

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
- to agricultural land for final utilization as a resource.

CONDITIONS WHERE PRACTICE APPLIES

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

Where material is generated by livestock production or agricultural product processing and a conveyance system is necessary to transfer the byproducts 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 nutrient in an environmentally acceptable manner.

CRITERIA

General Criteria Applicable to all purposes

Laws and regulations. Design manure transfer system to comply with all Federal, state, and local laws, rules and regulations.

Evaluate and avoid or minimize impact to cultural resources, wetlands and Federal and state protected species to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

Structures. Design all structures, including those that provide a work area around pumps, to withstand the anticipated static and dynamic loading. Design structures to withstand earth and hydrostatic loading in accordance with Florida NRCS conservation practice standard Waste Storage Facility, Code 313 and NRCS National Engineering Handbook, Section 6, Structural Design or other equivalent design manual. Design covers, when needed, to support the anticipated dead and live loads.

Size reception pits to contain a minimum of one full day's manure production. For reception pits collecting runoff, size the reception pit to also contain at least the volume of runoff from the 25-

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Section IV

year, 24-hour storm plus any required freeboard and emergency storage.

Design openings to structures to receive manure from alley scrape collection to be a minimum of 9.0 square feet with one dimension no smaller than 4.0 feet. Equip the opening with a grate designed to support the anticipated loads.

When curbs are needed in conjunction with structures, construct the curbs of either concrete or wood. Design the curbs to be of sufficient height to ensure total manure flow into the structure and be adequately anchored.

Pipelines. Design pipelines in accordance with sound engineering principles considering the type of load on the pipe, exposure, etc. Design the minimum pipeline capacity from collection facilities to storage/treatment facilities to convey the maximum peak flow anticipated.

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

Design pipelines used for transferring waste to an irrigation system to meet the requirements of Florida NRCS conservation practice standard, Irrigation Water Conveyance, Pipeline, Code 430.

Design all pipes based on the type of material and total solids content and to convey the required flow without plugging. To minimize settling of solids in the pipeline, design velocities to be 3 to 6 feet per second. Design fluid velocities not to exceed 5 feet per second if pipe is not buried or securely tied down.

Provide clean-out access for gravity pipelines at a maximum interval of 150 feet unless an alternative design is approved by the design engineer. Design gravity pipelines without 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 system, a minimum head is required, depending upon the consistency of the material: 4 feet for heavily bedded manure, 2 feet for slurry or semi-solid manure, and 1 foot for liquids and 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.

Install pipelines with appropriate valves and devices to prevent contamination of private or public water supply distribution systems and ground water.

Refer to National Engineering Field Handbook Part 651, Agricultural Waste Management Field Handbook, Chapter 10, for guidance on the design of gravity flow pipes.

Other conduits. Design concrete lined ditches in accordance with Florida NRCS conservation practice standard Lined Waterway or Outlet, Code 468. Use a minimum design velocity of 1.5 feet per second.

Pumps. Design pumps for manure transfer to meet the requirements of Florida NRCS conservation practice standard Pumping Plant, Code 533. Size pumps to transfer manure at the required system head and volume. Select the type of pump based on the consistency of the manure and the type of bedding used. Install pumps based on manufacturer's recommendations.

Solid/liquid waste separation. Design 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 in accordance with Florida NRCS conservation practice standard Solid/Liquid Waste Separation Facility, Code 632.

Safety. Consider the safety of humans and animals during construction and operation when designing the system.

Provide open structures with covers or barriers such as gates, fences, etc. Provide ventilation and warning signs for manure transfer systems as necessary to warn of the danger of entry and to reduce the risk of explosion, poisoning, or asphyxiation.

Provide pipelines from enclosed buildings with a water-sealed trap and vent or similar devices where necessary to control gas entry into buildings.

Place barriers on push-off ramps to prevent tractors or other equipment from slipping into waste collection, storage, or treatment facilities.

Biosecurity. Handle the products from diseased animals in accordance with the recommendations of the state veterinarian.

Sanitize as appropriate equipment leaving the farm to prevent the spread of disease.

If the manure contains antibiotics, the person utilizing the manure shall be informed of the type of antibiotic in the manure.

Additional Criteria in Support of Agricultural Land for Final Utilization

Waste utilization. Apply nutrients to utilization area in amounts, uniformity, rates, and at a time consistent with the requirements of Florida NRCS conservation practice standard Nutrient Management, Code 590 or Waste Utilization, Code 633 as appropriate.

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

Hauling equipment. Ensure equipment used for hauling manure from one geographical area to another area is capable of hauling the manure without spillage, leakage, or wind-blown losses during transport. Ensure hauling equipment meets all applicable local, state, and Federal laws regarding highway transportation.

Additional Criteria in Support of Storage and Treatment Facility

Inlet. Design inlets to be of any permanent type designed to resist corrosion, plugging, freeze damage, and ultraviolet ray deterioration while incorporating erosion protection as necessary.

Pipe inlets may be steel, concrete, aluminum, HDPE, or PVC as required in Florida NRCS conservation practice standard for Pond, Code 378. However if corrugated steel is used, protect it with an appropriate coating.

Design pipe inlets to be a minimum diameter of 6 inches and to convey the required flow without plugging. Preferably, install pipes on a slope of 1 percent or greater and preferably 1.5 percent or greater. Install pipes a sufficient depth below

the ground surface to avoid freezing or provide other protective measures.

Size pumped inlets to meet the requirements of the pumping equipment.

Design gravity flow inlet pipes for liquids only to outlet at or above the maximum operating level which is the design volume less the volume contribution of precipitation and runoff from the 25-year, 24-hour storm event. Protect the slope of the pond at the pipe outlet from erosion by paving or by extending the pipe outlet to a point where the discharge will not fall on the slope. Support pipes on pilings of pressure treated wood, steel, concrete, or masonry and anchored to prevent dislodging or flotation. Install pilings so as to maintain liner integrity.

Design large diameter gravity loading pipes for solids and liquids to outlet at the bottom of the pond. Design the effective head (vertical difference between the top of drop inlet and the design volume elevations) to be no less than 4 feet.

Design pushoff ramp slopes to be no steeper than 4 horizontal to 1 vertical (4:1). Design paved slopes to be no flatter than 1 percent or greater and preferably 1.5 percent or greater and not to be used when appreciable bedding material is used.

Outlet. Ensure no outlet will automatically release storage from the required storage volume. Design manually operated outlets to be of permanent type designed to resist corrosion and plugging.

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.

Section IV

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.

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

The pipe pressure rating required may need adjusting based on manure temperature.

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

Consider flushing pipelines used for transferring manure with clean water after use.

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.

Consider sizing the vehicles used to transfer waste material to reduce the danger of rollover.

Consider making provisions for removing solids from conveyance conduits such as concrete lined ditches, etc.

Where material is to be spread on land not owned or controlled by the producer, a nutrient management plan consistent with the requirements identified in Florida conservation practice standard Nutrient Management, Code 590 is recommended, establishing environmentally acceptable utilization of the material.

Off Farm Transfer/Transport

Consider equipment type and covering of the material to minimize odor impacts on others.

Consider sizing the vehicles used to transfer to reduce the danger of rollover.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for installing manure transfer systems in accordance with this standard. Describe the requirements for applying the practice to achieve its intended purpose. As a minimum the plans and specifications shall include:

- Location of the structure.
- Cross sections and profiles of the proposed structures with critical elevations.
- Type, quality, and quantity of all materials used.
- Location of utilities and notification requirements.

OPERATION AND MAINTENANCE

Prepare and review a written Operation and Maintenance (O&M) Plan with the landowner or operator responsible for the application of this practice. Provide in the O&M Plan specific instructions for proper operation and maintenance of each component of this practice and details of the level of repairs needed to maintain the effectiveness and useful life of the practice.

Describe in the operation and maintenance plan 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, include in the record keeping such items as:

- the type, nutrient content, and amount of manure transferred,
- the solids percentage of the manure,
- the date of the transfer,
- the name and address of the source and destination of the manure, and
- the condition of the manure as left at the destination (spread, stockpiled, and covered, etc.).

REFERENCES

Florida NRCS Conservation Practice Standards:
Irrigation Water Conveyance, Pipeline, Code 430
Lined Waterway or Outlet, Code 468
Pond, Code 378
Pumping Plant, Code 533

Nutrient Management, Code 590
Solid/Liquid Waste Separation Facility, Code 632
Waste Utilization, Code 633
General Manual (GM)
Title 420-Part 401
Title 450-Part 401
Title 190-Parts 410.22 and 410.26
National Cultural Resources Procedures Handbook
National Engineering Handbook, Section 6,
Structural Design
National Engineering Handbook Part 651,
Agricultural Waste Management Field
Handbook, Chapter 10
National Environmental Compliance Handbook
National Food Security Act Manual
National Planning Procedures Handbook
Florida Supplements to Parts 600.1 and
600.6