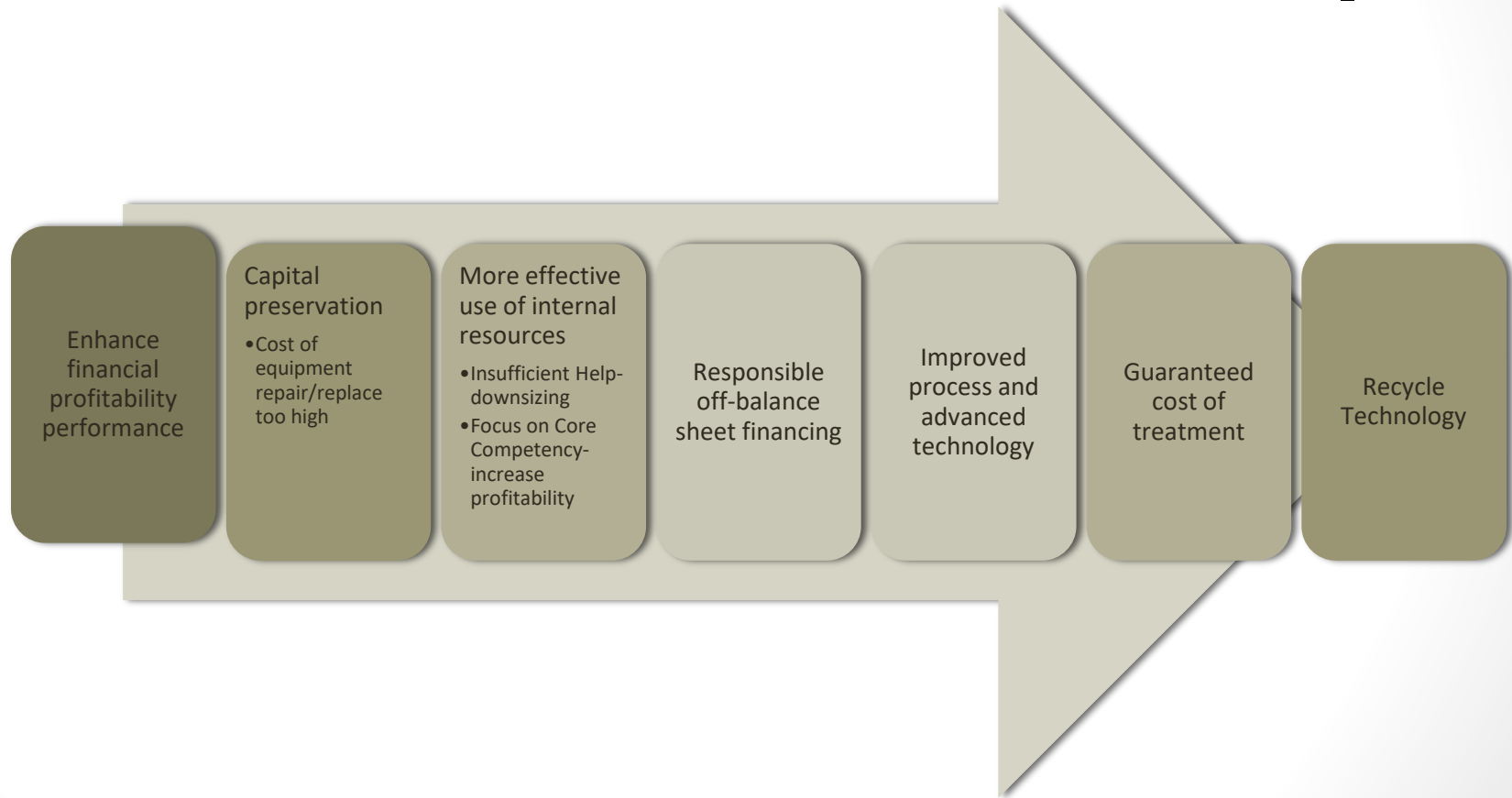
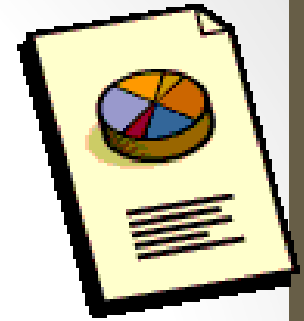


Food Industry

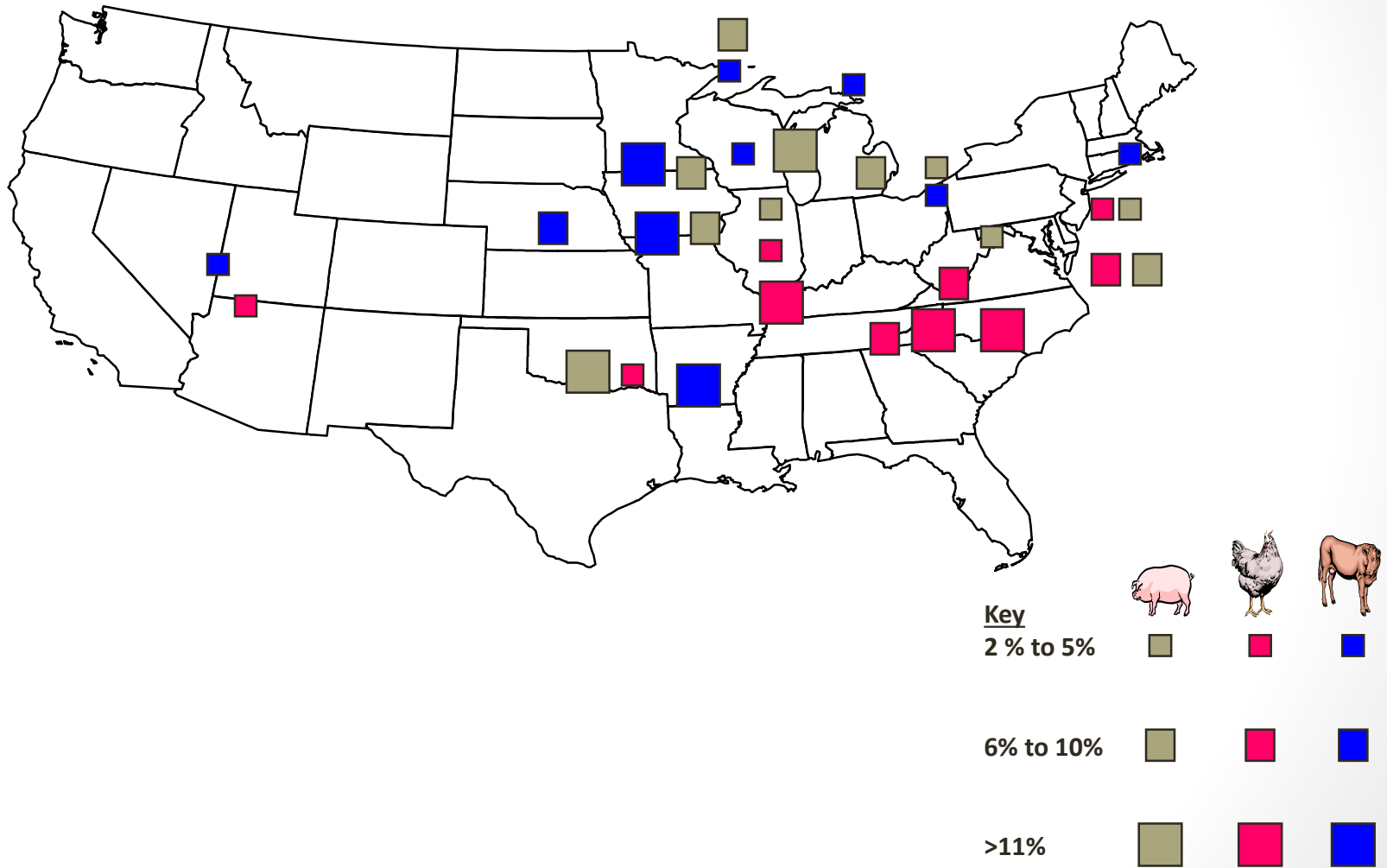
Solution Options for
wastewater treatment
BOD and FOG removal
POTW charges and
Surcharges



Customer Drivers- We have to reduce our costs



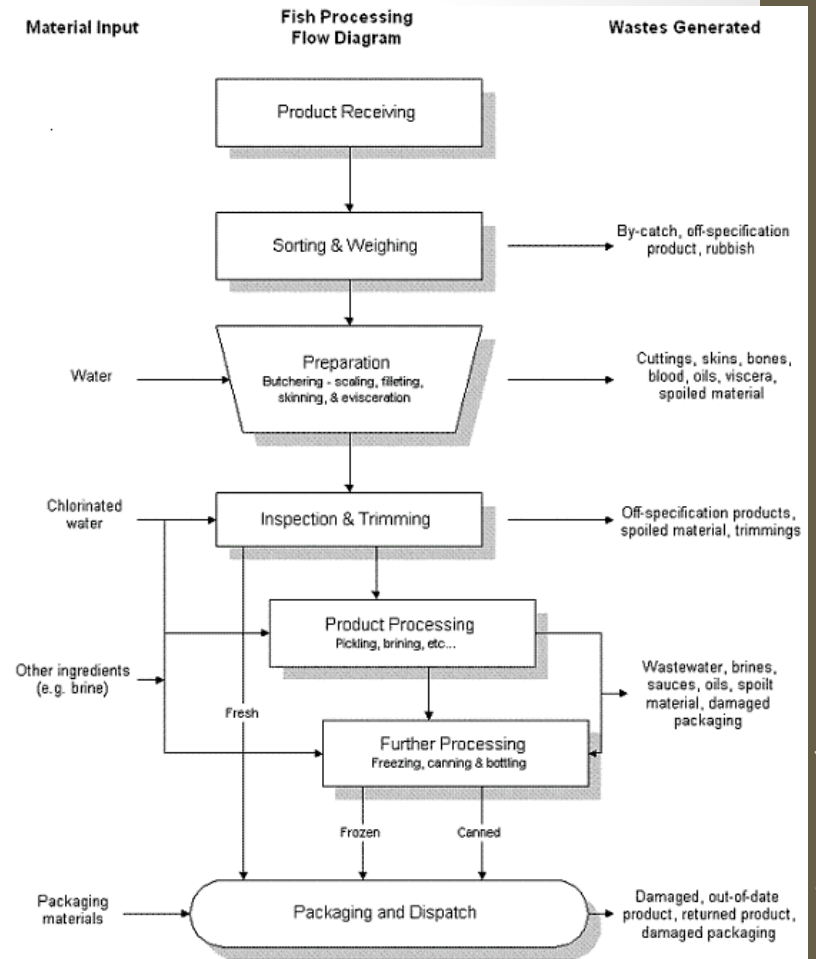
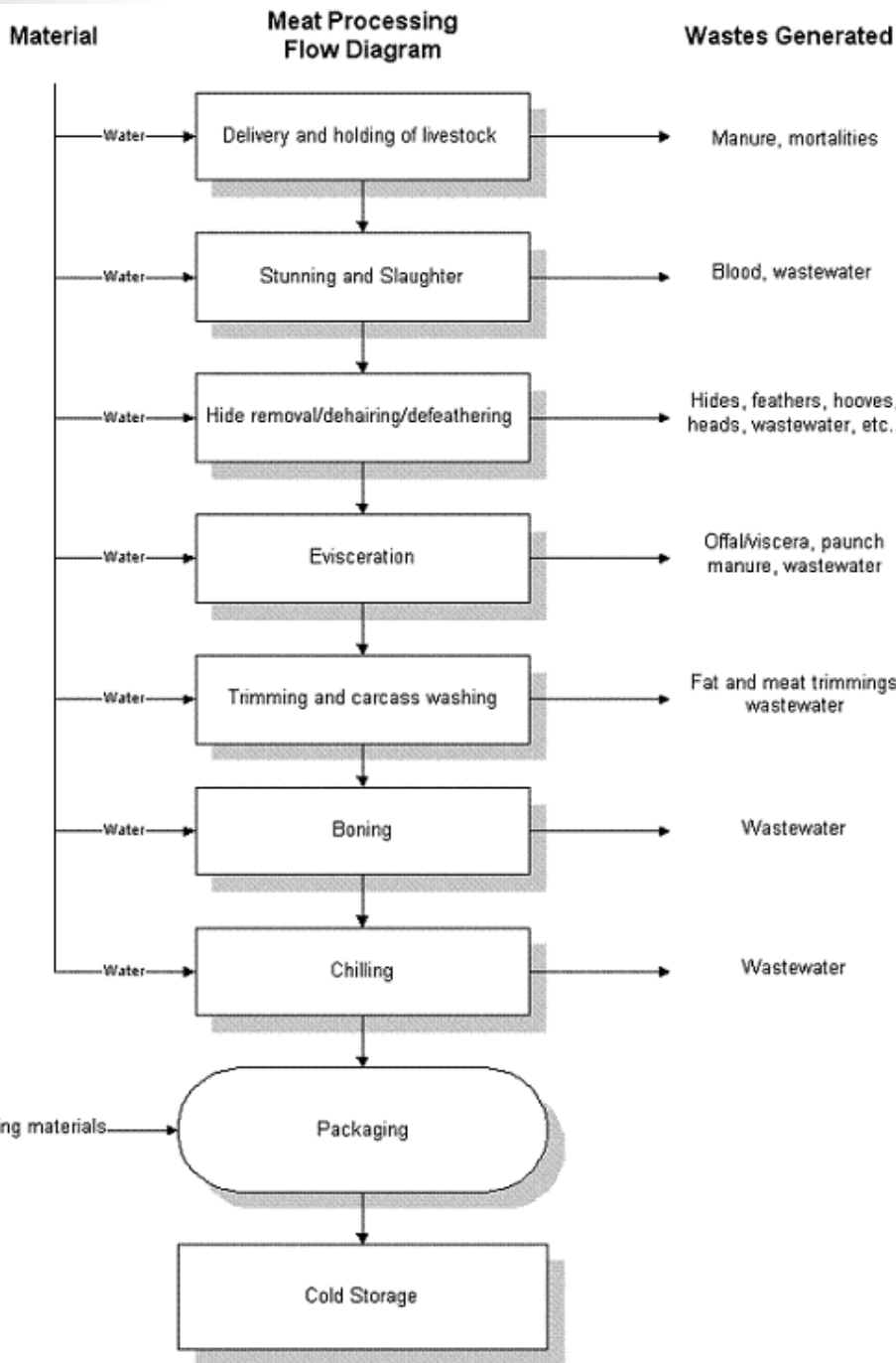
Meat Slaughter Concentrations By% of US Total, By State

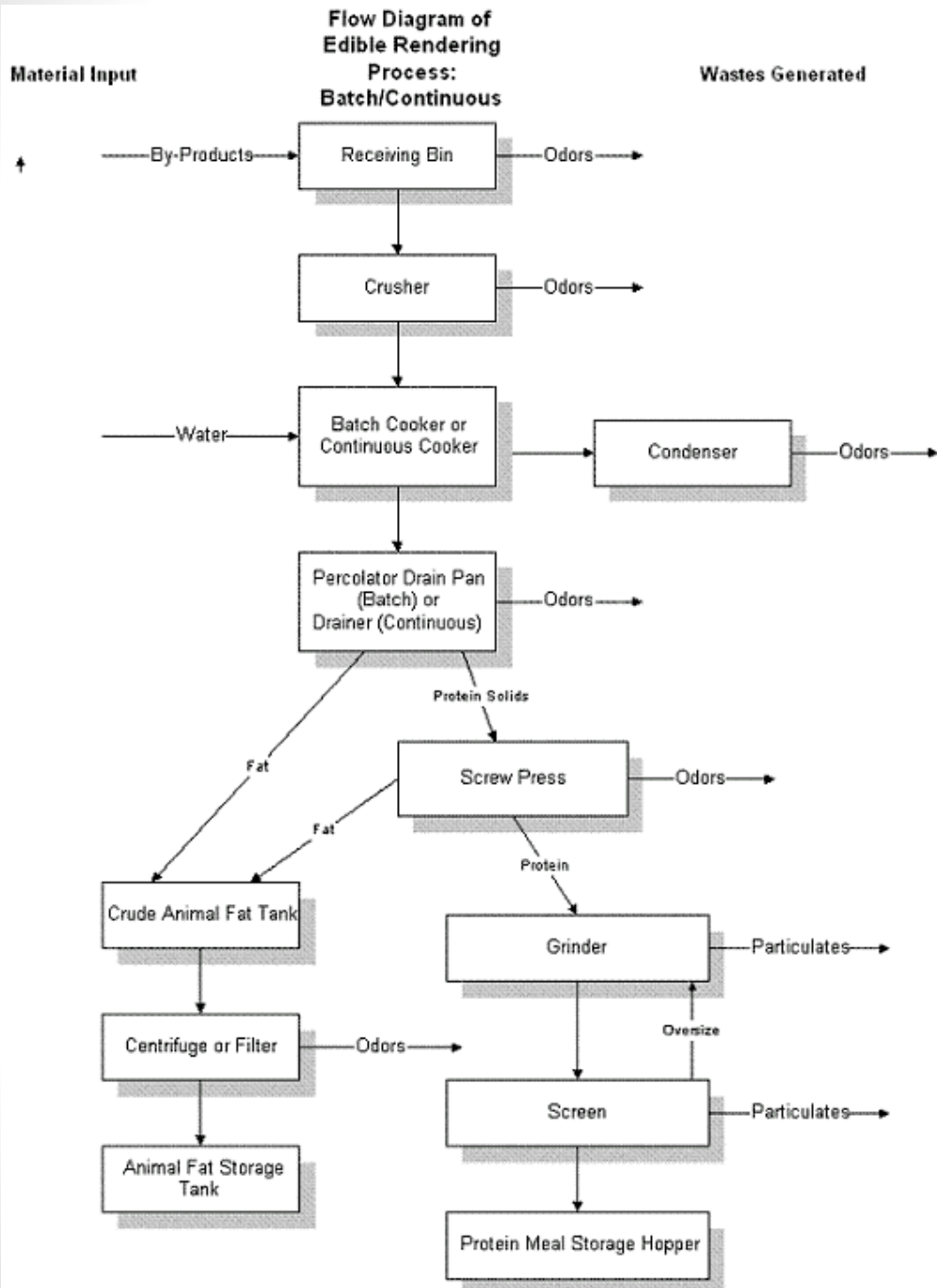


Meat processing- problem areas

- Hundreds of thousands \$ on POTW fees and surcharges
- Oil and Grease, blood
- Wide changes in loading
- pH
- Filaments
- Nitrification
- Odor control

Beef Processing
Pork Processing
Poultry Processing
Fish Processing
Rendering Process





Typical problems

- pH swing issues
- Blood
- Salts
- Ammonia
- Grease and Oils

Table 6.2:Relative Wastewater Treatment Costs		
Technology	Ref.	Relative Cost (\$/m ³ treated)
Screening	6.2.1	\$0.20
Gravity clarifier	6.2.2	\$0.30
Trade waste interceptor	6.2.2	\$0.05
Filtration	6.2.3	\$0.40
Floatation	6.2.4	\$0.70
Hydrocyclones	6.2.5	\$0.30
Centrifuges	6.2.5	\$0.90
Coagulation	6.2.6	\$0.70
Flow equalization	6.2.7	\$0.20
Aerobic lagoons	6.2.8	\$0.20*
Aerated lagoons	6.2.9	\$0.40*
Anaerobic lagoons	6.2.10	\$0.20*
Trickling filters	6.2.11	\$0.50
Activated sludge	6.2.12	\$0.90
Rotating biological contractor	6.2.13	\$0.50



Order of magnitude costs for complete installations, including estimated cost of capital borrowing, depreciation on equipment, maintenance, utilities and material.

** land costs not included.*

Treated volume assumed to be 70,000 m³ per year.

Treatment Options- BOD, FOG reduction and Surcharge elimination



Upstream pits, drains and wet wells



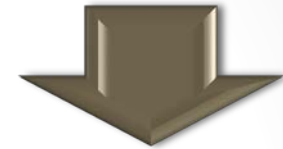
Solids, oils foaming, debris, septicity



Bioaugmentation in drains and wet wells



*20-45% BOD
reduction



depending
upon time



Bioblocks for slow release

**Liquids can be fed
with a polymer
pump on
automated drip
feed**

**Dry products used
for concentrated
applications**

Preliminary Treatment

Screening (Bar Screens)

Removes large objects from entering the WWTP



Grit Removal

Protects pumps against excessive wear.



Flow Equalization

Equalizes flow over 24 hour period, reduces hydraulic surges

pH neutralization

Maintains pH within an acceptable range

Heat Exchange

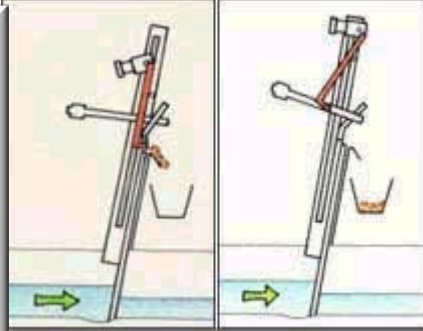


Upstream in the plant



Screening

- ✓ Protects pumps against excessive wear.
- ✓ Protects system from large debris



Screening





Flow Equalization



✓ Overcomes problems caused by variations in flow patterns

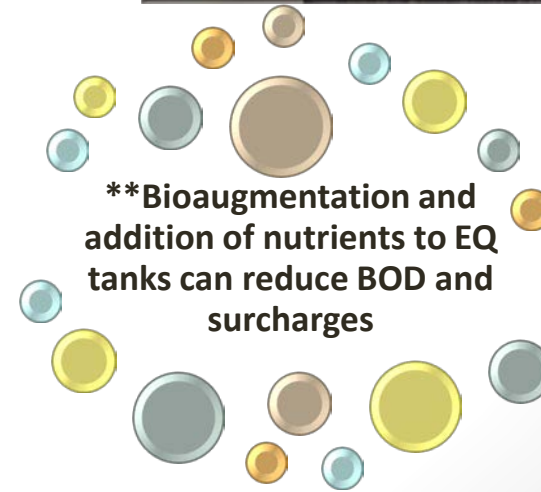
✓ Benefits:

reduced organic shock

pH stabilization

reduced solids washout

improved treatment (stabilize hydraulic retention time in primary and secondary units.



****Bioaugmentation and addition of nutrients to EQ tanks can reduce BOD and surcharges**



Installation of small tanks-For pretreatment prior to POTW

- Small tank
- Aerator
- N and P
- Bioaugmentation
- pH adjustment



Primary Treatment

American Petroleum Institute separator (API's)

Purpose:
Solids/Oils and Grease Removal



Dissolved Air Flotation / Dissolved Gas Flotation

- Circular
- Rectangular

Induced Air Flotation / Induced Gas Flotation

- Nozzle Type
- Rotor Type

Sedimentation (Primary Clarifier).



Grease



Nitrification issues at Meat packing plant

- High amines sent to local POTW
- Existing API and DAF
- Large storage tanks for grease concerted to use for bioaugmentation
- BioBlocks also used upstream



Troubleshooting



****Grease can have an extremely high BOD which can impact your surcharges**



Analytical Report

Client: Amwell - A Division Of McNish Corp
Project ID: VA - WWTP PO# 64120
Sample: Primary Tank #1 Pass 3
Sample: 7-3986-001

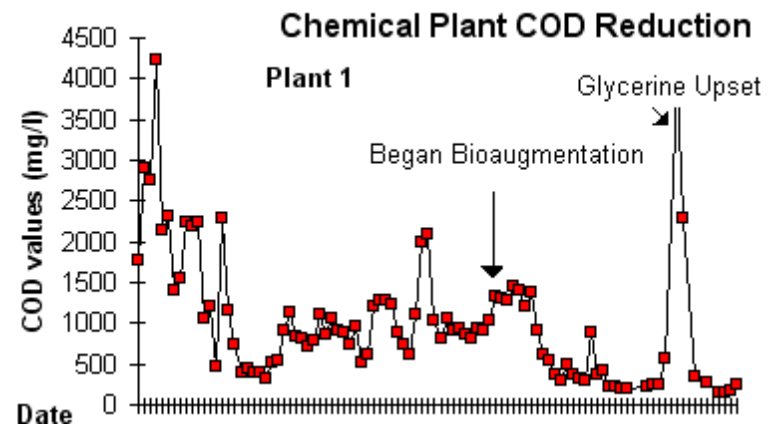
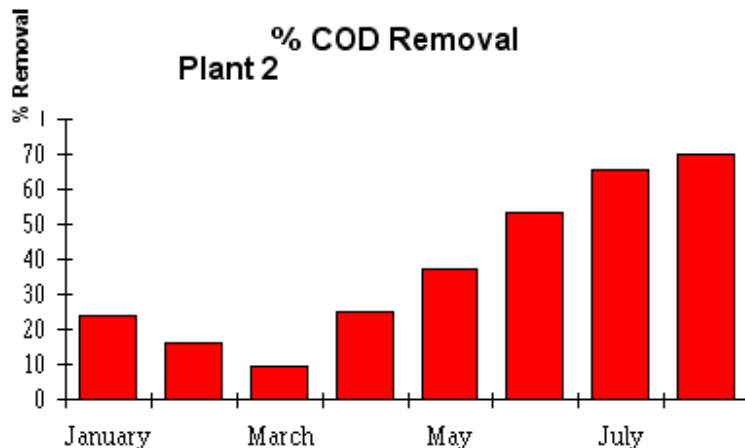
Date: 09/06/07
Time: 10:15
Date Received: 09/07/07
Date: 09/12/07

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Date Analyzed	Method	Flag
Oil & Grease	748,000	10	mg/kg	09/12/0	9071B	P
Specific Gravity	1.00	1.00		09/11/0	2710F	N
COD	3,690,000	100	mg/kg	09/10/0	5220D	

Bioaugmentation

- **Bioaugmentation Case Histories**
- Two food and chemical plants that needed to pretreat prior to a local POTW. Bioaugmentation programs were implemented. At plant #2, COD removal was 24-39% prior to bioaugmentation. After only a few months on the program, the plant was achieving between 70-79% COD removal. Below, a graph of COD reduction at plant #1.



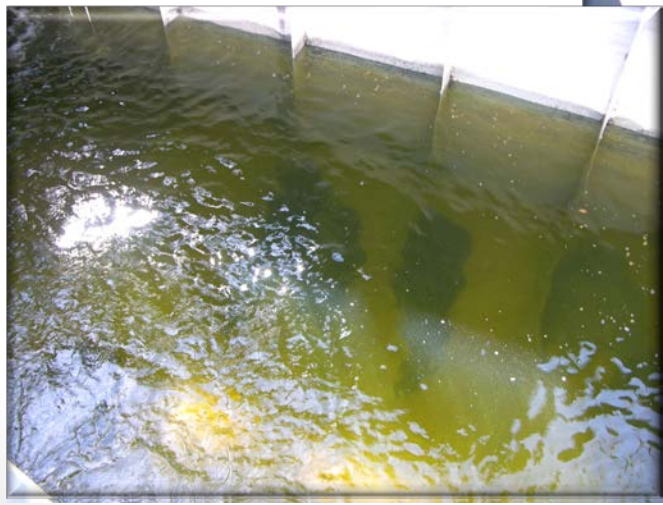
Texas Barbecue- Before Bioaugmentation



Texas Barbecue – After Bioaugmentation



** Existing plant



Packaged Plant Concept

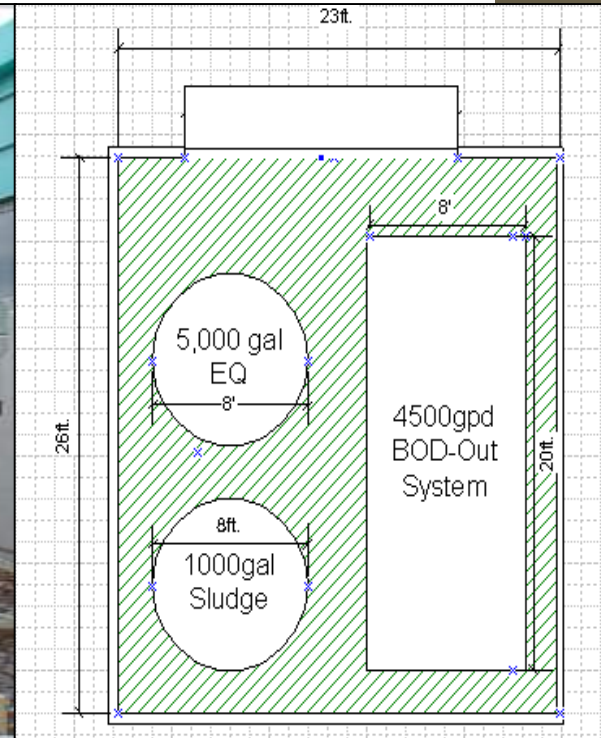


- Modular construction
- Standard Container dimensions minimizes transport costs
- Minimal onsite installation
- Multiple models

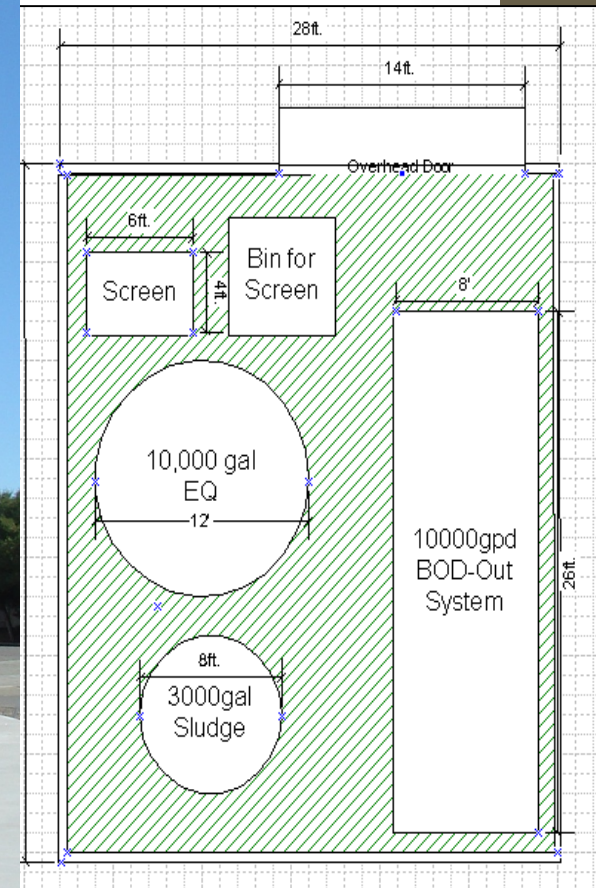
7 m³, 25m³, 40m³, 100m³ – per day



25m³/day system



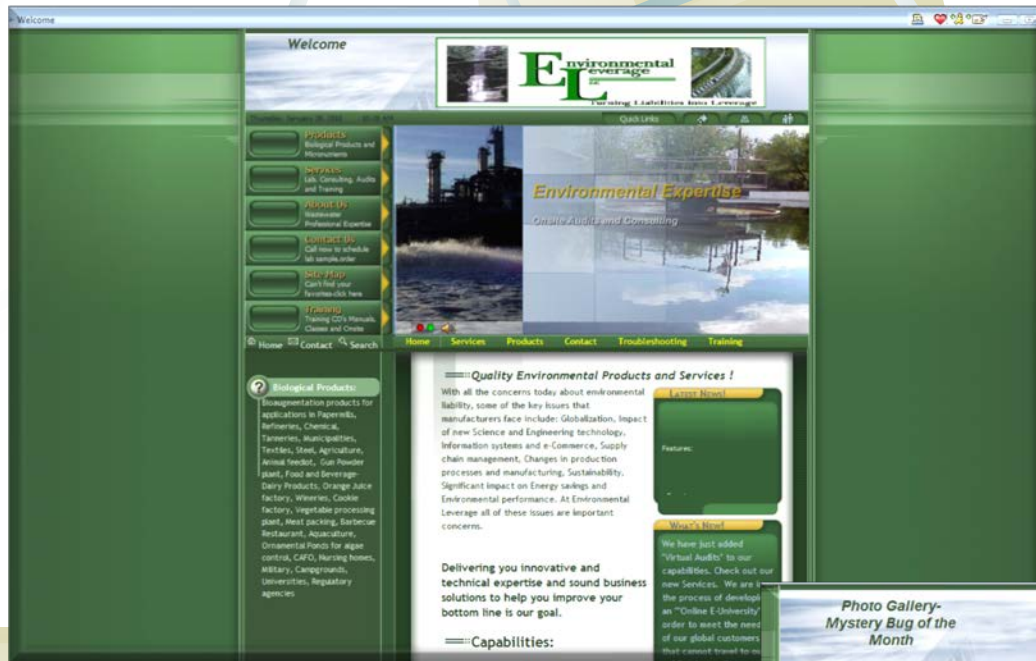
40m³ / day system



Questions



EnvironmentalLeverage.com



Training

Troubleshooting

Filamentous

Higher Life Forms

Products

Bug of the Month

Microscopic



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