Prince William County Organic Waste Management Project

George Washington Regional Commission

Composting Conference

August 21, 2018

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Prince William County, VA

**Background**
- Suburban county of ≈ 430,000 residents (≈ 150,000 households, and 8,000 business), located ≈ 30 miles from Washington, DC

**Balls Ford Road Composting Facility**
- Began composting leaves and grass on the 30-acre site in 1992
- Existing permitted capacity of 50k tons per year; presently handling ≈ 25k tons per year
- Simple windrow composting – large piles turned every few weeks with an excavator
Balls Ford Road Facility Services

• Facility Services Include:
  – Citizens Convenience Center
  – Residential yard waste and brush tipping
  – Commercial yard waste and brush tipping
PWC’s Driving Forces

Driving Forces Behind Project

- Stagnated recycling rates
  - County recycling rate has hovered around 37% since 2006
- Desire to implement mandatory county-wide yard waste recycling program
- Large regional demand for food waste processing infrastructure

Path to the Project

- **Spring 2009** – Began internal discussions about enhanced organic waste processing opportunities and technologies
- **Winter 2011** – Began pilot program to accept Category 1 pre-consumer plant-based food scraps at Balls Ford Road
- **Summer 2012** – Began accepting pre-consumer plant-based food scraps under amended PBR
- **November 2013** – Issued RFP for organic waste management project
- **February 2015** – Executed 20-year contract with Freestate Farms LLC to redevelop existing site for expanded throughput capacity and range of organics processed
Benefits to Prince William County

• Improved management of organic wastes generated in the County and surrounding areas
• Enhance operations and optimize existing facility
• Increase County recycling rate
• Extend life of County landfill
• RFP process to bring in private party to design, build, finance, own, and operate the facility
  – Included technical and financial requirements to minimize risk to the County and ensure commercial viability
Freestate Farms LLC delivers full-cycle sustainable solutions to its local community partners by developing, owning, and operating integrated facilities for advanced composting, anaerobic digestion, renewable energy, and commercial organic greenhouse 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, and fresh locally-grown organic produce to the Metropolitan DC Region. 
The PWC Board of Supervisors approved the Development Services Agreement with Freestate in early 2015 for the purpose of granting Freestate the right to develop, own, and operate its proposed integrated organic waste processing, renewable energy, and indoor organic food production facility at the County’s existing composting facility.

The Agreement includes a 20-year term dated from the commencement of new operations, as well as two five-year extension terms (upon mutual agreement).

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<thead>
<tr>
<th>Organic Waste Capacity</th>
<th>Biogas Use</th>
<th>Organic Produce</th>
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<tbody>
<tr>
<td><strong>Phase 1</strong></td>
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<tr>
<td>Process ≈ 45,000 tons per year of source-separated food waste via anaerobic digestion, and ≈ 40,000 tons per year of yard and wood waste via aerated composting and traditional mulching</td>
<td>Use a 1 MW combined heat and power (CHP) generator to provide electricity and heat for the facility’s elements, with excess electricity sold to the grid</td>
<td>Controlled environment agriculture (CEA) in repurposed shipping containers, with CO₂ injection for increased yields</td>
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<td><strong>Phase 2</strong></td>
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<tr>
<td>Process ≈ 90,000 tons per year of source-separated food waste via anaerobic digestion (with depackaging capabilities), and ≈ 75,000 tons per year of yard and wood waste via aerated composting and traditional mulching</td>
<td>Either (a) clean biogas to pipeline quality for injection into the natural gas grid or (b) clean and compress biogas for use in local trucks, cars, and buses</td>
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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.
Balls Ford Road Site – Present

- Traditional Windrows (turned every few weeks)
- Commercial Yard Waste Receiving Pad: Grinding and Screening
- Citizen Convenience Center
- Resident Brush Receiving Pad: Grinding
Freestate Integrated Site Plan

Reversing Aerated Static Pile Bunkers
Positive Aerated Mass Bed Formations
Pre-Processing
Tipping Pad
Pad for Indoor Organic Food Production
AD System
Freestate Site Views
**Benefits of Freestate-PWC P-P-P**

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<td>• 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.</td>
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<td>• Increased overall recycling levels through wider range and greater capacity of organic waste processing.</td>
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<td>• Optimization of existing asset — same site, with over 3x the processing capacity, and increased variety and volumes of sustainably generated products.</td>
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<td>• Donated compost/mulch to County-based non-profits and discounts for County agencies.</td>
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<td>• Receive annual profit sharing payment and portion of proceeds from sales of environmental attributes (e.g., renewable energy credits, carbon offset credits, etc.)</td>
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<td>• 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.</td>
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<td>• Site control; use of amenities</td>
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<td>• 20-year term and two 5-year renewals</td>
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<td>• Payment for “County Material” and policy allowing residents and businesses to tip for free</td>
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<td>• Permitting support – local and state</td>
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<td>• Public support and public relations assistance</td>
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<td>• Ongoing operations and second ancillary location</td>
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<td>• Reservoir of knowledge, information, and relationships/introductions</td>
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<td>• Assistance with tax-exempt financing</td>
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Thank you

Douglas Ross, Chief Executive  Bernie Osilka, PWC


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