Brown Grease Recovery For Biodiesel

EPA
Innovative Energy Management Workshops
February, 2010
Hawai`i

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Welcome!

Grease trap waste

Solids and Rag Layer

www.biodiesel.com

PACIFIC BIODIESEL TECHNOLOGIES

Presentation Overview

- Company Background
- Grease Trap Waste Separation Systems
- Hawaii Grease Trap Recovery Program
- Brown Grease to Biodiesel

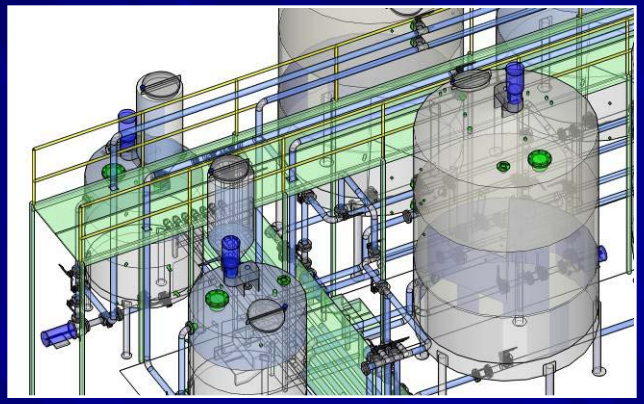
Pacific Biodiesel Inc.

Company History

- Formed in 1996 in Kahului.
- Distributed production focus
- Built 11 Biodiesel facilities
- Present Company Activities
  - Used Cooking Oil (UCO) and Grease Trap (GT) pumping
  - Biodiesel production facilities
  - Fuel sales and distribution
  - Mgmt. contracting

Pacific Biodiesel Technologies

- Process Technology
  - Multi-feedstock biodiesel process technology
  - Process utilities and tank farm equipment
  - Feedstock collection and rendering equipment
  - Facility retrofits
- Laboratory Services
  - ASTM fuel testing
  - QC Program development
  - Process verification and optimization
- Research and Development
  - Contract R&D projects
  - Feedstock development
  - Pilot Plant verification



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The Pacific Biodiesel Ohana

Grease Trap Disposal Options

- Land Application
- Headworks Injection
- Dewatering and Landfill
- Anaerobic Digestion
- Grease Separation and Fuel Use

Land Application

- Overhead application can cause oily runoff
- FOG Can kill vegetation
- Sometimes mixed with septage
- Long driving distances often necessary
- Not a clean or effective solution

Headworks Injection

- Eliminates pump station plugs
- Increases load on primary clarifier
- May not be compatible with tertiary treatment technologies

Dewatering and Landfill

- Small, low capital cost
- Hauler Owned
- Difficult to get consistent results
- Requires substantial polymer use, landfill cost

Anaerobic Digestion

- High carbon content
- Good gas production
- Slow breakdown of grease layer
- Lower value return compared to separation and fuel use

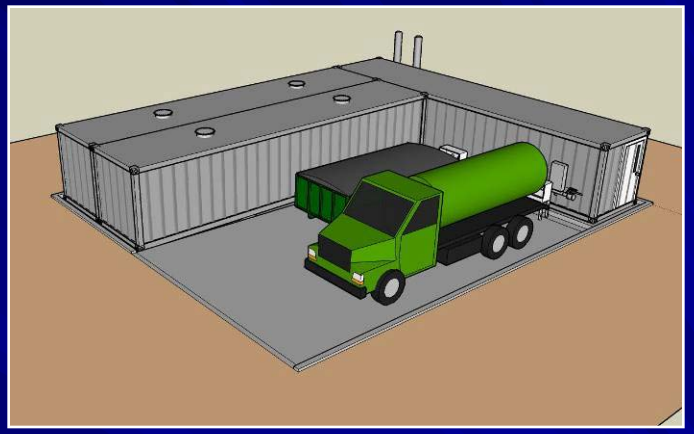
Grease Separation and Fuel Use

- Separate Grease from water and solids
  - Solids: AD feedstock or composted
  - Water: discharged
  - Grease: fuel replacement in boilers or biodiesel feedstock

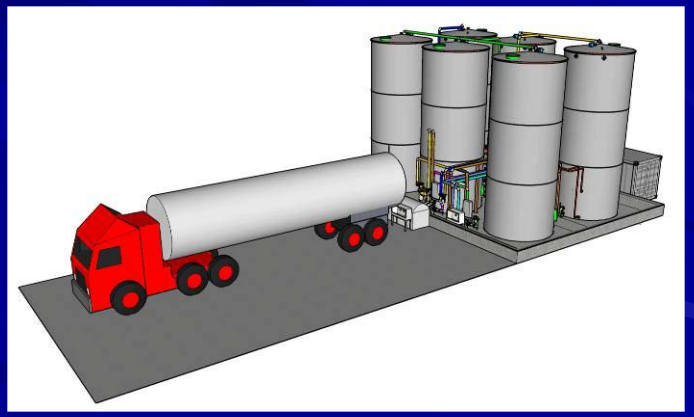
PACIFIC BIODIESEL TECHNOLOGIES

Grease Trap Separation Facilities

- Pre-assembled or built on site
- Capacity: 6,000-45,000 gal/day
- Stand alone, integrate with biodiesel plants or POWT plants
- Grease Trap and/or Used Cooking Oil



6,000 gal/day stand alone

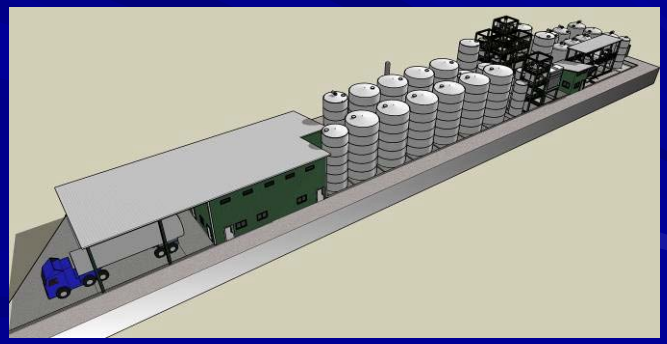


25,000 gal/day stand alone

Grease Trap Separation Facilities

- Low elec. consumption <$0.002/gal
- Low chem. consumption <$0.005/gal
- Low odor – fully enclosed equipment
- Small footprint: 2100-4500 sq ft (including loading bays)

25,000 gal/day sited with 1Mgpy Biodiesel Plant



45,000 gal/day sited with 5Mgpy Biodiesel Plant

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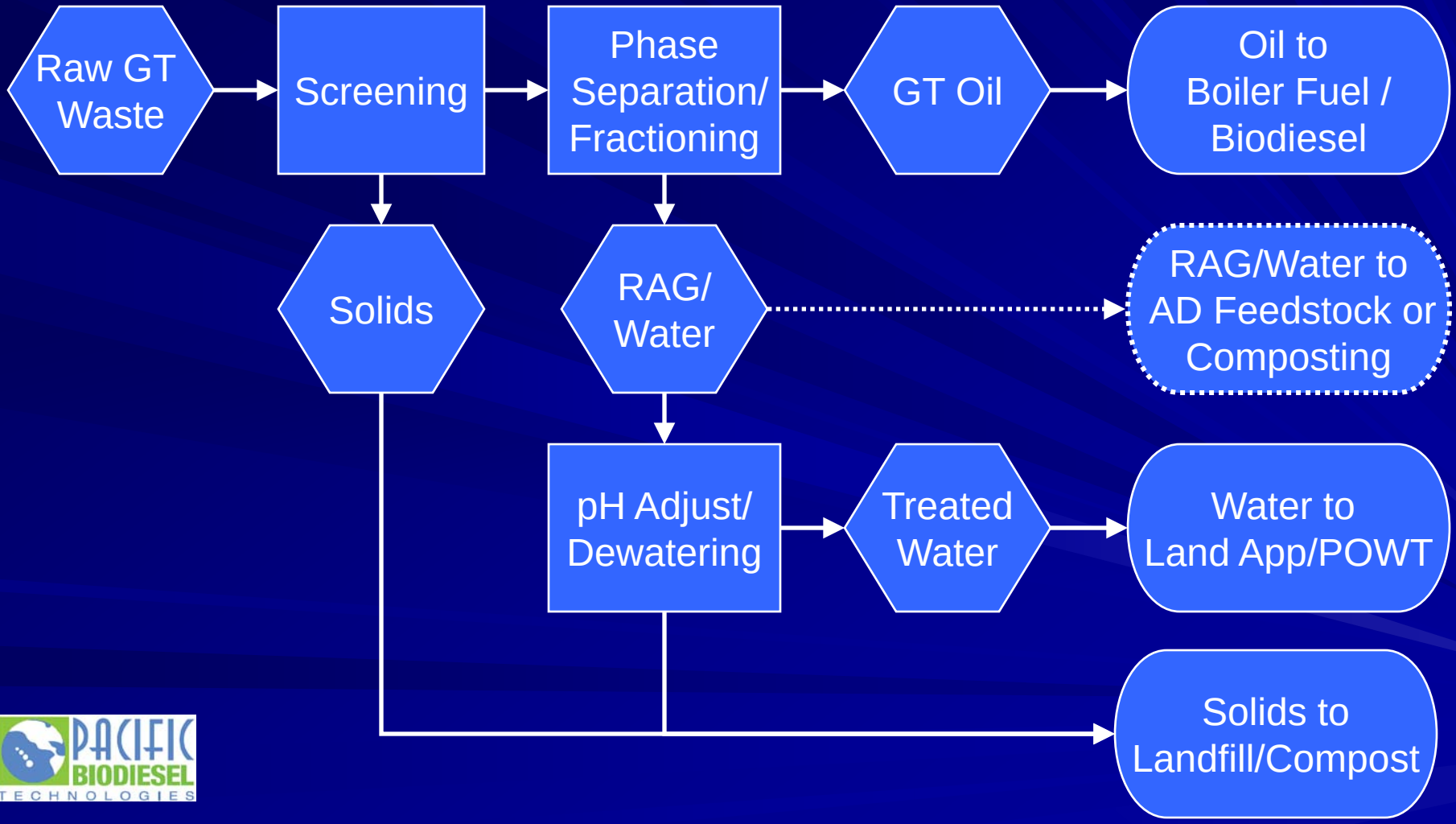
Grease Trap Waste Separation



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San Francisco PUC FOG Separation Plant

PACIFIC BIODIESEL TECHNOLOGIES

PB Hawaii Grease Trap Program

- Started 1999, expanded in 2000 to Honolulu
- Plants located at central landfill (Maui) and Sand Island, adjacent to POWT plant (Oahu)
- Accept grease trap waste and cooking oil only
- Current capacity 30,000 gal/day
- Process grease trap waste into four streams:
  - "Bio bunker" heavy fuel replacement (1-10%)
  - Co-composting liquid additive (5-8%)
  - Landfill solids (1%)
  - POWT plant discharge water (80-90%)

PB Hawaii Grease Trap Program

Successes:

- Significant diversion of GTW from landfills - approx. 150,000 tons to date
- Approx. 4,000,000 gals of low sulfur alternative fuel oil produced

Oahu Biofuels Grease Trap Plant

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PB Hawaii Grease Trap Program

Program Benefits

- Much lower disposal costs for haulers compared to landfill
- Keeps illegal dumping at a minimum
- Produces value-added product
- Potential for even higher value as biodiesel production feedstock

PB Hawaii Grease Trap Program

Mixed Waste | Separated Grease | Compost Additive | Discharge Water

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Brown Grease to Biodiesel

- Program began in 2005
- Solve biodiesel feedstock issues:
  - High FFA (80%-100%)
  - High Sulfur ~500 ppm
  - Emulsions, fine solids
  - Heavily Polymerized Fatty Acids

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Brown Grease To Biodiesel

- Developed Method:
  - Mixed Stream approach
  - 50% FFA capacity
  - Modification of traditional Acid-Based Technology
  - High Vacuum Evaporator purification

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Brown Grease To Biodiesel

- Mixed Feedstock facility
  - Accept all types of greases and tallow
  - Allow for variations in waste feedstock
  - Blend for cloud point consistency, oxidative stability
- Retrofit installations under development

Separated Grease Trap Oil and Finished Grease Trap Biodiesel

PACIFIC BIODIESEL TECHNOLOGIES

Brown Grease To Biodiesel

- First dedicated 2.5Mgpy facility with advanced technology to produce biodiesel from trap grease and other hard to convert oils under construction in Hawaii in 2010.

- Biodiesel fuel may be used in diesel engines including generators, on-road trucks and farming/construction/industrial equipment.
- Biodiesel can fuel cars with diesel engines. Roughly 5% of U.S. passenger vehicles have diesel engines. In Europe, > 40% are diesel.

America's Most Experienced Biodiesel Company

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