

# Thinking of Taking Septage – Here are Some Considerations

Kim Riddell and Paul Matrka

Smith Environmental

[www.go-smith.com](http://www.go-smith.com)

[kim@go-smith.com](mailto:kim@go-smith.com)

[paul@go-smith.com](mailto:paul@go-smith.com)

# Where to Start if You're Considering Taking Septage:

1. Determine if the WWTP can Handle the Extra Loading.
2. Develop Ordinances to Set Regulations and Fees.
3. Recording Keeping and Sampling Recommendations.
4. Equipment Considerations and Selection

# First, Some Septage Facts and Figures...

- “Domestic Septage” means either liquid or solid material removed from a septic tank, cesspool, portable toilet or type III marine device that receives only domestic sewage.
- In 1990 it was estimated that there were over 24.6 million septic tanks generating approximately 5.5 billion gallons of septage annually.
- A septic tank usually retains 60-70% of the solids, oils and grease that enter it.
- Treatment and disposal of domestic septage is governed by the CFR Part 503, as well as by any state or local regulations.

# Septage Characteristics are Affected by:

- User habits
- Septic Tank Size, Design and Pumping Frequency
- Water Supply Characteristics
- Use of Water Conservation Measures, Garbage Disposals, Household Chemicals and Water Softeners.
- Note: This pertains to domestic septage. If you are considering taking industrial wastes or grease traps, this should be considered on a case by case basis and only after sampling is performed.

# Characteristics of Septage – Conventional Parameters

Parameter	Minimum Concentration (mg/l)	Maximum Concentration (mg/l)
Total Solids	1,132	130,475
Total Volatile Solids	353	71,402
Total Suspended Solids	310	93,378
BOD	440	78,600
COD	1,500	703,000
TKN	66	1,060
Ammonia Nitrogen	3	116
Total Phosphorus	20	760
Alkalinity	522	4,190
Grease	208	23,368
pH	1.5	12.6

# Characteristics of Septage – Conventional Parameters

Parameter	Average Concentration mg/l
Total Solids	34,106
Total Volatile Solids	23,100
Total Suspended Solids	12,862
BOD	6,480
COD	31,900
TKN	588
Ammonia Nitrogen	97
Total Phosphorus	210
Alkalinity	970
Grease	5,600

# So What are the Options with Septage:

- Land Application
- Treatment at a WWTP
- Treatment at an Independent Septage Treatment Facility
- We will be focusing on treatment at the WWTP for the purpose of this presentation.

# Pros and Cons:

- Pros:
  - Convenient option
  - Centralizes waste treatment for a community
  - Many plants, particularly large ones are easily capable of taking the extra load.
- Cons:
  - Potential for upset at the WWTP
  - Increased Requirement for handling and disposal of residuals
  - Typical Increase in O&M at the WWTP which in turn increases costs (important when setting rates).

# Determining if the WWTP can Handle the Additional Load...

- Several methods to consider...
- Chart provided by The National Small Flows Clearinghouse (<http://nesc.wvu.edu.nsf/>)
  - For example with an activated sludge facility with primary treatment:
    - A facility at 50% design load can accept 1.4%Q
    - If  $Q = 2$  MGD then, the facility can accept 28,000 gallons of septage daily.
    - The same facility at 80% design load can accept 0.4%Q or only 8,000 gallons per day of septage.

# Utilizing WWTP Data:

- Determine limiting parameter (always consider CBOD and TSS at a minimum...)
  - Say the WWTP is designed for 3.83 MGD and 12,000 lbs of CBOD<sub>5</sub> daily... but receiving 2.1 MGD at an average concentration of 425 mg/l or 7,443 lbs/ day CBOD<sub>5</sub>
  - Using a safety factor of 85% of design for septage receiving...  $10,200 \text{ lbs} - 7443 \text{ lbs} = 2,757 \text{ lbs per day left}$
  - Using 30,000 mg/l as an average CBOD<sub>5</sub> for septage that would mean the facility could take approximately 11,019 gallons of septage daily and “safely” not exceed their NPDES Permit.

# Other Considerations:

- Loads are often discharged directly into the facility from a truck (takes about 10 minutes) – this is extremely important for small plants because the instantaneous load can increase by as much as 4 times and has the potential to overwhelm downstream processes.
- Also should consider monitoring DO during peak septage loadings to ensure adequate levels ( $>2.0$  mg/l) are present for proper treatment.

# Options for Septage Receiving at the WWTP

- Addition at an Upstream Manhole
- Addition at the WWTP Headworks
- Addition to the Sludge Handling Process at the WWTP
- Addition to Both the Wet and Solids Stream Processes

# Septage Receiving Location:

- Upstream Sewer Manhole
  - Substantial dilution occurs prior to the WWTP
  - Best if done in large diameter sewers
  - Always the potential for grit and debris to accumulate in sewer
  - Potential for odors near the manhole (best to choose location away from residential areas if possible)

# Septage Receiving Location:

- Addition at WWTP Headworks
  - Typically added to sewage immediately upstream of grit and screening
  - Option to utilize very nicely designed septage receiving stations
  - Allows facility staff to control the discharge

# Septage Receiving Location:

- Solids Handling Process:
  - Reduces the load to the wet stream processes.
  - Eliminates the potential for affecting effluent quality
  - Potential to effect sludge dewatering
  - May cause clogging of pipes and increase wear on pumps if not accepted utilizing a receiving station at this location.
  - Still has the potential to allow facility staff to control discharge

# Local Regulations:

- Now that you've determined you have the extra capacity and where you are going to take the septage:
  - Ensure that your local ordinances have regulations in place to help prevent and deal with issues that can arise when accepting septage.
  - Develop a contract with regulations that each contract hauler must sign prior to discharging at your facility.
  - Set a fee structure that compensates for the higher O&M costs associated with accepting septage (in the 1990's this was between 3-6 cents per gallon; today it is closer to an average of 10 cents per gallon).

# Record Keeping and Sampling

- Records of septage sources and volumes and routine sampling of septage loads are essential parts of a comprehensive septage management program!
  - Can deter septage haulers from discharging bad loads.
  - Can also assist in determining the source of a bad load if an upset occurs at the WWTP.

# Records to Keep:

- Septage / Sludge Hauler Information Sheet:
  - Company and Driver information
  - Contact information
  - Type of truck or trucks if they have a fleet
  - Tank capacity of each truck
  - Type of waste typically hauled
  - Card # assigned to each driver if applicable
  - Initial load sampling data sheet(s)

# Records Continued:

- Septage / Sludge Manifest:
  - Date / Time
  - Hauler Information / Driver #
  - Septage Generator Information:
    - Source: Residential, Commercial, Industrial, Restaurant, WWTP or other
    - Waste Type: septage, holding tank, sludge, grease trap, portable toilets, other
    - Volume
  - Lab Information
    - Sample Taken or Not
    - pH
    - Other odors or grease present
    - Sent for additional testing (attach sheets when data received)

# Other Considerations / Recommendations:

- Some systems are equipped with card readers which may even allow for after hours dumping if necessary for approved haulers.
- Many facilities require that either grab samples of “random” loads be collected and analyzed or that samples of each load be collected, preserved and stored (samples may or may not actually be analyzed).
- Many facilities collect a pH on every load simply to allow for a visual observation and to check for anything unusual.
- **THE BOTTOM LINE: GET TO KNOW YOUR HAULERS TO ENSURE THE PROTECTION OF YOUR FACILITY!**

# And Now On to Picking Your Equipment...

Paul Matrka

Smith Environmental, Owner

[paul@go-smith.com](mailto:paul@go-smith.com)

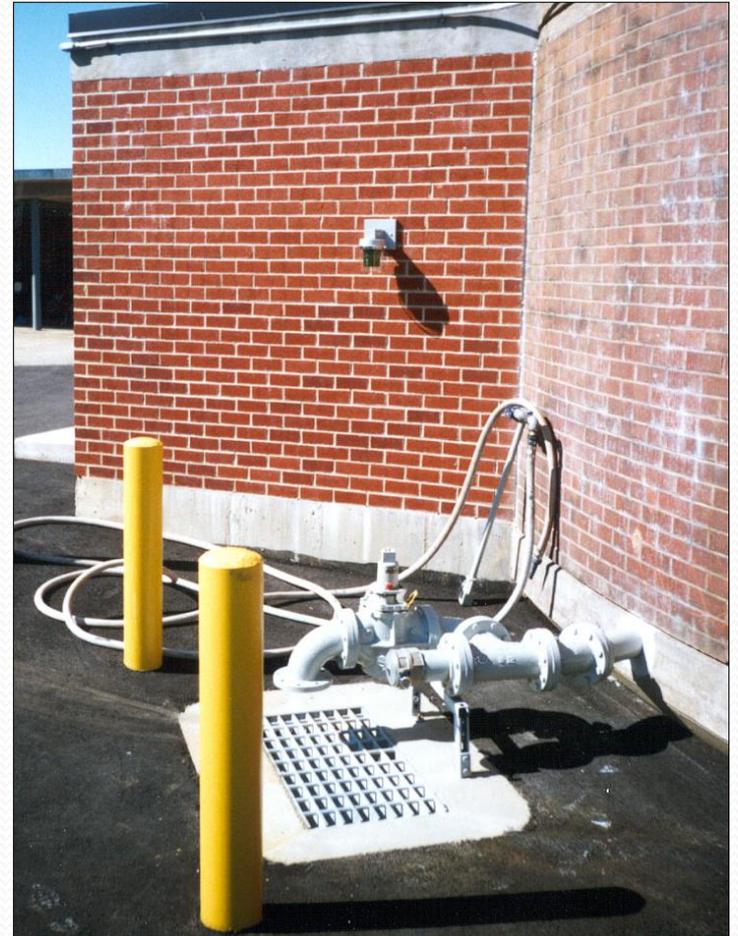
# Key Components of a Septage Receiving Facility

- Unloading Area
- Septage Screen
- Installation Considerations
- Record Keeping/Billing

# Septage Hauler Unloading Area



# Septage Hauler Unloading Area



# Septage Hauler Unloading Area

Drive through set-up is preferable for traffic flow considerations.

Hose bib and drain for housekeeping.

Truck outlet higher than SAP inlet.



# Septage Screen



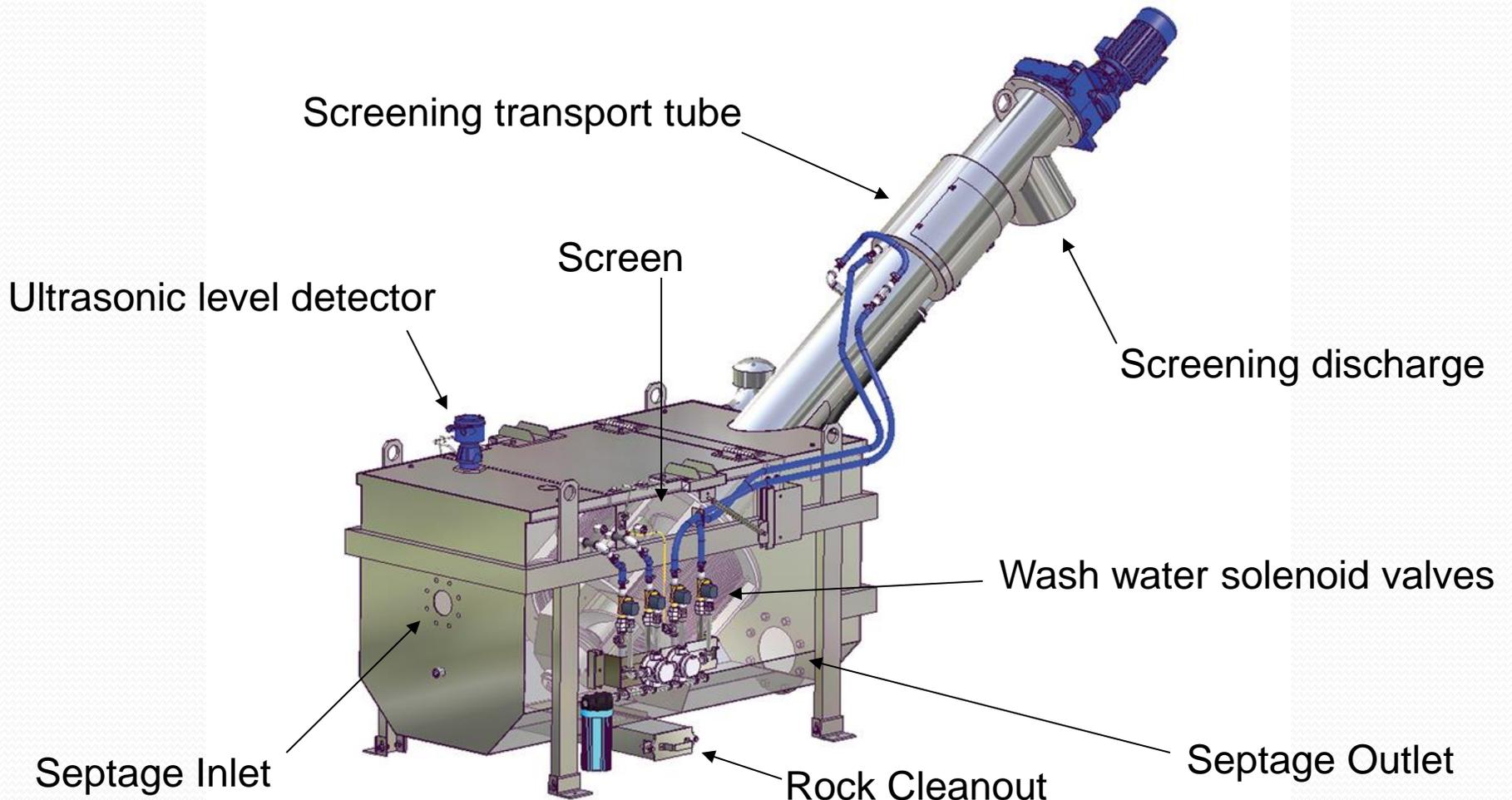
# Septage Screen

When selecting your screening equipment you should consider:

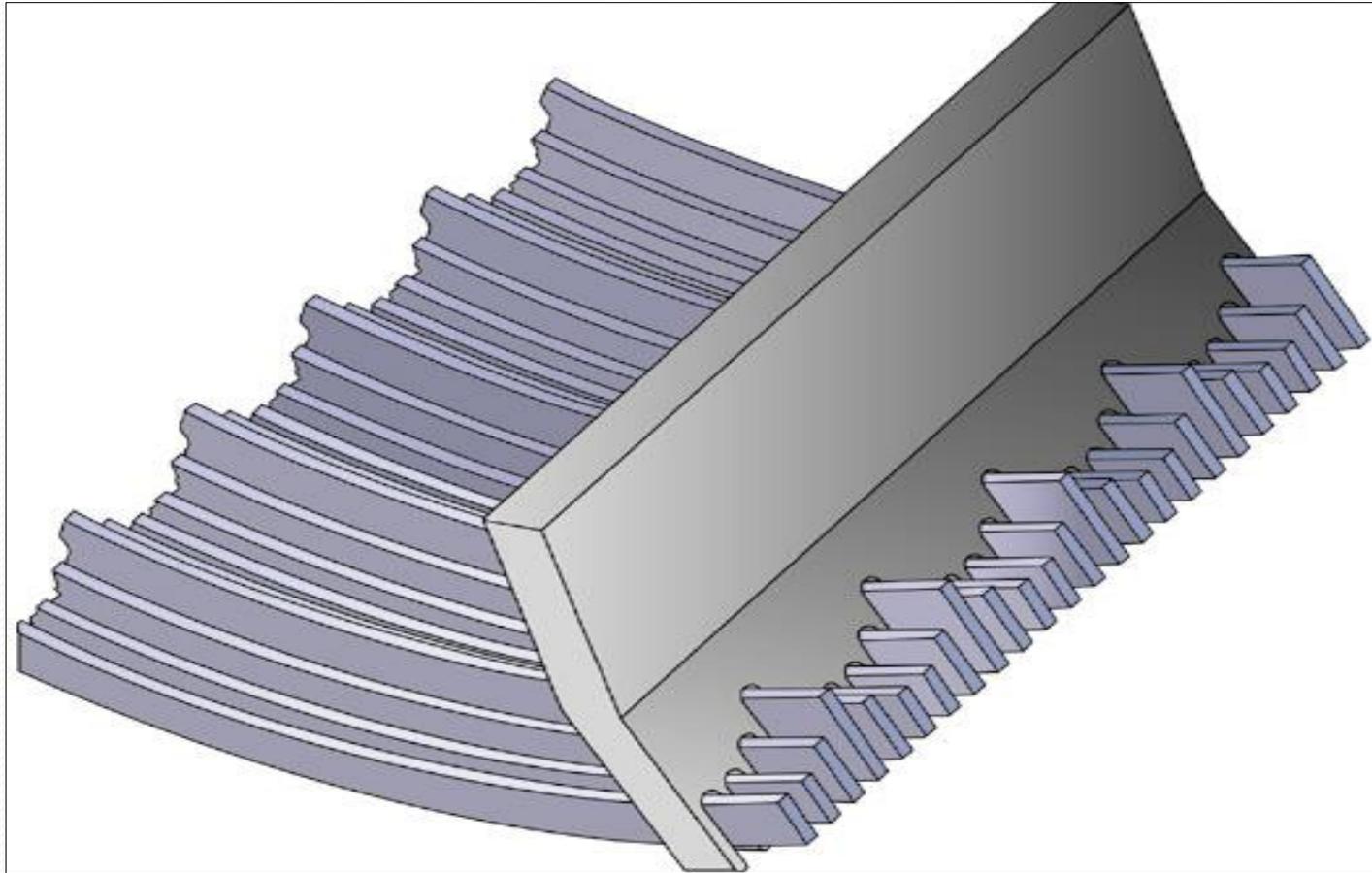
- Its suitability to the application
- Its operating characteristics
- Its septage flow capacity
- Its maintenance requirements

# Septage Screen

## Typical Components

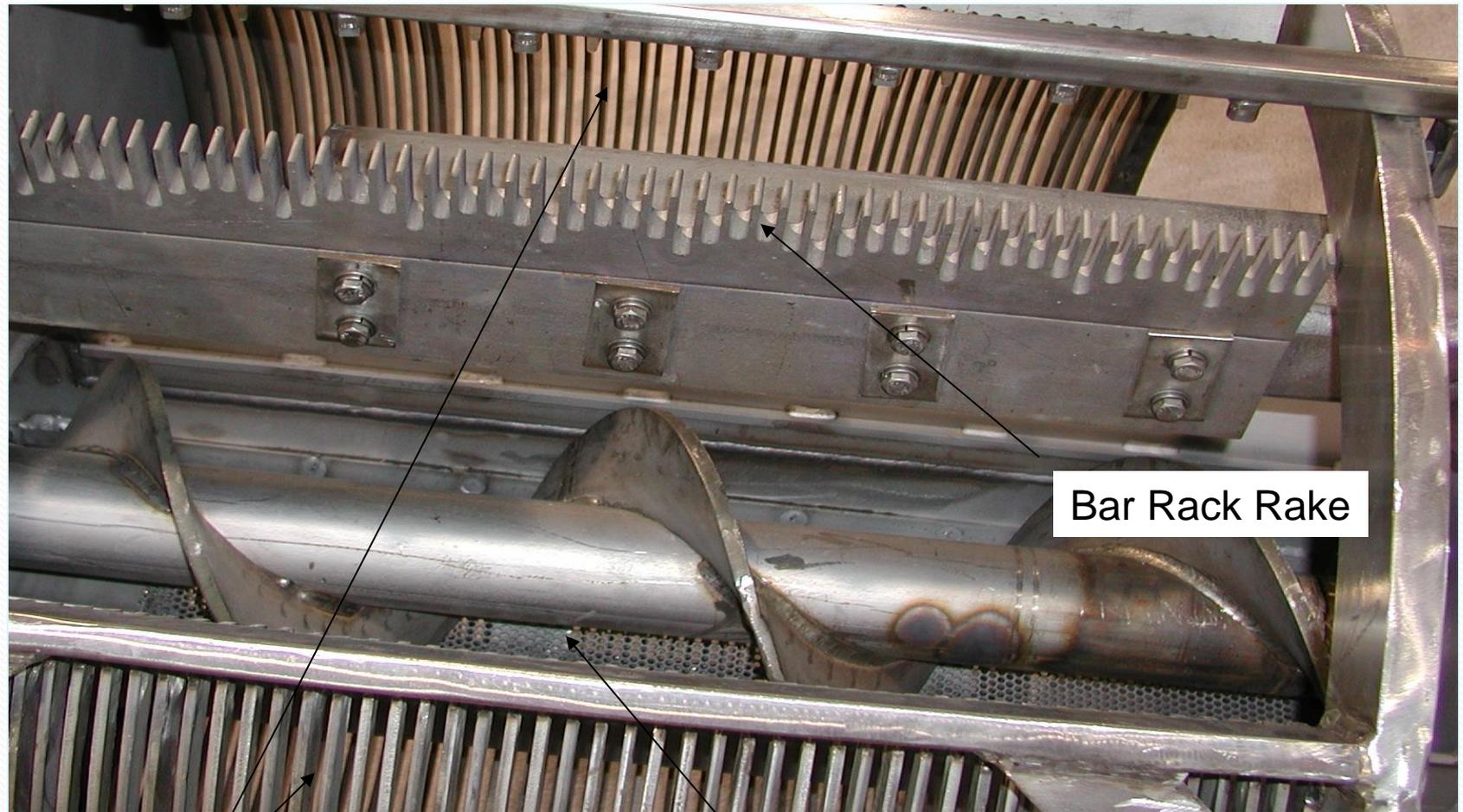


# Septage Screen



A true bar screen works best.

# Septage Screen



Bar Rack Rake

Bar Rack

Screenings Conveyance Trough

# Septage Screen



Perforated Screens don't cut the mustard (or grease).

# Septage Screen

Perforated Plate Type Screens are not appropriate for Septage Applications

- Don't handle grease well
- Flow capacity is limited
- Screenings remain on screen



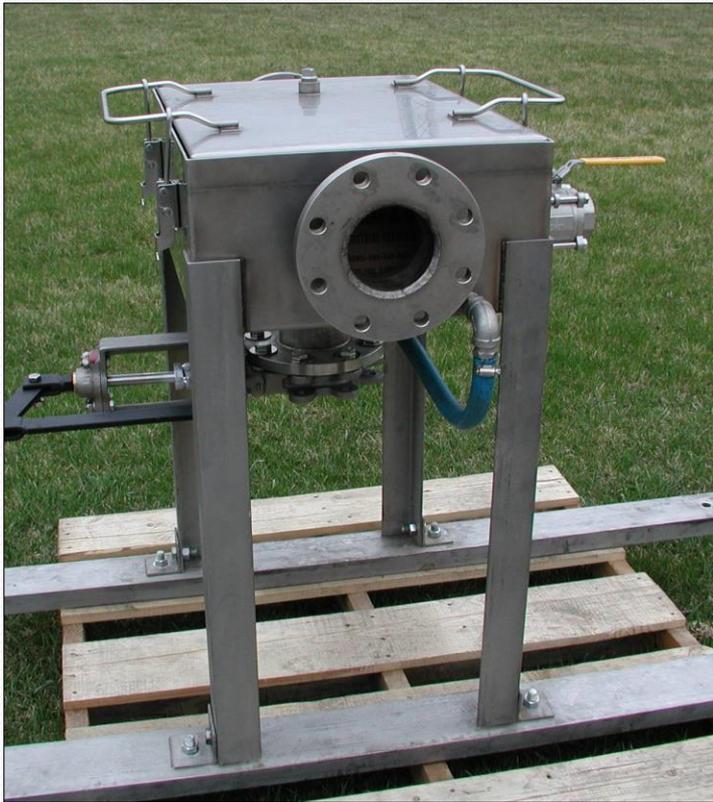
# Installation Considerations

What about ROCKS?



# Installation Considerations

## Rock Trap



# Installation Considerations

## Newark's Better Idea



# Installation Considerations

## What about ODORS



**Longofill™**



- an enclosed bagging system for the containment and easy handling of sludge cake from the small and medium sized sewage treatment plant

# Installation Considerations

## What about ODORS



# Installation Considerations

## Housekeeping



Jet Spray Nozzle

# Installation Considerations

## Flowmeter



# Record Keeping/Billing

## Hauler Access



# Record Keeping/Billing

Multiple Levels of Sophistication are available

- Basic Keypad Access System
  - Printer for customer receipts
  - Operator is able to retrieve and print summary of events
  
- Data Acquisition Software
  - Retrieves septage data from Access System
  - Monitor and track hauler activity
  - Create and maintain septage program data base
  
- Billing
  - Import information from data base to bill customers

***Questions?***

***Comments?***

***General Excitement?***