2007 Pumper and Cleaner Environmental Expo International

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)

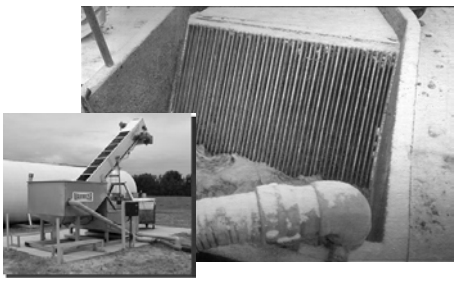
- Economic Elements
  - Disposal Fee
    - Per Load 5 cents/gal -3000 gal $150.00
  - Truck Time
    - Time Additional 1 hour @80.00/hr $ 80.00
  - 24/7 Facility – Yes
  - Total Cost for 3,000 Gallons $230.00
    - Per 1,000 gallons $230/3= $ 76.67
    - Per Gallon $230/3,000 = $ 0.07667

LAND APPLICATION

LAND APPLICATION

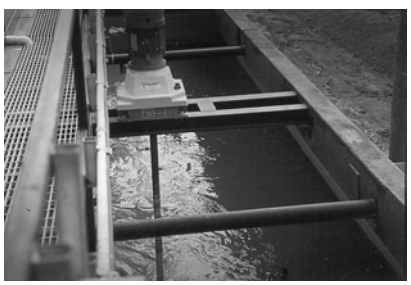
- 40 CFR Part 503 (USEPA)
- Screening
- Class B Biosolid
  - Pollutant Limits
  - Pathogen and Vector Attraction Reduction
    - pH 12 for 30 minutes or,
    - Inject or,
    - Incorporate within 6 hours
- Recordkeeping

LAND APPLICATION



LAND APPLICATION

DEDICATED FACILITY TECHNOLOGIES



LAND APPLICATION

LAND APPLICATION

LAND APPLICATION

- Economic Elements
  - Land Cost
  - Equipment
    - Screening
    - Tankage w/mixing
    - Lime Storage
    - Spreading Equipment
  - Lime
  - Trucking
  - Volume to be disposed
  - Recordkeeping

LAND APPLICATION

- Economic Elements
  - Volume to be Disposed 500,000 gal/yr
  - Land Cost None
  - Equipment $50,000 10 yr
    - Screening
    - Tankage w/mixing
    - Lime Storage
    - Spreading Equipment
  - Lime 25# per 1,000 gal @$150.00/ton
  - Trucking 1 hr turnaround @ $ 80.00
  - Recordkeeping

LAND APPLICATION

Disposal Costs Based on 20,000 Gallons Per Day			
PARAMETER	COST	PER	Cost Per Year
EQUIPMENT	$50,000	10 Years	$ 5,000
LIME	$150 per Ton	25 # per 1,000 5200 x 25 lbs = 130,000 lbs	$ 9,750
TRUCKING	$80.00/hr	1 hr per 4,000 gal 5,200,000/4,000 =1300 trips	$ 104,000
TOTAL COST			$ 118,750
COST PER 1,000			$ 22.84
COST PER GAL			2.284 Cents

DEDICATED FACILITY TECHNOLOGIES

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

DEDICATED FACILITY TECHNOLOGIES

THINK! … What are your Resources?

	Solids			Liquid	
Lime Stabilization	Land Apply				
Thickening	Land Apply		POTW	POTW	Land Apply
Dewatering	Land Apply	Composting Heat Drying etc	Landfill	POTW	Land Apply

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

Dedicated Facility Technologies

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

DEDICATED FACILITY TECHNOLOGIES

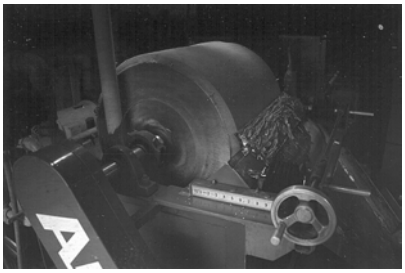
- Thickening
- Dewatering Equipment
  - Belt Press
  - Rotary Drum Vacuum Filter
  - Recessed Cavity Plate & Frame
  - Container Filter
  - Centrifuge
  - Others

DEDICATED FACILITY TECHNOLOGIES

Belt Press

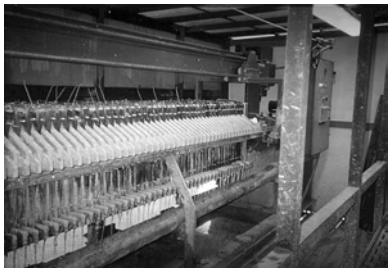
DEDICATED FACILITY TECHNOLOGIES

Rotary Drum Vacuum Filter



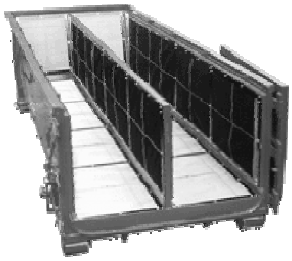
DEDICATED FACILITY TECHNOLOGIES

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

Disposal Costs Based on 20,000 Gallons Per Day		
POTW	7.667	cents/gallon
Land Application	2.284	cents/gallon
Dedicated Facility	5.24	cents/gallon

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~~
  - Utilities 8,000
  - Chemicals (Polymer/Lime) 8,000 ~~9,750~~
  - Permit & Analysis 3,000
  - Repair & Maintenance 5,000
  - Wages & Benefits 40,000
  - Insurance 5,000
  - 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/

Disposal Options – Choosing the Best Method

JUST DO IT

NAWT
2nd Annual Septage/Grease Trap Waste Treatment Symposium

September 12-13, 2007
Lancaster, Pennsylvania

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

Disposal Options – Choosing the Best Method

NATIONAL ASSOCIATION OF WASTEWATER TRANSPORTERS, INC.

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