Pasco County Biosolids Facility: Achieving Class AA Biosolids Treatment Via Solar Drying Paired with Limited Fossil Fuel Pasteurization

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Presentation Overview

County’s Current Biosolids Program

History of this Project

Drivers for Alternative Biosolids Processing

Facility Design

Facility Operation

Project’s Current Status
Pasco County Biosolids Program

- Yearly production ≈ 23,000 wet tons
- Waste activated sludge is dewatered at the following facilities:
  - Shady Hills
  - Wesley Center
  - Land O’Lakes
  - Southeast
- Dewatered sludge cake (16% solids or 84% water) is hauled via hauling contract. Historically has been composted or landfilled at facilities as far away as Georgia.
History of the Biosolids Project

In 2011, County conducted RFP process to solicit proposal for Design-Build-Operate of new Biosolids Facility.

Top-ranked “Earth, Wind, and Fire,” which claimed to use their proprietary MicroFuel technology to convert carbon pellets and dried biosolids to create a synthetic diesel fuel – company appeared to dissolve after RFP process.

County approved moving forward with negotiations with Merrell Bros. (second highest ranked) for biosolids facility.

County and Merrell Bros. developed preliminary design of facility, construction and service agreements, and completed detailed design phase.
Drivers for Alternative Biosolids Processing

Revised State Rule 62-640

- Revised in 2010
- Restricted Class B in parts of Lake, Orange and Seminole Counties
- Restricted Class B in the Lake Okeechobee Watershed unless no net increase in phosphorous
- Restricted Class B in the Caloosahatchee and St. Lucie River Watersheds unless no net increase in phosphorous and nitrogen
- Limits quantity that can be stockpiled at land application site
Drivers for Alternative Biosolids Processing (cont.)

Additional Restrictions for Biosolids Land Application by County

• 33% of Florida’s Counties already have restrictive biosolids ordinances
• Another 20% are considering restrictive biosolids ordinances
• Many other counties (including Pasco) have FDEP imposed biosolids land applications restrictions due to sensitive spring watersheds
Drivers forAlternativeBiosolids Processing
(cont.)

With land application reduced, there has been a **dramatic increase** in Sub-B, Class B and Class A biosolids being sent to landfills

Most landfills have reduced intake volumes or **banned biosolids** received altogether because of capacity and impact to operation

In addition to **major odor issues**, biosolids create potential dangers to landfill operators due to the material’s **instability** – because of wetness it compresses easily and provides little support structure

Biosolids in a landfill have a long-term effect on the leachate system which potentially **affects the life** of the landfill cell
Drivers for Alternative Biosolids Processing (cont.)

**ECONOMIC IMPACT**

Shortage of application sites + increasing production = **landfill disposal price increases**

Tipping fee for Pasco’s sludge at largest receiving landfill in central Florida increased nearly 13% at time of RFP.
Facility Design

Facility consists of three main components

1. Greenhouse drying “pods” – dry biosolids using solar energy, ventilation, and mixing from 16% solids to 60% solids

2. Pasteurization Building – houses the belt dryer which uses natural gas to dry material to 75% solids

3. Odor Control Systems – treats air exhausted from biosolids processing areas
Site Plan
Biosolids Receiving
Greenhouse Pods
Solar Drying and Agitation
Solar Drying and Agitation
Odor Control
Odor Control (cont.)
Odor Control: Evaluation Performed

- System was piloted with Pasco County biosolids
- Odor samples were taken and analyzed for chemical composition and for olfactory sensing
- Odor and meteorological data was modeled in AERMOD odor assessment model
- Many odor control technologies and configurations were modeled to establish performance criteria to minimize off-site odor
Product Conveyance
Product Conveyance
Day Hopper
Pasteurizing Building
Pasteurization Building

7-31-18 Temp Data

Date: 07/18/10

Operator: 

Signed: 

Percent Solids Recordings

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Notes: Day 9

All material was pasteurized for 30 minutes or longer, in order to achieve Class A pathogen reduction by meeting the requirements in Section 503.32(a)(1) of CFR Part 503. The temperature of the biocides shall be maintained at 0°C (32°F) or higher for 30 minutes or longer. Time and temperature was recorded to demonstrate compliance with pathogen reduction requirements specified in Rule 82-640.000, F.A.C. (82-640.000(9)(A)(3)(B)(2)-640.000(9)(A)(1)). Vector reduction for Class A biocides (Section 503.31(4)(7) of Title 40 CFR Part 503) is achieved as the final product achieves 75% solids or greater. This document is to serve as record that time and percent solids was routinely monitored throughout processing.
Benefits

• Product is approved by State as Class AA fertilizer

• Dry and uniform product is highly marketable and easy to handle

• Operationally simple – not equipment intensive

• Co-located next to WWTP and WTE Facility

• Solar energy offsets bulk of gas usage

• Reliability of dryer to provide Class A pathogen destruction
Components of the Deal: Basics

The business arrangement (the Deal) is between Pasco County and Merrell Bros. Inc. (Contractor)

- Engineering (civil, structural, MEP) services provided by Kimley-Horn
- The Project was delivered using a design/build/operate approach.
- The Design/Build (DB) portion was contracted to Merrell Bros. LLC with Merrell Bros. Inc. providing a parent guarantee for performance
- The Operation portion is contracted with Merrell Bros. Inc.
Components of the Deal: **Design-Build Agreement Summary**

**Guaranteed Not To Exceed Price (NTEP) was approximately $13.4M.**

**Strict Acceptance and Performance Criteria**

- Processing capacity
- Product quality
- Odor control
- Energy consumption
- Environmental regulatory compliance
Components of the Deal: Service Agreement Summary

Term Provisions
• Term is for 15 years with three 5-year renewals at mutual agreement of the parties.

Pricing Provisions
• Fixed price subject to annual escalation

• Host Community Fee, subject to annual escalation, for all tons from non-county owned facilities.

• Contractor guarantees delivery of 50,000 wet tons per year or pays the County the host community fee for any short fall to this number.

• County to share in all biosolids products revenues
Components of the Deal: Service Agreement Summary (cont.)

Operation and Maintenance Contractor Responsibilities

• Collect biosolids from County-owned WWTPs and deliver to the Facility
• Operate, maintain, and repair the Facility in accordance with standards of maintenance
• Meet all performance guarantees
• Disposal of any unprocessed biosolids and non-marketable products at a location/facility which is not County–owned

Other Provisions

• Maintain payment and performance bonds
• Maintain county specified insurances
• Standard county indemnification
• Termination for non-performance
Contact Us!

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