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## **Grease Buildup Preventative Maintenance In Vacuum Sewer Systems**

Vacuum sewer is the best solution for replacing septic tanks in high-water table communities. Typically coastal properties, lakes shores or salt-water shores, choose a vacuum sewer system because the pipes are installed in shallow trenches and with existing infrastructure of water, electric, gas, telephone, and roadways, the cost of digging is the most expensive part of a sewer system installation. Alternatively, new developments could go with a gravity system instead of a vacuum sewer system in an attempt to save initial cost; however, the additional cost in preventative maintenance of a gravity system is substantially higher and ongoing.

The disadvantage of any sewer system in an economically challenged area or a high tourist rental property area is the lack of communications and knowledge of the repercussions of dispensing hostile items in the sewer system, which are comprised of grease, rags, and large heavy items. A vacuum sewer system has a substantial advantage over gravity systems in economically challenged areas due to a lower man-power demand for preventative maintenance of the vacuum system. Using the vacuum sewer monitoring system to identify the exact valve pits needing preventative maintenance, one man can perform preventative maintenance and maintain a vacuum sewer system, whereas in a gravity or low-pressure system, the task of scheduled cleaning sewer main lines for grease buildup takes several people and several high-pressure washer/vacuum trucks.

Regardless of why hostile items are dispensed in a sewer system, the end result in a vacuum system is a valve hung open too long causing low-vacuum spikes in the system. The majority of the time, a valve stuck open momentary (1 minute to 60 minutes) is because of a malfunctioning valve controller or grease buildup in the sensor tube; where the more the sensor tube is clogged, the longer the vacuum valve will remain open due to the clogged sensor tube sending false information to the valve controller. However, in a vacuum system, the preventative maintenance man-power workload is tightly controlled and maintenance is only performed on the valve pits identified by the vacuum sewer monitoring system as having a clogged sensor tube or malfunctioning valve controller; thereby preventing these low-vacuum spikes with minimal man-power resources.

Shown below, grease has built up in a vacuum sewer valve pit sensor tube.



Shown below, grease is building up in gravity system sewer main pipes.



Grease buildup is the most common cause of gravity system sewer lateral and main line backups. A gravity system operator communicates basic guidelines to help slow the

buildup of grease in the gravity system lines as follows: 1) Oil or grease residue should be poured, wiped, or scraped from plates, pots, and pans and disposed of with household solid waste or garbage, and 2) Garbage disposals should be used wisely and sparingly and never for the disposal of household generated oils, greases, or grease bearing food products. In addition to communicating with the homeowners, the gravity system operator works closely with restaurants within the community to insure that their oil and grease management programs are similar to those described above and are effective in protecting the restaurants main lines and laterals as well as the gravity system sewer mains.

Gravity system line backups can be a traumatic and costly experience for a homeowner or renter. Crews are on call 24 hours a day to respond to sewer lateral or main line blockages, since this requires several men and several trucks with vacuum cleaning equipment and high-pressure water equipment to clear the blockage in a gravity system sewer main. Preventative maintenance cleaning the sewer lines in a gravity system is ongoing and costly, but is necessary to avoid blockages and customer backups.

The sewage flow in the main lines of a gravity sewer system is so slow that grease collects and builds up very quickly. Alternatively, there is no grease buildup in vacuum system main lines due to the cleaning effect of the high-speed sewage traveling through the vacuum main lines. Typically, a normal operating vacuum sewer system moves the sewage through the vacuum sewer mains at velocities of an astounding 15 – 18 feet per second which power washes the mains clean, leaving only the valve pit sensor tubes as the problem area for grease buildup. Since the grease buildup in the sensor tubes is totally dependent on the user's habits, i.e. restaurants or seasonal properties, the need for preventative maintenance varies enormously from valve pit to valve pit. However, the major advantage of a vacuum sewer system over a gravity system is its ability to identify the exact locations and areas to direct preventative maintenance resources by using the vacuum sewer monitoring system; whereby efficiently managing man-power workload.

In summary, communications to users on "How to Treat Your Sewer System" is lacking or ignored in economically challenged areas and tourist rental areas. Grease buildup in the pipes is rapid, so preventative maintenance cleaning is necessary to prevent frequent backups. With gravity systems, an expensive ongoing process of cleaning the gravity system mains is either performed on a periodic schedule or after an inspection by camera. With vacuum systems, a simple process of cleaning the sensor tube is performed when alarmed by the vacuum sewer monitoring system that the sensor tube is 50% plugged and the valve pit is ready for a quick inspection and cleaning.