reading	Daily Use	Meter Reading	Daily Use	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

Date	Problems Observed	Repairs Made	Initials

¹ A water meter reading may not be an acceptable option to direct visual inspections. Check with the permitting authority.

Section C. Manure and Wastewater Handling Storage.

Form 6. Weekly Manure Storage/Lagoon Inspection Checklist and Maintenance Log.

Farm: _____ Storage/Lagoon ID: _____ Checked by: _____

Date _____

Inspected by (initials): _____

Critical Storage Liquid Levels

Must Pump or Maximum
 Operating Level: _____ ft.
 Pre-Winter Must Pump Level: _____ ft.
 Stop Pumping or Minimum
 Operating Level: _____ ft.^a
 Max Sludge/Solids Level: _____ ft.^b

a. Anaerobic lagoons only
 b. Anaerobic lagoons and runoff holding ponds only

Manure/Effluent Level Observations

Inspection Results¹

Depth remaining to sidewall low point (ft.)²

Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

Is liquid level marker available & visible?

Does sufficient freeboard exist?³

Other: _____

Earthen Storage Structure

Maintenance Log

Interior Liner Erosion Observed:

Due to wave action?

In vicinity of inlets?

In vicinity of outlets?

Due to erosion from rainfall?

Near agitation equipment access points?

Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Date	Maintenance Performed & Initials

Signs of berm damage due to:

Burrowing animals?

Presence of trees?

Presence of large weeds?

Erosion or gullies?

Poorly established sod?

Are there indications of:

Damp, soft, or slumping areas on berms?

Seepage near toe of berm?

Seepage around pipes through the berm?

Other: _____

Other: _____

¹Check in grey box indicates concern that may require additional attention.

²Measured from liquid surface to lowest point on top of dam, berm, or spillway (nearest one-foot interval).

³Runoff holding pond should maintain sufficient volume for freeboard and volume for runoff from 25-year, 24-hour storm.

Form 6. Continued.
Concrete/Steel Tanks

Inspection Results¹

Maintenance Log

Date:	Inspection Results ¹										Date	Maintenance Performed & Initials
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No		
Signs of cracks or structural damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Signs of leakage or overflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Signs of wet spots around base of tank?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Dry Storage (Long-term or permanent storage)

Is clean water diverted away from stockpile?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Is the stockpile under roof or cover?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
If no, is runoff from stockpile collected?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Clean Water Diversion

Are perimeter drains plugged or blocked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Is roof water entering storage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Is field runoff entering storage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Are diversions/waterways maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Storm Water

Is the storm water drainage to storage functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Pumping and Transfer Equipment

Security: Are gravity drains or pump power supplies locked/secure from tampering?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Are transfer pipes/pumps functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Are recycle pumps/transfer pipes functioning?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Are backflow/well protection valves in place and functioning properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

¹Check in grey box indicates concern that may require additional attention

Section C. Manure and Wastewater Handling Storage.
Form 7, Option A. Monthly Storage Volume and Level Record.

Purpose: To provide a record of precipitation, land application events, and liquid levels for each storage structure. *For each pumping event, the land application event should also be documented with a record similar to Irrigation Field Record in Section E.*

Month: _____ **Structure / Basin ID:** _____ **Maintained by:** _____

Day	Precipitation	Land Application or Discharge to Waters of the State							Pond Liquid Levels	
		Time/Pumping Events		Level/Pumping Events		Pump Flow Rate (gpm)	Field Used for Application	Total Volume Pumped		Check If Discharge ¹
		Start	Stop	Start	Stop					
1	in.					gpm		gal.		ft.
2	in.					gpm		gal.		ft.
3	in.					gpm		gal.		ft.
4	in.					gpm		gal.		ft.
5	in.					gpm		gal.		ft.
6	in.					gpm		gal.		ft.
7	in.					gpm		gal.		ft.
8	in.					gpm		gal.		ft.
9	in.					gpm		gal.		ft.
10	in.					gpm		gal.		ft.
11	in.					gpm		gal.		ft.
12	in.					gpm		gal.		ft.
13	in.					gpm		gal.		ft.
14	in.					gpm		gal.		ft.
15	in.					gpm		gal.		ft.
16	in.					gpm		gal.		ft.
17	in.					gpm		gal.		ft.
18	in.					gpm		gal.		ft.
19	in.					gpm		gal.		ft.
20	in.					gpm		gal.		ft.
21	in.					gpm		gal.		ft.
22	in.					gpm		gal.		ft.
23	in.					gpm		gal.		ft.
24	in.					gpm		gal.		ft.
25	in.					gpm		gal.		ft.
26	in.					gpm		gal.		ft.
27	in.					gpm		gal.		ft.
28	in.					gpm		gal.		ft.
29	in.					gpm		gal.		ft.
30	in.					gpm		gal.		ft.
31	in.					gpm		gal.		ft.

¹ This column should be checked if pump out is directed to surface waters, wetlands, ditch or drainage connecting to surface waters. Permitting authority should be notified by phone within 24 hours. Review and follow permitting authority reporting requirements.

² Liquid level is measured from: ___ low point at top of berm, dam, or spillway; or ___ bottom of storage. Measure to the nearest foot.

Year: _____

Section C. Manure and Wastewater Handling Storage.

Form 7, Option B. Daily Precipitation Record (alternative to form C4 when precipitation only is needed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mo. Total												
Year to Date												

Year: _____

Section C. Manure and Wastewater Handling Storage.

Form 8. Livestock Waste Discharge Notification.¹

Name: _____
Permitted Operation Name

Owner/Manager: _____

Address: _____
P.O. Box, Street Address

City, State and Zip Code

Legal Description of Operation

_____, of _____, _____ N, _____ E or W, _____ County
1/4 1/4 Section Township Range

Do you have an **NPDES** Permit? _____ Yes _____ No If yes, Permit No. _____

Complete the following:

1 List reason(s) for discharge (i.e., power failure, large storm or chronic wet period, leak or break in water supply system, component failure of the waste control facility; and/or releases during land application due to equipment failure, accidents or irrigation equipment failure):

2. The discharge flowed into _____
(ditch, drainage way, stream name)

3. Did the discharge flow directly into surface water or did the discharge flow over cropland prior to discharging to surface water?

4. The approximate width and depth of the surface water (which the discharge entered):

_____ (width in feet) and _____ (depth in feet)

5. The discharge started on (date and time): (Please indicate if this was the actual time or if this was when the discharge was discovered.)

The discharge ended on (date and time): (Please indicate if this was the actual or the estimated time.)

6. Average flow of the discharge was: _____ (gallons/minute)

(continued on next page)

¹ Adapted from Nebraska NDEQ Discharge Notification Form.

Year: _____

7. Estimated total volume of discharge (cu. ft.): _____ (length x width x depth)
8. List any damage to the waste control facility: _____

9. Describe factors and conditions that were used to minimize the adverse effects to the environment from the discharge:

10. List changes or actions taken or that will be taken to prevent future potential discharges: _____

OPTIONAL INFORMATION

1. You may submit rainfall, land application and system storage records for up to a 12-month period prior to the discharge event to demonstrate the need for the discharge.
2. If you choose to sample, the following items should be analyzed. Sample locations, at a minimum, must include point of discharge, upstream, downstream and the mix zone (where the discharge mixes with surface water). Provide a map with collection sites marked.
- a) Five-day Biochemical Oxygen Demand (BOD-S);
 - b) total ammonium-nitrogen;
 - c) nitrate-nitrite nitrogen;
 - d) pH;
 - e) temperature of the effluent and receiving stream;
 - f) sodium;
 - g) total phosphorus;
 - g) chlorides;
 - h) Chemical Oxygen Demand (COD);
 - i) total kjeldahl nitrogen;
 - j) dissolved oxygen (field measurement).
3. Was the sample kept cool with ice from the time it was taken to when it was delivered to the lab?
_____ Yes _____ No

I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

X _____
Signature of Authorized Representative Date

Year: _____

Section D. Land Treatment Practice.

Form 9. Phosphorus Index Record (or attach P-Index output forms).

Field ID	Phosphorus Index Final Score				Management Changes and Year	Initials
	Yr: ____	Yr: ____	Yr: ____	Yr: ____		

Section E. Crop Nutrient Management Plan. Form 12. Crop Available Manure Nitrogen Instructions.

Purpose

This worksheet will estimate a crop available nitrogen credit for a known (calibrated) manure application rate. A *Manure Use Plan* spreadsheet, available online at cnmp.unl.edu/cnmpsoftware.html, completes these same calculations.

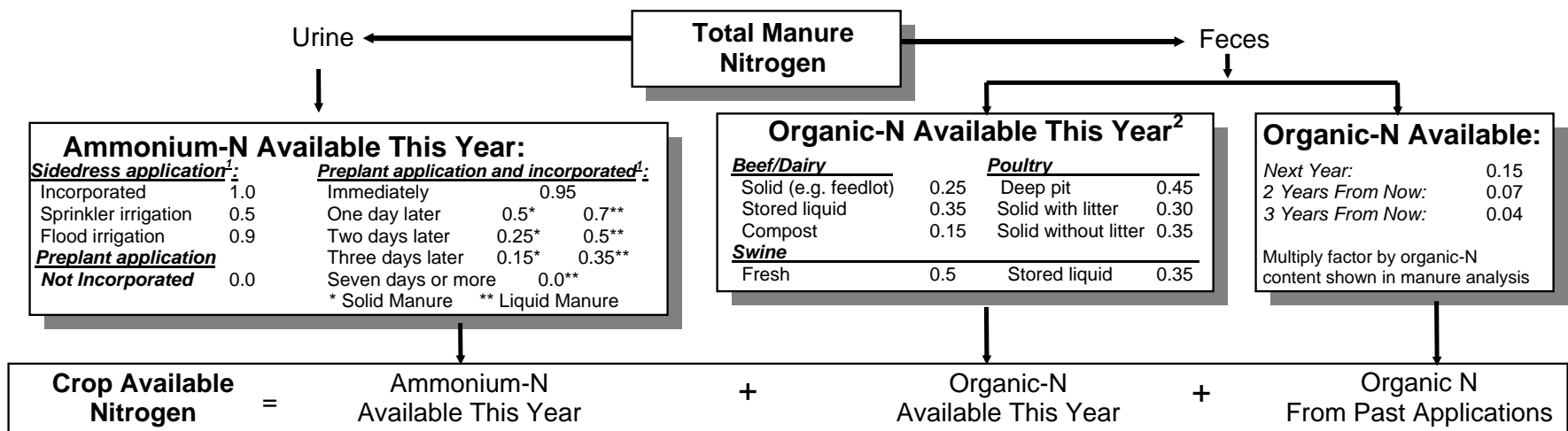
Steps

- Col. a: The number in this column can be used as a reference for the individual application rate/method described in this form when used later in Forms 13 (column n) or 14 (column c).
- Col. b: Enter description of manure source (e.g. lagoon, below barn pit, open lot), season of application and timing of incorporation.
- Col. c: Enter the planned application rate. Application equipment should be calibrated to achieve approximately the desired rate.
- Col. d: Enter the manure's ammonium-N from lab analysis or, if not available, an approximate nutrient content from an accepted reference such as "Manure Characteristics," MWPS-18 Manure Management Series (<http://www.mwpsdq.org/catalog.html>).

- Col. e: Fill in the ammonium-N availability factor based on the most applicable situation from the left box in *Figure 1*.
- Col. f: Calculate crop available ammonium-N (Col. c x Col. d x Col. e)
- Col. g: Enter the manure's organic-N from lab analysis, or, if not available, an approximate nutrient content from an accepted reference such as "Manure Characteristics," MWPS-18 Manure Management Series (<http://www.mwpsdq.org/catalog.html>)
- Col. h: Enter the organic-N availability factor from the middle box in *Figure 1*.
- Col. i: Calculate the crop available organic-N (Col. f x Col. g x Col. h).
- Col. k, l, and m: Organic-N available over the next three years can be estimated by multiplying the appropriate availability factor in the right hand box of *Figure 1* by the value in *Col. i*.

This procedure should be repeated for each manure application system (or piece of equipment), each application rate and timing of incorporation.

Figure 1. Availability factors for manure nitrogen (replace with state specific information).



¹ Incorporation can be accomplished by tillage or by a 0.50 inch or greater rainfall.

² Organic-N availability assumes spring-seeded crops such as corn and soybeans. For winter or spring manure application prior to planting small grains, multiply organic-N availability factor by 0.7. For late summer or fall manure application prior to planting small grains, use the organic N values shown in *Figure 1*.

Section E. Crop Nutrient Management Plan.

Form 12. Crop Available Manure Nitrogen.

Manure Application Options			Ammonium-N Available This Year			Organic-N Available This Year			Organic-N Available:			
a. Option #	b. Manure Source, Season of Application, and Incorporation	c. Planned Application Rate	d. Ammonium-N Content ("as is" basis)	e. Available Factor (see <i>Figure 1</i>)	f. Available NH ₄ -N (c x d x e) (lb/ac)	g. Organic-N Content ("as is" basis)	h. Available Factor (see <i>Figure 1</i>)	i. Available Organic-N (c x g x h) (lb/ac)	j. This Year's Total N Available (f + i) (lb/ac)	k. Next Year (c x g x 0.15) (lb/ac)	l. 2 Years from Now (c x g x 0.07) (lb/ac)	m. 3 years from Now (c x g x 0.04) (lb/ac)
<i>Ex.</i>	<i>Feedlot manure, surface applied, incorporate in 24 hrs.</i>	<input checked="" type="checkbox"/> tons/ac 18 <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input checked="" type="checkbox"/> lb/ton 4 <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in	0.5	36	<input checked="" type="checkbox"/> lb/ton 16 <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in	0.25	72	108	36	18	9
1		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						
2		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						
3		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						
4		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						
5		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						
6		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						
7		<input type="checkbox"/> tons/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in						

Section E. Crop Nutrient Management Plan.

Form 13, Option A. Annual Preseason Plan and Post Season Summary for Nitrogen.¹

Complete the line for the next year before applying any manure.

Field or Management Area: _____ Method for Measuring Crop Yield: _____

a. Year ¹	d. Expected Yield / Actual Yield	e. Soil Test Nitrate-N (average ppm)	f. Total Nitrogen Need or Removal	Nitrogen Credits (Lbs./acre)				k. Net Nitrogen Need Before Manure Application (Cols. f – [g through j]) (lb/ac)	l. Manure Application Option (write line no. from Form 12, Col. a)	m. Planned Manure Application Rate / Actual Rate	n. Rate of Manure Nitrogen Available (Form 12, Col. j) (lb/ac)	o. Extra Nitrogen Needed as Fertilizer (Cols. k-n) (lb/ac)
				g. Manure N from Past Years	h. Irrigation Water N (ppm x 0.227 x ac-in) (lb/ac)	i. Legume/ Green Manure N (lb/ac)	j. Fertilizer Nitrogen (Starter, etc.) (lb/ac)					
2001	170 163	3 ppm	167 at 2% OM	0	(10 ppm) 20 lb/ac	45 lb/ac	6 lb/ac	96 lb/ac	Option 21	18T/ac 15T/ac	108 lb/ac 100 lb/ac	-12 lb/ac -4 lb/ac

¹It may be preferable to summarize multiple fields for a single year onto one record sheet. If so, edit the first column heading and other relevant information in the form.

Section E. Crop Nutrient Management Plan.

Form 13, Option B. Annual Preseason Plan and Post Season Summary for Nitrogen (summarized by year).

Complete the line for the next year before applying any manure.

Field or Management Area: _____ Method for Measuring Crop Yield: _____

a. Field ID	d. Expected Yield / Actual Yield and Method of Measure	e. Soil Test Nitrate-N (average ppm)	f. Total Nitrogen Need or Removal	Nitrogen Credits (Lbs./acre)				k. Net Nitrogen Need Before Manure Application (Cols. f – [g through j]) (lb/ac)	l. Manure Application Option (write line no. from Form 1a, Col. a)	m. Planned Manure Application Rate / Actual Rate	n. Rate of Manure Nitrogen Available (Form 12, Col. j) (lb/ac)	o. Extra Nitrogen Needed as Fertilizer (Cols. k-n) (lb/ac)
				g. Manure N from Past Years	h. Irrigation Water N (ppm x 0.227 x ac.-in.) (lb/ac)	i. Legume/ Green Manure N (lb/ac)	j. Fertilizer Nitrogen (Starter, etc.) (lb/ac)					
Home 80	170 163 yield monitor	3 ppm	167 at 2% OM	0	(10 ppm) 20 lb/ac	45 lb/ac	6 lb/ac	96 lb/ac	Option 21	18T/ac 15T/ac	108 lb/ac 100 lb/ac	-12 lb/ac -4 lb/ac

Section E. Crop Nutrient Management Plan.
Form 14. Annual Preseason Plan and Post Season Summary for Phosphorus.¹

Field or Management Area: _____

a. Crop Year ¹	Manure Phosphorus Availability						Crop Phosphorus Balance							
	b. Manure Handling System	c. Planned Manure Application Rate	d. Manure Phosphorus (P ₂ O ₅) Concentration from Analysis	e. Phos. Avail- ability Factor (0.7 or 1.0) ²	f. Phosphorus Manure Credit (c x d x e) (lb/ac)	Planned Crop		i. Soil Test Phos- phorus (ppm) & Method	j. Phosphorus Recom- mendation (P ₂ O ₅ lb/ac)	k. P Fertilizer Appli- cation (P ₂ O ₅ lb/ac)	Crop P (P ₂ O ₅) Removal (<i>use if soil test recommends no P</i>)		n. P ₂ O ₅ Balance (Cols. f + k - m) (lb/ac)	o. Potential Soil P ₂ O ₅ Increase or Decrease (n ÷ 20) (ppm)
						g. Name	h. Expected Yield				l. Factor	m. Total P Removed (h x l)		
2001	Beef, dirtlot	20 <input checked="" type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	18 <input checked="" type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in	0.7	250 lb/ac	Corn	150 bu/ac	20 Bray-1	Row 0 Bdcst 0	10 (pop-up)	0.3 lb/bu	45 lb/ac	215 lb/ac	11 ppm
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in		lb/ac				lb/ac			lb/ac	lb/ac	

¹It may be preferable to summarize multiple fields for a single year onto one record sheet. If so, edit the first column heading and other relevant information in the form.

²If soil test suggests a P requirement for the crop, use a P availability factor of 0.7. If soil test suggests no P requirement, use a P availability factor of 1.0.

Section E. Crop Nutrient Management Plan.
Form 15. Application Plan for Equipment Operator.

This document should be copied and carried to the field during land application.

Crop Year: _____

Field ID	Manure Source	Planned Manure Application Rate	Incorporate Into Soil?	Manure Nutrient Applic. Rate (lb/acre)		Suggested Timing of Manure Application	Commercial Fertilizer Rate (lb/acre)		Application Instructions
				N	P ₂ O ₅		N	P ₂ O ₅	
<i>Sample: North Pivot</i>	<i>Beef Finisher, dirt lot</i>	18 <input checked="" type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input checked="" type="checkbox"/> Yes, <input type="checkbox"/> No 1 days	90	360	<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D	0	0	30 ft. creek setback
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			
		<input type="checkbox"/> Ton/ac <input type="checkbox"/> 1000 gal/ac <input type="checkbox"/> ac-in/ac	<input type="checkbox"/> Yes, <input type="checkbox"/> No ____ days			<input type="checkbox"/> J <input type="checkbox"/> F <input type="checkbox"/> M <input type="checkbox"/> A <input type="checkbox"/> M <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> O <input type="checkbox"/> N <input type="checkbox"/> D			

Application Rate	Tractor Settings		Applicator Settings		Pivot Settings		
	Gear	RPM	PTO/hydraulic	Chain sp. or orifice	% speed	psi/gpm	Dilution: ? manure/1 gal. water
							gallons manure
							gallons manure

Section E. Crop Nutrient Management Plan.

Form 16, Option A. Solid Manure Application Field Record.

Manure Source: _____ Application Equipment: _____ Net Load Capacity: _____ tons

Date & Times	Field ID or Management Area	Number of Loads	Is Manure Incorporated into Soil?	Area Covered (acres)	Set backs Maintained (feet) ¹	Wind Direction from:	Wind Speed ___<5 mph ___>5 mph	Weather Conditions (precipitation)			Operator Initials
								Day before Application	Day of Application	Day after Application	
Sample	Home 80	///	<input checked="" type="checkbox"/> Yes, <u>1</u> days later <input type="checkbox"/> No	12 ac.	30 ft. grass buffer	SE	___<5 mph ___>5 mph	dry	dry	0.5 inch rain	JMK
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				
			___ Yes, ___ days later ___ No				___<5 mph ___>5 mph				

¹ Federal regulations require a minimum of a 100-foot setback from U.S. waters or a 30-foot permanently vegetated buffer for all CAFOs. Setbacks should be illustrated on your aerial maps. Check for requirement variations in this setback or buffer specific to your state.

Section E. Crop Nutrient Management Plan.

Form 16, Option B. Slurry or Sludge Application Field Record.

Manure Source: _____ Application Equipment: _____ Net Load Capacity: _____ gallons

Date & Times	Field ID or Management Area	Number of Loads	Is Manure Incorporated into Soil?	Area Covered (acres)	Setbacks Maintained ¹	Wind Direction from:	Wind Speed	Weather Conditions (precipitation)			Operator Initials
								Day before Application	Day of Application	Day after Application	
<i>Sample</i>	<i>Home 80</i>	<i>///</i>	<input checked="" type="checkbox"/> Yes, <u>1</u> days later <input type="checkbox"/> No	<i>12 ac.</i>	<i>100 ft. from stream</i>	<i>SE</i>	<input checked="" type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph	<i>dry</i>	<i>dry</i>	<i>0.5 inch rain</i>	<i>JMK</i>
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
			<input type="checkbox"/> Yes, ___ days later <input type="checkbox"/> No				<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				

¹Federal regulations require a minimum of a 100-foot setback from U.S. waters or a 30-foot permanently vegetated buffer for all CAFOs. Setbacks should be illustrated on your aerial maps. Check for requirement variations in this setback or buffer specific to your state.

Section E. Crop Nutrient Management Plan.

Form 16, Option C. Towed Hose or Irrigation System Field Record of Manure Application.

Manure Source: _____ Application Equipment: _____ Pumping Rate: _____ gpm

Date & Times	Field ID	Operating Hours		Rate of Clean Water Addition	Is Manure Incorporated into Soil?	Area Covered (acres)	Setbacks Maintained ¹	Wind		Weather Conditions (precipitation)			Operator Initials
		Begin	End					Direction from:	Speed	Day before Application	Day of Application	Day after Application	
Sample 3/30/00		8:15 am	_____ am _____ pm 2:30 pm	2 to 1	<input checked="" type="checkbox"/> Yes, <u>1</u> days later <input type="checkbox"/> No	130 ac	30 ft. grass buffer	SE	<input checked="" type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph	dry	dry	0.5 inch rain	RKL
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				
		_____ am	_____ am _____ pm _____ pm	to 1	<input type="checkbox"/> Yes, _____ days later <input type="checkbox"/> No	ac			<input type="checkbox"/> <5 mph <input type="checkbox"/> >5 mph				

¹Federal regulations require a minimum of a 100-foot setback from U.S. waters or a 30-foot permanently vegetated buffer for all CAFOs. Setbacks should be illustrated on your aerial maps. Check for requirement variations in this setback or buffer specific to your own state.

Section E. Crop Nutrient Management Plan.

Form 16, Option D. Irrigation Field Record of Manure Application (If Application Rate is Known).

Manure Source: _____ Application Equipment: _____ Field : _____

Manure Pumping Rate: _____ gpm or _____ ac-inches/hr

Date & Times	Depth of Irrigation Application (inches)	Rate of Clean Water Addition	Is Manure Incorporated into Soil?	Area Covered (acres)	Set backs maintained ¹	Wind:		Weather Conditions			Operator Initials
						Direction from	Speed	Day Before Application	Day of Application	Day After Application	
<i>Sample 3/30/00</i>	<i>0.75</i>	<i>2 to 1</i>	<input checked="" type="checkbox"/> Yes, _____ days later <input checked="" type="checkbox"/> No	<i>130 ac</i>		<i>SE</i>	<input checked="" type="checkbox"/> <5 mph ____ >5 mph	<i>dry</i>	<i>dry</i>	<i>0.5 inch rain</i>	<i>RKL</i>
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				
		to 1	____ Yes, _____ days later ____ No	ac			____ <5 mph ____ >5 mph				

¹Federal regulations require a minimum of a 100-foot setback from waters of the U.S. or a 30-foot permanently vegetated buffer for all CAFOs. Setbacks should be illustrated on your aerial maps. Check for variations in this setback or buffer specific to your own state.

Year: _____

Section E. Crop Nutrient Management Plan.

Form 18, Option A. Solid Manure Spreader Calibration and Maintenance for _____ Equipment.

Calibration Log *Date:* _____ *Calibration Completed by:* _____

Tractor Gear/RPM	Spreader Setting	Spreader Capacity is Unknown:	Spreader Capacity is Known:	Calculated Application Rate (ton/ac)
/		Area of plastic sheet: _____ ft ² Net Manure Weight on: Sheet 1: _____ lbs Sheet 2: _____ lbs Sheet 3: _____ lbs	Net Manure Weight on Spreader: _____ tons Width of Spread Pattern: _____ ft Travel Distance to Empty Spreader: _____ ft	
/		Area of plastic sheet: _____ ft ² Net Manure Weight on: Sheet 1: _____ lbs Sheet 2: _____ lbs Sheet 3: _____ lbs	Net Manure Weight on Spreader: _____ tons Width of Spread Pattern: _____ ft Travel Distance to Empty Spreader: _____ ft	
/		Area of plastic sheet: _____ ft ² Net Manure Weight on: Sheet 1: _____ lbs Sheet 2: _____ lbs Sheet 3: _____ lbs	Net Manure Weight on Spreader: _____ tons Width of Spread Pattern: _____ ft Travel Distance to Empty Spreader: _____ ft	

Inspection and Maintenance Log

Inspection Date							Maintenance		
							Date	Action	Initials
Inspected by (initials):									
	Is the equipment functioning properly?								
Item(s) Inspected:	Yes	No	Yes	No	Yes	No			

Record will be stored permanently at _____

Form 18, Option A (continued)**Solid Manure Spreader Calibration****1. Spreader Capacity is Known.**

$$\text{Rate per acre} = \frac{\text{Spreader Capacity} \times 43560}{(\text{Width} \times \text{Travel Distance})}$$

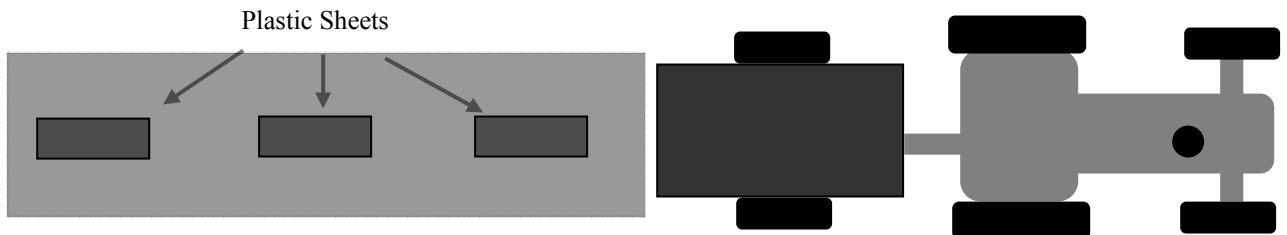
1

Example: A 20-ton manure solids spreader that makes a pass every six 30-inch corn rows (15 feet) and empties spreader in 2400 feet is applying 24 tons per acre.

$$\text{Rate per acre} = \frac{20 \text{ ton} \times 43560}{(15 \text{ ft.} \times 2400 \text{ ft.})} = 24 \text{ ton /acre}$$

2. Spreader Capacity is Unknown.

- Cut three or more sheets of equally sized plastic; 22 square feet (3' x 7'4" or 4' X 5'6") is preferred size.
- Weigh empty 5-gallon bucket plus one plastic sheet on a scale: _____ lbs.
- Lay sheets in field with edges secured by stones or other heavy objects.
- Drive tractor at normal speeds and discharge manure at typical rates over plastic sheets. Record tractor gear: _____, engine RPM: _____, and spreader settings: _____



- Check the sheet. Did a reasonably representative application rate fall on the plastic sheet?
- Carefully fold individual sheets without losing manure and place each sheet in a separate bucket. Weigh each bucket.
Bucket 1: _____ lbs. Bucket 2: _____ lbs. Bucket 3: _____ lbs.
- Subtract weight of empty bucket and plastic (*Step b*) to determine net manure weight in each bucket. Net manure weight for
Bucket 1: _____ lbs. Bucket 2: _____ lbs. Bucket 3: _____ lbs.
- Calculate average weight of buckets. Average Net Manure Weight: _____ lbs.
- Calculate application rate.

$$\text{Tons per Acre} = \frac{(\text{Net Manure Weight} \times 22)}{\text{Area of Plastic Sheet (ft}^2\text{)}}$$

If plastic sheet = 22 ft², then Tons per Acre = Net Manure Weight

Year _____

Section E. Crop Nutrient Management Plan.

Form 18, Option B. Slurry/Liquid Manure Applicator Calibration and Maintenance for _____ Equipment.

Calibration Log

Date: _____ Calibration Completed by: _____

Tractor Gear/RPM	Spreader Setting	Area Method	Calculations	Calculated Application Rate (ton/ac)
/		Net Manure Weight on Spreader: _____ tons Width of Spread Pattern: _____ ft Travel Distance to Empty Spreader: _____ ft		
/		Net Manure Weight on Spreader: _____ tons Width of Spread Pattern: _____ ft Travel Distance to Empty Spreader: _____ ft		
/		Net Manure Weight on Spreader: _____ tons Width of Spread Pattern: _____ ft Travel Distance to Empty Spreader: _____ ft		

Inspection and Maintenance Log

Inspection Date:							Maintenance		
							Date	Action	Initials
Inspected by (initials):									
	Is the equipment functioning properly?								
Item(s) Inspected:	Yes	No	Yes	No	Yes	No			

Record will be stored permanently at _____

Section E. Crop Nutrient Management Plan.

Form 18, Option B. Slurry or Liquid Tank Applicator Calibration Guide (continued).

From chart below, select

- a. Spreader Capacity: _____ lbs. or gallons;
- b. Distace traveled (length) to empty spreader: _____ feet; and
- c. Spread pattern width or distance between individual passes: _____ feet.
- d. Intersection indicates application rate: _____.

If appropriate values cannot be found in table below: Rate per acre = Spreader Capacity x 43560 / (Spread Pattern Width X Travel Length to Empty).

Example: A 3000-gallon tank spreader that makes a pass every four 30-inch corn rows (10 feet) and empties spreader in 1200 feet is applying 11,000 gallons per acre.

Spead Width→	2000 Gallon tank						2500 gallon tank						3000 gallon tank						3500 gallon tank						4000 gallon tank					
	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'
Length	Liquid manure application rate (1000's of gallons per acre)																													
600'	15	10	7	6	5	4	18	12	9	7	6	5	22	15	11	7	5	4	25	17	13	8	6	5	29	19	15	10	7	6
800'	11	7	5	4	4	3	14	9	7	5	5	4	16	11	8	5	4	3	19	13	10	6	5	4	22	15	11	7	5	4
1000'	9	6	4	3	3	2	11	7	5	4	4	3	13	9	7	4	3	3	15	10	8	5	4	3	17	12	9	6	4	3
1200'	7	5	4	3	2	2	9	6	5	4	3	3	11	7	5	4	3	2	13	8	6	4	3	3	15	10	7	5	4	3
1400'	6	4	3	2	2	2	8	5	4	3	3	2	9	6	5	3	2	2	11	7	5	4	3	2	12	8	6	4	3	2
1600'	5	4	3	2	2	2	7	5	3	3	2	2	8	5	4	3	2	2	10	6	5	3	2	2	11	7	5	4	3	2
1800'	5	3	2	2	2	1	6	4	3	2	2	2	7	5	4	2	2	1	8	6	4	3	2	2	10	6	5	3	2	2
2000'	4	3	2	2	1	1	5	4	3	2	2	2	7	4	3	2	2	1	8	5	4	3	2	2	9	6	4	3	2	2
2500'	3	2	2	1	1	1	4	3	2	2	1	1	5	3	3	2	1	1	6	4	3	2	2	1	7	5	3	2	2	1
3000'	3	2	1	1	1	1	4	2	2	1	1	1	4	3	2	1	1	1	5	3	3	2	1	1	6	4	3	2	1	1

Spead Width→	4500 gallon tank						5000 Gallon tank						5500 gallon tank						6000 gallon tank					
	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'
Length	Liquid manure application rate (1000's of gallons per acre)																							
600'	33	22	16	11	8	7	36	24	18	12	9	7	40	27	20	13	10	8	44	29	22	15	11	9
800'	25	16	12	8	6	5	27	18	14	9	7	5	30	20	15	10	7	6	33	22	16	11	8	7
1000'	20	13	10	7	5	4	22	15	11	7	5	4	24	16	12	8	6	5	26	17	13	9	7	5
1200'	16	11	8	5	4	3	18	12	9	6	5	4	20	13	10	7	5	4	22	15	11	7	5	4
1400'	14	9	7	5	4	3	16	10	8	5	4	3	17	11	9	6	4	3	19	12	9	6	5	4
1600'	12	8	6	4	3	2	14	9	7	5	3	3	15	10	7	5	4	3	16	11	8	5	4	3
1800'	11	7	5	4	3	2	12	8	6	4	3	2	13	9	7	4	3	3	15	10	7	5	4	3
2000'	10	7	5	3	2	2	11	7	5	4	3	2	12	8	6	4	3	2	13	9	7	4	3	3
2500'	8	5	4	3	2	2	9	6	4	3	2	2	10	6	5	3	2	2	10	7	5	3	3	2
3000'	7	4	3	2	2	1	7	5	4	2	2	1	8	5	4	3	2	2	9	6	4	3	2	2

Section E. Crop Nutrient Management Plan.

Form 18, Option C. Irrigation Equipment or Towed Hose Applicator Calibration and Maintenance for _____ Equipment.

Calibration Log

Date: _____ **Calibration Completed by:** _____

Tractor Gear/RPM	Other Equipment Settings	Field Measurements	Calculations	Calculated Application Rate (ton/ac)

Inspection and Maintenance Log

Inspection Date:							Maintenance			
	Inspected by (initials):						Date	Action	Initials	
		Is the equipment functioning properly?								
Item(s) Inspected:	Yes	No	Yes	No	Yes	No				

Record will be stored permanently at _____.

Section E. Crop Nutrient Management Plan.

Form 18, Option C. Pivot or Other Sprinkler Application or Towed Hose Unit Calibration (continued).

A. *If flow rate is known:*

- a. Estimate pumping time: _____ hours
- b. Estimate water flow rate: _____ gallons per minute
- c. Estimate acres covered: _____ acres
- d. Estimate application rate:

$$\text{Inches (or ac-in/ac)} = \frac{\text{Pumping Time X Flow Rate}}{\text{Acres X 450}} \times \frac{\text{X}}{\text{X 450}} = \text{_____ in.}$$

B. *If flow rate is not known:*

- a. Identify Rated Pump Pressure and Flow Rate: _____ psi at _____ gpm
- b. Identify Actual Pump Pressure: _____ psi
- c. Estimate Actual Flow Rate

$$\text{GPM}_{\text{actual}} = \text{GPM}_{\text{rated}} \times \sqrt{\text{P}_{\text{actual}} / \text{P}_{\text{rated}}} = \text{_____} \times \sqrt{\text{_____} / \text{_____}} = \text{_____ gpm}$$

- d. Substitute actual Flow Rate from *Step c.* into the Flow Rate space in *Step d.* of “A. If Flow Rate Is Known” and complete calculation of application rate.

* Square Root

C. *Optional method for pivot or other sprinkler irrigation system:*

- a. Place 4 to 6 rain gauges (pans or straight sided plastic cups also will work) in line with the pivot center point at roughly equally spaced intervals. Placement on access road away from crop canopy is preferred.
- b. Measure depth in rain gauges and calculate average.
 Gauge #1: _____ in. #2: _____ in. #3: _____ in. #4: _____ in. #5: _____ in. #6: _____ in.
 Average depth: _____ inches

Section F. Record Keeping (General).

Form 20. Staff Training Record.

Date	Educational Program and Location	Time Involved	Who Taught Program?	Who Organized Program?	Who Attended?
<i>Example: 3/1/00</i>	<i>Nutrient Mgmt. Planning /Kearney</i>	<i>4 hrs.</i>	<i>UNL Extension</i>	<i>NE Cattlemen</i>	<i>John Doe</i>
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			
		hrs.			

Section F. Record Keeping (General).

Form 21. Annual NPDES Report.

Adapted from NPDES Permit Writer's Guidance Manual. US Environmental Protection Agency, Office of Water.
December 31, 2003. EPA-833-B-04-001

NPDES CAFO PERMIT ANNUAL REPORT

NPDES Permit Number: _____	Reporting Period (mm/dd/yyyy-mm/dd/yyyy)
State Permit Number: _____	/ / - / /

Facility Name: _____

I. Type and Number of Animals

Report the maximum number of each type of animal confined at the facility at any one time

Type	Number in Open Confinement	Number Housed Under Roof
Mature Dairy Cow		
Dairy Heifers		
Veal Calves		
Other Cattle		
Swine (55 lb or more)		
Horses		
Sheep or Lambs		
Turkey		
Chickens (broilers)		
Chickens (layers)		
Ducks		
Other (specify) _____		

II. Manure, Litter and Process Wastewater Production

Report the estimated amounts of manure, litter, and process wastewater that were generated at the facility in the 12-month period covered by this report.

A. Amount of manure generated in the 12-month period covered by this report. _____ (tons)

B. Amount of litter generated in the 12-month period covered by this report. _____ (tons)

C. Amount of wastewater generated in the 12-month period covered by this report. _____ (tons)

If amount is known in acre-inches, then: Tons = Acre-inches X 110
 If amount is known in gallons, then: Tons = Gallons X 0.0042
 If amount is known in cubic feet, then: Tons = Cubic feet X 0.031

Form 21. Annual NPDES Report (Continued).

III. Manure, Litter, and Process Wastewater Transferred To Other Persons
 Report the estimated amount of manure, litter, and process wastewater that were generated at the facility in the 12-month period covered by this report.

A. Amount of manure generated in the 12-month period covered by this report. _____ (tons)

B. Amount of litter generated in the 12-month period covered by this report. _____ (tons)

C. Amount of wastewater generated in the 12-month period covered by this report. _____ (tons)

If amount is known in acre-inches, then: Tons = Acre-inches X 110
 If amount is known in gallons, then: Tons = Gallons X 0.0042
 If amount is known in cubic feet, then: Tons = Cubic feet X 0.031

IV. Land Application of Manure, Litter and Process Wastewater

A. Report the total number of acres of land covered by this facility's nutrient management plan. Include all land application acres covered by the nutrient management plan, whether or not they were used for land application during the 12-month period covered by this report.

Total number of land application acres covered by the nutrient management plan: _____ acres

B. Report the total number of acres of land where manure, litter, or process wastewater generated at this facility was spread. Include only land application areas that are under the control of this CAFO facility.

Total number of acres under the control of the CAFO used for land application in the 12-month period covered by this report. _____ acres

V. Summary of Discharges
 Provide a summary of discharges of manure, litter, and/or process wastewater from the production area(s) that occurred in the 12-month period covered by this report. Attach additional sheets, if needed.

Date ^a	Time ^b	Location ^{c,f}	Description ^{d,f}	Volume ^e

^a **Date:** The date of the discharge. If the discharge was detected after it happened, give an estimate of the date when the discharge occurred.
^b **Time:** The time of the discharge. If the discharge was detected after it happened, give an estimate of the time when the discharge occurred.
^c **Location:** The location of the discharge to U.S. waters. Be specific. Include the name of the water body and a specific description of where the manure, litter, or process wastewater entered the water body. Include landmarks or other points of reference (e.g., Three Mile Creek, at southeast corner of feedlot where creek bends to the west).
^d **Description:** Provide other relevant information about the discharge, including the source, cause, composition (e.g., emergency overflow of process wastewater from lagoon #2), and impacts observed (e.g., fish kill in waterbody).
^e **Volume:** Give an estimate of the number of gallons or tons of manure, litter, or process wastewater discharge.
^f NPDES CAFO regulations do not require that this information be included in the annual report.

VI. Nutrient Management Plan
 Indicate whether the facility's nutrient management plan was either developed or approved by a certified nutrient management planner. Note: The [permitting authority] does not require CAFO owners or operators to use a certified nutrient management planner to prepare or approve nutrient management plans.

Was the current version of the facility's nutrient management plan prepared or approved by a certified nutrient management planner? Yes No If so,

Name _____ Address: _____

Section F. Record Keeping (General).

Form 22. Producer Record of Odor Complaints.

Farm: _____

Date / Time	Neighbor Expressing Concern	Concern Expressed	Weather Conditions at Time of Concern	Livestock Operation's Follow-up Actions	Initials
Of Contact: Of Odor Observations:			Wind Speed ¹ : _____ Direction Wind is From: _____ Sky Conditions ² : _____ Temperature: _____		
Of Contact: Of Odor Observations:			Wind Speed ¹ : _____ Direction Wind is From: _____ Sky Conditions ² : _____ Temperature: _____		
Of Contact: Of Odor Observations:			Wind Speed ¹ : _____ Direction Wind is From: _____ Sky Conditions ² : _____ Temperature: _____		

¹ **Wind Conditions:** 1 = calm or light breeze (0-5 mph), 2 = moderate wind (5-15 mph), 3 = strong wind (15+ mph)

² **Sky Conditions:** SY = Sunny; PC = Partly Cloudy; MC = Mostly Cloudy; OC = Overcast; HZ = Hazy; NT = Night

Section G. Other Utilization Activities.
Form 23. Manure Transfer to Off-Farm Users.¹

Year _____

Method of verification of manure transfer amounts: Scale Flow meter Count of loads Other: _____

Date	Off-Farm User Name/Address	Employee Making Entry	Amount of Transfer	Manure Analysis		Total Nutrient Transfer		Location of field receiving manure	
				N	P ₂ O ₅	N (lbs)	P ₂ O ₅ (lbs)		
Mar. 6-9, 2001	John Corn Grower, RR 2, Anytown, NE	Jim part-time	<input checked="" type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.	16	19	<input checked="" type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in	32,000	38,000	Corn Grower's Home 80 (1 mi north of feedlot)
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			
TOTAL			<input type="checkbox"/> tons <input type="checkbox"/> gals. <input type="checkbox"/> ac-in.			<input type="checkbox"/> lb/ton <input type="checkbox"/> lb/1000 gal <input type="checkbox"/> lb/ac-in			

¹All transfer of manure to a third party by a permitted CAFO must include providing this third party representative with a copy of the most recent manure analysis for the manure being transferred.

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Appendix A. CAFO Final Rule Record Keeping Requirements

CAFO final rule preamble: what records and reports must be kept on-site or submitted?

Today's rule specifies the types of records to be kept on-site at the CAFO in accordance with the record keeping requirements section of the permit. Today's rule also specifies the types of monitoring to be performed, the frequencies for collecting samples or data, and how to record, maintain, and transmit the data and information to the permitting authority in accordance with the monitoring and reporting section of the permit. The specific record keeping, monitoring, and reporting requirements in today's rule balance the need for information documenting permit compliance and minimizing the burden on the permittee to collect and record data. State permit authorities can include more stringent requirements if they find such an action necessary. The minimum record keeping, monitoring, and reporting requirements that must be included in each NPDES permit are as follows:

Record keeping requirements: All CAFO operators must maintain a copy of the site-specific nutrient management plan on site, and records documenting the implementation of the best management practices and procedures identified in the nutrient management plan. In addition, large CAFOs must maintain operation and maintenance records that document: a) visual inspections, inspection findings, and preventive maintenance needed or undertaken in response to the findings; b) the date, rate, location and methods used to apply manure or litter and wastewater to land under the control of the CAFO operator; c) the results of annual manure or litter and wastewater sampling and analysis to determine the nutrient content; and d) the results of representative soil sampling and analyses conducted at least every five years to determine nutrient content.

Large CAFOs must also maintain records of manure transferred to other persons that demonstrate the amount of manure and/or wastewater that leaves the operation and record the date, name, and address of the recipient(s);

Today's rule requires all CAFOs to submit an annual report that includes the following information:

- Number and type of animals confined (open confinement and housed under roof);
- Estimated amount of total manure, litter, and process wastewater generated by the CAFO in the previous 12 months (tons/gallons);

- Estimated amount of total manure, litter, and process wastewater transferred to other persons by the CAFO in the previous 12 months (tons/gallons);
- Total number of acres for land application covered by the nutrient management plan;
- Total number of acres under control of the CAFO that were used for land application of manure, litter, and process wastewater in the previous 12 months;
- Summary of all manure and wastewater discharges from the production area that have occurred in the previous 12 months, including date, time, and approximate volume; and a statement indicating whether the current version of the CAFO's nutrient management plan was developed or approved by a certified nutrient management planner.

CAFO Final Rule Section 412.37 Additional Measures

{a) Each CAFO subject to this subpart must implement the following requirements:

- (1) *Visual inspections.* There must be routine visual inspections of the CAFO production area. At a minimum, the following must occur:
 - (i) Weekly inspections of all storm water diversion devices, runoff diversion structures, and devices channeling contaminated storm water to the wastewater and manure storage and containment structure;
 - (ii) Daily inspection of water lines, including drinking water or cooling water lines;
 - (iii) Weekly inspections of the manure, litter, and process wastewater impoundments; the inspection will note the level in liquid impoundments as indicated by the depth marker in paragraph (a)(2) of this section.

- (2) *Depth marker.* All open surface liquid impoundments must have a depth marker which clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation of the 25-year, 24-hour rainfall event, or, in the case of new sources subject to the requirements in § 412.46 of this part, the runoff and direct precipitation from a 100-year, 24-hour rainfall event.
 - (3) *Corrective actions.* Any deficiencies found as a result of these inspections must be corrected as soon as possible.
 - (4) *Mortality handling.* Mortalities must not be disposed of in any liquid manure or process wastewater system, and must be handled in such a way as to prevent the discharge of pollutants to surface water, unless alternative technologies pursuant to § 412.31(a)(2) and approved by the Director are designed to handle mortalities.
- (b) *Record keeping requirements for the production area.* Each CAFO must maintain on-site for a period of five years from the date they are created a complete copy of the information required by 40 CFR 122.21(i)(1) and 40 CFR 122.42(e)(1)(ix) and the records specified in paragraphs (b)(1) through (b)(6) of this section. The CAFO must make these records available to the Director and, in an authorized State, the Regional Administrator, or his or her designee, for review upon request.
- (1) Records documenting the inspections required under paragraph (a)(1) of this section;
 - (2) Weekly records of the depth of the manure and process wastewater in the liquid impoundment as indicated by the depth marker under paragraph (a)(2) of this section;
 - (3) Records documenting any actions taken to correct deficiencies required under paragraph (a)(3) of this section. Deficiencies not corrected within 30 days must be accompanied by an explanation of the factors preventing immediate correction;
 - (4) Records of mortality management and practices used by the CAFO to meet the requirements of paragraph (a)(4) of this section.
 - (5) Records documenting the current design of any manure or litter storage structures, including volume for solids accumulation, design treatment volume, total design volume, and approximate number of days of storage capacity;
 - (6) Records of the date, time, and estimated volume of any overflow.
- (c) *Record keeping requirements for the land application areas.* Each CAFO must maintain on-site a copy of its site-specific nutrient management plan. Each CAFO must maintain on-site for a period of five years from the date they are created a complete copy of the information required by § 412.4 and 40 CFR 122.42(e)(1)(ix) and the records specified in paragraphs (c)(1) through (c)(10) of this section. The CAFO must make these records available to the Director and, in an authorized State, the Regional Administrator, or his or her designee, for review upon request.
- (1) Expected crop yields;
 - (2) The date(s) manure, litter, or process wastewater is applied to each field;
 - (3) Weather conditions at time of application and for 24 hours prior to and following application;
 - (4) Test methods used to sample and analyze manure, litter, process wastewater, and soil;
 - (5) Results from manure, litter, process wastewater, and soil sampling;
 - (6) Explanation of the basis for determining manure application rates, as provided in the technical standards established by the Director;
 - (7) Calculations showing the total nitrogen and phosphorus to be applied to each field, including sources other than manure, litter, or process wastewater;
 - (8) Total amount of nitrogen and phosphorus actually applied to each field, including documentation of calculations for the total amount applied;
 - (9) The method used to apply the manure, litter, or process wastewater;
 - (10) Date(s) of manure application equipment inspection.





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