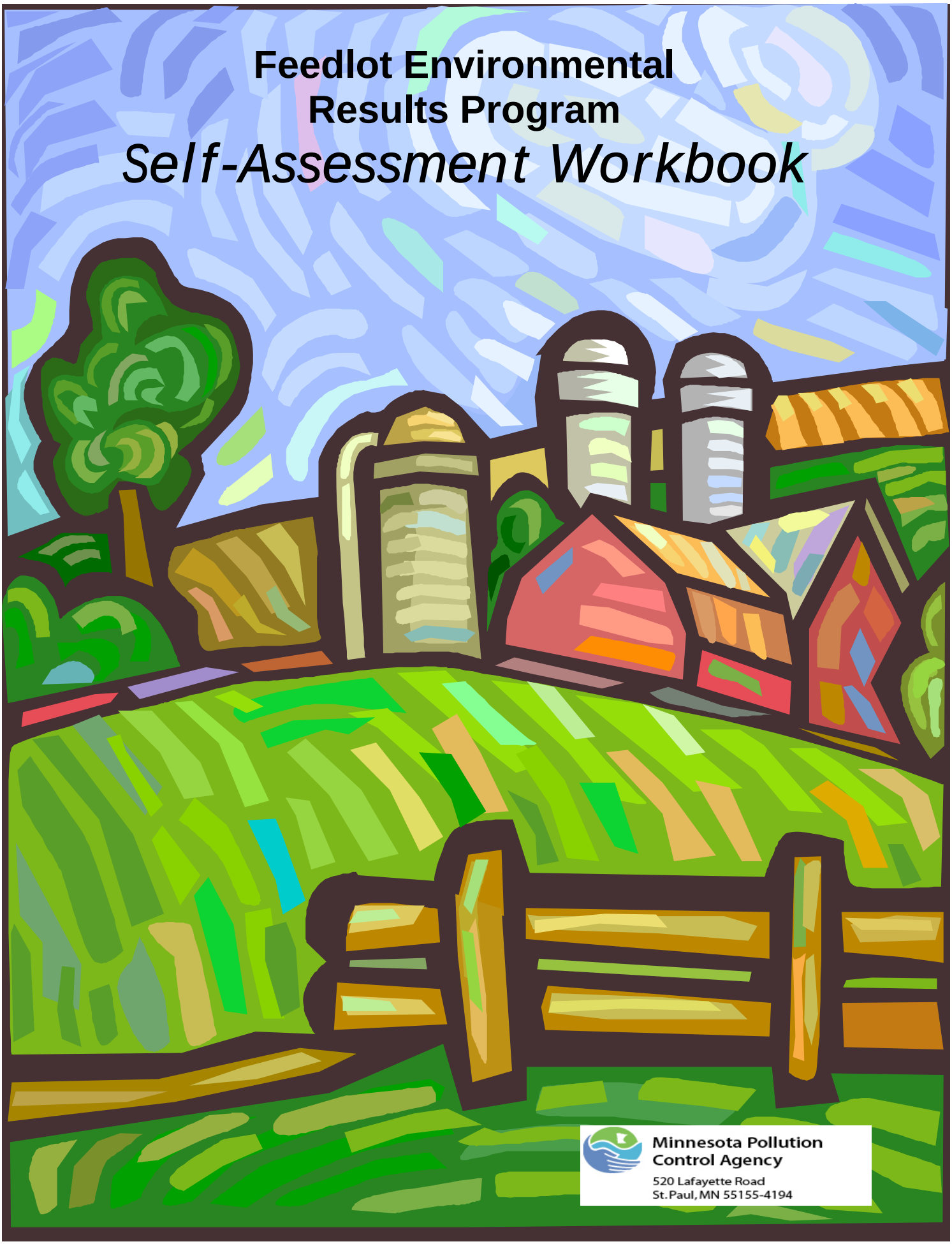
Feedlot Environmental Results Program

Self-Assessment Workbook



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Self-Assessment Workbook

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This Self-Assessment Workbook is a tool for you to use to assess the level of compliance at your livestock facility as well as with regulations that apply to your farmstead. This workbook is designed for those small, open-lot facilities located in non-delegated counties in Minnesota. It is comprised of the following sections:

Self-Assessment Part 1: Livestock Facility Management

Self-Assessment Part 2: Nutrient & Farmland Management

Self-Assessment Part 3: Farmstead Management

Appendix

Glossary

Answer all questions to the best of your ability and knowledge.

- Items that are **Yes**, **No** are information only. They have no bearing on levels of compliance.
- Items with **Yes/BMP** are Best Management Practices that can assist you to operate your facility more economically and as a long-term steward of your land. Where you answer **No**, you can improve your operation's level of water quality protection and possibly its economic strength by adopting the **BMP**. Some of the **BMP** items are actually required of some sized facilities.
- Items with **No/NC** are issues of non-compliance and indicate where corrections are necessary. Where you indicate **No/NC** you will be asked to describe how you will remedy the situation. Your planned remedy is part of your Return to Compliance Plan.
- For questions regarding compliance issues, if you cannot answer "Yes" or "No" where No = NC, it is your responsibility to learn more about the issue so that you can answer the question. Request help if you need it.

Transfer your responses to the enclosed Response Form:

- The Response Form contains space to identify your Return to Compliance (RTC) plan for all **NC** items. The Response Form also contains a Certification Statement.
- Read the Certification Statement and sign your name. The certification is a statement that you have answered the questions to the best of your ability and knowledge. It is not a statement of compliance at the facility.
- If you need more information about a topic, request a fact sheet or other identified document using the enclosed Fact Sheet Order, which is the last page of the Response Form.
- The Project Evaluation section of the Response Form is our feedback loop. Please provide us with your feedback.
- **Please mail the completed Response Form to the MPCA using the enclosed envelope.**
- Keep your Workbook for future reference as to previous-year responses.

NEED HELP? Use the Appendices and the Glossary enclosed in this booklet. In addition, call your producer group, NRCS, SWCD, county and state agencies or others who can assist you.

The agency's toll-free number is **1-800-657-3864.** Request your message be sent to Kate Brigman or Paul Brietzke.

Current Registration Information:

The parts of the feedlot regulations that apply to you are determined by your facility size and location. Using the form in the Response Form, calculate your size in Animal Units (AU), enter the number here and answer these questions to determine if you are required to register your livestock facility.

1.1 Enter your total AU here:_____

1.2 Are there any surface waters within 1,000 feet of the facility (including open lots, barns, septic system or manure application)?

☐ Yes ☐ No

1.3 If yes, check which types of surface water:

☐ Lake ☐ River/Stream ☐ Wetland

☐ Drainage ditch ☐ Tile intake ☐ Other

1.4 If you checked River/Stream or Drainage ditch in the previous question, is the river, stream or drainage ditch within 300 feet of the facility?

☐ Yes ☐ No


Farm activities such as feedlots, septic systems, or manure, fertilizer and pesticide application are of particular concern when they take place close to surface water.

See Appendix #1 for an Overview of Size- and Location-Specific Regulations.


The worksheet for documenting the number of animals you have now and converting those numbers to Animal Units is located on the first page of the enclosed Response Form.

If you are not currently registered and are required to be:

Call **1-800-657-3864** and request a feedlot registration form be mailed to you. This will add your name to the list of registered facilities operating in the state. Registration is a listing of who has livestock, where you are located, what type of operation (open or closed confinement), size of operation and proximity to water.

You are now ready to do the Self-Assessment.

These questions regard compliance issues at the livestock facility, about your land application of manure and about the farmstead as a whole.

Answer the questions to the best of your ability and knowledge. Use the information included within the booklet, the appendices and the glossary to answer the question. Request help if needed.

All responses should reflect how everything is functioning today. If the answer that best fits your situation is marked with **NC**, this means that this is something you will need to correct. Watch for the STOP to remind you to keep developing your Return to Compliance plan.

Create your Return to Compliance plan using the Response Form.

- Feel free to group individual NC items into a plan that works for your operation.
- The Self-Assessment Workbook contains suggested **BMPs** to correct common water quality problems.
- More complex problems will probably require technical assistance.
- At the end of the Self-Assessment you will find an **Appendix** and a **Glossary** to assist you in understanding described processes and terms used.

Self- Assessment Part 1: Livestock Facility Management

Facilities housing livestock with open lots can pose environmental challenges. For example, precipitation that falls directly into the open lot, or that flows through the lot from adjoining land, will mix with any accumulated manure. As it flows from the open lot, the water carries bacteria and nutrients from the manure and has the potential to violate water quality standards developed to protect human health and the environment.

- Bacteria in the water indicate that other disease-causing organisms may also be present.
- When organic materials such as manure and silage leachate decompose in water, oxygen is used up that otherwise would support aquatic life. This use of the dissolved oxygen is called biological oxygen demand or BOD. Fish-kills can be caused by the lack of oxygen.
- The nutrients carried from the manure can be so strong that they kill non-aquatic plants or can cause excessive aquatic plant growth.

An open lot can have a pollution hazard if:

- Runoff enters water or a channel on the down-slope edge of the open lot;
- Down-slope vegetative buffers don't provide adequate treatment; or
- Pollution levels exceed standards at a body of water that is defined as "waters of the State".
- If sufficient quantities of contaminated runoff collect in porous soils, near-surface bedrock, or where high water table conditions exist, the runoff can contaminate groundwater.

Low Cost Improvements to correct for Open Lot Runoff:	**Address manure accumulations.** **BMP -** Minimize manure build-up in open lots. Scrape and haul at least once in every seven days in areas where heavy defecation takes place such as around feeders, bunks and waterers. **Move fences or change the lot area.** **BMP** – Reduce the open lot area to no more than what is needed to a) maintain good animal health, b) provide adequate feeding and watering space, and c) prevent animals from becoming too agitated. **BMP** – Seed the newly abandoned lot area to permanent vegetation. The now-vegetated area will serve as a buffer at least partially treating runoff. **BMP** – If water flows through the feedlot, adjust fencing so that the feedlot area does not enclose any part of a stream, intermittent stream or waterway. **BMP** – Move fences so that runoff from the open lot areas is directed away from water and water channels and instead is directed into areas where treatment can occur (e.g. onto cropland or a constructed Vegetative Treatment Area. **Install clean water diversions.** **BMP** – Where "clean" water enters the lot from the land upslope of the feedlot and flows through the lot, construct a diversion that directs the clean water around the area of manure accumulation thus keeping it "clean". Clean water requires no treatment. **Grade channelized areas.** **BMP** – Where downslope vegetated buffers already exist, reconstruct any areas where runoff is channelized upslope or within the buffer. Install gravel spreaders or other devices to prevent channelized flow from re-developing. **Install rain gutters or on-ground rock channels.** **BMP** – Attach rain gutters to the open lot flow side of the buildings when and where needed, and complete all other clean water diversions not addressed in #3 above. Instead of installing rain gutters on the buildings, rocked channels at the base of the buildings can also be used. *Through-out this document the term Best Management Practice (BMP) is used in the generic sense to describe actions that can reduce water quality impacts from land-use activities.*

Low Cost Open Lot Improvements Continued:	**Install grass buffers.** **BMP** – Grade the soil and plant grass buffers downslope of the feedlot. Also construct spreaders where appropriate to prevent channelization within the grass buffers. **Construct a solids settling area.** **BMP** – Construct a solids settling area and picket dam to settle solids prior to reaching the grassed buffer. This may require some re-grading of the feedlot area. Concrete lips and slabs should also be considered, where budget allows.
Open Lot Correction for Facilities with less than 300 AU	**Install Vegetative Treatment Areas (VTA).** **BMP** – With appropriate operation and maintenance these areas of dense grasses (no visible channels), well-maintained pasture (not over-grazed to bare ground and no visible channels), or cropped field (no visible channels and no manure puddles limiting crop growth) are effective in reducing nutrient and sediment delivery to nearby water features.
Main components of a VTA:	• The surface area should be at least 60% as large as the feedlot area it is treating. • Relatively flat land is needed. In the direction of flow the slope should be less than 4%. • The area is planted to vigorously growing grasses that tolerate wet conditions well. Examples are Brome, Reed Canary, or Timothy grass. • A solid manure separation structure such as a picket fence or a settling basin.
A very important part of "fixing" a runoff problem from an open lot is the **Operation & Maintenance** you provide after the installation. When you invest in farm equipment, you are careful to use the equipment responsibly and to keep maintenance current. You know the equipment will fail if you avoid these responsibilities. The same holds true for something as simple as a Vegetative Treatment Area or a Clean Water Diversion. After installation it looks like so much grass. However, it is a carefully-designed system so inspect it monthly or after heavy rain. Proper operation and maintenance is key to continued function.	
Management issues critical to effective VTA operation include:	• The land needs to be devoted solely to treating runoff. • Keep out all traffic – vehicles and animals when wet to avoid tracks and or ruts that can cause channelization. • Keep solid manure out of a VTA. • Harvest the grass periodically to maintain a healthy stand. • The area should not pond. • Inspect for channels, solids (clogging), or dead grass, and correct these problems when they appear.
Management issues for other Open Lot Fixes:	• Inspect the structure regularly. • Regrade and restore as needed. • Keep lots cleaned of accumulated manure.

The following questions refer to open lot runoff.

1.5 When you walk around the perimeter of your open lots do you see evidence of manure runoff leaving the lots? (Especially pay close attention to location where the runoff has created a channel.)

☐ Yes ☐ No

1.6 Do you prevent runoff from the Open Lot from reaching the road ditch?

☐ Yes ☐ No/NC

1.7 Do you prevent runoff from the Open Lot from reaching other surface waters?

☐ Yes ☐ No/NC

1.8 Do you prevent runoff from the Open Lot from reaching a surface tile intake either in or near the Open Lot?

☐ Yes ☐ No/NC

1.9 Do you prevent runoff from the Open Lot from reaching any sinkhole, well, mine or quarry?

☐ Yes ☐ No/NC

1.10 Does runoff from the feedlot pass through a VTA?

☐ Yes/**BMP** ☐ No

1.11 Does the VTA prevent discharge to surface waters?

☐ Yes ☐ No/NC ☐ NA

Open lots can be considered as a confinement area in which manure accumulates or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. Open lots include loafing areas, paddocks, pens, etc., but does not include pastures. See the glossary for additional detail on this definition.

Manure-contaminated runoff from all farms, no matter the size, must not reach waters of the state.

See Appendix #2 for additional detail on Water Quality Standards.

Remember that "surface water" includes all of the following: a road ditch, drainage ditch, tile intake, lake, perennial and intermittent stream, river or wetland.

An inadequate Vegetative Treatment Area (VTA) indicates a strong potential for discharge into surface waters. Technical assistance is highly recommended for designing VTA to fit your operation**.** Lot size, number and species of animals, slope and distance to surface water are all used to determine the dimensions of an adequate VTA.

See Appendix #3 for additional detail on sizing a VTA.

Remember to use the <u>Response Form</u> to enter your plans for any NC issues from the previous section.

The following questions cover milkhouse waste.

1.12 Are you using a septic system designed specifically to treat milkhouse waste?

☐ Yes/**BMP** ☐ No

1.13 Do you keep milkhouse waste from reaching the road ditch?

☐ Yes ☐ No/NC

1.14 Do you keep milkhouse waste from reaching other surface waters?

☐ Yes ☐ No/NC

1.15 Do you keep milkhouse waste from reaching a surface tile intake?

☐ Yes ☐ No/NC

1.16 Is the milkhouse waste totally absorbed into an actively growing VTA without discharge

☐ Yes ☐ No/NC

1.17 Does your milkhouse waste or open lot runoff flow into a storage basin?

☐ Yes/**BMP** ☐ No

Regular septic systems are designed for household-strength wastes. Milkhouse waste is a much higher strength waste. See Appendix #4 for additional information.

Waste pretreatment or special system design is strongly recommended when using a septic system for milkhouse wastes. Congealed milk-fat solids as well as the high nutrient loading can clog up the drainfield leading to septic system failure.

Milkhouse waste cannot reach waters of the state either by way of a buried pipe or overland flow. Again, an inadequate VTA indicates a strong potential for discharge into surface waters.

Note: Grade A dairies are prohibited from commingling human and livestock waste.

See Appendix #4 for additional detail on Milkhouse Waste.

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

The following questions are about Liquid Manure Storage Areas (LMSA).

1.18 Do you have a LMSA?

☐ Yes ☐ No

1.19 Did you receive technical assistance from a government agency or private engineering firm when your LMSA was constructed?

☐ Yes ☐ No

1.20 Do you have records documenting construction of your LMSA?

☐ Yes ☐ No

1.21 Do you have a permit issued by the MPCA or County Feedlot Officer (CFO) documenting approval of your LMSA?

☐ Yes ☐ No

1.22 Is your LMSA approved for use by the MPCA or CFO?

☐ Yes ☐ No/NC

1.23 Do you operate the LMSA without it ever overflowing?

☐ Yes ☐ No/NC

1.24 Do you operate your LMSA with the liquid level at least one-foot down from the top of the berm?

☐ Yes/**BMP** ☐ No

1.25 Do you keep deep-rooted vegetation such as trees, shrubs, or cattails from growing in the berm of the earthen basin or within ten feet of a concrete LMSA?

☐ Yes/**BMP** ☐ No

1.26 Do you conduct regular visual examination of your LMSA to identify and correct erosion channels and rodent burrows?

☐ Yes/**BMP** ☐ No

What's in a name? An earthen lagoon is designed and operated to provide treatment. It has a large perimeter and is shallow to encourage mixing by the wind. An earthen basin is built for storage. It has a smaller perimeter and is deeper. This way the nutrient content of the manure is saved for use as fertilizer.

If you did not receive technical assistance by a government agency or private engineering firm or if other documentation is not available:

See Appendix #5 for additional detail on Obtaining Approval of your LMSA.

If you cannot answer "Yes" to these questions, you need to consider your answer a "No" until you confirm your site conditions.

Proper operation and maintenance of a LMSA is critical.

BMP - Operating an open-air LMSA with one foot freeboard (liquid level at least one foot down from the top of the berm) leaves storage space to accommodate precipitation. For a covered LMSA, the freeboard is available if a problem occurs such as a waterline break.

BMP- Keeping all deep-rooted vegetation such as trees, scrubs, and even cat-tails clear of the area ten-feet wide around your LMSA protects the structure whether earthen or concrete.

BMP- Regular visual inspection of your LMSA will allow you to identify erosion and burrowing animal activities so that you can stop them from damaging your LMSA.

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

The following questions are about manure stockpiles. See Glossary for the terms "Permanent Stockpile" and "Short-Term Stockpile".

1.27 Do you keep all clean water flowing around or away from your stockpile site?

☐ Yes/**BMP** ☐ No

1.28 Do you keep manure-contaminated runoff flowing from a stockpile from reaching waters of the state?

☐ Yes ☐ No/NC

1.29 Are the materials stored at the stockpile at least 15% solids or stacked with a 3:1 horizontal – vertical ratio?

☐ Yes ☐ No/NC

1.30 Do you use a short-term stockpile?

☐ Yes ☐ No

1.31 Is your stockpile area allowed to revegetate for a period of one year prior to reusing that stock pile location?

☐ Yes ☐ No/NC

1.32 Is your stockpile located on a slope of less than six percent?

☐ Yes ☐ No/NC

1.33 Is your short-term stockpile 300 feet flow distance and at least 50 feet horizontal distance from surface water?

☐ Yes ☐ No/NC

1.34 Do you use a permanent stockpile?

☐ Yes ☐ No, if no, skip to question 1.36.

1.35 Does the permanent stockpile sit on an impervious pad?

☐ Yes ☐ No/NC

What is a stockpile?

Manure and bed-pack material that has been scraped from the open lot and removed from the lot is a stockpile.

The accumulated manure and bedding within an open lot is not considered a stockpile.

Bed-pack material is considered the same as manure. Although it is mostly bedding material, it will contain some manure.

Solid Manure Storage

- Stockpiling is allowed for solid manure where a three-to-one horizontal-vertical ratio can be maintained or where the manure has a 15% or greater solids content. (If the manure won't stay in a pile, it is too low in solids).
- Stockpiles are one of two kinds: permanent or short-term. Know the difference and manage properly.
- Permanent stockpiling is where the same site is used without establishing a vegetative cover between stockpiling events.
- Short-term stockpiling is where manure is stored on a different site from year to year and a vegetative cover is established during the growing season prior to reuse of the site.
- If your stockpile is for less than 100 AU, nutrient analysis and record-keeping is not a requirement – *although it is recommended*.
- If your stockpile is for 100 AU or more, the nutrient analysis and record-keeping is required.

When is manure solid and when is it liquid?

Solid manure can be stockpiled. Manure is considered a solid if it contains at least 15% solids and can be stacked with a 3:1 horizontal to vertical ration. Otherwise it should be handled as a liquid.

BMP – Divert upslope clean water away from the area of manure stockpiling.

BMP – Relocate all manure stockpiles away from any areas that may create a discharge to waters of the state.

BMP – Locate manure stockpiles on predominately clayey soils to protect groundwater.

Remember that "surface water" includes all of the following: a road ditch, drainage ditch, tile intake, lake, perennial and intermittent stream, river or wetland.

1.36 Is your record-keeping current?

☐ Yes ☐ No/NC

1.37 Are records of the stockpiling activity kept for at least three years?

☐ Yes ☐ No/NC

 Record-keeping of stockpiling activities are required for all livestock facilities of greater than 100 AU. These records are to include ALL of the following:

a) location of the stockpile;
b) the date each stockpile was established;
c) the volume of manure stockpiled;
d) the nutrient analysis of the manure current within four years;
e) the date when the stockpiled manure was land applied.

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

The following question is directed towards management of feedstock.

1.38 Is leachate from feed storage kept from reaching surface water?

☐ Yes ☐ No/NC

 **Feed Storage**

It is important to clean up spilled feed and feed and maintain runoff control of areas storing feedstock and spoiled or refused feed. Silage leachate, the liquid that percolates through exposed feedstock (including silage) and then flows, is a very high-strength waste. It is considered equal to manure in its ability to violate water quality standards.

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

The following questions are about Mortality Management.

1.39 Do you use rendering?

☐ Yes – Answer questions 1.43-1.44 ☐ No

1.40 Do you compost mortality?

☐ Yes – Answer questions 1.45-1.48 ☐ No

1.41 Do you bury mortality?

☐ Yes – Answer questions 1.49-1.53 ☐ No

1.42 Do you burn mortality?

☐ Yes – Answer question 1.54 ☐ No

 Animal mortality is part of livestock production. The handling of carcasses is regulated by the Minnesota Board of Animal Health.

For more information see www.bah.state.mn.us/animal/carcass_disposal/carcass_disposal.htm.

Information is also available through the MPCA factsheet "Animal Mortality".

 If you cannot answer "Yes" to these questions, you need to consider your answer a "No" until you confirm your site conditions.

Rendering: Skip these questions if you don't employ rendering for carcass management.

1.43 Are the carcasses removed within 72 hours?

☐ Yes ☐ No/NC

1.44 Is your offsite carcass-storage structure scavenger-proof?

☐ Yes ☐ No/NC

 NOTE: Carcass management is an aspect of your facility that has big public relations value:

- Keep carcasses out of sight of the public
- Make sure carcasses are removed or otherwise taken-care-of promptly.
- An "offsite" carcass structure can be as close as the end of your driveway.

<u>Composting:</u> Skip these questions if you don't compost carcasses.

1.45 Do ALL liquids stay in the compost bin?

☐ Yes ☐ No/NC

1.46 Is the composting done on an impervious pad?

☐ Yes ☐ No/NC

1.47 Do you run two 7-10 day cycles where the temperatures are 130+ degrees?

☐ Yes ☐ No/NC

1.48 Do you have a finished product that is free of animal tissue?

☐ Yes ☐ No/NC

<u>Burying:</u> Skip these questions if you don't bury carcasses.

1.49 When burying your dead animals, do you stay 5 feet or more above the seasonal high water table?

☐ Yes ☐ No/NC

1.50 Do you stay away from surface waters?

☐ Yes ☐ No/NC

1.51 Do you cover carcasses over immediately with at least 3 feet of soil?

☐ Yes ☐ No/NC

1.52 Do you avoid burying carcasses in areas of sandy or gravelly soils?

☐ Yes ☐ No/NC

1.53 Do you maintain 10 feet or more of vertical separation between dead animals and bedrock?

☐ Yes ☐ No/NC

<u>Incineration:</u> Skip these questions if you don't incinerate carcasses.

1.54 Do you burn carcasses using an incinerator manufactured for mortality incineration that is fitted with an afterburner?

☐ Yes ☐ No/NC

Nice to Know: the temperature and time requirements are to assure destruction of pathogens. Thermometers with up to 3-foot probes can be used to check the temperatures.

You should be keeping records on: 1) when you add carcasses; 2) daily temperatures; 3) when you remove to land apply composted materials.

A Board of Animal Health permit is required when composting cattle.

You can check the depth to seasonal high water where the right kind of soils for burying carcasses can be found by looking in your county's Soil Survey. This document can be found at the local SWCD.

What does opacity mean?

Opacity is defined as "the degree to which emissions reduce the transmission of light and obscure the view of an object in the background". These emissions include gases and fine particulate matter (particles) such as dust and soot. An example of emissions with high opacity would be the black smoke produced during the illegal burning of waste tires.

Incinerators must be:

- Capable of producing emissions not to exceed 20 percent opacity;
- Fitted with an afterburner that maintains flue gases at 1,200 degrees Fahrenheit for at least 0.3 seconds; and
- Ash from the incinerator must be handled in such a manner as to prevent particulate matter from becoming airborne.

Remember to use the <u>Response Form</u> to enter your plans for any NC issues from the previous section.

Continue to page 13 to complete the Self-Assessment Part 2 – Farmland & Nutrient Management.

Notes:

Self-Assessment Part 2: Farmland & Nutrient Management

How you manage the land you own and/or rent, including non-crop land, can influence water quality as well as your bottom-line. This section focuses on requirements of nutrient management planning and additional Best Management Practices (BMP) aimed at protecting water quality.

Your crop production management and land management have an important connection. Over-application or miss-application of nutrients can be both an economic loss to you and a water quality loss. In 2006 the University of Minnesota released new nitrogen recommendations focused on maximizing your economic return. The guidelines are based on the soil productivity and a ratio between the price of nitrogen and the value of the crop. Economic and water quality losses can be potentially reduced by developing and implementing a nutrient management plan.

Additionally, economic losses and water quality impacts result from soil loss and from the phosphorus attached to the soil. Soil can be a pollutant if it is somewhere it doesn't belong. One pound of phosphorus yields approximately 500 pounds of algae if that phosphorus gets into surface water. A whole-farm soil conservation plan can work to your advantage and at the same time protect water quality.

Your nutrient management and soil conservation plan will determine what impacts the water that flows both through and across the soil has on the environment. Because this flowing water can carry nutrients, bacteria, and soil particles it is important to reduce both the velocity of flow and over-application of nutrients. Here are some of the impacts:

- Excessive nitrogen can leach through the soil and contaminate ground water.
- Soil particles can cover the bottom of the creeks and rivers suffocating insect larvae decreasing food supplies for fish.
- Soil suspended in the water contributes to how cloudy (turbid) the water is. The resulting reduction in sunlight penetration affects both aquatic animals and plants.
- Phosphorus carried to surface water attached to the soil particle results in algal blooms.
- Organic debris transported by flowing water decomposes in the receiving waters whether it is a river or a municipal storm-water pond. When organics decompose they take oxygen out of the water. In some cases this can lead to a fish-kill.

Successful conservation plans use as many practices as possible. There is no one-size-fits-all solution. Each farmstead has its own unique character. Each landowner has his or her own management style. The Best Management Practices included here will assist you in reducing potential water quality impacts.

How many acres do you farm? 2.1_____ How many of these have manure applied? 2.2_____

Farmland Management to Protect Water Quality	**Reduce soil erosion** **BMP** – Residue tillage such as No-till or Zone-till. **BMP** – Conservation tillage that leaves at least 30% crop residue after planting. **BMP** – Plant cover crops such as rye after canning crops or corn silage. **Reduce wind erosion.** **BMP** – Plant and maintain windbreaks. **Slow the flow of water.** **BMP** – Grass buffer strips along surface waters, 50 feet for rivers – 100 feet for lakes **BMP** – Terraces for long sloping fields, grass waterways where channeled flow occurs **BMP** – Observe a 25 foot setback from water courses including the road ditch. **BMP** – Contour strip cropping

Applying Manure in Sensitive Areas

The following is a list of required setbacks:

1. Lakes, streams, intermittent streams, wetlands (10+ acres), Drainage ditches without berms
   - Within 25 feet, no manure can be applied.
   - Within 300 feet, manure can be applied if it is injected or incorporated within 24 hours (no winter applications).
   - For perennial streams where a vegetative buffer of 100 feet is maintained, manure applications during non-winter months can be broadcast without incorporation required within 24 hours.
   - For intermittent streams where a vegetative buffer of 50 feet is maintained, manure applications during non-winter months can be broadcast without incorporation required within 24 hours.

2. Open tile intakes and side-inlets to a bermed ditch
   - Within 300 feet, manure can be applied if it is injected or incorporated within 24 hours (no winter applications).

3. Wells, quarries, sinkholes
   - Within 50 feet, no manure can be applied.
   - Near sinkholes, within 300 feet, manure can be applied if it is injected or incorporated within 24 hours (upslope areas) (no winter applications).

4. Road ditches
   - No manure can be applied.

The following questions address manure application activities in sensitive areas.

2.3 Have you identified and located all sensitive features adjacent to or within your land application acreage?

☐ Yes ☐ No

2.4 Are all manure applications further than 25 feet from lakes, streams, intermittent streams, wetlands (10+ acres) and drainage ditches without berms?

☐ Yes ☐ No/NC

2.5 Within 300 feet of surface tile intakes is all manure application incorporated within 24 hours?

☐ Yes ☐ No/NC

2.6 Are all manure applications further than 50 feet from any well, mine, quarry, or sinkhole?

☐ Yes ☐ No/NC

What is a Sensitive Area?

Land within 300 feet of water where the natural drainage runs to a surface water feature is considered sensitive to water quality impacts. The water features include surface tile intakes, drainage ditches, creeks, streams, wetlands and lakes. If a berm protects the ditch, the sensitive feature becomes the side inlet to the ditch. Other sensitive features include: wells, mines, quarries, and sinkholes. There are BMPs for the following types of soils: coarse-textured soils, shallow soil over bedrock and frequently flooded soils

All people applying manure, including those who do not need a permit or written manure management plan, are required to follow setbacks and other rules regarding sensitive areas.

Do you want more information about surface waters requiring 25-foot setback?

To find out more about identifying and protecting sensitive areas, contact your county University of Minnesota Extension Service, USDA Natural Resources Conservation Service, soil and water conservation district, planning and zoning office, county environmental services office, or your nearest regional office of the Minnesota Pollution Control Agency.

2.7 In winter, is all manure applied further than 300 feet away from a sensitive area? *See glossary for Winter Application.* (Frozen or snow-covered ground is considered winter)

☐ Yes ☐ No/NC

Since manure application within 300 feet of a sensitive feature requires incorporation within 24 hours, plan ahead. When possible, apply manure in setback areas right after harvest to allow for incorporation before freeze-up.

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

Nutrient Management to Protect Water Quality

Know your land.

BMP – Know how to determine your land's realistic cropping potential.

BMP – Test your soils.

BMP – Identify features in your acreage sensitive to water quality impacts.

Know what nutrients you are putting on your land.

BMP – Know the nutrient content of your manure.

BMP – Calibrate your manure spreader.

Know what your nutrient sources are.

BMP – Know how to determine your non-legume crops total nitrogen needs.

BMP – Know how to determine credits from previous legume crops.

BMP – Know how to determine available nutrients from your manure applications.

BMP – **Know** the University of Minnesota Extension Service nutrient recommendations for crop production.

The following questions are about Nutrient Management.

2.8 Do you follow the basic nutrient management guidelines? See the above guidelines "Nutrient Management to Protect Water Quality".

☐ Yes ☐ No

The size of a livestock operation determines specific manure management plan requirements.

2.9 Do you know the University of Minnesota Extension Service nitrogen recommendations?

☐ Yes ☐ No

See Appendix #6 to see Who Needs a Manure Management Plan (MMP). The appendix includes the basics of the University's nitrogen recommendations.

2.10 If you are required to have a current Manure Management Plan, do you have one?

☐ Yes ☐ No/NC

If you were **ever** required to have a Manure Management Plan, possibly as part of an Interim Permit, you are required to keep the Manure Management Plan current.

The specific items required in a manure management plan are listed in Minn. R. ch. 7020.2225, subp. 4 and the MPCA publication "Manure Management Plan Requirements." **The types of required information include:**

- Manure storage and application methods
- Field locations and acreage
- Amount of manure to be applied to each field
- Manure-nutrient testing plans
- Soil-nutrient testing plans
- Crop-nutrient needs and/or expected nutrient removal
- Protective measures when applying in environmentally sensitive areas
- Protective measures when applying during winter months

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

The following questions are about manure handling.

2.11 Are all manure spills on a public roadway promptly cleaned up?

☐ Yes ☐ No/NC

2.12 Do you have an emergency response plan to use when you have a manure spill?

☐ Yes/BMP ☐ No

An Emergency Response Plan is <u>required</u> of all the large CAFO sites. At any size site accidents happen and mechanical failures happen, so be prepared. It is far easier to have a plan and put it into use when the spill happens than to be standing there watching the manure head for the tile intake wondering what to do!

- Carry a shovel – you can dig a quick trench or berm.
- Stop and contain the spill.
- Phone numbers – who do you need to call first?
- Call the State Duty Officer at 1-800-422-0798.
- Call your regional MPCA office.
- Get it cleaned up.

Remember to use the <u>Response Form</u> to enter your plans for any NC issues from the previous section.

If your Facility is smaller than 100 AU, ➡➡➡Go now to Part 3, "Farmstead Management."

If your facility has more than 100 AU Continue:

2.13 Do you have any manure storage structure or stockpile that stores manure of 100 AU or more animals?

☐ Yes ☐ No

2.14 Do you get that manure tested at least once every four years?

☐ Yes ☐ No/NC

If manure from 100 AU or more is stored in a single liquid manure storage area or stockpile, you are required to get a manure analysis for nitrogen (N) and phosphorus (P) at least once every 4 years.

2.15 Do you soil test?

☐ Yes/BMP ☐ No

2.16 If your manure stockpile or storage structure holds the manure of less that 100 AU, do you test the manure?

☐ Yes/BMP ☐ No

2.17 Do you keep records of your manure applications?

☐ Yes ☐ No/NC

Go to Appendix #7 to see contact information for MPCA feedlot staff or call 1-800-657-3864 and ask for the FERP contact folks.

Minimum record keeping requirements for feedlots with 100 AU and larger are as follows:

- Manure nutrient test results,
- Field location (where manure is applied),
- Method and rate of manure application,
- Dates of manure application,
- Available nitrogen from manure and fertilizer.

Additional record keeping is required for 300 or more AU feedlots.

Remember to use the <u>Response Form</u> to enter your plans for any NC issues from the previous section.

If your Facility is smaller than 300 AU, Go now to Part 3, "Farmstead Management"

If your facility is 300 AU or larger Continue:

2.18 Do you get soil phosphorus (Bray P1 or Olsen), testing done at least once every 4 years on all fields where manure is applied?

☐ Yes ☐ No/NC

2.19 Do you have a permit or approved phosphorus management strategy prior to applying manure to fields with high soil phosphorus levels (exceeding 60 Olsen or 75 Bray P1) within 300 feet of surface water?

☐ Yes ☐ No/NC

2.20 If you apply manure to fields with extremely high soil phosphorus levels (exceeding 120 Olsen or 150 Bray P1), do you have a permit?

☐ Yes ☐ No/NC

2.21 Are you testing the manure in all newly constructed manure storage structures each year for the first 3 years of operation?

☐ Yes ☐ No/NC

2.22 Is the manure test of all manure storage structures current within four years?

☐ Yes ☐ No/NC

2.23 Do you keep records of your manure applications and manure management information for at least 3 years?

☐ Yes ☐ No/NC

2.24 Do you keep records of your manure applications and manure management information for 6 years for fields adjacent to sensitive features?

☐ Yes ☐ No/NC

Soils with high testing phosphorus levels near surface waters can have a negative impact on water quality. Excessive soil phosphorus levels (exceeding 60 Olsen or 75 Bray P1) within 300 feet of surface waters require additional management. The rate and frequency of manure applications must not allow soil phosphorus build-up over any six year period. Single year applications can be based on nitrogen needs if excess phosphorous is removed by subsequent crops before reapplying.

Obtain a representative manure sample from an LMSA, after the LMSA has been well agitated. For solid manure, or daily haul, or the LMSA, mix together a number of small samples to make one composite sample. Contact your extension agent or forage laboratory for a sampling kit.

Minimum record keeping requirements for feedlots with 300 AU and larger are as follows:

- Manure nutrient test results,
- Field location (where manure is applied),
- Rate of manure application,
- Dates of manure application,
- Available nutrients from manure and fertilizer, and
- Soil test results.

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

Continue to page 19 to complete the Self-Assessment Part 3 – Farmstead Management.

Notes:

Self- Assessment Part 3: Farmstead Management

Your farmstead is a combination of your home and your business. The following set of questions address topics drawn from the regulatory programs of the Minnesota departments of Agriculture, Health, Natural Resources and the Pollution Control Agency. Topics include:

- Solid Waste
- Hazardous Waste
- Household Septic System
- Drinking Water Well
- Pesticide Use
- Certified Animal Waste Technician Licensing

In addition to regulatory details, the questions include suggestions focused on reusing materials, reducing waste and recycling waste.

3.1 Is all trash created at the farmstead handled through recycling and/or solid waste pick-up?

☐ Yes ☐ No

See list of counties that prohibit burning of household and general solid waste:

3.2 Do you dispose of plastics without burning them?

☐ Yes ☐ No/NC

3.3 Do you recycle plastics?

☐ Yes ☐ No

3.4 Do you get rid of treated wood without burning it?

☐ Yes ☐ No/NC

3.5 Do you get rid of old tires without burning them?

☐ Yes ☐ No/NC

Solid Waste Management

If regularly scheduled pick-up of solid waste is reasonably available at your location, burning and burying of solid waste material may not be allowed.

As of 2006, the following counties prohibit burning of household and general solid waste:

❖ Aitkin	❖ Houston	❖ Red Lake
❖ Beltrami	❖ Hubbard	❖ Scott
❖ Carver	❖ Itasca	❖ Sherburne
❖ Cass	❖ Lake	❖ St. Louis
❖ Chisago	❖ Mille Lacs	❖ Stearns
❖ Clearwater	❖ Otter Tail	❖ Swift
❖ Cottonwood	❖ Polk	❖ Wabasha
❖ Crow Wing	❖ Pope/Douglas	❖ Washington
❖ Hennepin	❖ Ramsey	❖ Wright

If you don't see your county listed, check with your Planning & Zoning or Environmental Services office. Additional counties my have banned the practice since 2006. A statewide ban is anticipated.

Throughout Minnesota, there are prohibitions on the burning of tires, treated wood and plastics which enforced by DNR conservation officers and local law enforcement. In addition to contributing to nearly 50% of the wildfires in MN annually, burning solid waste on-site creates significant pollution and health risks for people around the burn site as well as the community at large.

Our garbage has changed significantly in the past 50-plus years, so much of it is hazardous when burned, particularly plastics used for bags or wrap. Even seemingly harmless things like paper and cardboard can create dioxins and other toxins that build up in our bodies as we take in food, water, and air.

Burning approved brush and wood waste with proper permits is acceptable. To learn more about local disposal options in your area, contact your county solid waste office or go to

www.pca.state.mn.us/oea/lc/county.cfm

3.6 Do you take unused paints, thinners, stains and solvents to an approved disposal site?

☐ Yes/BMP ☐ No

3.7 Do you dispose of all used antifreeze at an approved disposal site?

☐ Yes/BMP ☐ No

Where do I find an approved disposal site for hazardous wastes?
Contact your county Environmental Services or Planning & Zoning office or look it up online at: www.pca.state.mn.us/waste/hhw/hhw-localprograms.html

3.8 Do you dispose of all used oil by one of three approved methods

- Burn on-site using a heater designed to burn used oil;
- Reuse on-site as non-motor lubrication; or
- Recycle by taking it to a used oil collection site?

☐ Yes/BMP ☐ No

3.9 Do you take old batteries to an approved disposal site?

☐ Yes/BMP ☐ No

3.10 Do you keep all high-intensity discharge (HID) lamps out of the trash by recycling?

☐ Yes ☐ No/NC

It is prohibited to dispose of HID lamps in the trash. HID lamps, including fluorescent lamps, contain mercury. HID includes mercury-vapor, sodium-vapor and metal-halide lamps. If recycling isn't available for your area yet, store the used HID bulbs on-site. Watch for new recycling opportunities.

3.11 Are all your wells cased above flood-level and properly grouted and capped?

☐ Yes ☐ No/NC

Wells
Find more information on well requirements on the MN Department of Health web page www.health.state.mn.us/divs/eh/wells/, particularly the Well Owner's Handbook at www.health.state.mn.us/divs/eh/wells/construction/handbook.pdf

3.12 Are your wells located upslope of or protected from pollutant sources upslope?

☐ Yes ☐ No/NC

Note: Cross-contamination of drinking water supplies is a real concern to you and your neighbors. You can use bibbs (valves) on hose ends or install Atmospheric Vacuum Breakers (AVB) or Pressure Vacuum Breakers (PVB). This protection is not the same as the check-valve on your well. Vacuum breakers prevent backflow to the water supply by venting water onto the ground when backflow conditions exist. They cost approximately $5-$10.

3.13 Have you installed anti-backflow devices on all faucets with hose connections?

☐ Yes ☐ No/NC

3.14 Are all unused wells properly sealed, abandoned and documented?

☐ Yes ☐ No/NC

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

3.15 Is the system completely disconnected from any pipe discharge or agricultural drainage system?

☐ Yes ☐ No/NC

3.16 Have you replaced open bottom or cracked tanks or corrected any systems which allow sewage to surface (discharge above ground) or back up into the dwelling?

☐ Yes ☐ No/NC

3.17 Is the system a drainfield in well drained (i.e., dry) soil or a mound system?

☐ Yes ☐ No/NC

Septic Systems

Septic Systems which are not properly treating wastewater are significant contributors of disease-causing bacteria in Minnesota's surface and ground waters.

To answer these questions, examine your records and walk around your yard to look for surface outlets, sewage seeping to the surface, or changes in vegetation indicating wet soils, such as excessive growth, dead spots, or wetland vegetation like cattails.

If your system is emptying straight to a tile line or is otherwise releasing raw sewage onto the ground this is an Imminent Threat to Public Health and must be corrected within ten months of being identified.

During system pumping you may ask your tank pumper for a general assessment of your system. Note that if an official compliance inspection is conducted by a licensed inspector – public or private – the results will be sent to your local regulating authority.

3.18 If the system doesn't display the issues in the preceding 3 questions, was the system installed after 1980?

☐ Yes ☐ No/NC*****

** most likely non-compliant, dependent on past local regulation*

BMP - Regular pumping and evaluation by a Registered ISTS Professional protect your drainfield and are recommended.

- You must maintain records of design, installation date, and maintenance (pumping, etc.).
- Contact an ISTS designer and ask for suggestions on upgrades and costs. Note that if an inspection occurs as part of the service, you could end up on an enforceable timeline for completing upgrades.

Information on ISTS Professionals is at www.pca.state.mn.us/programs/ists/registration.html.

Information on financial assistance is available at www.pca.state.mn.us/programs/ists/financial-assistance.html.

3.19 Do you hire a licensed pesticide applicator for all applications of restricted-use pesticides?

☐ Yes ☐ No

3.20 Do you keep records of all restricted-use pesticide applications?

☐ Yes ☐ No/NC

Find more information on managing pesticides, waste pesticides and empty pesticide containers at www.mda.state.mn.us/appd/bmps/waste.htm

3.21 Do you store restricted-use pesticides in their original containers?

☐ Yes ☐ No/NC

3.22 Do you triple-wash and recycle pesticide containers OR use the disposal process on the label?

☐ Yes ☐ No/NC

3.23 Do you have any underground fuel tanks greater than 1100 gallons in size?

☐ Yes ☐ No If no, skip question 3.24.

3.24 If yes, are they coated and monitored?

☐ Yes ☐ No/NC

3.25 Are you able to store used ag-bags on your property for periodic transport to a collection center?

☐ Yes ☐ No

Fuel Tanks

On-farm underground fuel tanks are regulated if greater than 1100 gallons storage capacity; smaller underground fuel tanks are exempt. Underground tanks storing any other material are not exempt. Underground refers to tanks with 10% or more of the tank below grade. On-farm aboveground tanks are exempt from MPCA requirements. For further information go to www.pca.state.mn.us/programs/tanks_p.html

Ag Plastic Management

As you know, the use of polyethylene wrap for hay, silage, and general grain storage is soaring. To avoid disposal through burning or land-filling, MPCA will be piloting Ag-Bag Collection programs in Benton, Stearns and possibly one other county in 2008. If pilot efforts are successful, MPCA would like to work with partners to develop a wider collection network and greater re-processing capacity in areas of the state where livestock operations are concentrated.

Contact: Wayne Gjerde
1-800-657-3864

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

3.26 Do you haul and land-apply manure for hire?

☐ Yes ☐ No

3.27 If yes to question 3.26, do you have a commercial animal waste technician license?

☐ Yes ☐ No/NC

Minnesota law requires Commercial Animal Waste Technicians (CAWT) to obtain a state license. If you apply or manage manure on a for-hire basis, you must be licensed. There are two categories, solid and liquid. An open-book exam is required as part of the license application.

www.mda.state.mn.us/licensing/pestfert/cawt.htm

3.28 Do you know that a pathogen control program includes BMPs reducing pathogens at three points in the manure management cycle?

☐ Yes ☐ No

The three points in a manure management cycle where you can reduce pathogens are 1) in the animal, 2) during manure collection and storage, and 3) during land application. MES 08544. 2007

3.29 Do you know where to go to find out if a watershed study is in progress for your home watershed?

☐ Yes ☐ No

Contact your county Planning & Zoning office or Environmental Services office or go to:

www.pca.state.mn.us/water/tmdl/tmdl-projects.html

Remember to use the Response Form to enter your plans for any NC issues from the previous section.

Congratulations!

You have completed the Self-Assessment.

- *Copy your answers over to the enclosed Response Form.*
- *Remember to fill in the Return to Compliance information.*
- *Read the Certification Statement and sign your name.*
- *Mail your completed forms back to the MPCA in the enclosed stamped and addressed envelope.*
- *Request additional information as needed.*

For the Pilot Project:

- Update your responses to last year's self-assessment and certification to track accomplishments.
- Results from this two-year pilot project will be mailed to you as soon as the project is completed.
- The target for project completion is late fall 2008.

Notes:

1. Overview of Size-Specific Feedlot Regulations

Registration Requirements:

Registration is who you are, where are you located, verification of Shoreland status, verification of type of production and manure storage. All livestock facilities within Minnesota are to maintain their registration current within a four year period. In delegated counties the county feedlot officer maintains the registrations. In non-delegated counties the MPCA maintains the registration.

- If any of the site is within Shoreland, registration is required at a size of 10 AU and larger.
- If none of the site is within Shoreland, registration is required at 50 AU and larger.

Permit Requirements:

There are three types of permits used in Minnesota. Counties are allowed to set permit fees for the Interim and Construction Short-form permits. The state levies a permit fee on the NPDES/SDS permit. If a site is required to have just the SDS part of the state permit, the permit fee is waived. The state permit fees are set by the legislature.

The Interim Permit:

- This permit is used to document correction of a pollution hazard.
- This permit can be issued to any size facility not required to use the NPDES/SDS permit described below.
- This permit can be used where construction/expansion is planned if a pollution hazard needs to be corrected. The pollution hazard must be corrected prior to expansion actually occurring.
- This permit expires after 24 months. It can be issued for a shorter time period. It can be extended for an additional 90 days. Once this permit expires, the facility returns to operating as a registered facility if it is large enough to require registration.

The Construction Short-form Permit (CSF):

- This permit is used to document construction/expansion activities at livestock facilities that do not also need to correct a pollution hazard.
- This permit is issued to sites that will be 300 AU or more post-construction. This permit is required if the animals are housed at the site or if the site is constructed to store manure of at least 300 AU of animals.
- This permit expires after 24 months. It can be issued for a shorter time period. It can be extended for an additional 24 months. Once this permit expires, the facility returns to operating as a registered facility.

The National Pollutant Discharge Elimination System/State Disposal System Permit (NPDES/SDS):

- The U. S. Environmental Protection Agency (EPA) set size thresholds. The NPDES Permit is required for large confined animal feeding operations (CAFO). The size where the permit is required depends on the livestock species:

• 10,000 swine < 55 pounds	• 1000 cattle or cow/calf pairs
• 2,500 swine > 55 pounds	• 700 mature milking cows
• 10,000 sheep or lambs	• 1000 head veal calves
• 55,000 turkeys	• 500 horses
• 30,000 laying hens or broilers on a liquid manure handling system	• 30,000 ducks on other than a liquid manure handling system
• 125,000 chickens other than laying hens on other than a liquid manure handling system	• 5,000 ducks on a liquid manure handling system
• 82,000 laying hens on other than a liquid manure handling system	

- The State of Minnesota requires the NPDES/SDS permit where the total animals on a site meet a cumulative total of 1000 AU.
- Smaller facilities will be required to operate under a NPDES/SDS permit if they meet specific definitions or are legally designated a CAFO.

Options for Correcting Open Lot Runoff:

- Some options for correction are not appropriate if the facility may expand to 300+ AU.
- Any site considering expansion to or beyond 300 AU is strongly advised to get technical assistance prior to deciding on corrective measures.

Manure Management Plan Requirements:

- All size facilities are required to meet application rate restrictions and setbacks from waters.
- A Manure Management Plan (MMP) is required for facilities 100 AU and larger if the facility is covered by an Interim Permit.
- All facilities ever required to have a MMP as part of an Interim Permit, are required to maintain the MMP.
- All livestock facilities of 300+ AU are required to have and maintain a Manure Management Plan as of January 1, 2006.
- Livestock facilities of 300+ AU where all manure is applied by a certified commercial application or a certified private manure applicator are NOT required to have a MMP unless they previously were required to have a MMP through permit issuance.
- For information about nutrient plan requirements contact your county, University of Minnesota Extension Service, USDA Natural Resources Conservation Service, soil and water conservation district, or your nearest regional office of the Minnesota Pollution Control Agency.

Manure Management Plan Record-Keeping Requirements:

- Records of manure applications outside of Sensitive Areas are to be kept for three years.
- Records of manure application within Sensitive Areas are to be kept for six years.

Size-Specific Record-Keeping Requirements

- 100 AU +
  - The amount of manure or process wastewater applied.
  - The information needed to credit the nitrogen available for crop growth as supplied by the land application of both manure and process wastewater.
  - Manure and process wastewater test results for nitrogen and phosphorus content.
    - Retest manure every four years.
    - If changes in manure storage and handling systems change in livestock type or livestock feed OR if climatic conditions are unusual, more frequent manure testing may be required.
    - A laboratory certified by the Minnesota Department of Agriculture must be used.
    - Use University of Minnesota recommendations to assure manure sample is representative of manure production.
  - If manure application from a 100 AU + facility is to be applied within a drinking water supply-management area where the aquifer is designated as "vulnerable", the record-keeping must be done to the same level as for a 300 AU + facility.
- 300 AU +
  - Field locations and cropland acreage where manure is applied.
  - Volume or tonnage of manure applied on a field-by-field basis.
  - Manure and process wastewater test results for nitrogen and phosphorus content.
    - All requirements listed for 100 AU + facilities, and
    - For new manure storage areas capable of storing manure from 300 or more AU, test the new system each year for the first three years.
  - Dates of application.
  - Dates of incorporation when incorporating within ten days.
  - Expected plant-available nitrogen and phosphorus from manure and commercial fertilizer.
  - Soil test results.
  - Justification of changes to Manure Management Plan.

2. Water Quality Standards

7050.0215, Subp. 2. A.: Any person discharging pollutants to surface waters of the state from an animal feedlot or manure storage area who is not regulated by federal requirements under part 7050.0212, subpart 1, shall comply with the following limitations after allowance for pollutant removal by treatment works:

5-day biochemical oxygen demand	25 milligrams per liter (arithmetic mean of all samples taken during any calendar month).

If the discharge is directly to or affects a lake or reservoir, the person discharging the pollutants shall comply with the nutrient control requirements of 7050.0211, Subp. 1:

Total phosphorus	1 milligram per liter (arithmetic mean of all samples taken during any calendar month).

These effluent limitations are not applicable whenever rainfall events, either chronic or catastrophic, cause an overflow from an animal feedlot or manure storage area designed, constructed and operated: 1) to meet the effluent limitations for rainfall events less than or equal to a 25-year, 24-hour rainfall event for that location; or 2) to collect and contain runoff from a 25-year, 24-hour rainfall event for that location.

3. Vegetative Treatment Area

This table provides an approximation of the types of buffers needed to achieve compliance. Actual compliance will be affected by feedlot size and other management factors.

For an official determination of compliance it is necessary to get a trained technician to visit your site. Your county Soil and Water Conservation District (SWCD) staff may be able to assist you. In addition, you can call your regional MPCA office for more information.

	Dense grasses	Pasture or row crop
Flat – less than 2% (1 foot rise in 50 foot run)	350 feet	700 feet
Slight slope – between 1 foot rise in 50 foot run and 1 foot rise in 20 foot run)	500 feet	1000 feet

4. Milkhouse Waste Options

Four wastewater treatment systems were studied by the University of Minnesota Bioproducts and Biosystems Engineering Department. They were:

- ***Bark Beds***: A large soil infiltration area covered by wood or bark shreds,
- ***Aerobic Treatment Units*** (ATUs) followed by a subsoil infiltration area,
- ***Recirculating Media Filters*** (RMFs) followed by a subsoil infiltration area
- ***Daily surface irrigation*** to pasture or cropland.

Other options available to dairy producers but not studied include chemical flocculation with the treated effluent discharged into a soil infiltration area (drainfield), constructed wetlands and vegetative filter areas using a dosing system. Commercial chemical flocculation systems are available and have been installed in Wisconsin, Minnesota, Canada and elsewhere with success. Constructed wetlands have been used in Wisconsin with limited success. Dosing systems have been used in other states for feedlot runoff treatment but not for milkhouse wastewater treatment.

Onsite sewage treatment systems have been used to treat milkhouse wastes. However, these systems are not designed to handle the waste strength of milkhouse waste and failure results. Other more successful means of handling milkhouse wastes include adding the wastes to the barn's gutter system or adding the wastes to a liquid manure storage structure.

Table 1. Milk house wastewater characteristics. Reported ranges are average values on the various farms involved in the project.

	First tank effluent - mg/L	Design - mg/L
BOD_5	500-2600	1200
TS	200-1000	450
Fats, Oils, & Grease	90-500	225
Total Nitrogen	30-100	65
Total Phosphorus	20-100	55
pH	6.2-8.0	7.5
Temperature	53-70	-

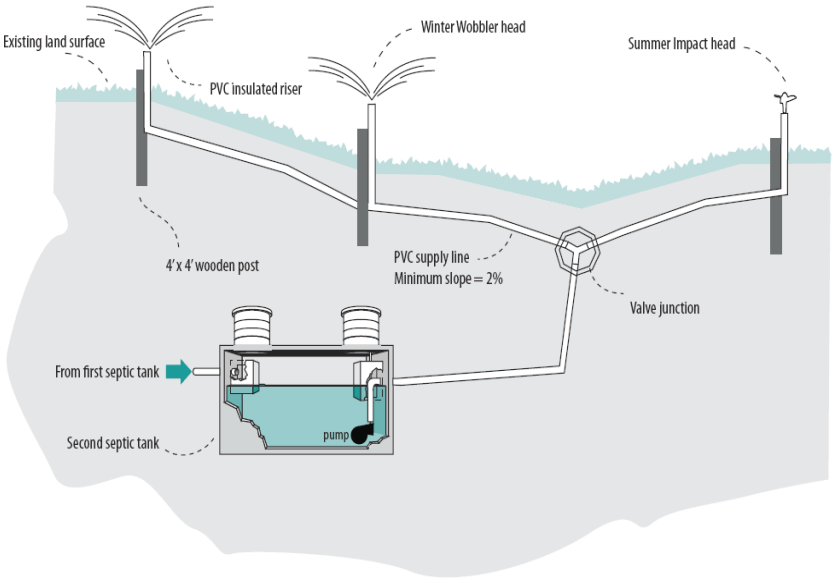
Raw milk has a BOD5 concentration of approximately 100,000 mg/L (Wright and Graves, 1998). This is about 100 times greater than the septic tank effluent concentrations measured in this study. Cleaning of the bulk tank, pipeline, and milking equipment result in approximately 2-3 gallons of milk entering the wastewater system each day. Additional contributions of raw milk from treated cows or colostrum from fresh cows will quickly overwhelm any milk house waste treatment system. As such, this waste milk must be disposed of by other means such as feeding it to other farm animals or applying it to cropland.

Bark Bed

A Bark Bed is a soil infiltration area covered with bark or wood shreds. Prior to treatment in this infiltration area, the wastewater flows through a series of one or more septic tanks where some grit, dirt, and other solids, organic material, and milk fat are removed. The last septic tank has an effluent filter to prevent large particles from exiting the septic tanks and getting into the bark bed. Effluent from the septic tanks is pumped daily or more frequently to a large soil infiltration area and distributed evenly through a pressure distribution system. Distribution pipes, typically 1.5 to 2-inch PVC pipes with small drain holes, are used to distribute the wastewater over the entire infiltration area. The PVC pipes lay either on a bed of gravel or are hung in plastic chambers used commonly in septic system drainfields. Distribution pipes are spaced at 10-foot intervals and can be up to 220 feet long. The entire infiltration area is then covered with 18 to 24 inches of bark or wood shreds which protects the area from freezing, enhances oxygen transfer to the soil, and aids in the wicking and evaporation of moisture from the system.

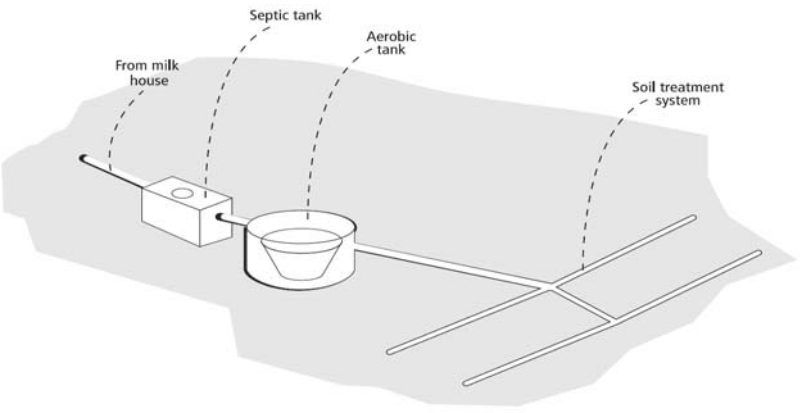
Surface Irrigation System

Surface irrigation systems are used to distribute milk house wastewater at agronomic rates to large areas with minimum erosion potential. The areas can be flat soil areas with minimal ground cover (e.g. cropland) or well vegetated areas with up to 15% slopes (e.g. pasture). Components of the irrigation system include one or more primary septic tanks, a dosing tank, pump, piping, and irrigation heads. The irrigation system is designed to land apply the milk house wastewater daily throughout the year with special frost proof irrigation heads used during cold weather. Two or more operating zones are used to allow the areas to dry during times when the area is being grazed or crops harvested. Often the zones are divided by winter and summer operation. More zones provide additional flexibility in irrigation management.



Sizing of the irrigation area is a function of the nutrient content of the wastewater (nitrogen and phosphorus produced per year), the crop grown in the application area and the erosion potential of the application area. If the area has a slope less than 15% and is covered by vegetation, the application rate is a function of nitrogen. If there is potential for soil erosion, the application area is determined by crop phosphorus uptake by the growing plants.

Aerobic Treatment Unit (ATU)



ATU systems are used to provide additional treatment after a septic tank and distribute milk house wastewater into a soil infiltration area, typically a drainfield trench similar to what is used with household septic systems. The ATU reduces the organic material concentration to levels similar to household wastewater which the soil can treat over the long term. If milk house wastewater is directly discharged to a drainfield trench system without treatment the organic material and milk fat in the waste will quickly plug up the soil and restrict infiltration.

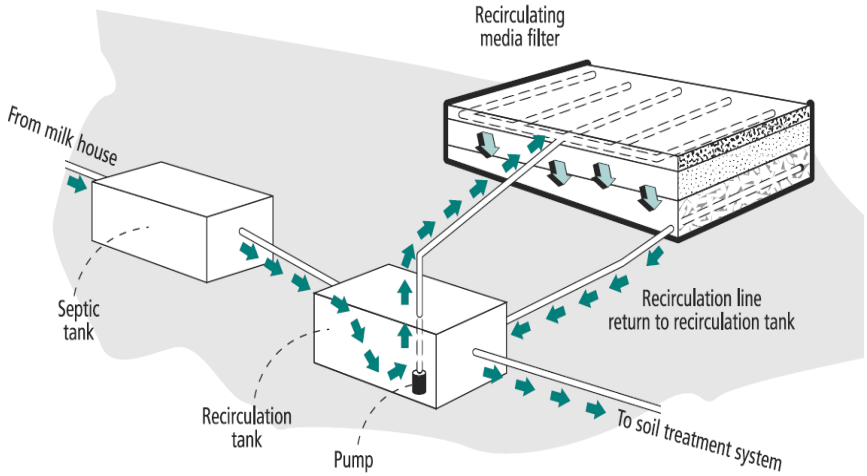
Typically two septic tanks in a series are used to reach a 3-6 day hydraulic retention time. These tanks allow lime and other heavy materials to settle out and lighter materials to float. Naturally-occurring anaerobic bacteria begin to breakdown the organic material in the wastewater. The septic tanks are a critical component of the overall process but this effluent needs additional treatment before being distributed to a soil infiltration area.

Recirculating Media Filter (RMF)

RMF systems are used to provide additional treatment after a septic tank and distribute milk house wastewater into a soil infiltration area, typically a drainfield trench similar to what is used with household septic systems. The RMF reduces the organic material concentration to levels similar to household wastewater which the soil can treat over the long term. If milk house wastewater is directly discharged to a drainfield trench system without treatment the organic material and milk fat in the waste will quickly plug up the soil and restrict infiltration.

Typically two septic tanks in series are used to reach a 3-6 day hydraulic retention time. These tanks allow lime and other heavy materials to settle out and lighter materials to float. Naturally occurring anaerobic bacteria begin to breakdown the organic material in the wastewater. The septic tanks are a critical component of the overall process but this effluent needs additional treatment. A screen or filter on the exit of the septic tank prevents large particles from plugging the media filter.

For more information regarding milkhouse waste treatment systems go to
www.manure.umn.edu/applied/milkhouse_waste.html#Publications



5. LMSA Determination and Certification for Continued Use

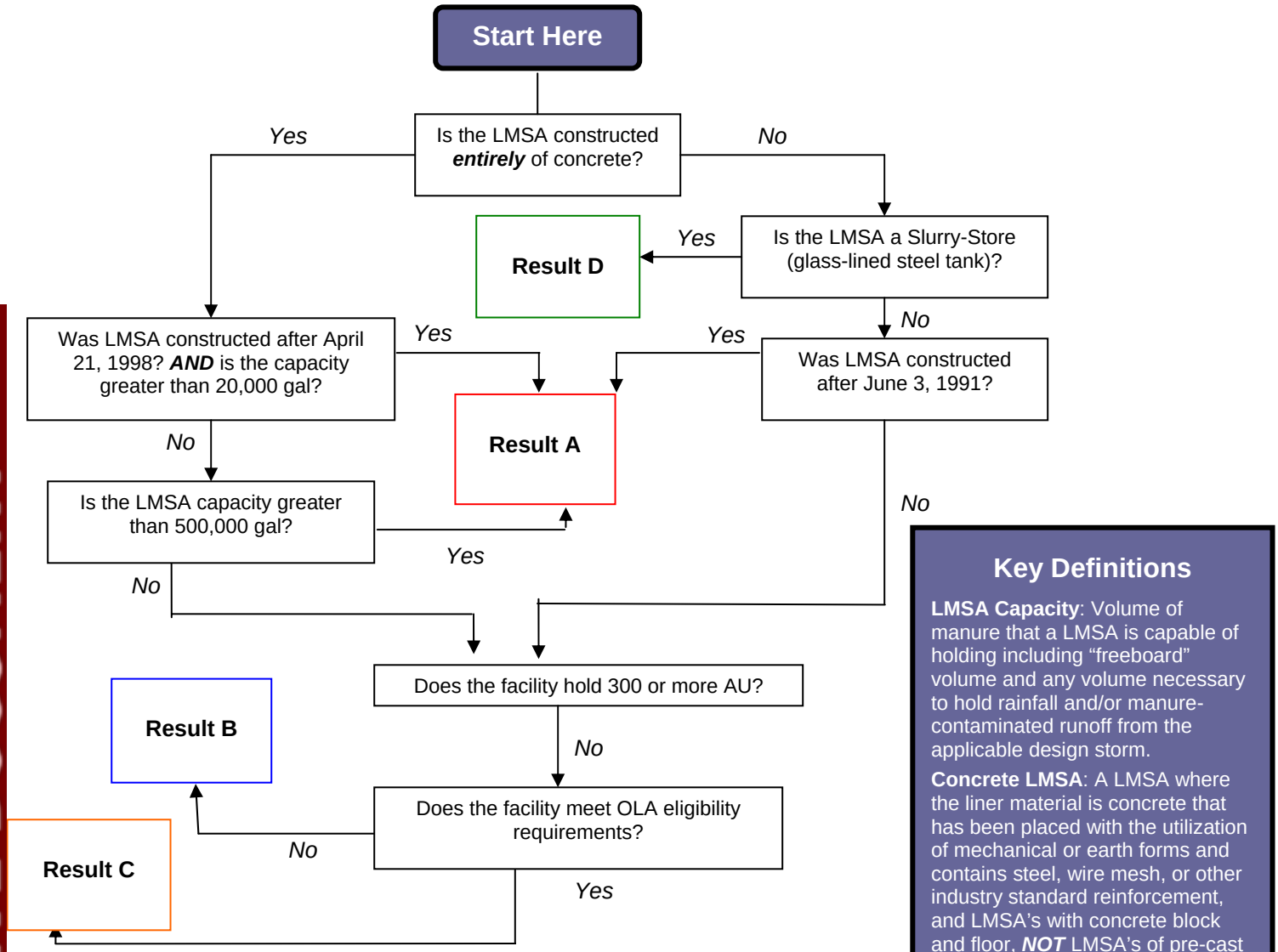
LMSA (Liquid Manure Storage Areas) are used to store liquid manure and to contain runoff from open lots. In earlier years of the state's Feedlot Program, many LMSA were constructed without proper approval. The agency has developed a system to review the unapproved structures and identified means of certifying them. If no longer in use, abandoned LMSA need to be closed. The agency has developed criteria to assure proper closure is achieved.

Uncertified LMSA constructed before June 3, 1991 and having a capacity of greater than 300 AU require immediate action to certify, close or reconstruct the LMSA. Please contact the closest MPCA office. Staff will assist you in establishing a timeframe for completing required activities.

For uncertified LMSA where the facility capacity is fewer than 300 AU, certification, closure or reconstruction activities are to be completed by October 1, 2010.

On the next page you will find an "answer-tree" which was constructed to determine what action is required to gain certification for your LMSA. You will finish with Result A, Result B, Result C, or Result D. Each result has a list of available options.

Go to the **START HERE** spot on the next page and answer each question as per your LMSA.



Key Definitions

LMSA Capacity: Volume of manure that a LMSA is capable of holding including "freeboard" volume and any volume necessary to hold rainfall and/or manure-contaminated runoff from the applicable design storm.

Concrete LMSA: A LMSA where the liner material is concrete that has been placed with the utilization of mechanical or earth forms and contains steel, wire mesh, or other industry standard reinforcement, and LMSA's with concrete block and floor, ***NOT*** LMSA's of pre-cast concrete panels or those using non-concrete liner material.

Slurry-Store: Any glass-lined steel tank.

If you ended with Result A, these are your options:
(Minn R. 7020.2110 subp. 1 A-E)
1. Reconstruction
2. Closure
3. Provide plans (prepared before construction) and construction report signed by engineer (if required)
4. NRCS manager certification if original NRCS plans are not available or on file.
5. Water balance.

If you ended with Result B, these are your options:
(Minn R. 7020.2110 subp. 1 A-E & subp. 2 B)
1. Reconstruction
2. Closure
3. Provide plans (prepared before construction) and construction report signed by engineer (if required)
4. NRCS manager certification if original NRCS plans are not available or on file.
5. Water balance
6. Soils investigation by professional

If you ended with Result C, these are your options:
(Minn R. 7020.2110 subp. 3)
1. Notify MPCA/CFO of intent to close or reconstruct by Oct. 1, 2010 (must complete closure or reconstruction by Oct. 1, 2010.)
2. Complete one of the items identified in *Result B – Options*.

If you ended with Result D: These are your options:
1. Complete one of the items identified in *Result A – Options*.
2. Manufacturer Certification that basin was constructed using applicable manufacturer construction standards and the LMSA is still in good working condition.

6. Who Needs a Manure Management Plan?

Manure Management Plans and Requirements

- All size facilities are required to meet application rate restrictions and setbacks from waters.
- Manure application records are required if facility is larger than 100 AU.
- A Manure Management Plan is required for facilities larger than 100 AU if the facility is covered by an Interim Permit.
- All livestock facilities of 300+ AU are required to have and maintain a Manure Management Plan as of January 1, 2006, *(except for feedlots which have all manure applied by a certified commercial applicator and which also have not been required to obtain a feedlot permit since October 2000).*
- Where manure management plans are required, these plans are to be updated annually.
- When hiring a company to do custom manure applications verify that they are licensed by the MN Department of Agriculture. www.mda.state.mn.us/lis/default.htm.
- Manure Management Plans and land application records are reviewed during a site inspection by County Feedlot Officers and MPCA staff.

The following steps are meant to be used as an introduction to Manure Management Planning. The examples below will demonstrate how to determine the total nitrogen needs for growing corn. The rotation is a first year corn field following a plow down of grass-legume hay. The soil is considered to have a medium productivity capability. Dairy manure was broadcast on the surface and was not incorporated until spring tillage that took place a month later.

1. Total nitrogen needs = 140 pounds/acre (See Table 2)
2. Subtract 1st year grass/legume hay credit of 75 pounds from the above 140 pound total. (See Table 3) (140-75 = 65 pounds nitrogen)
3. Subtract Starter fertilizer of 100 pounds of 9-23-30 = 9 pounds nitrogen (65 – 9 = 56 pounds)
4. Manure spreader was calibrated at an application rate of 25 tons/acre.
5. Manure was broadcast no incorporation. (See Table 1) Incorp. After 4 days = 20% available the first year.
6. A book value nutrient analysis for Dairy Cows was used. (See Table 7) = 10 pounds of nitrogen per ton of manure.
7. 25 tons/acre of manure x 10 pounds of nitrogen/ton of manure = 250 total pounds of nitrogen.
8. 250 pounds x 20% (broadcast no incorporation) = 50 pounds nitrogen.
9. Subtract the 50 pounds of nitrogen available from the manure application. (56 pounds- 50 pounds = 6 pounds)

More information is available at www.extension.umn.edu/distribution/cropsystems/DC3553.html or request "Manure Management in Minnesota" using the request form in the Response form.

The following Nutrient Management tables were copied from the document "Mini – MMP"
Use the form enclosed in the workbook to request a full copy of a "Mini-MMP".

Table 1: 1st year N availability from manure (%)

	Incorporated after 4 days	Incorporated in ½ to 4 days	Incorporated within ½ day	Sweep inject	Knife inject
Beef	25	45	60	60	50
Dairy	20	40	55	55	50
Swine	35	55	75	80	70
Poultry	45	55	70	NA	NA

Table 2: Crop N needs with manure – before legume credit

	Medium or Low productivity soils	High Productivity soils
Corn	100-140	130-180
Alfalfa	0	0
Soybeans	0	0
Wheat	80-105	130-170
Grass-legume	60	60

Table 3: Legume N credits (for corn)

	Good quality	Average quality
1st year after alfalfa	150#	100#
2nd year after alfalfa	75#	50#
Soybeans	40#	40#
1st year grass/legume hay	75#	75#
2nd year grass/legume hay	0#	0#
1st year after red clover	75#	75#
2nd year after red clover	35#	35#

Table 7: Mid-range rough estimates of typical manure nutrient content.

(Use actual manure nutrient analyses whenever possible.**)**

Livestock Type		Liquid			Solid		
		N	P_2O_5	K_2O	N	P_2O_5	K_2O
		------ lb/1000 gal. ------			--------- lb./ton ---------		
Swine							
	Farrowing	15	12	11	14	6	4
	Nursery	25	19	22	13	8	4
	Gestation	25	25	24	9	7	5
	Finishing	58	44	40	16	9	5
Dairy							
	Cows	31	15	19	10	3	6
	Heifers	32	14	28	10	3	7
Beef	Cows	20	16	24	7	4	7
	Finishing Cattle	29	18	26	11	7	11
Poultry							
	Broilers	63	40	29	46	53	36
	Layers	57	52	33	34	51	26
	Tom Turkeys	53	40	29	40	50	30
	Hen Turkeys	60	38	32	40	50	30

Source: Manure Characteristics, MWPS-18 Section 1, Midwest Plan Service, 2004

7. Regional MPCA staff

Staff Names and Phone Numbers	Counties by Assigned Office
▪ **Brainerd Office-Based Staff** John Pokorney, 218-828-2668 Samantha Adams, 218-825-3055	Aitkin, Benton, Carlton, Cass, Cook, Crow Wing, Itasca, Kanabec, Koochiching, Lake, Mille Lacs, Morrison, Pine, St. Louis, Sherburne, Stearns, Todd, Wadena
▪ **Detroit Lakes Office-Based Staff** Mark Steuart, 218-846-7388 Andy Butzer, 218-846-0485 Mike Sharp, 218-846-0491	Becker. Beltrami, Clay, Clearwater, Douglas, Grant, Hubbard, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Otter Tail, Pennington, Polk, Pope, Red Lake, Roseau, Stevens, Traverse, Wilkin
▪ **Mankato Office-Based Staff** Kate Brigman, 507-389-1775 Wayne Cords, 507-389-3273	Blue Earth, Brown, Faribault, Le Sueur, Martin, Nicollet, Sibley, Waseca, Watonwan
▪ **Marshall Office-Based Staff** Brent Riess, 507-537-7166 Steve Howey, 507-537-6382 Vacant, 507-537-6383	Cottonwood, Jackson, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Rock
▪ **Willmar Office-Based Staff** Jerry Holien, 320-231-5398 George Schwint, 320-214-3793 Toby Sunderland, 320-214-3605	Big Stone, Chippewa, Kandiyohi, Lac Qui Parle, McLeod, Meeker, Renville, Swift, Yellow Medicine
▪ **Rochester Office-Based Staff** Chuck Peterson, 507-280-3591 Steve Schmidt, 507-280-2993	Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmstead, Rice, Steele, Wabasha, Winona
▪ **St. Paul Office-Based Staff** Courtney Ahlers, 651-296-7209	Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Washington, Wright

Updated April 2008

Call Toll-free 1-800-657-3864

Glossary

Animal Unit (AU) The animal unit is used to compare differences in production of animal manure accounting for differences in animal types.

Legume Credits. Legumes such as alfalfa, clover, soybeans, provide nitrogen to the next crop in the rotation. Additionally, some forage legumes provide nitrogen in the second year after the legume was grown. Consult UMES publication FO-3790-C. Revised 2006. Fertilizing Corn in Minnesota; and MPCA's Manure Nutrients – Short Plan.

Livestock Manure Sampling Obtain a manure sample from the LMSA after the LMSA has been well agitated. Mix together several samples to make a composite sample. Submit a sample from the composite. For solid manure or daily haul, take several small samples and mix them to create a composite. Submit a sample from the composite.

Milkhouse Wastewater The wastewater that contains milk, cleaning agents, or manure also has the potential to degrade water quality. It must be treated prior to allowing it to enter a road ditch, drainage ditch, grassed waterway, tile intake, lake, stream, river or wetland. On-site sewage treatment systems commonly called septic systems are sometimes used to treat milk house wastewater. The milk-fat and other solids commonly clog up the septic system and cause it to fail. In addition, many systems used this way were not designed for milkhouse wastewater strength or volumes. Consultation with an ISTS (Individual Sewage Treatment System) designer to ensure adequate system design is recommended. Pre-treatment is critical if a septic system is to be used. Regular maintenance is also needed.

Manure analysis The manure should be analyzed for nitrogen, phosphorus, and potassium. Consult UMES publication FO-6423-GO. 2000.

Method of manure application and nutrient availability The amount of nitrogen that will be available from manure applications depends upon how the manure was applied and when it was incorporated into the soil. See Table 1 in the nutrient management section of Appendix 6 or request the Mini- MMP publication.

Nutrient Recommendations for Crop Production Determinations of crop nutrient needs are based on published recommendations of the University of Minnesota Extension Service. Consult UMES publication FO-3790-C. Revised 2006. Fertilizing Corn in Minnesota.

Pasture Where vegetative cover is maintained while supporting active livestock grazing are not regulated with the state of Minnesota feedlot rules. A poorly-managed pasture area can become a feedlot if the vegetative growth is destroyed through overuse. Feedlot conditions develop where the accumulating manure and animal activity destroys the vegetation. The area around temporary supplemental feeders and watering devices are excluded.

Realistic Yield Goals The accepted procedure for determining yield goals is to take the most recent 5 years of yield records for each field, drop the lowest yield and average the remaining 4. Use your county average until this is possible.

Sensitive Areas The following is a list of some of the most commonly found sensitive areas: 1) Perennial and intermittent streams. Perennial streams flow continuously. Intermittent streams typically flow after storms or when snow melts; 2) Lakes and protected wetlands. Protected wetlands are typically more than 10 acres in rural areas; 3) Drainage ditches. Drainage ditches without earthen berms that prevent runoff from entering into a ditch; 4) Open tile intakes; 5) Wells. Wells include all active and inactive wells that have not been sealed in accordance with Minnesota Department of Health requirements; 6) Sinkholes; and 7) Mines and Quarries.

Shoreland Area In general, shoreland means land located within the following distances from public water: 1,000 feet from the ordinary high water level of a lake, pond or flowage; and 300 feet from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater.

Soil Tests	Field specific soil samples should not be older than 4 years. A composite sample obtained from numerous sampled sites within a field. The samples should be analyzed for phosphorus, potassium, pH, and organic matter.
Spreader Calibration	It is important to calibrate your broadcast spreader for both the net weight of the manure it holds and your typical application rate. Consult MPCA's Manure Nutrients – Short Plan.
Total Nitrogen Needs	State rules limit nitrogen rates on all fields where manure is applied. Estimated plant-available nitrogen from all sources may not exceed expected crop nitrogen needs for non-legumes and expected nitrogen removal for legumes. Consult UMES publication FO-3790-C. Revised 2006. Fertilizing Corn in Minnesota; and MPCA's Manure Nutrients – Short Plan.
25 Year – 24 Hour Precipitation Event	Generally, this will be for rainfall of 5 inches or more in a 24-hour period
UMES	University of Minnesota Extension Service
Waters of the State	"Waters of the State" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof. Tile intakes, rock inlet, or surface inlet, are an entry into "Waters of the State".
Wellhead Protection Area	The groundwater recharge area for a well that is a public source of drinking water. Check with the Minnesota Department of Health to find local wellhead protection areas and a person to contact by calling 651-201-4700 or at www.health.state.mn.us/divs/eh/water/swp/whp/index.htm. In addition, Minnesota Department of Agriculture's website also has an interactive map of wellhead protection areas at www.mda.state.mn.us/water/protection/mapping.htm.
Winter Application	Anytime the soil is snow covered and/or frozen.