

Practice: 366 - Anaerobic Digester

Scenario # 1 Small Plug Flow <1000 AU

Scenario Description: Actual Scenario # 1

New York

A plug flow anaerobic digester with less than 1000 animal unit capacity is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313)

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 910 animal units (650 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	910	Animal Unit	Tot Unit Cost	\$688.99
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Equip./Install.	Plug Flow, Small (less than 1,000	1	Each	\$625,994.65	\$625,994.65
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Mobilization	Mobilization, medium equipment	1	Each	\$282.78	\$282.78
Mobilization	Mobilization, large equipment	1	Each	\$539.90	\$539.90
Acq. Tech. Know.	Training, Workshops	2	Each	\$41.42	\$82.84

Total Cost: \$626,978.25

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$516.74	EQIP-HU	\$620.09
WHIP	\$0.00	WHIP-HU	\$0.00

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Scenario # 2 Medium Plug Flow 1000-2000 AU

Scenario Description: Actual Scenario # 2

New York

A plug flow anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen on a livestock operation between 1,000 and 2,000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical design scenario: 1,750 animal units (1,250 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	1750	Animal Unit	Tot Unit Cost	\$490.44
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Equip./Install.	Plug Flow, Medium (between 1,000	1	Each	\$857,003.25	\$857,003.25
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Mobilization	Mobilization, medium equipment	2	Each	\$282.78	\$565.56
Mobilization	Mobilization, large equipment	1	Each	\$539.90	\$539.90
Acq. Tech. Know.	Training, Workshops	2	Each	\$41.42	\$82.84

Total Cost: \$858,269.63

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$367.83	EQIP-HU	\$441.40
WHIP	\$0.00	WHIP-HU	\$0.00

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Scenario # 3 Large Plug Flow >2000 AU

Scenario Description: Actual Scenario # 3

New York

A plug flow anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen on a livestock operation with more than 2,000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 3,920 animal units (2,800 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	3920	Animal Unit	Tot Unit Cost	\$327.60
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Equip./Install.	Plug Flow, Large (more than 2,000	1	Each	\$1,282,630.58	\$1,282,630.58
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Mobilization	Mobilization, medium equipment	3	Each	\$282.78	\$848.34
Mobilization	Mobilization, large equipment	1	Each	\$539.90	\$539.90
Acq. Tech. Know.	Training, Workshops	2	Each	\$41.42	\$82.84

Total Cost: \$1,284,179.74

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$245.70	EQIP-HU	\$294.84
WHIP	\$0.00	WHIP-HU	\$0.00

Practice: 366 - Anaerobic Digester

Scenario # 4 Small Complete Mix <1000 AU

Scenario Description: Actual Scenario # 4

New York

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with less than 1000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 1,039 animal units (742 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	1039	Animal Unit	Tot Unit Cost	\$693.85
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Equip./Install.	Complete Mix, Small (less than	1	Each	\$719,931.44	\$719,931.44
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Mobilization	Mobilization, medium equipment	1	Each	\$282.78	\$282.78
Mobilization	Mobilization, large equipment	1	Each	\$539.90	\$539.90
Acq. Tech. Know.	Training, Workshops	2	Each	\$41.42	\$82.84

Total Cost: \$720,915.04

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$520.39	EQIP-HU	\$624.47
WHIP	\$0.00	WHIP-HU	\$0.00

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Scenario # 5 Medium Complete Mix 1000-2500 AU

Scenario Description: Actual Scenario # 5

New York

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with 1,000 to 2,500 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 1,890 animal units (1,350 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	1890	Animal Unit	Tot Unit Cost	\$665.51
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Equip./Install.	Complete Mix, Medium (between	1	Each	\$1,256,546.75	\$1,256,546.75
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Mobilization	Mobilization, medium equipment	2	Each	\$282.78	\$565.56
Mobilization	Mobilization, large equipment	1	Each	\$539.90	\$539.90
Acq. Tech. Know.	Training, Workshops	2	Each	\$41.42	\$82.84

Total Cost: \$1,257,813.13

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$499.13	EQIP-HU	\$598.96
WHIP	\$0.00	WHIP-HU	\$0.00

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Scenario # 6 Large Complete Mix >2,500 AU

Scenario Description: Actual Scenario # 6

New York

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with more than 2,500 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 3,220 animal units (2,300 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	3220	Animal Unit	Tot Unit Cost	\$453.70
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Mobilization	Mobilization, large equipment	1	Each	\$539.90	\$539.90
Acq. Tech. Know.	Training, Workshops	2	Each	\$41.42	\$82.84
Equip./Install.	Complete Mix, Large (more than	1	Each	\$1,459,349.41	\$1,459,349.41
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Mobilization	Mobilization, medium equipment	3	Each	\$282.78	\$848.34

Total Cost: \$1,460,898.57

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$340.27	EQIP-HU	\$408.33
WHIP	\$0.00	WHIP-HU	\$0.00

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Scenario # 7 Covered Lagoon/Holding Pond

New York

Scenario Description: Actual Scenario # 7

A covered lagoon is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The waste holding/treatment area is covered by waste treatment lagoon (359) or waste storage facility (313) and the cover is addressed under roofs and covers (367). Costs for this scenario are only for system controls, gas collection, and flaring system. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Practice Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Practice Situation:

A covered lagoon/holding pond with a flexible top is installed over an earthen storage/treatment facility for the purposes of capturing biogas. Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 1,000 animal units (715 - 1,400 lbs dairy cows).

Scenario Feature Measure:

Animals Units Contributing to Digester

Scenario Typical Size:	1000	Animal Unit	Tot Unit Cost	\$0.40
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Mobilization	Mobilization, medium equipment	1	Each	\$282.78	\$282.78
Mobilization	Mobilization, very small equipment	1	Each	\$78.08	\$78.08
Acq. Tech. Know.	Training, Workshops	1	Each	\$41.42	\$41.42

Payment types:				Total Cost:	\$402.28
	<u>PayType</u>	<u>Unit Payment</u>		<u>PayType</u>	<u>Unit Payment</u>
	EQIP	\$0.30		EQIP-HU	\$0.36
	WHIP	\$0.00		WHIP-HU	\$0.00