

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WASTE TRANSFER

(No.)

CODE 634

DEFINITION

A system using structures, conduits, or equipment to convey byproducts (wastes) from agricultural operations to points of usage.

PURPOSE

To transfer agricultural material associated with production, processing, and/or harvesting through a hopper or reception pit, a pump (if applicable), a conduit, and/or hauling equipment to:

- A storage/treatment facility
- A loading area, and/or
- Agricultural land for final utilization as a resource

CONDITIONS WHERE PRACTICE APPLIES

The transfer component is a part of a planned waste management or comprehensive nutrient management system.

Material generated by livestock production or agricultural product processing and a conveyance system is necessary to transfer manure from the source to a storage/treatment facility and/or a loading area, and/or from storage/treatment to an area for utilization. This includes hauling nutrients from one geographical area with excess nutrients to a geographical area that can utilize the nutrients in an acceptable manner.

This practice does not include land application or other use of manure. Criteria for land application of manure are included in Nutrient Management, (590) or Waste Utilization, (633).

CRITERIA

General Criteria Applicable to All Purposes

Waste transfer components shall comply with all federal, state, and local laws, rules and regulations.

Structures. All structures, including those that provide a work area around pumps, shall be designed to withstand the anticipated static and dynamic loading. Structures shall be designed to withstand earth and hydrostatic loading in accordance with Waste Storage Facility, (313). Waste Facility Covers, (367), when needed, shall be designed to support the anticipated dead and live loads.

Reception pits shall be sized to contain a minimum of one full day's waste production. For reception pits receiving runoff, the reception pit shall be sized to also contain the volume of runoff from the 25-year, 24-hour storm plus any required freeboard and emergency storage. Six inches additional depth is the recommended minimum for freeboard and emergency storage.

Openings to structures to receive material from alley scrape collection shall be a minimum of 9 square feet with one dimension no smaller than 4 feet. The opening shall be equipped with a grate designed to support the anticipated loads.

When curbs are needed in conjunction with structures, they shall be constructed of either concrete or wood. Curbs shall be of sufficient height to ensure total material flow into the structure and be adequately anchored.

Pipelines. Pipelines include watertight conveyance pipelines and inlets/outlets to storage/treatment facilities.

Design of pipelines shall be in accordance with sound engineering principles considering the waste material properties, management operations, exposure, etc. The minimum pipeline capacity from collection facilities to storage/treatment facilities shall be the maximum peak flow anticipated on a daily basis.

The minimum pipeline capacity from storage/treatment facilities to utilization areas shall ensure the storage/treatment facilities can be emptied within the time limits stated in the management plan for manure utilization.

Pipe materials shall be corrosion resistant and the pipe joints shall be water tight.

Pipelines used for transferring waste to an irrigation system shall meet the requirements of Irrigation Water Conveyance, Pipeline, (430).

All pipes shall be designed based on the type of material and total solids content and shall convey the required flow without plugging. Flow velocities shall be sufficient to minimize settling of solids in the pipeline. Gravity pipelines will be designed to have a minimum velocity of 3.0 feet per second and a maximum velocity of 6.0 feet per second except for large diameter (approximately 24-inch diameter) pipelines used for solids transfer. Pressure pipe shall be designed according to criteria in Irrigation Water Conveyance, Pipeline, (430). Fluid velocities shall not exceed 5 feet per second if pipe is not buried or securely fastened.

For pipelines carrying bedded manure the maximum cleanout interval shall be 150 feet. Alternative cleanout maximum intervals are accepted if approved by design engineer. Gravity pipelines shall not have horizontal curves or bends except minor deflections (less than 10 degrees) in the pipe joints unless special design considerations are used.

In a gravity flow pipe system, a minimum head is required, depending on the consistency of the material: 4 feet for heavily bedded manure, 2 feet for slurry or semi-solid manure, and 1 foot for liquids or liquid manure.

Gravity discharge pipes used for emptying a storage/treatment facility shall have a minimum of two gates or valves, one of which shall be manually operated. Pipelines shall have the appropriate check valves, antisiphon protection, and open air breaks installed.

Pipelines shall be installed with appropriate connection devices to prevent contamination of private or public water supply distribution systems and ground water.

Other Conduits. Concrete lined ditches shall be designed in accordance with Lined Waterway or Outlet, (468). A minimum design velocity of 1.5 feet per second shall be used.

Pumps. Pumps installed for transfer shall meet the requirements of Pumping Plant, (533). Pumps shall be sized to transfer material at the required system head and volume. Type of pump shall be based on the consistency of the material and the type of solids. Requirements for pump installations shall be based on manufacturer's recommendations.

Solid/Liquid Waste Separation. A filtration or screening device, settling tank, settling basin, or settling channel used to separate a portion of solids from the manure or liquid waste stream will be designed in accordance with Solid/Liquid Waste Separation Facility, (632).

Safety. The system design shall consider the safety of humans and animals during construction and operation.

Open structures shall be provided with covers or barriers such as gates, fences, etc. Ventilation and warning signs shall be provided for manure transfer systems as necessary to warn of the danger of entry and to reduce the risk of explosion, poisoning, or asphyxiation.

Pipelines from enclosed buildings shall be provided with a water-sealed trap and vent or similar devices where necessary to control gas entry into buildings.

Barriers shall be placed on push-off ramps to prevent tractors or other equipment from slipping into waste collection, storage, or treatment facilities.

Biosecurity. Manure from diseased animals shall be handled in accordance with the recommendations of the state veterinarian.

Equipment leaving the farm shall be sanitized as appropriate to prevent the spread of disease.

Additional Criteria in Support of Agricultural Land for Final Utilization

Waste utilization. Nutrients shall be applied to

the utilization area in amounts, uniformity, rates, and at a time consistent with the requirements of Nutrient Management, (590) or Waste Utilization, (633) as appropriate.

Liquid or slurry manure shall be adequately agitated prior to transfer for the purpose of land application both on and off the farm.

Hauling Equipment. Equipment used for hauling manure from one geographical area to another area shall be capable of hauling the manure without spillage, leakage, or wind-blown losses during transport. Hauling equipment and hauling operations shall meet all applicable local, state, and federal laws regarding on-road transportation.

CONSIDERATIONS

General. Consider economics (including design life), overall nutrient management system plans, and health and safety factors.

Consider the timing and location of agitation and transfer activities to minimize odor formation and transport and to minimize the breeding of insects within the material.

Consider covering and/or minimizing the amount or number of times the material is disturbed to reduce the likelihood of air emissions of particulate matter, volatile organic compounds, and ammonia air emissions formation and release.

Transfer Operations. In locating structures, utilize existing topography to the greatest extent possible to generate head on structures and reduce pumping requirements.

Consider the operating space requirements of loading and unloading of equipment in the vicinity of the manure transfer components.

Consider the subsurface conditions, i.e., depth to bedrock, water table, etc., when locating and designing structures.

Pipelines used for transferring manure may need to be flushed with clean water after use to reduce the risk of gas build up and pipeline explosion.

When applicable and compatible, consider the joint use of manure transfer pipelines with irrigation system design requirements.

The pipe pressure rating required may need adjustment based on material temperature.

Consider corrosion resistance and water tightness in the selection of pipe material and joints.

Consider the potential for salt (struvite) deposits in smaller diameter pipes.

Consider the need for appropriate check valves, anti-siphon protection and open air breaks in all pipelines.

Provisions should be made to prevent debris from entering conveyances and for removing solids from conveyance conduits such as concrete lined ditches, etc

Consider route selection and timing of manure transfer to minimize impact of nuisance odors on others.

Consider equipment type and covering of manure to minimize particulate matter generation during transport of manure.

Vehicles used to transfer manure should be sized to minimize the danger of rollover.

PLANS AND SPECIFICATIONS

The following list of Construction Specifications is intended as a guide to selecting the appropriate specifications for a specific project. The list includes most but may not contain all of the specifications that are needed for a specific project:

IA-1	Site Preparation
IA-3	Structural Removal
IA-5	Pollution Control
IA-6	Seeding and Mulching for Protective Cover
IA-11	Removal of Water
IA-21	Excavation
IA-23	Earthfill
IA-24	Drainfill
IA-26	Salvaging and Spreading Topsoil
IA-27	Diversions
IA-31	Concrete
IA-32	Concrete for Nonstructural Slabs
IA-45	Plastic (PVC, PE) Pipe
IA-81	Metal Fabrication and Installation
IA-83	Timber Fabrication and Installation
IA-92	Fences

Plans and specifications for installing manure transfer systems shall be in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan must be prepared and reviewed with the landowner or operator responsible for the application of this practice.

The O&M Plan shall provide specific instructions for proper operation and maintenance of each component of this practice and shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

The operation and maintenance plan shall describe what actions will be taken to minimize flies and other insects during the transfer of manure.

For the hauling of manure from one geographical area to another, record keeping by the producer or his/her designated representative will be required and may include such items as:

- Type, nutrient content, and amount of manure transferred
- Solids percentage of the manure
- Date of the transfer
- Name and address of the source and destination of the manure
- Condition of the manure as left at the destination (spread, stockpiled and covered, etc.)

Where manure is to be spread on land not owned or controlled by the producer, the manure management plan, as a minimum, shall document the amount of manure to be transferred, the nutrient content of the manure, the date of transfer, and who will be responsible for the environmentally acceptable use of the waste. Provisions shall be made to inform the receiver of the manure of the proper storage and/or utilization requirements.

Record keeping shall also be consistent with Nutrient Management, (590) or Waste Utilization, (633) and any other waste storage/treatment practices as appropriate.

Records will also be kept for manure utilized within the operation according to these standards.

Records will be kept for a minimum of 5 years.

REFERENCES

USDA-NRCS, National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH)

USDA-NRCS, National Handbook of Conservation Practices