Everything Old is New Again

Biosolids Recycling in the 21st Century

VT BIOSOLIDS FORUM PRESENTATION

St. Leo's Hall, Waterbury, VT
November 5th, 2013

CASELLA RESOURCE SOLUTIONS
recycling · collection · organics · energy · bio-fuels · landfills

Background

- Where It All Began
  - Dispersed, Nomadic Populations
  - Used Everything
  - Wasted Little
  - Residuals/Residues Dispersed

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Background

- Modern Day
  - Intense Centralization
  - Convenience, Cheap Goods, & Planned Obsolescence
  - Increased Waste per Person
  - Large Concentrations of Waste
    - Dumps Evolving into Landfills

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Presentation Overview

- Solid Waste Management Hierarchy
- Residuals not Wastes
- Direct Recycling
- Indirect Recycling
- Looking Forward

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Casella Organics – Who We Are

- Recycler of Organic & Mineral Residuals Since 1983
- Manage Nearly 800K Tons Annually
- More than 50% is Recycled
- Staff of over 50 Soil Science Professionals, Engineers, Agronomists, Crop Advisors, and Project Managers
- Provider of Material Management and Resource Recovery Solutions

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Casella Organics – Solution Providers

- Generator Solutions
  - Class A Processing & Land Application
  - Class B Processing & Land Application
  - Sludge Incineration
  - Landfilling
  - Cost-effective & Proper Solutions

- Farmer Solutions
  - Crop Fertilization & Liming Solutions
  - Soil Improvement from Organic Matter
  - Affordable Alternatives to Conventional Agricultural Chemicals

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Solid Waste Management Hierarchy

(Policy, not Regulation)

Goal is to Eliminate (or at least Reduce) Waste and Then Achieve Highest, Best Use

- Reduce
- Reuse
- **Recycle – Today's Focus**
- Incinerate
  - w/Energy Recovery (Fuel – Regulatory)
  - w/o Energy Recovery
- Dispose

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Residuals not Wastes

Q: When is a waste not a waste?

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Residuals not Wastes

Q: When is a waste not a waste?

A: When it has value that can be safely and cost-effectively captured and used. This does not happen without a lot of research and education.

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Residuals not Wastes

Why is this important?

- Public perception
- Regulation
  - Beneficial Use Determination
    - Categorical
    - Material Specific
  - Suitability for Use or Reuse
- Landfills are a Finite Resource
  - Construction and Expansion
    - Moratoriums
    - Regulatory Thresholds & Hurdles
  - Waste Bans

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Recycling – or Resource Recovery

Many ways to reclaim value, turning wastes into commodities

Direct

With Energy Recovery

Indirect

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Direct Recycling of Biosolids

- Land Application
  - Class B Biosolids – Some (AD)
  - Site Use Restrictions
    - Setbacks
    - Public Access Controls
    - Crop Production Limitations (Time)

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Indirect Recycling of Biosolids

- Class A Processes & Land Application
  - Composting
  - Alkaline Stabilization
  - Heat Drying
  - Anaerobic Digestion
  - Sludge Incinerator Ash
- Class B Biosolids & Land Application – Most
- Topsoil Manufacturing w/ Class A & B

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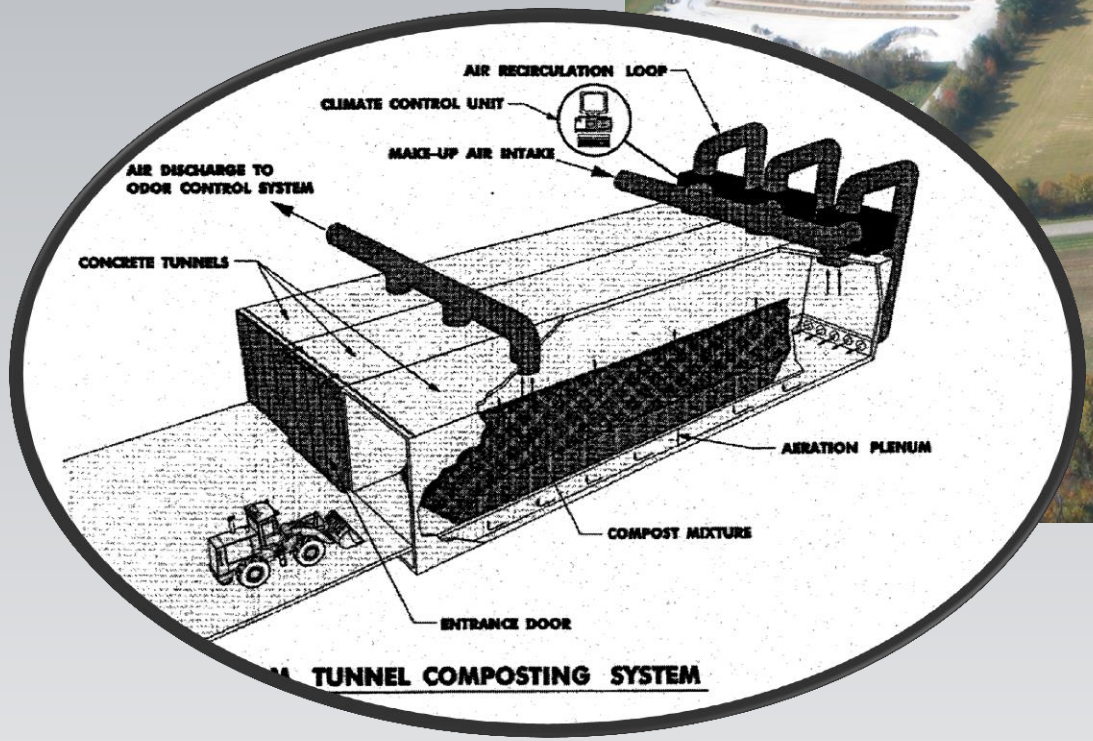
In-Vessel Biosolids Composting



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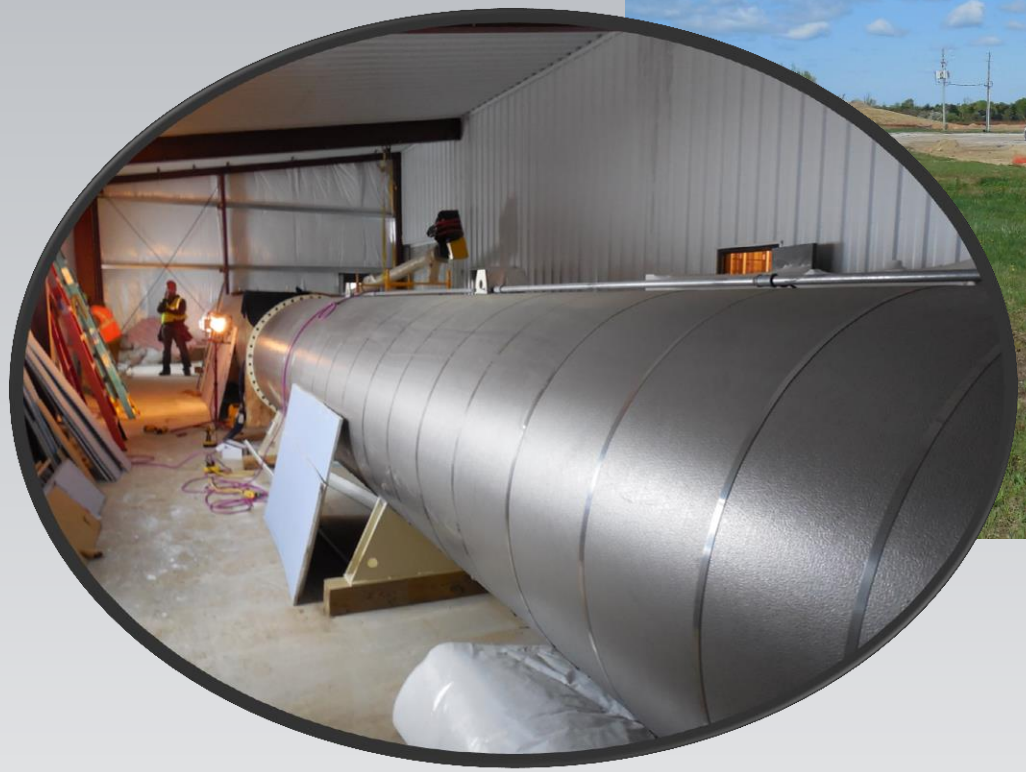
Biosolids Alkaline Stabilization/Pasteurization



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Biosolids Heat Drying & Pelletizing

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Facility Heating and Cooling using Combined Geothermal and Process Heat Capture System

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Looking Forward

- Diminishing Landfill Capacity
- Legislative Bans of Materials from Landfills
- New Technology
  - or Resurrected Old Technology, Improved or Repurposed
- Diminishing Availability of Natural Resources
- Stricter Environmental Regulation and/or Enforcement
- Sustainability – Because It's the Right Thing to Do

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Contact Information

Jeffrey C. McBurnie, P.E.

Casella Organics

Director of Permitting & Regulatory Affairs

207-347-3618

jeff.mcburnie@casella.com