

The Power of FOG – Turning a bad situation into a good one!

Presented by:

Melissa Hamkins, PE

WRIGHT-PIERCE 
Engineering a Better Environment

Presentation Agenda

- What is FOG?
- Why be concerned about FOG?
- Improve Enforcement of FOG rules
- Making \$\$ from FOG
 - Methods and Case Studies

**What is Fats, Oils and Grease
(FOG)?**



FOG



Yellow Grease



Brown Grease
(trap grease)

Why be concerned about FOG?

It Makes Life Miserable

- Restricts Flow in Sewer Pipes
- Builds up in pump stations
- Creates Treatment Difficulties in WWTP
- Increases O&M Costs



Regulatory Concern: Sewer Overflow



In a Connecticut DEP study, 11% of SSOs could be attributed to FOG and in another 29% of SSOs FOG was a contributing factor.

FOG Generation Estimates

	<u>Total Grease</u>
<u>vs. Population</u>	
average, pounds/year/person	23
<u>vs. Number of Restaurants</u>	
average, pounds/year/restaurant	16,325

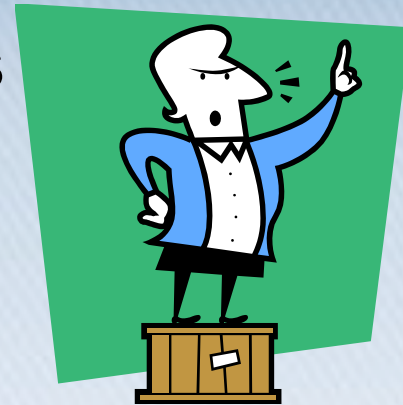
Population of New England is 14.3 million people

Over 158,000 tons of grease produced!
Of which 94,800 tons is brown grease

**What can you do to limit or
control FOG?**

Elements of a FOG Control Program

1. Legal Framework / Requirements
2. Awareness-Building and Training
3. Collection and Disposal
4. Inspection and Enforcement



The Fifth Element

An Economical Method to Handle FOG

Without This FOG Control Programs Fail

Where does FOG Go?

It Gets Hidden in Other Streams

- Brown Grease gets Hidden in Yellow Grease
- Dumped illegally into sewer
- Mixed with Septage
- In Grit From WWTP



The Silver Lining

- FOG Generators pay to get rid of FOG
- FOG has high energy value
- Energy can be recovered from FOG

Therefore,

FOG has economic value

Opportunity for WWTPs

- Receive Grease Trap Pumpings
- Dewater Trap Material
 - Treat Wastewater in WWTP
- Dispose of smaller FOG stream



Case Study: Torrington, CT

- Ray Drew: Plant Superintendent
- Gerry Rollett: Director of Public Works
- Receives Grease Trap Pumpings
 - Collects Tipping Fee
- Dewater/Concentrates FOG
 - Treats Wastewater Fraction



Methods to Recover FOG Energy

- Directly As Supplementary Fuel
- Anaerobic Digestion
- Biodiesel Production

**The Key is to Match the FOG Source
with the Energy Recovery System**

FOG Varies with Source

- Food Production FOG
 - Varies by Product
- Grease Trap FOG
 - Varies with Restaurant Source
 - Emulsified
 - Contains water, food, grit, paper, plastic
- Pretreatment May Be Necessary

Pretreatment Design Concerns

- Consider final end use
 - Additives could cause problems
- Method of Receiving
 - Batch vs continuous feed system
 - Dewatering system must match
- Some separation happens quickly
 - Must handle mostly grease/mostly water

Concentrating Grease

- Fractionation Tank
 - Gravity Dewatering Tank
 - DAF
 - Grease Scum Concentrator
 - Screw Press
-
- Gravity Separation with Heat
 - Heat breaks emulsions



Anaerobic Digestion

- Boosts Digester Gas Production
- Improves Digester Operation
- Consistent FOG Feed Rate
- Provide Proper Mixing



Case Study:

Essex Junction, VT

- Jim Jutras, Director of Public Works
- Receives FOG and Treats in Anaerobic Digester
 - Collects tipping fee
 - Improved gas production
 - Higher methane content
 - Generates less solids in digester

Supplementary Fuel

- Dewater FOG for higher fuel value
- Compatible Systems:
 - MSW Incinerators
 - Sludge Incinerators
 - Solid Waste/Fuel Boilers



Case Study: Torrington, CT

- Ray Drew: Plant Superintendent
- Gerry Rollett: Director of Public Works
- Dewatered FOG to New Haven Incinerator
 - Used as Supplementary Fuel
 - Reduces Dependence on Petroleum Oil



Biodiesel Production

- Pretreatment Required
 - Remove water, solids
- Brown FOG has high FFA levels
 - Requires two stage biodiesel process
- Biodiesel Production Technologies are targeting higher FFA



Summary

- FOG is a problem for Collection and Treatment systems
- Over 158,000 tons of FOG is generated each year in New England.
- FOG has economic value and can be an opportunity.
- The Key is matching the FOG source to the an Energy Recovery System.

Questions & Answers

