Edmonton Organics Processing Facility

General Supervisor, Engineering and Technical Services
Edmonton Waste Management Centre
Background

Edmonton Waste Management Centre

- No separate organics collection – 100% participation
- Approximately 250,000 tonnes per year Municipal Solid Waste processed to remove organics
- Approximately 120,000 tonnes per year organic fraction of MSW and 15,000 tonnes per year biosolids processed in Co-composter
Site Overview
Considerations

- Peak organics during summer overwhelms co-composter, 40% is grass clippings
- Only current product is low value
- Solution needs to be integrated with co-composter
- Energy use getting more expensive
- Limited Institutional-Commercial-Industrial options for organic waste
- Marginal site for expansion
Anaerobic Digestion Design Basis

- Design capacity of 40,000 tonnes per year, based on peak loading and providing opportunity for ICI SSO materials
- Biogas to be used for electrical generation in Combined Heat and Power generators
- Operate CHPs in “island mode”, no connection to power grid
- CHPs to be able to blend in natural gas
- Ability to accept current compost feed material
- Ability to produce compost product suitable for cure site
- Easy to operate system, with minimal maintenance required
Anaerobic Digestion - Advantages

- Opportunity to recover energy value of organics before composting
- Electricity generation through combined heat and power generators (CHP) best option for site, but other options
- Heat required for another process use
- Process requirements fit with site
- Grant availability
- Opportunity to engage Institutional – Commercial – Industrial clients
Anaerobic Digestion - Disadvantages

- New process requires permitting
- Vendors are mostly European-based
- Not much design and construction expertise locally
- Typical municipal procurement not practical
- Requires multiple supply, design, construction, and commissioning contracts
- Requires project team expertise
Integration into Co-Composting

**Feedstock**
- <3” MSW
- From IPTF

**Composting**
- 33,000 t

**Anaerobic Digestion Facility**
- Processing
- Stockpile
- 8 Digester Boxes
- 2 Aeration Tunnels
- 38,000 t

**Processing**
- Biogas
  - 7,000 t
- Percolate
  - 51,000 t
- Condensate
  - 2,000 t

**Feed**
- 10,000 t
- 38,000 t

**To ECF & RDF**
- Electricity & Heat

**COCCUS Tank**
- 48,000 t
Project Team
Project Delivery - Concept

- Design and procurement hinge on biogas production and quality
- Requires testing of biogas production from waste
- Biogas production affects CHP size, flare size, etc.
- Biogas quality affects CHP engines, pre-treatment requirements, and emissions
- Some vendors can offer biogas production testing
- It is good to have a third party capable of doing testing
Project Delivery - Permitting

- Environmental guidelines for anaerobic digesters don’t exist in many jurisdictions
- Discussion of project with permitting organizations required
- Emissions, noise, and odours are primary concerns
- Many fire provisions are related to wastewater treatment digesters
- Building permit variances will likely be required
Project Delivery - Procurement

- Originally developed a “turn-key” RFP requiring Vendors to partner with local design and construction firms in November 2013
- All bids came in substantially over budget
- Re-tendered equipment portions separately in October 2014
- After securing equipment contracts, tendered for Design-Build Construction Management in June 2015
- Equipment suppliers responsible for commissioning
- Performance holdbacks part of equipment contracts
Project Delivery - Design

- City taking responsibility for design integration
- Third party process design consultant
- Each Vendor has their own design standards
- Coordination meetings between Vendors’ technical staff and DBCM Consultant
- 30%, 60%, and 90% design reviews
- Hazardous Operation (HAZOP) safety review
Project Delivery - Construction

- Excavation completed in April 2016
- Piling to begin in May 2016
- Concrete to begin in July 2016
- CHPs to be installed June 2017
- Building erection to begin in March 2017
- Mechanical completion in November 2017
- Commissioning and start-up by end of 2017
Current Status

- Operating approval received from AEP
- Detailed design is near 90% completion
- Excavation is completed, piling to start in May
- Foundation permit received, building permit in progress
- Plan to install and commission CHPs early on natural gas
- Project is on schedule for late 2017 start-up
Thank you.

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