

**Practice: 634 - Waste Transfer**

**Scenario # 1 Wastewater catch basin < 1000 gal.**

Missouri

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will be transferred from the collection basin to a waste storage facility.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Practice Situation:**

Inadequate waste management system able to collect wastewater from an operation that may contaminate surface or groundwater resources.

**After Practice Situation:**

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal production facilities. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, 533.

**Scenario Feature Measure:**

Collection volume installed

<b>Scenario Typical Size:</b>	1000	Gallon	Tot Unit Cost	\$5.91
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Catch Basin, concrete, 60" dia.	1	Each	\$2,113.31	\$2,113.31
Materials	Aggregate, Gravel, Ungraded, Quarry Run	5	Cubic yard	\$17.82	\$89.10
Equip./Install.	Tractor, agricultural, 120 HP	4	Hour	\$47.06	\$188.24
Equip./Install.	Dozer, 80 HP	4	Hour	\$57.19	\$228.76
Equip./Install.	Concrete, CIP, formed reinforced	2	Cubic yard	\$402.08	\$804.16
Equip./Install.	Backhoe, 80 HP	8	Hour	\$47.04	\$376.32
Equip./Install.	Demolition, concrete	2	Cubic Yard	\$15.38	\$30.76
Equip./Install.	Concrete, CIP, slab on grade, reinforced	4	Cubic yard	\$253.20	\$1,012.80
Labor	Equipment Operators, Heavy	8	Hour	\$27.22	\$217.76
Labor	General Labor	8	Hour	\$21.56	\$172.48
Mobilization	Mobilization, medium equipment	2	Each	\$200.43	\$400.86
Mobilization	Mobilization, small equipment	2	Each	\$136.80	\$273.60

Total Cost: \$5,908.15

**Payment types:**

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$4.43	EQIP-HU	\$5.32
EQIP-MRBI	\$4.43	EQIP-HUMRBI	\$5.32
EQIP-NOI	\$4.43	EQIP-HUNOI	\$5.32

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**Scenario # 2 Concrete Channel, no footers**

Missouri

**Scenario Description:**

Installation of a concrete channel that consists of a slab with curb for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility.  
 Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.  
 Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Before Practice Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Practice Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick for the entire length. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. ☒

**Scenario Feature Measure:**

Bottom surface area of concrete channel

<b>Scenario Typical Size:</b>	1200	Square Foot	Tot Unit Cost	\$8.14
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Aggregate, Gravel, Ungraded, Quarry Run	26	Cubic yard	\$17.82	\$463.32
Equip./Install.	Dozer, 80 HP	8	Hour	\$57.19	\$457.52
Equip./Install.	Concrete, CIP, slab on grade, reinforced	19	Cubic yard	\$253.20	\$4,810.80
Equip./Install.	Concrete, CIP, formed reinforced	9	Cubic yard	\$402.08	\$3,618.72
Labor	Equipment Operators, Heavy	8	Hour	\$27.22	\$217.76
Mobilization	Mobilization, medium equipment	1	Each	\$200.43	\$200.43

Total Cost: \$9,768.55

**Payment types:**

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$6.11	EQIP-HU	\$7.33
EQIP-MRBI	\$6.11	EQIP-HUMRBI	\$7.33
EQIP-NOI	\$6.11	EQIP-HUNOI	\$7.33

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**Scenario # 3 Manure Flush System**

**Missouri**

**Scenario Description:**

Installation of a manure flush system that includes materials and structures to flush waste from a concrete surface into a collection basin or a waste storage facility. The system includes flush water tank, piping and valves. The animal waste will be transferred by a flush cycle released from the flush tank to rinse the concrete surface and carry the waste to a collection basin, into a pipe or to a waste storage facility.

Associated practices may include: 313 Waste Storage Facility for storage structures; PS 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; PS 633, Waste Recycling.

This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

**Before Practice Situation:**

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and collect the waste materials deposited.

**After Practice Situation:**

This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. The design flush volume for the flush system is less than 1000 gallons and requires no more than 50 feet of an 8 inch diameter pressure pipe for the flush pipe. The scenario includes materials and installation of a flush tank, piping and valves to manage the flush flow, concrete flush lane, concrete curbs or gutters to transfer the flow to a collection basin. The liquids then flow from the basin to the waste storage pond, an estimated length of 200 feet and requires an 8 inch diameter low pressure pipeline with an open outlet to the waste storage pond. The cost includes excavation, placement of bedding aggregate as needed, forming and placement of structures, conveyance pipeline with valves and structural backfill. Pump must be contracted under pumping plant, PS 533.

**Scenario Feature Measure:**

1000 Gallons of flush water

<b>Scenario Typical Size:</b>	1000	Gallon	Tot Unit Cost	\$4.52
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Tank, Poly enclosed Storage, 300-1000 gal	1000	Gallon	\$0.74	\$740.00
Materials	Pipe, PVC, 6", SCH 40	40	Foot	\$5.31	\$212.40
Equip./Install.	Backhoe, 80 HP	8	Hour	\$47.04	\$376.32
Equip./Install.	Demolition, concrete	4	Cubic Yard	\$15.38	\$61.52
Equip./Install.	Concrete, CIP, formed reinforced	3	Cubic yard	\$402.08	\$1,206.24
Equip./Install.	Concrete, CIP, slab on grade, reinforced	4	Cubic yard	\$253.20	\$1,012.80
Labor	Equipment Operators, Light	8	Hour	\$20.92	\$167.36
Labor	General Labor	16	Hour	\$21.56	\$344.96
Mobilization	Mobilization, medium equipment	2	Each	\$200.43	\$400.86
<b>Total Cost:</b>					<b>\$4,522.46</b>

**Payment types:**

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$3.39	EQIP-HU	\$4.07
EQIP-MRBI	\$3.39	EQIP-HUMRBI	\$4.07
EQIP-NOI	\$3.39	EQIP-HUNOI	\$4.07

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**Scenario # 4 Wastewater Recycle System for Flush System - Pipes only**

Missouri

**Scenario Description:**

Installation of the pipe and appurtenances for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a catch basin or a waste storage facility. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

**Before Practice Situation:**

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.

**After Practice Situation:**

This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete production surfaces. The pipe design for the flush volume requires 300 feet of 3 inch diameter pipe for pressure flow. The cost includes excavation, placement of bedding as needed, conveyance pipelines with valves and pipe backfill to transport water to the flush tank. Pumps must be contracted under pumping plant, PS 533.

**Scenario Feature Measure:**

Flush - pipes

<b>Scenario Typical Size:</b>	300	Foot	Tot Unit Cost	\$8.27
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Aggregate, Sand, Graded, Washed	10	Cubic yard	\$23.82	\$238.20
Materials	Pipe, PVC, 3", SCH 40	300	Foot	\$2.12	\$636.00
Equip./Install.	Trenching, Earth, 12" x 48"	300	Foot	\$1.15	\$345.00
Equip./Install.	Backhoe, 80 HP	12	Hour	\$47.04	\$564.48
Labor	Equipment Operators, Light	12	Hour	\$20.92	\$251.04
Labor	General Labor	8	Hour	\$21.56	\$172.48
Mobilization	Mobilization, small equipment	2	Each	\$136.80	\$273.60

Total Cost: \$2,480.80

**Payment types:**

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$6.20	EQIP-HU	\$7.44
EQIP-MRBI	\$6.20	EQIP-HUMRBI	\$7.44
EQIP-NOI	\$6.20	EQIP-HUNOI	\$7.44

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**Scenario # 5 Gravity or Low pressure ≤ 8" PVC pipeline**

Missouri

**Scenario Description:**

Gravity or low pressure flow pipeline used to transfer manure or wastewater according to the CNMP. This practice includes the pipe plus clean-out risers and fittings, trench excavation and backfill, labor and equipment for installation. Typical installation applies to soils with no special bedding requirements.

This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling; 635, Vegetated Treatment Area.

**Before Practice Situation:**

There is a need to transport manure or wastewater within a waste management system.

**After Practice Situation:**

Install a 100 foot long 8 inch diameter PVC gasketed IPS pipe to transfer the manure wastewater. This scenario includes the pipe, inlet conditions, trench excavation, and backfill. The site should be evaluated by the designing engineer to make sure the design will function.

The transfer pipeline will deliver the manure slurry according to the CNMP, thereby protecting water quality resources.

**Scenario Feature Measure:**

Length of pipe installed

<b>Scenario Typical Size:</b>	100	Foot	Tot Unit Cost	\$14.66
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Pipe, PVC, 8", SDR 35	125	Foot	\$6.23	\$778.75
Equip./Install.	Earthfill, Manually Compacted	8	Cubic yard	\$4.83	\$38.64
Equip./Install.	Trenching, Earth, loam, 24" x 48"	100	Foot	\$2.62	\$262.00
Labor	General Labor	16	Hour	\$21.56	\$344.96
Mobilization	Mobilization, Light Equipment Operator	2	Hour	\$20.73	\$41.46

Total Cost: \$1,465.81

**Payment types:**

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$10.99	EQIP-HU	\$13.19
EQIP-MRBI	\$10.99	EQIP-HUMRBI	\$13.19
EQIP-NOI	\$10.99	EQIP-HUNOI	\$13.19

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**Scenario # 6 PVC Pressure Distribution Pipeline.**

**Missouri**

**Scenario Description:**

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP.

The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

**Before Practice Situation:**

There is a need to transport manure or wastewater within a waste management system. The pressure distribution pipeline is utilized in the land application aspect of the operation.

**After Practice Situation:**

Install a 2000 foot long 8 inch diameter PVC gasketed IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function.

The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

**Scenario Feature Measure:**

Length of pipe installed

<b>Scenario Typical Size:</b>	2000	Foot	Tot Unit Cost	\$14.60
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Valve, sprinkler hydrant irrigation valve with	7	Each	\$263.30	\$1,843.10
Materials	Plug Valve, 8"	1	Each	\$1,138.32	\$1,138.32
Materials	Pipe, PVC, 8", SDR 26	2000	Foot	\$8.29	\$16,580.00
Materials	Valve, Pressure Relief	1	Each	\$32.34	\$32.34
Materials	Valve, Air Vacuum Release, Continuous	3	Each	\$165.56	\$496.68
Equip./Install.	Earthfill, Manually Compacted	180	Cubic yard	\$4.83	\$869.40
Equip./Install.	Trenching, Earth, loam, 24" x 48"	2000	Foot	\$2.62	\$5,240.00
Equip./Install.	Concrete, CIP, formless, non reinforced	4	Cubic yard	\$124.22	\$496.88
Labor	Supervisor or Manager	20	Hour	\$37.21	\$744.20
Labor	General Labor	80	Hour	\$21.56	\$1,724.80
Mobilization	Mobilization, Light Equipment Operator	2	Hour	\$20.73	\$41.46

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**Payment types:**

Total Cost: \$29,207.18

<u>PayType</u>	<u>Unit Payment</u>	<u>PayType</u>	<u>Unit Payment</u>
EQIP	\$10.95	EQIP-HU	\$13.14
EQIP-MRBI	\$10.95	EQIP-HUMRBI	\$13.14
EQIP-NOI	\$10.95	EQIP-HUNOI	\$13.14