CASA CWEA Bio Solids and Renewable Energy Seminar

October 13 Oakland and October 14 Costa Mesa

Steve Delson: CEO

Mike Moore: Environmental Compliance Advisor
Organic Residuals Management Options:

**Class A**
- Compost
- Chemical Stabilization
- Dryer/Pellets

**Class B**
- Direct land application
- Silviculture
- Incineration
- Landfill utilization/disposal
Additional Organic Residuals Management Needs

- Onsite Management
- Sustainability
- Enhanced Methane Management
- Manage Contaminates of Concern
- Resource Recovery - Energy Production
Simplicity:

Gate 5 Energy Solution

1. SLUDGE, FOOD OR ANIMAL WASTE
   - RECIRCULATING DRYING GAS
   - FLASH DRYER
   - DISTILLED WATER

2. BIOFUEL
   - BURNER & BOILER
   - CLEANED AIR
   - INERT ASH

3. Electricity
   - TURBINE
What is Gate 5?

• A transformative process for managing sewage sludge and other organic waste
• Disrupts methane production
• Destroys contaminatees of emerging concern
• Scalable and economic to operate
• A bright light amidst a global warming catastrophe
Flash Dryer

- No internal moving parts
- Maintenance is minimal
- Dryers used for > 50 years
- Ceramic liner to protect metal
Why Gate 5?

- **Scalable**
  - From 100,000 lbs./day with no upper limit
- **Simple to Operate**
  - No co-fuel required
- **Energy Positive**
  - When processing 5 WTDP or more
- **Small Footprint**
  - 60 WTPD Gate 5 System requires < 0.5 acres
Why Gate 5?

*Efficient Thermal Process Using Well-Proven Equipment*

- **Flash Dryer**
  - Used in variety of industries for < 50 years
  - No internal moving parts - maintenance is minimal
  - Feedstock becomes Powdered Biofuel

- **Powdered Fuel Burner and Biomass Boiler**
  - 100 year history in coal industry
  - Recovers > 85% latent energy of feedstock
Biofuel Features

- Latent energy in feedstock becomes usable fuel
- ThermaJet flash dryer product < 400 microns & > 90% dry
- Energy value of coal, but not a fossil fuel
**Solids Drying & Combustion Assessment**  
September 2021

**Conclusions:**

- Dried biofuel product meets technical standards for class A/EQ biosolids as per 40 CFR 503 without upstream treatment.

- Combustion of biofuel at target temperature (1,800 F) will remove > 99% PFAS compounds from combusted ash.

- Testing confirms ash to be non-hazardous.
Benefits and Features:

- **Efficient & Effective**
  Air quality-friendly thermal process eliminates hazardous organic and inorganic substances

- **Reduced Operating Costs**
  Can simplify and consolidate processes + reduce capital and operating expenditures

- **Increased Energy Production**
  Renewable energy can be produced when processing biosolids or sludge, food and animal waste
Benefits and Features:

**Complete Recourse Recovery**
100% of the sludge, food or animal waste is thermally transformed into readily usable products: biofuel, clean water, thermal energy, and ash.

**No Hauling**
No costly transportation and land-based management of biosolids and no GHG emissions from hauling.

**Improved Environmental Protection**
Efficient thermal combustion process reduces pollution of air, land, and water resources.
Awards/Accomplishments:

- **Department of Energy (DOE) Award**

- **California Energy Commission (CEC) award**
  - $1.6 Million Grant Demo Plant Santa Margarita Water District

- **California Emissions Quantity Act (CEQA)**
  - Approval from CEQA for Mitigated Negative Declaration
  - Meets emission standards

- **Patents**
  - Utility Patents: United States, France, Ireland, Greece, Netherlands, United Kingdom, Germany, Australia, and New Zealand
Gate 5 Advantages

- Sustainability
- Reduced environmental footprint
- Public perception
- Regulatory risk reduction
- Reduction in truck traffic
- Cost savings
Thank you!
Contact Information:

**Steve Delson**
Chief Executive Officer

949-306-5580
steve.d@gate-5.com

**Mike Moore**
Environmental Compliance Advisor

714-749-6314
mmoore.biosolids@gmail.com

**Website:** gate-5.com

**Gate 5**
UCI Beall Applied Innovation
5270 California Avenue, Suite 200
Irvine, CA 92617