Developing an Integrated Organics Recycling Facility through P-P-P

ASTSWMO 2018 Annual Meeting
Materials Management Session – Anaerobic Digestion

October 25, 2018
Introduction to Freestate Farms:

Freestate Farms LLC delivers full-cycle sustainable solutions to its local community partners by developing, owning, and operating integrated facilities for organic waste processing, generation of renewable energy, and indoor organic food production.

Presently developing its first facility through a public-private partnership with Prince William County, Freestate Farms is starting to bring sustainable waste management, baseload renewable energy, nutrient rich compost and natural fertilizer products, as well as fresh locally-grown organic produce to the Metropolitan DC Region.
## Key Project Information

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<tr>
<th>Phase 1</th>
<th>Advanced ASP Composting</th>
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<tr>
<td>✓ Expansion of throughput capacity from 35,000 tpy of yard and wood waste (via traditional composting/mulching) to 88,000 tpy of food, yard, and wood waste (via advanced aerated composting and mulching)</td>
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<td>✓ Permitted for and capable of handling up to 20,000 tons per year of mixed post-consumer food waste</td>
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<th>Phase 2</th>
<th>Anaerobic Digestion and CEA</th>
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<td>✓ Additional 84,000 tons per year food waste via anaerobic digestion</td>
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<td>✓ Installation of 1 MW biogas-fueled combined heat and power (CHP) generator to provide electricity and heat for the facility, with excess electricity sold to grid</td>
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<td>✓ Additional biogas likely to be cleaned and injected into natural gas pipeline</td>
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<td>✓ Organic food production through controlled environment agriculture (CEA) in repurposed shipping containers with CO₂ injection for increased yields</td>
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Strategic Element No.01: Aerated Static Pile Composting

The foundational strategic element of the Freestate Farms system is advanced composting, and we have chosen to partner with Engineered Compost Systems of Seattle, Washington for our initial project in Prince William County.

ECS’s in-house engineering and design expertise has been well proven at the 30+ sites across the U.S. where its systems are presently in operation, with many more under construction and development.

ECS’s systems include intelligent process control and reliable environmental protections in the production of top quality compost products that conform to health and safety regulations and also meet the U.S. Composting Council’s Seal of Testing Assurance (STA) Standards.
The core strategic element of the Freestate Farms system is the anaerobic digester, and we have chosen to partner with quasar energy group of Cleveland, Ohio for our initial project in Prince William County.

Capitalizing on its proven digester design, in-house engineering, and construction capabilities, quasar has successfully constructed 13 facilities presently operating in the United States, with numerous other facilities in different stages of development and construction.

quasar specializes in scalable and replicable continuously stirred tank reactor anaerobic digester systems that are designed to meet applicable environmental regulations.
Current Operation
Balls Ford Site – Manassas, VA

- Traditional Windrows (turned every few weeks)
- Citizen Convenience Center
- Commercial Yard Waste Receiving Pad: Grinding and Screening
- Resident Brush Receiving Pad: Grinding
Future Operation
Site Views
## Regulatory Umbrella and Solid Waste Permit-By-Rule

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<tr>
<th>Regulatory Umbrella</th>
<th>Virginia Dept of Environmental Quality</th>
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<tr>
<td></td>
<td>• Stormwater discharge</td>
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<td>• Air emissions</td>
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<td>• Solid waste processing</td>
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<th>PWC Dept of Development Services</th>
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<td>• Zoning</td>
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<td>• Land development</td>
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<td>• Building development</td>
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### Scope of Solid Waste Regulation
- Siting
- Design
- Operations

### Applicable Solid Waste Categorizations
- Compost
- Waste-to-Energy
- "Miscellaneous"
## Benefits of the Freestate – PWC Public Private Partnership

### Benefits to Prince William County

- Long term solution for yard- and food-waste management, which make up 30% of incoming tipped material, and thus extending the life of the County landfill by 10-15 years.

- Increased overall recycling levels through wider range and greater capacity of organic waste processing.

- Optimization of existing asset — same site, with over 3x the processing capacity, and increased variety and volumes of sustainably generated products.

- Donated compost/mulch to County-based non-profits and discounts for County agencies.

- Receive annual profit sharing payment and portion of proceeds from sales of environmental attributes (e.g., renewable energy credits, carbon offset credits, etc.)

- Collaboration with County K-12 schools — organic waste division policies/practices at schools, and educational space and opportunities at the integrated full-circle Freestate site.

### Benefits to Freestate

- Site control; use of amenities

- 20-year term and two 5-year renewals

- Payment for “County Material” and policy allowing residents and businesses to tip for free

- Permitting support – local and state

- Public support and public relations assistance

- Ongoing operations and second ancillary location

- Reservoir of knowledge, information, and relationships/introductions

- Assistance with tax-exempt financing

www.freestatefarmsva.com
Thank You!

Chief Executive
Douglas Ross

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