Biosolids Emerging Technology Workshop

IPS Composting System & Biosolids Drying Technology

Barbara Petroff
September 28, 2004
IPS Composting System

- Technology
- Trends
- Timing
- Clean Water
- Clean Solids
- Innovations – 7% to research
IPS Composting System

- Enclosed, Automated, Agitated Bin
IPS Composting System

- Biosolids processing size range
  - Plymouth, NH (4.5 wtpd)
  - Calabasas, CA (30 wtpd)
  - Burlington County, NJ (200 wtpd)
  - Proposed (700-1500 wtpd)
IPS Installations

- Canada
- United States
- Europe
- Middle East
- New Zealand

26 Operating
5 Design/Start-Up
IPS Composting Trends

- Canada - MSW
- United States - MSW, SSO & Biosolids
- Europe - MSW, SSO & Biosolids
- Middle East - MSW
- Australia - MSW
- New Zealand - Biosolids & SSO

Legend:
- Green = Biosolids
- Yellow = SSO
- Orange = MSW
Southern California Composting

Las Virgenes Municipal Water District
Southern California Composting

- Technologies – Outdoor Vs Enclosed

Windrow

Aerated Static Pile

In-Vessel
Southern California Composting

- SCAQMD Rule 1133
- CIWMB recycling goals
- Class A and EQ trends
- Composting established
Southern California Composting

- IPS and EASP Capital and O&M Costs
  - Enclosed
  - Odor control
  - Amendment
  - Compost products
Southern California Composting

- Capacity and Space

ASP

Windrow

Agitated Bin
Southern California Composting

- **Capacity and Space**
  - 75,000 tons per year biosolids
  - Composting, Curing and Odor Control
  - IPS 9 Acres
  - ASP 24 Acres
IPS Composting System

- CIWMB 2004 Diversion Rate 50%
  - Municipal Solid Waste
  - Green and Yardwaste
  - Industrial Residuals
  - Food Scraps
  - Agriculture
  - Biosolids
  - Wood
IPS Composting System

- Amendment Flexibility (2 inch minus)
  - Woodwaste and pallets
  - Agriculture
    - Tree and vine cuttings
    - Peanut shells
    - Cotton husks
    - Rice hulls
  - Yardwaste
  - Sawdust
IPS Composting System

- Process
  - Mixing
  - Loading
IPS Composting System

- Process
IPS Composting System

- Agitator Improvements
  - Narrow bay 25 to 50 Hp
  - Wide bay 75 to 100 Hp
  - Level bed device
  - Stainless steel drum
  - Independent 4 wheel drive
IPS Composting System

- **Agitator Improvements**
  - Capacity 8-15%
  - Efficiency
    - Short time
    - More bays
  - **Las Virgenes**
    - 2 fpm to 5 fpm
  - **Rapid City**
    - Load 38 cy Vs 15
IPS Composting System

- Bay Temperature and Aeration
IPS Composting System

- Bay Water System Options
  - Overhead
  - Bay Wall
IPS Composting System

- CompMaster™ Computer Control
IPS Composting System

- Active Composting to Curing
IPS Composting System

- Screening and End Use
IPS Composting System

- End Use Innovations
  - Landscaping
  - Turf farms
  - Potting soils
  - Soil blending
  - Bagging retail
  - Green roofs
  - Fire control
  - Storm water control
  - Soil erosion and slope protection
IPS Composting System

- Air Management
IPS Composting System

- Air Management
IPS Composting System

- Biofilter with moisture addition
IPS Composting System

- Las Virgenes Biofilter Test Results 2004
  - BacTee
  - Standard Biofilter
  - Total reduced sulfur >99.998%
  - Ammonia >99.924%
  - VOCs 96.15%
IPS Composting System

- Facility in Review
IPS Composting System

- Technology
- Trends
  - Class A and EQ
  - Composting established
- Timing
  - SCAQMD Rule 1133
  - CIWMB recycling goals
Drying

Convective Thermal Dryer
Contact Surface Dryer
J-Vap®
Dragon Dryer
The Convective Thermal Dryer is a complete direct biosolids drying system that produces a 95 percent dry pelletized product and exceeds EPA 40 CFR Part 503 Class “A” requirements.
Contact Surface Dryer (CSD)

The compact, low maintenance CSD system can be engineered to recycle a portion of the dried sludge or as a single pass dryer for continuous dried sludge discharge.
By combining traditional filter press and patented vacuum/evaporation technologies, J-Vap achieves up to 99% moisture-free cake with minimal operator or material handling requirements.
Dragon Dryer™

- Indirect Dryer
  - Dual indirect heat source
  - Continuous single pass
  - 2-4 mm Class A granules
  - Input 12% to 30% solids concentration
  - Capacity 0 to 100 wet tons/day per unit
Dragon Dryer ™ Installations

- Forest City, NC
- Loudon, TN
- Mount Holly, NJ
- Newport, TN
- Ocala, FL
- Orange Beach, AL
- Seneca, SC
- Tallahassee, FL
Dragon Dryer™ Installations

- Ocala, FL (Series 4008)
  - Per 24 hours
  - 20 dry tons
  - 08 dry tons
Dragon Dryer ™ Installations

- Newport, TN (Series 4008)
Dragon Dryer ™

- Trailer Mounted Demo Unit
Dragon Dryer™ Demonstration

City of San Bernardino
Water Reclamation Plant
399 Chandler Place
San Bernardino, CA
2:00 p.m. to 4:00 p.m.
**Dragon Dryer™**

- **Wet End Housing** - Entry point for the wet sludge cake.
- **Feed/Storage Hopper** - Collects the sludge cake from the dewatering equipment and meters it into the Wet End Housing.
Hollow Flight Auger - Heats and moves the sludge cake through the Dehydration Chamber.

Hot Oil Unit - heats transfer fluid and circulates it through the Hollow Flight Auger.
Dragon Dryer™

Dehydration Chamber - Rotates in the opposite direction around the Hollow Flight Auger gently lifting, tumbling and drying the sludge cake.

Dehydration Chamber Burners - 3 individually controlled burners heat the rotating Dehydration Chamber.
**Dragon Dryer™**

Discharge Auger - Conveys the dried product to the dried product storage.

Dry End Housing - Exit point for the dried sludge cake (Biosolids).
Odor Control - Odor Control is optional and can be custom designed for each Dragon Dryer application.

Condenser System - Collect the steam from the Dehydration Chamber and condenses it back to water and returns it to the head-works.
Dragon Dryer™

- Operator Friendly
  - PLC controlled
  - Remote monitoring
  - Remote Alarm notification
  - Automatic operation
  - Limited hands-on operation
  - Continuous operation

- Low pressure system
  - No Boiler required
  - No danger from high pressure steam

- Closed system
  - Clean work area

- Automatic safety set points
  - Alarms
  - Automatic cool down
  - Automatic shut down

- Operator Friendly
  - PLC controlled
  - Remote monitoring
  - Remote Alarm notification
  - Automatic operation
  - Limited hands-on operation
  - Continuous operation
Dragon Dryer™

Advantages
- Safe, easy operation
- Air emission standards
- Beneficial use (income potential)
- Small area requirement
- Proven technology
- Short processing time
- Automatic, continuous operation
- Volume reduction
Dragon Dryer™

- **Product Characteristics, Average**
  - Density, kg/m³: 720.83 (45 lb/ft³)
  - Dry Solids Content, percent: 90.8
  - Color: Black
  - Appearance: Granular
  - Volume Reduction, percent: 76.8
  - Weight Reduction, percent: 83.6