

Milk House Wastewater Treatment System Selection & Economics



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Operation Factors

- Number of cows
- Water use
- Wastewater strength



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Farm Site Factors

- Available area
- Depth to seasonal high water table or bedrock
- Soil texture
- Site elevations
- Distances to wells and surface waters



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Farmstead Factors

- Milk house effluent pipe elevation
- Farmstead space



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Management & Economics

- Owner preference
- Operation and maintenance requirements
- Capital investment
- Operating costs



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Initial and Operating Costs

| System | Initial ¹ (\$) | Operating (\$/yr) ² |
|------------|---------------------------|--------------------------------|
| Irrigation | \$6,000 to \$10,000 | \$150 |
| Bark bed | \$6,000 to \$10,000 | \$150 |
| ATU | \$10,000 to \$20,000 | \$300 |
| RMF | \$12,000 to \$20,000 | \$200 |

¹ Equipment and installation

² Estimated

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Operation and Maintenance

- Electricity for pumps and blowers
- Annual septic tank pumping (\$100/year)
- Maintenance for long term operation
 - Check effluent filters
 - Pumps and blowers
 - Bark Replacement
 - Rodent management
- Miscellaneous repairs

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Storage with Land application

Assume

- Lined storage pond costs \$0.90 per ft³ or \$0.12 per gal
- Manure land application costs \$10 per 1,000 gal or \$0.01 per gal



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Find storage cost

Given

- 60 cow herd and 5 gpd/cow
- 1) Find annual volume
- 2) $60 \text{ cows} * 5 \text{ gpd/cow} * 365 \text{ d/yr} = 109,500 \text{ gal/yr}$
- 3) Find cost of storage
 - = $\$0.12/\text{gal} * 109,500 \text{ gal}$
 - = **\$13,140**

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Find land application cost

Given

- 60 cow herd
- 5 gpd/cow
- 1) Annual volume = 109,500 gal/yr
- 2) Find application cost
 - = $\$0.01/\text{gal} * 109,500 \text{ gal/yr}$
 - = **\$1,095/yr**

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Total cost Storage with Land Application

Assume 15 year life

- Manure storage **\$13,140**
- Land application
- $\$1,095/\text{yr} * 15 \text{ yr} = \underline{\underline{\$16,425}}$
- Total cost **\$29,565**

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Questions?

Visit www.manure.umn.edu and click on Milk House Waste



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