Disposal Options – Choosing the Best Method

Presented by
Tom Ferrero

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OVERVIEW

- Publicly Owned Treatment Works (POTWs)
- Land Application
- Dedicated Septage Facilities
- Economic Elements
- Business Plan – Decision by $

PUBLICLY OWNED TREATMENT WORKS (POTWs)

- Head of Plant

PUBLICLY OWNED TREATMENT WORKS (POTWs)

- Septage Receiving Area

PUBLICLY OWNED TREATMENT WORKS (POTWs)

- Economic Elements
  - Disposal Fee
    - Per Gallon
    - Per Load
    - Honor System
  - Truck Time
    - Distance
    - Time
  - 24/7 Facility
    - Need Holding Tank

PUBLICLY OWNED TREATMENT WORKS (POTWs)

- Economic Elements
  - Disposal Fee
    - Per Load 5 cents/gal - 3000 gal $150.00
  - Truck Time
    - Time Additional 1 hour @ 80.00/hr $  80.00
  - 24/7 Facility – Yes
  - Total Cost for 3,000 Gallons $230.00
    - Per 1,000 gallons $230/3= $ 76.67
    - Per Gallon $230/3,000 = $ 0.07667
40 CFR Part 503 (USEPA)
- Screening
- Class B Biosolid
  - Pollutant Limits
  - Pathogen and Vector Attraction Reduction
    - pH ≥ 12 for 30 minutes or,
    - Inject or,
    - Incorporate within 6 hours
- Recordkeeping
LAND APPLICATION

- Economic Elements
  - Land Cost: None
  - Equipment: $50,000 for 10 years
  - Screening
  - Tankage w/mixing
  - Lime Storage
  - Spreading Equipment
  - Lime: 25# per 1,000 gal @ $150.00/ton
  - Trucking: 1 hr turnaround @ $80.00
  - Recordkeeping

Volume to be Disposed: 500,000 gal/yr

Cost Per Gal: $22.84
Cost Per 1,000: $118,750
Total Cost: $104,000

Dedicated Facility Technologies

- Economic Elements
  - Planning/Engineering
  - Permitting
  - Funding
  - Capital Reimbursement Fee
  - Equipment Selection
  - Operational Costs

![Land Application Image]

DEDICATED FACILITY TECHNOLOGIES

THINK! ... What are your Resources?

<table>
<thead>
<tr>
<th>Solids</th>
<th>Liquid</th>
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<tbody>
<tr>
<td>Lime Stabilization</td>
<td>Land Apply</td>
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<tr>
<td>Thickening</td>
<td>Land Apply</td>
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<tr>
<td>Dewatering</td>
<td>Land Apply</td>
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</tbody>
</table>
DEDICATED FACILITY TECHNOLOGIES

- Unit Processes
  - Screening/Grit Removal
  - Equalization Tankage
  - Dewatering
    - Polymer Addition
  - Sludge
    - Further Treatment
  - Filtrate
    - Further Treatment
  - Odor Control

PRIVATELY OWNED DEDICATED FACILITY

PRIVATELY OWNED DEDICATED FACILITY

DEDICATED FACILITY TECHNOLOGIES

- Thickening
  - Add Lime and/or
  - Add Polymer

DEDICATED FACILITY TECHNOLOGIES

- Thickening
  - Add Lime and/or
  - Add Polymer
  - Gravity Belt
  - Drum Thickener
DEDICATED FACILITY TECHNOLOGIES

- Thickening
- Dewatering Equipment
  - Belt Press
  - Rotary Drum Vacuum Filter
  - Recessed Cavity Plate & Frame
  - Container Filter
  - Centrifuge
  - Others

DEDICATED FACILITY TECHNOLOGIES

- Belt Press

DEDICATED FACILITY TECHNOLOGIES

- Rotary Drum Vacuum Filter

DEDICATED FACILITY TECHNOLOGIES

- Recessed Cavity Plate & Frame

DEDICATED FACILITY TECHNOLOGIES

- Container Filter

DEDICATED FACILITY TECHNOLOGIES

Economics of Construction
- Land & Building $400,000
- Screen/Grit Removal $50,000
- Dewatering Equipment $100,000
- Tankage $50,000
- Odor Control $25,000
- Engineering & Permits $30,000
- Plumbing & Electrical $40,000

$695,000

Disclaimer: Costs May Vary Considerably
DEDICATED FACILITY TECHNOLOGIES

- Capital Reimbursement Fee
  - Defined in Sewer Use Ordinance
  - Usually _____ Dollars per _____ Gallons per Day
    (EDU-Equivalent Dwelling Unit)

Example:
- $3,500 per EDU
- 228 gallons per day (gpd) is an EDU
- Say 20,000 gpd or 20,000/228 = 87.72 EDUs
- 87.72 EDUs x $3,500 per EDU = $307,020

Note: Costs May Vary Considerably

DEDICATED FACILITY TECHNOLOGIES

- Economic Elements
  - Cost to Construct $695,000
  - Capital Reimbursement Fee $307,020
    $1,002,020

Assume 20 year Payback @ 6.5% Interest
12 Payments per year = $89,650

DEDICATED FACILITY TECHNOLOGIES

- Economics of Annual Costs for 20,000 gpd
  - Payback of Capital Costs $89,650
  - Sewer Discharge Fees @ $.005 26,000
  - Sludge Disposal @ $35.00/ton 75,900
  - Utilities 8,000
  - Chemicals (Polymer/Lime) 9,750
  - Permit & Analysis 3,000
  - Repair & Maintenance 5,000
  - Wages & Benefits 40,000
  - Insurance 5,000
  - Cost of Property 10,000
  5,200,000 Gal per year at 5.2 cents/gallon $272,300

SUMMARY

<table>
<thead>
<tr>
<th>Disposal Costs Based on 20,000 Gallons Per Day</th>
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<tr>
<td>POTW 7.667 cents/gallon</td>
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<tr>
<td>Land Application 2.284 cents/gallon</td>
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<td>Dedicated Facility 5.24 cents/gallon</td>
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DEDICATED FACILITY TECHNOLOGIES

- Economics of Construction
  - Land & Building $400,000
  - Screen/Grit Removal 10,000 50,000
  - Dewatering Equipment 150,000 100,000
  - Tankage 50,000
  - Odor Control 25,000
  - Engineering & Permits 30,000
  - Plumbing & Electrical 40,000
  705,000 $695,000

Disclaimer: Costs May Vary Considerably

DEDICATED FACILITY TECHNOLOGIES

- Economics of Annual Costs for 20,000 gpd
  - Payback of Capital Costs 90,550 $89,650
  - Sewer Discharge Fees @ $.005 26,000
  - Sludge Disposal @ $35.00/ton 40,000 75,900
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  - Cost of Property 4.53 235,550 10,000
  5,200,000 Gal per year at 5.2 cents/gallon $272,300
MORE INFO?

Water Environment Federation
Septage Handling
Manual of Practice No. 24
1-703-684-2400
www.wef.org/applications/publications/

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JUST DO IT

NAWT
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September 12-13, 2007
Lancaster, Pennsylvania

NAWT Thanks Kline’s Services, Inc. for hosting the 2007 Treatment Symposium

336 Chestnut Lane
Ambler, PA 19002-1001
Telephone: 800-236-6298
www.nawt.org
info@nawt.org