

## Regional Solid Waste Management Plan Review: *Engaging solutions for tomorrow*

Garbage School 301:  
Composting

## Why Compost?

- Meet waste diversion goals
  - Organics are a significant part of waste stream
- Address waste liabilities
  - Removing organics from landfill reduces leachate
- Beneficial reuse of organic matter
  - Improve soil condition
  - Reduce greenhouse gas emissions

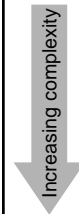


## How does it work?

- Organic materials are separated from waste stream
- Ratios of carbon and nitrogen are adjusted to optimal level
- Moisture level and particle size are adjusted
- Naturally occurring microorganisms digest the organic matter, creating a stable product that improves soil condition



## Types of composting



- Static piles
- Turned windrows
- Aerated static piles
- Bays, beds and runnels
- In-vessel systems



## Static Piles

- Rudimentary
- Piles must be large enough to heat up, small enough to aerate by convection
- No controls
- Not recommended



## Turned Windrows



## Turned Windrows

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- Best suited for yard and garden waste
- Can be at almost any scale
- Small capital investment and low operating costs
- Large land requirement
- Most common option in North America
- Currently used by City of Vancouver for residential yard waste



## Aerated Static Piles

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- Applicable to a wider range of materials
- Air is forced in or out with fans
- Piles built on platforms
- Rate of air flow is often controlled by temperature or oxygen feedback
- Capital costs are higher than windrow



## Covered Aerated Static Piles

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- Covers reduce odours and energy requirements
- Expanding usage in North America, well established in Europe



## Bays, Beds and Tunnels

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- Usually inside
- A variation on windrows
- Good odour control



- Suitable for a wide range of materials, including sewage sludge

## In-Vessel Systems

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- Highest level of containment and control
- Recent opening of a facility in Squamish
- Feedstock mixing is critical



## How to Choose?

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- Costs
  - Capital
  - Operating
  - Land Requirements
- Flexibility
  - Adaptable to seasonal variations
  - Ease of expansion
- Public Acceptance
  - Ease of Siting
  - Reputation
  - Proven Technology
- Process Simplicity
  - Process Duration
  - Front end processing



## How to Choose?

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- Environmental Controls
  - Leachate
  - Odors
  - Vectors
- Feedstock Variability
  - Yard and Garden
  - Food Wastes
  - Bio-solids / Manures / Mortalities
  - Mixed MSW
- Product Marketability
  - Process Control
  - Product Quality
  - Market Value of End Product



## Cost Comparison

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	Static Piles	Turned Windrows	Aerated Static Piles	Bays, Beds, Tunnels	In-Vessel
Capital Cost (excluding land)	\$0.5 million	\$2 million	\$6 million	\$10 million	\$13 million
Operating Cost	\$15	\$25	\$30	\$50	\$50
Land requirement	Medium	High	Medium	Medium	Low



Costs are based on a capacity of 20,000 tonnes per year