

Managing the Monster:

*Developing and Maintaining a FOG
Program that works for your
Community*

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What is FOG? Why is it a monster?



System-Wide Threat

FOG creates collection system
blockages and treatment plant disruptions

Chemical Complexity

Complex hydrocarbon structures
resistant to normal breakdown

Widespread Sources

Generated by numerous commercial and
residential establishments



What is FOG?

Definition

Fats, Oils and Grease: unwanted byproducts from food preparation processes.

Physical Properties

Liquid when heated but solidifies or becomes semisolid when cooled.

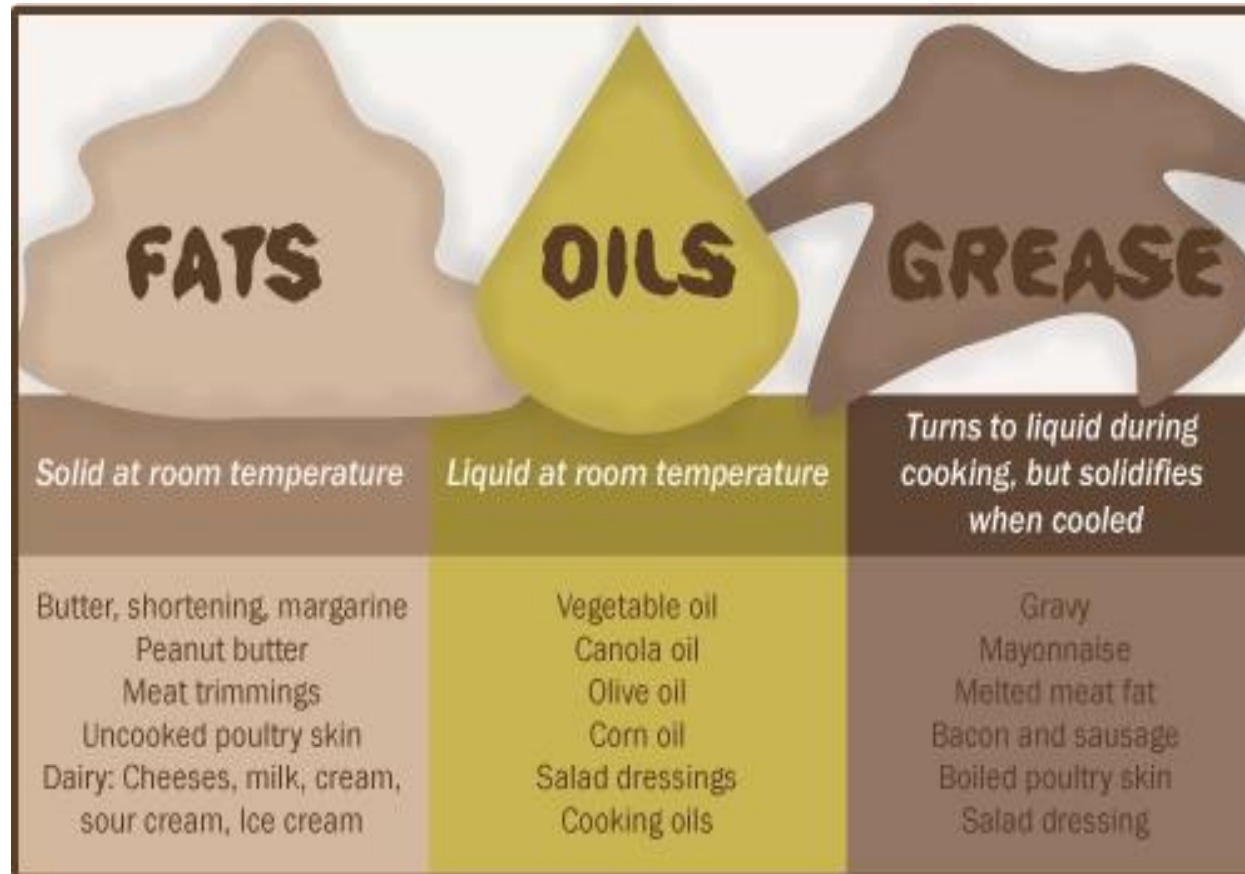
Common Sources

Butter, meats, sauces, milk products, plant oils, dressings, and gravies.





FOG in Sewer Systems



System Infiltration

FOG enters the sewer system through drains in food service establishments and homes.

Accumulation Process

As FOG cools, it adheres to pipe walls, gradually building up and restricting flow.

Blockage Formation

Over time, accumulated FOG can completely block pipes, causing backups and overflows.



What Does FOG Look Like?



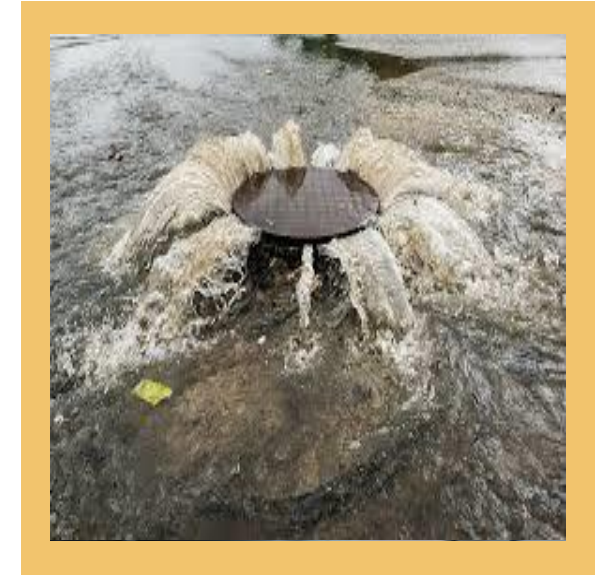
FOG Buildup in Pipes

Early-stage FOG accumulation appears as yellowish-white deposits on pipe surfaces.



Grease Trap Contents

In collection devices, FOG forms a distinct layer floating on top of water.



Advanced Blockages

Severe accumulation can form solid masses that completely obstruct flow.



Similar Impact in Bodies and Sewers

Human Body

Human Body

In humans, accumulated fats create blockages in arteries:

- Reduces blood flow
- Creates pressure points
- Leads to system failures
- Requires intervention

Wastewater System

FOG Generators (Restaurants, Industry, etc.)

FOG is introduced into the wastewater system

Aerobic Respiration/
Anaerobic Fermentation

Oxygen or anaerobic electron acceptors (Nitrate, Sulfate, etc.) drive FOG metabolism

Collection System

Wastewater System

In sewers, FOG creates similar problems:

- Constricts flow paths
- Builds pressure points
- Causes system failures
- Demands costly maintenance

Mouth
FOG is introduced into the human body

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Small intestine

Triglyceride FOG molecules are broken down into fatty acid chains by hydrolysis by intestine cells and bacteria cells for metabolism



What Problems Does FOG Cause?

Collection System

Blockages, overflows, and increased maintenance requirements

Pump Stations

Mechanical failures, reduced efficiency, and increased power consumption

Treatment Plants

Process disruptions, filamentous growth, and reduced treatment effectiveness

Financial Impact

Increased operation costs, equipment replacement, and regulatory penalties





FOG Impacts and Controls at WWTP



Upstream Loading Reduction

Implement effective FOG management program and collection system treatments.

Mechanical Removal

Use of primary skimmers, flocculants, and other physical separation methods.

Process Adjustments

Increase wasting rates and apply dosed chlorination to control filamentous growth.

Oxygen Management

Eliminate anaerobic zones in headworks and pump stations to reduce H_2S formation.



FOG Management & Mitigation-How?

Program Foundation

Ordinances, policies, and standard operating procedures

Stakeholder Engagement

Education and cooperation with food service establishments

Effective Compliance

Regulatory adherence through systematic inspection and monitoring

Technical Controls***

Mechanical, chemical, and biological treatment methods

FOG Program Development and Implementation – Controlling FOG at the Source



1 Develop FOG Ordinance

Create legal framework establishing authority and requirements.

2 Identify Contributors

Locate and Inventory potential FOG-generating businesses.

3 Build Management System

Develop survey tools and tracking database for program management.

4 Implement Education

Create and distribute best management practices and training materials.

5 Establish Inspections

Train staff and develop inspection protocols and schedules.

FOG Ordinance: The Legal Foundation

Legal Authority

Provides the legal basis for program implementation and enforcement actions.

Program Framework

Documents expectations, requirements, and standards for all stakeholders.

Control Mechanisms

Establishes specific requirements for devices, maintenance, and compliance.

Regulatory Coordination

Integrates with building codes and other local/state regulations





FOG Ordinance Components

1 Definitions

Clear explanation of terminology used throughout the ordinance.

2 Prohibitions

Specific actions that are not permitted under the ordinance.

3 Applicability

Which businesses and facilities must comply with the requirements.

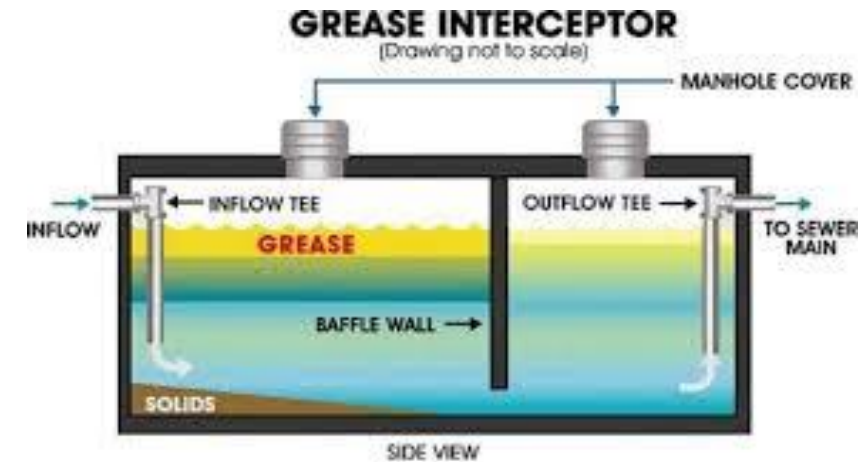
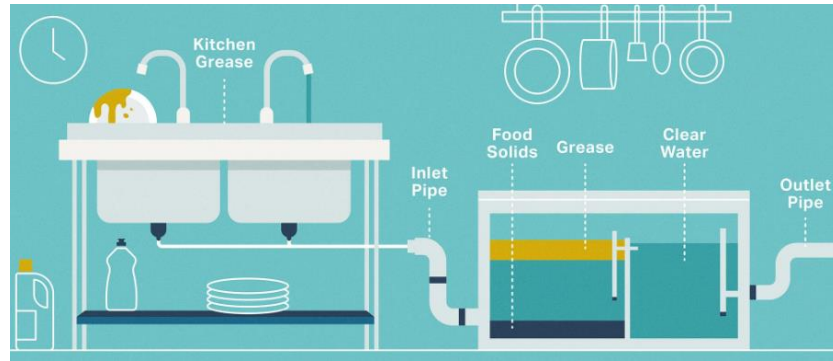
4 Technical Standards

Requirements for grease control devices, construction, and maintenance.

5 Waste Disposal

Proper methods for disposing of grease trap/interceptor waste.

Maintenance Guidelines for Grease Control Devices



Interior Grease Traps

Typically, ≤ 100 gallons, located inside food service establishments:

- Skim accumulated grease regularly
- Check baffles, inlet, and outlet
- Monitor flow conditions
- Periodically empty for thorough cleaning
- Maintain detailed maintenance logs

Exterior Interceptors

Typically $\geq 1,000$ gallons, located outside the building:

- Schedule regular pump-outs
- Maintain hauling manifests
- Document all maintenance activities
- Oversee pump-out operations
- Track hauler schedules

Creating an Inventory of Food Facilities



Utility Records

Review water and sewer billing records to identify commercial food establishments.

Codes Department

Coordinate with building officials for information on new and existing restaurants.

Tax Records

Access business privilege tax records to identify food service operations.

GIS Mapping

Create spatial database linking facilities to sewer infrastructure.





Training Your FOG Inspection Team

1 Regulatory Knowledge
Comprehensive understanding of ordinance requirements and standards

2 Communication Skills
Effective interaction with facility representatives and stakeholders



3 Consistency
Uniform application of standards and procedures across all facilities

4 Technical Proficiency
Ability to identify problems and recommend appropriate solutions



FOG Inspections Overview



1 Preparation

Review facility records and previous inspection findings

2 Facility Visit

Conduct on-site inspection of kitchen practices and control devices

3 Technical Assessment

Evaluate equipment condition and maintenance practices

4 Documentation

Record findings and issue compliance recommendations

5 Follow Up

Schedule subsequent visits and verify corrective actions



FOG Inspections Report Elements

Key Information Categories

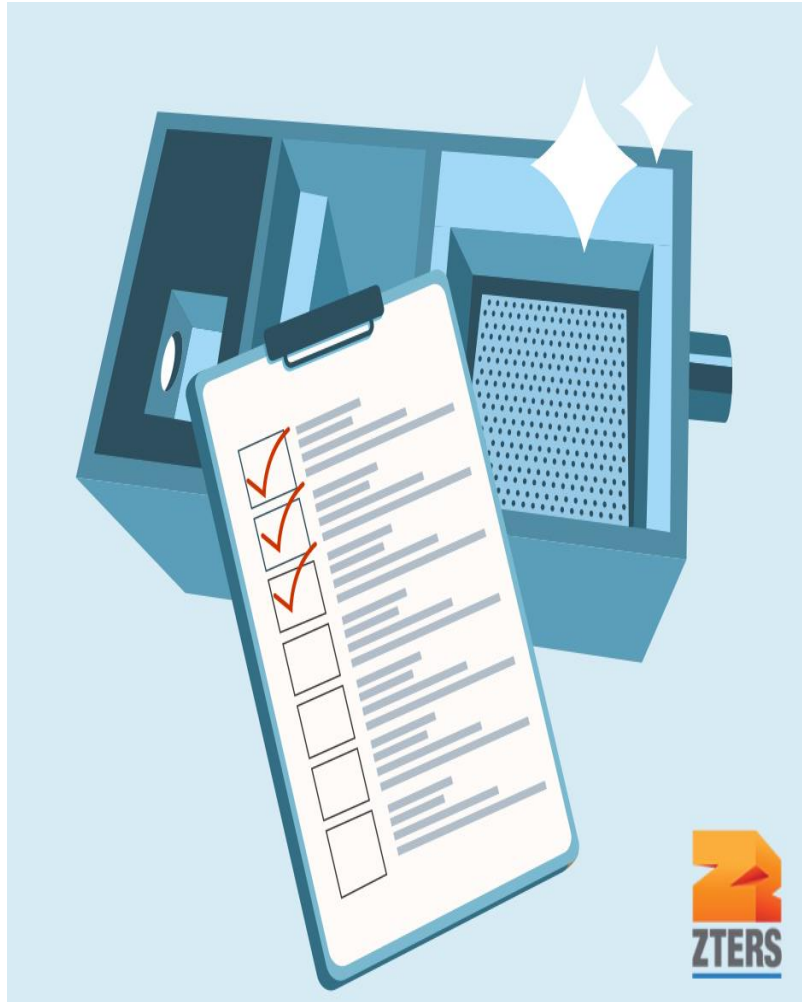
- General facility and contact information
- Water and wastewater service details
- Grease trap/interceptor specifications
- Kitchen operations assessment
- Cleaning procedures evaluation
- Residual grease handling practices
- BMP implementation status
- Follow-up requirements and timeline

Documentation Best Practices

Thorough inspection reports provide:

- Legal documentation of compliance status
- Historical record of facility conditions
- Evidence for enforcement actions if needed
- Data for program effectiveness evaluation
- Communication tool with facility owners

Grease Interceptor Inspection Process



1 Document Location

Note interceptor position on site and take photographs for records.

2 Review Records

Check cleaning logs and hauling manifests for maintenance compliance.

3 External Inspection

Examine area around interceptor for signs of overflow or leakage.

4 Core Sampling

Use specialized tools like the Dipstick Pro to measure layer depths.

5 Capacity Assessment

Apply the 25% Rule to determine if maintenance is required.



The 25% Rule for Grease Interceptors



25%

Max. Combined Layers

Industry standard threshold for required maintenance

2

Measured Layers

Top FOG layer plus bottom solids layer

1

Tools Needed

Specialized core sampling device (e.g. Dipstick Pro)

When the combined thickness of FOG and solids reaches 25% of the total water column depth, the interceptor has reached its useful capacity and requires pumping.



Grease Interceptor Measurement

Measurement Process

The Dipstick Pro provides a visual core sample showing distinct layers:

1. Insert device through full dept of interceptor
2. Close valve to capture sample
3. Withdraw and measure each layer
4. Calculate percentages of total depth

Interpretation

Evaluating the results:

- **Top layer:** FOG accumulation
- **Middle layer:** Relatively clear water
- **Bottom layer:** Settled solids
- Combined FOG + solids $\geq 25\%$ = pumping required
- *Document findings with photographs

Core Sampling using the Dipstick Pro:

<https://www.youtube.com/watch?v=5qNC-lFLFN4>



Interior Grease Trap Components

Inlet

Where FOG-laden wastewater enters the trap from kitchen drains.

Inlet Baffle

Directs flow downward to promote separate and reduce turbulence.

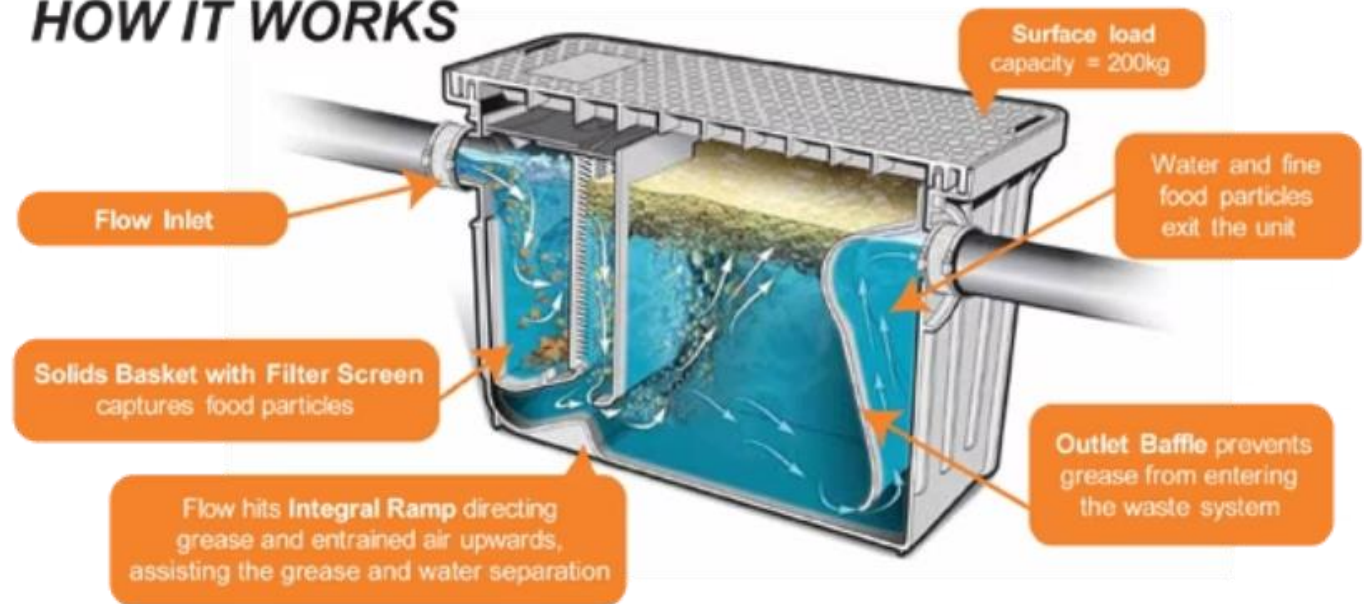
Separation Chamber

Where FOG rises while water passes underneath to outlet.

Outlet Baffle

Prevents floating grease from exiting while allowing water to pass.

HOW IT WORKS



Outlet

Where clarified water exits to continue through drainage system.



What **SHOULD** Connect to Grease Control Devices



Prep and Washing Areas

Pot sinks, food prep area sinks, three-compartment sinks, and pre-rinse stations must connect to grease control devices.

Food Equipment

*Dishwashers, tilt kettles, and floor drains in food preparation areas should route through grease interceptors.

Cleaning Systems

Floor washings, mop sinks, and automatic hood wash units that may contain FOG require proper interception.



Grease Trap Inspection Procedure

1 Visual Assessment

Examine overall condition of trap and surrounding area.

2 Baffle Inspection

Check inlet and outlet baffles for proper positioning and damage.

3 Structural Evaluation

Look for cracks, leaks, or deterioration of trap materials.

4 Flow Verification

Ensure proper flow through the trap without blockages.

5 Documentation Review

Examine cleaning logs and maintenance records for compliance.



FOG Sampling Techniques

Oil & Grease Testing

Laboratory analysis determines the amount of non-volatile hydrocarbons in wastewater, including petroleum derivatives, vegetable oils, animal fats, and related materials.

Hexane Extractable Material (HEM)

Standard testing methodology uses hexane solvent to extract and quantify oil and grease components from wastewater samples.

Sample Types

Grab samples provide point-in-time data while composite samples show average conditions over time. Results categorize FOG as polar (animal/vegetable) or non-polar (petroleum).

Total Recoverable Oil & Grease, HEM mg/L
(Subtract) Petroleum SGT-HEM-NPM mg/L (hydrocarbons)
(Equals) Animal & Vegetable Oil & Grease mg/L (triglycerides)



Identifying Maintenance Issues

Observation	Probable Cause	Recommended Action
Thick FOG layer	Infrequent cleaning	Increase cleaning frequency
Food particles in grease	Missing sink strainers	Install/replace sink strainers
Damaged baffles	Improper cleaning methods	Repair/replace baffles, train staff
Odors/gas bubbles	Anaerobic decomposition	Immediate pump-out needed
Grease past outlet baffle	Trap exceeding capacity	Increase size or cleaning frequency



Residual Grease Hauling Manifests

Essential Information

Manifests must document who performed service, what was collected, where waste was taken, when service occurred, and how much was removed.

Regulatory Compliance

Complete manifests provide proof of proper disposal and maintenance frequency compliance.

Tracking Benefits

Systematic manifest review helps identify cleaning frequency issues and illegal disposal activities.

FATS, OIL AND GREASE HAULED WASTE MANIFEST

PART 1 – WASTE HAULER INFORMATION

Transporter/Permittee: _____ Permit No. _____
Name of Driver: _____ Truck License No.: _____

PART 2 – WASTE GENERATOR INFORMATION

Name of Generator: _____ Permit No. _____
Address: _____
Phone: () _____ Date Pumped: _____ Time Pumped: ____:____ ☐ A.M. ☐ P.M.
Size of Trap/Interceptor: _____ (gallons) Volume Pumped: _____ (gallons)
Signature of Generator: _____ Date: _____
Print Name: _____

PART 3 – WASTE DISPOSAL SITE INFORMATION

Name of Disposal Site: _____ DEP Permit No. _____
Address: _____
Phone: () _____ Total Gallons Received: _____
Signature of Operator: _____ Date: _____
Print Name: _____

I certify under penalty of law that this manifest was prepared by me or under my direction or supervision. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that the wastes covered by this manifest are not hazardous as defined at 40 CFR Part 261. I further certify that all discharges made to North Cornwall Township sewer system or the disposal site are being made in accordance and in compliance with requirements specified in North Cornwall Township Ordinance No. _____ and any issued permit.

Printed Name

Signature of Transporter

Date

NOTICE – Completion of this report is required by North Cornwall Township for informational purposes only. This manifest shall not be deemed as certification of conditions for real estate purposes.

A copy of this report is to be submitted to the waste generator listed above, and a copy is to be mailed within thirty (30) days after pumping to:





Know Your Haulers and Plumbers



Contractor Relationships

Develop relationships with reputable service providers familiar with program requirements.



Service Provider Database

Maintain current contact information for approved haulers and plumbers.

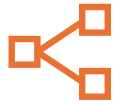


New Business Integration

Establish notification systems for new facilities requiring FOG services.



Know Your Property Owners and Landlords



The power of relationships and communications



Support with Enforcement



Connection with business owner



Break down communication barriers



Support cause



Routine property flushing





Best Management Practices (BMPs)



Contractor Oversight

Verify service providers follow proper procedures and documentation.

Waste Management

Maintain clean dumpster areas and proper disposal of food waste.

Staff Training

Educate all employees on FOG management procedures and importance.

Clear Signage

Post visible reminders about proper disposal practices throughout the kitchen.



More..Best Management Practices (BMPs)



- Strainers – control those solids!
- Documentation
- Dry cleanup procedures
- Expired/waste food disposal

Restaurant BMP's Link:

<https://www.youtube.com/watch?v=d89NhBBRxZ0>



Documentation and Tracking

Program Effectiveness

Track metrics to demonstrate success and identify improvement areas

Regulatory Compliance

Document activities to demonstrate due diligence in permit requirements



Program Evolution

Apply insights to continuously improve program effectiveness

Resource Allocation

Use data to optimize staffing and budget for maximum impact

Essential Documentation Elements

1 Inspection Records

Detail documentation of all inspection activities, findings, and follow-up actions.

2 Maintenance Tracking

Records of all preventative maintenance activities and emergency responses.

3 Communication Logs

Documentation of all correspondence with FSEs, haulers, and regulatory agencies.

4 Waste Manifests

Copies of all hauling records showing proper disposal of interceptor waste.

Follow up Correspondence

- Why is it important?
- What should it include?
 - Follow up with authorized representative (if different from site representative)
 - Clearly state findings and action items
 - Identify required response time and method to respond
 - Note the capacity status of the trap/interceptor



Enforcement... What does it look like?

- Increase grease trap/interceptor cleaning schedule
- Require evaluation by a licensed/experienced plumber
- Required cleaning of lateral and main sewer lines
- Reimbursement for cost of cleaning sewer mains or backup
- Monetary penalties



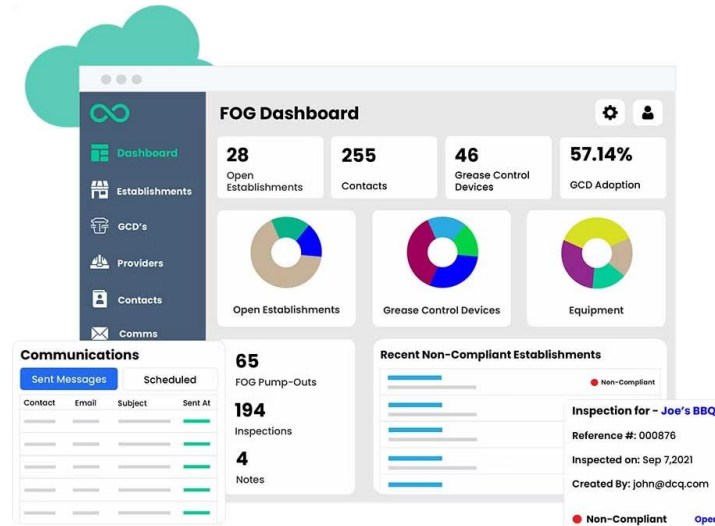


FOG Program Tracking Systems

In-House Systems

Internally developed tracking tools:

- Customized spreadsheets
- Basic database applications
- Document management systems
- Lower initial cost
- Limited integration capabilities
- May require increased staff time



Specialized Software

Purpose-built FOG management platforms:

- Mobile inspection capabilities
- Automated scheduling
- Reporting and analytics
- GIS integration
- Higher initial investment
- Potentially lower long-term cost



Key Takeaways for FOG Management and a Successful Program



1 Regulatory Foundation

Strong ordinance is essential for program success

2 Approach

Discuss what works with your resources; make a plan

3 Education Focus

Staff and FSE training drives compliance improvement

4 Documentation Priority

Comprehensive records protect from liability

Effective FOG management requires a systems approach that addresses the entire wastewater infrastructure from food service establishments to the treatment plant.



Thank you!

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