Update on Biosolids Regulatory & Market Trends

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1. Biosolids 101
2. Regulatory Trends
3. Market Trends
4. Perception & Reality
Typical Solids Processing Schematic

Primary sludge

Waste
Secondary Sludge (WSS)

Thickening

Stabilization

Dewatering (optional)

Examples:
- Centrifuge
- Belt Filter Press
- Screw Press

Examples:
- Anaerobic Digestion
- Aerobic Digestion
- Lime stabilization

Examples:
- Agriculture
- Compost
- Landscaping
- Forests
- Golf courses
- Coal substitute

Determinations

Screenings

Grit

Landfill
Definitions

**Sludge**
- Semi-solid organic residuals generated during the water reclamation process
- Not suitable for beneficially recycling

**Biosolids**
- Treated (digested) sludge suitable for beneficially recycling
- Meets state and federal treatment standards
Biosolids Regulations

• 40 CFR Part 503 – Federal Rule contained within the U.S. Clean Water Act
  – EPA administered
  – Requirements in NPDES permits
  – State and Local Requirements
Biosolids Quality

The Part 503 regulation focuses on three parameters as a basis for determining biosolids quality:

1. The presence of pollutants (As, Cd, Cu, Pb, Hg, Mo, Ni, Se, Zn)
2. The presence of pathogens (e.g., bacteria, viruses, parasites)
3. The biosolids attractiveness to vectors (e.g., rodents, flies, mosquitoes).
Pathogen Reduction Standards

• Class A:
  – Pathogen free
  – Unrestricted use

• Class B:
  – Pathogens significantly reduced
  – Restrictions on use

• Class B with appropriate restrictions equally protective as Class A according to state and federal regulations
Possible Changes to Federal Regulations

- Class A Alternatives 3 & 4 may be eliminated
- Phosphorous may be added to nutrient limit
- Pharmaceuticals and Personal Care Products are being considered for regulatory controls
- Possible reduction in limits on some metals
Legal, Regulatory & Perception

- Bans on Product Use or Out of Area Materials
  - Ban on Class B (Except “in-county” Class B)
  - Ban on all but “Class A, EQ Compost”

- Increased Regulatory Control & Decreased Constituent Limits
  - New EPA As limits, elimination of test method for Class A, Nutrient Limits

- Product Use (San Francisco Compost Use)
  - Center for Food Safety
Sewage Sludge Incineration (SSI) Rule

- 40 CFR Part 60
  - Emission Guidelines
  - MACT Standards

USEPA Definition of Sewage Sludge as Solid Waste

Implication to SSI

Biosolids Management
Common Biosolids Products/Management Options

• Class A & B Dewatered Cake:
  - Agriculture
  - Landfill, Cover/Reclamation of Disturbed Areas
  - Injection for Methane Recovery

• Compost:
  - Nursery
  - Landscaping
  - Residential

• Dried pellets:
  - Golf courses, Landscaping
  - Energy Production
Agriculture

- Agreements with private farmers
- Agency-owned land
- Public-Private Partnership
  - Contractor permitting, siting, and operations
- Permitting, siting, application
- Hauling
Agriculture

**Advantages**
- Cost effective
- Environmentally and economically beneficial
- Most common management alternative in U.S.

**Disadvantages**
- Public perception may be negative
- Depends on farmer participation
- Most susceptible to changing regulations
- Can’t be used in organic farming per USDA
Land Application Old Technology Still Innovative

- Land application for Bio-diesel crops
- Sally Brown Research
  - [http://faculty.washington.edu/slb/](http://faculty.washington.edu/slb/)
Alternative Landfill Cover & Disturbed Land Restoration/Reclamation

- Possible soil manufacturing: blending biosolids with amendment such as wood chips

**Advantages**
- Environmentally beneficial
- Typically long-term projects
- Less susceptible to future regulatory changes
- Non food chain use

**Disadvantages**
- Limited number of end users in local area
- Typically long-term projects
- Less susceptible to future regulatory changes
- Non food chain use
Compost Production

- Composting (EPA Class A): 131 deg F or more for 3 days (aerated static pile or in-vessel methods)

**Advantages**
- Marketable product (public loves compost)
- Revenue potential (not profit)
- Less susceptible to future regulatory changes

**Disadvantages**
- Higher costs
- May need additional land
- Potential siting challenges
Dried Pellet Fertilizer Production

- Thermal Drying definition (EPA Class A): 90% solids, biosolids or gas leaving dryer is 176 deg F or more

- **Advantages**
  - Marketable Product
  - Revenue potential (not profit)

- **Disadvantages**
  - Less control over final use of biosolids fertilizer
  - Higher costs
Biosolids Trends

Bioenergy

Agricultural, Industrial Residuals and Product Use

Public/Private Partnerships, Regionalization & Process Diversity

Outreach, Education And Stakeholder Involvement
Bioenergy Technologies

• Anaerobic Digestion
• Biogasification
• Thermal Drying
• Thermal Oxidation

• Combinations/Other:
  – Thermal Conditioning type processes
  – Cement Kilns

Regulatory Considerations
Other National / International Issues & Trends

- Emerging Contaminants
- Micro-constituents
- Reactivation and Re-growth of Bacteria
- Public Perception Issues
Getting Biosolids Recognized as “Value-Added Products”

• Bioenergy
• Compost Product
• Nutrients to bio-diesels
• Carbon Sequestration
• Biosolids Products & Bio-Gas Utilization

Recognized as “Renewable Resources”
Environmental Management Systems

- Sustainability through EMSs
- Importance of Demonstrating Value of NBP EMSs
- Continuous Improvement
Sustainable Biosolids Programs

• Long Range Planning
• Risk Reduction
• Cost Effectiveness
• Publically Supported
Questions?

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