



FOG System Update

A Three Year Review



FOG System Update

Background

Concept was identified in the HDR Energy Alternatives Study 2010

\$619,000 Project . Construction completed September 2012

Projected ROI:

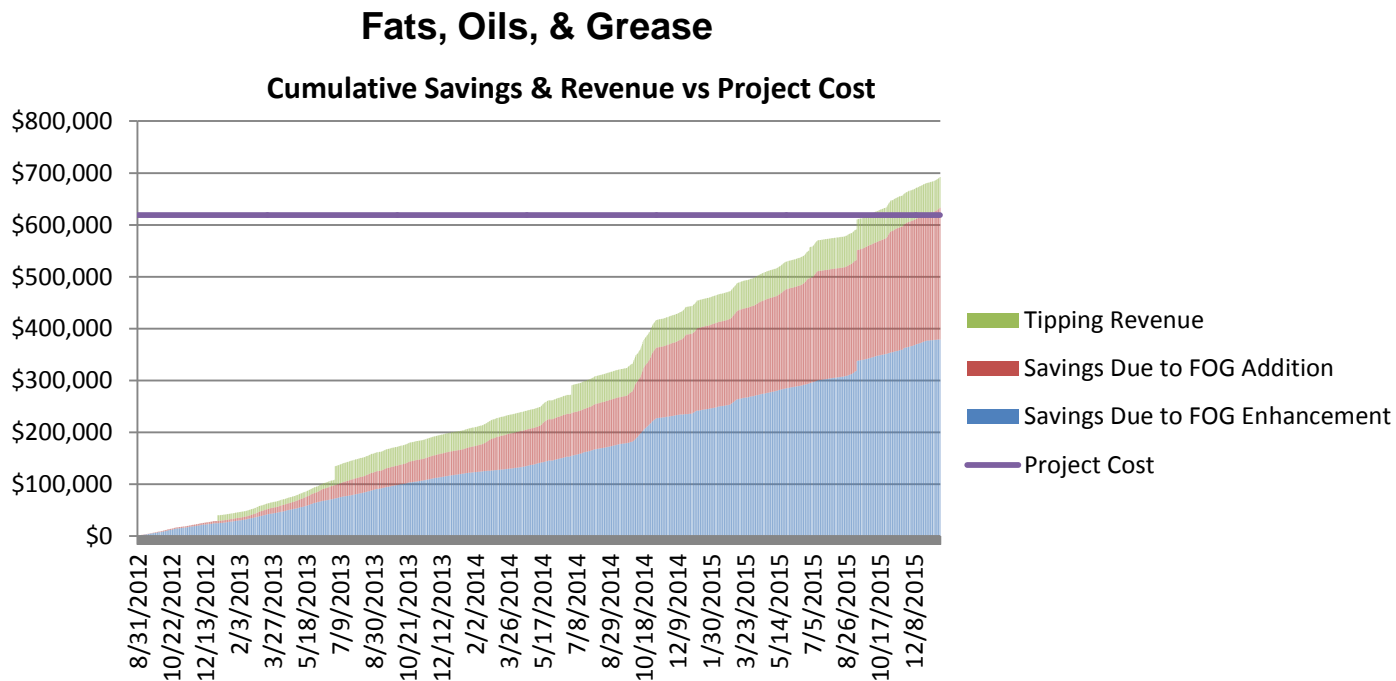
3 years w/o tipping fees

1.4 years with tipping fees



FOG System Update

After about 3 years of operation the the FOG system has paid for itself and continues to save the District money.





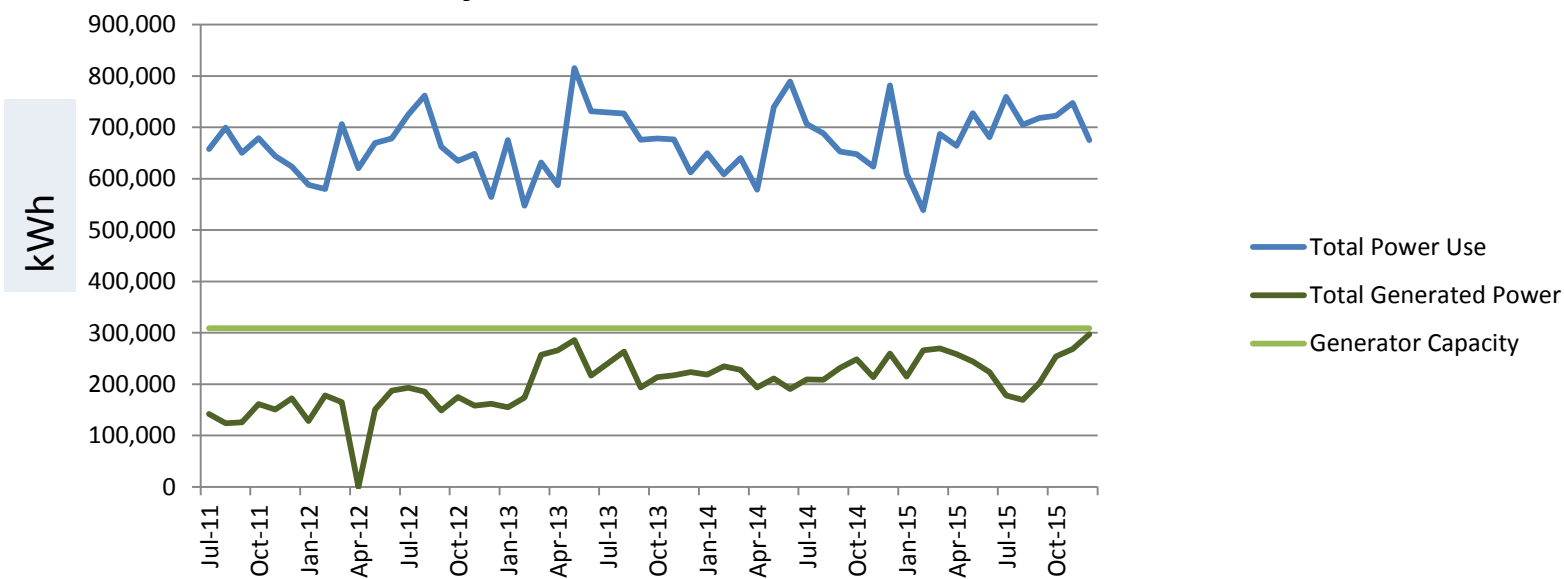
FOG System Update

Item	Revenue/Savings
Tipping Fees	\$ 59,358
Energy Savings FOG Addition	\$ 379,290
Energy Savings Enhancement	\$ 253,770
Total	\$ 692,418
Days in Operation	1,237
Savings Per Day	\$ 560



FOG System Update

Total Facility Power Use vs Power Generated





FOG System Update

Snags Along The Way

Designed gallons of FOG delivered 11,000 gallons per day.
Estimated payback was 3 years after receiving 12,000,000 gallons FOG.

The tipping fee was waived during a four month startup. Once tipping fees were charged the FOG deliveries stopped.

GM developed a tiered schedule.

Fats, Oils & Grease Waste	
Gallons	Price/Gallon
50,000 gallons or more/month	No charge
25,000 to 49,999 gallons/month	\$0.03
2,500 to 24,999 gallons/month	\$0.07
Less than 2,500 gallons/month	\$0.10

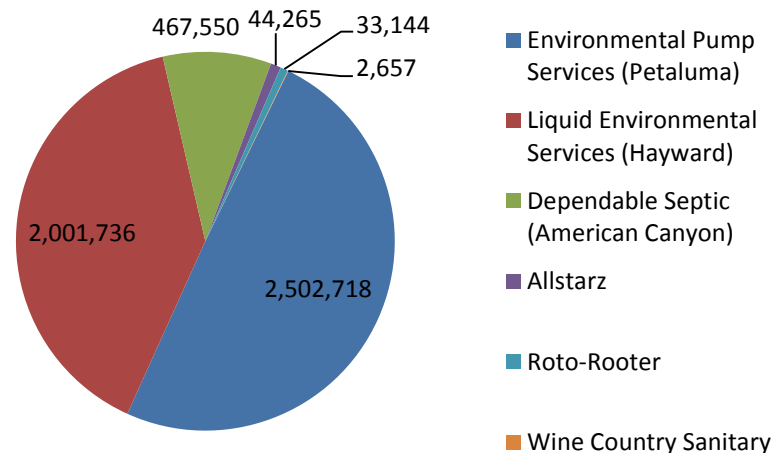
This change encouraged FOG haulers to discharge at the plant a total of 5,400,000 gallons of FOG which falls short of the projected requirements but enhanced the overall digester performance .



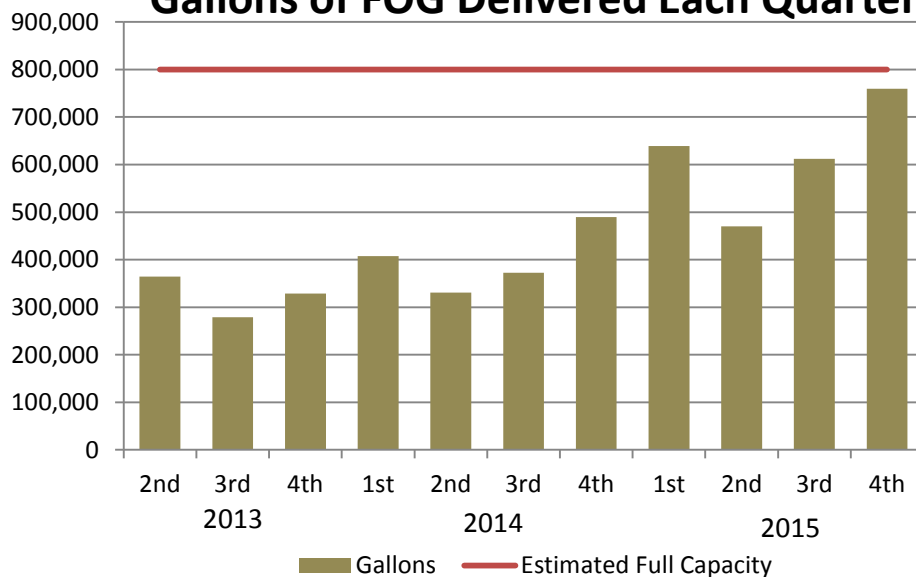
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Haulers

Gallons of FOG Delivered



Gallons of FOG Delivered Each Quarter





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Operating Observations

Debris in FOG

Causing frequent plugging of the system requiring operator attention.

Causing premature wear of equipment.

Chopper Pumps – parts \$12,130 /labor 70.5 Hours

Transfer Pump – parts \$5,815 /labor 26 Hours

Pressure Ring – parts \$925 /labor 8 Hours

Poses safety risk to the District

(lost time injury April 2016)

Debris is indigestible and may end up on our ranches.



FOG System Update



Left is a debris packed strainer that requires manual cleaning at least three times per week. It's an unpleasant task.



Above is debris found plugging the system downstream of the strainer. This photo was of the debris leading to worker lost time.



FOG System Update

Successful Equipment Pilot



Strainpress

Pressure feed
sludge screening

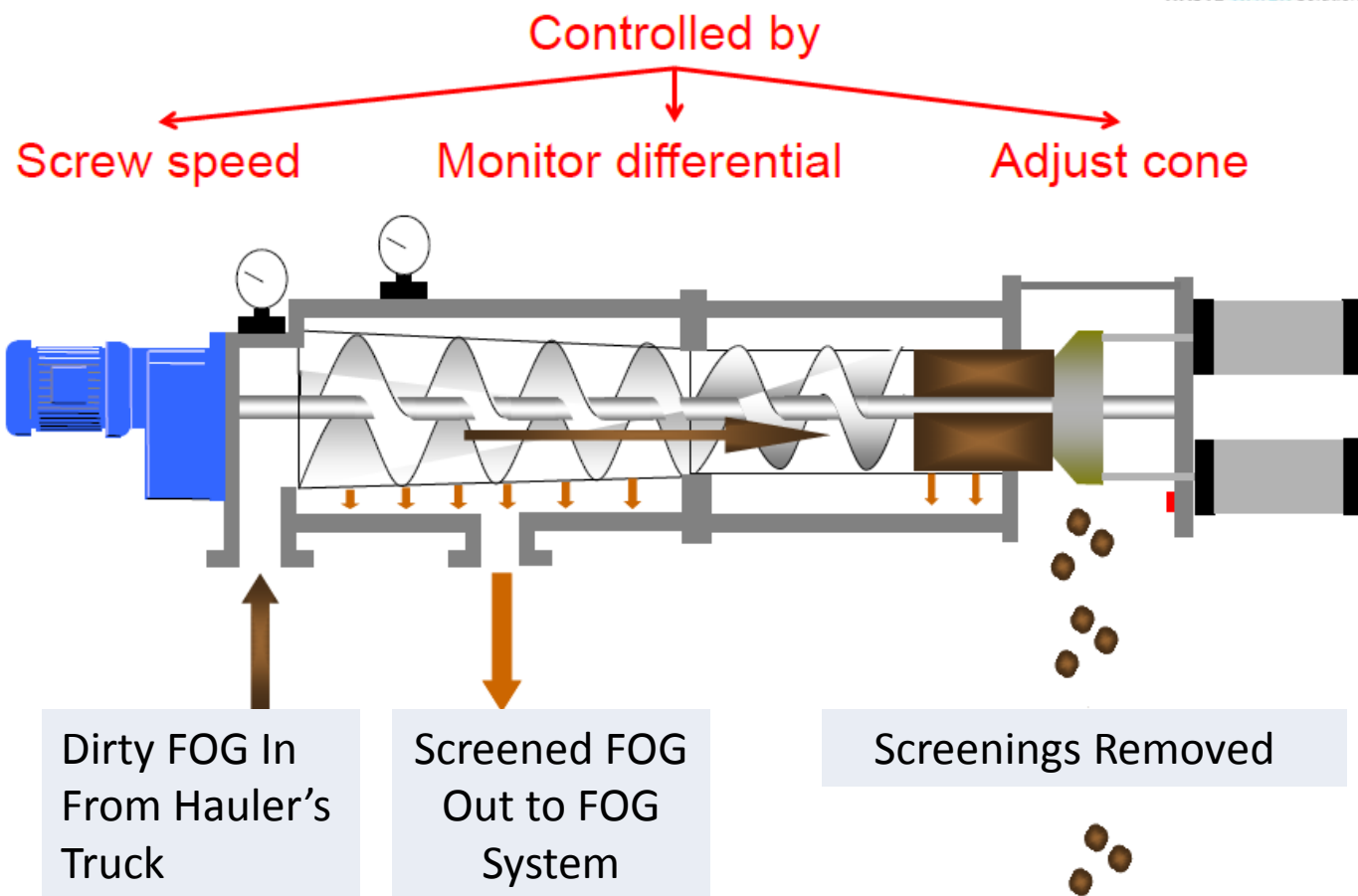


The strainpress was run on the FOG system for eight weeks starting in September 2015. It was easily connected with a hose between the FOG system strainer and the Hauler's truck. Thirty-two (32) truck loads were run through the strainpress. The strainpress removed debris from the stream, no debris was found on the system strainers, no system plugging was experienced. There was no change in the hauler's unloading time or unloading pressure.



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Strainpress – principal of operation





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Moving Forward

Purchase and install a strain press to:

- remove debris from the FOG stream
- reduce system plugging and frequent staff contact
- reduce wear on mixing and transfer equipment

Equipment cost \$ 150,000

Additional Cost ~ \$ 50,000

Payback – less than one year

We may have to start limiting the FOG haulers soon as we are approaching our capacity to utilize the biogas.



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Questions?