

## 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 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 separate 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.

***Temporary Storage, Headland Stacking, or Stockpiling of Solid Manure.*** Solid manure may be temporarily stored in cropland intended for final utilization only under the following conditions:

1. *The temporary storage is included as part of a Comprehensive Nutrient Management Plan or Nutrient Management Plan. The plan will identify locations and sizes of*

- temporary storage, nitrate leaching index at the planned locations, and planned quantity of manure to be temporarily stored.*
2. *Records are maintained documenting temporary storage field identification, transfer date to temporary storage location, end date of temporary storage or dates of application to cropland, quantity of manure temporarily stored, and date of vegetation re-establishment.*
3. *The manure is handled as a solid. It has bedding such as straw or other materials that binds it so it can be stacked and handled with loaders.*
4. *The temporary storage period does not exceed:*
  - *20 calendar days for locations where the nitrogen leaching index is high, or*
  - *90 calendar days where the nitrogen leaching index is medium or low.*
5. *The Bray P1 soil test level in the agricultural land at the planned temporary storage location prior to use as temporary storage is less than 300 lb/ac (150 ppm).*
6. *The manure quantity temporarily stored does not exceed the nutrient needs as identified in the nutrient management plan for the cropland where it will be utilized.*
7. *The land slope in the temporary storage location is 3 percent or flatter.*
8. *No subsurface or surface drainage systems are located within 20 feet of the temporary storage location.*
9. *The bedrock at the temporary storage location is at least 2 feet below the soil surface. Avoid temporary storage in known karst areas.*
10. *The bottom elevation of the temporary storage location is at least 2 feet above the seasonal high water table as defined in Web Soil Survey for the soil series at the temporary storage location.*
11. *The temporary storage location is outside any areas where runoff concentrates and/or ponds.*
12. *The temporary storage location is at least 150 feet from any natural or constructed water course.*
13. *The temporary storage location is outside the 25 year floodplain or flooding area.*
14. *The temporary storage location is at least 50 feet from property lines where the adjoining property is not owned or leased by the farm operation utilizing the manure.*
15. *The temporary storage location is at least 500 feet from a residence not owned by the*

*titleholder and/or lessee of the cropland, a commercial enterprise, a bona fide religious institution, an educational institution, or a public use area.*

16. *The temporary storage location is at least 400 feet from any private well and at least 800 feet from any Type IIb and III Public well.*
17. *The temporarily stored manure is piled as high as practicable with available equipment and is shaped in a conical manner (cross section view) that creates a distinct peak in order to shed as much water as possible.*
18. *Manure at the temporary storage location is removed to the fullest extent practicable. Any remaining residual manure is incorporated into the soil as part of vegetation re-establishment.*
19. *After removal and utilization of the manure, vegetative cover is re-established at the temporary storage location either through a crop or grass planting. Tillage prior to establishment is required to redistribute nutrients and salts that will affect establishment.*

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.

## 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 matter, 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.

## 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 for Temporary Storage, Headland Stacking, or Stockpiling of Solid Manure are as follows:

- Comprehensive Nutrient Management Plan or Nutrient Management Plan for the cropland where the temporarily stored manure will be utilized and the quantity of manure to be temporarily stored.
- Map showing planned location(s) of temporary storage
- Soils inventory data including soil type, slope percent, karst areas, and nitrogen leaching index at the planned location(s) of temporary storage
- Web Soil Survey documentation of the seasonal high water table depth from surface at planned location(s) of temporary storage.

Support data documentation requirements for all other waste transfer 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.