HRSD’s Three Pronged Management of Grease Trap Waste

Virginia Water Environment Association
2019 Education Seminar
May 9th, 2019

Chris Wilson, Ph.D., P.E.
HRSD Chief of Process Engineering and Research
From **Nine** Large Treatment Plants to **Three** geographically advantageous grease receiving facilities.
HRSD receives lots of grease trucks because:

1. HRSD serves approximately 1.7 million Virginians.
2. I-64 drains Central and Northwest VA and ends in Coastal VA.
3. Many of those people, as Virginians and Americans, like to take food that are either soft and/or heathy and make them warm and crunchy.
Dated, but still relevant, hauling data shows relative impact on our plants.
Choose the form of this presentation...

Williamsburg Treatment Plant
Burn!

Nansemond Treatment Plant
Boat!

Atlantic Treatment Plant
Biogas!
Atlantic Treatment Plant

Biogas!

Choose the form of this presentation...
What is the nature of the problem?
Our current solution: **Grease trap waste will be diverted to dedicated screening facility and metered to THP pulper in dilute form**

General process flow diagram for FOG receiving at the ATP (from HRSD/B&C/HDR Preliminary Engineering Report, 2014)
The investment, to date, results in tanks full of screened, warm, dilute, grease water – pretty much a resource recovery party.
After the THP/FOG project, we will derive some value from grease while effectively managing a nuisance issue.

Estimated value of grease-derived biogas via CHP

- Annual Average: $40k
- Max Month: $80k
- Peak Two-Peak: $120k
- Peak Day: $160k
We’re aware and interested in opportunities for CNG at Atlantic, but our interest is contingent on D3 RINs.
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- Wastewater Sludge
- Screened Grease

THP/Digestion

CNG/D3 RIN
HIGH value!!

ACME Grease Purification Factory

Beneficial Use
Variable value
This is all pretty exciting for us at Atlantic, because:

1. With THP, we need to FOG to support CHP.

2. Marginally beneficial use is infinitely better than current Ches-Liz and Atlantic FOG operations.

3. This system is bespoke for Atlantic…we get to benefit from lots of external experience and best practices in grease receiving and management.

4. Atlantic is our big biogas producer, and the system being built provides flexibility for other than co-digestion if Grease-to-Fuel can be relied upon in the future.
Choose the form of this presentation...
Did you know?...

Enough low-sulfur fuel at US ports come 2020?

Bill Mongelluzzo, Senior Editor | Feb 19, 2019 6:09PM EST

The International Maritime Organization has mandated that all ocean carriers must switch to burning fuel with a sulfur content of less than 0.5 percent on Jan. 1, 2020. Photo credit: Shutterstock.com.

Source: JOC.com, Bill Mongelluzzo, Senior Editor | Feb 19, 2019
The separated grease fraction of brown grease has demonstrated value.

At $0.15/lb, product from NP grease loads ~ $100-150k/yr
But the value to NP has largely to do with reduced maintenance from hauled grease currently into he headworks.
This is all pretty exciting for us at Nansemond, because:

1. Nansemond is the external face of SWIFT due to the SWIFTRC.
2. Nansemond was an early installation of Ostara Pearl – still super successful.
3. Beneficial use of brown grease makes sense – and this sets us up with a lot of flexibility for the future (CNG/RINs, etc.)

Project is under 30% design development right now...stay tuned.
Choose the form of this presentation...

Williamsburg Treatment Plant
Burn!

Nansemond Treatment Plant
Boat!

Atlantic Treatment Plant
Biogas!
Burn!

Williamsburg Treatment Plant
Monthly Natural Gas Usage for Incineration (in Thousands of cubic feet/month)
And...it solves a problem!

Δ = -600 Mcf/month
($20-25k/yr @ $3/Mcf)

Also...

About 200 tons CO₂e less per year
(about 50 cars)
This is all pretty exciting for us at Williamsburg, because:

1. You would never build this – you probably couldn’t afford to.
2. That said, implementing this was really inexpensive because we had most of the concrete.
3. Williamsburg takes a big grease load for the District because of its location (…thanks Central VA)
4. Great burns hotly and the FOG refinery’s capacity isn’t without limits.
5. Probably need to think about NP as a pressure relief valve for excess grease in the future.
6. It just works.
Choose the form of this presentation...

Williamsburg Treatment Plant: Burn!
Nansemond Treatment Plant: Boat!
Atlantic Treatment Plant: Biogas!
In summary, necessity is the mother of invention... and the invention depends on the necessity.

- Williamsburg Treatment Plant: Burn!
- Nansemond Treatment Plant: Boat!
- Atlantic Treatment Plant: Biogas!
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