Investing in FOG Futures: *Trends in Regulation and Treatment*

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NACWA
A Clear Commitment to America's Waters

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Trends in Regulation and Treatment

- **Provide an overview of a general FOG program.**
- **Provide a summary of the most common challenges for regulators and businesses subject to FOG program requirements.**
- **Summarize latest initiatives:**
  - Grease Abatement Device (GAD) performance assessments
  - GAD nomenclature
  - Specialty dairy-based Food Service Establishment (FSE) findings
  - School partnerships for education about FOG
  - “Regionalizing” FOG Management Programs

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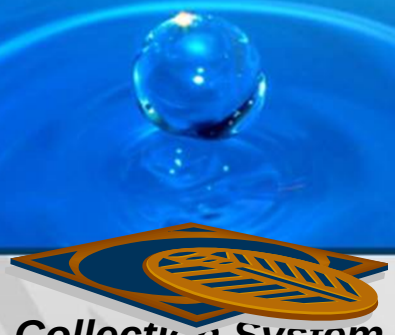
GENERAL REFERENCES



- **Sanitary Sewer Overflow (SSO)**

  Any unpermitted spill, release, or discharge from the Collection System (overflowing manholes, pumping stations, stream crossings, etc…)

- **Building Backup (BBK)**

  The release from the Collection System through a lateral to a building or structure (usually basement backups)

- **Food Service Establishment (FSE)**

  The business, usually defined by Code, that prepares food that may contain FOG.

- **Grease Abatement Device (GAD)**

  Any device designed to physically remove FOG within given specifications.

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WSSC SERVICE AREA
MONTGOMERY AND PRINCE GEORGES COUNTIES IN MARYLAND (SUBURBAN WASHINGTON DC AREA)
1.8 MILLION CUSTOMERS;
4900 'ACTIVE' FSEs

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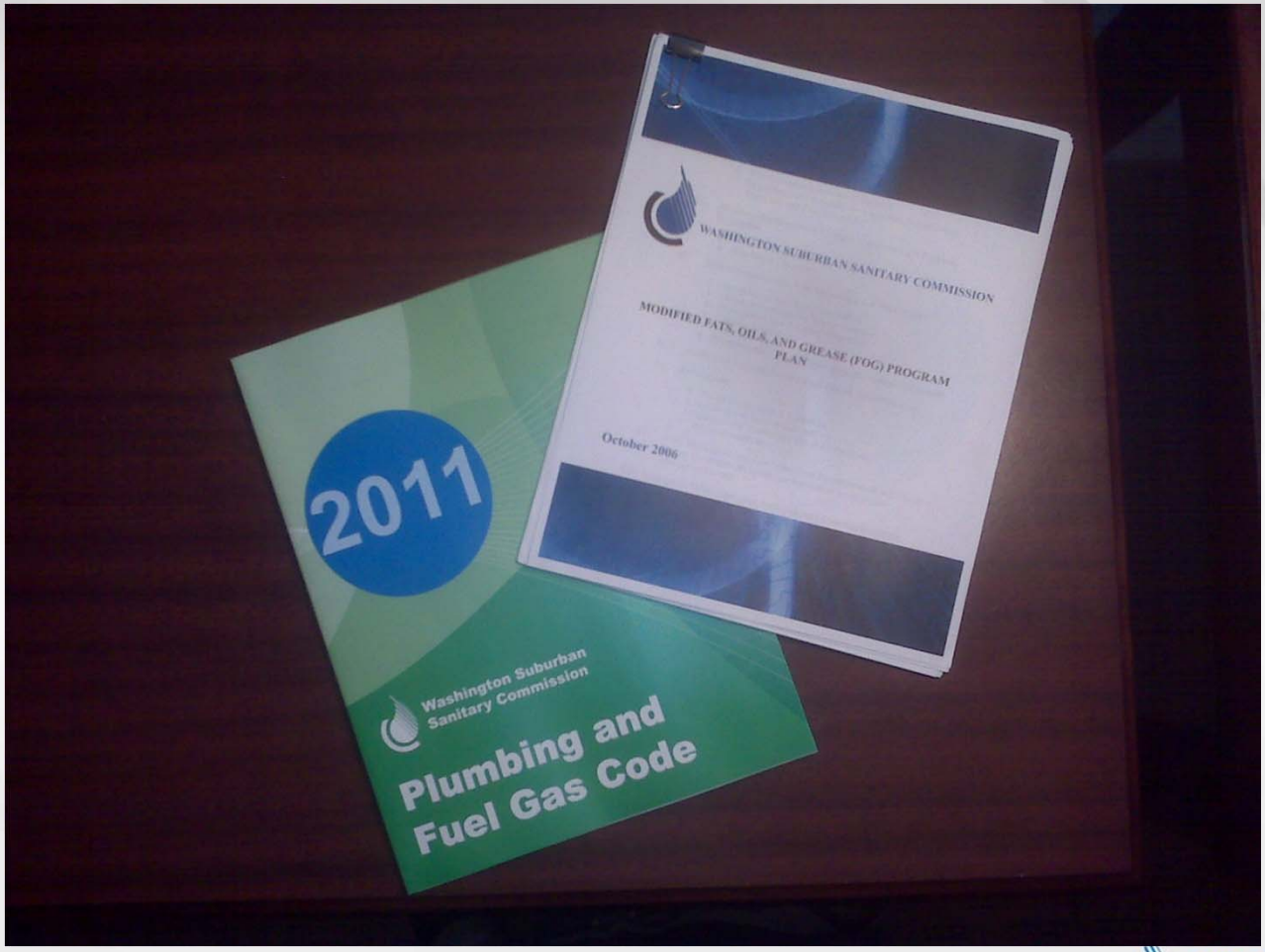
We regulate/control FOG *and* Plumbing Codes



FOG PROGRAM ADMINISTERED AS AN INDEPENDENT SECTION OF THE PRETREATMENT PROGRAM

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WHY FOG CONTROL THROUGH A FORMAL PROGRAM?

- **PROACTIVE MAINTENANCE (known/assumed consequences)**
- **“RUMORS” (plumbers, haulers, health dept.)**
- **REACTIVE (overloads in sewer, pump stations and/or WWTP)**
- **COSTS OF THE MAINTENANCE**
- **MANDATE, PERHAPS A CONSENT DECREE**
- **CMOM (Capacity Management Operations Maintenance)**

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A FOG program's primary objective is SSO (or CSO) PREVENTION

- SSO's in a service area have the potential to discharge thousands of gallons of raw or partially treated sewage into the storm drain system and ultimately to the local water bodies;
- In addition, BBK's can cause additional damages to property and the environment.
- It has been estimated that 40-60% of all SSOs and basement backups nation wide are grease related.
- What's your utility's record?
  - **Pollution prevention** (FOG control) is often the first line of defense.

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GREASE BUILD UP
SEWER PIPE CLOGGED WITH GREASE

SEWAGE OVERFLOW IN PARKING LOT

FOG PROGRAMS
the early years

- REACTIVE in nature
- Communication via phone or “word of mouth’ about a back-up or sewage overflow with a lot of grease and near a restaurant.
- May require Health Department / Plumbing Inspector assistance/intervention if Pretreatment Code did not cover/non-existent

Courtesy bat-mania.co.uk

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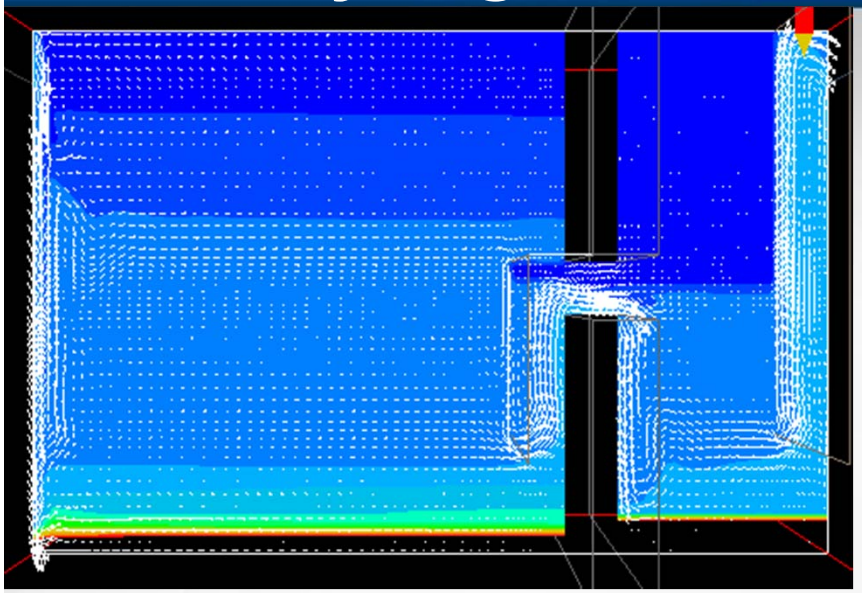
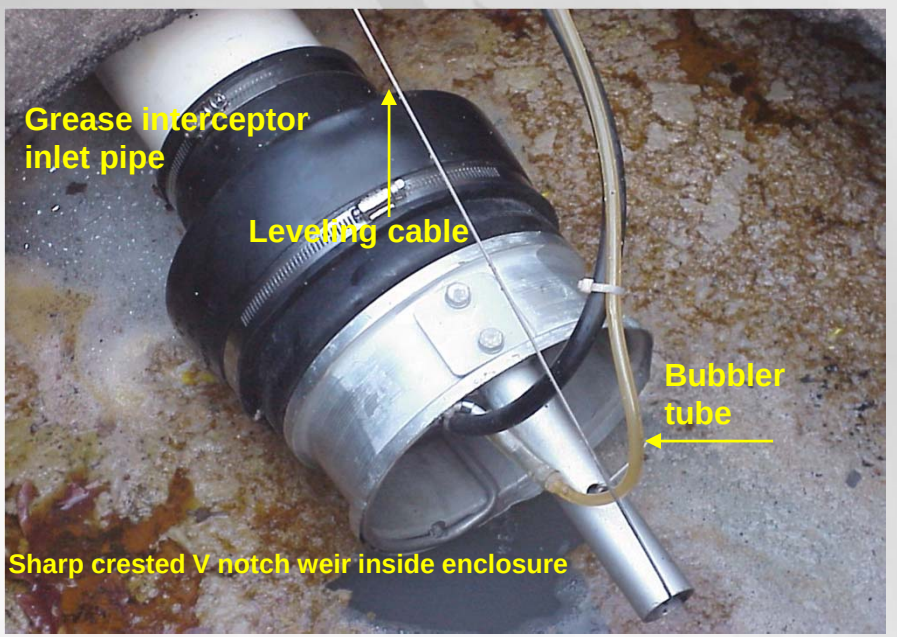
FOG Programs today: relying on technology

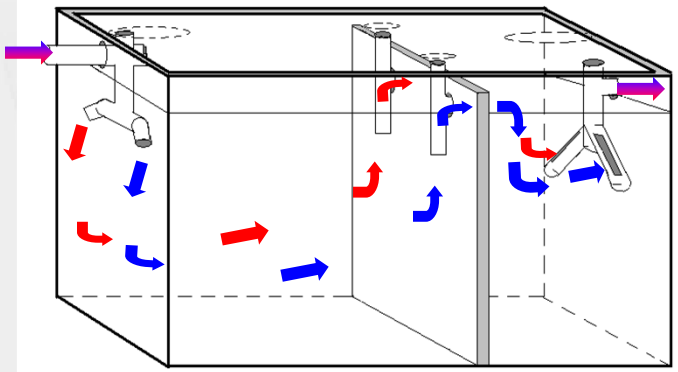


(above) three phase computational fluid dynamics (CFD) model (developed at NC State University) of a GI



GI flow measurement device

FROM: Emerging Technological Advances in FOG; Leon Holt-City of Cary NC-retired



Distributed GI flow

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WHY FOG PROGRAM? REASON #1

40CFR403 and/or sewer use ordinance

courtesy café press.com

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National Pretreatment Regulations

- From the Federal Environmental Protection Agency (EPA):
- **The National Pretreatment Program provides regulatory tools and authority** to state and local POTW pretreatment programs **for eliminating** pollutant discharges that cause **interference at POTWs, including interference caused by the discharge of Fats, Oils, and Grease (FOG) from food service establishments (FSE).** More specifically, the Pretreatment Program regulations at 40 CFR 403.5(b)(3) prohibit “solid or viscous pollutants in amounts which will cause obstruction” in the POTW and its collection system.

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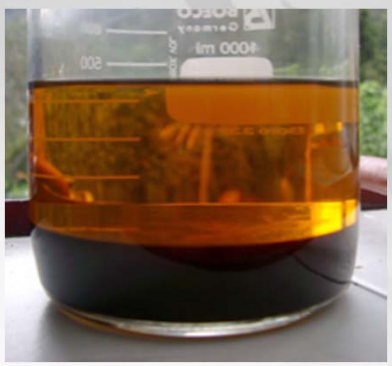
WHY FOG CONTROL THROUGH A FORMAL PROGRAM?
REASON NUMBER 2:

- **THE GREEN THING TO DO**



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Idea from N.C. Dept of Environment and Natural Resources (DENR)

THE GREEN PLAN FOR THE

Food Service Industry

- **THE GREEN PLAN-waste reduction, recycling, pollution prevention.**
- **OVERVIEW-the why's and how to's**
- **FATS, OIL AND GREASE (FOG)-management**
- **FOOD WASTE-guidelines and recommendations**
- **SOLID WASTE-recycling**

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#3: PROFITABLE or NOVEL RECOVERABLE RESOURCE?

- BLACK GOLD,
- TEXAS TEA,
- FSE FOG?

Photo courtesy www.cyclelicio.us/2010/bubbling-crude/

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FOG Disposal/Recycling Options

Definitions:

- ***Yellow Grease*: Used fryer oil or any other used cooking oil** (various contractors exist for this service)
- ***Brown Grease*: Grease that goes down the drain into a volume or flow-based grease interceptor** (WSSC regulates this)

Note: it is possible that grease collected daily from flow-based grease interceptors may be closer to yellow than brown grease

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Water Environment & Technology
APRIL 2011 WE&T

Introducing FOG to solids

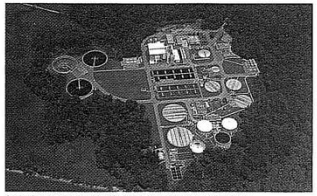
A sticky proposition

Tom Johnson, Tim Shea, Dale Gabel, and Bob Forbes

Rising energy prices prompt interest in energy recovery, which in turn promotes innovations in handling fats, oils, and grease (FOG). To ensure that new systems are successful, it is essential that wastewater management professionals share their experiences with various approaches.

FOG is a generic term for myriad organic compounds that exhibit hydrophobic characteristics, liquefy when heated, yield methane when digested anaerobically, and produce a lot of energy when thermally oxidized. Interest in accepting and processing truck-hauled FOG at municipal wastewater treatment plants is increasing because of its energy recovery potential and the desire to keep FOG out of collection systems. FOG usually is commingled with wastewater solids at the treatment plant, and the approach can affect the solids treatment train's performance, so it must be done properly.

This article presents some options for coprocessing FOG with solids. The principal focus is not on energy recovery but rather on various methods of managing FOG while minimizing such problems as pipe and pump blockages, digester foaming, grit accumulation in digesters, "stuck" digesters (curtailed methanogenesis), clogged gas-collection and -handling systems, flashback and air emission exceedances in multiple hearth incinerators, and excessive maintenance.



At the Hampton Roads (Va.) Sanitation District's Williamsburg treatment plant, adding fats, oils, and grease to the furnace influent increases energy recovery and reduces natural gas use. CH2M Hill

Liquid FOG management

Traditionally, wastewater treatment plants that accepted FOG did so as part of a septage receiving operation. The FOG was directed through rock traps and coarse screening before being transferred to the headworks and primary sedimentation tanks, where it was separated as primary clarifier scum. Some FOG was captured as secondary clarifier scum, which typically was recycled to the primary sedimentation tank for removal as primary scum.

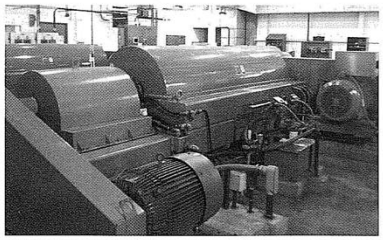
Unfortunately, FOG not captured as scum can be lost in the treatment process (cling to the walls of basins, channels, or piping; form grease balls; etc.). Not only is this a loss of energy-yielding material, but it increases maintenance needs and can overload primary clarifier scum wells. Accurate estimates of unrecovered FOG are a subject for future research, but it can be assumed that at least 15% of FOG traditionally has been lost.

The FOG collected in the primary clarifier scum well can be directed to anaerobic digestion, thermal oxidation, or a landfill. Before thermal oxidation or landfilling, FOG is further

Basic considerations

Overall, a FOG-management and energy-recovery scheme should be designed to maximize efficiency. However, there are many tradeoffs to consider. For example, it may be more cost-effective to haul FOG in a dewatered cake form, but liquid FOG requires less processing at a wastewater treatment plant.

FOG may contain between 2% and 20% total solids, of which 80% to 99% is volatile (see Table 1, p. 50). When chemically conditioned and dewatered, semisolid FOG can contain 50% total solids or more, of which 75% to 95% is volatile. These characteristics determine whether the FOG-recovery scheme should be integrated into the existing liquid treatment train or the solids processing train.



At the Williamsburg plant, the decanted concentrated scum is blended into the cake from this centrifuge just before the combined blend is dropped into the multiple-hearth incinerator. CH2M Hill

Table 1. Characteristics of liquid and semisolid fats, oils, and grease (FOG)

Component	Restaurant interceptor FOG	Biodiesel glycerin	Polymer-dewatered FOG	Lime-dewatered FOG
Total solids (%)	1–22	14–16	30–50	40–50
Volatile solids/total solids (%)	88–99	93–97	85–98	70–80
Chemical oxygen demand (g/L)		1000–1200	1100–1300	1000–1200
Total nitrogen (g/L)			3–6	
Total phosphorus (g/L)		0.12–0.14	0.5–0.8	
pH	4–5	8–9	4–6	5–7
Volatile solids destruction potential[1] (%)			70–75	75–80
Methane content of generated gas (%)			74–78	72–76
Methane potential yield[2] (m^3/kg [ft^3/lb] feedstock volatile solids)			0.94–1.1 (15–17)	0.88–1.0 (14–16)
Biogas potential yield[2] (m^3/kg [ft^3/lb] feedstock volatile solids)			1.3–1.4 (21–23)	1.2–1.3 (19–21)

[1]Maximum potential volatile solids destruction and yield based on long-term (120-day) batch.
[2]At 16°C (60°F) and 1 atm.

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FOG Programs vary in size and complexity

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FOG Programs range from the "little guys" to the "big dogs"

Photo from:
suziesden.com

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ENFORCEMENT

FOG Management should follow the “cradle to grave” environmental mentality of various E.P.A. Laws

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Most common FOG program violations

- GAD not being maintained properly.
- Improper tail pieces from sinks / potential for overloading the flow rating of a GAD*
- One or more kitchen fixtures not connected to GAD inside or out (flow or volume based)
- Floor drains not connected to interceptor
- Floor mop sink not connected to GAD inside or out
- No interceptor / passive GAD for amount of wastewater that can potentially be discharged
- Wrong / unapproved device for grease removal
- Garbage disposal to GAD

*GAD-Grease Abatement Device: can be categorized as flow or volume based via utility code-it is NOT just a small kitchen based unit of 50 gal. or less.

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Most common FSE challenges

(in general order of expense/investment)

- Unfamiliarity with the FOG Program, their FOG permit or applicable portions of the Utility Code.
- Best Management Practices (BMP's) for grease discharge prevention.
- Unfamiliarity with maintenance requirements/needs for a GAD.
- Older/outdated/obsolete kitchen devices or plumbing needing modernized.
  - Limited kitchen space or resources
- Ability to comply with the plumbing or drainage of all related fixtures to grease abatement system(s)
  - Limited kitchen space or resources

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Trends in Regulation and Treatment

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- **Provide a summary of the most common challenges for regulators and businesses subject to FOG program requirements.**
- **Summarize latest initiatives:**
  - ***GAD performance assessments***
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  - Specialty dairy-based Food Service Establishment (FSE) findings
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Grease Abatement (Reduction, Control) Devices (GAD, GRD)

(from VA BEACH FOG Program training module)

- “Last line of Defense” against illicit FOG discharge.
- Install, register, and regularly maintain grease traps and interceptors.
- This keeps wastewater from backing up and overflowing into the FSE and also keeps FOG from damaging the sanitary sewer system.

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RESEARCH: work with NC State regarding a 3 compartment/2 baffle interceptor design

- **FATE OF FOG IN GAD's**
  - **'INDOOR' / 'OUTDOOR' TYPES**
- **VARIOUS SPECIFICATION SOURCES**

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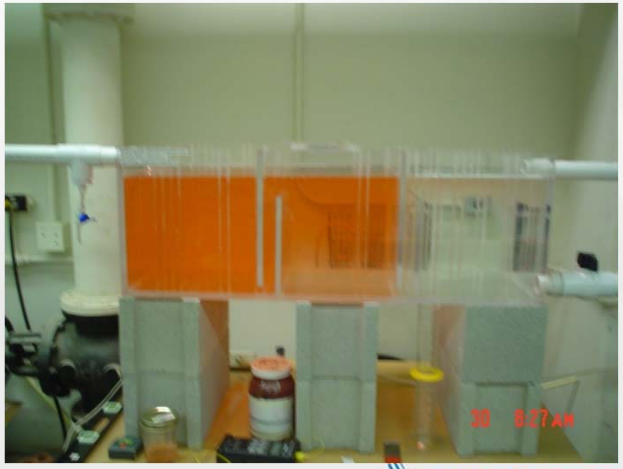
NC State has been performing extensive research on GAD technology



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Other NC State research recently published (EPA grant funding)

ENVIRONMENTAL Science & Technology

ARTICLE

pubs.acs.org/est

Evidence for Fat, Oil, and Grease (FOG) Deposit Formation Mechanisms in Sewer Lines

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Supporting Information

ABSTRACT: The presence of hardened and insoluble fats, oil, and grease (FOG) deposits in sewer lines is a major cause of line blockages leading to sanitary sewer overflows (SSOs). Despite the central role that FOG deposits play in SSOs, little is known about the mechanisms of FOG deposit formation in sanitary sewers. In this study, FOG deposits were formed under laboratory conditions from the reaction between free fatty acids and calcium chloride. The calcium and fatty acid profile analysis showed that the laboratory-produced FOG deposit displayed similar characteristics to FOG deposits collected from sanitary sewer lines. Results of FTIR analysis showed that the FOG deposits are metallic salts of fatty acid as revealed by comparisons with FOG deposits collected from sewer lines and pure calcium soaps. Based on the data, we propose that the formation of FOG deposits occurs from the aggregation of excess calcium compressing the double layer of free fatty acid micelles and a saponification reaction between aggregated calcium and free fatty acids.

INTRODUCTION

As the numbers and density of commercial food preparation and serving facilities increase, so do the amounts of fats, oils, and grease (FOG) that are routinely discharged into sewer collection systems. Of the estimated tens of thousands of sanitary sewer overflows (SSOs) that occur each year in the United States, approximately 48% are due to line blockages, of which 47% are related to FOG deposits that constrict the cross-sectional access of pipes.[1] Despite the central role that FOG deposits play in SSOs, very little is known about the mechanisms of FOG deposit formation in sanitary sewers. Examination of the physical properties and chemistry of FOG deposit samples from 23 cities around the United States[2] showed that FOG deposits display an adhesive character, have a grainy, sandstone-like texture and high yield strength. In addition, 16 of 19 FOG deposit samples (84%) contained greater than 50% lipid content, with the primary lipid being palmitic, a saturated fat and 85% of FOG deposit samples contained calcium as the primary metal, with average concentrations of 4255 mg/L.[2] The preferential accumulation of fats and calcium further suggests that FOG deposits may be metallic salts of fatty acids, and chemical saponification may be responsible for their formation.[2] Calcium ions are naturally present in domestic and industrial wastewater, and high levels of free fatty acids have been found in wastewater due to processes such as food frying.[3] Additionally, calcium may be released from biologically induced concrete corrosion.[4−6] While the saponification process may be a plausible explanation for the formation of these deposits due to their chemical constituents and physical structure, proof for this mechanism requires additional data, including the actual formation of FOG deposits under saponification conditions. The objective of this study is to verify the hypothesis that FOG deposit formation is the result of a saponification reaction between free fatty acids and metal ions such as calcium.

MATERIALS AND METHODS

Formation of FOG Deposits under Laboratory Conditions. Grease interceptor (GI) effluent from a steakhouse in Cary, NC was collected and used as the source of free fatty acids. The GI effluent characteristics were as follows: COD of 1136 ± 368 mg/L, alkalinity of 237 ± 17 mg $CaCO_3$/L, pH of 6.9 ± 0.25, and average Ca, Mg, Fe, and K concentrations of 9.1, 3.1, 0.4, and 7.2 mg/L, respectively. The reaction was performed using a jar-test apparatus (Phipps & Bird Jar Tester). In each beaker, 1 L of GI effluent was added and mixed with calcium chloride salt ($CaCl_2.2H_2O$) at varying concentrations. The mixing speed was set at 20 rpm and operated continuously at 20 °C for 10 days. On day 10 of the reaction process, the solution in each beaker was filtered through a wet-strengthened qualitative filter

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samples taken from sewer lines (apartment, shopping center 1, and shopping center 2). Saturated fat was the major component, and palmitic was the primary saturated fatty acid in all FOG deposit samples, consistent with the results of Keener et al.[2] Monounsaturated fat was the second major component in all FOG deposit samples. Although the percentages of monounsaturated fat in FOG deposit samples from sewer lines were higher than those of the deposits formed in the lab, low percentages (around 10%) of monounsaturated fat in FOG deposits were observed in 12 FOG deposits from sewer lines.[2] Oleic was the primary monounsaturated fat in the FOG deposits formed in the lab and in those collected in the apartment area and shopping center 1. In addition, linoleic was the primary polyunsaturated fat in all FOG deposit samples, similar to the results of Keener et al.[2]

Three reactions (R1, R2, and R3) of GI effluent and calcium chloride were assessed at calcium concentrations of 50, 400, and 750 mg/L, respectively. Increasing concentrations of calcium were explored to determine any impact on the amount of FOG deposit formed. As mentioned earlier, biological reactions that induce corrosion of concrete pipes[4−6] may release excess calcium beyond that found in typical wastewaters. As the calcium concentration was increased from 50 mg/L to 750 mg/L, the resulting FOG deposit weight also increased (Table 2). From R1 to R3, increasing levels of calcium led to higher calcium levels measured in the FOG deposits.

Total fat in the FOG deposit increased from R1 to R2, indicating that additional calcium reacted with surplus free fatty acids in R2. Total fat, however, remained constant at 23 mg from R2 to R3, suggesting that although more calcium was added, no more free fatty acids were available to react with calcium.

The total fat to calcium ratios are higher in FOG deposit samples collected from shopping centers than in those formed under laboratory conditions, which may have been caused by different reaction conditions such as the finite amount of available free fatty acids to react with excess calcium under lab batch conditions. The FOG deposits from the shopping centers were likely the result of long-term reactions with higher concentrations of available free fatty acids that were continuously discharged from food service establishments. However, with the same fatty acid substrate (GI effluent), in R2 and R3, the total fat concentration remained at 23 mg, but the total fat to calcium ratio decreased from 5.16 in R2 to 3.67 in R3. The decreased ratio suggests that there may be other processes aside from saponification that led to accumulation of calcium within these deposits.

The results in Table 2 suggest that there may be two processes involved in FOG deposit formation. In the first process, calcium tends to accumulate around fatty acid micelles due to a DLVO type process[11] (i.e., compression of charged double layer) due to the slightly negative carboxylic end of the free fatty acids. In the second process, free fatty acids react with calcium to form calcium based fatty acid salts through a saponification reaction. The slightly negative carboxylic ends of unreacted free fatty acids continue to attract positive calcium ions, since the saponification reaction may be slow compared to the transport of calcium ions toward the solid deposit (i.e., a reaction limited process).[9] Due to the slower saponification reaction, it is hypothesized that more calcium than the stoichiometric amount needed for saponification would accumulate in the deposit. Research is needed, however, to confirm the involvement of a double layer compression process along with a saponification reaction to create solid FOG deposits in sewer lines.

FTIR Analysis. FTIR is a simple and powerful technique that is widely applied to determine oil and grease in water,[12−15] oily materials in different chemical processes,[16−19] trans fat in food,[20,21] and fatty acids and fatty acid salts.[9,22−24] If the saponification hypothesis is correct, then the calcium soap should be detected in the FOG deposit. In the infrared spectra, when free fatty acids react with calcium salt and the "hard" metallic salts of fatty acids (soaps) is formed, the carbonyl group stretching vibration at 1745 cm^{-1} of triacylglycerols (TAG) disappears, and three characteristic calcium soap bands appear: (i) the carboxylate ion symmetric stretching vibration, ν_1 at 1422 cm^{-1}; (ii) the carboxylate ion asymmetric stretching vibration, ν_2 at 1577 cm^{-1}; and (iii) the metal−oxygen bond vibration at 665 cm^{-1}.[9,25] Poulenat et al.[9] identified four regions that can be attributed to

(a) (b)

Figure 1. FOG deposits formed under laboratory conditions. (a) Photo was taken at day 10 when free fatty acids reacted with calcium salt in 1 L beaker; (b) Close-up of FOG deposit particles.

Table 1. Fatty Acid Composition of FOG Deposits

sample	total fat[a] (g/g)	saturated fat[b] (%)	primary saturated fat	mono unsaturated fat[c] (%)	primary mono unsaturated fat	poly unsaturated fat[d] (%)	primary poly unsaturated fat
R1	0.344	78.8	palmitic	9.8	oleic	0.8	linoleic
R2	0.255	57.5	palmitic	9.0	oleic	0.6	linoleic
R3	0.18	70.6	palmitic	14.0	oleic	0.7	linoleic
apartment	0.261	56.5	palmitic	38.3	oleic and palmitoleic	1.0	linoleic
shopping center 1	0.393	38.7	palmitic	37.2	oleic	15.3	linoleic
shopping center 2	0.489	64.7	palmitic	31.7	palmitoleic	0.6	linoleic

[a] Total fat content was calculated from a 1 g FOG deposit sample. [b] Saturated fat is shown as a percentage of the total fat. [c] Monounsaturated fat is shown as a percentage of total fat. [d] Polyunsaturated fat is shown as a percentage of total fat.

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http://www.msnbc.msn.com/id/42709424/ns/technology_and_science-science/

Think first before pouring cooking grease down the drain

when you're doing your dishes in the sink

Science on msnbc.com

- **That kitchen grease isn't sliding through sewers**
  - **Icky slop is hardening and forming drain-blocking deposits of 'stalactites'**
- **Greasy discharges**
- **Soapy sewers**

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Researching 3 compartment sink theoretical maximum flows for GAD sizing

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Trends in Regulation and Treatment

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Grease Interceptor Terminology

Background

Many jurisdictions have established mandatory grease removal requirements

Various municipalities and manufacturers have developed their own terminologies.

It is hard to effectively communicate about the design, sizing, installation, operation and maintenance of these devices

Establishing scientifically-based terminology facilitates better communication

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Nomenclature

Recommendation

New grease abatement system names and definitions

I. Retention/***Volume-based*** grease interceptors (GIs)

II. ***Flow-based*** grease interceptors (GIs)

a. Passive

b. Mechanical

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Types of Grease Abatement

(WSSC example descriptions and general national opinions of GAD)

- **"FLOW" BASED**
  - **Manual Grease Trap -** ***a passive interceptor that has a rated flow of 50 gpm (50 gal volume) or less. (IPC)***

  - **Automatic Grease Recovery Device (GRD)**
    – An electrical/mechanical device designed to 'automatically' remove grease

- **"VOLUME" BASED**
  - **'Outside' Grease Interceptor** ***– an interceptor that has a rated flow greater than 50 gpm (50 gal volume) or generally no flow restriction requirements. (IPC)***

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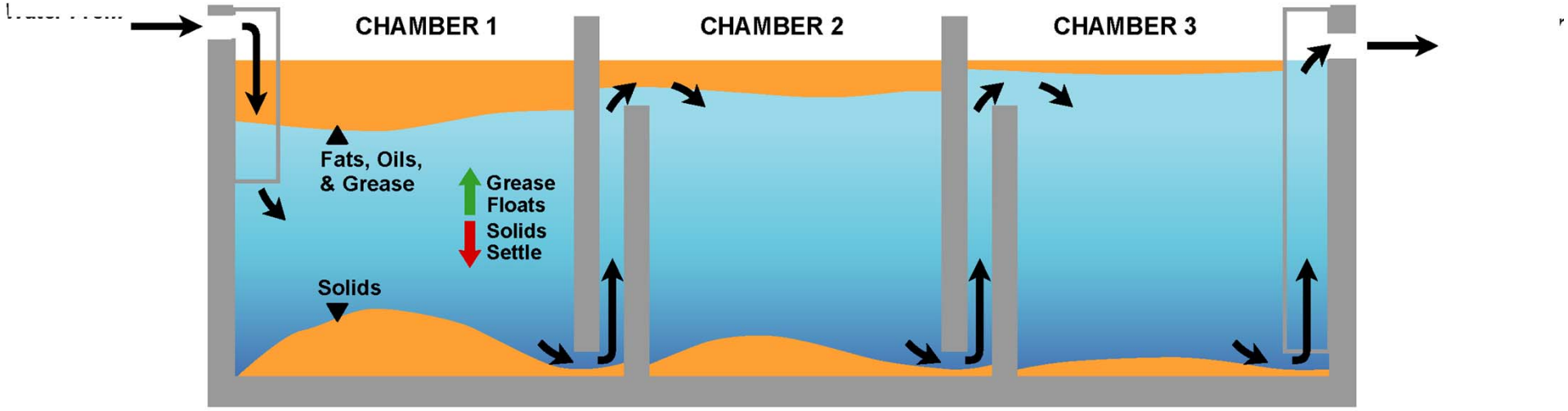
Volume/Retention-Based Grease Interceptor

(Current WSSC Recommended Design-"3 chamber")



Flow-Based Grease Interceptors

Passive Flow-Based Grease Interceptor

Mechanical Flow-Based Grease Interceptor

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Examples of the New Terminology

Current Name	Design Based On	Mechanical/Moving Parts	New Category	New Abbreviation
Manual Trap	Flow Rate	None - Passive	Passive Flow -Based	PFGI
Grease Trap	Flow Rate	None - Passive	Passive Flow -Based	PFGI
Hydro-mechanical Grease Interceptor	Flow Rate	None - Passive	Passive Flow -Based	PFGI
Automatic Grease Removal Unit (AGRU)	Flow Rate	Mechanical skimming device	Mechanical Flow Based	MFGI
Grease Removal Device (GRD)	Flow Rate	Mechanical skimming device	Mechanical Flow Based	MFGI
Large Outdoor Interceptor	Retention	None	Volume/Retention-Based	RGI
Gravity Grease Interceptor or Grease Interceptor	Retention	None	Volume/Retention-Based	RGI

Next Steps: WEF FOG Sub-Committee

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Trends in Regulation and Treatment

- **Provide an overview of a general FOG program.**
- **Provide a summary of the most common challenges for regulators and businesses subject to FOG program requirements.**
- **Summarize latest initiatives:**
  - GAD performance assessments
  - Grease Abatement Device (GAD) nomenclature
  - ***Specialty dairy-based Food Service Establishment (FSE) findings***
  - School partnerships for education about FOG
  - "Regionalizing" FOG Management Programs

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Regulated FOG discharges from FSE's range from the obvious to the obscure

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2011 University of Maryland research findings- typical potential “qualifying” FSEs

Specialty coffee and small dairy shops

- BASKIN ROBBINS
- CARVEL
- CARIBOU COFFEE
- COLDSTONE
- MAYORGA COFFEE
- RITAS
- SEATTLES BEST
- SMOOTHIE KING
- STARBUCKS
- YOGIBERRY

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Reasoning idea

- Dairy FOG is a precursor to (potential and/or actual) FOG build-up in a sewer system, therefore removal of dairy FOG, to the extent of best available technology (BAT), should be pursued.

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Specialty coffee shop "captured" material

FLOW BASED UNIT

VOLUME BASED UNIT

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FOG training and education: School system partnerships

- Multi-location FSE with possible diverse architecture/menus;
- Various “targets” under one umbrella:
- Operations
  - Cafeteria (food service) staff, housekeeping
- Maintenance
  - Plumbers, contractors (haulers)
- Administration
  - Engineering, design, budgeting
- Curriculums
  - Science, culinary arts, family consumer science (‘home ec.’)
- Teachers
  - Always looking for guest speakers

BONUS! They’re all potential residential customers!

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SCHOOLS-form partnerships; understand their process; review all food prep

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“HOMEWORK”
this doesn’t end at the school !

NO HOME COOKIN DOWN THE DRAIN

CAN THE GREASE !!!

EDUCATE THE FAMILY

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“FOG Alliance” theory

- It may be a worthwhile effort to create an “independent” organization available to all of the stakeholders in FOG production, regulation, recycling and disposal within a given large geographical area for the purposes of education, training, and networking both internally and with the general public.

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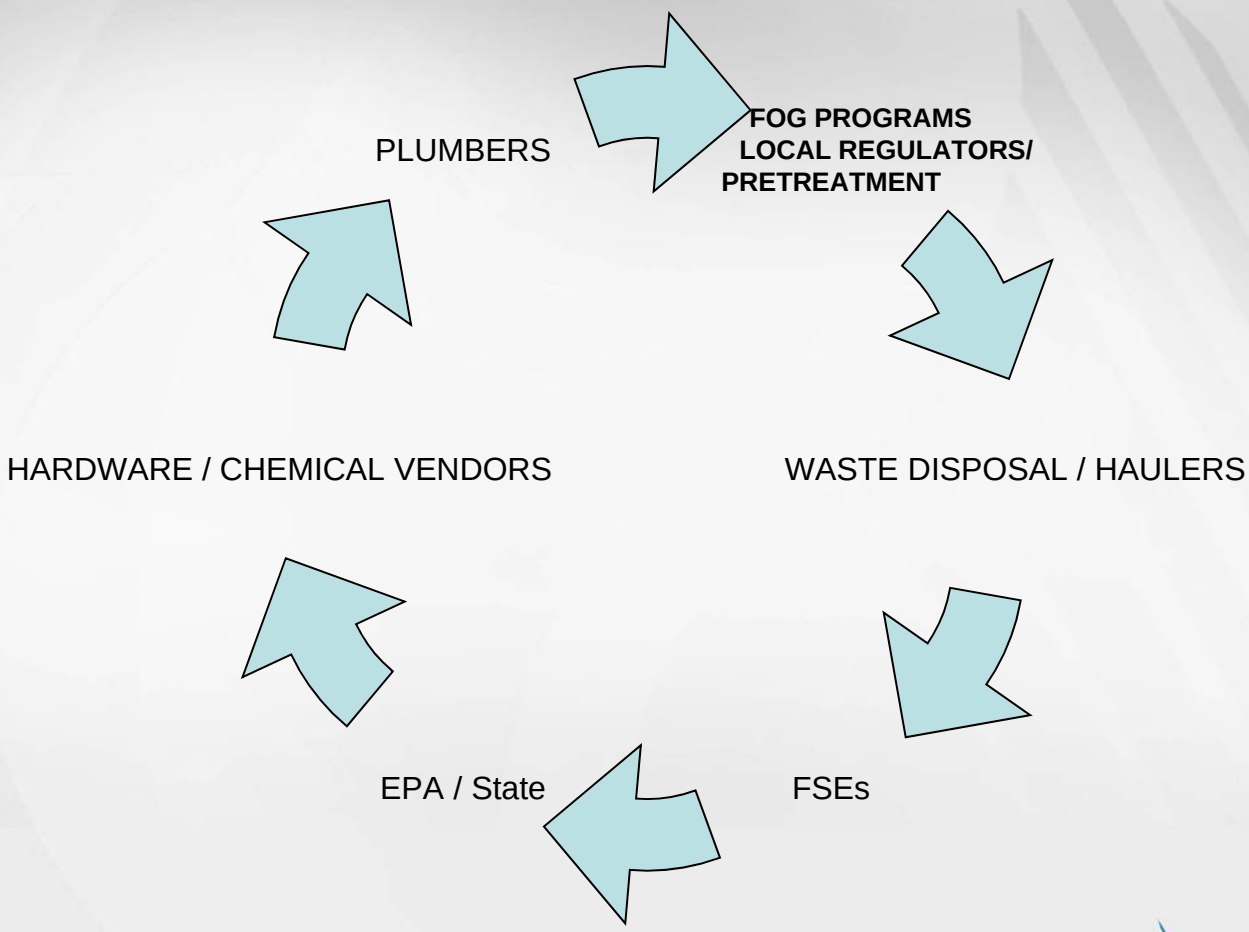
FOG ALLIANCE THEORY



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Primary and Secondary Benefits

- DEVELOPING PEOPLE (across jurisdictions)
- CARING FOR CUSTOMERS (the FSEs)
- STRENGTHENING COMMUNICATIONS AND COMMUNITY RELATIONSHIPS
- PRACTICING ENVIRONMENTAL STEWARDSHIP

  - Possible State Regulatory / EPA participation allows ‘mutual understanding relationships’ to develop
    - **Potential for a conduit to State/Federal grants to help programs or FSEs comply.**
  - Potential for private industry sponsorships
    - “**controlled” advertising**
  - Formal training / workshops hosted by members with presentations by members.
    - **Inspector, waste hauler certifications**

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STEPS TO A PLAN

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- SURVEY THE INITIAL POTENTIAL MEMBERS FOR INTEREST;
- OBTAIN DETAILS IN ORGANIZATION PROS, CONS, ADVANTAGES/DISADVANTAGES FROM OTHER ALLIANCES;
- CONVENE A GROUP WITH CONCRETE IDEAS

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Possible “stakeholders” in a “FOG Alliance”

- **FOG PROGRAM AND/OR PRETREATMENT (IDC) COORDINATORS IN REGION**
- **PLUMBING PLANS REVIEWERS/INSPECTORS**
- **FSE OWNERS/OPERATORS***
- **HEALTH DEPT. OFFICIALS**
- **FOG WASTE HAULERS***
- **PLUMBERS AND/OR GRD/GAD INSTALLERS***
- **GAD/GRD MANUFACTURERS AND/OR REPS***
- **STATE AND/OR FEDERAL REGULATORS**
- **CWEA / WEF**
- **PUBLIC INFO. ORGANIZATIONS**
- **COLLECTION SYSTEM OPERATORS**
- **FOG PROGRAM CONSULTANTS**
- **FOG INTEREST GROUPS OUTSIDE REGION**
- **APARTMENT MANAGERS***
- **COMMERCIAL PROPERTY MANAGERS***

*** May include representative Association(s)**

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Example organizations

- GEORGIA FOG ALLIANCE
- CalFOG TriTAC Workgroup
- North Carolina Pretreatment Consortium, Inc: FOG

- ***All include a consortium of diverse stakeholders***

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AVAILABLE TO MEMBER ASSOCIATIONS
Water Environment Federation (WEF)
FOG Specialty Seminar (2 days)

Water Environment Association of Ontario

Fat, Oil & Grease (FOG) Management Workshop

Water Environment Federation
the water quality people

Morning Session

7:30 – 8:00	***REGISTRATION AND COFFEE***
8:00– 8:30	**FOG Workshop Introduction** • *Goals* • *FOG Program Purpose* • *FOG Program Goals* • *FOG Program Philosophies*
8:30 – 9:00	**FOG Program building blocks** • *Strategic Goals* • *Problem Definition* • *Legal Authority*
9:00 – 11:45	**Source Control** • *Food Service Establishments* o *Grease Removal Devices* o *Effective Management Practices* • *Hauling* • *Disposal* • *Residential*
10:00 – 10:15	***NETWORKING COFFEE BREAK***

Afternoon Session

11:45 – 12:30	***NETWORKING LUNCH***
12:30 – 2:30	**Source Management** • *Permits* • *Information Management* • *Inspections* • *Principals of Enforcement* • *Food Service Establishments & Public Education* • *FOG Chemistry & Additives*
2:30 – 2:45	***NETWORKING COFFEE BREAK***
2:45 – 4:15	**Collection System Management** • *Failure Response* • *Failure Analysis* • *Site Specific Solutions*
4:15 – 5:00	**Wrap Up and Question & Answer Session**

Course Description

- Over the last few years, WEF, in partnership with the US EPA, has developed a Fats, Oils and Grease Management Training Course and has been conducting workshops at various locations across the United States. Utilizing the knowledge of experts already involved in the management of fats, oils and grease as well as input from new developments such as research and implementation feedback, this course presents implementation details for a variety of FOG control options
- The purpose of the training course is to present a spectrum of options that can be used on a basis for utilities to design and implement their own site-specific FOG management programs for preventing the entry of FOG into the collection system.
- Speakers
  - Roy Herwig, P.E., President
    Bluewater Environmental Engineering, LLC
  - Dr. John Parnell
    Pretreatment Solutions, Inc.

0.7 CEUs can be obtained for this workshop

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FOG Management: Team Effort*

- **“FOG” and/or Pretreatment Unit**
- **Plumbing review/inspections Group**
- **Customer Care/Relations**
- **Communications Group (PIO)**
- **WW Collection/Treatment Unit**
- **General Counsel/Organization’s Legal Office**
- **Information Technology Group**

***may or may not be controlled by one entity**

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EXAMPLES OF OTHER CHALLENGES FOR A FOG UNIT

- Continue to assure mandated regulatory deadlines are met.
- Follow-up and scheduling frequency of inspections.
- Code and Permit clarifications and improvements.
- Streamline enforcement procedures.
- Update computer tracking database/program.
- “How to” training booklets, videos and classes.
- Case study scenarios for reference guides.
- Input to national FOG committee(s) such as the Water Environment Federation (WEF) workgroup.
- Continue research into GAD efficiencies and certifications.
- Assist with other public and/or organization education, training and outreach.
- Memberships in various Property Manager organizations, explore interceptor options for multi-unit residential complexes.
- Permit fee structure based on FOG potential/production
- What’s the **Research** out there showing?

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Investing in FOG Futures: *Trends in Regulation and Treatment*

Summary

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Strive for FOG clarity

Flickr photo: Saul Zackson's photostream

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The clarity *may* be necessary to address…

- Collection system problems
- Overloaded pumping stations
- Overloaded wastewater plants
- SSO's and/or CSO's
- CMOM
- Consent Decree or other regulatory mandate

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“Keep in touch”

- http://www.wsscwater.com/home/jsp/content/fog-index.faces

  or “search” : WSSC:

  tab to pollution prevention, FOG

- wludwig@wsscwater.com
  - **301-206-8719**

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NACWA
A Clear Commitment to America's Waters

QUESTIONS?

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