

*Fats, Oils, Grease (FOG)  
Grease Digester  
Wastewater  
Clarifier  
Bioreactor*

## **WWTP PLANT ADDS GREASE DIGESTER INCREASES REVENUES, SOLVES FOG PROBLEMS**

A wastewater treatment plant in Central Pennsylvania had a persistent problem in dealing with fats, oils and grease products (FOG). These FOG products would cause fouling of the primary clarifier and inhibit the settling of solids. Further, it plugged up the scum pit and the scum pit transfer line to the pressroom and anaerobic digester, and FOG caused other problems in different areas in the treatment plant. The WWTP accepts commercial food waste grease from a large local commercial food processor [confectionery] as well as local area restaurants and businesses in order to keep it out of the collection system where it would present a greater problem for the utility. Originally, accepted FOG was accepted and blended with septage but this fouled the screens and the degreasing system.

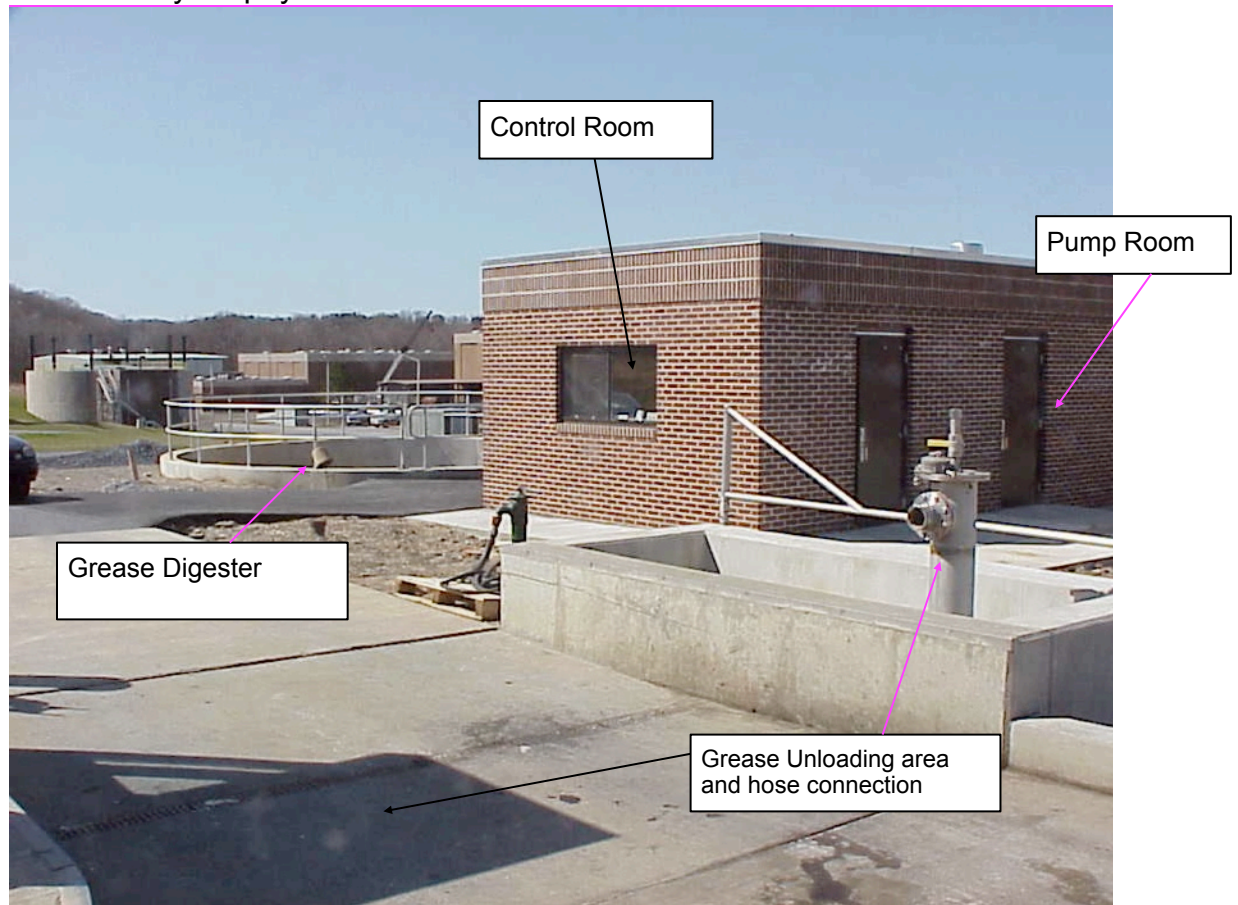
To solve the problems of handling grease a very simple grease digester design was selected. Components of the system include:

1. a 40,000 gallon in ground tank,
2. a separate grease receiving area,
3. a control room,
4. a pump room and storage area
5. a Venturi Aerator to supply the required dissolved oxygen to support the break down of the grease.
6. Additionally the tank is seeded with live cultured grease-eating bacteria from an incubator.

The treatment process is designed to handle an influent of 10,000 gpd of grease, which is added into the 40,000-gallon in ground tank. The retention time in the tank is a minimum of 72 hours during which time the contents of the digester are aerated using the venturi aerator, pH adjusted with a lime slurry and live bacteria are continuously dosed into the digester. Daily 10,000 gallons of the treated grease are decanted from the grease digester to the adjacent headworks and where they are blended into the plants influent wastewater.

Since the addition of this grease digester there have been no plugs or fouling in the plant. The influent BOD loading from the grease is reduced significantly, the clarifier performs better and requires less cleaning from grease fouling, and odors have been reduced in the pressroom. Now that there is a legal grease disposal solution even the collection system is cleaner and there has been no grease fouling

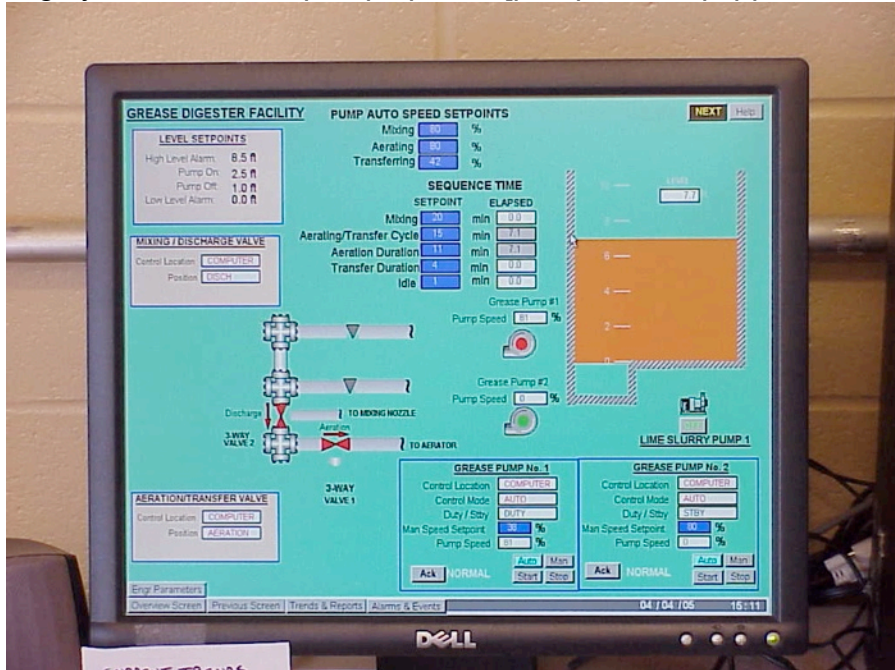
of lift stations. Additionally, the gross revenue is anticipated to be approximately \$250,000 for the first year of operation on a capital project which was \$~200K. This is less than a one-year payback.



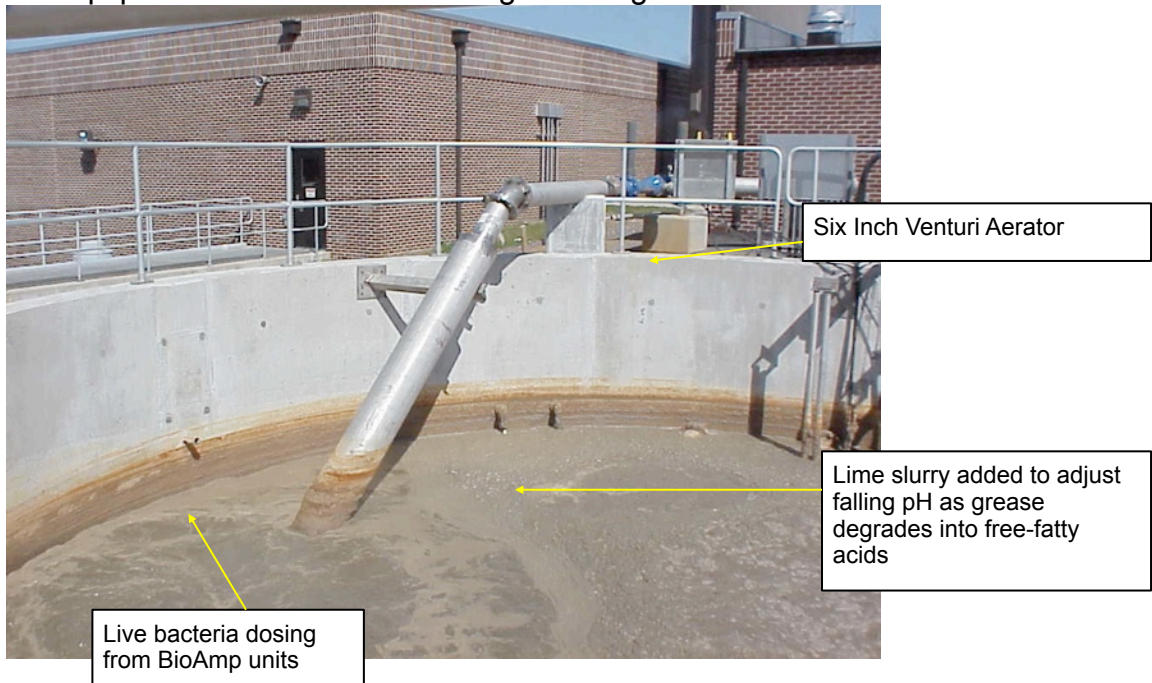
The grease hauler drives his truck up to the unloading station. The operator checks the gallonage in the truck for billing purposes and examines the grease to ensure it's not commingled with septage. [Current rate is \$85/1000 and will be raised at the end of the year]. The hauler connects the hose to the pipe station quick connect and begins off loading his grease.

The grease flows directly into the grease digester where it is aerated, and mixed. Lime is added as a slurry and live bacteria are seeded from one of two biological activators. [There are two units working on alternating 12-hour cycles]. This pH control is important because as grease degrades into free fatty acids the pH drops precipitously and would kill off the beneficial grease-eating bacteria. The newly received grease is mixed in with the 30,000 gallons already in the tank. Only 10,000 gallons is accepted daily at this facility five and one-half days a weeks. The operator decants degraded grease residual liquids upon arrival in the morning and slowly "blends" the treated and digested grease into the head works during the high volume first flush cycle of the day.

The operator monitors the process from a computer interface which controls actuated valves for adding lime, transferring treated residuals to the headworks, controlling cycle times, and pump speeds [pumps are equipped with VFDs].



The operators control panel in the control room on an interactive computer shows all pumps and product feeds. From this panel the operator can monitor and actuate any of the equipment associated with the grease digester.



40,000 Grease digester tank shows the submerged discharge from the venturi aerator to maximize oxygen transfer. Small pipe protrusions are for adding lime slurry, and live bacteria from the incubator directly into the tank.

