MUSCATINE

Fats, Oil, and Grease
Best Management Practices Manual

Pollution Prevention and Compliance Information for Kitchens, Restaurants, and other Business Owners and Managers in the City of Muscatine, Iowa.

F.O.G. creates sewer overflows to homes and the environment.




Fats, Oil, and Grease (FOG) Best Management Practices Manual

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Knowledgeable municipal staff, working with business owners, can effectively prevent oil and grease buildup, and associated problems, for both the sewerage agency and the restaurant owner.

Sanitary Sewer Overflows (SSO) sends raw sewage flowing to the nearest stream and into house basements.

Chapter 1
Introduction


Grease Plugged Pipe

Fats, oil, and grease — also called FOG in the wastewater business — can have negative impacts on wastewater collection and treatment systems. Most wastewater collection system blockages can be traced to FOG. Blockages in the wastewater collection system are serious, causing sewage spills, manhole overflows, or sewage backups into homes and businesses. These Sanitary Sewer Overflows (SSO's) cause disease, damage the environment and cost cities, homeowners and businesses for expensive clean-up events.

Two types of FOG pollutants are common to wastewater systems. Petroleum-based oil and grease (non-polar concentrations) occur at businesses using motor oil and grease, and can usually be identified and regulated by municipalities through local limits and associated pretreatment permit conditions. Animal and vegetable-based oil and grease (polar concentrations) are more difficult to regulate due to the large number of restaurants and fast-food outlets in every community.

This manual is written to provide Muscatine kitchen, restaurant and fast food business managers and owners —along with Muscatine staff — information about animal and vegetable-based fat, oil and grease pollution prevention techniques focused on their businesses, effective in both reducing maintenance costs for business owners, and preventing oil and grease discharges to the sewer system.

This manual focuses on proper maintenance of grease traps and interceptors, sizing of grease traps and interceptors in accordance with Uniform Plumbing Code guidelines, and includes inspection checklists for municipal inspectors.

Manual contents include:

- Frequently Asked Questions about Fats, Oil, and Grease
- Best Management Practices (BMPs)
- Prohibitions Relating to Discharge of Fats, Oil, and Grease
- Grease Trap and Interceptor Maintenance
- Fats, Oil, and Grease Haulers and Recyclers
- How Grease Traps and Interceptors Work
- Grease Interceptor Sizing Worksheet
- Compliance Inspection and Installation Checklists

Chapter 2
Frequently Asked Questions about Fats, Oil, and Grease (FOG)

Is grease a problem?

In the sewage collection and treatment business, the answer is an emphatic YES! Grease is singled out for special attention because of its poor solubility in water and its tendency to separate from the liquid solution.

Large amounts of oil and grease in the wastewater cause trouble in the collection system pipes. It decreases pipe capacity and, therefore, requires that piping systems be cleaned more often and/or some piping to be replaced sooner than otherwise expected. Oil and grease also hamper effective treatment at the wastewater treatment plant.

Grease as a warm liquid may not appear harmful, but as the liquid cools, the grease or fat congeals and re-forms on the interior of pipes and other surfaces. This may cause a shutdown of wastewater treatment units or any of the 21 lift stations throughout town that pump wastewater to the treatment plant. Problems caused by wastes from restaurants and other grease-producing establishments have served as the basis for ordinances and regulations governing the discharge of grease materials to the sanitary sewer system. This type of waste has forced the requirement of the installation of preliminary treatment devices at the source, commonly known as grease traps or grease interceptors.

The City of Muscatine has adopted a Sewer Use Ordinance 10-6-16 that regulates the discharge of FOG into the City's sewer system. The ordinances require pretreatment devices in new construction and retrofit of existing facilities as necessary to comply with the City's FOG discharge limit.

What is a grease trap and how does it work?

A trap is a small reservoir built into the wastewater piping a short distance from the grease producing area. Baffles in the reservoir retain the wastewater long enough for the grease to congeal and rise to the surface. The grease can then be removed and disposed properly. See *How Grease Traps and Interceptors Work* for a description of how the various components of grease traps function.

What is a grease interceptor?

An interceptor is a vault with a capacity of between 500 and 3000 gallons that is located on the exterior of the building. The vault includes a minimum of two compartments, and flow between each compartment is through a 90° fitting designed for grease retention. The capacity of the interceptor provides adequate residence time so that the wastewater has time to cool, allowing any remaining grease not collected by the traps time to congeal and rise to the surface where it accumulates until the interceptor is cleaned. See *How Grease Traps and Interceptors Work* for a description of how the various components of a grease interceptor function.

How do I clean my grease interceptor and grease trap?

Refer to *Maintenance of Grease Traps and Interceptors*.

Can you recommend a grease interceptor or grease trap maintenance schedule?

All outdoor grease interceptors should be cleaned at least four times each year. Most establishments will find it necessary to clean their interceptor monthly. If it requires cleaning more often than twice per month, the owner should consider installing a larger interceptor.

Inside grease traps should be cleaned weekly but no less than every two weeks. The longer waste is trapped the more odors are produced, the more acids will deteriorate the trap and the greater the chance for a back-up into homes and businesses.

Do I have a grease trap or grease interceptor?

If the establishment is uncertain whether it has a grease trap or interceptor, the owner should contact the City of Muscatine Pretreatment staff at 263-2752.

Do I need a grease interceptor or trap?

Any establishment that introduces grease or oil into the drainage and sewage system in quantities large enough to cause line blockages or hinder sewage treatment is required to install a grease trap or interceptor. Interceptors are usually required for high volume restaurants (full menu establishments operating 16 hrs/day and/or serving 500+ meals per day) and large commercial establishments such as hotels, hospitals, factories, or school kitchens.

Grease traps are required for small volume (fast food or take-out restaurants with limited menus, minimum dishwashing, and/or minimal seating capacity) and medium volume (full menu establishments operating 8 to 16 hrs/day and/or serving 100 to 400 meals/day) establishments. Medium volume establishments may be required to install an interceptor depending upon the size of the establishment.

Is the grease trap I have adequate?

The Uniform Plumbing Code (UPC) requires that no grease trap have a capacity less than 20 gallons per minute (gpm) or more than 55 gpm. The size of the trap depends upon the number of fixtures connected to it. The following table provides criteria for sizing grease traps:

Total number of fixtures connected	Required rate of flow, gpm	Grease retention capacity, lbs
1	20	40
2	25	50
3	35	70
4	50	100

The size will also depend largely upon the maintenance schedule. If a grease trap or interceptor is not maintained regularly it will not provide the necessary grease removal. The establishment should work out a specific cleaning schedule that is right for the establishment. All grease traps need to have the grease cleaned out periodically and no one likes to do the job. It is a dirty, stinky job. Running extremely hot water down the drain only moves the problem down stream. It does not go away. Catch the grease at the source! This is the most economical means to reduce all costs.

What if I don't install a grease abatement device?

If the establishment uses grease and oil in food preparation, it will eventually encounter a maintenance problem with a plugged building sewer line. The blockage can create a sewer backup situation and ultimately a potential health problem in the establishment. Someone will have to pay for removing the blockage. If the problem is in the building sewer line, then the establishment has direct responsibility for paying for the maintenance. If the blockage or restriction is in the public sewer main and it can be proven that the establishment is the cause of the blockage, then the establishment may have to pay for the public sewer to be maintained. The City of Muscatine ordinance gives the City the authority to recover costs for repairs to the City sewer system due to failure to comply with the City requirements. Blocking a sanitary sewer line is also a violation of the federal Clean Water Act.

Who determines if I need a grease trap or interceptor?

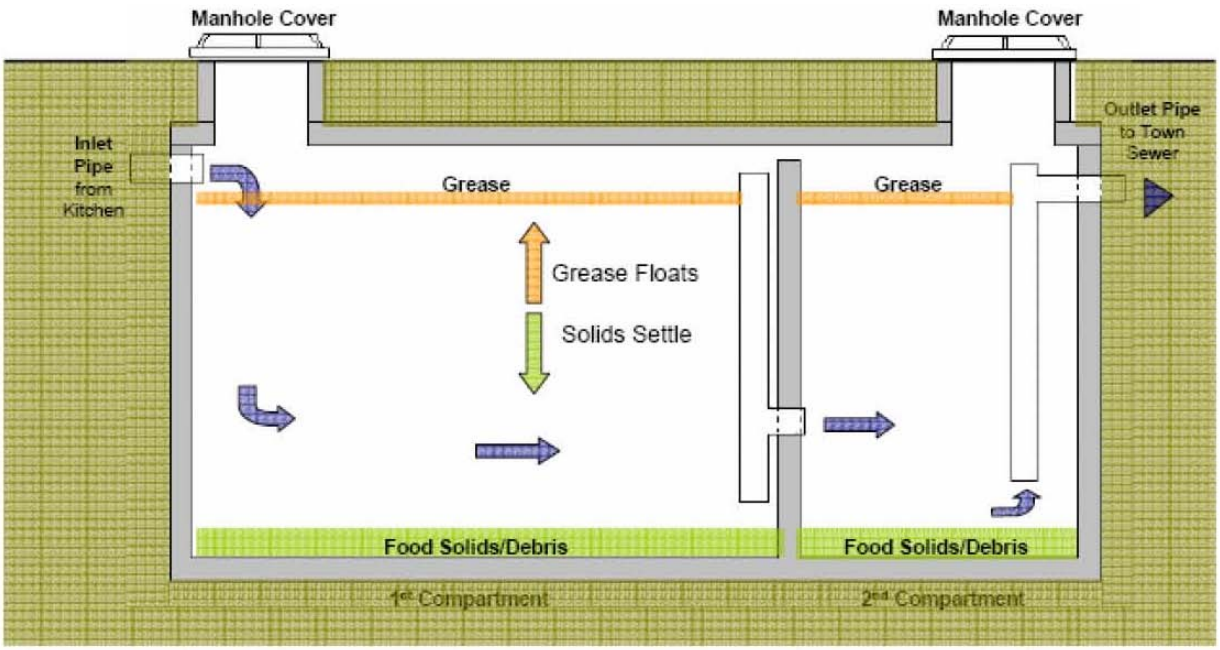
When waste pretreatment is required by the City of Muscatine, an approved grease trap or interceptor shall be installed according to the UPC by a certified plumber. The City of Muscatine prohibits the discharge of materials that can solidify and create blockages in the wastewater collection system or treatment plant. The Health and Pretreatment Departments make periodic inspections to see that no health problems exist due to improperly maintained grease traps and interceptors. These rules will be enforced if a problem exists.

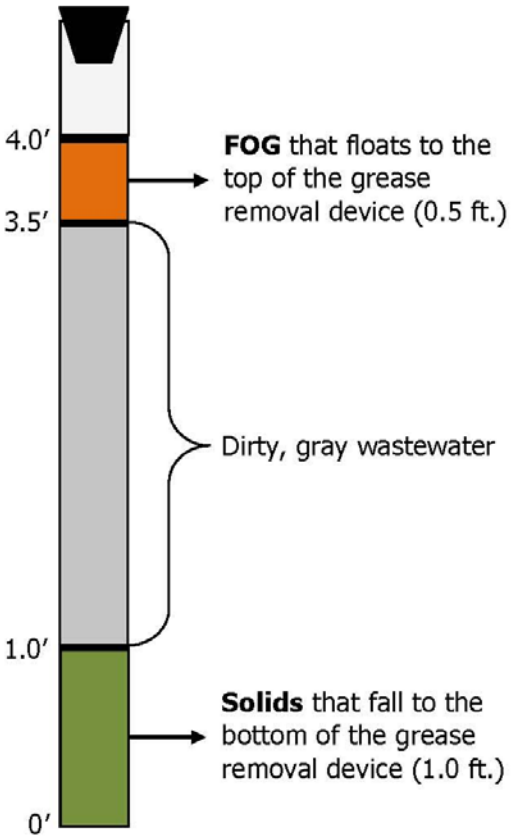
How can I get in compliance?

The establishment should contact the City of Muscatine Pretreatment Department at pretreatment@muscatineiowa.gov or 563-263-2752. The establishment will be asked to purchase a permit for the grease device. This will enable the City to assist the establishment in cleaning schedules and advise them of a problem showing up in the wastewater collection system. A Grease Discharge Permit is required regardless of whether the establishment has an existing device or is installing a new one.

What are the criteria for inspecting grease traps and interceptors?

All food service establishments will be inspected for compliance with the 25% rule. Per City Ordinance, all food service establishments must have grease removal devices cleaned when they reach 25% of capacity. If the sediment level exceeds 25% of the tank depth, the cleaning frequency must be increased.





Does this example meet the 25% rule?

- **Total FOG on top of device = 0.5 ft.**
- **Total solids at the bottom of device = 1.0 ft.**
- **Total depth of device contents = 4.0 ft.**

Percentage of FOG + solids:

$$\frac{\text{(FOG + solids)}}{\text{Depth of interceptor contents}} = \frac{(0.5' + 1.0')}{4.0'} =$$

$$= \frac{1.5'}{4.0'} = \mathbf{37.5\%}$$

- **<u>Answer:</u> No, the 25% rule is not met and the FSE needs to increase pumping frequency.**

Chapter 3
Best Management Practices

Fats, oil, and grease (FOG) can be managed effectively in the food service industry to minimize adverse impacts on municipal wastewater systems and the environment. Municipal pretreatment staff and food service industry workers have developed Best Management Practices (BMPs) that, when implemented, will minimize the adverse impacts of FOG. This chapter summarizes these BMPs, and other important information, including the reason for BMPs and the benefit of BMPs to the food service industry.

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Train kitchen staff

- **BMP**
  Train kitchen staff and other employees about how they can help ensure BMP's are implemented.

- **Reason For**
  People are more willing to support an effort if they understand the basis for it.

- **Benefit to food service establishment**
  All of the subsequent benefits of BMPs will have a better chance of being implemented.

- **Pretreatment inspection tip**
  Talk to the establishment manager about the training program that he/she has implemented.

Post "No Grease" signs

- **BMP**
  Post "No Grease" signs above sinks and on the front of dishwashers.

- **Reason For**
  Sign serves as a constant reminder for staff working in kitchens.

- **Benefit to food service establishment**
  These reminders will help minimize grease discharge to the traps and interceptors and reduce the cost of cleaning and disposal.

- **Pretreatment inspection tips**
  Check appropriate locations for "No Grease" signs.

Use water temperatures less than 140° F

- **BMP**
  Use water temperatures less than 140° F in all sinks, especially the pre-rinse sink before the mechanical dishwasher. The mechanical dishwasher requires a minimum temperature of 160° F, but the UPC prohibits discharging the dishwasher to grease traps.

- **Reason For**
  Temperatures in excess of 140° F will dissolve grease, but the grease can re-congeal or solidify in the sanitary sewer system as the water cools.

- **Benefit to food service establishment**
  The food service establishment will reduce its costs for the energy – gas or electric – for heating the water.

- **Pretreatment inspection tips**
  Check boiler or hot water heater discharge temperature. Measure the temperature of the hot water being discharged from the closest sink.

Use a three-sink dishwashing system

- **BMP**
  Use a three-sink dishwashing system, which includes sinks for washing, rinsing, and sanitizing in a 50 to 100-pip bleach solution. Water temperatures are less than 140° F.

- **Reason For**
  The three-sink system uses water temperatures less than 140° F where a mechanical dishwasher requires a minimum temperature of 160° F.
  Note: The UPC prohibits the discharge of dishwasher water to grease traps.

- **Benefit to food service establishment**
  The food service establishment will reduce its costs for the energy – gas or electric – for heating the water for the mechanical dishwasher and for operating the dishwasher.

- **Pretreatment inspection tips**
  Measure the temperature of the hot water at the three-sink system.

Recycle waste cooking oil

- **BMP**
  Recycle waste cooking oil.

- **Reason For**
  There are many waste oil recyclers throughout Iowa. This is a cost recovery opportunity.

- **Benefit to food service establishment**
  The food service establishment will be paid for the waste material and will reduce the amount of garbage it must pay to have hauled away.

- **Pretreatment inspection tips**
  Obtain the name of the recycler used. Review recycling records. Confirm records with the recycler.

“Dry wipe” pots, pans, and dishware prior to dishwashing

- **BMP**
  “Dry wipe” pots, pans, and dishware prior to dishwashing.

- **Reason For**
  The grease and food that remains in pots, pans, and dishware will go to the landfill. By “dry wiping” and disposing in garbage receptacles, the material will not be sent to the grease traps and interceptors.

- **Benefit to food service establishment**
  This will reduce the amount of material going to grease traps and interceptors, which will require less frequent cleaning, reducing maintenance costs.

- **Pretreatment inspection tips**
  Observe dishwashing practices.

Dispose of food waste by recycling and/or solid waste removal

- **BMP**
  Dispose of food waste by recycling and/or solid waste removal.

- **Reason For**
  Some recyclers will take food waste for methane production or animal feed. In the absence of such recyclers, the food waste can be disposed as solid waste in landfills by solid waste haulers.

- **Benefit to food service establishment**
  Recycling food wastes will reduce the cost of solid waste disposal. Solid waste disposal of food waste will reduce the frequency and cost of grease trap and interceptor cleaning.

- **Pretreatment inspection tips**
  Inspect grease traps and interceptors for food waste accumulation.
  Confirm the recycler or solid waste removal company with the establishment manager.

Witness all grease trap or interceptor cleaning and maintenance

- **BMP**
  Owners or managers should witness all grease trap or interceptor cleaning and maintenance activities to ensure that the device is properly operating.

- **Reason For**
  Grease trap/interceptor haulers and recyclers may take shortcuts. If the establishment manager inspects the cleaning operation and ensures it is consistent with the procedures in *Grease Trap and Interceptor Maintenance* they are more assured of getting full value for their money.

- **Benefit to food service establishment**
  The establishment will ensure it is getting value for the cost of cleaning the grease trap or interceptor. Otherwise the establishment may be paying for cleaning more often than necessary.

- **Pretreatment inspection tips**
  None.

Clean under sink grease traps weekly

- **BMP**
  Clean under sink grease traps weekly. If grease traps are more than 50 percent full when cleaned weekly, the cleaning frequency needs to be increased.

- **Reason For**
  Under sink grease traps have less volume than grease interceptors. Weekly cleaning of under sink grease traps by the establishments own maintenance staff will reduce the cost of cleaning the grease interceptor. If the establishment does not have a grease interceptor, the under sink grease trap is the only means of preventing grease from entering the sanitary sewer system. If the grease trap is not providing adequate protection, the City may require installation of a grease interceptor.

- **Benefit to food service establishment**
  This will extend the length of the cleaning cycle for grease interceptors that the establishment maintains.

- **Pretreatment inspection tips**
  Visually inspect the contents of the under sink grease traps. Inspect cleaning records.

Clean grease interceptors routinely

- **BMP**
  Clean grease interceptors routinely.

- **Reason For**
  Grease interceptors must be cleaned routinely to ensure that grease accumulation does not cause the interceptor to operate poorly. The cleaning frequency is a function of the type of establishment, the size of the interceptor, and the volume of flow discharged by the establishment.

- **Benefit to food service establishment**
  Routine cleaning will prevent plugging of the sewer line between the food service establishment and the sanitary sewer system. If the line plugs, the sewer line may back up into the establishment, and the business will need to hire someone to unplug it.

- **Pretreatment inspection tips**
  No more than 25 percent of the depth should be a combination of grease (top) and sediment (bottom).

Keep a maintenance log

- **BMP**
  Keep a maintenance log.

- **Reason For**
  The maintenance log serves as a record of the frequency and volume of cleaning the interceptor. It is required by the pretreatment program to ensure that grease trap/interceptor maintenance is performed on a regular basis.

- **Benefit to food service establishment**
  The maintenance log serves as a record of cleaning frequency and can help the establishment manager optimize cleaning frequency to reduce cost.

- **Pretreatment inspection tips**
  Inspect maintenance log. Provide the establishment with a sample maintenance log if it does not have one. Confirm the maintenance log with the grease hauler identified.

Cover outdoor grease and oil storage containers

- **BMP**
  Cover outdoor grease and oil storage containers.

- **Reason For**
  Uncovered grease and oil storage containers can collect rainwater. Since grease and oil float, the rainwater can cause an overflow onto the ground. Such an overflow will eventually reach the stormwater system and nearby streams.

- **Benefit to food service establishment**
  The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.

- **Pretreatment inspection tips**
  Observe storage area for signs of oil and grease. Inspect containers for covers. Remove covers to ensure containers have not overflowed and do not have excess water.

Locate grease dumpsters and storage containers away from stormdrain catch basins

- **BMP**
  Locate grease dumpsters and storage containers away from storm drain catch basins.

- **Reason For**
  The farther away from the catch basin, the more time someone has to clean up spills or drainage prior to entering the storm drain system. Be aware of oil and grease dripped on the ground while carrying waste to the dumpster, as well as oil and grease that may “ooze” from the dumpster.

- **Benefit to food service establishment**
  The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams and rivers by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.

- **Pretreatment inspection tips**
  Observe storage area for signs of oil and grease. Inspect the closest catch basin for signs of accumulated grease and oil.

Use absorbent pads or other material in storm drain catch basins

- **BMP**
  Use absorbent pads or other material in the storm drain catch basins if grease dumpsters and containers must be located nearby. Do not use free flowing absorbent materials such as “kitty litter” or sawdust.

- **Reason For**
  Absorbent pads and other materials can serve as an effective barrier to grease and oil entering the storm drain system.

- **Benefit to food service establishment**
  The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.

- **Pretreatment inspection tips**
  Check the nearest catch basin and drainage paths for signs of grease and oil. Require absorbent pads if the basin is within 20 feet of grease dumpsters or containers, or if there are signs of grease in the catch basin at any distance. Do not permit the use of free flowing absorbent material such as “kitty litter.”

Use absorbent pads or other material to clean up spilled material

- **BMP**
  Use absorbent pads or other material to clean up spilled material around outdoor equipment, containers or dumpsters. Do not use free flowing absorbent materials such as “kitty litter” or sawdust that can be discharged to the storm drain system.

- **Reason For**
  Absorbent pads or materials can help clean up grease and oil that is spilled on the ground and prevent it from flowing to the storm drain system.

- **Benefit to food service establishment**
  The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.

- **Pretreatment inspection tips**

  If grease and oil are observed on the ground in the storage area, recommend the use of absorbents to minimize movement of the grease and oil. Do not permit the use of free flowing absorbent material such as "kitty litter."

Routinely clean kitchen exhaust system filters

- **BMP**

  Routinely clean kitchen exhaust system filters.

- **Reason For**

  If grease and oil escape through the kitchen exhaust system, it can accumulate on the roof of the establishment and eventually enter the storm drain system when it rains.

- **Benefit to food service establishment**

  Grease and oil accumulation in the exhaust system and on the roof of buildings is an extreme fire hazard.

  The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.

- **Pretreatment inspection tips**

  Inspect roof (if safely accessible) for signs of oil and grease. Require a maintenance schedule and records for cleaning exhaust filters. Cleaning is usually by washing, which will discharge the grease to the interceptor where it can be controlled.

Chapter 4
Prohibitions Relating to Discharge of Fats, Oil, and Grease

Certain activities relating to discharge of fats, oil, and grease are prohibited. These activities, if allowed, would interfere with the proper operation of grease traps and interceptors and potentially have an immediate, negative effect on the municipal wastewater system or the environment. This chapter provides a list of prohibited activities and the basis for each prohibition.

Prohibition	Basis
Do not discharge fats, oil, and grease in concentrations that will cause an obstruction to the flow in a sewer, or pass through or cause interference at a wastewater treatment facility.	Grease can solidify and trap other solid particles to completely plug the wastewater collection system.
Do not discharge grease, improperly shredded garbage, animal guts or tissues, paunch manure, bones, hide, hair, fleshings, or entrails.	These materials in combination or alone can cause blockages and other operations and maintenance problems in the wastewater collection and treatment system.
Do not discharge wastewater with temperatures in excess of 140° F to any grease traps. This includes water from mechanical dishwashers that have a minimum required temperature of 160° F.	Temperatures in excess of 140° F will dissolve grease, but the grease can re-congeal and cause blockages further downstream in the sanitary sewer collection system as the water-cools. Note: High temperature water, such as from a dishwasher, is discharged to the remotely located grease interceptor, if there is one. The remote location and the high volume of the interceptor allows the water time to cool so that there is not a problem with dissolving grease and moving it further downstream. The high volume also provides dilution of the detergents in the dishwasher waste.
Do not discharge waste from a food waste disposal, garbage disposal, aerator or grinder unit to any grease traps.	The food waste will greatly reduce the capacity of the grease trap for retaining grease and can cause worse problems with blockages.

Prohibition	Basis
Do not discharge caustics, acids, solvents, or other emulsifying agents.	Though emulsifying agents can dissolve solidified grease, the grease can re-congeal further downstream in the sanitary sewer collection system. Caustics, acids, and solvents can have other harmful effects on the wastewater treatment system and can be hazardous to those working in the wastewater collection system.
Do not discharge fats, wax, grease or oils containing substances that will become viscous between 32° F (0°C) and 150°F (65°C).	The temperatures shown are temperatures that can occur in the wastewater collection and treatment system. If these substances congeal, solidify, or become too viscous, they can cause blockages and other operations and maintenance problems.
Do not utilize biological agents for grease remediation without permission from the City Pretreatment Department.	The biological agents may disrupt the biological treatment process at the wastewater treatment plant.
Do not clean equipment outdoors in an area where water can flow to the gutter, storm drain, or street.	Grease and dirt will be washed off the equipment and enter the storm drain system and flow to nearby streams.

Never pour grease down the sink, floor drain, toilet or into storm drains.

Chapter 5
Grease Trap and Interceptor Maintenance

The grease traps and interceptors used by food service establishments must be cleaned on a regular basis to ensure that they work properly. Regular cleaning of grease traps and interceptors can improve their efficiency and effectiveness. This chapter describes step-by-step maintenance actions that can be used to clean these devices.

Maintenance staff, or other employees usually perform grease trap maintenance. Grease interceptor (GI) maintenance, which is usually performed by permitted haulers or recyclers (contact the Pretreatment Department for a list of certified haulers at pretreatment@muscatineiowa.gov or 263-2752), consists of removing the entire volume (liquids and solids) from the GI and properly disposing of the material in accordance with all Federal, State, and/or local laws. When performed properly and at the appropriate frequency, GI and trap maintenance can greatly reduce the discharge of FOG into the wastewater collection system.

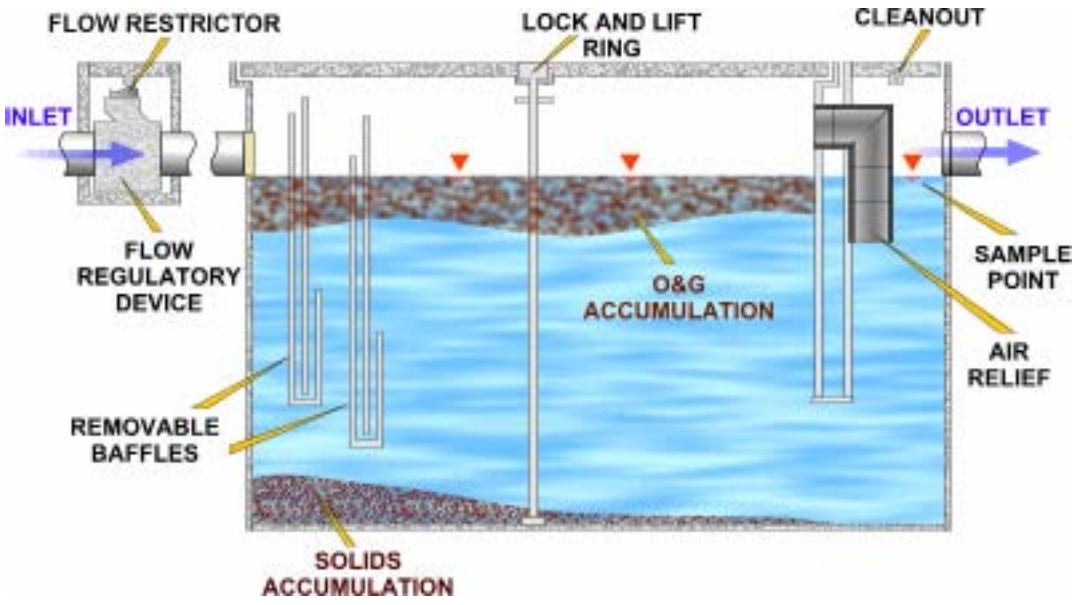
The required maintenance frequency for GIs and traps depends greatly on the amount of FOG a facility generates as well as any BMPs implemented to reduce the FOG discharged into the sanitary sewer system. In many cases, an establishment that implements BMPs will realize financial benefit through a reduction in their required GI and trap maintenance frequency. Refer to *Best Management Practices* for examples of BMPs that FOG generating establishments should implement.

WARNING!

Do not use hot water, acids, caustics, solvents, or emulsifying agents when cleaning grease traps and interceptors.

Grease Trap Maintenance

A proper maintenance procedure for a grease trap is outlined on the following page:



TOOLS AND MATERIALS

1. A large trash can
2. Two or three trash can liners/bags (thick or heavy duty) or sealable containers
3. Absorbent material (floor dry available at auto parts stores or clay kitty litter)
4. Proper hand tools and safety equipment to open trap: hex head wrench (allen wrench), screw driver/small pry bar, scraper, rubber gloves and safety glasses
5. Tools for removing contents
   a. scoop of some type for removal of water and solids
   b. scraper (putty knife)
   c. wet/dry vacuum (optional)
6. Clean paper towels or cloth rags

BEFORE YOU BEGIN

1. Develop a strict maintenance schedule and adhere to it. Typically, clean the grease trap once a week but no less than every two weeks.
2. Prepare your work area (clear area of debris, bleach, bottles, and other cleaners).
3. Line the trash can with garbage bags.
4. Add absorbent material (floor dry or kitty litter) into the lined trash can. This will soak up the water and liquid waste making transport of waste to the dumpster cleaner and safer.
5. Refer to the installation manual for disassembly of the unit.

CLEANING YOUR TRAP

1. Turn fasteners counter-clockwise to loosen and carefully remove the lid of the grease trap without damaging the gasket. Clean, inspect, and replace gasket if necessary.
2. Observe the manner in which the internal parts are installed because you'll have to reinstall them properly after you finish cleaning the trap.
3. Begin removing contents of the grease trap by dipping or vacuuming the waste products from the inside of the trap.
4. Remove all contents until grease trap is empty.
5. Do NOT use hot water, degreasers, or soaps to clean the interior of the trap.
6. Scrape all the inside walls, baffles, and screens to insure movement of water through unit.
7. Inspect and note the condition of tank, baffle, and all removable parts. Schedule repairs or replacement as needed.
8. Make sure the grease trap has been properly reassembled (all internal parts are in their proper place).
9. Examine the gasket for damage. Replace if necessary - never use tube silicone as a gasket.
10. Clean and re-install rubber gasket and reposition lid on tank. Ensure all screws and hold-downs are in place and properly tightened.
11. Ensure enough absorbent material has been placed in bag to soak up all excess liquids. Add more if needed. Securely tie the bag of waste closed so that it does not leak.
12. Place bag in the garbage (solid waste) dumpster or designated receptacle. **It is ILLEGAL to dump grease trap or kitchen waste into the sanitary sewer system (toilets, cleanouts, manholes, etc.), storm drains, ponds, or outdoor areas.**

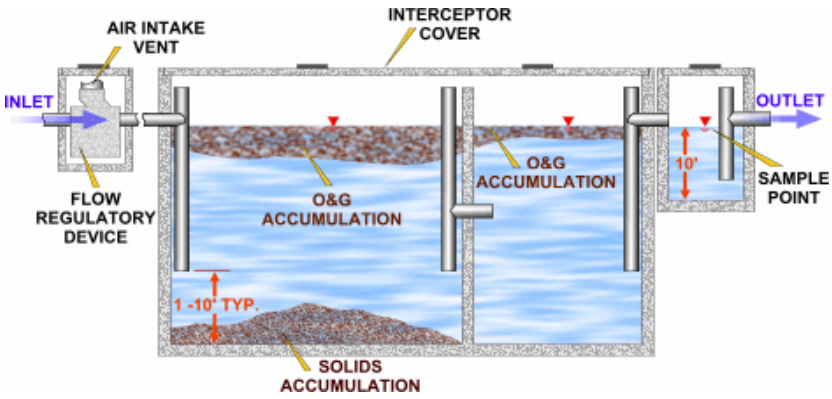
REPORTING & DOCUMENTATION

1. Contact the Muscatine Pretreatment Dept. for sample grease control device maintenance logs to be kept on site. Contact at 263-2752 or pretreatment@muscatineiowa.gov.
2. Maintain documentation and report grease trap cleanings a minimum of 3 years.

Tips!

- A mask is recommended due to the rancid odors of the grease trap.
- Grease trap cleaning should be a regular part of your facility's maintenance routine. The EPA requires that these traps remain clutter-free and functional.
- Wait until the day before trash pickup in your area to clean the traps. This will minimize the time the waste must sit in your garbage, thereby also minimizing the odor.
- There are many different methods available for disposal of grease trap waste. Rather than to just throw the debris in the garbage, which goes to a dump, consider available alternatives, such as companies that recycle the waste into usable bio fuel or liquid hauling companies that use special disposal techniques for fatty liquids, oils, or grease. These haulers vacuum the trap completely and provide an effective and easy way to keep your trap clean and functioning.
- Never use grease trap additives including bacterias or enzymes. These products push the grease from the trap into the sanitary sewer. The grease eventually re-hardens and causes severe grease blockages.

Grease Interceptor Maintenance



Grease interceptors, due to their size, will usually be cleaned by grease haulers or recyclers. Licensed septic haulers can also pump out grease interceptors and haul the waste to the treatment plant.

MINIMUM STANDARDS

- Due to the size of grease interceptors, grease haulers must clean them to ensure proper operation. This cleaning must occur at least every 90 days or when accumulated FOG and solids reach 25% of the capacity. Licensed grease haulers pump out grease interceptors and haul the waste to an approved disposal facility.
- Keep records of proper maintenance on-site for a minimum of 3 years. The waste hauler is required to identify the disposal facility on the document they provide you to record the cleaning. Remember your facility is legally responsible for the disposition of the grease even after it leaves your facility.
- Do not pour FOG waste directly into the Grease Interceptor (GI). The GI is not designed as a disposal device.
- Too much build up of FOG and solids makes the interceptor less effective. Regular periodic inspections and cleaning are needed.

RECOMMENDATIONS

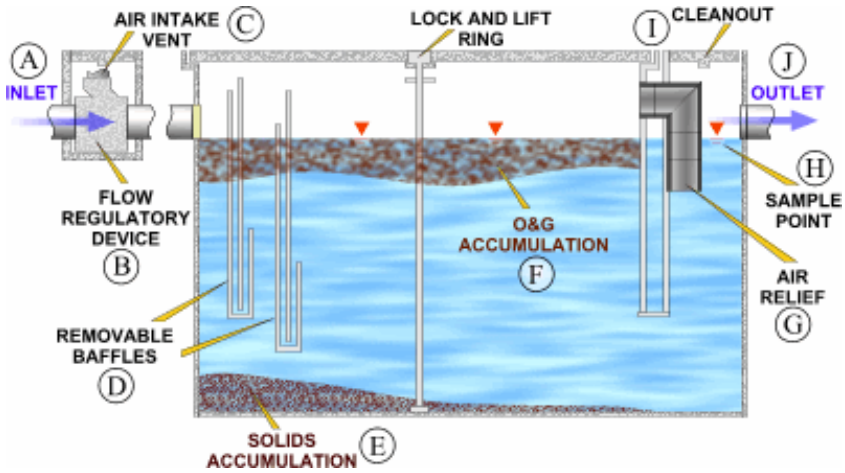
- The facility owner/operator is responsible for the condition of the grease interceptor, so an appropriate representative should witness and monitor all grease interceptor pump-outs to ensure proper cleaning and maintenance procedures are followed, and that the grease hauler does not take any shortcuts.
- The facility owner/operator is responsible to make the necessary repairs or replacements if damages or missing parts are reported or observed.

Chapter 6

How Grease Traps and Interceptors Work

This chapter explains how grease traps and interceptors work. Understanding how treatment devices work improves operation and maintenance. The chapter uses a graphic of each device, with a description keyed to each element of the graphic. The description is designed to follow the flow of wastewater through the grease trap or interceptor.

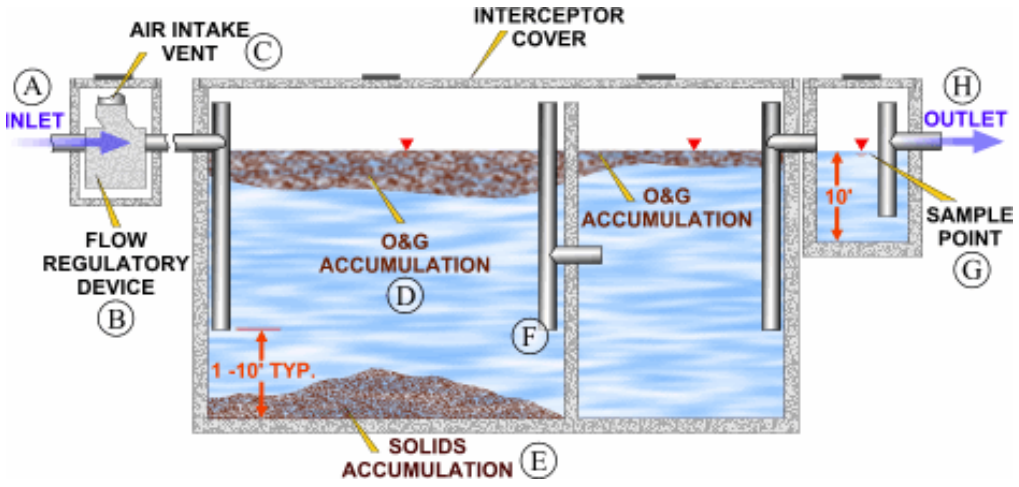
Grease Traps



A. Flow from four or fewer kitchen fixtures enters the grease trap.
B. An approved flow control or restricting device is installed to restrict flow to the grease trap to the rated capacity of the trap.
C. An air intake valve allows air into the open space of the grease trap to prevent siphonage and backpressure.
D. Baffles help to retain grease toward the upstream end of the trap since grease floats and will generally not go under the baffle. This helps to prevent grease from leaving the trap and moving further downstream where it can create blockages.
E. Solids in the wastewater that do not float will be deposited on the bottom of the grease trap and will need to be removed during routine grease trap cleaning.
F. Oil and grease floats on the water surface and accumulates behind the baffles. The oil and grease will be removed during routine grease trap cleaning.
G. Air relief is provided to maintain proper air circulation within the grease trap.

H. Some grease traps have a sample point at the outlet end of the trap to sample the quality of the grease trap effluent.
I. A cleanout is provided at the outlet or just downstream of the outlet to provide access into the pipe to remove any blockages.
J. The water exits the grease trap through the outlet pipe and continues on to the GI or the sanitary sewer system.

Grease Interceptors (GIs)



A. Flow from under sink grease traps or directly from plumbing fixtures enters the GI. The UPC requires that all flow entering the interceptor enter through the inlet pipe.
B. An approved flow control or restricting device is installed to restrict the flow to the GI to the rated capacity of the interceptor.
C. An air intake valve allows air into the open space of the GI to prevent siphonage and backpressure.
D. Oil and grease floats on the water surface and accumulates behind the grease retaining fittings and the wall separating the compartments. The oil and grease will be removed during routine GI cleaning.
E. Solids in the wastewater that do not float will be deposited on the bottom of the GI and will need to be removed during routine interceptor cleaning.
F. Grease retaining fittings extend down into the water to within 12 inches of the bottom of the interceptor. Because grease floats, it generally does not enter the fitting and is not carried into the next compartment. The fittings also extend above the water surface to provide air relief.
G. Some interceptors have a sample box so that inspectors or employees of the establishment can periodically take effluent samples. Having a sample box is recommended by the UPC but not required.
H. Flow exits the interceptor through the outlet pipe and continues on to the sanitary sewer system.

Chapter 7
Grease Trap and Interceptor Sizing Worksheets

The City of Muscatine requires kitchens, restaurants and other affected businesses to size pretreatment devices in accordance with Chapter 10 and Appendix H of the Uniform Plumbing Code. The chapter describes the sizing methods used in the Uniform Plumbing Code (edition adopted by the City) for grease traps and interceptors and provides sample calculations using these methods.

Grease trap sizing method and sample calculation

Chapter 10 of the Uniform Plumbing Code (UPC) requires that no grease trap have a capacity less than 20 gallons per minute (gpm) (1.3 Liters/sec) or more than 55 gpm (3.5 Liters/sec). Table 10-2 in the Uniform Plumbing Code provides required flow rate and grease retention capacity for grease traps based on the total number of fixtures connected to the grease trap. Table 7-3 in the Uniform Plumbing Code provides drainage fixture unit values used for sizing based on type of fixture.

For example, consider a small restaurant with the following drainage fixtures and drainage fixture unit values:

Lavatory, single	3.0 FU
Sink, commercial with food waste	3.0 FU
Service or mop basins	3.0 FU
Total hydraulic loading	9.0 FU

This restaurant has three fixtures connected to the grease trap. In accordance with Table 10-2 of the Uniform Plumbing Code, a grease trap with a capacity of 35 gallons per minute and a grease retention capacity of 70 pounds is required. Assuming a 12 minute retention time if the restaurant has a garbage disposal:

35 gpm x 12 minutes = 420 gallons

Therefore, this restaurant will need a 420-gallon grease trap.

Grease interceptor sizing method and sample calculation

Appendix H of the UPC requires that grease interceptors have a minimum of two compartments. The first compartment should have two-thirds of the total capacity of the interceptor, and a minimum liquid volume of 333 gallons (1260 L). Additional sizing and dimensional criteria are provided in Appendix H. The sizing formula for grease interceptors is provided in Table H-1 of the UPC.

Chapter 8
Compliance Inspection and Installation Checklists

A role of City of Muscatine staff is to determine compliance with ordinances, regulations, or BMPs designed to protect wastewater systems and the environment. This chapter provides checklists for City staff to use when visiting food service establishments. Two checklists are provided:

- ✓ Compliance inspection
- ✓ Installation

Each checklist can be used as a reminder during site visits and as file documentation for compliance of each establishment inspected.

Inspection Checklist-page 1 of 3

Instructions for form:

1. Completely fill out general information.

2. For items that require some measurement of field data, the inspector should obtain the necessary data or information and record it under the column titled, "Field Data."

3. For all items marked in violation, note the fact that the establishment contact was notified of the violation and the contact's response.

Inspector:_____ Signature:_____

Date:_____ Time Inspec. Started: _____ Time Inspec. Completed: _____

Establishment:_____

Address:_____

Contact Name:_____ Title:_____

Phone:_____ Email:_____

Inspection Checklist-page 2 of 3

	Item Description	Field Data (where appropriate)	Compliance Status[1]
1.	The establishment has implemented a training program to ensure that the BMPs are followed.		
2.	"No Grease" signs are posted in appropriate locations.		
3.	The establishment recycles waste cooking oil and can provide records of this.		
4.	Water temperatures at all sinks, especially the pre-rinse sink before the mechanical dishwasher or the sinks in the three-sink system are less than 140° F. Measure and record temperature.		
5.	The establishment "dry wipes" pots, pans, and dishware prior to rinsing and washing.		
6.	Food waste is disposed of by recycling or solid waste removal and is not discharged to the grease traps or interceptors.		
7.	Grease trap(s) is cleaned regularly. Note and record the frequency of cleaning.		
8.	Grease trap cleaning frequency is documented on a maintenance log (obtain a copy of the document).		
9.	GI does not contain greater than 1/3 the depth in grease accumulation. Estimate and record amount of grease in interceptor.		
10.	GI does not contain greater than ¼ the depth in sediment accumulation. Estimate and record amount of sediment in interceptor if possible.		
11.	GI is cleaned and maintained regularly. Note and record the frequency of cleaning.		
12.	GI cleaning and maintenance frequency is documented on a maintenance log (obtain a copy of the document).		

Inspection Checklist-page 3 of 3

	Item Description	Field Data (where appropriate)	Compliance Status[1]
13.	Outdoor grease and oil storage containers are covered and do not show signs of overflowing.		
14.	Grease and oil storage containers are protected from discharge to storm drains.		
15.	Absorbent pads or other materials (not free flowing material such as cat litter) are used to clean up any spills or leakages that could reach the storm drain.		
16.	Storm drain catch basins show no signs of grease or oil.		
17.	The roof shows no signs of grease and oil from the exhaust system.		
18.	Exhaust system filters are cleaned regularly, which is documented by cleaning records. Note and record the frequency of cleaning.		

[1]An entry should be made for each item using the following codes:
"C" – Compliance with the item
"V" – Violation of the item (provide explanation in the notes)
"NA" – Not applicable (provide explanation in the notes)
"NC" – Not checked (provide explanation in the notes)

Notes

Installation Checklist-page 1 of 3

Instructions for form:

1. Completely fill out general information.

2. For all items marked in violation, note the fact that the establishment contact was notified of the violation and the contact's response.

Inspector:_____Signature:_____

Date:_____ Time Inspec. Started:_____Time Inspec. Completed:_____

Establishment:_____

Address:_____

Contact Name:_____ Title:_____

Phone:_____ Email:_____

	Item Description	Compliance Status[1]
1.	Each grease trap serves not more than four single compartment sinks of the same depth. Grease trap is sized based upon the number of fixtures discharging to it. See *Frequently Asked Questions about Fats, Oil, and Grease*.	
2.	Grease trap has a water seal of not less than two inches in depth or the diameter of its outlet, whichever is greater.	
3.	No food waste disposal unit or dishwasher is connected to or discharges into any grease trap.	
4.	Waste from toilets and urinals does not discharge to the GI.	
5.	Waste in excess of 140° F is not discharged to any grease trap. Dishwasher with a min. temperature of 160° F is not discharged to any grease trap.	
6.	The vertical distance between the fixture outlets and grease trap weirs is as short as practical.	
7.	GI is as close as practical to the fixtures served.	
8.	Each fixture connected to a grease trap is provided with an approved type flow control or restricting device installed in a readily accessible and visible location. Devices shall be designed so that the flow through the device or devices at no time exceeds the rated capacity of the grease trap or interceptor.	
9.	Each fixture discharging into a grease trap or interceptor is individually trapped and vented in an approved manner.	
10.	Each grease trap and interceptor is properly vented to allow air circulation throughout the entire drain system.	

Installation Checklist-page 2 of 3

	Item Description	Compliance Status[1]
11.	No water-jacketed grease trap or interceptor is installed.	
12.	GI is easily accessible for inspection and cleaning and access does not require the use of ladders or the removal of bulky equipment.	
13.	There is a minimum of one access point into each compartment of the interceptor and no access points are greater than 10 feet apart. Each access opening is leak-resistant and cannot slide, rotate, or flip.	
14.	Location of GI is shown on approved building plans. Drawings of interceptor are complete and show all dimensions, capacities, and reinforcing and structural design calculations.	
15.	GI is not installed in any part of a building where food is handled. Location shall meet the approval of the Administrative Authority.	
16.	GI serves a single business establishment.	
17.	GI has a minimum of two compartments and 3-inch diameter fittings designed for grease retention. The compartments shall be separated by partitions or baffles that extend at least 6 inches above the water level. The inlet compartment shall be 2/3 of the total interceptor capacity and shall have a minimum liquid volume of 333 gallons. The length of the inlet compartment shall be longer than the inside width of the interceptor.	
18.	The inlet and outlet fittings shall be a baffle tee (or similar flow device) that extends at least 4 inches above the water level to within 12 inches of the bottom of the interceptor. The outlet tee out of a sample box shall extend at least 6 inches below the water surface. Flow between the separate compartments is through a baffle tee or bend that extends down to within 12 inches of the bottom of the interceptor.	
19.	The liquid depth shall be greater than or equal to 2 feet 6 inches and less than 6 feet 0 inches.	
20.	There shall be a minimum of 9 inches of open vent space above the water level to the top of the interceptor. The airspace has a minimum capacity equal to 12-1/2 percent of the interceptor's liquid volume.	
21.	The GI has at least one square foot of surface area for every 45 gallons of liquid capacity.	
22.	All waste enters the interceptor through the inlet pipe.	
23.	GI cover is gastight and has a minimum opening of 20 inches in diameter.	

Installation Checklist-page 3 of 3

	Item Description	Compliance Status[1]
24.	GIs located in areas of pedestrian or vehicle travel are adequately designed to support the imposed loads. Review of structural calculations may be required to verify adequacy.	
25.	Redwood baffles are not installed in GI.	
26.	A sample box is provided on the outlet side of the GI. This is only recommended but may be required so that the City can periodically sample the effluent of the interceptor.	
27.	GI is permanently and legibly marked with the manufacturer's name of trademark, model number, UPC certification mark and registration (if product is listed by the International Association of Plumbing and Mechanical Officials), and any other markings required by law.	

NOTES:

[1]An entry should be made for each item using the following codes:
"C" – Compliance with the item
"V" – Violation of the item (provide explanation in the notes)
"NA" – Not applicable (provide explanation in the notes)
"NC" – Not checked (provide explanation in the notes)

Acknowledgements

This Best Management Practices (BMP) Manual has been developed from a BMP Manual originally published by the Oregon Association of Clean Water Agencies Industrial Pretreatment Committee and the material contributed by the Unified Sewerage Agency of Washington County, Oregon, the City of Woodburn, Oregon, and the Des Moines Wastewater Reclamation Authority.