

Waste Transfer (No.) 634

DEFINITION

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

PURPOSES

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 comprehensive nutrient management plan or planned agricultural waste management system.

Material 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 *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 NRCS conservation practice standard Nutrient Management (590).

CRITERIA

General Criteria Applicable To All Purposes

Waste transfer components shall be planned, designed, and installed to meet all federal, state, local, and tribal laws 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 NRCS conservation practice standard Waste Storage Facility (313). Covers, 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 production. For reception pits receiving runoff, sufficient storage shall be provided to also contain the volume of runoff from the 25-year, 24-hour storm plus any required freeboard and emergency storage.

Reception pits shall be installed above the water table where practicable. When it is necessary to install a reception pit within the water table, the reception pit shall be designed with a factor of safety of at least 1.2 for buoyant forces and shall meet all other requirements for a fabricated structure as defined in NRCS conservation practice standard Waste Storage Facility (313).

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 pressure-treated wood. Curbs shall be of sufficient height to ensure *all materials* flow into the structure and be adequately anchored.

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

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 *nutrient* utilization.

Pipelines used for transferring *material* to an irrigation system shall meet the requirements of NRCS conservation practice standard Irrigation Water Conveyance, Pipeline (430).

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

Clean-out access shall be provided for gravity pipelines at a maximum interval of 150 feet *unless an alternative design is approved by the 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 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.

For gravity pipes outletting into a waste storage facility, head is measured from the inlet invert of the pipe to the maximum operating level elevation in the storage facility.

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

Openings where manure transfer pipes pass through a liner, wall, or other barrier shall be sealed to provide at least the same level of leakage protection provided by the liner, wall, or barrier. If the liner, wall, or barrier is a manufactured product, follow

the manufacturer's recommendations for sealing the opening.

Pipe used to transfer *waste* shall meet or exceed the applicable specification listed in Table 1 below. Pipe used with manure pumps shall be consistent with the pump manufacturer's recommendations. Joints shall be watertight using rubber/elastomeric (gasket) seals or solvent-welded couplings/fittings.

TABLE 1 - PIPE SPECIFICATIONS	
Pipe Material	Applicable Specification(s)
Plastic (PVC)	ASTM: D3034; D1785; D2241; F679; F794
Plastic (HDPE)	AASHTO: M294 Type S
Concrete	ASTM: C76
Steel	ASTM: A52; A134; A135; A139

Gravity Pipelines for Non-Bedded Manure. The minimum diameter shall be 6 inches with a minimum of one-percent (1 percent) grade. Pipes for non-bedded manure shall enter at least 3 feet above the pond or structure bottom. A clean-out shall be installed for pipes entering below the design volume elevation.

Gravity Pipelines for Bedded Manure. The minimum diameter shall be 24 inches and the grade shall not exceed five-percent (5 percent). Pipes for bedded manure shall enter at the pond or structure bottom

Other Conduits. Concrete lined ditches shall be designed in accordance with NRCS conservation practice standard 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 NRCS conservation practice standard 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 including outlet pipe size* shall be based on pump manufacturer's recommendations.

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

practice standard Solid/Liquid Waste Separation Facility (632).

Safety. The system design shall *address* 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 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. *Products* from diseased animals shall be handled in accordance with the recommendations of the state veterinarian *or Michigan Department of Agriculture.*

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 NRCS conservation practice standard Nutrient Management (590) *or Waste Utilization (633)*, as appropriate.

Hauling Equipment. *Equipment used for hauling material from one geographical area to another area shall be capable of hauling the material without spillage, leakage, or wind-blown losses during transport.*

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

Transfer equipment shall have adequate capacity to ensure the emptying of storage/treatment facilities within the planned time periods.

CONSIDERATIONS

General

Consider the potential effects of installation and operation of *waste* transfer components on the cultural, archeological, historic, and economic resources.

Consider economics (including design life), overall nutrient management system plans, 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 mater, volatile organic compounds, and ammonia air emissions formation and release.

Transfer Operations

Utilize existing topography to the greatest extent possible to generate head and reduce pumping requirements.

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

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

Consider a system for flushing pipelines with clean water, where appropriate.

When applicable and compatible, consider the joint use of *waste* 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.

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

Consider the potential for sand deposition in pipes when sand bedding is used.

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

Consider equipment type and covering of *waste* to minimize particulate matter generation during *transfer*.

Vehicles used to transfer waste material should be sized to reduce the danger of rollover.

Where material is to be spread on land not owned by or controlled by the producer, a nutrient management plan is recommended, establishing environmentally acceptable utilization of the material.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended use.

Support data documentation requirements are as follows:

- Inventory and evaluation records
 - Assistance notes or special report
- Survey notes, where applicable
 - Design survey
 - Construction layout survey
 - Construction check survey
- Design records
 - Physical data, functional requirements, and site constraints, where applicable
 - Soils/subsurface investigation report, where applicable
- Design and quantity calculations
- Construction drawings/specifications with:
 - Location map
 - “Designed by” and “Checked by” names or initials
 - Approval signature
 - Job class designation
 - Initials from preconstruction conference
 - As-built notes
- Construction inspection records
 - Assistance notes or separate inspection records
 - Construction approval signature
- Record of any variances approved, where applicable
- Record of approvals of in-field changes affecting function and/or job class, where applicable

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.