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## EC71-795 Waste Management for Feedlots

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# WASTE MANAGEMENT

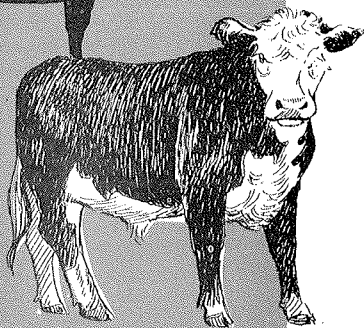
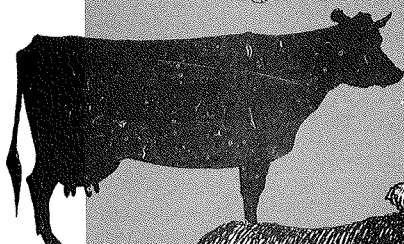
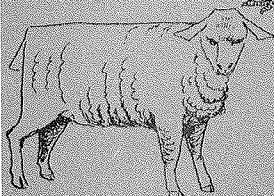
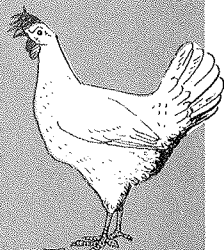
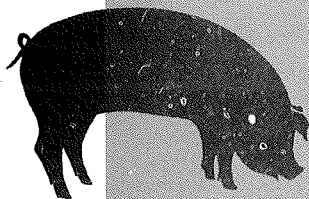
## FOR

# feedlots

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E. F. FROLIK, DEAN J. L. ADAMS, DIRECTOR

# Waste Management for Feedlots

By E. A. Olson  
Extension Engineer (Farm Building)

## INTRODUCTION

Management of livestock wastes is a new, major concern for livestock producers. Recent state and Federal legislation requires that producers prevent wastes from running off their property or from entering water courses and polluting them. These laws are a part of the national effort to improve our environment by enhancing the quality of streams in the interest of public health and safety.

The Nebraska Water Pollution Act<sup>1</sup> states that it is unlawful for any person to cause pollution of any waters of the state or to place, or to cause to be placed, any wastes in a location where they are likely to cause pollution of any waters of the state. It is also unlawful to discharge any wastes into waters of the state which would reduce the quality of such waters below the quality standards<sup>2</sup> established by the Water Pollution Control Council.

This circular provides guidance and information to help livestock producers develop facilities that will, by proper waste management, help them prevent pollution. It is hoped that some of the obvious site planning considerations often overlooked will be carefully considered in making decisions on a new feedlot location.

The first part of this circular deals with selecting a new site for livestock production facilities. Consideration of factors discussed in this section can help reduce potential water and/or air pollution problems.

The second part of this circular contains methods for controlling and managing waste runoff for existing or new lots. These techniques are based on results of recent research on waste management by USDA Agricultural Research Service personnel and the University of Nebraska.

In developing a waste management system for your livestock facilities, help can be obtained from the Soil Conservation Service (SCS) representative of your local Soil and Water Conservation District Office or from consulting engineers.

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<sup>1</sup>Nebraska's Water Pollution Control Act Article 30, Sections 71-3001 through 3016, R.R.S. Nebraska 1943 and LB 360, 1967.

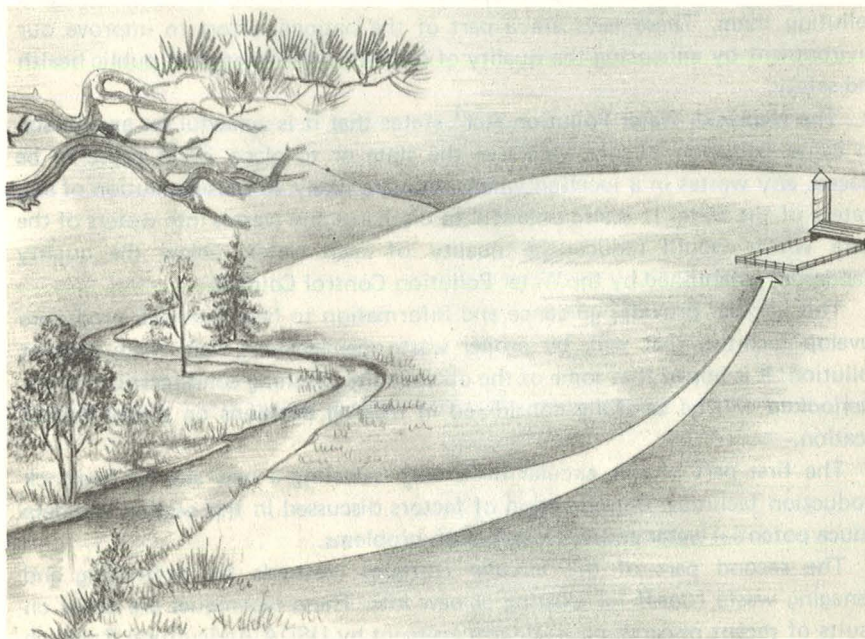
<sup>2</sup>Water Quality Standards applicable to Nebraska Waters adopted by Water Pollution Control Council, January, 1969.

Individual plans for each feedlot will be required since physical conditions such as size, soil types, topography, rainfall and other items will vary for the geographic location. Your action on this problem is urgent. Nebraska law states that livestock waste problems are to be under control by December 31, 1972.

### Locate Feedlots Away From Streams

Locating a feedlot away from a stream greatly reduces pollution potential. It is impossible to suggest a specific distance since lot size, soil topography and soil types will vary. However, space *must* be provided for the construction, maintenance and operation of the waste runoff control facility.

On existing lots, located adjacent to streams, it may be necessary to relocate some or all lots to provide an economical or practical solution for pollution control.

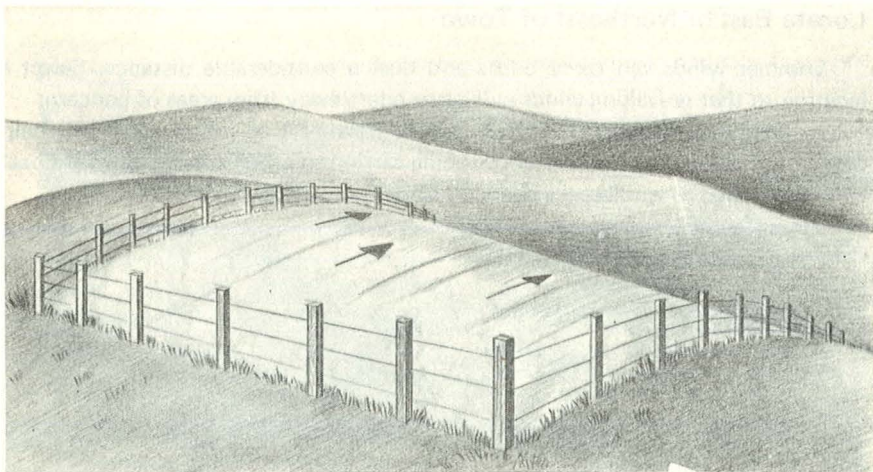


Locate feedlots away from streams.

### Locate Feedlots Near Top of Slope

If feedlots are located near or at the top of a slope, the problem of diverting or handling surface runoff from land higher than the lots is eliminated. If outside water cannot be diverted, runoff control facilities must be adjusted to take care of excess runoff.



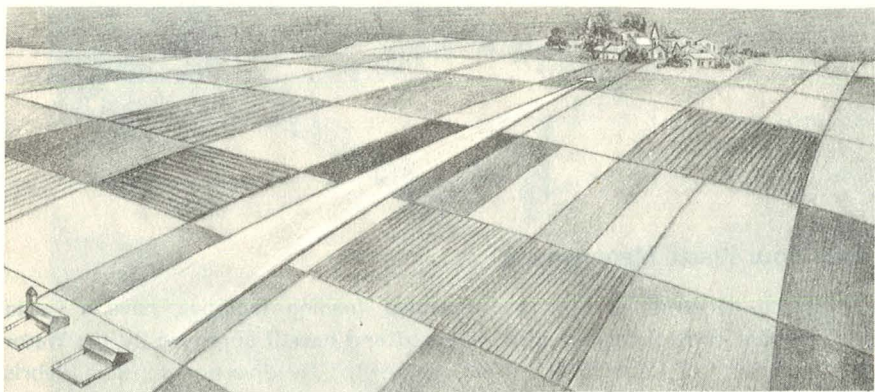


Locate near the top of a slope.

## Build Away From Towns

The livestock producer can avoid potential problems and headaches if he locates his operation some distance from town, housing developments, or recreational areas. This becomes more important when the size of the operation increases. The greater the number of animals, the greater the potential for odor or water nuisance problems.

Consider agricultural zoning. This could provide specified areas for livestock production. Zoning can restrict the location of residential housing in areas zoned for agriculture. Livestock producers need to take the lead in such a program by working through local county government.



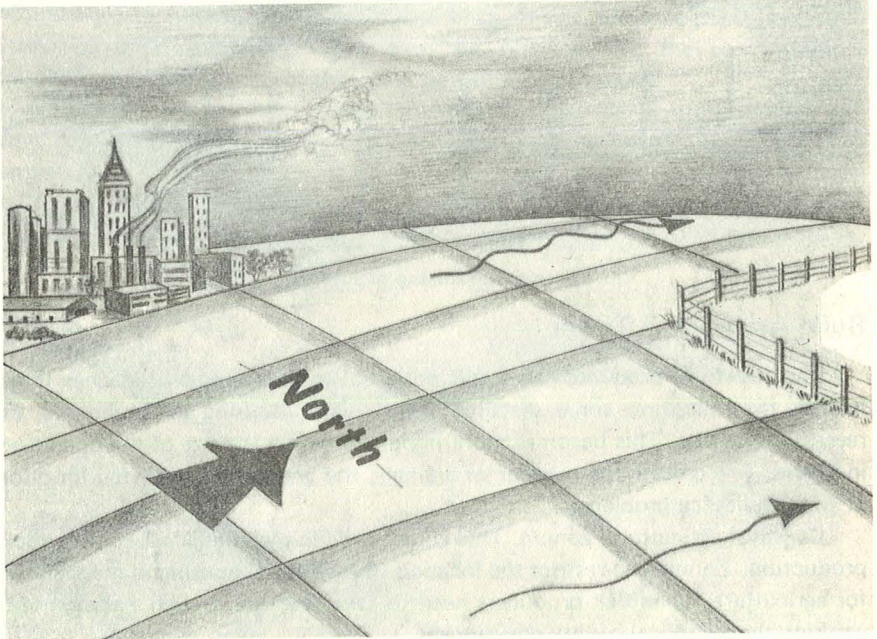
Build away from towns and housing developments.

Encourage county zoning for agriculture.

## Locate East or Northeast of Town

Summer winds can carry odors and dust a considerable distance. Select a location so that prevailing winds will carry odors away from areas of concern.

In Nebraska, a feedlot located east to northeast of urban areas will help reduce the dangers of summer odors being carried to urban areas. However, local conditions such as windbreaks and land slopes may affect wind direction.

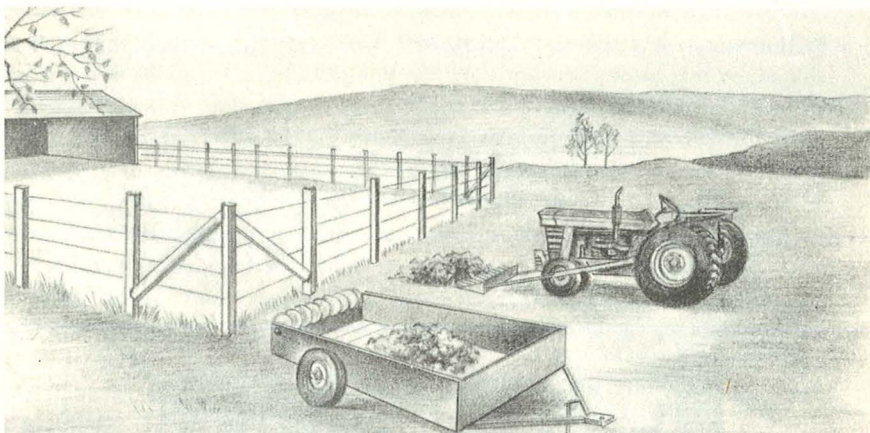


Locate east or northeast of town.

## Plan Your Waste Management

Before constructing new or expanded feeding facilities, have a waste management control facility plan prepared and have it approved by the Water Pollution Control Council. Space will be needed for diversion terraces, debris basins, holding ponds and a disposal area. An allowance of additional space for future expansion can prevent an operation from being "boxed-in."





**Plan your waste management system before you build.**

## **Consider Animal Space**

Consider animal space when planning new facilities. Specific space needs per animal will vary for different parts of Nebraska and may range, for cattle, from 200 to 450 square feet per animal. If oversized lots are provided, there will be more runoff. This will increase the size and cost of waste control facilities.

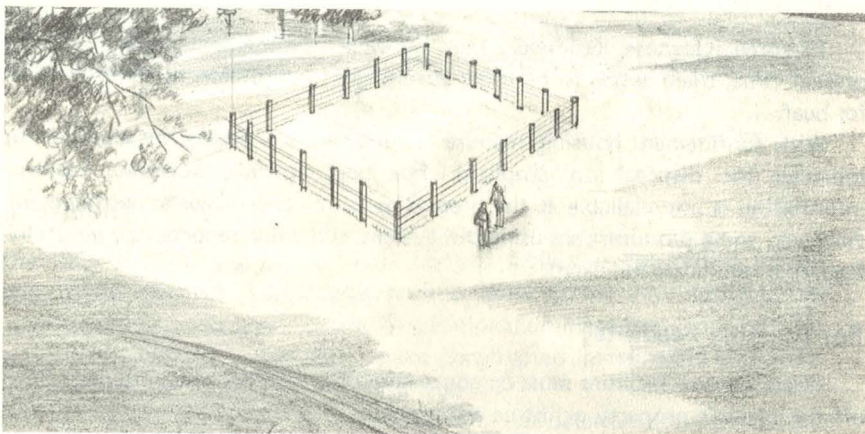
Recommendations on feedlot space needs for animals are given in:

E.C. 63-716 Beef Housing and Equipment Handbook

E.C. 71-726 Dairy Equipment Plans and Housing Needs

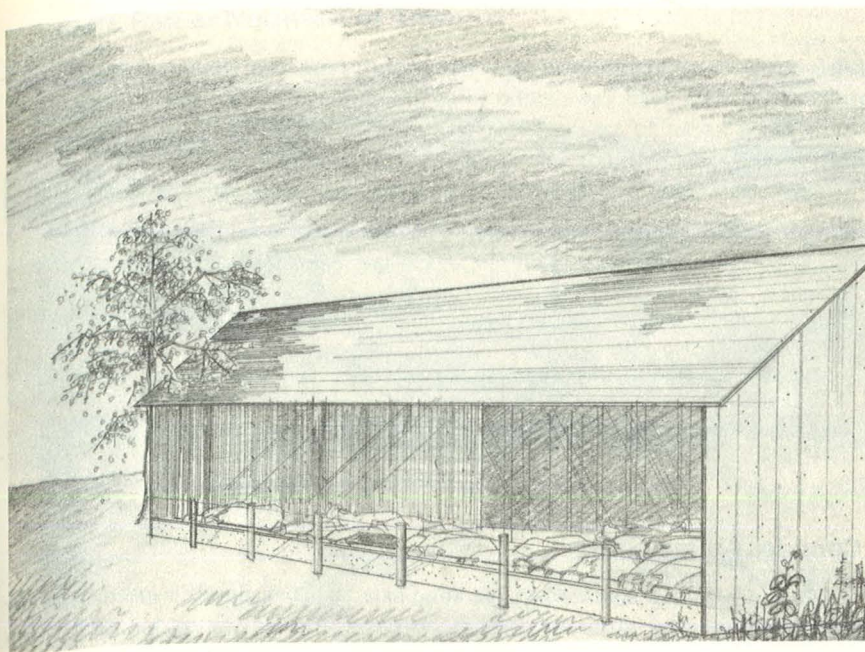
E.C. 64-731 Swine Housing and Equipment Handbook

Copies are available from your county Extension office.



**There will be more runoff from an oversize lot.**

**Allow required space for the desired number of animals in lots.**



**Consider confinement feeding.**

## **Confinement Feeding**

In some instances, producers may consider confinement housing. At the present time, there seems to be more advantages in confinement for swine than for beef.

With confinement housing, manure is collected in a storage pit and must be removed for disposal on cropland. For beef animals, adequate research information is not available at the present as to the advantages of confinement. However, some producers are using this system; and while reports vary generally, favorable results are indicated.

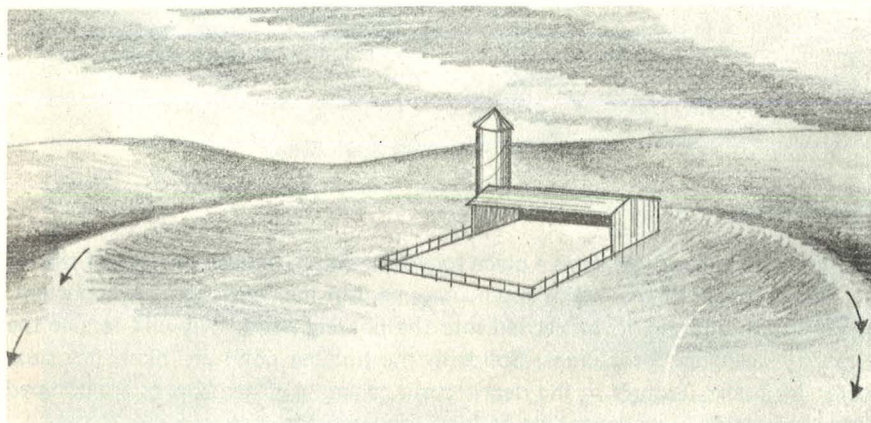
## **For Existing Feedlots**

Waste control facilities must be constructed for feedlots when drainage flows off the owner's property or into a water course. The waste control plan must be approved by the Water Pollution Control Council before facilities are constructed.



If a feedlot operator creates a pollution problem because of his failure to construct and maintain waste control facilities, complaints can be filed with the Water Pollution Control Council. When this situation develops, a representative of the Water Pollution Control Council will visit the site and operator. At this time a determination is made to see if there is a reason for the complaint. If there is a reason, the offender is advised to discuss the problem with the local SCS office or a consulting engineer and to make plans for a waste control facility.

Plans for waste control facilities must be sent to the State Water Pollution Control Council for approval. Help in preparation of plans is available from either your local Soil Conservation Service representative or a practicing professional (consulting) engineer. SCS generally will provide assistance when areas are 10 acres or less. The area may be less in some SCS districts because of a critical shortage of qualified personnel or because of a heavy workload with other practices.



Divert runoff.

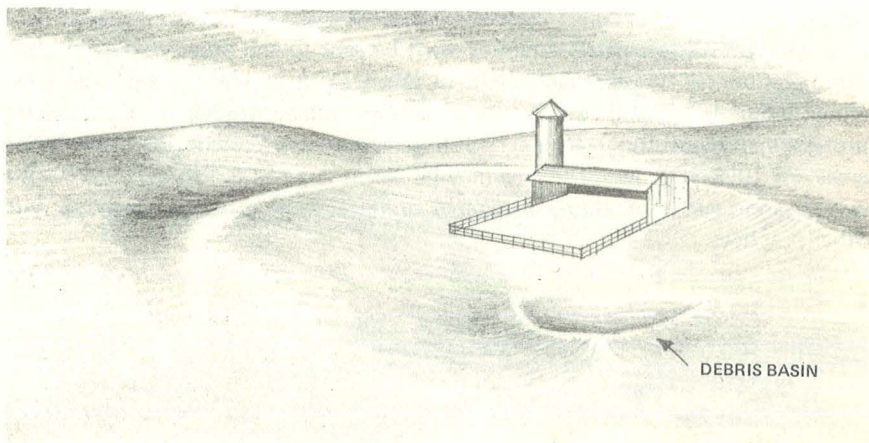
## Divert Runoff

The first step in planning a waste control facility is controlling excess drainage. When drainage from higher ground flows across your feedlot, the pollution potential is increased because of additional drainage from your lots. To overcome this problem, a diversion terrace constructed immediately above the lots will divert excess water away from the area.

The size, type and location of the diversion will be determined by the person designing your waste control facility.

## Collect Runoff

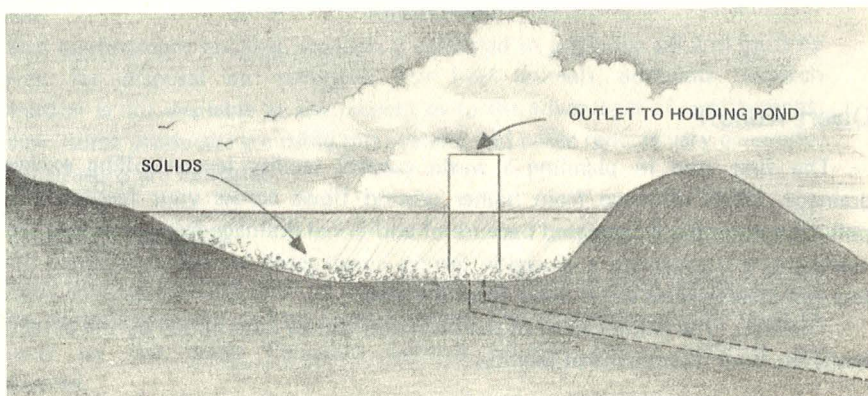
The next step is to collect the feedlot runoff in a debris basin or settling pond. The debris basin can be located immediately below the lots or inside the lower portion of the lot depending on lot shape, ground slope and available space.



Collect lot runoff in a debris basin.

## Debris Basin

The debris basin serves as a place for solids that have been carried off the lot to settle. The settling of solids and management of the debris basin is important. If solids are allowed to be carried into the holding pond, they will reduce the capacity available for storage. Solids in the holding pond are likely to cause offensive odors. Liquids in the debris basin generally either flow or are pumped into the holding pond depending on local topography.



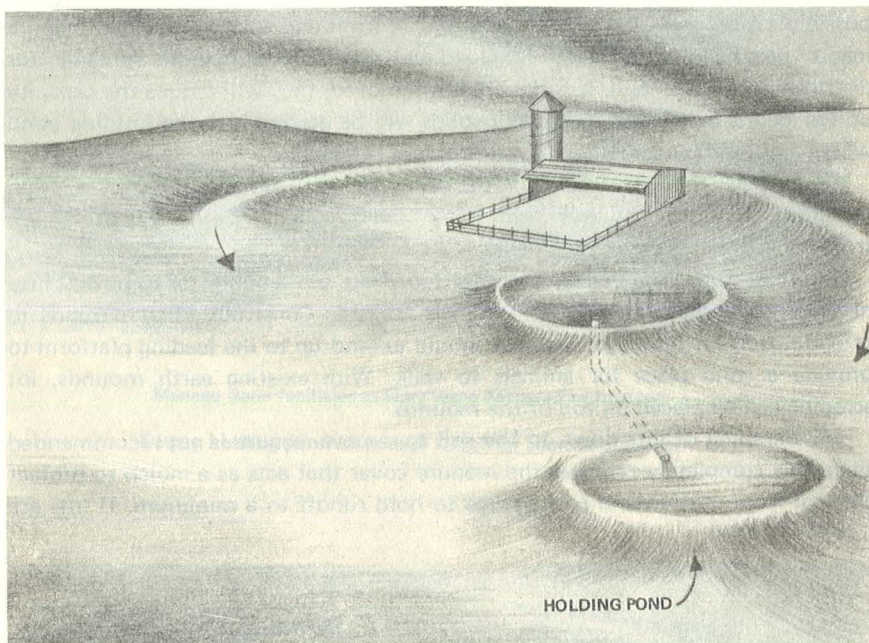
Lot runoff caught in debris basin where many solids settle.



## Holding Pond

Liquids from the debris basin are stored in a holding pond located immediately below and adjacent to the debris basin. This is generally a below-ground pit; however, in areas of high water tables or near level land, it may be necessary to build the storage above ground. The holding pond capacity is determined by the maximum 10-year rainfall that can be expected in your area during a 24-hour period.

Information of the amounts of design rainfalls are available from your local SCS office.



Drain liquids to holding pond.

## Empty Holding Pond

Empty the holding pond within 2-3 weeks after a rain—earlier if possible. Unless the holding pond is emptied, adequate storage capacity may not be available to retain lot runoff from the next rain.

Spread liquid waste from the holding pond on cropland preferably located away from streams to reduce pollution. Avoid spreading during winter months when ground is frozen.



Haul solid wastes to the fields for spreading. Pump liquid wastes to fields for spreading.

A small pipeline to carry liquids to adjacent fields and spreading with irrigation techniques will be preferred in most instances. Hauling and spreading with a liquid manure wagon will require considerably more time and labor.

## Manage Facilities

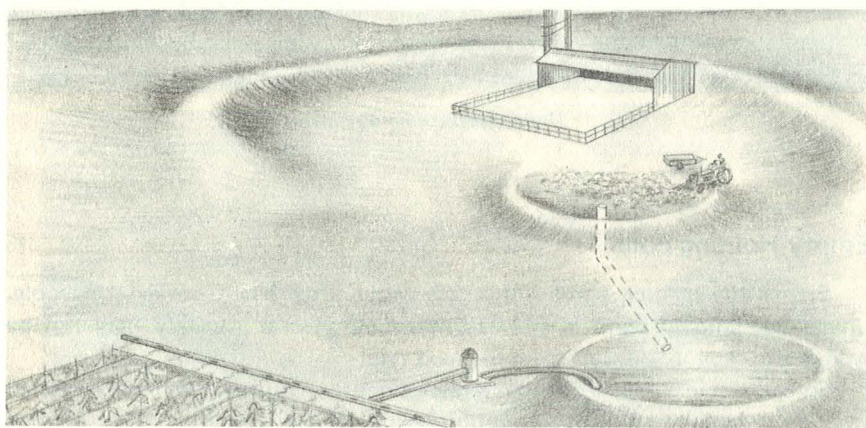
Management of your waste disposal system is important. Several items will need your attention:

1. Remove the relatively dry solids in the debris basin at least once and possibly twice each year—spring and fall. A front-end tractor-mounted manure loader has been satisfactory for loading these into a manure spreader for distribution on cropland. If solids are not removed, they will reduce the capacity of the debris basin and eventually solids will be carried into the holding pond where a difficult and costly removal problem will result.

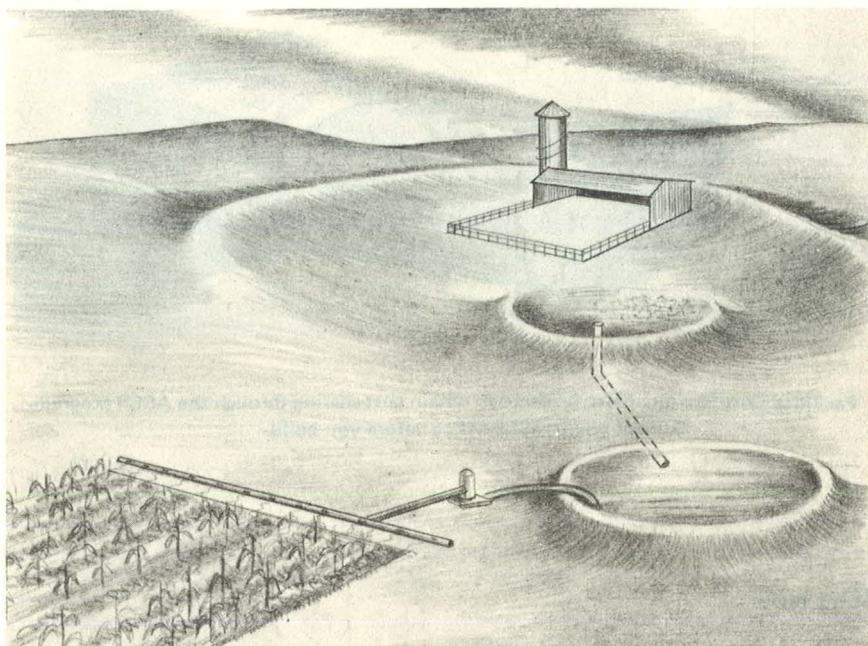
2. Repair the banks of the debris basin and holding pond if erosion develops. Mow banks to keep them free of tall growths of weeds. Repair damage from rodents burrowing in the banks.

3. If manure in your lots becomes too deep, use a bulldozer to push it into mounds to provide a place for animals to rest. Construct earth mounds to provide good lot drainage. Mounds should extend up to the feeding platform to provide a solid place for animals to walk. With existing earth mounds, lot scraping can be placed on top of the mounds.

4. Scraping of lots down to the soil to remove manure is not recommended since this completely removes the manure cover that acts as a mulch to protect the soil from erosion and as a sponge to hold runoff to a minimum. If lots are



Remove liquids from holding pond. Use a small pump and pipeline to distribute on cropland.



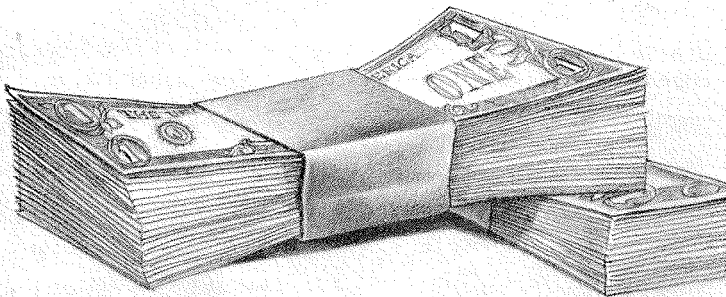
**Manage your facilities as they were designed to be used.**

**Empty holding pond after each runoff as soon as practical.**

scraped completely clean, runoff will increase resulting in more management problems. A manure pack on the lot will also help reduce the dangers of ground water contamination in areas of high water table.

## **Cost-Sharing**

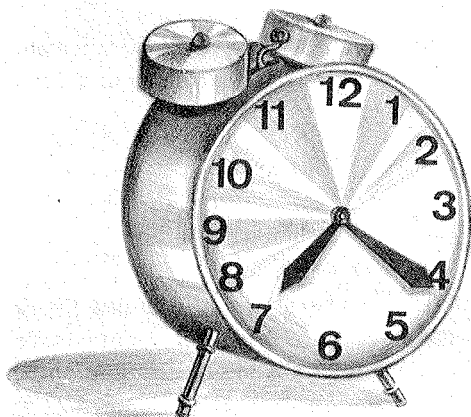
Cost-sharing for waste control facilities is available in most counties. Check with your local ASCS office for details and advise them of your intentions. To qualify for cost-sharing, facilities must be built according to specifications of the Soil Conservation Service.



**Facilities Cost-Sharing.** Most feeders can obtain cost-sharing through the ASCS program.  
Contact your ASCS office before you build.

## Start Now

The Nebraska Water Pollution Control Act requires that programs to control livestock wastes be operational by December 31, 1972. Time may be your limiting factor, so start now to make plans for getting waste control facilities designed and installed if you need them. Delay will likely cause headaches and problems so don't be the last to act. Proper management of waste to prevent pollution helps make you a good neighbor, so practice the Golden Rule and be a good neighbor.



**Start making plans for waste control NOW!!** The Nebraska Water Pollution Control Council (By Nebraska Law) requires that facility to control livestock wastes will be operating by December 31, 1972.