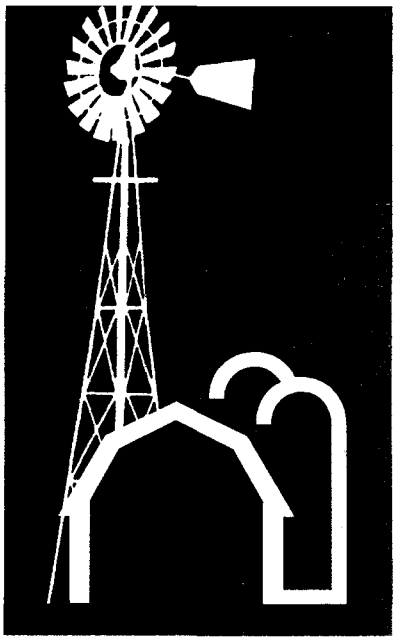

PROTECTING YOUR GROUNDWATER THROUGH FARMSTEAD ASSESSMENT

AE-1079

NORTH DAKOTA STATE UNIVERSITY
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Assessing Your Livestock and Dairy Operation

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Livestock and dairy operations on a farmstead can generate large amounts of waste and wastewater. These materials are often associated with bacterial and nutrient contamination.

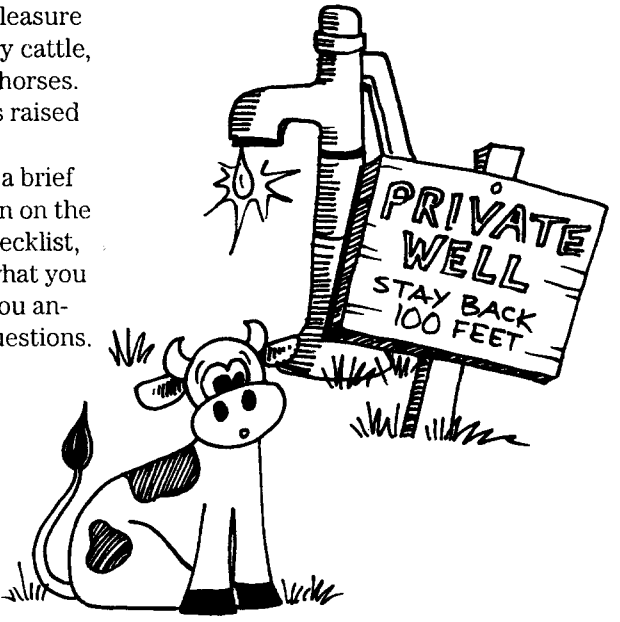
Concentrated feeding or feedlot means any livestock feeding, handling or holding operation or feed yard where animals are concentrated in an area (a) which is not normally used for pasture or for growing crops and in which wastes may accumulate, or (b) where the space per animal unit is less than 600 square feet.

The term livestock means any animal raised for food or pleasure and includes beef and dairy cattle, sheep, swine, poultry and horses. It also includes fur animals raised for their pelts.

This circular contains a brief discussion of each question on the Farmstead Assessment checklist, and a section discussing what you can do and who to call if you answer "Yes" to any of the questions.

1 Do you have livestock/ poultry within 100 feet of your well?

All livestock operations should be located at least 100 feet from private wells (including abandoned wells) and 500 feet from public wells. If your livestock operation is within 100 feet of your well, your well water should be tested for bacteria and nitrates by a qualified laboratory. It may be necessary to change your feedlot arrangement or treat your water supply if your well water has high levels of either of these contaminants.



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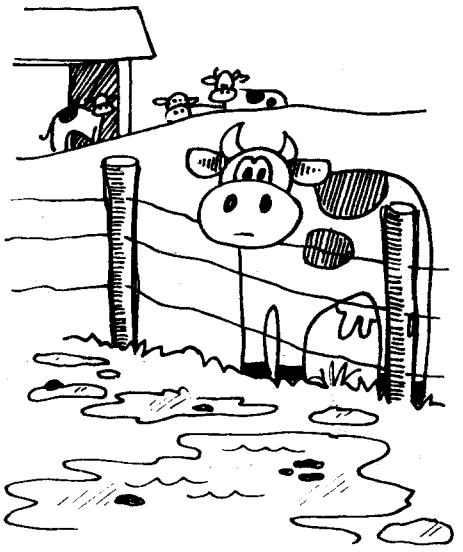
2 Do you store manure within 250 feet of your well?

Livestock manure is generally stored in either liquid, semi-solid or solid forms. Each of these systems works well, but do require conscientious management to prevent groundwater contamination. Whenever a potential contaminant is concentrated in a small area, the risks to groundwater increase. Of particular concern are existing wells that provide a direct path for contaminated surface water to reach the groundwater. Distance between waste storage sites and wells is the best preventive measure that can be taken. Avoid manure storage within 250 feet of your well.

Waste storage sites that reduce off-site movement of waste materials also reduce the risk to groundwater. Reducing the volume of waste material stored by regular cleaning of the storage facility is a good management technique. An effective volume reduction method that has other benefits is to return livestock waste to the land as fertilizer for crops or pasture. Proper placement of wastes in a flat area can help reduce the size and capacity of the waste control facility needed.



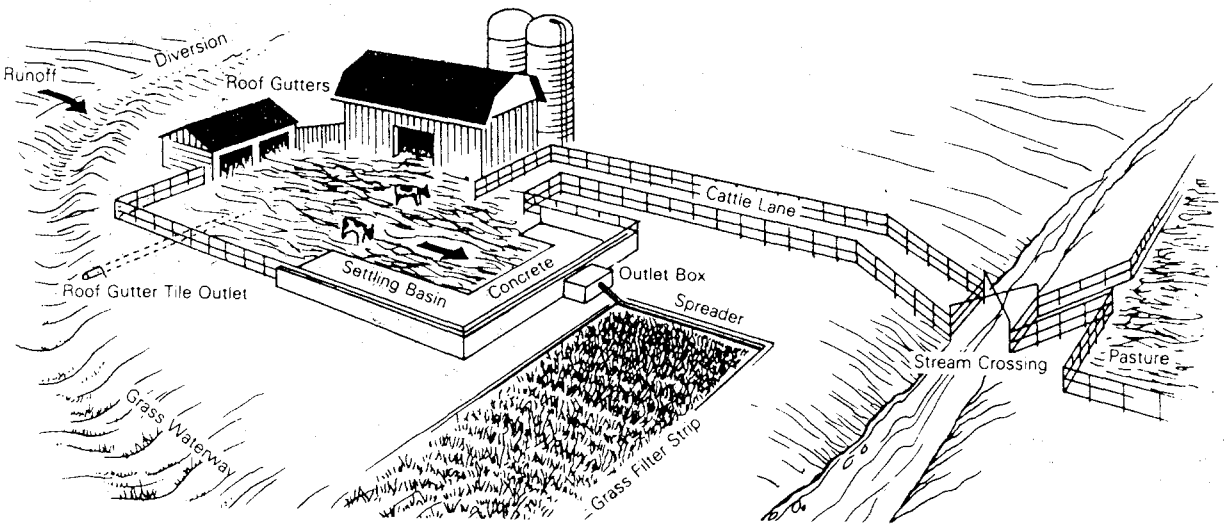
3 Does runoff from your livestock feedyard run near your well?

Runoff from outdoor livestock areas can transport animal waste to locations that may cause water contamination. Runoff is affected by slope, rainfall and maintenance of the feedyard.

Your livestock operation should be located downslope from your well, so that runoff will not drain toward the well. Surface water should be diverted around the feedyard and any waste storage facility. Snow melt can generally be controlled by proper location of shelterbelts or a shallow ditch that interupts snow melt and diverts it past the feedyard area.

4 Do you dispose of dead animals on your farmstead near your well?

Dead animal disposal on a farm can be a possible risk to groundwater contamination. Dead animals can be carriers of disease. If animals are thrown into an open pit or improperly buried in a high water table area, they can contaminate your water source. In regard to dead animal disposal, local health laws may be in effect. In the absence of local ordinances, there are three proper ways to dispose of dead animals according to North Dakota law. They are burning, burial and using a rendering service. If a rendering service is used, it must be done within 36 hours of the animal's death. If the animal died due to a disease such as Anthrax, it is recommended to burn the animal and then bury it. In areas where high water tables exist, burying animals is not recommended. Burning and then burying is considered a better practice in these areas.



A barnyard runoff management system will help prevent groundwater contamination.
(Source: Craig Thompson, Wisconsin Department of Natural Resources)

5 Do you store silage within 50 feet of your well?

Silage is an integral part of many livestock operations. However, silage can also be a water quality problem because of high levels of nitrogen. Large amounts of leachate can be produced from silage if careful management is not used.

The amount of leachate produced from silage depends on the material stored, moisture content, and storage conditions. For example, grass silage at 75 percent moisture will only produce a trickle of leachate, while grass silage at 85 percent moisture will produce as much as 79 gallons of leachate per ton.

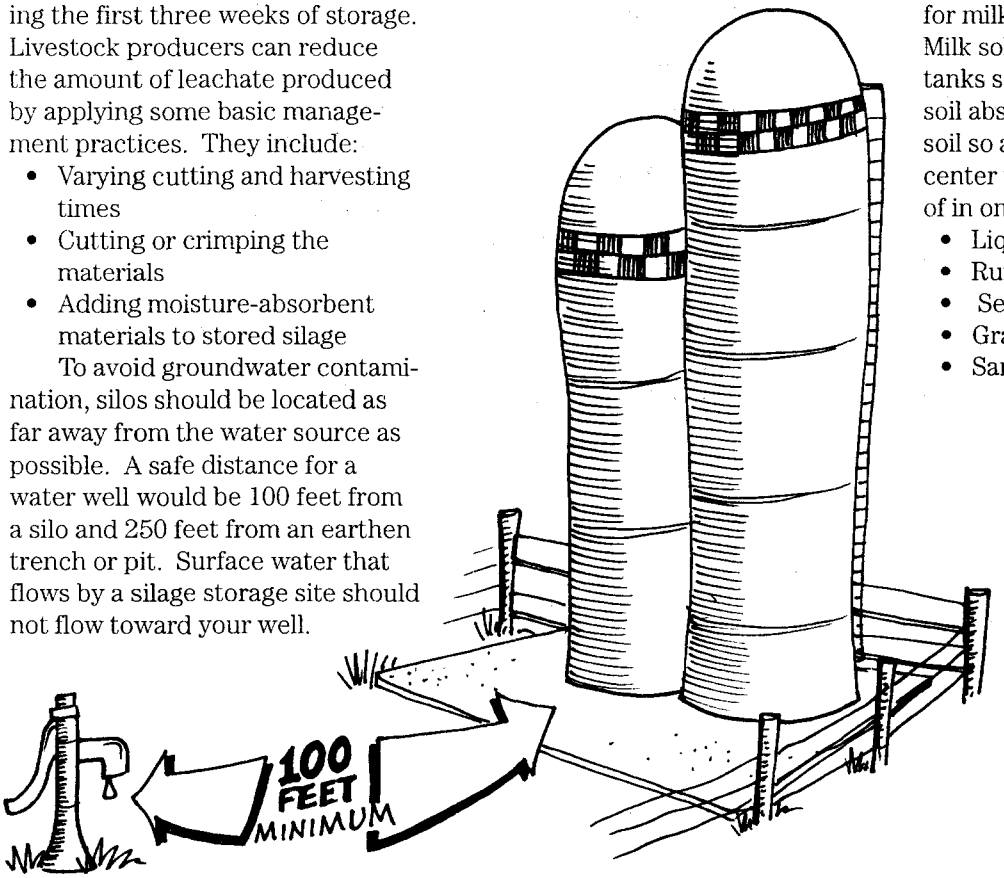
Approximately three-quarters of leachate produced occurs during the first three weeks of storage. Livestock producers can reduce the amount of leachate produced by applying some basic management practices. They include:

- Varying cutting and harvesting times
- Cutting or crimping the materials
- Adding moisture-absorbent materials to stored silage

To avoid groundwater contamination, silos should be located as far away from the water source as possible. A safe distance for a water well would be 100 feet from a silo and 250 feet from an earthen trench or pit. Surface water that flows by a silage storage site should not flow toward your well.

6 Is your silage stored on a permeable soil?

Coarse, permeable soils have greater potential to allow silage leachate to percolate into the ground and eventually the groundwater. If possible, silage storage sites should be located on concrete, pavement or a soil with low permeability. Soils on your farm can be determined by referring to your county soil survey.



7 Is milkhouse wastewater discharged with 250 feet of your well?

Treatment and disposal of milking center wastes must be solved by proper engineering design to protect public health and to prevent pollution of ground and surface waters.

Milking center wastewater is contaminated with organic matter, nutrients, chemicals and microorganisms. Poorly designed or mismanaged waste disposal systems can contaminate water with ammonia, nitrate, phosphorus, detergents and disease-causing organisms.

Do not dispose of milkhouse and parlor wastewater into field tile, streams, lakes or groundwater. Septic tank, soil absorption systems are also *not* recommended for milking center wastewater. Milk solids do not settle in septic tanks so they carry over into the soil absorption system and plug the soil so absorption stops. Milking center wastewater can be disposed of in one of the following:

- Liquid manure system
- Runoff holding pond
- Separate lagoon
- Grassed infiltration area
- Sand filtration

ASSESSING LIVESTOCK AND DAIRY OPERATIONS

If you answered "Yes" to the following questions	What to do	Who to call	Other references
Question 1.	Test your water for nitrate and bacteria contamination. Move livestock area if possible.	North Dakota State Dept. of Health or county Extension office for water testing bottles.	North Dakota Guidelines for the Control of Pollution from Certain Livestock Enterprises. North Dakota State Department of Health.
Question 2.	Move manure storage area. Clean manure on a regular basis.	Local county Extension office for design on proper manure storage.	Livestock Waste Facilities Handbook. Midwest Plan Service MWPS-18.
Question 3.	Divert runoff water around the waste storage facility and away from your well.	Local county Extension office for livestock waste facilities handbook.	Livestock Waste Management with Pollution Control Handbook. Midwest Plan Service. MWPS-19.
Question 4.	Dispose of animals by using a renderer, burning or burial.	Local health unit or county Extension office for information.	North Dakota Board of Animal Health, Bismarck. (701)-224-2654.
Question 5.	Move silage piles if possible. If not, test water for nitrate and bacteria contamination.	North Dakota State Dept. of Health or county Extension office for water testing bottles.	Silo construction guidelines (for tower silos) can be obtained through the International Silo Association, Lenexa KS. (913)-599-1919.
Question 6.	Store silage on a hard, non-permeable surface.	Local Soil Conservation Service office for soil maps.	
Question 7.	Stop dumping milkhouse wastewater within 250 feet of your well.	Local county Extension office for plans to design a proper disposal system.	Dairy Housing and Equipment Handbook. Midwest Plan Service MWPS-7.

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