

# Incorporating High Solids Anaerobic Digestion into an Existing, Successful Composting Facility

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**HARVEST**<sup>TM</sup>

## Extracting Maximum Value from Organic Waste

- Divert organic waste out of landfills → Lower disposal costs
- Extract renewable energy → Added Value
- Produce organic fertilizer → Added Value
- Manage the **complete cycle** of organic waste material





## Harvest at a Glance

- We manage organic waste streams:  
**Foodwaste, biosolids, wood waste and yard waste**
- We add value:  
**Operational expertise, end-product marketing and renewable energy**
- Experienced team: 200+ years in organic waste management
- Strong historical and projected growth: 250% from 2009 to 2010
- Cluster focus: Selected “geographical clusters”
- Technology focus: Open platform for use of other technologies

## Two Covered Aerated Static Pile (CASP) systems

- Each 100,000 CY
- Using negative aeration
- Input ~ 200,000 tons/ year
- Output ~ 400,000 CY/year (blended soil products)
- Minimized odors
- Grinding, turning, cover, and process control are unique to Harvest





HARVEST

## Fraser Richmond Soil & Fibre (BC)

- Site has space for High Solids Anaerobic Digestion (HSAD)
  - Co-digestion of urban materials in batch tunnels
  - Simplified grinding, mixing, heating, feedstock
  - Output can be composted
- Existing infrastructure serves both HSAD and composting
  - Scales, composting, screening, contaminant control, odor control, product marketing

## CASP Biofiltration



Biofilters - Two at 42,000 cfm flowrate each



## Screening and Contaminant Removal



Six-product screening plant - 1,000 CY per hour

## Material Handling – Canadian Style



Large buckets help minimize incidental odor emissions



## Site Tours – Canadian Style



Bucket Capacity: 23 – not quite full



## Unique Aspects of Harvest Composting

- **Reduced Energy Costs**
  - 38% less energy consumption per ton through improved grinding and aeration technology
- **High Throughput**
  - 36% more processing capacity due to greater space efficiency
- **Seasonal Peak Capacity**
  - More tolerant of seasonal differences in volume and moisture levels
- **High-Quality, High-Value Compost**
  - Our products sell as fast as we can manufacture them, indicating demand is greater than supply



## Operational Excellence and Quality

- An enterprise-wide approach for Harvest
- Performance specifications for compost, soil, mulch, fertilizer, biogas, and other manufactured outputs
- Products are measured against quality targets
- Harvest manages quality with specific plans regarding environmental management, operating procedures, and testing
- The Harvest Operational Excellence and Quality Management System will be used in accordance with American Society of Quality Training and Standards



## Product Quality Assurance in Practice

- Create a facility design so the product is “not sold before its time”
  - A true batch system to track inventory and allow quality control to work
  - A routine that works for the production crew
  - A process control system where metrics and quality assurance can be used
- Create a management culture to assure quality
  - Create a road map to assure results
  - Install measurement and improvement at the operations level
  - Setting goals and comparing production to those goals
  - Creating a report card for the plant
  - Implement accountability and reward for good achievement
  - Link the results to research and testimony to differentiate us in the market
  - Manage contaminants at the source through education and container design, during collection, at receiving, and at finishing

- **Anaerobic Digestion Feedstock**

- Ideal for multi-family, commercial and food processing organics
- Can accept residential curbside collected organics
- Contamination and bio-plastics have to be managed to succeed

- **HSAD Attributes**

- Batch operation, fully enclosed for odor control
- 100 F Mesophilic temperatures
- 10-20 days residence time
- Feedstock must have some porosity and must be stackable – grinding not required
- Digestate is easily composted
- Water balance is manageable through feedstock mix design

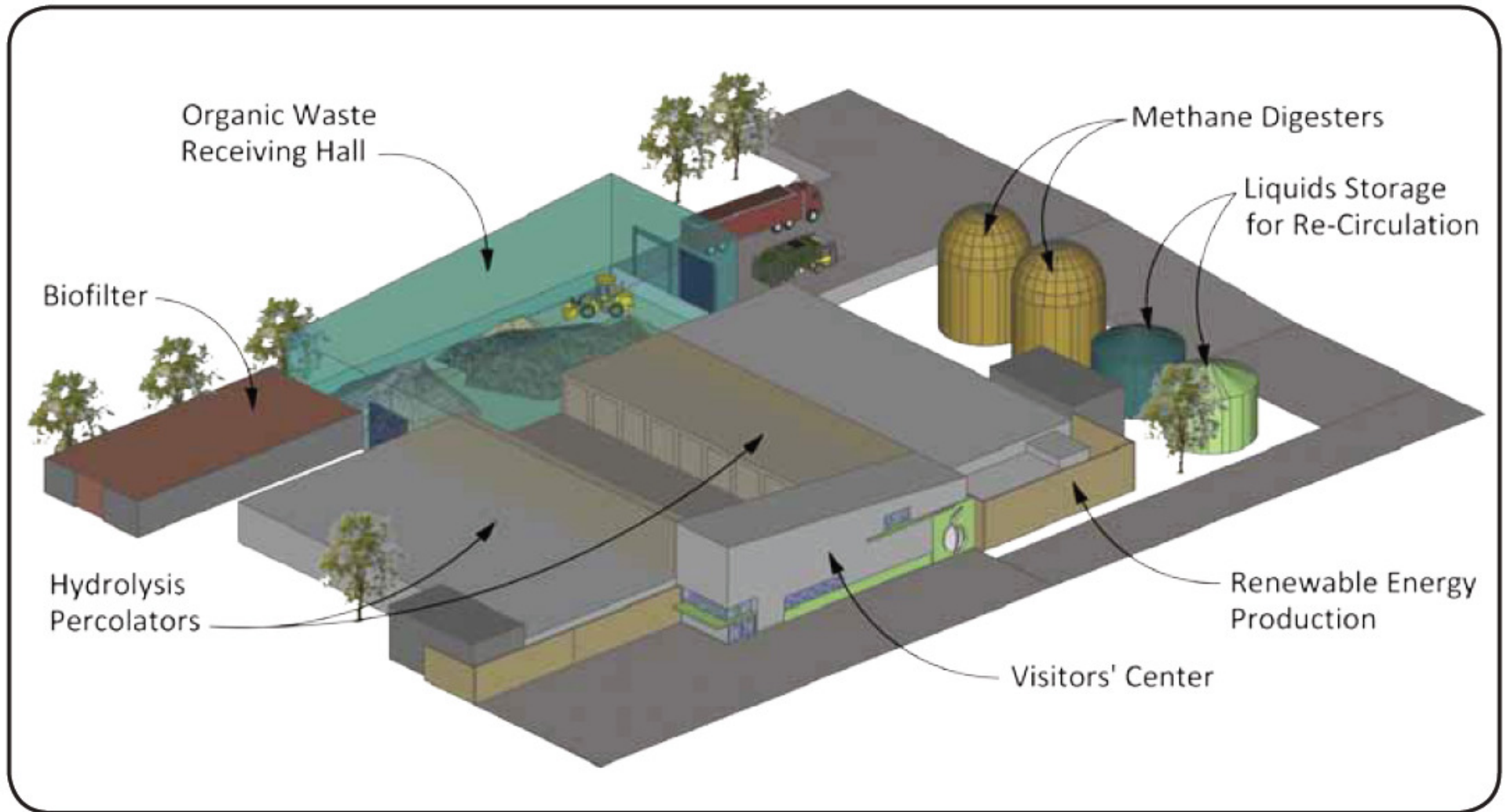




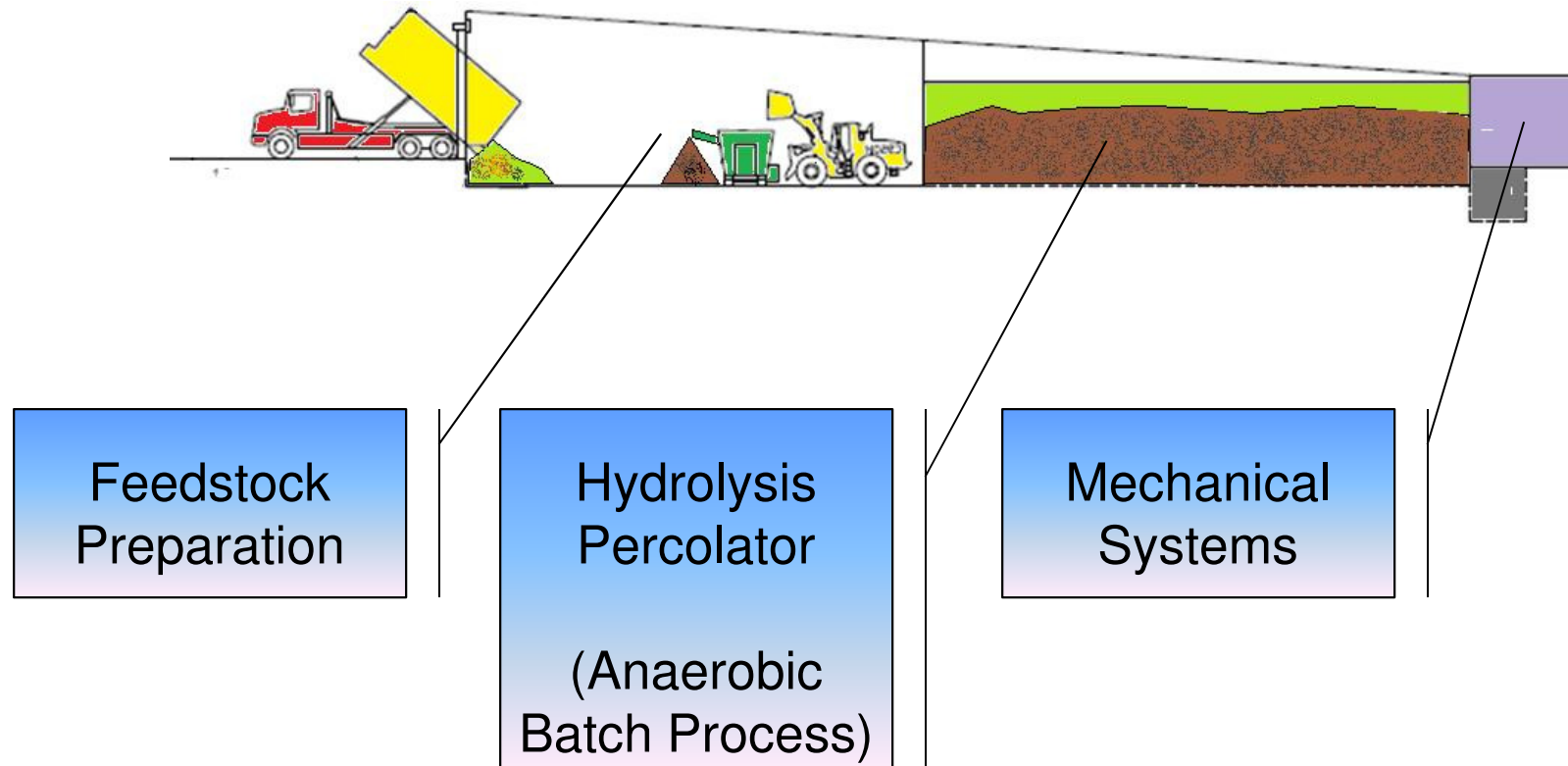
## The Drivers for Making HSAD a Reality

- British Columbia leads North America in promoting goals of environmental management and sustainability. Metro Vancouver region waste management issues:
  1. Landfilling is unsustainable - long distances and increasingly high costs for disposal, limited capacity, and generation of methane gases from organic waste
  2. The Zero Waste Challenge - landfill diversion goals cannot be met using current recycling and diversion strategies
  3. Fossil Fuel dependency - Communities are seeking sustainable alternative fuels. Carbon tax and energy policy creates a stable market for renewables.
  4. Demand for high-quality, nutrient-rich soil and compost products
  5. Aggressive targets to reduce GHG – set by provincial, regional and many local governments

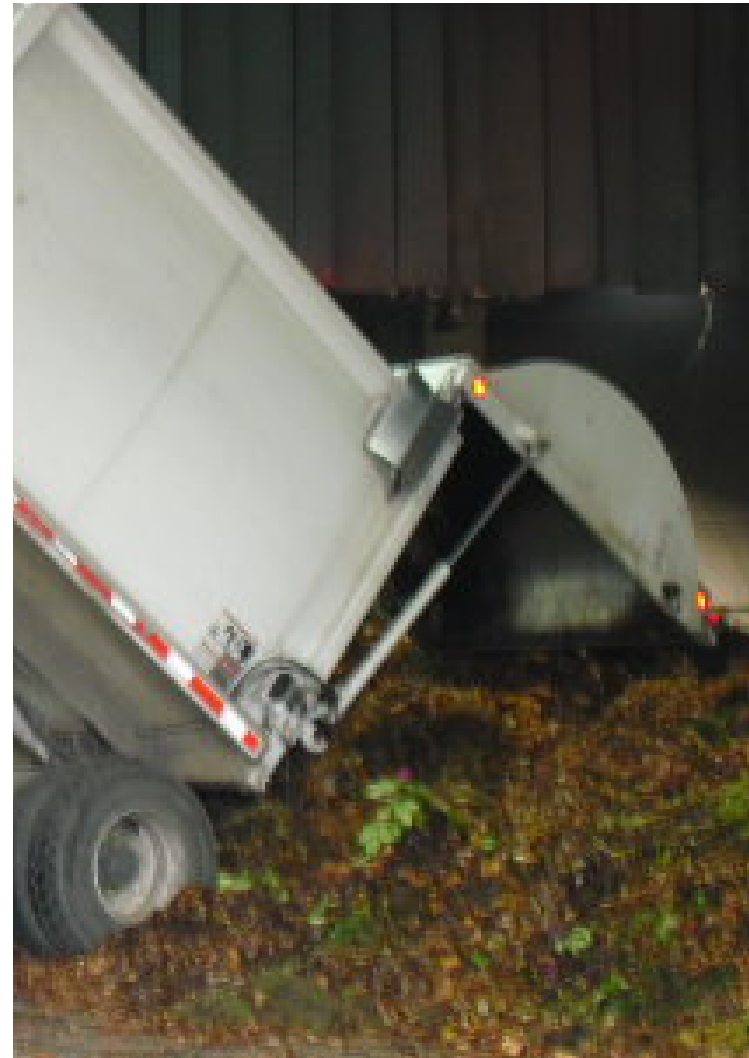
# HSAD Components



## HSAD Cross Section



- Waste material delivered into enclosure for preparation
- Feedstock is stackable in pile form and water in the form of hydrolyzed liquids can “percolate” through it



- Input material placed into hydrolysis percolators
- Organic acids (nutrients) are extracted by percolation
- Each percolator accepts 3,000 tons per year





- Nutrients are in solution and fed to a high rate anaerobic digester
- Remaining digestate is removed from the percolator for aerobic composting



- Finished compost product is screened and sold as soil, fertilizer, or compost
- Biomethane is sold as green natural gas, burned for electricity, or compressed into CNG vehicle fuel





# Green Energy Centre





## Follow Up Questions

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