

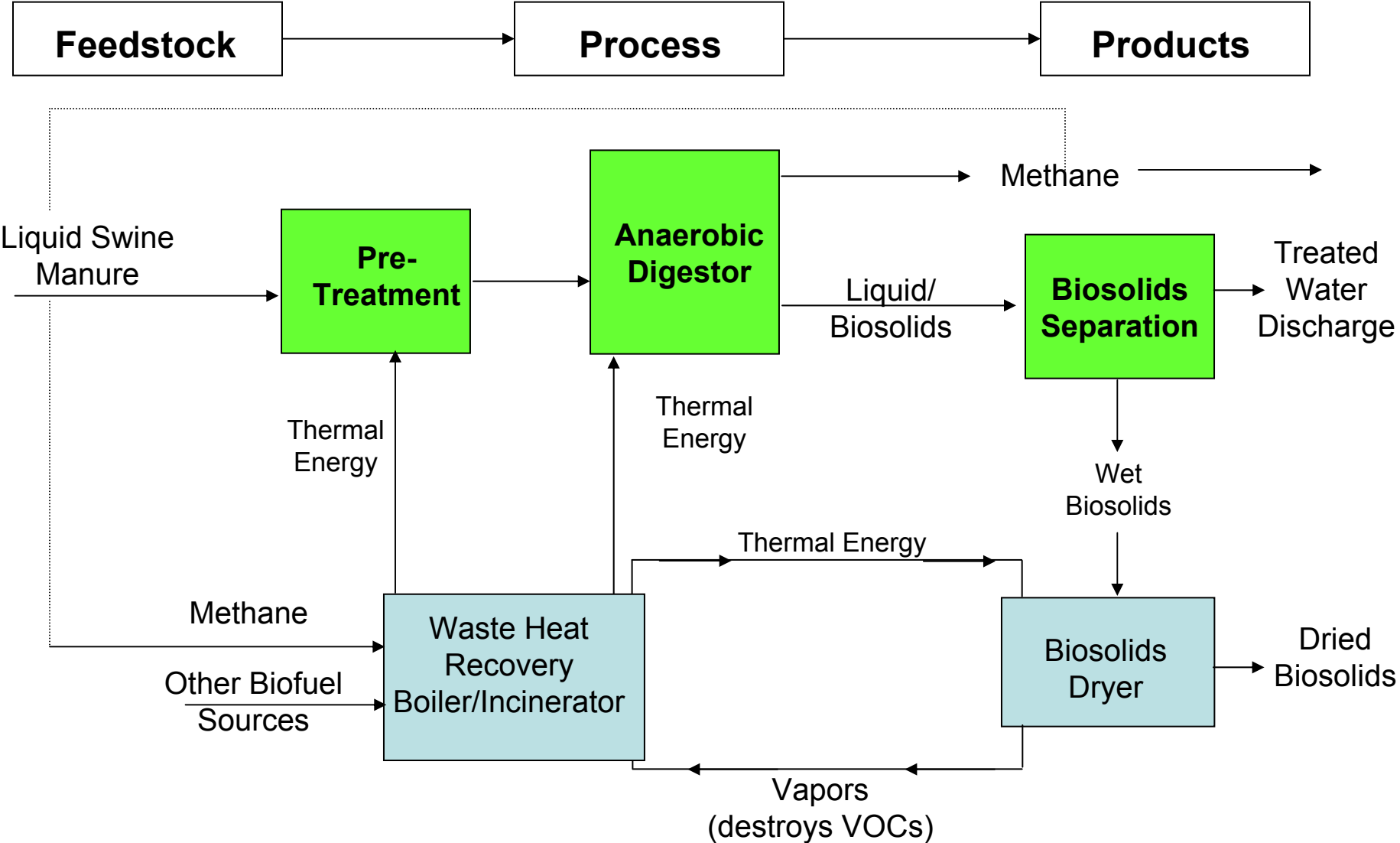
West Michigan Regional Liquid Livestock Manure Processing Center

Feasibility Study Presentation

Frazier, Barnes & Associates

April 19, 2005

Anaerobic Digestion – Technology Overview



Technology Summary

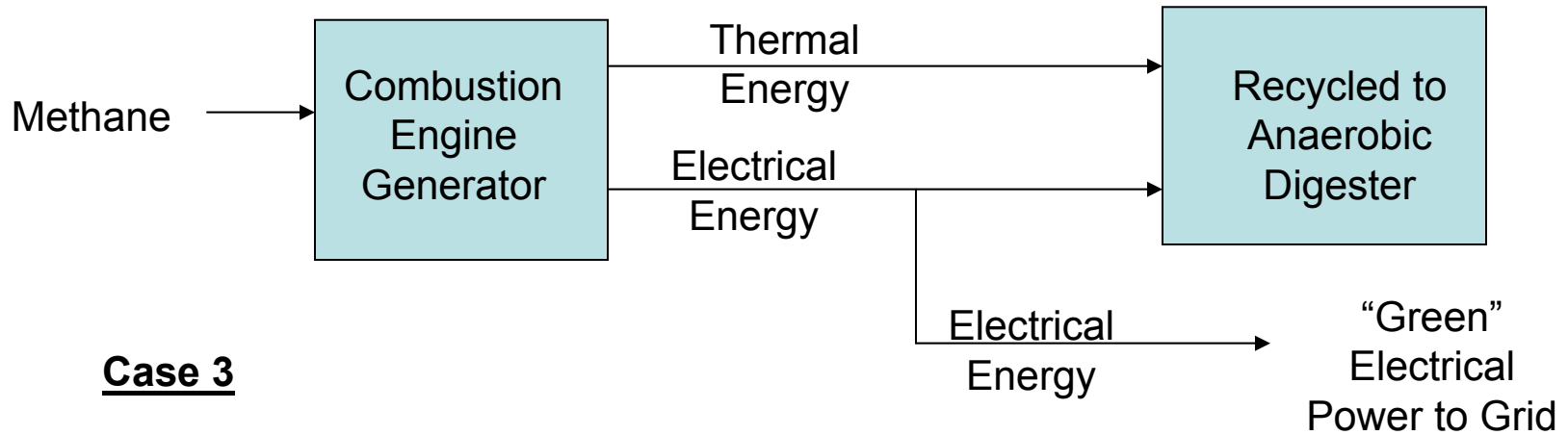
Methane to Pipeline

Case 1:

Case 2:

Feedstock:	50,000 Gallons/Day Nursery/Grow/Finish	100,000 Gallons/Day Addition of Sow/Veal
Volatile Solids:	0.69 lb/Gallon	0.58 lb/Gallon
Moisture:	90.6%	92.2%
Tipping Fee:	Deliver to Facility and \$0.00 to \$0.03 per Gallon	Delivery to Facility and \$0.00 to \$0.03 per Gallon
Methane Conversion Efficiency:	50% to 70%	50% to 70%
Methane Value:	\$1.50 to \$3.50 per mmBtu	\$1.50 to \$3.50 per mmBtu
Digestate Value:	\$50/Ton to \$200/Ton	\$50/Ton to \$200/Ton
Capital Cost:	\$2,800,000 to \$3,800,000	\$4,600,000 to \$5,600,000
Operating Costs:	\$250,000 to \$350,000/Year	\$400,000 to \$500,000
Estimated Annual Return:	\$275,000 to \$400,000/Year	\$550,000 to \$700,000

Technology Summary: Methane to Cogeneration System



Case 3

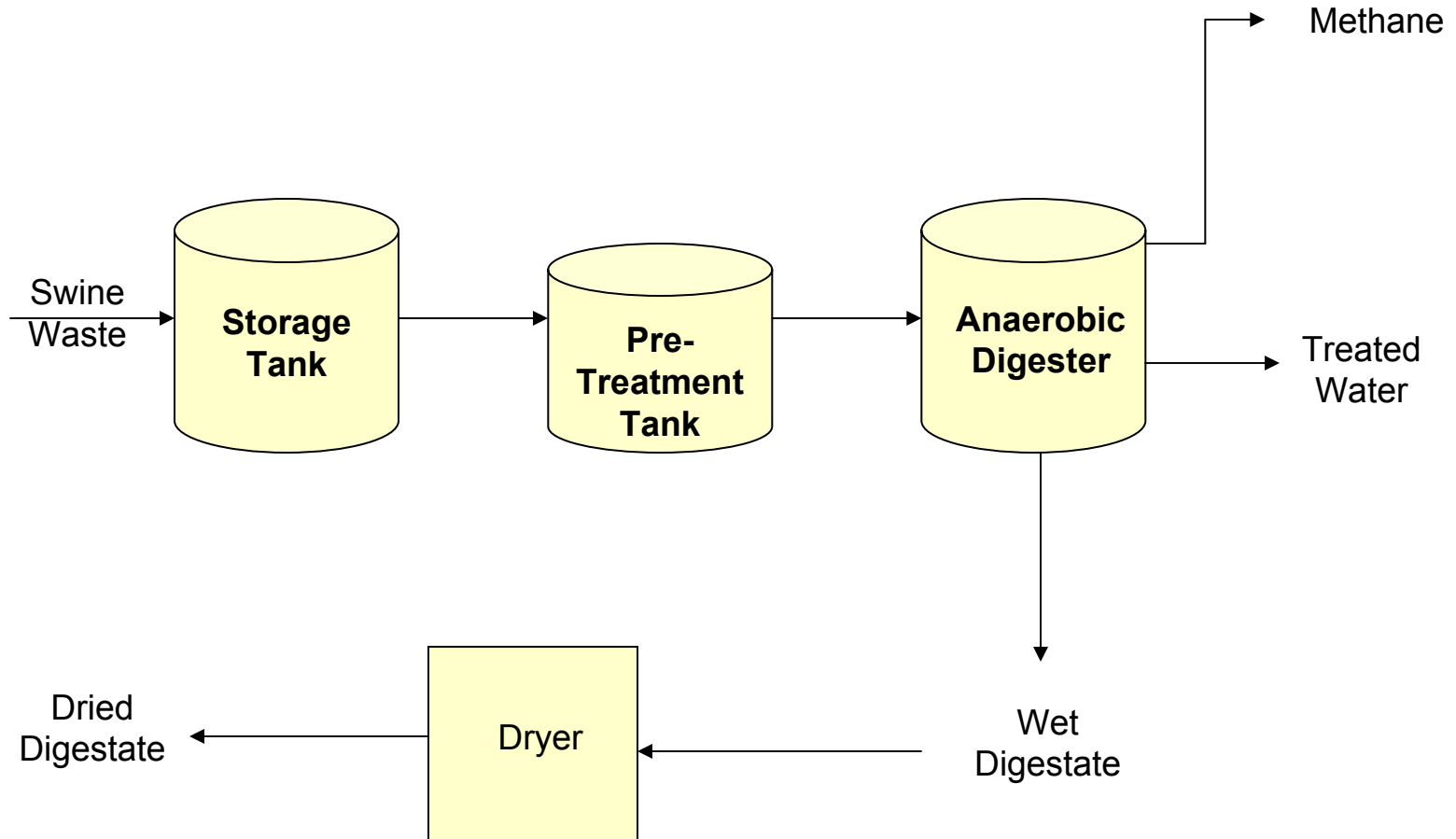
50,000 Gallon/Cogeneration

Case 4

100,000 Gallon/Cogeneration

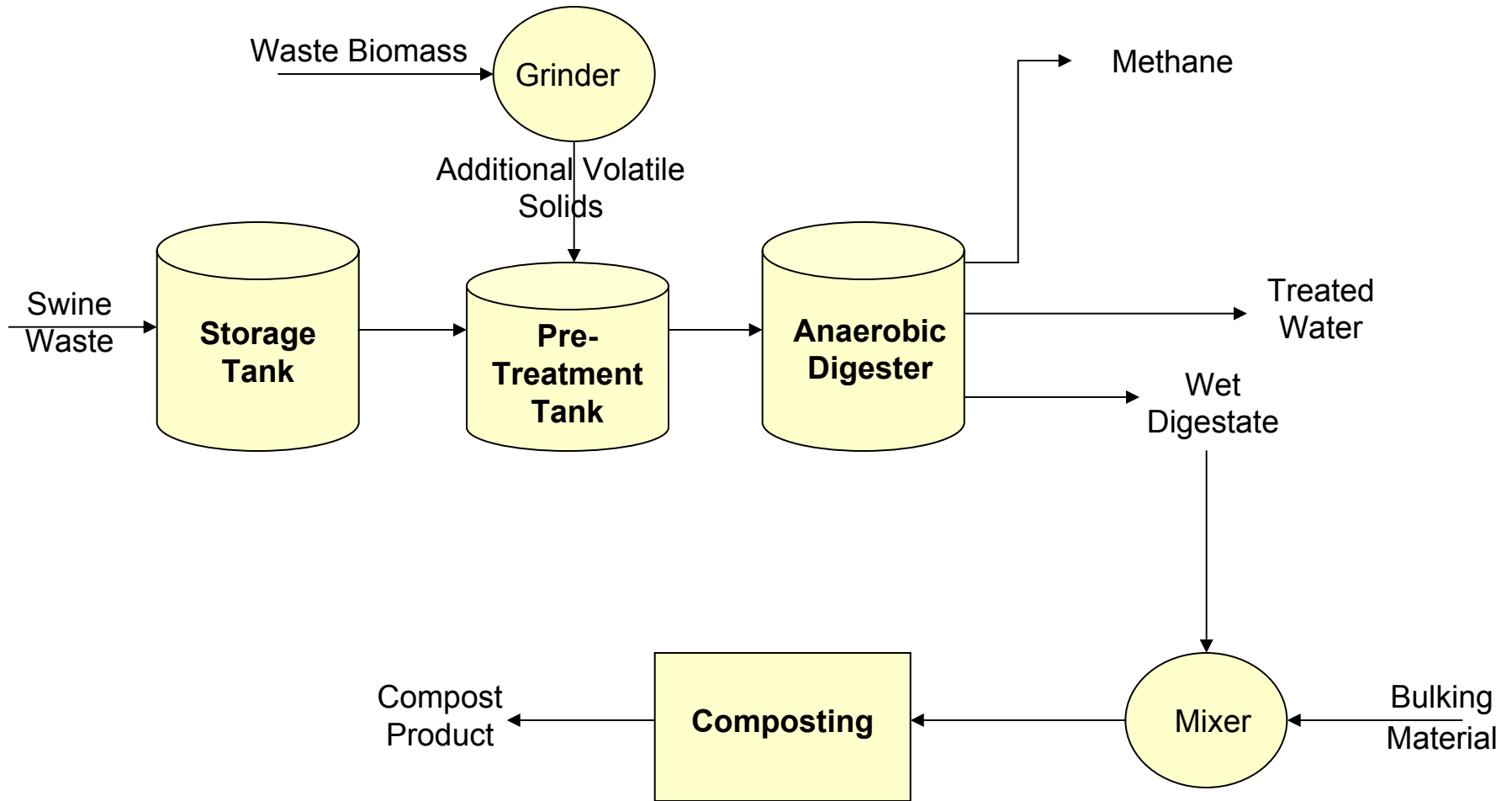
		<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
<u>Swine Waste (Gal/Day)</u>		50,000	100,000	<u>Cogen</u>	<u>Cogen</u>
	Capital Cost	\$ 2,800,000	\$ 4,600,000		
	Technology Conversion Efficiency	60%	60%		
Products Value					
	Swine Waste Tipping Fee (per gallon)	0.010	0.010		
	Methane (per mmBtu)	\$ 2.70	\$ 2.70		
	Digestate Value (per ton)	\$ 75.00	\$ 75.00		
	Total Solids (lb/gallon)	0.78	0.65		
	ROI	19.9%	21.6%		
Operating Costs					
	Maintenance & Supplies	\$0.0007	\$0.0007		
	Electricity (\$0.05/kWhr)	\$0.0003	\$0.0003		
	Chemicals	\$0.0004	\$0.0004		
	Labor & Benefits	\$0.0026	\$0.0026		
	Operating Expenses as % of Capital	2.5%	3.0%		
	Insurance & Taxes	\$0.0050	\$0.0050		
	Total w/out SG&A	\$0.0090	\$0.0090		
	SG&A	\$0.0020	\$0.0020		
	Total Operating Costs (per gallon)	\$0.0110	\$0.0110		
	Feedstock Receiving & Storage	\$900,000	\$1,500,000		
	Biosolid Dryer	\$350,000	\$400,000		
	A.D. Process	\$750,000	\$1,500,000		
	Biosolid Storage & Loadout	\$250,000	\$350,000		
	Contingency (20%)	\$450,000	\$750,000		
	Depreciable Basis	\$2,700,000	\$4,500,000		
	Land	\$100,000	\$100,000		
	Total Capital Investment	\$2,800,000	\$4,600,000		

Proposed Site Layout (Digestate Drying)



Proposed Site Layout

(Waste Biomass/Digestate Composting)



Questions?