Minnesota Pollution Control Agency

# Liquid Manure Storage Areas

Feedlot Program

Feedlot Rule Summary

February 2001

**Contents**

Site Restrictions…1
Storage Requirements…2
Liner Requirements…2
Plan Submittals…2
Notification…3
Inspection…3
Certifications…3
Operation/Maintenance….4
Permitting Notifications…4

MPCA Area Offices:
**Rochester area:**
507/285-7343
**Mankato area:**
507/389-5977
**Marshall area:**
507/537-7146
**Willmar area:**
320/214-3786
**Detroit Lakes area:**
218/847-1519
**Brainerd area:**
218/828-2492
**Duluth area:**
218/723-4660
**Metro area:**
651/296-6300
**Toll-Free Number:**
800/657-3864
**Feedlot Service Center:**
877/333-3508

The Minnesota Pollution Control Agency (MPCA) revised the rules for animal feedlots and the storage, handling, transportation and utilization of manure, Minn. Rules Chap. 7020. The revised rules became effective on October 23, 2000. Many of the MPCA guidelines that previously applied to the construction, operation and maintenance of liquid manure storage areas are now part of the revised rule.

## What is a liquid manure storage area?

A liquid manure storage area is any system used to store or process manure, manure-contaminated runoff, precipitation or other process wastewaters that are in liquid form and can not be stacked as a solid. Some common types of liquid manure storage areas include earthen-lined basins, geosynthetic-lined basins, concrete pits and slurry-stores.

However, there are other types of systems used to store or process liquid manure. The location, design, construction and operation requirements in the revised rules apply to all liquid manure storage areas.

## Site Restrictions

**Shoreland:** A new feedlot or manure storage area cannot be constructed within shoreland. For existing sites, a new liquid manure storage area may be constructed on the site as long as the total livestock capacity of the site does not exceed 1,000 animal units and the total manure storage capacity for the site is not for 1,000 animal units or more. The proposed liquid manure storage area may not encroach into the area located between the existing feedlot structures and the surface water, unless it is needed to correct a pollution hazard for a facility with less than 300 animal units.

**Floodplains:** A new feedlot or manure storage area cannot be constructed within a floodplain. Expansion to an existing facility located within a floodplain is prohibited, unless it is needed to correct a pollution hazard at a facility with less than 300 animal units.

**Private and public wells:** No new liquid manure storage area or expansion of an existing liquid manure storage area may be located within:

- 100 feet of a private well with at least 50 feet of watertight casing or that penetrates at least 10 feet of clay soil or shale
- 200 feet of a private uncased well
- 1,000 feet of a community water supply well

**Karst areas:** Owners proposing to construct a liquid manure storage area in southeastern Minnesota should refer to Minn. R. 7020.2100, subp. 2.

wq-f8-04
Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864
This material can be made available in alternative formats for people with disabilities.
Printed on recycled paper containing at least 20 percent fibers from paper recycled by consumers.

Owners should also refer to the fact sheet on Karst areas for restrictions based on proximity to sinkhole areas and depth to bedrock.

## Storage Requirements for Greater than 1,000 Animal Units

A new or modified liquid manure storage area for a feedlot facility with 1,000 animal units or more or a liquid manure storage area capable of holding the manure produced by 1,000 animal units or more must be designed to provide a minimum of **nine months** of storage capacity.

## Structures Unused for Three Years or More

An owner of a liquid manure storage area that has been unused for a period of three years or more needs to have a design engineer evaluate and prepare a report on the condition of the liner prior to using the area for storing manure.

The report must show that the liquid manure storage area as currently constructed will meet the technical requirements of Minn. R. ch. 7020 or contain the steps needed to bring the liquid manure storage area into compliance with the technical requirements. The report must be included with a permit application and submitted to the MPCA or delegated county for review.

## Liner Requirements

Any new or modified liquid manure storage area must have a liner. The design criteria for the liner is based on the type of material used and site considerations. These criteria are:

**Non-concrete liners:** This class of liner must be designed and constructed to achieve a maximum theoretical seepage rate of not more than 1/56 inch per day throughout the design life of the area. This classification includes earthen basins that typically use a compacted cohesive soil for the liner. Synthetic liners are also included in this classification.

**Concrete:** Concrete-lined storage areas must be designed and constructed with water stops or joint sealant at all construction joints; sealing of all cracks which may extend through the concrete liner with appropriate sealing materials; and a floor with a concrete thickness of at least five inches. The technical standards also contain reinforcement specifications. An example of this type of liner is a concrete pit located below a barn floor.

**Composite liners:** A composite liner is formed by using a combination of two or more liner types to form the liner for a single liquid manure storage area and is required for sites that are extremely susceptible to ground-water contamination. A composite-lined liquid manure storage area must be designed to achieve a maximum theoretical seepage rate of not more than 1/560 inch per day throughout the design life of the manure storage structure. Concrete, compacted cohesive soils and synthetic materials are commonly used to form a composite liner.

**Aboveground structures:** Aboveground storage areas located in the sensitive Karst areas of southeastern Minnesota are required to be designed to achieve a maximum theoretical seepage rate of not more than 1/560 inch per day throughout the design life of the manure storage structure. In non-sensitive areas aboveground structures may be designed for a seepage rate of not more then 1/56 inch per day.

## Penetration of Liners by Other Equipment

Piping and equipment used for the manure handling or transfer system that penetrates the liner of the liquid manure storage area must be identified in the plans and specifications for the structure. Include the size of the penetration and method used to seal the space between the equipment and liner material. Penetration of the liner by any other equipment not specifically used for the functioning of the liquid manure storage area is not allowed.

## Plan Submittals

The plans and specifications for the construction or modification of a liquid manure storage area must be submitted with the permit application or at least 90 days before the planned date of commencement of construction. The details of the plans and specifications must be in accordance with Minn. R. 7020.2100, subp. 4. Highlighted sections of the

subpart are provided below. Refer to the rule for all details to be submitted for each facility-specific plan.

1. The signature and registration number of the design engineer who prepared the design for the liquid manure storage area. (This is not required for concrete-lined structures that have a capacity of 20,000 gallons or less.)
2. A report on the results and interpretation of a site and soil investigation.
3. Manure storage areas proposed to be located in a Minnesota Department of Health-approved drinking water supply management area as delineated according to Minn. R. 4720 are to include the provisions of Minn. R. 7020.2100, subp. 4.B.
4. The volume/capacity of the liquid manure storage area and the amount of time it will take for the liquid manure storage area to fill to this volume.
5. Measures used to control water-table or saturated-soil conditions.
6. A quality-assurance and quality-control plan that includes specifications for inspections and ASTM testing methods and frequencies.
7. Specifications for protecting the liner material from damage due to drying and cracking before and after installation, manure agitation and pumping, freezing and thawing, hot and cold weather construction, erosion and other physical damage.
8. A plan for operation, periodic inspections and maintenance of the liquid manure storage area that includes routine inspections and record-keeping. It should document any damage to the liner, method used to repair liner damage, method used to monitor the liquid level in the structure on a regular basis and routine inspections of any perimeter tile outlets and manholes to ensure proper operation of the system.

## Notification Requirements

The owner of a proposed liquid manure storage area is required to notify the MPCA or delegated county of any modifications to approved plans that may affect the liner, structure location, depth or separation distance to bedrock before construction begins.

The owner is also required to notify the MPCA or delegated county and design engineer of intent to begin construction at least three business days before starting construction. Once the liquid manure storage area has been completed the owner is to notify the MPCA or delegated county within three business days following completion of construction. For a vertical concrete-lined walled liquid manure storage area, backfilling of the walls cannot be done until notification has been made to the MPCA or delegated county.

When making all notifications, the owner should provide the permit number (if applicable), facility owner's name, location of the site (by county, township, section and quarter section), the design engineer's name and the contractor's name.

## Inspection Requirements

The owner of a proposed liquid manure storage area needs to have inspections done during construction for all structures except concrete-lined structures with a capacity of 20,000 gallons or less. The inspector must be a professional engineer registered in the state of Minnesota, a person working under a professional engineer's direct supervision, or a qualified Natural Resources Conservation Service staff person. If the structure has a concrete liner the inspector may also be a person who is certified by the American Concrete Institute or Minnesota Department of Transportation in concrete field testing.

The inspector is to use a form provided by the MPCA to record observations related to conforming to the design plans and specifications and construction standards. The inspection form must show that the liquid manure storage area was indeed constructed per the plans and specifications and that all performance standards were met. Minn. R. 7020.2100, subp. 6 contains the information required in the Construction Inspection Form. The liner contractor must also certify on this form that construction was in accordance with the plans and specifications.

## Certifications

The contractor responsible for installation of the liner must certify on a form provided by the MPCA that the liquid manure storage area was constructed to

conform to the design plans and specifications and construction standards.

The owner is responsible for submitting the name and qualifications of the inspector, inspector's completed inspection form, and contractor's certification form to the design engineer for incorporation into the construction report.

## Construction Report

The owner must submit a construction report to the MPCA or delegated county within sixty days of completing construction of any new or modified liquid manure storage area. This report must be prepared and signed by the design engineer and must contain an assessment indicating whether the liquid manure storage area was constructed according to the submitted plans and specifications. The inspection form required of the inspector and liner contractor is also to be included in this report.

Manure may be added to the liquid manure storage area any time after construction completion. However, the MPCA may require the manure to be removed and correction measures taken if the construction report indicates the completed liquid manure storage area does not conform to the design plans and specifications.

## Operation and Maintenance

The liquid manure storage area must be operated and maintained according to the operation and maintenance plan submitted with the plans and specifications for the liquid manure storage area.

## Permitting/Notification Requirements

The following are the notifications and permitting requirements for construction or modification of a liquid manure storage area under the revised rules.

The owner of any facility who is proposing to construct or modify a liquid manure storage area that will house **500 animal units or more** is required to notify all landowners and residents within 5,000 feet of the perimeter of the feedlot regarding the proposed construction activity. This notification is to be done within 10 business days of submitting a permit application to the MPCA or delegated county.

For a feedlot facility that will house **less than 300 animal units** and that **does not have a pollution problem** a construction permit **is not required**. However, the owner is required to submit the design engineer plans and specifications to the MPCA or delegated county at least 90 days prior to beginning construction. The owner is also required to notify all local zoning authorities at least 30 days before beginning construction.

The owner of a feedlot facility that will house **300 to 999 animal units** is required to submit the plans and specifications to the MPCA or delegated county with a permit application for a Construction Short-Form permit when proposing to construct a liquid manure storage area.

For a site with a **pollution problem that has less than 1,000 animal units**, the owner must apply to the MPCA or delegated county for an Interim permit. If an liquid manure storage area is being proposed as a part of the corrective measures, plans and specifications for the liquid manure storage area are to be included with the permit application.

An owner of a livestock facility that will have **1,000 animal units or more** after construction of the proposed liquid manure storage area is complete is required to submit an application to the MPCA for a National Discharge Elimination System permit.

## For More Information

For more detailed information on the construction or modification of liquid manure storage areas, please see Minn. R. 7020.2100. The revised feedlot rule and other fact sheets can be downloaded from the MPCA website at: http://www.pca.state.mn.us/hot/feedlot-rules.html.

Or, for more information call your area office listed on the first page of this fact sheet and ask for the feedlot staff person, or call the Feedlot Service Center toll-free at (877) 333-3509.