**Conservation Practice Effects**

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| **Anaerobic Digester (No) 366**  **Definition: A device or system for reducing emissions of air contaminants from a structure via interception and/or collection.**  **Major Resource Concerns Addressed: Air and water quality.**  **Benchmark Condition: Dairy operation that applies manure to cropland.**  **Date: October, 2016 Developer/Location: Hal Gordon, OR** | |
| **Positive Effects** | **Negative Effects** |
| **Soil**   * **Proper field application of compost should improve soil health.**   **Water**   * **Water quality management options are increased, proper field application of nutrients should minimize runoff losses.** * **Digester provides storage and treatment of manure, pathogens, chemicals and other organics from manure which would normally reach surface or ground water.**   **Air**   * **Dust from manure application will be less from a liquid application system compared to a dry untreated manure system.** * **Decrease in potential ozone precursor emissions (VOCs).** * **Emissions of greenhouse gases will be reduced by combusting the syngas, methane is converted to CO2.** * **Objectionable odors will reduced, cover will retain gas emissions and eliminate contact with atmosphere.**   **Plants**   * **Productivity may increase with compost and better nutrient management.**   **Animals**   * **Improved quality and quantity of forage with compost and nutrient management.**   **Energy**   * **Opportunity for on-site electricity production from methane gas.**   **Human**   * **Increase yields/reduce costs as land becomes more productive.** * **Create sustainability of natural resources that support your business.** * **Increase the property value (real estate) of your property.** * **Conserve soil and water for periods of drought and future use.** * **Prevent off-site negative impacts.** * **Comply with environmental regulations.** * **Save time, money and labor.** * **Promote family health and safety.** * **Make land more attractive and promote good stewardship.** * **May be eligible for cost share.** * **Profitability depends on potential compost and electricity sales and reduced manure management costs.** | **Land**   * **Construction may possibly impact archaeological sites.** * **Minor amount of land taken out of agricultural production, change to headquarters landuse.**   **Capital**   * **Purchase and installation of new equipment.** * **Annual operation and maintenance costs to maintain structure, equipment and dispose of compost.**   **Labor**   * **Increase in labor to operate and maintain equipment and compost.**   **Management**   * **Increase in record keeping and developing compost disposal plans.**   **Risk**   * **Increase in farm operation flexibility due to energy and compost by-product opportunities.** * **Cash flow will be negative while implementing operation.** * **Anaerobic digestion may result in a greater potential for ammonia release.** |
| **Net Effect: Digester may improve soil productivity and water quality at a significant cost.** | |

**Commonly Associated Practices:** Access Road, Critical Area Planting, Nutrient Management, Waste Storage Facility, Waste Transfer, Waste Utilization, Windbreak/Shelterbelt Establishment

**Note:** This worksheet contains general talking points for the conservation planner to discuss with the land user. It is the first step towards an economic or financial analysis. The second step would include identifying a specific site for analysis at the farm or field level, editing the template for local conditions, adding units and quantities of farm inputs and outputs. The third step in the economic analysis is to place a dollar value on as many variables as possible, put all units in the same time frame, using amortization ($/Acres/Year) or net present value ($/Acre), so benefits and costs can be compared. The fourth and final step would be to combine several conservation practices into a conservation system, which is how most conservation practices are applied at the field level. Data for the worksheet comes from the land user, conservation planner, technical specialist and local agricultural supply vendors and contractors. See Economics Technical Note: TN 200-ECN-1, Basic Economic Analysis Using T-Charts (August 2013) for more information.