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WAL FEEDLOTS



**Minnesota Pollution Control Agency
Division of Water Quality**

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TABLE OF CONTENTS

	Page
Introduction: About the MPCA	1
A Resource Out of Place	1
Philosophy Behind the Regulations	2
Definitions	3
Discussion of Rules Governing Pollution from Animal Feedlots	5
Odors from Animal Feedlots	8
What is a Potential Pollution Hazard	8
What to Do With Dead Animals	10
A Guide to the Feedlot Permitting Process	10
Soil Conservation Service Technical Assistance	11
Blank Permit Application	13-16
Example of a Completed Permit Application	17-20
Example Manure Management Plan	22
Systems Being Used For Feedlot Pollution Control	26
The Role of the County in the Feedlot Permitting Program	27
Complaint Handling Procedures	29
Tax Benefits	29
National Pollutant Discharge Elimination System	30
Listing of Minnesota Pollution Control Agency Regional Offices	32
Tables	
1. Daily Manure Production	22
2. Annual Fertilizer Content Approximated for Manure	23
Figures	
1. Aerial Photo Example	21
2. Earthen Runoff Collection Basin	26
3. Holding Pond Capacity	28
4. Building with Concrete Collection Pit	28
5. MPCA Regional Offices	Back Cover

ABOUT THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA)

The Minnesota Pollution Control Agency (MPCA) is a department of State government given the responsibility of protecting Minnesota's environment. The Agency consists of an Agency Board, an Administration and a staff which is divided into the Air, Water, and Solid and Hazardous Waste Divisions. The Agricultural Unit, which deals with animal feedlot operations, is located in the Permits Section of the Division of Water Quality. The Agency also has regional offices located in Marshall, Rochester, Duluth, Brainerd and Detroit Lakes. These offices can answer many questions and provide needed forms. Addresses and phone numbers are located in the back of this manual.

The MPCA Board has nine (9) members appointed by the Governor. This Board represents a cross section of Minnesota residents. One member must be a person knowledgeable in the field of agriculture. The Executive Director of the Agency is also appointed by the Governor.

The Agency staff uses the information gathered in the feedlot permit application and associated materials to evaluate a feedlot's compliance with the State Rules. Occasionally inspections are necessary to gather facts about a feedlot operation. The Agency will make inspections to investigate complaints about polluting feedlots. A staff member visiting a feedlot will always identify himself and try to contact the feedlot owner.

This manual was prepared by the Division of Water Quality, MPCA. Its purpose is to provide information and guidance for persons interested in controlling pollution from animal feedlots. Feedlot owners are encouraged to obtain help from qualified technical assistants when planning feedlots. This manual and its contents are subject to change without notice.

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A RESOURCE OUT OF PLACE

Pollution is a "hot" issue. You can see it daily on television news programs. You can hear about it from politicians and officials. It is a topic that comes up for discussion among people you know—friends, family, neighbors. People are concerned about pollution.

But what exactly is pollution? Pollution occurs when a substance is present in water, soil or air in such a quantity that the water, soil or air is either degraded or its usefulness is impaired. Pollution may render these natural resources offensive to the senses of sight, taste or smell. The adverse effects of pollutants will depend on the next use of the water, soil or air. Pollutants may endanger the health of humans and livestock, reduce the production of food, or damage the beauty or recreational use of a natural resource, such as a lake.

When people talk about agricultural pollution, they often single out animal manures as a major problem. But the mere presence of animal manures in a particular location does not constitute pollution. These animal residues can be managed properly and can provide an important resource in crop and animal production.

What are the principal agents of pollution that can arise from animal manure? Most animal manures are composed of a large fraction of water (70 to 90 percent) and smaller fractions of organic materials and nutrients. Some of these organic materials are biodegradable. Others—which come from the partially-undigested feed of the animals—are relatively unbiodegradable. Other agents present in animal waste are inorganic substances, volatile substances which can move into the air, and pathogens which may infect humans or animals.

When organic materials—such as those from animal manures—reach a body of water, they are used as food by aerobic bacteria. These microscopic bacteria can very rapidly use up all of the available dissolved oxygen in the water. If the bacteria use oxygen at a faster rate than the water can absorb oxygen from the air, the resulting oxygen depletion disrupts plant and animal life. Sport fish—which demand high levels of dissolved oxygen in water—are very sensitive to oxygen depletion. Rough fish can often subsist in the lower levels of dissolved oxygen.

If the oxygen in the water becomes totally depleted, however, the body of water becomes anaerobic and all fish life disappears. The body of water then supports a different type of microorganism called anaerobic bacteria. This produces a combination of volatile gases which may cause odors.

Sometimes, poor management of animal wastes cause nutrients—such as nitrogen, phosphorus and potassium—to have a more serious effect on a body of water than the organic materials. The water may be able to take the organic waste and break it

down into smaller components. But when nutrients are added, both directly from animal wastes and from the bacterial breakdown of the waste, the water becomes enriched. Plants grow very rapidly in the water—die and then decay. This process of aging in a lake is called eutrophication. While it is a natural process in all lakes, it becomes a problem if it happens too fast. While animal manures are not the only cause of this type of pollution, they are a significant source of nutrients which cause the lakes to age.

Aren't pollutants from farmlands and feedlots visible in the water? Not necessarily. Runoff water from farms and feedlots may contain large amounts of dissolved material, no color, and may not be detectable by the human eye. However, brown-colored water may contain eroded soil from cropland, stream banks, or roadsides, or large amounts of organic acids from a bog or wetland—which would constitute different sources of pollution. On the other hand, runoff waters which contain relatively low amounts of solids but which have high levels of nutrients such as nitrogen and phosphorus may appear clear.

So, even good-looking water running off cropland and from feedlots may not be safe water. Even if polluted runoff is diluted with more clean water, the total amount of nutrients in the runoff will be the same. The runoff water, when discharged into lakes, will cause pollution.

But animal manure in the right places can be a valuable resource. The nutrients which are so harmful to lakes are very beneficial to crops and in conditioning the soil, which has a large capacity to breaking down organic matter. In addition to the nutrients, animal manures provide organic matter and moisture to cropland. The challenge to the farmer and to the feedlot operator is to keep animal manures from being wasted in runoff—where manures can cause pollution— and instead to use manures as a resource to enhance food production.

PHILOSOPHY BEHIND THE REGULATIONS

The guiding philosophy of the rules governing pollution from animal feedlots is described in the following paragraphs. An adequate supply of healthy livestock, poultry, and other animals is essential to the well-being of Minnesota citizens and the nation. These domesticated animals provide our daily source of meat, milk, eggs and fiber. Their efficient, economic production must be the concern of all consumers if we are to have a continued

abundance of high-quality, wholesome food and fiber at reasonable prices.

However, livestock, poultry, and other animals produce manure which may, when improperly stored, transported, or disposed, negatively affect Minnesota's environment. The feedlot rules have been established to protect the state's land and water from pollution caused by animal manures. However, the rules also recognize that animal manures, when properly controlled, can be beneficial to soil quality and the production of agricultural crops.

These rules provide for a cooperative program between counties and the Minnesota Pollution Control Agency (hereinafter Agency). County programs, in many instances, represent considerable experience and sensitivity to local agricultural practices and to successful soil and water conservation. Pollution control measures, where deemed necessary by the Agency, should be individually designed and developed to provide the site-specific controls needed for the operation in question. Therefore, a joint county-state program is desirable because it will insure local involvement, minimal disruption to agricultural operations and protect the environment from further degradation.

In repealing the old rules controlling pollution from animal feedlots, specifically Minn. Rule SW 54 containing certain location requirements, the Agency will look to local units of government to provide adequate land use planning for residential and agricultural areas. It has been the Agency's experience that residential and agricultural uses of land are often incompatible and that the best forum for resolving the conflicting use of land is at the local level. However, in establishing these rules the Agency does not seek to abdicate its mandate to protect the purity of the natural resources of the State of Minnesota.

The rules for controlling pollution from animal feedlots are referenced as 6 MCAR §4.8051. The provisions of these rules govern the storage, transportation, disposal, and utilization of animal manure, and the application for and issuance of certificates of compliance for animal feedlots.

These rules comply with the policy and purpose of the State of Minnesota in regard to the control of pollution as set forth in Minn. Stat. Chs. 115 and 116 (1978). Specifically, these rules are established in accordance with Minn. Stat. §116.07 (1978) and Minn. Stat. §115.03 (1978). Finally, these rules shall have the force and effect of law and shall supersede and replace Minn. Rules SW 51-55 (1971) and Minn. Rules SW 56-61 (1974).

In order to understand the feedlot rules, it is necessary to define the following terms.

1. **"Agency."** The Minnesota Pollution Control Agency as established in Minn. Stat. Ch. 116 (1978).
2. **"Animal feedlot."** A lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these rules, open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these rules.
3. **"Animal manure."** Poultry, livestock or other animal excreta or a mixture of excreta with feed, bedding or other materials.
4. **"Animal unit."** A unit of measure used to compare differences in the production of animal manures that employs as a standard the amount of manure produced on a regular basis by a slaughter steer or heifer. For purposes of this rule, the following equivalents shall apply:

Animal	Unit
one mature dairy cow	1.4 animal unit
one slaughter steer or heifer	1.0 animal unit
one horse	1.0 animal unit
one swine over 55 pounds	.4 animal unit
one duck	.2 animal unit
one sheep	.1 animal unit
one swine under 55 pounds	.05 animal unit
one turkey	.018 animal unit
one chicken	.01 animal unit

For animals not listed above, the number of animal units shall be defined as the average weight of the animal divided by 1,000 pounds.

5. **"Certificate of compliance."** A letter from the Director or the county feedlot pollution control officer to the owner of an animal feedlot stating that the feedlot meets Agency requirements.
6. **"Change in operation."** An increase beyond the permitted maximum number of animal units, an increase in the number of animal units which are confined at an unpermitted animal feedlot requiring a construction invest-

ment, or a change in the construction operation of an animal feedlot that would affect the storage, handling, utilization, or disposal of animal manure.

7. **"Corrective or protective measure."** A practice, structure, condition, or combination thereof which prevents or reduces the discharge of pollutants from an animal feedlot to a level in conformity with Agency rules.
8. **"County feedlot pollution control officer."** A county employee or officer who is knowledgeable in agriculture and who is designated by the county board to receive and process animal feedlot permit applications.
9. **"Director."** The Executive Director of the Minnesota Pollution Control Agency whose duties are defined in Minn. Stat. §116.03 (1978).
10. **"Domestic fertilizer."**
 - a. Animal manure that is put on or injected into the soil to improve the quality or quantity of plant growth, or
 - b. Animal manure that is used as compost, soil conditioners, or specialized plant beds.
11. **"Floodplain."** The areas adjoining a watercourse which have been or hereafter may be covered by a large flood known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100 year recurrence interval.
12. **"Interim Permit."** A permit issued by the Director or the county feedlot pollution control officer which expires no later than ten months from the date of issue.
13. **"Manure storage area."** An area associated with an animal feedlot where animal manure or runoff containing animal manure is stored until it can be utilized as domestic fertilizer or removed to a permitted animal manure disposal site. Animal manure packs or mounding within the animal feedlot shall not be considered to be manure storage for these regulations.
14. **"New animal feedlot."** An animal feedlot constructed and operated at the site where no animal feedlot existed previously or where a pre-existing animal feedlot has been abandoned or unused for a period of five years or more.

15. **"National Pollutant Discharge Elimination System (NPDES) permit."** A permit issued by the Agency for the purpose of regulating the discharge of pollutants from point sources including concentrated animal feeding operations.
16. **"Owner."** All persons having possession, control, or title to an animal feedlot.
17. **"Pastures."** Areas where grass or other growing plants are used for grazing and where the concentration of animals is such that a vegetation cover is maintained during the growing season except in the immediate vicinity of temporary supplemental feeding or watering devices.
18. **"Permit."** A document issued by the Agency, at no charge to the applicant, which contains requirements, conditions and compliance schedules relating to the discharge of animal manure pollutants.
19. **"Potential pollution hazard."** A condition which indicated a potential for pollution of the land or waters of the state including:
 - a. An animal feedlot or manure storage area whose boundaries are located within shoreland or floodplain, or are located in an area draining directly to a sinkhole or draining to an area with shallow soils overlying a fractured or cavernous rock, or are located within 100 feet of a water well, or
 - b. An animal feedlot or manure storage area whose construction or operation will allow a discharge of pollutants to surface waters of the state in excess of applicable standards (including, but not limited, to Minnesota Rules WPC 14, 15, 24, and 25) during a rainstorm event of less magnitude than the 25 year-24 hour event, or will allow uncontrolled seepage of pollutant into the ground water, or will violate any applicable state rules.
20. **"Shoreland."** Land located within the following distances from the ordinary high water elevation of public waters:
 - a. Land within 1,000 feet from the normal high watermark of a lake, pond or flowage, and
 - b. Land within 300 feet of a river or stream or the landward side of floodplain delineated by ordinance on such a river or stream, whichever is greater.

21. **"Sinkhole."** A surface depression which is connected to a cavernous bedrock (generally limestone) by a channel or collapse of the overlying formation.

The rules governing pollution from animal feedlots were revised in December, 1979. The following pages contain statements taken from the rules and a discussion of key provisions in the feedlot rules. An unabridged copy of the Rules may be obtained from:

Documents Section
 Department of Administration
 117 University Avenue
 St. Paul, Minnesota 55155
 Telephone: (612) 297-3000

Ask for: Pollution Control Agency Rules for Animal Feedlots 6 MCAR §4.8051 Rules for the control of pollution from animal feedlots; and

6 MCAR 4.8052 Rules for the processing of animal feedlot permit applications by counties.

Send check or money order for \$1.10 (tax included) payable to: State of Minnesota.

Rule Provisions

Animal Feedlot Pollution Control Requirements.

1. No animal feedlot or manure storage area shall be constructed, located or operated so as to create or maintain a potential pollution hazard unless a certificate of compliance or an Agency permit has been issued.

2. All vehicles used to transport animal manure on county, state and interstate highways or through municipalities shall be leakproof. Manure spreaders with endgates shall be in compliance with this provision provided the endgate works effectively to restrict leakage and the manure spreader is leakproof. This shall not apply to animal manure being hauled to fields adjacent to feedlot operations or fields divided by roadways provided the animal manure is for use as domestic fertilizer.

3. Animal manure, when utilized as domestic fertilizer, shall not be stored for longer than one year and shall be applied at rates not exceeding local agricultural crop nutrient requirements except where allowed by permit. Local agricultural crop nutrient requirements can be obtained at local Soil Conservation Service Offices or local Agricultural Extension Service Offices.

4. Any animal manure not utilized as domestic fertilizer shall be treated or disposed of in accordance with applicable state rules and regulations.

5. The owner of any animal feedlot shall be responsible for the storage, transportation and disposal of all animal manure generated in a manner consistent with the provisions herein.

Animal Feedlot Permitting Procedure.

Animal feedlot permit application requirements.

The owner of a proposed or existing animal feedlot for greater than 10 animal units shall make application to the Director for a permit when any of the following conditions exist:

- (1) A new animal feedlot is proposed; or
- (2) A change in operation of an existing animal feedlot is proposed; or
- (3) Ownership of an existing animal feedlot is changed; or
- (4) A National Pollutant Discharge Elimination System (NPDES) permit application is required under state or federal rules and regulations.

The owner of any animal feedlot shall be required to make an application for a permit when an inspection by the Agency staff or a county feedlot pollution control officer determines that the animal feedlot creates or maintains a potential pollution hazard.

Discussion

No animal feedlot is exempt from the responsibility of controlling pollution from animal feedlots.

Leakage of manure from vehicles used to transport manure can cause nuisance conditions. Good management can prevent manure loss on roads. Load within the capacity of the manure spreader and use end gates.

This provision encourages the use of manure as a crop resource. Excessive manure application may depress crop growth or pollute ground or surface waters. When manure is stored for greater than one year, the resource value is generally not being utilized. Manure dumped in road ditches, wetlands or along streams cannot be classified as proper manure handling. Application on cropland at reasonable rates is required.

When is a Feedlot Owner Required to Apply?

These are the conditions in which a feedlot owner is required to apply for a feedlot permit. The conditions are set up so that the entire feedlot operation is reviewed prior to the feedlot owner's financial investment, to determine if the operation is in compliance with the State Rules. This can help the feedlot owner avoid costly mistakes and can help him demonstrate to the local government and citizens that his feedlot is operating correctly. Operating a feedlot under a permit or certificate of compliance will tend to discourage any frivolous complaints about the feedlot.

The permit application must include the following items:

(1) A completed permit application form listing all owners and signed by at least one of the owners, including animal types, the maximum number of animals of each type which can be confined at the animal feedlot, the location of the animal feedlot, soil conditions, and hydrogeological conditions.

(2) A map or aerial photograph showing the location of all wells, buildings, lakes, and watercourses within 1,000 feet of the proposed feedlot.

(3) A manure management plan including manure handling and application techniques, acreage available for manure application and plans for any proposed manure storage structure. Any plans for manure storage structures of 500,000 gallons capacity or larger shall have been prepared or approved by a registered professional engineer or a soil conservation service employee.

(4) Such additional information relating to the specific site or the specific feedlot operation as may be requested by the Director to evaluate compliance with federal and state rules and regulations.

- . When more than one person is in possession, control or has title to a single animal feedlot, only one person needs to apply for an animal feedlot permit, however, the permit application must list all owners in accordance with 6 MCAR §4.8051 D.1.c.(1). All owners are responsible for compliance with these rules and permits or certificates of compliance issued pursuant to these rules.

Permit Issuance

The animal feedlot permit application shall be reviewed by the county feedlot pollution control officer or by the Director if a county permit processing program has not been implemented in the county where the animal feedlot will be located.

No permit shall be required when the review of the application indicates that all animal manures are being used as domestic fertilizer and that a potential pollution hazard does not exist or that potential pollution hazards have been satisfactorily addressed by corrective or protective measures. However, a certificate of compliance shall be obtained by the owner of such an animal feedlot prior to commencing operation of the new feedlot, changing the operation of an existing feedlot or changing ownership of an existing feedlot.

The Agency shall consider the issuance of a permit when the review indicates that a potential pollution hazard exists and has not been addressed by corrective or protective measures or when manure is not being used as a domestic fertilizer.

What the Feedlot Owner Must Do!

The application form must be completely filled out and include all materials requested to allow proper evaluation of the feedlot. Failure to provide this information will cause delays in processing. All important features should be labeled on the aerial photo.

A manure management plan detailing how, where, and when manure will be removed from the feedlot is an important part of planning a feedlot operation. The feedlot owner must have identified access to enough cropland in this plan to avoid manure application at rates which exceed annual crop nutrient requirements.

If the feedlot is under multiple ownership, all owners must be listed on the application and all owners are responsible for keeping the feedlot in compliance with the state rules.

What Happens Next?

If after evaluating the permit application it is determined that a permit is not required, a certificate of compliance will be issued to the feedlot owner(s). A permit will be issued for those operations with a potential pollution hazard that has not been corrected. The permit would contain a schedule for correcting the pollution hazard, including conditions and/or requirements relating to the discharge of pollutants. For example, a permit is required if manure is intended to be stored for more than one year or if manure is applied at a rate in excess of crop nutrient requirements. In most cases a permit is used to set up a schedule for correcting a feedlots pollution.

(1) An interim permit shall be issued by the Director when the potential pollution hazard will be corrected within ten months of the date of permit issuance. When all necessary corrective and protective measures have been installed on a permitted animal feedlot, the permit shall terminate and a certificate of compliance shall be issued.

(2) An animal feedlot permit may be issued by the Agency when the potential pollution hazard will not be corrected within ten months of the date of permit issuance or when manure is not used as a domestic fertilizer. This permit shall contain such conditions and requirements as the Agency deems necessary in order to insure compliance with applicable state rules and regulations.

(3) If it is determined during the review process that an animal feedlot must obtain a National Pollutant Discharge Elimination System (NPDES) permit, the applicant shall be notified and a permit shall be processed and issued as prescribed in Minn. Rule WPC 36 (1974).

Existing Permits

For the Construction and Operation of Livestock Feedlots, Poultry Feedlots and Other Animal Lots. The conditions and provisions of all Agency animal feedlot permits issued under Minn. Rules SW 51-61 before the effective date of the new rules shall continue to be in effect. Upon application for a change in operation or change of ownership of an existing, permitted animal feedlot, the permit shall be reconsidered pursuant to the new rules.

Procedural Rules and Appeals. All requests for hearings, appeals and other procedural matters not specifically provided for herein shall be governed by the Agency Rules of Procedure, the Rules of the Office of Hearing Examiners and other applicable statutes and rules.

Severability. If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of this rule or application of any other part of this rule which can be given effect without application of the invalid provision. To this end the provisions of all sections, subsections and subdivisions herein and the various applications thereof are declared to be severable.

Variance from Rules. Any person may apply for a variance from any requirements of this rule. Such variances shall be applied for and acted upon by the Agency in accordance with Minn. Stat. §116.07 subd. 5 (1978) and other applicable statutes and rules.

Federal permits (NPDES) are required for a relatively small number of large feedlots with a significant potential for discharge of pollutants.

All existing permits will remain in force until changes are made in the feedlot. Then there will be an evaluation under these rules of existing and any proposed facilities and the appropriate document will be issued.

In certain exceptional circumstances, strict conformity to the rules may be unreasonable, impractical, or cause undue hardship. Under these conditions, a variance from a rule may be applied for by the operator. All variances are acted upon by the MPCA Board at their regular monthly meeting on the fourth Tuesday of each month. Variance requests received by the first of a month will be presented to the Board in that month.

ODORS FROM ANIMAL FEEDLOTS

Feedlot owners and their neighbors must realize that some odors are an inevitable part of livestock production. The feedlot owner must accept responsibility for controlling odors to a reasonable level. The type of manure handling system and the management practices selected by the feedlot operator can have a large effect on the amount of odor generated by the feedlot. The Minnesota Pollution Control Agency (MPCA) has developed a booklet containing a discussion of animal feedlot odor problems and current methods known for odor control. This booklet is available by writing to the Central Office of the MPCA, Public Information Office.

MPCA's authority in the area of odor control must be consistent with the policy set forth in Minn. Stat. Chs. 115 and 116 (1978). Specifically, Minnesota Rule APC 9 addresses the odors from animal feedlots in Part (f).

(f) Agri-business Exception. The odor of growing vegetation shall not be considered odorous air pollution. The odor of domestic (organic) fertilizer, industrial (inorganic) fertilizer, and pesticides shall not be considered odorous air pollution if such substances are used effectively according to their intended purposes and application. The open storage (piling) of such materials shall be accomplished in a nuisance-free manner and in compliance with the regulations of federal, state and local government and their regulatory agencies.

To paraphrase the above Rule provision: The odor coming from manure being used as fertilizer on cropland shall not be considered odorous air pollution. The storage of manure in uncovered storage areas (piles, earthen holding ponds, etc.) must be accomplished in a nuisance-free manner.

WHAT IS A POTENTIAL POLLUTION HAZARD?

Since elimination of pollution hazards associated with feedlots is the purpose of the MPCA feedlot program, the feedlot owner should know what a pollution hazard is and how to correct it. The portion of the Agency Rule that this discussion will center on is:

No animal feedlot or manure storage area shall be constructed, located or operated so as to create or maintain a

potential pollution hazard unless a certificate of compliance or an Agency permit has been issued.

Many factors enter into whether or not a potential pollution hazard exists at a feedlot. The general criteria used to identify a potential pollution hazard, with regard to feedlots, are found in the Rule, definition 19, "Potential pollution hazard."

19. "Potential pollution hazard." A condition which indicates a potential for pollution of the land or waters of the state including:

a. An animal feedlot or manure storage area whose boundaries are located within shoreland or floodplain, or are located in an area draining directly to a sinkhole or draining to an area with shallow soils overlying a fractured or cavernous rock, or are located within 100 feet of a water well, or

b. An animal feedlot or manure storage area whose construction or operation will allow a discharge of pollutants to surface waters of the state in excess of applicable standards (including, but not limited, to Minnesota Rules WPC 14, 15, 24, and 25) during a rainstorm event of less magnitude than the 25 year-24 hour event, or will allow uncontrolled seepage of pollutants into the ground water, or will violate any applicable state rules.

It is important to note that these items, labeled "potential" hazards are indicators which stimulate a closer look at the specific site to determine if there is an actual pollution hazard.

1. **Shoreland** (definition # 20) identifies land located within certain distances where a feedlot could have an impact on waters of the State. The distance at which a given feedlot could have an adverse impact would most likely vary from one piece of shoreland to the next. The pollution hazard exists if uncontrolled runoff from a feedlot may enter a lake or river carrying nutrients and pathogens from the manure into the water body. Nutrients added to a lake will increase the rate of eutrophication. This feedlot situation can be corrected by diverting or storing the feedlot runoff so it does not reach the water body.
2. Feedlots located in a **floodplain** (definition # 11) represent a hazard in that a large flood could wash manure from an open lot or damage a manure storage facility causing manure to be discharged to a river or stream. A high water table in a floodplain makes con-

struction of adequate manure storage facilities difficult. Flood protection dikes or durable storage facilities are suitable protective measures.

3. If **feedlot runoff** reaches a tile inlet or a drainage ditch, it is considered to be a pollution hazard. The pollutants in the runoff will not be removed before the polluted runoff reaches a lake or river. Solid material in runoff may settle out in a ditch but the nutrients and pathogens in the water will eventually reach a water body causing a decrease in quality. To prevent this, feedlot runoff must be diverted from tile inlets or drainage ditches near the feedlot.
4. Feedlot runoff which reaches a **sinkhole** (definition #21) may cause direct contamination of ground water which can affect the wells for miles from the site. Feedlot runoff which drains to an area with shallow soils overlying a fractured or cavernous rock can also be diverted away from the sinkhole or area of shallow soils. A manure storage unit located in an area near sinkholes or fractured cavernous rock represents a potential pollution hazard because a leak or seepage from the storage unit could contaminate ground water. Situations with these characteristics generally require additional information and a careful site specific evaluation.
5. A manure storage unit or a feedlot located less than 100 feet from a **water well** may cause the well to become contaminated or provide a conduit for contamination of ground water as pollutants follow the well casing down. New wells must meet Health Department standards and the well code.
6. The rules require feedlot owners to prevent the **discharge** of pollutants in feedlot runoff to surface waters for all storms amounting to less rainfall than the 25 year-24 hour storm (4-5 inches depending on location). The control system used to prevent a polluted runoff discharge might be a diversion, a vegetative buffer area, or a holding pond.
7. Animal feedlots and manure storage areas must be constructed and operated in a manner which restricts **seepage** of pollutants into the ground water. A clay liner or concrete base is often used to restrict seepage. Seepage of pollutants should be considered on each feedlot site because of the wide variety of soils and potential for ground water contamination in Minnesota.

Good Construction Planning and Good Management Practices May Avoid Potential Pollution Hazards.

1. If a feedlot is constructed so that runoff from outside the feedlot drains through it, there is a higher potential for manure being washed away causing a pollution hazard. A clean water diversion to prevent outside water (including roof water) from washing across an open lot may be constructed to correct this situation.
2. **Feedlot slope:** The greater the slope of the feedlot, the faster the rainfall runoff flows, giving it the ability to carry more manure. To correct the problem, open lots can be regraded to divert runoff into storage and sedimentation areas. Construction of new open lots on moderate or steep slopes should be avoided.
3. Proper site selection for a feedlot or manure storage area is very important in preventing pollution. Sites should be selected away from sensitive areas such as floodplains, wells, high water table areas and shoreland.
4. **Management procedures:** Any pollution abatement system depends upon proper management to be effective. Feedlot operators should check with the Soil Conservation Service and the Agricultural Extension Service for more information about proper feedlot management practices.
5. **Number of animals:** The number of animals is not in itself a potential pollution hazard. The pollution potential is dependent upon the characteristics of the feedlot site and how it is utilized. A greater number of animals will result in more manure to be handled and increase the potential pollution hazard at a problem site.

The above criteria taken separately or in combination may indicate a potential pollution hazard. Corrective or protective measures must be designed and applied to a feedlot site so that an actual pollution hazard is not created or maintained. It should be emphasized that each case must be decided on an individual basis and there is not any easy measuring stick of a potential pollution hazard. If you need assistance, call the feedlot officer in your county or the Agricultural Unit of the MPCA at (612) 296-7326.

WHAT TO DO WITH DEAD ANIMALS

Dead animals must not be put into holding ponds, concrete tanks or manure storage areas of any kind. Dispose of dead animals through proper burial, incineration, or by a rendering service. Dead animals or animal entrails shall be disposed of in conformance with Minnesota Rules SW 1-11, or Rules of the Minnesota Board of Animal Health, whichever may be applicable. The rules of the Board of Animal Health control the manner in which diseased animals are burned, buried or otherwise disposed of. If an incinerator is used to burn dead animals, it must be in conformance with MPCA Air Quality rules for incinerators.

Under no circumstances should dead animals be put into abandoned wells, sinkholes, or buried in shallow soils over fractured or cavernous rock where contaminants have direct access to underground water supplies.

A GUIDE TO THE FEEDLOT PERMITTING PROCESS

* First determine if you are required to make application for a feedlot permit.

The owner of a proposed or existing animal feedlot for greater than 10 animal units must make application to the Director for a permit when any of the following conditions exist:

1. A new animal feedlot is proposed; or
2. A change in operation of an existing animal feedlot is proposed; or
3. Ownership of an existing animal feedlot is changed.

* Because the "Permit Application" and the "attached information" are the only basis, in most cases, for evaluating the entire feedlot operation, it is ESSENTIAL that 1) all the questions be answered to the best of your ability, and 2) that all items requested in the application be included (e.g. soil borings, and farmstead sketch). Failure to provide this information will result in delays in receiving approval.

* There are a few informational items which you must attach to the application to gain approval.

1. An aerial photo showing location of wells, building sites, lakes and water courses.
2. A manure management plan (see example application and tables provided).
3. Plans by a registered professional engineer or qualified SCS employee are required for manure storage structures of 500,000 gallons

capacity or larger. However, plans are also desirable for all smaller manure and runoff control systems.

4. A soil map.
- * Plan ahead: Allow time to obtain all the required information, plans, and permit processing time before you schedule a contractor. Play it safe and start this process at least 60 days before you want to begin construction.
 - * A blank application form is provided in the center of this book. Also, there are examples to help you make a complete application.
 - * Where to go for help: There a number of places and persons who can be contacted to obtain forms and information requested or just get help in gathering all that is needed to get the job done right.
 - * You may want to obtain assistance from the Soil Conservation Service (USDA-SCS). They can provide application forms, soil maps and help in getting the information requested. The SCS can help in developing plans to control pollution hazards and provide information on cost-sharing available for agricultural pollution control.
 - * Other locations where you can receive the proper form and assistance are:
 - County Planning and Zoning Office
 - Designated County Feedlot Pollution Control Officer
 - County Extension Office
 - Minnesota Pollution Control Agency Central Office in Roseville or the Regional Office nearest you (see the back cover for address)

To Complete the Process:

After you have completed the permit application, make a copy for yourself; then send the application to the County Feedlot Pollution Control Officer in those counties which have an Agency approved feedlot program. In all other counties, the application should be sent directly to the MPCA Central Office. A permit, certificate of compliance, or notice of denial should be received by the operator in two to three weeks. In cases where this time frame would present hardship to the operator, verbal approval can sometimes be given in two to three days after receipt of a properly completed application. If the permit or notice of denial is not received within three weeks, contact the County Feedlot Officer or the MPCA. Construction should not begin until you obtain approval.

SOIL CONSERVATION SERVICE

The Soil Conservation Service (SCS) is a federal agency which provides technical assistance (through soil and water conservation districts) to landowners who wish to control animal waste pollution on their farm. There is no charge to the landowner for these services.

Upon request of landowners or feedlot operators who are soil and water conservation district cooperators, SCS can provide the following phases of technical assistance for pollution control practices:

1. On-site investigation, analysis and consultation with the cooperators for a solution to an animal waste pollution control problem.
2. Recommendations and general layout for a complete pollution control system, including a manure management plan.
3. Site surveys, soil borings, investigations and design of detail plans for structural or non-structural measures to be installed for pollution control.
4. Layout and inspection during construction.

If you are interested in SCS assistance for animal waste pollution control problems, you should contact your county SCS office.

Examples of Structural Measures for Pollution Control:

- clean and polluted water diversions
- manure stacking slab (solid storage)
- earthen manure holding pond (liquid or slurry)
- concrete manure pit (liquid or slurry)
- above or below ground level tanks.

Examples of Nonstructural Measures for Pollution Control:

- grassed waterways
- terraces, strip cropping, contour planting
- grassed or vegetated buffer areas
- grading and leveling to redirect or improve open lot drainage patterns.

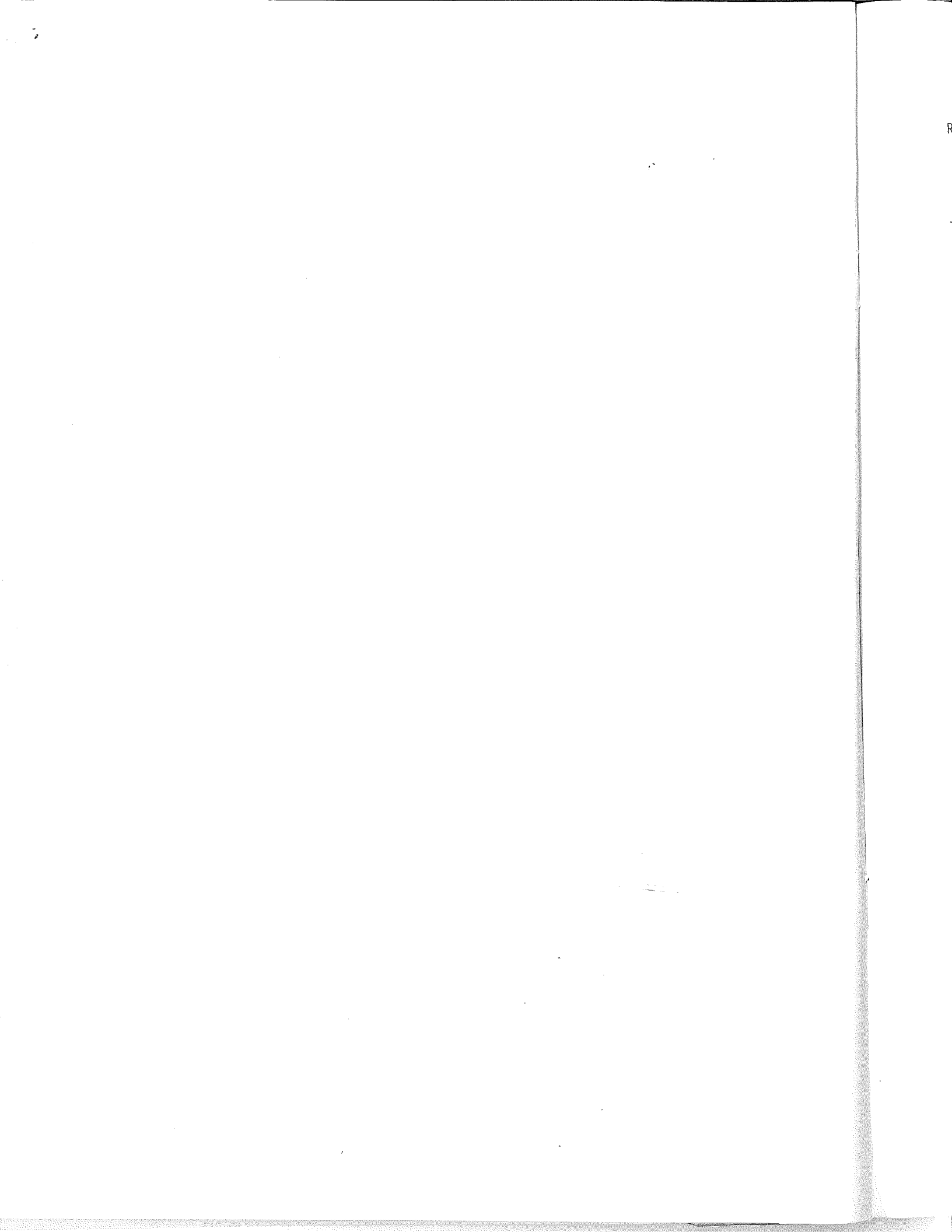
A COMPUTER MODEL AND PLANNING FOR FEEDLOT POLLUTION CONTROL

The Agency has developed a method for predicting the impact of runoff from existing open lots which discharge to public waters. This method can be used to look at both problems with existing feedlot situations and in planning for nonstructural means of controlling runoff from animal lots.

Rainfall runoff from an open lot is evaluated by gathering information in the field about the feedlot and surrounding area. The field information is then taken back and put into a computer which estimates the amount of runoff and the nutrient load contained in the runoff. Results from the computer model evaluation can be used to compare with water quality standards. The model results can also be used as a tool by various agencies to set priorities for distribution of cost-share money used for pollution control.

MPCA staff, county feedlot officers and the Soil Conservation Service (SCS) have the ability to gather the needed field data for the computer model. Results of the field investigations, the computer model, and any other pertinent information will be used as tools to evaluate the feedlot operations.

The Agency has also completed an assessment of feedlots through the water Quality Planning Section. Three (3) reports titled Feedlots Package I, II and III, were prepared as a part of the section "208" planning study funded under federal legislation, Public Law 92-500, for water quality management. Package I examines the many aspects of feedlots as they relate to non-point source pollution and their effect on water quality. Package II was prepared to reflect MPCA's understanding of existing water quality related programs and to communicate information on such programs to those persons participating in the water quality planning process. Package III describes alternative courses of action or programs for dealing with feedlots and explores the environmental, social and economic implications of each alternative. Work in the area of non-point source pollution and the part which animal feedlots play in the total picture is continuing in order to determine where the Agency's efforts will best improve the State's water quality.



STATE OF MINNESOTA PERMIT APPLICATION FOR CONSTRUCTION AND OPERATION
OF AN ANIMAL FEEDLOT

RETURN TO: Minnesota Pollution Control Agency (MPCA)
Division of Water Quality/Agricultural Unit
1935 West County Road B-2
Roseville, Minnesota 55113

This application is for: (check applicable box)

- new animal feedlot at new site (no existing facilities or abandoned for 5 years)
- expansion of existing animal feedlot
- modification of existing animal feedlot (no expansion)
- change of ownership of animal feedlot

Approval for proposed changes should be obtained BEFORE construction begins.

SECTION I - GENERAL INFORMATION

A. If the feedlot site already has an MPCA permit, please state the number. _____

Names of All Owners (Please Print) _____

Questions and correspondence should be directed to:

Mailing Address (Street or RFD) _____

Town _____ Zip Code _____

Telephone: Residence (_____) Business Phone (_____) _____
area area

B. Location of Animal Feedlot

_____, of Section _____, in _____ Township
(quarter section)

of _____ County.

Township No. _____ Range No. _____

Directions from the nearest town _____

General topography surrounding feedlot _____
(flat, gently rolling, hilly, steep)

Soil type _____
(attach S.C.S. soils map if available)

Is feedlot less than 1,000 feet from a lake, pond, or spring, or 300 feet from a stream or
river? _____ yes _____ no _____
(give distance and name of water body)

Is the feedlot located in a floodplain? _____ yes _____ no

SECTION II - EXISTING LIVESTOCK OPERATION

What is the Existing Total Maximum Number of Animals at Any-One-Time?

Feeder Cattle _____ Beef Cows & Calves _____ Dairy Cows _____ Dairy Youngstock _____

Poultry (specify) _____ Other _____

Swine: Sows _____ Feeder Pigs _____ Finishing Hogs _____

List ALL EXISTING Livestock Facilities:

Type of confinement (open lot, partially housed, total confinement)	Dimensions (feet)	Capacity (maximum number of animals at any-one-time)	Floor Surface: Concrete, dirt, or if slatted floor, give pit size
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Drainage patterns of outside lots _____
(indicate distance to dry runs, gullies, tile inlets,

drainage ditches, springs, sinkholes, lakes, streams, etc.)

Describe all other EXISTING manure storage facilities (give dimensions and type), pollu-
tion control devices including diversions and holding ponds _____

Draw a sketch to show existing farmstead and proposed facilities. Include: Wells,
abandoned wells, manure storage, rivers or lakes, sinkholes, dikes or diversions.
If the space provided is not large enough, attach a separate sheet.

SECTION III

A. Planned Expansion or Modification of Operation

- 1. Describe new facility or equipment (give dimensions) _____
- 2. Total Animal Capacity AFTER construction (maximum number at any-one-time) _____
- 3. Proposed construction starting date: _____ completion date: _____
- 4. Manure handling technique (check appropriate boxes)

_____	slatted floor	_____	manure stacker
_____	poured concrete tank (both walls & floor)	_____	daily scraping
_____	concrete block or stave pit	_____	manure pack
_____	earthen holding basin	_____	above ground tank
		_____	other _____
- 5. Size of new manure storage facility (state dimensions) _____
(length x width x depth)

NOTE: If a belowground manure storage facility is proposed: a SOIL BORING to a depth of two (2) feet below the bottom is required, using both USDA and Unified classification systems and PLANS are required.

- 6. Wells _____
(depth) (domestic/livestock) (distance to manure storage and feedlot)
- 7. Are there any abandoned wells within 1,000 feet of the feedlot or manure storage area?
_____ yes _____ no (If yes, show location on aerial photo required below.)
- 8. Depth to water table (seasonally high water table, not well water level) _____
- 9. Is depth to bedrock: _____ 0-10 ft. _____ 11-20 ft. _____ 21-30 ft. _____ 31-40 ft.
_____ 40 or more ft. Determined by: ___soil boring ___well log ___estimate
- 10. How is seepage restricted in manure storage facility?
(plastic liner, clay, concrete, etc.) _____
- 11. How often is manure removed from storage? _____
- 12. Number of acres available for spreading _____ acres owned _____ acres rented
(Submit written agreements on land not owned or rented.)

B. Pollution Controls

Describe any proposed pollution control devices or practices _____
(diversions, settling basins
runoff basins, manure injection, etc.)

NOTE: Required with this application is a copy of a map or aerial photo (ASCS preferred) showing the location of all surface drainage patterns, wells, lakes, rivers, buildings (including homes), and water-courses within 1,000 feet of the livestock facilities.

SECTION IV - STATEMENTS & RECOMMENDATIONS

A. Required Additional Information

Have all local permits (zoning or conditional use) been applied for? yes no

Have you ever been subject to any type of legal action or cited for alleged environmental harm caused by your management of an animal feedlot? yes no

(If yes, please attach a short statement on a separate sheet to this application form explaining the circumstances surrounding this action.)

General Operator Comments: _____

The undersigned applicant, in accordance with the Minnesota Pollution Control Agency's Regulations for the Control of Pollution from Animal Feedlots, hereby applies to the Agency to construct and operate an animal feedlot. The applicant further agrees to complete an application for a National Pollutant Discharge Elimination System (NPDES) permit if required by the Agency. The MPCA may require additional information for permit evaluation.

I certify that the construction and operation of the above described animal feedlot will be in accordance with the plans, specifications, reports and related communications approved by the Minnesota Pollution Control Agency and on file in its office; and in accordance with conditions which have been or may be imposed in the permit or any applicable regulations or standards of the Agency.

I also certify that the information contained in this application is true, complete and accurate. Any knowingly false or misleading statement will be subject to penalties provided by law.

Signature of Applicant or Representative _____

Date _____

(Address of Applicant or Representative) () area (Phone No.)

B. Inspecting/Assisting Official

Comments & Recommendations _____

On site inspection conducted yes no

Signature of Official _____ Phone No. _____

Title _____

Address _____

STATE OF MINNESOTA PERMIT APPLICATION FOR CONSTRUCTION AND OPERATION
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RETURN TO: Minnesota Pollution Control Agency (MPCA)
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- new animal feedlot at new site (no existing facilities or abandoned for 5 years)
 expansion of existing animal feedlot
 modification of existing animal feedlot (no expansion)
 change of ownership of animal feedlot

Approval for proposed changes should be obtained BEFORE construction begins.

SECTION I - GENERAL INFORMATION

A. If the feedlot site already has an MPCA permit, please state the number. None

Names of All Owners (Please Print) Doe Brothers, Inc.
John, Jerald and Philip Doe

Questions and correspondence should be directed to: John V. Doe

Mailing Address (Street or RFD) Route 3, Box 820

Town Hometown Zip Code 57413

Telephone: Residence (507) 924-3561 Business Phone () same
area area

B. Location of Animal Feedlot

NE, of Section 2, in May Township
(quarter section)

of Skyblue County.

Township No. 129 Range No. 35

Directions from the nearest town Leaving Hometown, go 5½ miles north on
County Road 7 and 3/4 mile west on County Road 16.

General topography surrounding feedlot gently rolling
(flat, gently rolling, hilly, steep)

Soil type Fayette silt loam
(attach S.C.S. soils map if available)

Is feedlot less than 1,000 feet from a lake, pond, or spring, or 300 feet from a stream or
river? yes no
(give distance and name of water body)

Is the feedlot located in a floodplain? yes no

Revised 12/79
PQ-00234-02

SECTION II - EXISTING LIVESTOCK OPERATION

A. What is the Existing Total Maximum Number of Animals at Any-One-Time?

Feeder Cattle 200 Beef Cows & Calves _____ Dairy Cows _____ Dairy Youngstock _____

Poultry (specify) _____ Other _____

Swine: Sows 20 Feeder Pigs 100 Finishing Hogs _____

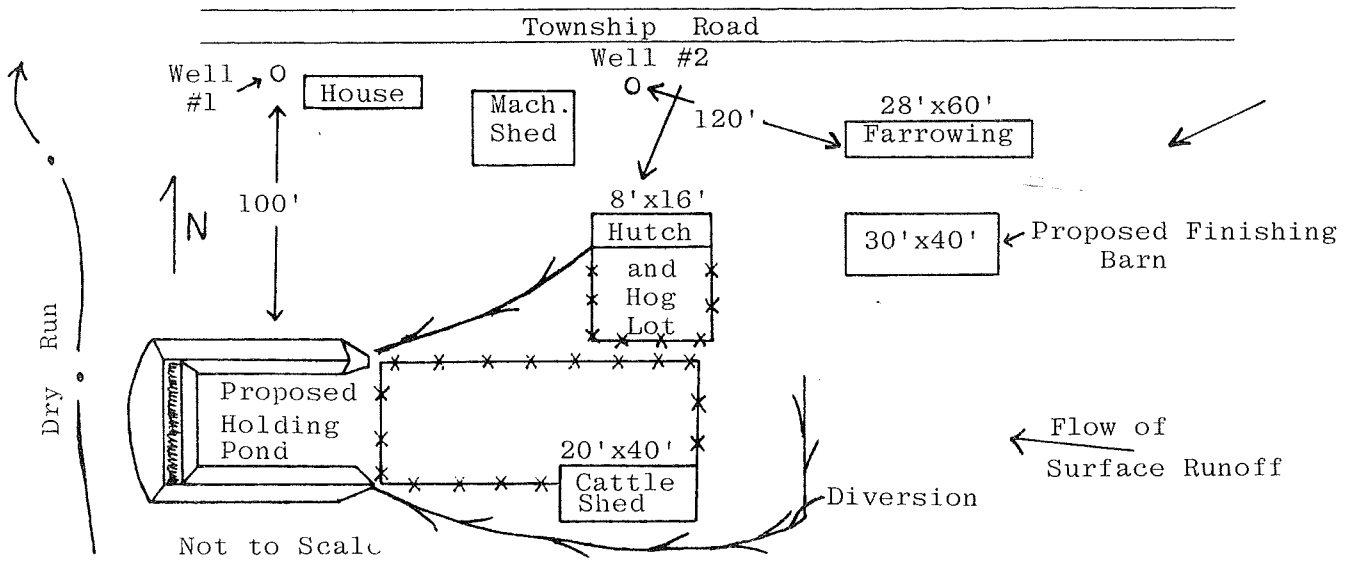
B. List ALL EXISTING Livestock Facilities:

Type of confinement (open lot, partially housed, total confinement)	Dimensions (feet)	Capacity (maximum number of animals at any-one-time)	Floor Surface: Concrete, dirt, or if slatted floor, give pit size
total confinement	28'x 60'	10 sows 100 feeder pigs	slatted/pit 28'x30'
partial housed with	20'x 40'	200 feeder	dirt
open lot	100'x200'	cattle	
hog hutch and lot	8'x 16'	10 gestating sows	dirt lot 16'x50'

C. Drainage patterns of outside lots 50' from cattle lot to dry run, runoff flows
(indicate distance to dry runs, gullies, tile inlets,
to the west
drainage ditches, springs, sinkholes, lakes, streams, etc.)

D. Describe all other EXISTING manure storage facilities (give dimensions and type), pollu-
tion control devices including diversions and holding ponds poured concrete pit
under nursery part of farrowing/nursery barn

E. Draw a sketch to show existing farmstead and proposed facilities. Include: Wells,
abandoned wells, manure storage, rivers or lakes, sinkholes, dikes or diversions.
If the space provided is not large enough, attach a separate sheet.



SECTION III

A. Planned Expansion or Modification of Operation

- 1. Describe new facility or equipment (give dimensions) 30' x 40' finishing building, runoff holding pond (100'x100'x6' below) see summary plan
- 2. Animal Capacity AFTER construction (maximum number at any-one-time) 100
- 3. Proposed construction starting date: 5/20/80 completion date: 6/30/80
- 4. Manure handling technique (check appropriate boxes)

<input checked="" type="checkbox"/> slatted floor	<input type="checkbox"/> manure stacker
<input checked="" type="checkbox"/> poured concrete tank (both walls & floor)	<input type="checkbox"/> daily scraping
<input type="checkbox"/> concrete block or stave pit	<input type="checkbox"/> manure pack
<input checked="" type="checkbox"/> earthen holding basin	<input type="checkbox"/> above ground tank
	<input type="checkbox"/> other _____
- 5. Size of new manure storage facility (state dimensions) pit 30'x40'x8', and basin 100'x100'x6' (length x width x depth)

NOTE: If a belowground manure storage facility is proposed: a SOIL BORING to a depth of two (2) feet below the bottom is required, using both USDA and Unified classification systems and PLANS are required.

- 6. Wells

1) 150'	domestic & livestock	100'	from holding pond & feedlot
2) 250'	livestock	120'	to concrete pits
(depth)	(domestic/livestock)	(distance to manure storage and feedlot)	
- 7. Are there any abandoned wells within 1,000 feet of the feedlot or manure storage area?
 yes no (If yes, show location on aerial photo required below.)
- 8. Depth to water table (seasonally high water table, not well water level) 8'
- 9. Is depth to bedrock: 0-10 ft. 11-20 ft. 21-30 ft. 31-40 ft.
 40 or more ft. Determined by: soil boring well log estimate
- 10. How is seepage restricted in manure storage facility? clay liner in holding pond and 6" of reinforced concrete in pits
(plastic liner, clay, concrete, etc.)
- 11. How often is manure removed from storage? every six (6) months
- 12. Number of acres available for spreading 200 acres owned 100 acres rented
(Submit written agreements on land not owned or rented.)

B. Pollution Controls

Describe any proposed pollution control devices or practices diversion for runoff (diversions, settling basins from cattle and hog lots, runoff holding pond, tank wagon with injectors runoff basins, manure injection, etc.)

NOTE: Required with this application is a copy of a map or aerial photo (ASCS preferred) showing the location of all surface drainage patterns, wells, lakes, rivers, buildings (including homes), and water-courses within 1,000 feet of the livestock facilities.

SECTION IV - STATEMENTS & RECOMMENDATIONS

A. Required Additional Information

Have all local permits (zoning or conditional use) been applied for? XX yes no

Have you ever been subject to any type of legal action or cited for alleged environmental harm caused by your management of an animal feedlot? yes XX no

(If yes, please attach a short statement on a separate sheet to this application form explaining the circumstances surrounding this action.)

General Operator Comments: Working with SCS on the holding pond; soil borings will be done in the spring; refer to the enclosed summary plan.

The undersigned applicant, in accordance with the Minnesota Pollution Control Agency's Regulations for the Control of Pollution from Animal Feedlots, hereby applies to the Agency to construct and operate an animal feedlot. The applicant further agrees to complete an application for a National Pollutant Discharge Elimination System (NPDES) permit if required by the Agency. The MPCA may require additional information for permit evaluation.

I certify that the construction and operation of the above described animal feedlot will be in accordance with the plans, specifications, reports and related communications approved by the Minnesota Pollution Control Agency and on file in its office; and in accordance with conditions which have been or may be imposed in the permit or any applicable regulations or standards of the Agency.

I also certify that the information contained in this application is true, complete and accurate. Any knowingly false or misleading statement will be subject to penalties provided by law.

Signature of Applicant or Representative John V. Doe
Date January 1, 1980

Route 3, Box 829, Hometown, MN 57413 (507) 924-3561
(Address of Applicant or Representative) area (Phone No.)

B. Inspecting/Assisting Official

Comments & Recommendations The runoff from open lots will be controlled by proposed diversions and holding pond. The operation is well managed.

On site inspection conducted XX yes no
Signature of Official Joe P. Control Phone No. 507/924-3002
Title County Feedlot Officer

Address Skyblue County Courthouse, Hometown, MN 56413



Figure 1. Aerial Photo (Approximate Scale: 1" = 600 Feet)

EXAMPLE: MANURE MANAGEMENT PLAN

Manure will be applied to 160 acres owned, located in the Northeast one-quarter of Section 9, of May Township, and to 100 acres rented, in the West one-half of the Southeast one-quarter of Section 9, of May Township.

The manure will be applied in the spring and fall on fields at rates needed to provide recommended nutrients for the next crop. Injection will be used when weather conditions allow. Fields will be supplemented with commercial fertilizer after soil testing.

Manure not injected will be incorporated within 1 and ½ days and not applied closer than 100 feet of the dry run and intermittent stream.

Components of the Waste Management Plan:

1. size of manure storage (in number of days manure production);
2. number of tillable acres (owned/rented);
3. location of cropland (indicate on soils map or aerial photo);
4. season(s) of application;
5. crop types - nutrient requirements for Nitrogen and Phosphorus;
6. manure application rate proposed (pounds N & P per acre); and
7. method of application/incorporation if any.

EXAMPLE: LOG OF SOIL BORING FOR MANURE STORAGE AREA

0'-2'	ML	Silt Loam
2'-5'	ML CL	Fine Sandy Loam
5'-9'	CL	Sandy Clay Loam
***		Water Table at 8 Feet

Table 1. Daily Manure Production

Animal	Size pounds	Total manure production			Water %	Density lb/cu ft	TS lb/day	VS lb/day	BOD ₅ lb/day	Nutrient content		
		lb/day	cu ft/day	gal/day						N lb/day	P lb/day	K lb/day
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dairy cattle	150	12	0.19	1.5	87.3	62	1.6	1.3	0.26	0.06	0.010	0.04
	250	20	0.32	2.4	"	"	2.6	2.1	0.43	0.10	0.020	0.07
	500	41	0.66	5.0	"	"	5.2	4.3	0.86	0.20	0.036	0.14
	1000	82	1.32	9.9	"	"	10.4	8.6	1.70	0.41	0.073	0.27
	1400	115	1.85	13.9	"	"	14.6	12.0	2.38	0.57	0.102	0.38
Beef cattle	500	30	0.50	3.8	88.4	60	3.5	3.0	0.80	0.17	0.056	0.12
	750	45	0.75	5.6	"	"	5.2	4.4	1.2	0.26	0.084	0.19
	1000	60	1.0	7.5	"	"	6.9	6.0	1.6	0.34	0.11	0.24
	1250	75	1.2	9.4	"	"	8.7	7.4	2.0	0.43	0.14	0.31
	cow ^b	63	1.05	7.9	"	"	7.3	6.2	1.7	0.36	0.12	0.26
Swine												
Nursery pig	35	2.3	0.038	0.27	90.8	60	0.20	0.17	0.07	0.016	0.0052	0.010
Growing pig	65	4.2	0.070	0.48	"	"	0.39	0.31	0.13	0.029	0.0098	0.020
Finishing pig	150	9.8	0.16	1.13	"	"	0.90	0.72	0.30	0.068	0.022	0.045
	200	13	0.22	1.5	"	"	1.2	0.96	0.39	0.090	0.030	0.059
Gestate sow	275 ^b	8.9	0.15	1.1	"	"	0.82	0.66	0.27	0.062	0.021	0.040
Sow & litter	375 ^b	33	0.54	4.0	"	"	3.0	2.4	1.0	0.23	0.076	0.15
Boar	350 ^b	11	0.19	1.4	"	"	1.0	0.84	0.35	0.078	0.026	0.051
Sheep	100	4.0	0.062	0.46	75	65	1.0	0.85	0.09	0.045	0.0066	0.032
Poultry												
Layers	4	0.21	0.0035	0.027	74.8	60	0.053	0.037	0.014	0.0029	0.0011	0.0012
Broilers	2	0.14	0.0024	0.018	"	"	0.036	0.025	0.0023	0.0024	0.00054	0.00075
Horse	1000	45	0.75	5.63	79.5	60	9.4	7.5	-	0.27	0.046	0.17

Table 2. Annual Fertilizer Content, Approximate

Nutrients available after losses due to handling and storage. To convert P_2O_5 to elemental P, multiply by 0.44. To convert K_2O to elemental K, multiply by 0.83.

Dashed lines refer to example.

Handling and disposal method	Swine			Beef			Dairy			Broiler			Layer			Turkey			
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
	----- Fertilizer content, lb/1000 lb liveweight -----																		
Manure pack																			
Broadcast	84	107	124	63	77	99	77	50	112	215	200	149	135	202	129	168	204	195	
Broadcast and cultivation	102	107	124	77	77	99	91	50	112	263	200	149	102	202	129	202	204	195	
Daily scrape																			
Broadcast	-	-	-	-	-	-	89	52	104	-	-	-	155	202	123	-	-	-	
Broadcast and cultivation	-	-	-	-	-	-	106	52	104	-	-	-	188	202	123	-	-	-	
Open lot																			
Broadcast	58	61	80	44	45	64	51	30	59	-	-	-	-	-	-	117	120	104	
Broadcast and cultivation	70	61	80	53	45	64	61	30	59	-	-	-	-	-	-	141	120	104	
Deep pit																			
Broadcast	-	-	-	-	-	-	-	-	-	-	-	-	164	209	123	-	-	-	
Broadcast and cultivation	-	-	-	-	-	-	-	-	-	-	-	-	201	209	123	-	-	-	
Manure pit																			
Broadcast	95	111	119	69	82	95	87	54	107	-	-	-	-	-	-	-	-	-	
Knifing	124	111	119	94	82	95	114	54	107	-	-	-	-	-	-	-	-	-	
Irrigation	92	93	99	65	82	95	84	45	89	-	-	-	-	-	-	-	-	-	
Lagoon																			
Irrigation	24	25	89	18	18	71	23	14	80	-	-	-	-	-	-	-	-	-	

Calculations Based on the Example Application and Table 1

Example for sows and litters

manure generated

$$10 \text{ sows and litters: } 10 \times \frac{4 \text{ gal.}}{\text{day}} \times 180 \text{ days} = 7,200 \text{ gal.}$$

nutrients in manure

$$(10 \text{ sows and litters): } 10 \times \frac{.23 \text{ lbs. N}}{\text{day}} \times 365 \text{ days} = 840 \text{ lbs. N}$$

$$10 \times \frac{.076 \text{ lbs. P}}{\text{days}} \times 365 \text{ days} = 277 \text{ lbs. P}$$

$$10 \times \frac{.15 \text{ lbs. K}}{\text{days}} \times 365 \text{ days} = 548 \text{ lbs. K}$$

Using this method and Table 1, you can calculate the totals shows below.

Animal	Gallons of manure per 180 days	Nitrogen	Nutrients lbs./year* Phosphorus	Potassium
10 sows & litters	7,200	840	277	548
10 gestating sows	1,980	266	77	146
100 nursery pigs	4,860	584	189	365
100 finishing hogs	20,340	2,482	803	1,643
200 feeder cattle	270,000	18,980	6,132	13,870
Totals		23,112	7,478	16,572

Example for Estimating Needed Storage Volume.

Assume six (6) month (180 days) storage is desired. Manure and wastewater generated:

100 finishing hogs	20,430 gals. = 2,719 cubic feet
wash water (25%)**	5,108 gals. = 682 cubic feet
1 foot air space under slatts***	<u>5,984 gals. = 800 cubic feet</u>
	31,522 gal. = 4,202 cubic feet

Solution: 55'x10'x8' (4,400 cubic feet) poured concrete pit would be adequate for the six (6) months storage for this unit.

* Approximate nutrient content of fresh manure.

** Volume of washwater will be an additional 25 to 50% of the manure generated depending on the management practices. (You may need to add storage volume for leaking waterers or continuous overflow waterers.)

*** Air space needed for ventilation purposes.

Example of How to Use Table 2 for Developing a Waste Management Plan

Step 1. Calculate live animal weight (LW) for each type of livestock.

Animal Type	Average Weights (Pounds)	Group Weights (Pounds)
200 feeder cattle	750	150,000 lbs. live animal weight (L.W.)
10 sows and litters	375	3,750
10 gestating sows	275	2,750
100 nursery pigs	35	3,500
100 finishing hogs	150	15,000

Total hog weight = 25,000 lbs. (L.W.)

Step 2. Divide total weight of livestock type by 1,000. 150,000 lbs. (L.W.) \div 1,000 = 150 beef cattle units; 25,000 lbs. (L.W.) \div 1,000 = 25 hog units

Step 3. Refer to Table 2, Annual fertilizer content for pounds of nutrients available after losses due to handling and storage.

If manure is broadcast with incorporation within two (2) days; Table 2 gives the following values for each 1,000 pound unit. (lbs. nutrient available/yr.)

beef cattle on open lots: 53 lbs.N; 45 lbs. P₂O₅; 64lbs. K₂O

hogs with manure pits: 124 lbs.N; 111 lbs. P₂O₅; 119 lbs. K₂O

Step 4. Multiply livestock units (from Step 2) by nutrient values (from Step 3).

150 x 53 = 7,950	150 x 45 = 6,750	150 x 64 = 9,600
25 x 124 = 3,100	25 x 111 = 2,775	25 x 119 = 2,975
11,050 lbs.N.	9,525 lbs. P ₂ O ₅	12,575 lbs. K ₂ O

Step 5. Calculating land needed for spreading.

Corn yielding 150 bu/ac needs: $\frac{185 \text{ lbs.N}}{\text{ac}}$ $\frac{80 \text{ lbs.P}_2\text{O}_5}{\text{ac}}$ $\frac{215 \text{ lbs.}}{\text{K}_2\text{O ac}}$

Total lbs. Nitrogen (N) available (from Step 4) $\frac{11,050 \text{ lbs. N}}{185 \text{ lbs. N}} = 60 \text{ acres needed ac}$

To get maximum value from Phosphorus (P₂O₅) $\frac{9,525 \text{ lbs. P}_2\text{O}_5}{80 \text{ lbs. P}_2\text{O}_5} = 119 \text{ acres ac}$

To get maximum value from Potassium (K₂O) $\frac{12,575 \text{ lbs. K}_2\text{O}}{215 \text{ lbs.}} = 58 \text{ acres ac}$

SYSTEMS BEING USED FOR FEEDLOT POLLUTION CONTROL

In Minnesota there are several methods of Feedlot Pollution control being used. Diagrams and descriptions of the most common concepts are included on the following pages. There are, of course, variations of these concepts being used and other methods are just coming into being. Most of these alternatives, however, are similar in theory to the ones which will be described.

It must be noted that these systems are, for the most part, collection or storage systems, which require proper management and predetermined areas of cropland for spreading of the manure as fertilizer. Most of these collection systems are designed to hold the quantity of wastes which will be generated over a six to twelve month period. Manure storage allows spreading on land as fertilizer when it can be immediately incorporated into the soil, thereby increasing the fertilizer quality and decreasing the amount of nutrient lost in runoff.

If these collection systems are not managed properly and are allowed to overflow or leak, the ensuing potential pollution hazard will be as detrimental or more so to the environment as natural runoff.

When planning a manure storage facility there are a number of factors which must be considered in the designed storage volume. The following is a partial list of things which should be considered in planning any manure storage system; you should also look for other factors which may influence your system: 1) volume of manure generated by maximum number of animals present; 2) length of storage time desired; 3) land available for spreading at one time; 4) bedding material added to system; and 5) additional water sources including washwater, water overflow, direct rainfall on uncovered storage area, and runoff or roof water collected.

In selecting a waste management system, be sure to consider the moisture content of the manure and bedding, if any, which will dictate the type of equipment which can be used for manure handling and spreading.

Examples of some waste management concepts are illustrated on the following pages. You may wish to refer to Tables 1 and 2 for aid in planning your feedlot operation.

Earthen Collection Basin:

The system diagramed in Figure 2 is used primarily to control runoff from existing open lots

and feeding floors. Initially, the area where the runoff problem exists is surveyed and the natural contours are determined. The best site for a collection basin is then determined, preferably where gravity flow will cause the runoff to enter it. In some areas where lack of space or some other natural factors cause the location of the collection pit to be moved away from the actual feedlot, the runoff is sometimes directed to a central point and pumped to a collection basin which is located a short distance away.

Collection pits are located in areas where the soils are impervious to moisture seeping through them. There are areas in the state where the natural soils are unacceptable for collection pits. In these areas a sealant of some type must be used to make the pit bottoms and sides impervious to seepage.

Materials used to restrict seepage include plastic and rubber liners, soil from another area having high sealant properties, and bentonite clay type materials.

The entire feedlot area will be sloped so that all runoff enters the collection basin. A clean water diversion system will be constructed so that uncontaminated waters from other areas will not enter the feedlot area. The diversion system usually consists of a dike or berm constructed around the perimeter of the feedlot and, in some cases, a water channel to direct the clean water around the feedlot.

In addition to controlling the runoff from the feedlot area, provisions are made for storage of the solid manure.

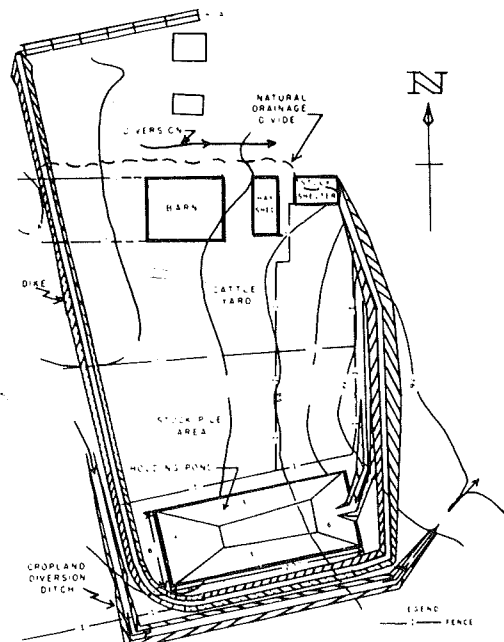


Figure 2. Earthen Collection Basin

Building with Concrete Collection Pit:

These systems are becoming more popular as herd sizes increase and complete confinement of animals becomes more prevalent. Besides controlling runoff, they enable the operator to manage the system with a minimum of manure handling.

The system consists of a concrete collection pit which will be situated directly under the confinement building. The walls and floor of these pits are reinforced to withstand the pressures exerted on them by both the contents of the pit and the external water and soil pressures.

There are variations in the way these pits are constructed in relation to the building. In some, the walls of the pit actually serve as the foundation of the building. In others, the pits are smaller in area than the actual building and the walls do not have to double as a support structure.

The area and depth of these pits will be determined by the number and type of animals to be housed and the length of storage time desired. Again, storage space for six months accumulation of manure and wash water is the minimum suggested size.

The method in which the manure enters the pit also varies. In some operations, primarily those involving meat producing animals, the major portion of the building is constructed with slatted floors. Openings between the slats allow the material to pass through the floor and be collected in the storage pit.

In other operations, primarily dairy, only gutter-sized areas are slatted, or a standard barn cleaner conveys the waste materials from the gutter to a central point where it is deposited into the pit.

The material from the pit is pumped out periodically and spread as fertilizer.

Ventilation is of primary importance in these operations. Bacterial action in the pit produces gases which may be either poisonous, (i.e. hydrogen sulfide), or explosive, (i.e. methane) if great enough quantities are allowed to remain within the building. Plans must be made for these gases to escape from the facility.

The figure 4 illustrates a concrete pit system.

A system which is similar in concept can be designed for existing buildings. The concrete pit is located adjacent to the building rather than under it and the waste material is mechanically conveyed to the pit. These outdoor pits must be covered or fen-

ced for safety reasons and pumped out to remove all solids as well as the liquid fraction of the manure.

THE ROLE OF THE COUNTY IN THE FEEDLOT PERMIT PROGRAM

In December of 1979, new rules were adopted to allow the processing of feedlot permits by the counties. These rules give the county government a role in assisting the farmer to meet Minnesota Pollution Control Agency rules for the control of pollution from animal feedlots. Under this program, any participating county may, at the option of the County Board, participate in the issuing, denying, modifying, or revoking of feedlot permits and certificates of compliance.

Under this program there are several advantages to the feedlot operator. He is able to deal at the local level with someone he knows and who is familiar with the situation. The feedlot operator is assured that prompt action will be taken on his application for a feedlot permit. The County Feedlot Officer is a source of accurate information close at hand and readily accessible.

At the county level, local input is maximized. The designated county official will not issue a feedlot permit unless all local ordinances and zoning regulations are complied with by the feedlot owner. Most non-pollution problems that arise are usually most effectively handled at the local level and do not require the intervention of a state agency.

When a county is officially participating in the feedlot program, the permit applications are handled in the following manner. The County Feedlot Officer makes certain that the permit application is completely filled out, and that it meets all local laws and regulations. The county will forward all applications for feedlots with greater than 1,000 animal units to MPCA for evaluation. The county will also forward applications for feedlots having 300 to 1,000 animal units with potential pollution hazards and all applications where the potential pollution hazard will not be corrected within a ten (10) month period. The participating county will issue interim permits for feedlots under 300 animals having a potential pollution hazard which will be corrected within ten (10) months. The county will also issue certificates of compliance for operations under 1,000 animal units which do not have a potential pollution hazard.

Where the county decides not to participate in the feedlot program, the farmer will still be required to obtain an animal facility permit from the MPCA, but will not have the benefit of a local official who

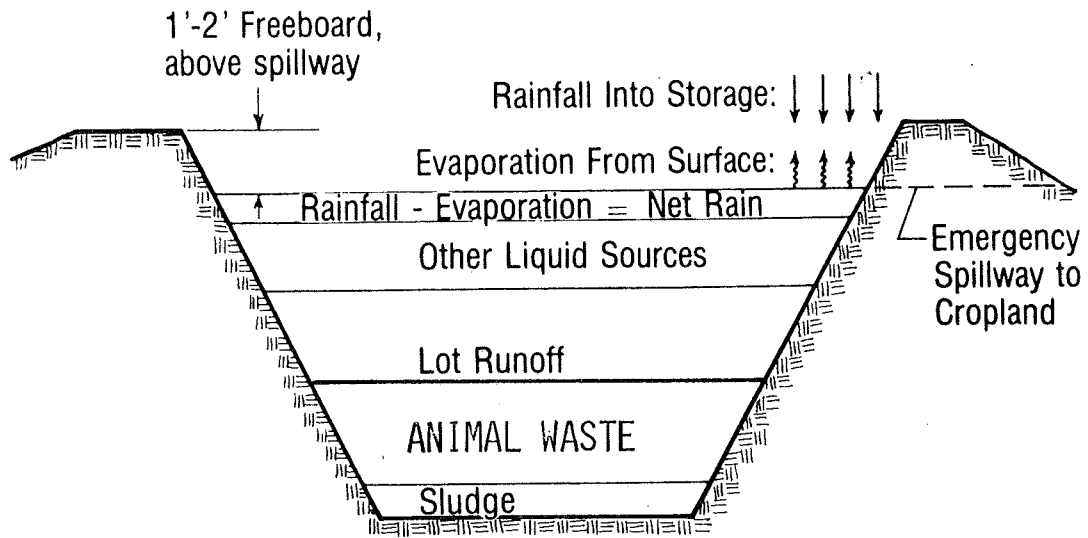


Figure 3. Holding Pond Capacity

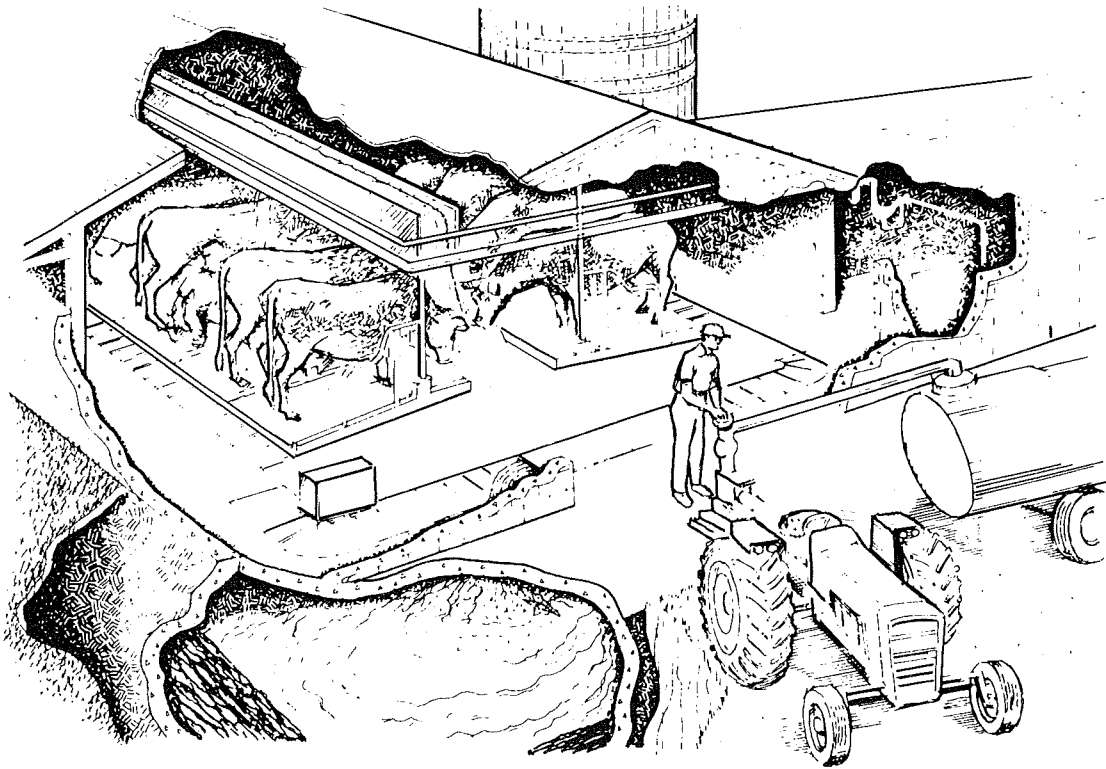


Figure 4. Building With Concrete Collection Pit

can process his application, the farmer must send the material to the MPCA for processing.

Further information about the County Feedlot Permit Processing Program may be obtained by contacting the Agricultural Unit, MPCA, 1935 West County Road B-2, Roseville, Minnesota 55113.

COMPLAINT HANDLING PROCEDURES

If a complaint is received by the Minnesota Pollution Control Agency about any feedlot, the following procedures are followed:

Agency personnel make an on-site inspection of the feedlot and if at all possible, discuss the operation with the owner and/or operator. In many cases, the complaint is unfounded or some relatively easy abatement procedures may solve the problem. Other problems however, will require technical assistance to correct the problem. The Agency personnel will indicate what governmental assistance is available and what other operators have done; he will not propose any specific plans or programs for the operator to follow.

The Agency Rules require that, if a potential pollution hazard is found to exist on any feedlot operation, the owner of the feedlot is to be notified of this fact. The owner must, within a reasonable amount of time, respond to the Minnesota Pollution Control Agency with his plans for abatement facilities to be constructed and a timetable for the construction.

If the owner or operator is not available during the time of the on-site inspection, and a potential pollution hazard is found to exist, the owner will be sent a letter informing him that the inspection was made, what the findings were, and that an opportunity to discuss the situation is to be afforded to him before official notification is made. This letter is sent so that the best working relationship can be attained.

Should the owner choose not to reply to the Minnesota Pollution Control Agency within the requested period, one (1) or more reminder letters are sent to him. If no response is received to the final letter, the Agency staff will submit the matter to the Agency Board with a recommendation that it be turned over to the Attorney General for whatever legal or administrative action is necessary.

TAX BENEFITS

Both the State of Minnesota and the Federal Government have passed various tax statutes

designed to provide some manner of beneficial tax treatment for those taxpayers that have installed pollution control facilities. The following discussion will set out those tax benefits available to the Minnesota taxpayer and in particular, the Minnesota farmer; however, this discussion is meant only for informative purposes and not as a legal analysis of a taxpayer's right under applicable law. Furthermore, there will be no attempt to explain how the statutes apply and to what extent. Any further questions should be directed to a qualified tax consultant, U.S. Internal Revenue Service, or Minnesota Department of Revenue.

Federal Credits:

Federal Accelerated Depreciation of 10% Federal Investment Credit.

"Certified pollution control facilities" may be eligible for a 60 month amortization period or an investment credit when figuring federal tax deductions. Section 169 of the Internal Revenue Code is the only federal law which provides a possible tax break for the farmer installing pollution control facilities. The tax payer has the option of selecting the 60 month amortization period rather than the ordinary depreciation deduction for "certified pollution control facilities". The 10% federal investment credit is only available for the year in which you installed the pollution control equipment.

A Certificate of Compliance or a Feedlot Permit issued by the Minnesota Pollution Control Agency can be used for certification of pollution control facilities. IRS Publication 577 will help in determining eligibility.

Minnesota Income Tax Credits:

The following two (2) Minnesota Statutes provide for an income tax credit where a taxpayer installs and operates equipment or devices for pollution control.

Minnesota Statute Section 290.06, Subsection 9 (1979), authorizes a 5% credit for the cost of equipment installed to abate pollution. The credit is limited to \$75,000. maximum but does provide for a carry forward of up to four (4) years for any unused portion of the credit.

Minnesota Statute Section 290.06, Subsection 9(a) (1979), applies explicitly to feedlot pollution control equipment and allows a 10% credit, as opposed to 5% with no limit on the amount of the credit. If the amount of the credit exceeds the taxpayer's liability for taxes in the taxable year in which the purchase is made, then the excess amount may be carried forward four (4) taxable years.

A taxpayer cannot claim both a 5% and 10% credit for the same equipment but must choose between the two (2) provisions. This is not to say, however, that equipment would necessarily qualify for both credits.

To apply for the above income tax credits, the taxpayer must complete a Schedule PC, a form distributed by the Department of Revenue, which is attached to the income tax return when filing.

Certification from the Minnesota Pollution Control Agency must be submitted with the Schedule PC, except when the credit is for a slurry manure spreader, soil injection equipment, conventional spreader with end gates, or for manure pumps. A copy of an Agency Certificate of Compliance or Permit page which includes the location and description of the eligible equipment provides this certification. The certificate of compliance contains a special listing of the equipment approved for tax benefits. Eligible equipment consists of: lagoons, earthen holding ponds, aerating equipment, slatted floors, concrete manure pits, tanks, stacking slabs, earthen diversions, runoff collection basins and treatment systems. If credit is denied or if equipment is not listed here or on a certificate of compliance, a "Request for Approval of Feedlot Pollution Control Equipment Credit", MPCA Form 613, may be obtained at the locations where permit applications are available or by writing to the Agricultural Unit, Division of Water Quality, Minnesota Pollution Control Agency, 1935 West County Road B-2, Roseville, Minnesota 55113.

Summary of Requirements for Tax Credit Eligibility:

The 10% income tax credit applies only if the equipment meets the rules prescribed by the Minnesota Pollution Control Agency and if the equipment or device is installed and operated within the State by a feedlot owner to prevent, control, or abate air, land or water pollution.

1. The applicant must provide the State Department of Revenue with evidence of approval by MPCA. The applicant must hold a Permit or Certificate of Compliance issued by the MPCA.
2. The operation must qualify as an Animal Feedlot. (See definition in earlier section.)
3. The equipment or facility eliminates or prevents a condition which may in the reasonable foreseeable future cause pollution of the land, air or waters in this state.
4. Equipment or devices were purchased or installed after January 1st of the taxable year.

5. The applicant must obtain the proper form (e.g. Schedule PC or Request for Exemption) from a tax consultant or the Department of Revenue.

Property Tax Exemptions:

MSA 272.02 (15), provides that real and personal property in use primarily for pollution control will be exempt from property taxes. Equipment and devices to be exempt must be installed pursuant to an Agency permit, certificate of compliance, or order issued by the MPCA.

A taxpayer requesting exemption of all or a portion of any equipment or device used primarily for pollution control must file an application form "Request for Exemption of Tax on Property Used for Control of Air, Land, and Water Pollution." This form may be obtained from county assessors or from the Property Equalization Division, Centennial Office Building, St. Paul, Minnesota 55145.

A copy of a MPCA Permit or Certificate of Compliance must be attached to the "Request for Exemption" as proof of eligibility.

THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AGRICULTURAL PERMIT PROGRAM 1

The Clean Water Act which was passed in October, 1972 by the United States Congress, identified the confined feeding of livestock as one of many point sources of pollution. As a result, certain livestock producers are required to make application for a National Pollutant Discharge Elimination System (NPDES) Permit. The NPDES Permit is different from a MPCA feedlot permit and the two (2) should not be confused. If you need a NPDES permit, you would probably need a MPCA feedlot permit also.

Who Must Apply:

Livestock producers must make application for an NPDES discharge permit if they have a discharge or a potential discharge of manure or runoff and have in a single location for more than 30 days, not necessarily consecutive, during the 12 months, 1,000 or more beef cattle, 2,500 or more hogs over 55 pounds, 700 mature dairy cows, 55,000 or more turkeys, 10,000 or more sheep, 30,000 or more layers or broilers with a liquid manure handling system, 100,000 or more layers or broilers with a continuous overflow watering system or 5,000 or more ducks. If a producer has several types of livestock at one location he might also need to

make application. This can be determined by the use of animal equivalents based on beef cattle. For example, a mature dairy cow is equal to 1.4 beefs, a hog is equal to 0.4 beefs, a sheep is equal to 0.1 beefs. These animal units can then be combined as shown in this example:

600 beef cattle x 1.0 = 600 animal units
200 dairy cows x 1.4 = 280 animal units
500 hogs x 0.4 = 200 animal units
200 sheep x 0.1 = 20 animal units
1,100 animal units

If these 1,100 animal units were located at one farm and there is a potential discharge, then an application for an NPDES permit should be made.

In addition, if the EPA or the State Pollution Control Agency identifies the livestock operation as a significant contributor of pollutants² an application for an NPDES permit should be made.

***Footnotes:**

1. The NPDES permit is in addition to the MPCA feedlot permit. The larger operators will be required to obtain both permits and the smaller operators need only obtain a MPCA feedlot permit.
2. A farmer who has a MPCA feedlot permit, less than 1,000 animal units, and complies with MPCA regulations, will not be considered a significant contributor of pollution.

What is a Discharge:

The most common type of discharge is the runoff from an open lot which results from a heavy rainfall. If this runoff can reach an open ditch, stream or lake, it is then a discharge and the feedlot operator must obtain an NPDES permit. Another type of discharge can result from mismanagement which allows the manure in a liquid manure tank to overflow and reach a surface body of water.

The Minnesota Pollution Control Agency has assumed the responsibilities for the Administration of the NPDES Permit Program. The MPCA Agricultural Unit is handling the short form B and questions should be referred to them at 1935 West County Road B-2, Roseville, Minnesota 55113.

In order to obtain the NPDES permit, a runoff control system and manure handling technique must be developed which will result in no discharge of manure to any open ditch, stream, pond or other body of water, except what might result due to extreme climatic conditions. These climatic conditions are selected by EPA so that the impact on water quality would be minimal. The final effluent guideline states that the runoff control facilities must be constructed to store the 25 year-24 hour rainfall event.

Those livestock production facilities which cannot meet these requirements will be issued a schedule of implementation which can give them a period of time to complete the construction of the facilities needed to insure no discharge.

Why Obtain a Discharge Permit:

The farmer with an NPDES discharge permit is the only farmer who can legally discharge point source wastewater. Even though the only discharge allowed on an NPDES permit holder would be that resulting from an extreme climatic event, the livestock producer who has a discharge or potential discharge would be given a permit with a schedule of implementation which would eliminate this unauthorized discharge. If a livestock producer has not made application for an NPDES discharge permit, his discharge cannot be authorized. An unauthorized discharge is illegal and he can be prosecuted for violations of the Federal Water Pollution Act.

The producer is also given financial protection if he applies for an NPDES permit. If his facilities are constructed to meet the promulgated performance standard for new facilities, he will not be required to meet any more stringent requirements for ten (10) years.

The goal of the entire NPDES permit program is to restore water quality. The agricultural permit program is designed to work with the small group of livestock producers who pose a large threat to the environment.

The vast majority of well-managed feedlots will not be required to make additional investments. Under this approach, facilities which need pollution controls will be assisted and those that do not have a potential discharge will not be bothered.

If the farmer is unsure of a potential discharge, we recommend that an application for a NPDES permit be made and the Pollution Control Agency make the decision.

MINNESOTA POLLUTION CONTROL AGENCY REGIONAL OFFICES

The Minnesota Pollution Control Agency, during the summer of 1972, established five district offices throughout Minnesota. The staff of these offices are available to the general public for any questions or problems which may arise regarding pollution control. These offices were established to facilitate better and closer contact between the Agency and the people and local governments in areas of the State.

Central Office

Minnesota Pollution Control Agency
Division of Water Quality
Agricultural Unit
1935 West County Road B-2
Roseville, MN 55113
PH: (612) 296-7326

Brainerd Regional Office MPCA

304 East River Road, Suite 3
Brainerd, MN 56401
PH: (218) 828-2492

Detroit Lakes Regional Office MPCA

116 East Front Street
Detroit Lakes, MN 56501
PH: (218) 847-1519

Duluth Regional Office MPCA

101 - 1015 Torrey Building
Duluth, MN 55802
PH: (218) 723-4660

Marshall Regional Office MPCA

Box 286, 1104 East College Drive
Marshall, MN 56258
PH: (507) 537-7146

Rochester Regional Office MPCA

1200 South Broadway, Suite 140
Rochester, MN 55901
PH: (507) 285-7343

The following page outlines the boundaries of these districts.

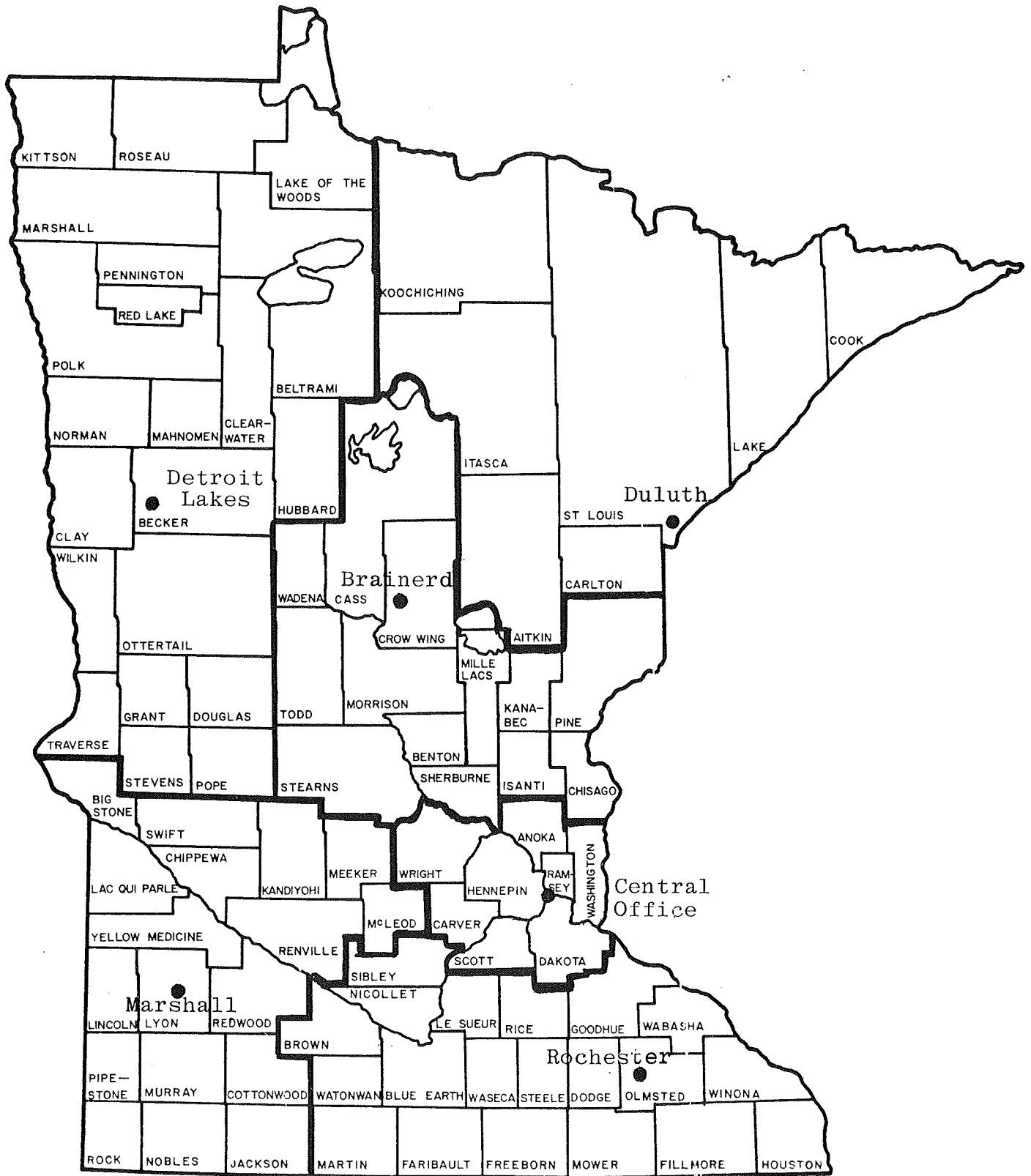


Figure 5. MPCA Regional Offices