

Prevention of fat, oil, and grease buildup throughout wastewater collection and treatment processes

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FOG: Fats, Oils, and Grease

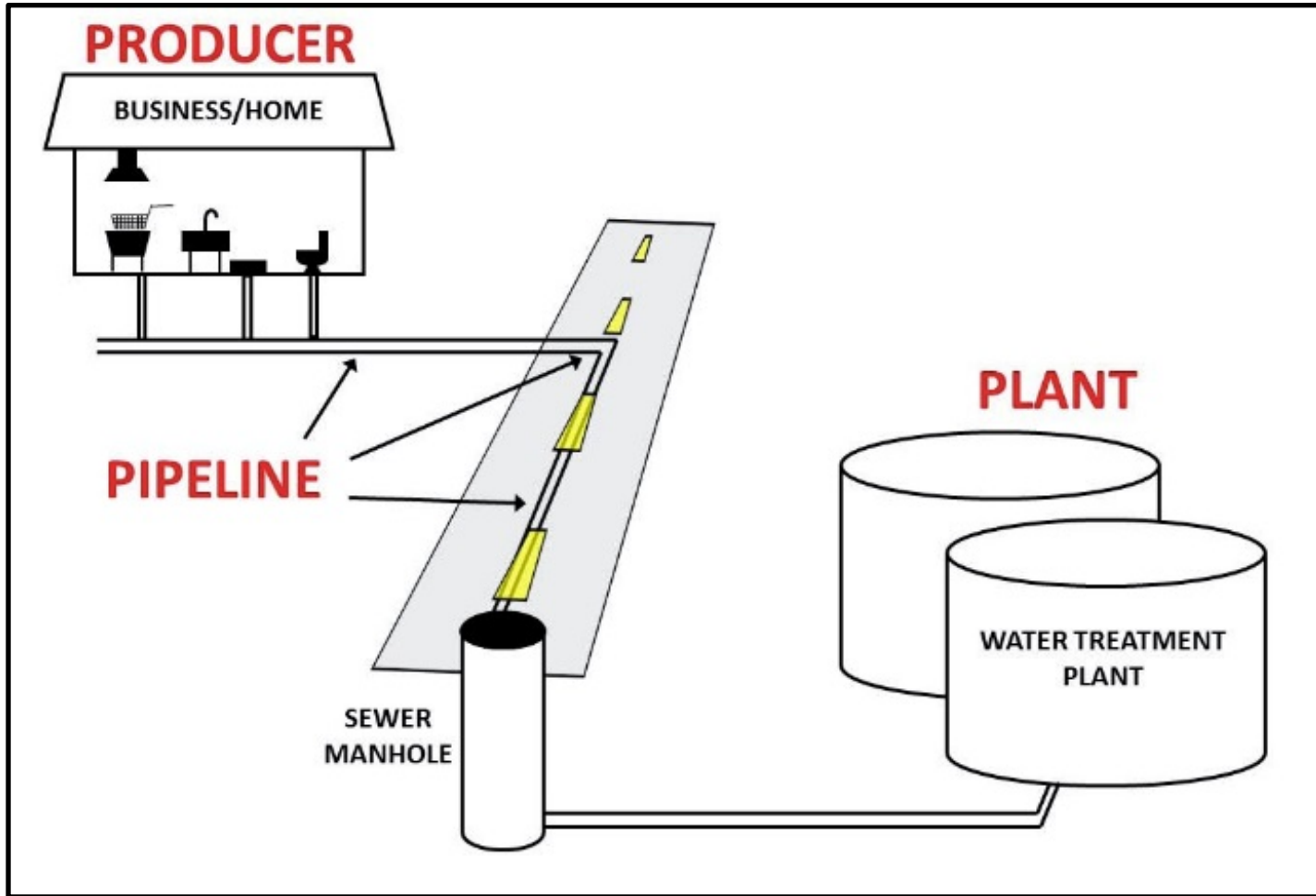
- Clogs
- Overflows (SSO)
- Emergency maintenance
 - Loss of efficiency

wasted



Does any of this look familiar?

The “3P” Model



How do we deal with it?



Time-
consuming
cleanouts



Dangerous
sodium
hydroxide

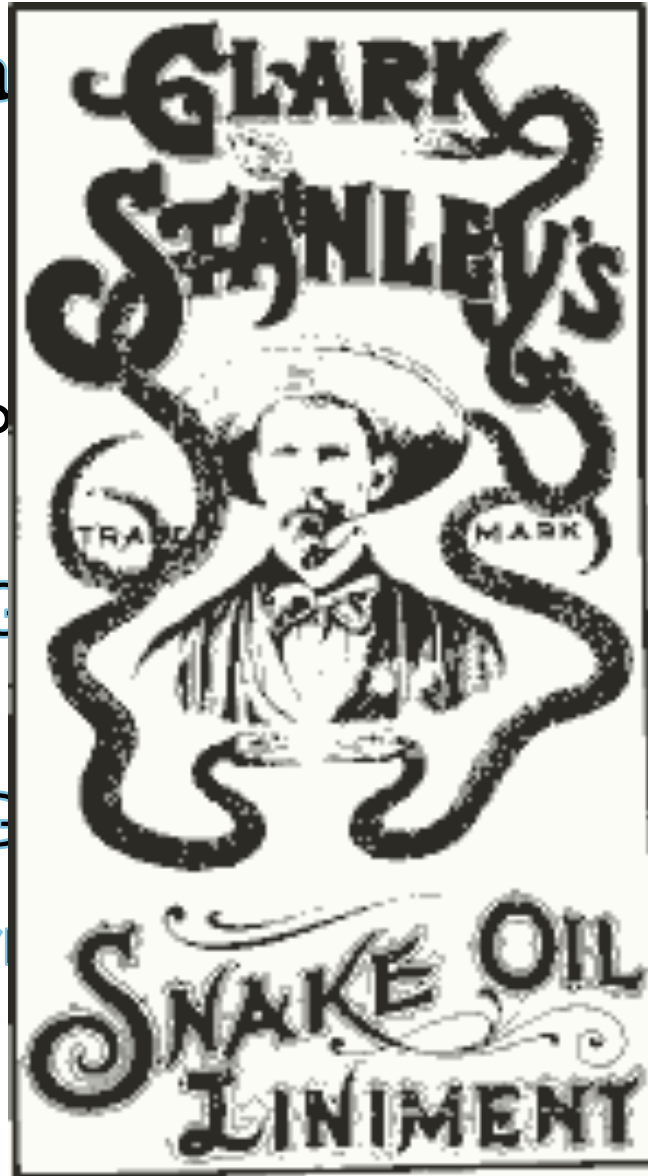


Ineffective
bacteria and
enzymes

What is Protein Matrix?

NO bacteria

- A mixture of proteins extracted from plants
 - Non-toxic, non-irritating
 - NSF/ANSI 60 certified
- Prevents FOG formation at all service stations
- Reduces FOG formation and maintenance
- Does not harm engine components or processes



enzymes

proteins extracted

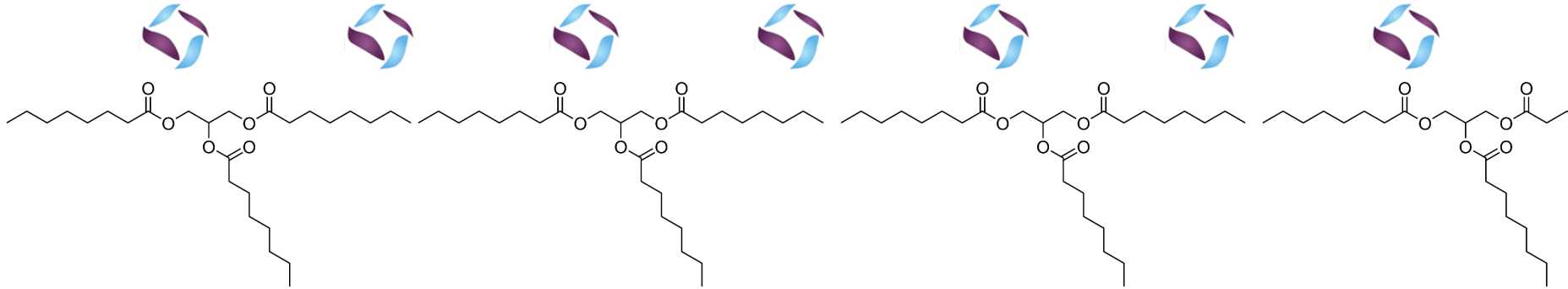
biodegradable

receptors, and lift

and maintenance

processes

Mechanism of Action



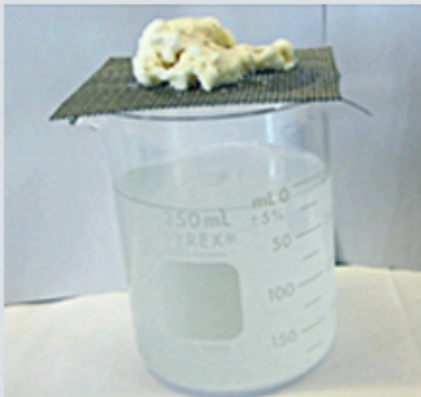
- Proteins disrupt intermolecular forces
 - Prevent large, sticky balls of fat
 - Facilitate conversion of individual FOG molecules
- Individual molecules are easier for sludge to digest
- Reaction byproduct will not resolidify

Byproduct does not resolidify

BACON FAT



DISTILLED WATER

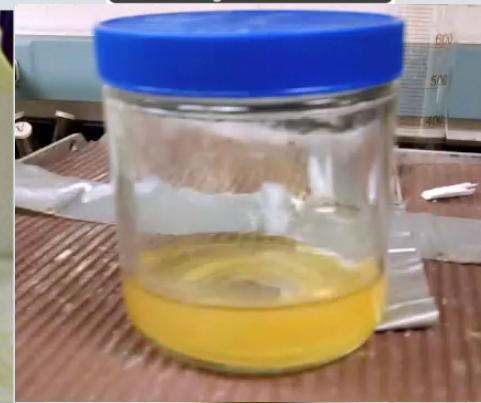


FAT

LYE SOLUTION



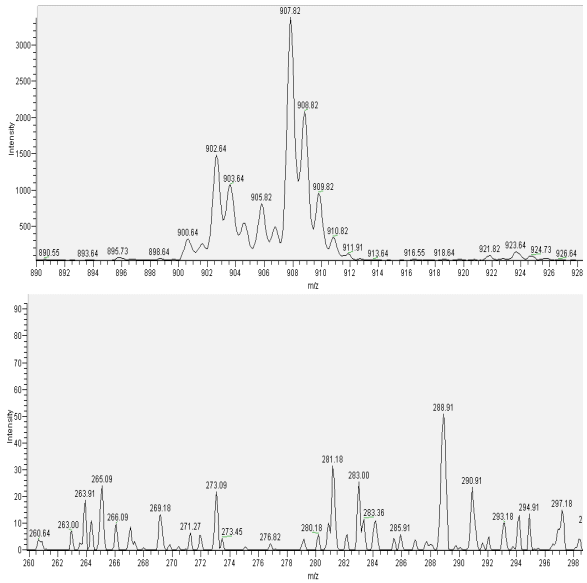
SOLID



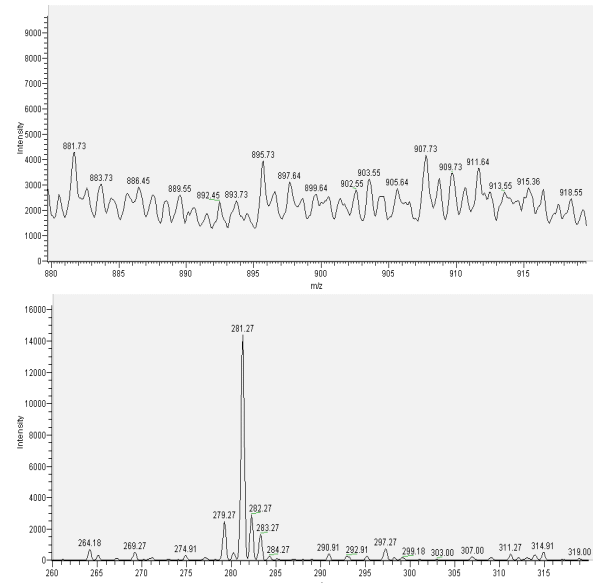
LIQUID

Laboratory Evidence of Fat Conversion

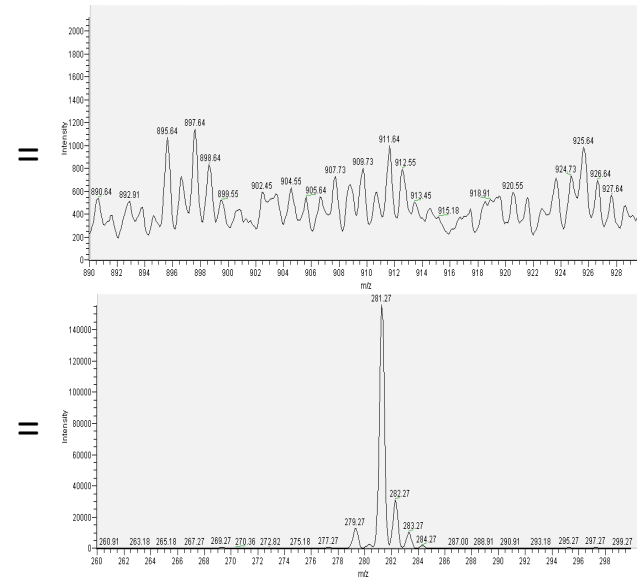
Triolein
Pre-treatment



Triolein treated with
Protein Matrix

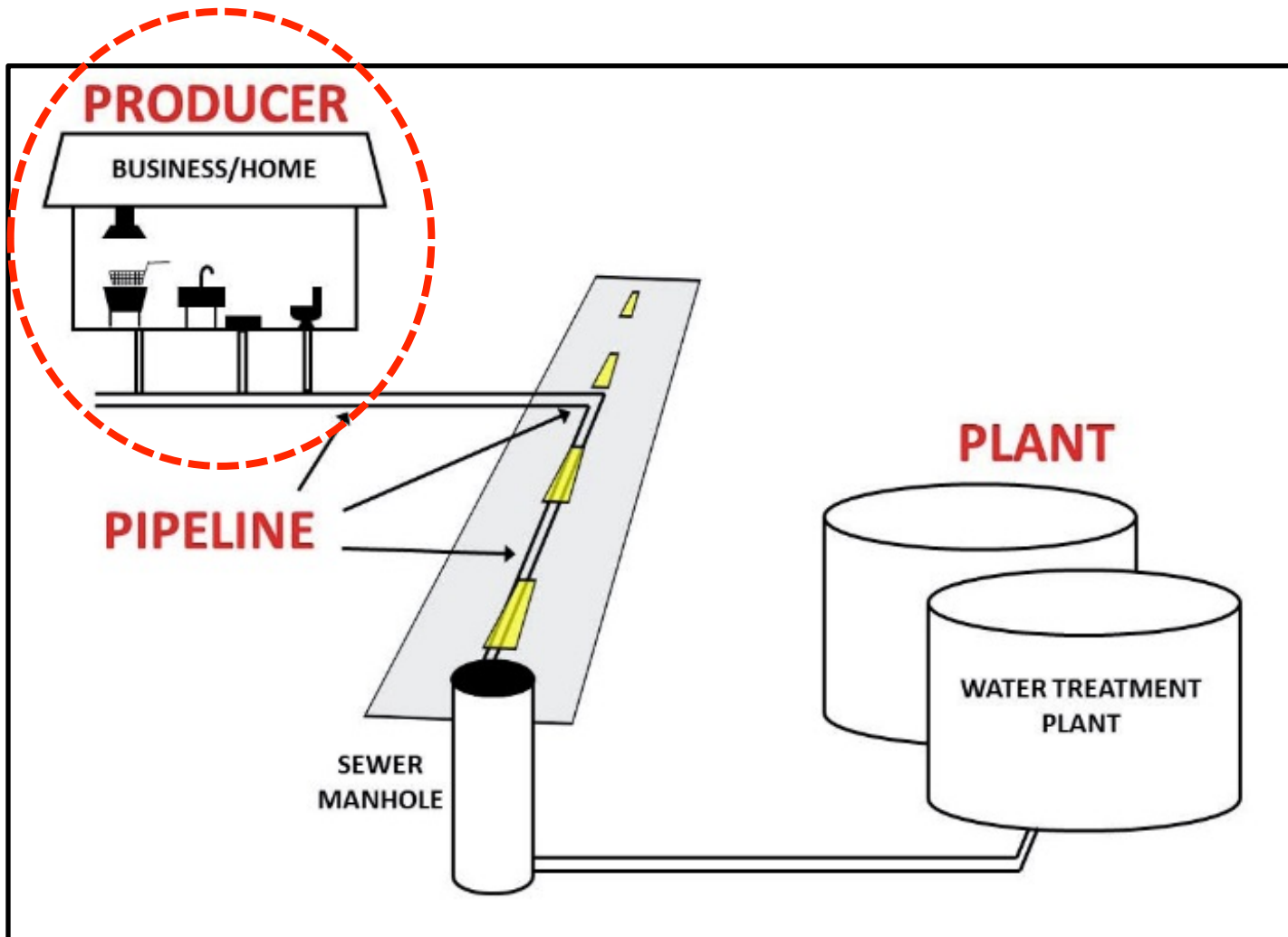


Oleic Acid



Triolein has been converted to oleic acid!

PI: Producers





Prevent Grease Buildup in Traps and Pipes

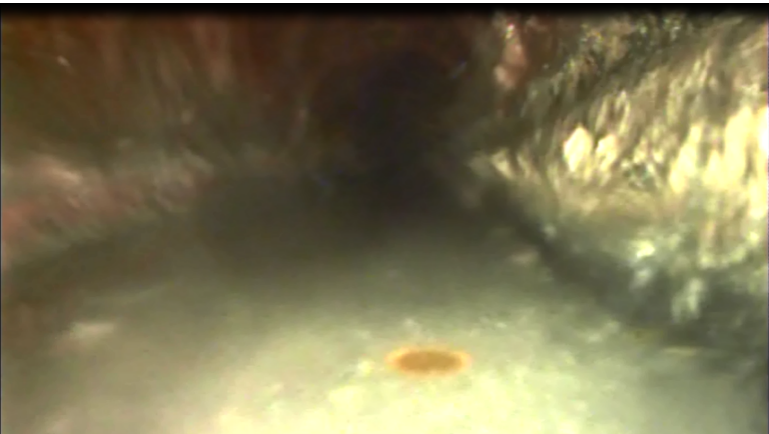
One month of buildup



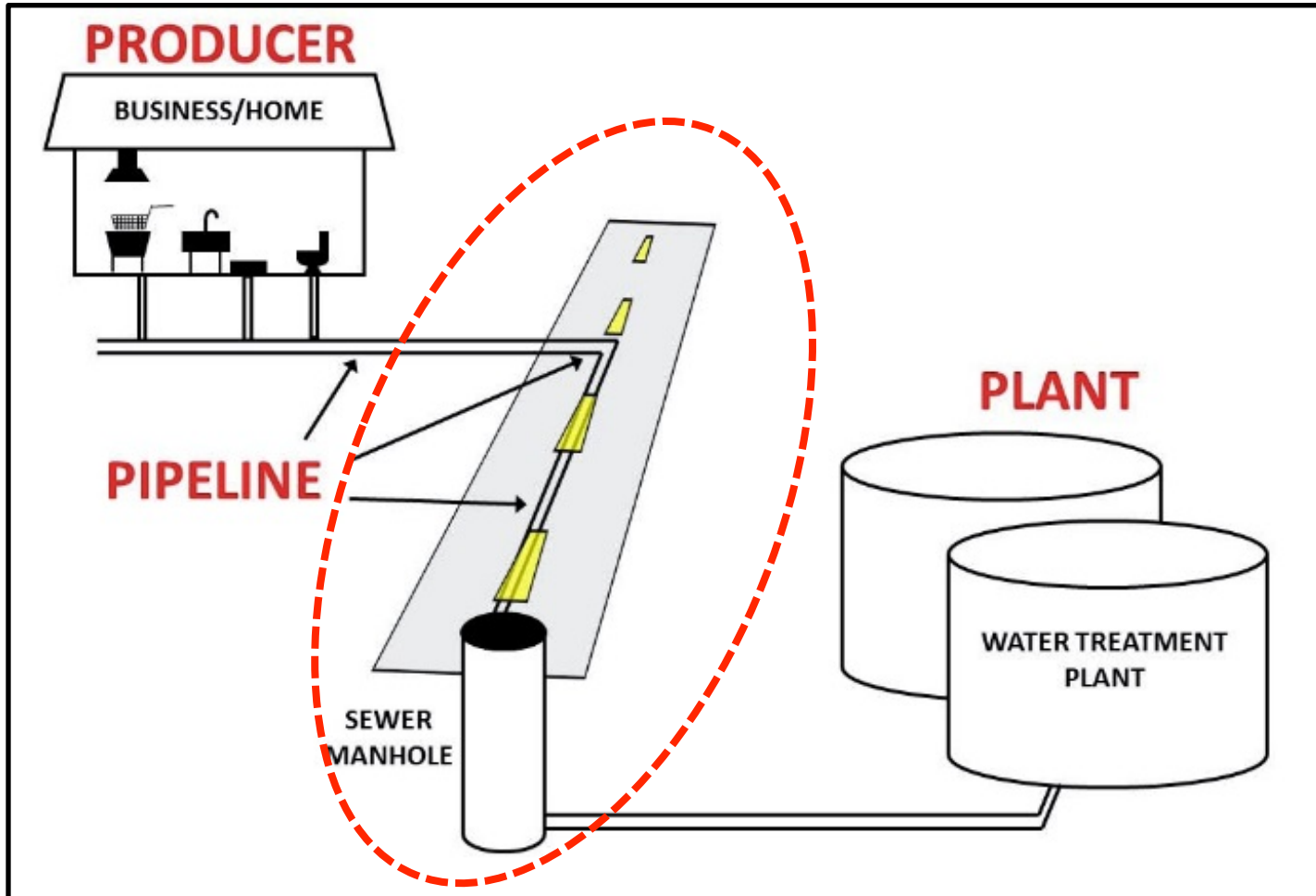
Three months of Protein Matrix



Years of buildup



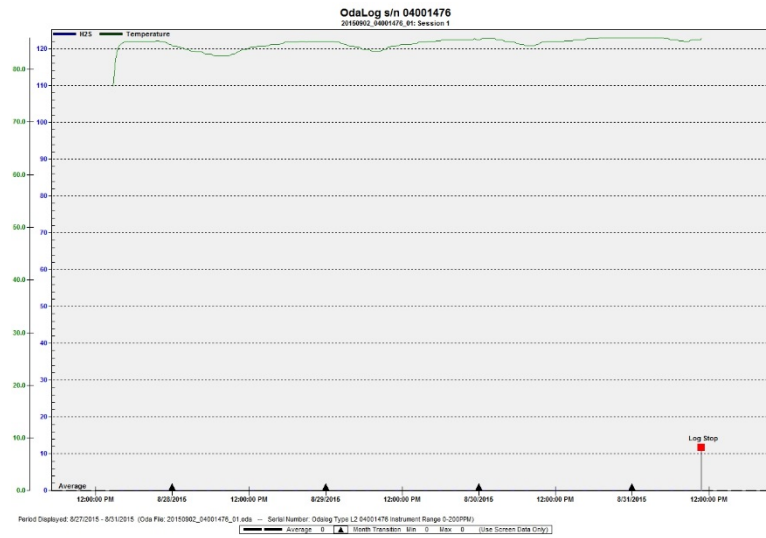
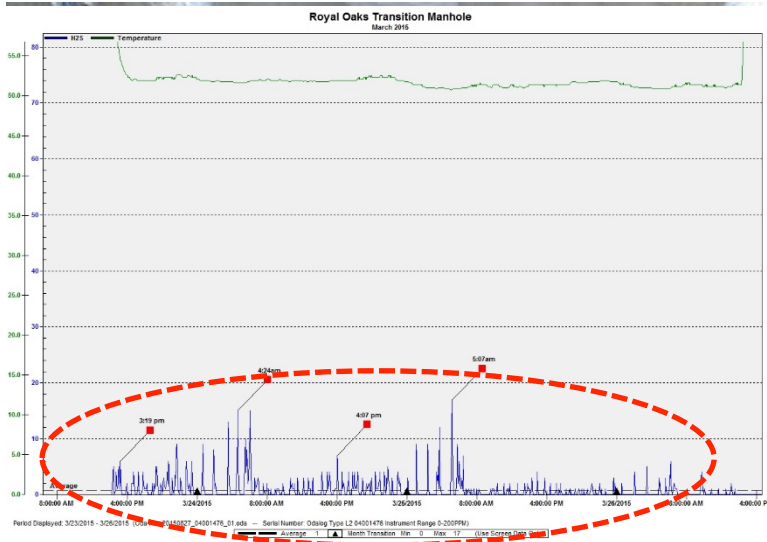
P2: Pipeline (collection system)



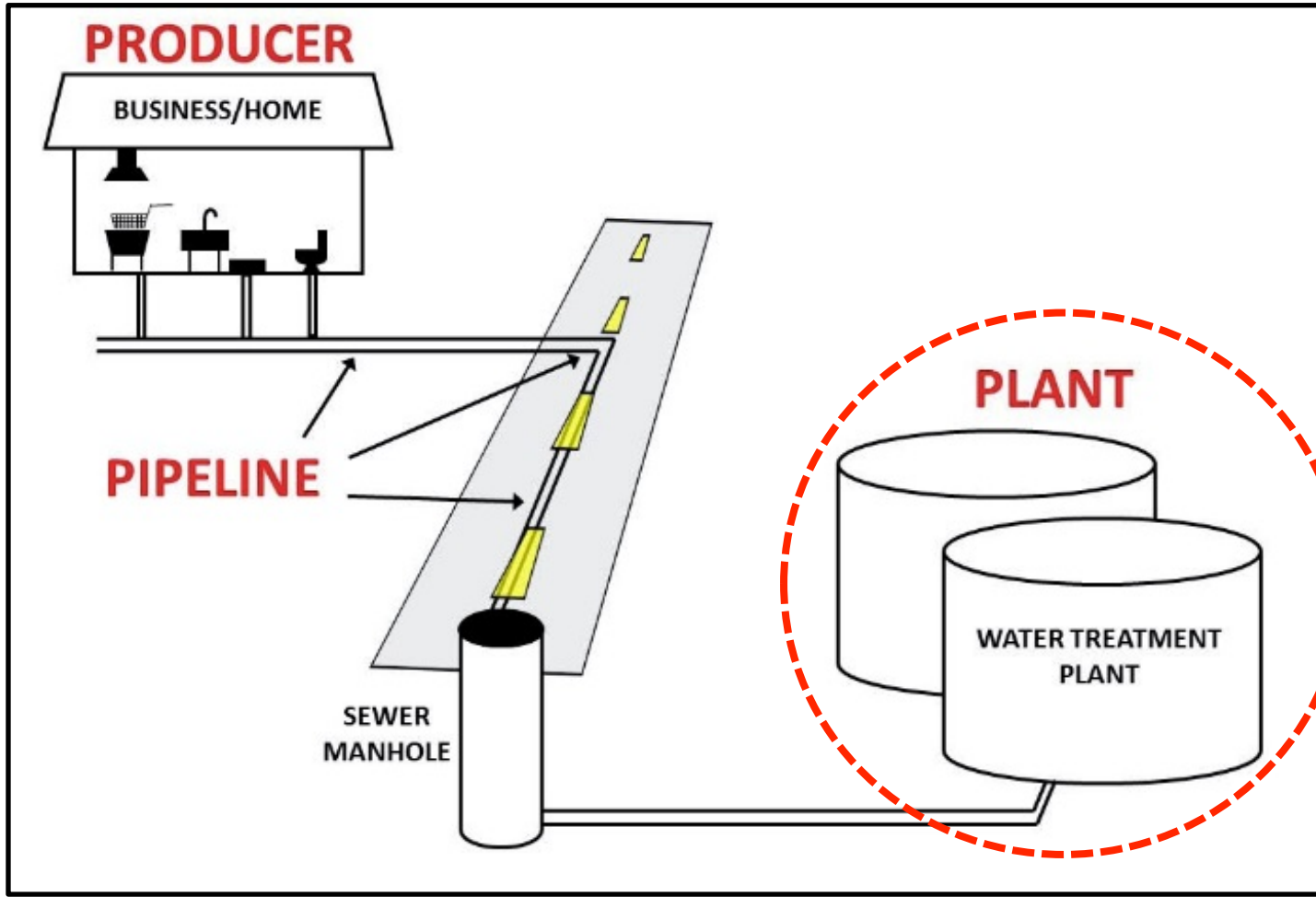
Keep Lift Stations Clean and Prevent Odor + Hydrogen Sulfide

One week of buildup

Two months of
ProteinMatrix



P3: Plant (WWTF)



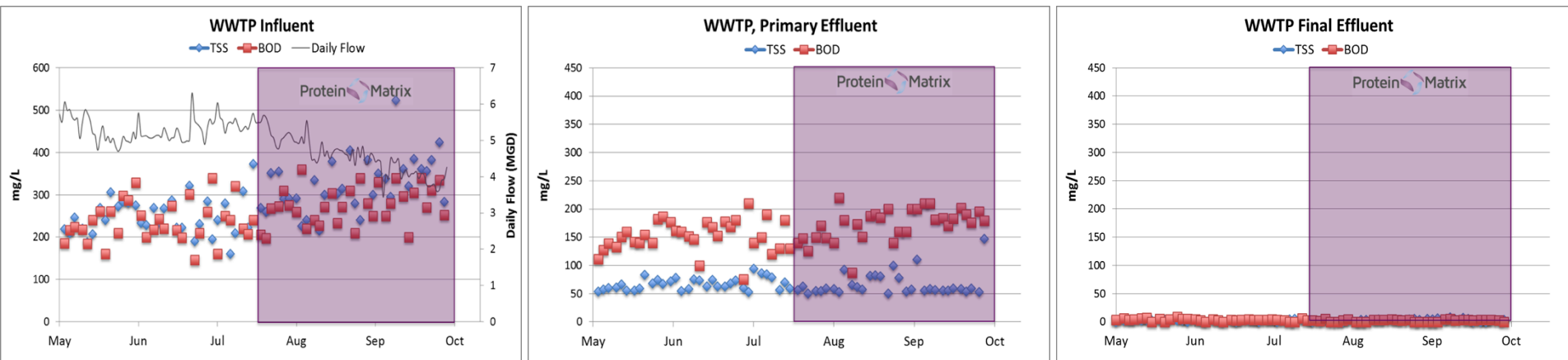
Total Influent Treatment

- P

- R



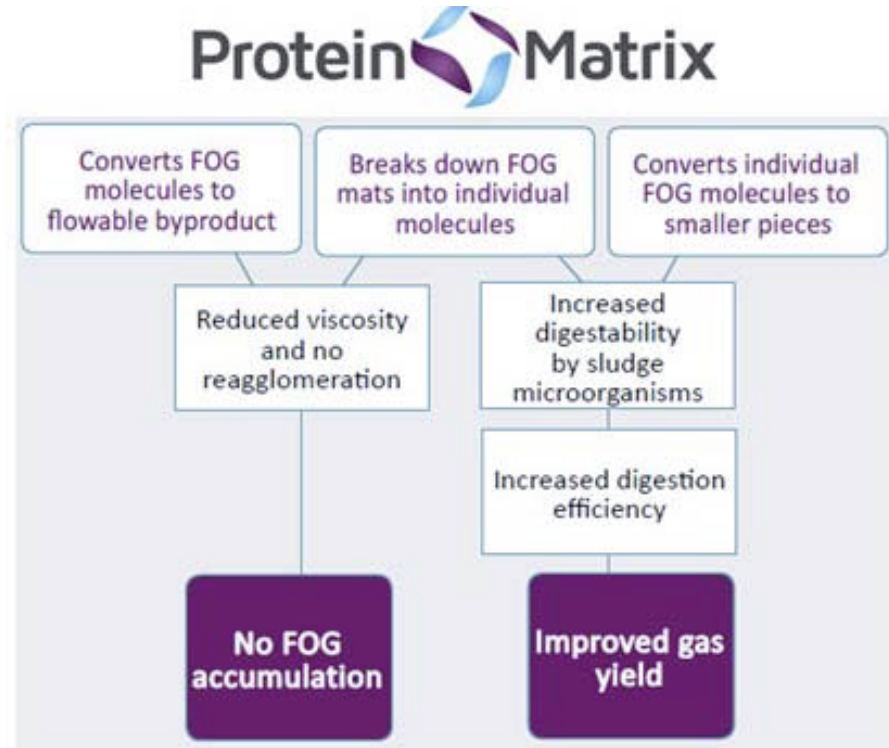
No Harm to Plant Processes



- Improved oxygen transfer
- Balance microbial populations
- Prevent overpopulation of *nocarida* / *M-parvicella*
- Reduced foaming and improved settling

Ongoing Research

- Use as a jetting fluid
- Increase in methane production during anaerobic digestion
- Mitigation of chemical burns



Acknowledgments

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