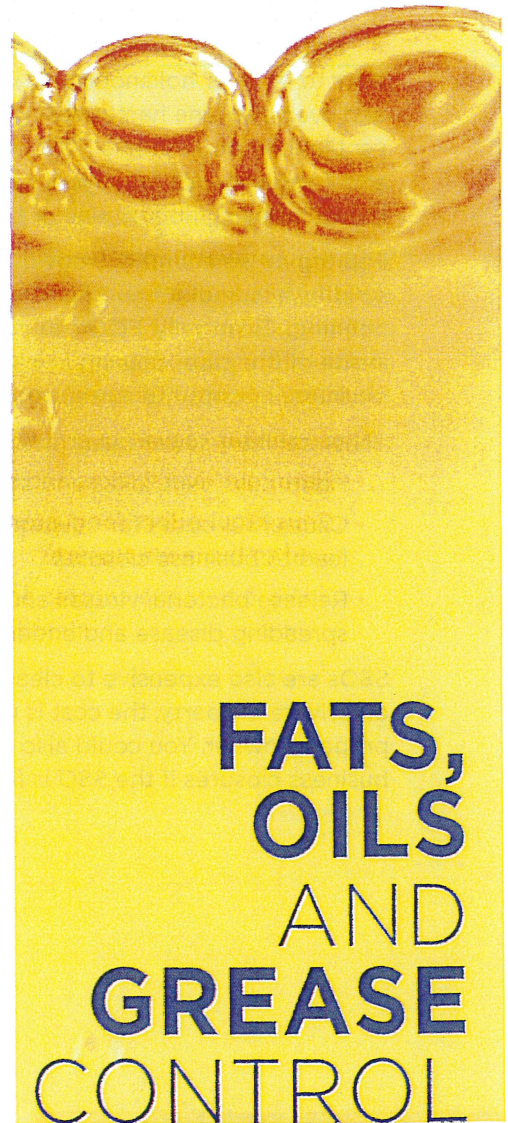




FATS, OILS AND GREASE CONTROL

*Best practices
for effective
grease control
management*

What is FOG?

Fats, oils and greases (FOG) are found in most restaurants — from cooking oil spilled on the floor to leftover hollandaise on customers' plates, and even airborne hamburger grease stuck to your ventilation hood. All this FOG must go somewhere and it usually ends up in your sewer pipes via the dishwasher, floor drains or the mop sink.

Pouring or washing FOG down the drain causes it to solidify, accumulate and narrow the pipe's internal opening. Eventually, FOG can completely clog the inside of the pipe, causing sewage to back up into your business, or onto the streets and into storm drains.

These sanitary sewer overflows (SSOs) can:

- Harm our rivers, lakes and streams
- Cause foul odors for customers and lead to business closures
- Release bacteria, viruses and other pathogens, spreading disease and endangering public health

SSOs are also expensive to clean up. If they occur on private property, the cost is usually borne by the property owner. You could also face civic fines and business closures if the SSO is found to be your fault.

FOG is ...

BATTERS

BUTTER/MARGARINE

COOKING OILS

DAIRY PRODUCTS

DRESSINGS

FOOD SCRAPS

GREASE FROM COOKING

GREASE FROM
VENTILATION HOODS

GRIDDLE SCRAPINGS

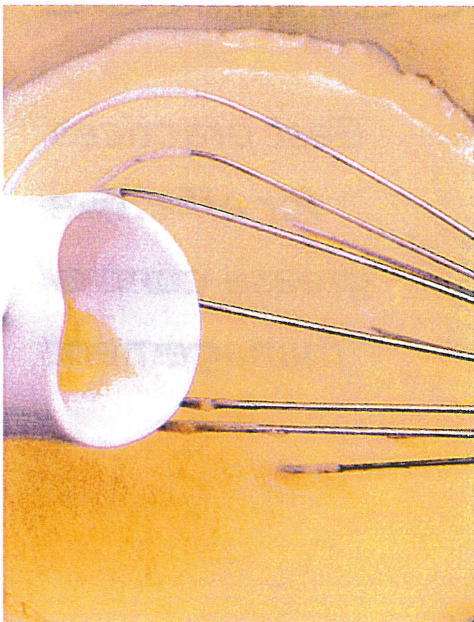
ICING

LARD

MEAT FATS

SAUCES

SHORTENING



Keeping **FOG** Out of Your Pipes

Do This First

Contact your sanitation district (city or county municipality). They will be happy to help you avoid pitfalls and might even have free resources (e.g., posters, log books).

Steps to Take

There are three steps you must take to keep FOG in its proper place:

- 1) ensure you have the correct equipment,
- 2) service that equipment and
- 3) modify employee behavior.



FOG Best Management Practices

Follow these practices to ensure you don't clog up your pipes

MUST DO

Don't pour excess oil or grease down the drain. Pouring excess oil or grease down the drain is a big no-no. You should collect "yellow grease" in special bins for rendering by a third-party contractor.

Scrape all extra grease and greasy food scraps off plates and cookware before using pre-rinse spray valve and dishwasher. Dispose of excess grease in the trash or recycle it as part of a food waste recycling program.

Install drain screens, particularly in your sinks, to help prevent much of the grease and food particles from clogging your pipes.

Wipe up grease with a paper or cloth towel before using water and soap to clean the floor to minimize grease washing down your drains.

Only put non-greasy foods (e.g., raw vegetables) into your garbage disposal to minimize the amount of grease ending up in your drains.

Make sure your employee training materials include these kitchen BMPs, grease control device cleaning and other steps into all your employee training materials.

SMART PRACTICES

Keep these BMPs "top of mind" by requiring refresher training for your employees. Many sewer agencies require foodservice businesses to keep log sheets documenting their continued employee training, and most require annual refresher training.

Periodically clean your lateral sewer line to prevent blockages and SSOs. Sewer agencies typically don't clean these pipes, so these lines can accumulate FOG and become blocked over time, causing an SSO.

Avoid overflows by inspecting your private sewer lateral lines periodically using closed circuit television. Private plumbing contractors typically perform these inspections, which can also identify potential structural issues such as cracks, breaks, or root infiltration.

Wash out your ventilation hoods regularly to prevent excessive FOG accumulation. Periodically clean the vents and grease pans on your roof as well. Make sure you put the leftover cleaning water and FOG in either your grease interceptor or via an offsite disposal method.

Grease Control Devices (GCDs)

What You Need to Know

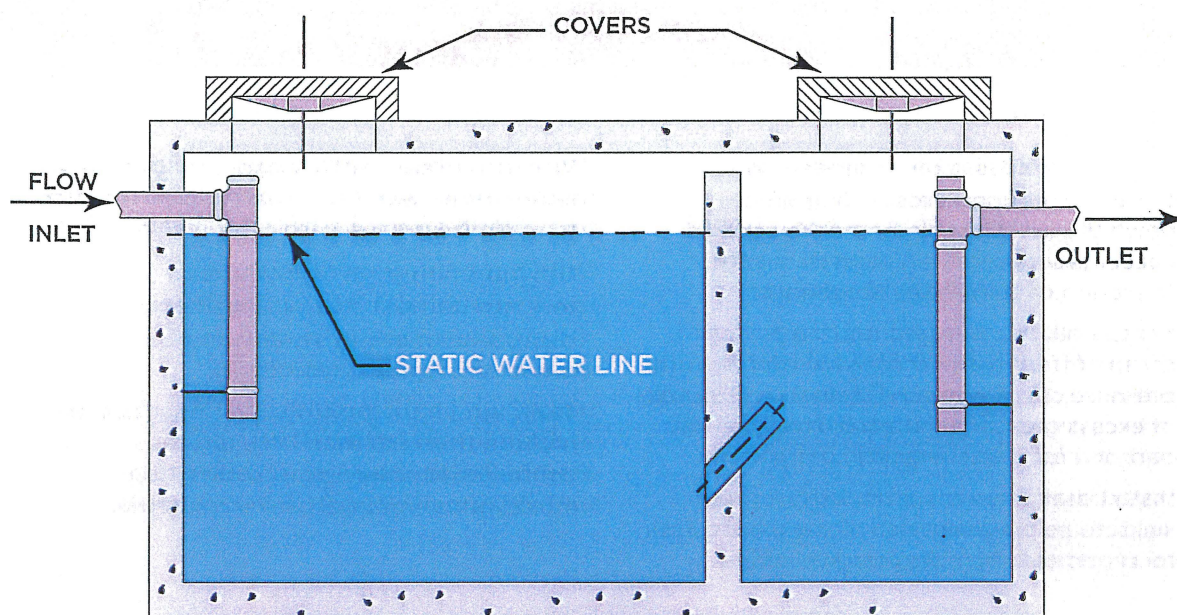
GCDs can be small or large with associated costs varying widely. Therefore, when you begin budgeting for expanding or opening a new restaurant, make sure you understand your cost liability for GCDs and plan accordingly.

GCD Equipment Types

There are many different equipment options — from large gravity grease interceptors to hydro-mechanical boxes that fit under the sink. Both the GCD equipment type and size are extremely important to how well the product functions. Also, the equipment

type could be regulated in your area so, before buying anything, contact your local permitting authority with jurisdiction over FOG discharge for details.

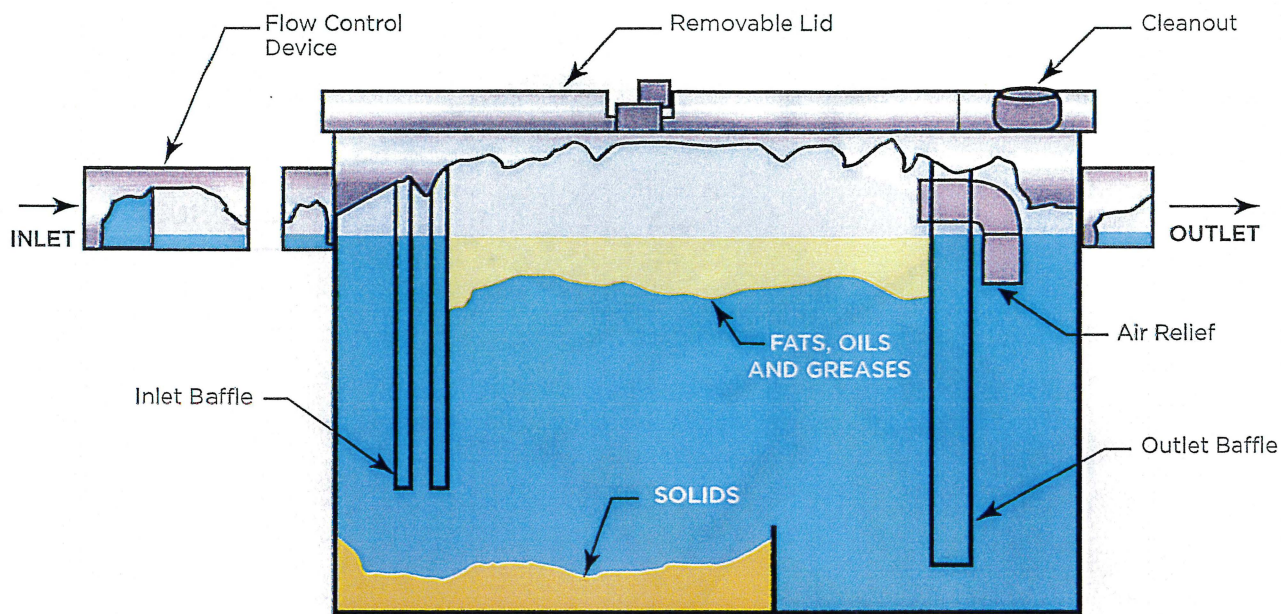
Gravity Grease Interceptors (GGIs)



Gravity Grease Interceptors (GGIs)

GGIs incorporate two or more connected compartments, with a minimum volume of 300 gallons. The GGI's design leverages its large tank size to slow water entering the device and let gravity (or FOG buoyancy) separate the FOG from the water (i.e., there are no flow control devices in pipes or baffles in the GGI). Given sufficient space and time, floating grease and settled solids separate from the kitchen wastewater and accumulate in the interceptor. That's why GGIs are usually much larger than other interceptor designs. If they are too small, the water will speed through the device, carrying the FOG with it and will accumulate "down pipe," causing a backup. The floating grease and settled solids must also be removed before they accumulate beyond a certain level to avoid clogging the plumbing or significantly reducing the available space in the interceptor.

Hydro-Mechanical Grease Interceptors (HGI)



Hydromechanical Grease Interceptor

Indoor, above ground; 15-60 gallons, 20-50 GPM; 40-100 pounds of FOG storage

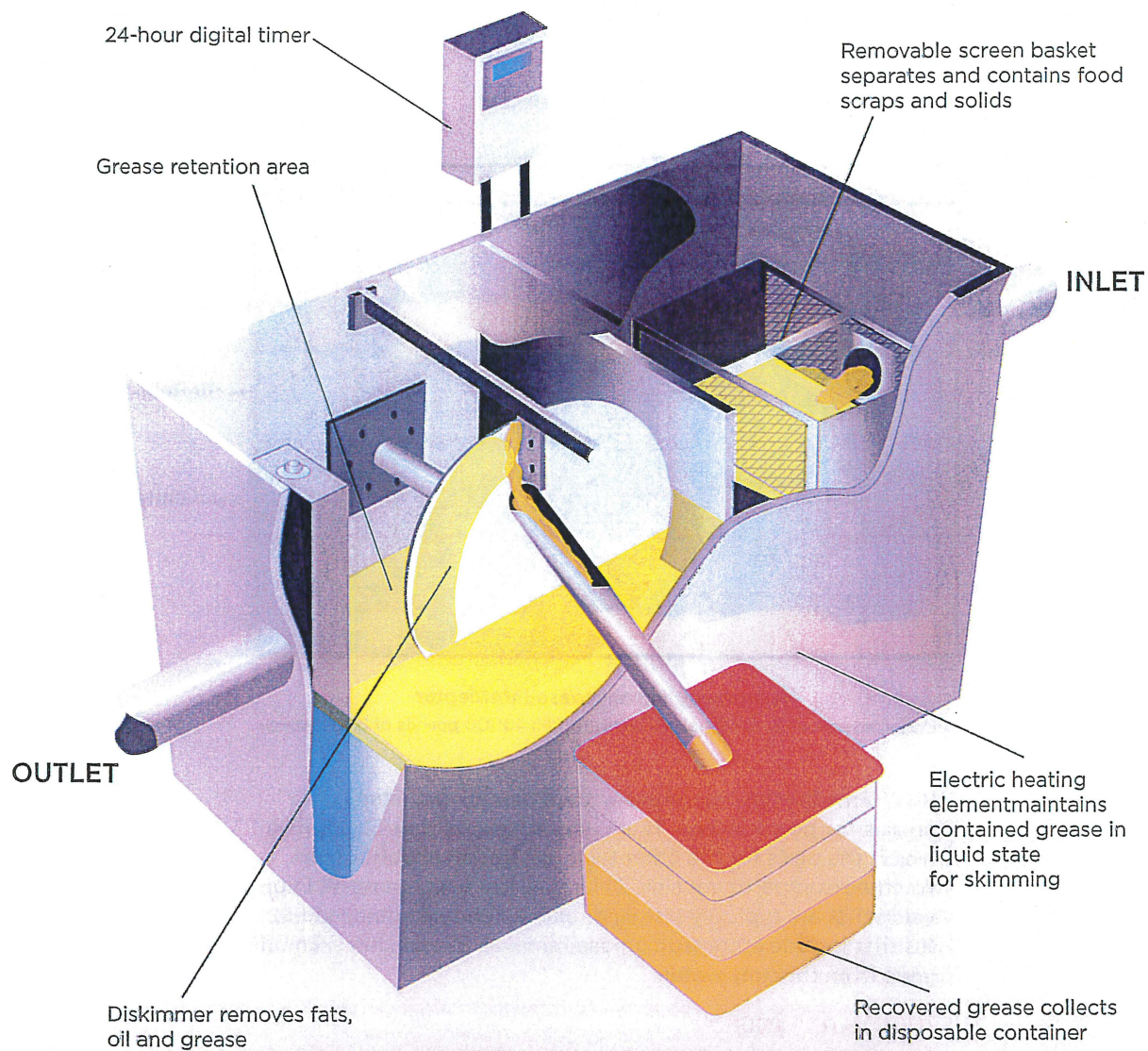
HGIs (formerly known as grease traps) are made of steel, fiberglass or polyethylene. There are three sub-types: 1) “regular,” which is the basis for the other two designs and that fit under your three-compartment sink, 2) large HGIs that are a scaled up version that are typically installed outside the restaurant, and 3) HGIs that include automatic grease removal devices that skim off grease from the grey water.

1 “REGULAR” HGIS

While there are many different designs, HGIs typically consist of a single compartment with baffles/screens to slow down incoming water/FOG mixture and changing the liquid’s direction. This direction shift forces air into the liquid mixture, allowing FOG to rise to the top, solids to sink to the bottom, and water to pass through the unit. HGIs need flow control devices installed further up the pipes to slow water down so the baffles can do their work properly. This “mechanical separation” allows HGIs to be much smaller than GGIs. HGIs are sized based on flow rate and the pounds of FOG they can store.

2 LARGE HGIS

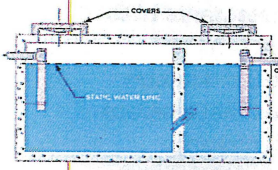
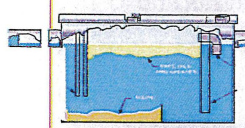
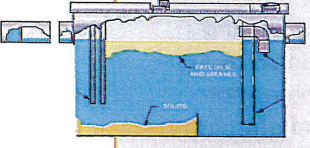
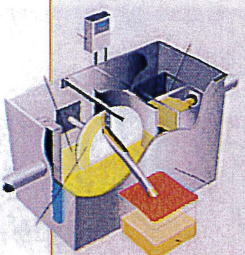
Some sewer agencies allow larger HGIs that are typically installed outside either above or below ground, but require less excavation space due to their smaller footprint. Large HGIs are usually made of plastic or fiberglass and have internal flow control devices. These devices offer a compromise to a GGI given their larger capacity with lower installation and maintenance costs.



3 AUTOMATIC GREASE REMOVAL DEVICES (AGRDs)

AGRDs are a type of HGI that treat kitchen wastewater from food service establishments (FSEs) using gravity separation aided by vented flow control. They are also equipped with automatic grease removal features. They are normally installed indoors and connected to one to four sinks in the kitchen. AGRDs are typically made of steel and are equipped with baffles, screens and external waste containers to store FOG waste. Some are equipped with heaters, skimmers, pumps or pressure chambers to assist in the removal of the FOG.

Equipment Types: the Good, the Bad, and the Ugly (\$)

	Benefits	Drawbacks	Costs
GGI 	• Large FOG storage capacity • Less maintenance • Outside installation for easy maintenance and inspection access • Maintenance can be performed during off hours • Minimal contact by employees	• Requires more space for installation • Can be source of odors if not maintained properly • More expensive to install • Higher maintenance costs per individual pumping events	• New construction restaurants = \$15,000 - \$25,000 • Existing restaurant retrofit = \$25,000 - \$75,000 • Maintenance = \$0.20/gallon - \$0.25/gallon
HGI 	• Requires significantly less space • Less expensive to install • Can be made with durable polyethylene materials • Lower maintenance costs per event • Can be maintained by restaurant staff	• Less FOG storage capacity; more frequent maintenance • Requires flow control device and additional venting • Indoor installation requires space for device • Potentially indoor odors if lid not sealed • Typically requires health department approval • Inspected or maintained during business hours	• Above ground installation = \$2,500 - \$5,000 • New construction, below ground installation = \$5,000 - \$15,000 • Existing restaurant retrofit, below ground installation = \$10,000 - \$25,000 • Maintenance = Typically a base fee of \$100 - \$150 per event
Large HGI  Just like "regular" HGI but bigger.	• Uses less space than a GGI • Typically less expensive installation than a GGI • Typically made with durable polyethylene materials • Lower maintenance costs per event than a GGI • Larger FOG storage space than an HGI • Airtight lids prevents odors	• Less FOG storage capacity than a GGI; more frequent maintenance • Requires flow control device and additional venting • Indoor installation requires space for device • Typically requires health department approval • Restaurant staff cannot conduct maintenance	• New construction restaurants = \$10,000 - \$20,000 • Existing restaurant retrofit = \$20,000 - \$50,000 • Maintenance = \$0.20/gallon - \$0.25/gallon
AGRD (type of HGI) 	• Doesn't require significant space • Lower maintenance costs per event • Self-cleaning resulting in less frequent complete pumping • Often preferred by sewer agencies over regular HGIs • Can be maintained by restaurant staff	• Requires daily, weekly and monthly maintenance • High degree of restaurant staff training required • No air tight seals; potential indoor odors • More expensive than passive HGI • Requires management of recyclable grease container • Typically cannot be installed below ground • Requires flow control device and additional venting • Typically requires health department approval	• Above ground installation = \$5,000 - \$10,000 • Existing restaurant retrofit = \$10,000 - \$15,000 • Maintenance = Typically a base fee of \$100 - \$150 per event

Sizing Your Equipment

Correctly sizing your new GCD (based upon water flow rate) is incredibly important. Sizing should always be performed by a professional plumber and comply within local regulations. Many manufacturers cite that their products are often undersized, installed incorrectly, or both.

Your GCD is less effective if it is too small or improperly installed, so make sure you consider the following before buying a GCD:

- Get your building permit lined up and approved.
- Hire a licensed plumber with ample experience installing grease removal systems.
- Consider your future expansion plans and buy the right size GCD (investing a few extra dollars up front could save you thousands down the road).
- If you sell a lot of fried or greasy foods, you'll need a bigger GCD. For example, pizza restaurants produce extra FOG effluent and should have a larger grease interceptor.
- Install the GCD in an accessible location for easy access for ease of cleaning.
- Purchase and install an up-stream screening device to catch food solids before they go into the GCD.

GCDs must be cleaned and maintained regularly to function properly. Quarterly cleaning is sufficient for most conventional GCDs, while weekly cleaning or maintenance is often required for both HGLs and AGRDs, particularly if following effective kitchen management practices.

Many sewer agencies have implemented a "25 Percent Rule" to assess the maintenance condition of a GCD. **The 25 Percent Rule is the measurement of the floating FOG and settled solids as a percentage of the total hydraulic water depth of the GCD. When the thickness of floating FOG and settled solids layers exceeds 25 percent of the GCD depth, the device needs maintenance.** This is typically determined by the inspector or food service establishment staff using a core sampling tool to measure the contents.

Cleaning: How Often?

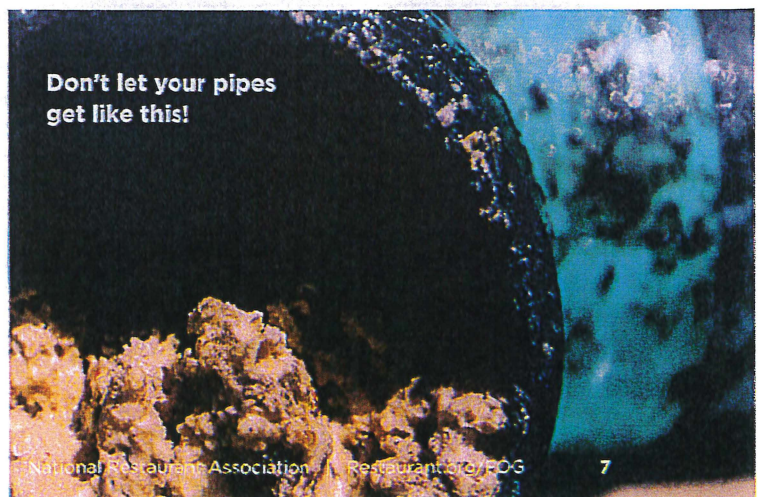
Cleaning frequency for GCDs depends on several factors, including equipment design, restaurant seating capacity, cooking techniques, and local sewer code. Typical cleaning frequency for a properly sized, well-maintained GCD is four times a year but could be more often.

New Restaurants

Most new restaurants are required to install a GCD to prevent grease from flowing into the sanitary sewer system. This applies to new restaurants that are expected to discharge grease due to their menu, preparation/cooking processes, or kitchen fixtures. Examples include restaurants that prepare significant quantities of steak, pork, chicken, fish, pasta, soup, or fried food using grills, fryers, rotisseries, woks and tilt kettles. Conversely, some new restaurants may not be required to install a GCD if they are not expected to discharge FOG due to their menu or kitchen fixtures, such as some sandwich shops, coffee shops, juice shops and other low-FOG generating operations.

Existing Restaurants

Many existing restaurants already have GCDs installed. Provided these devices are connected to the appropriate fixtures/drains, and properly installed and maintained, no other GCDs should be required in most cases. Due to new grease control requirements in many areas of the country, existing restaurants without GCDs are being required to retrofit one (or more). Some agencies may offer "grandfathering" (i.e., removing or postponing the requirement) for existing restaurants due to the potential significant cost of purchasing or retrofitting the device. However, grandfathering may not be possible when: 1) a significant remodel occurs, 2) a restaurant demonstrates non-adherence to FOG control program requirements or 3) the receiving sewer system has shown a history of grease blockages.



Third-Party Cleaners

City or county FOG control programs generally require regular cleaning and proper disposal of waste grease to stay in compliance. If you want to hire a FOG cleaning and hauling service, remember the following.

How to Choose

Choosing the right grease waste hauler for your facility can be challenging. **Restaurants should interview multiple haulers prior to choosing one for their facility.** Consider the following factors:

- Cost per gallon for pumping
- Ability to haul both GCD waste and yellow grease
- Flexibility in schedules and hauling times
- Ability to provide proper documentation (manifests) and respond to information requests
- Ability to quickly respond to emergency situations
- Disposal locations of hauled wastes and uses
- Biogas production
- Energy production
- Product inputs (e.g., soap)

Documentation Requirements

Proper documentation is essential when using a third-party hauling service. Sewer agencies typically require that all FOG cleaners/haulers provide your restaurant a copy of the pumping manifest prior to departing the business and that you (the restaurateur) maintain copies. Typical minimum information requirements include:

- Name of hauling company.
- Name and signature of operator performing the pump out.
- Documentation of full pump out with volume of water and FOG removed (e.g., 1,500 gallons).
- Documentation of the level of floating FOG and settled solids (to determine if volume exceeds 25 percent capacity of the grease removal equipment).
- Documentation if repairs to the grease interceptor are required.
- Identification of the facility where the hauler is planning to dispose of the waste.



Odor Control

There is no way around it: rotting grease stinks. Not only that, these septic conditions can create sulfuric acid that can corrode your GGI. Make sure you take the following steps:

- Perform frequent interceptor cleaning and maintenance, including complete removal (pumping) of all contents (clean quarterly or via 25 percent rule; more often if GCD begins to smell).
- Conduct thorough cleaning of the **interceptor walls** and promptly repair identified structural problems.
- Clean lateral line between the kitchen and the grease interceptor when cleaning the GCD.
- Utilize kitchen BMPs to minimize the food/solids introduced into the sewage system.
- Use a sewage/wastewater treatment additive and confirm with your local sewer agency that the use of a treatment additive is allowed.

Manage Yellow Grease and Save a Buck

Yellow grease, (basically, all the fryer oil and cooking fats from your back of house NOT in a GCD) should be managed appropriately and can often be sold and recycled by a third party to make biodiesel or other products. **Waste grease and oils from deep fryers, drippings from rotisseries or grills, and scrapings from griddles, should be separated and placed in specific containers for proper disposal.** The restaurant contracts with a certified waste hauler to collect the yellow grease for disposal. Most yellow grease haulers sell the grease or recycle it themselves for beneficial uses such as biofuels.

THE PRICE OF YELLOW GREASE

VARIES FROM QUARTER TO QUARTER AND IS LISTED BY THE USDA AGRICULTURAL MARKETING SERVICE. IN JANUARY 2017, IT SOLD FOR \$0.23 PER POUND OR ABOUT \$8.05 FOR A 35 LB. JIB OF OIL. (ABOUT 40% OF THE COST OF A \$20 FRYER OIL JIB.)

