Compost Facility Management

- Site Design & Requirements
- Safety
- Fires
- Odors
- Contaminants

Compost Facility Management

- Site Design
  - Picking the right location will minimize potential problems in the future.
    - Buffers & Setbacks
    - Residential Developments
    - Topography
    - Common Sense Design & Engineering

Sitting Requirements

	North Carolina	South Carolina
100-yr floodplain	Outside	Outside
Property Lines	100’	50’
Dwellings	500’	200’
Streams	50’	100’
Wells	100’	100’
Depth to SHWT	2’	2’
Local zoning approval	Yes	Yes
Wetlands	Outside	Outside

Compost Facility Management

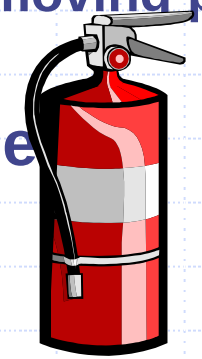
- Safety
  - The key to safety is common sense and good business practices.

Compost Facility Management

- Safety in Compost Production
  - Develop a Monitoring Program
    - Monitor Feedstocks- for hazardous waste & contaminates
    - Monitor Leachate – for nutrients & pathogens
    - Composite Sample in process

Compost Facility Management

- Safety in Compost Production
  - Equipment
    - Develop a preventative maintenance program
    - Identify potential work area hazards
      - Label - Pinch points, belts, chains, moving parts, throw zones
    - Equip with proper fire extinguishe



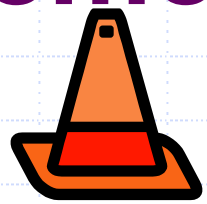
Compost Facility Management

- Safety in Compost Production
  - Personnel
    - Hold regular scheduled safety meetings
    - Train employees to recognize potential problems
    - Report injuries as per your company's guidelines

Compost Facility Management

- Safety in Compost Production
  - Minimizing Risks
    - Pick the right site
    - Design for storm water and leachate collection and reuse
    - Incorporate wind breaks and fire breaks
    - Contact the local fire dept. for site inspection
    - Know your feedstocks
    - Maintain a good housekeeping program

Compost Facility Management



- Safety
  - –The key to safety is common sense and good business practices.
  - – Ensure that adequate safety equipment is available for workers, staff and visitors
  - – Follow OSHA Guidelines
  - – Have an action plan in place for emergencies
    - Operations & Maintenance Manual

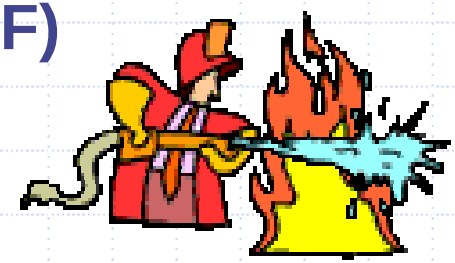
Compost Facility Management

- **Fires**
  - **Chemical equation for combustion**

organic hydrocarbon (fuel) + oxygen →

carbon dioxide + water + heat + residue (e.g. compost or ash)

- **Typical compost materials ignite at temperatures in the 150-200ºC (302-392ºF)**

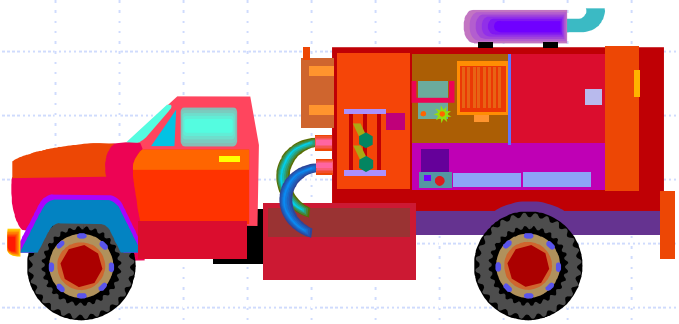


Compost Facility Management

- Fires
  - Ready available fuel source
  - Configured in piles or windrows
  - Ignition Source
    - Mechanical – sparks, equipment, cigarette
    - Biological – uncontrolled microbial activity.
    - At Temperatures exceeding 70- 80^{o}C (158-176^{o}F) chemical oxidation takes over and spontaneous combustion occurs.

Compost Facility Management

- Rules for Fire prevention
  - Meet with your local Fire Dept
    - Discuss & agree on guidelines
    - Have proper equipment on site
  - Assure adequate ventilation of piles or windrows
  - Avoid pile depths greater than 12 ft
  - Watch for vents
  - Monitor temperatures on all piles weekly
  - Locate the fire & open with front-end loader
  - Water embers

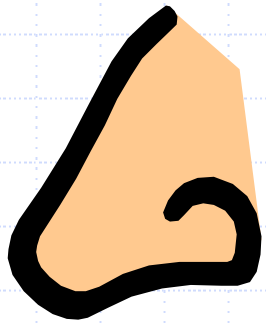


Compost Facility Management

- A huge mountain of cow manure continues to smolder for 3 months at a feedlot near Milford, Neb. NATI HARNIK, AP

Compost Facility Management

- Odors
  - Virtually all compost feedstock can produce some odor that is objectionable to someone.
  - The nose knows!



  - Some people believe that odor and compost are both synonymous.

Compost Facility Management

- Odors
  - Active composting
    - Breaking down complex organic compounds
    - Microbial action facilitates breakdown and odors
    - Odors released are dictated by
      - Facility design
      - Process design
      - Environmental conditions

Compost Facility Management

- Odors
  - Active composting
    - Creates hot air which rises and carries odors and volatile compounds are driven off
    - The more odorous the beginning feedstock the higher the potential for odor problems

Compost Facility Management

- Odors
  - Minimizing the risk
    - Understand the composting process
    - Facility design
      - set backs
      - topography
      - seasonal wind conditions
    - Screen with wind breaks and vegetation
    - Understand the composting process

Compost Facility Management

- Odors
  - Management practices to minimize odor problems
    - Know and understand composting & monitoring parameters, C:N ratio, Oxygen, pH, and moisture

Compost Facility Management

- Odors
  - Management practices to minimize odor problems
    - C:N Ratio

      More than 30:1 - Seldom a problem except when piles are too wet, too large, and insufficient in oxygen.

      Less than 25:1 - Common problem due to excess Nitrogen. Most easily corrected by adding carbonaceous materials and increasing oxygen by reducing pile size, increasing bulking material.

Compost Facility Management

- Odors
  - Management practices to minimize odor problems
    - Oxygen - Less than 2%

      Measure with an Oxygen Analyzer

      Aerate more frequently

      Reduce pile size to increase convection currents

      Add courser bulking materials to increase porosity

      Check moisture

Compost Facility Management

- Odors
  - Management practices to minimize odor problems
    - Moisture

      Ideal range 50-60%

      Hand squeeze test

      Oven dry composite sample

      Too wet - Turn to dry out or add more bulking materials

Compost Facility Management

- Odors
  - Management practices to minimize odor problems
    - pH

      Test feedstocks & compost mix

      Ammonia Odor - Indication of a high pH add lower pH materials such as sulfur, check C:N ratio or increase porosity

      Hydrogen Sulfide (Rotten Egg Odor) - indication of a low pH or low oxygen, add more bulking materials, reduce pile size or small amounts of lime

Compost Facility Management

- Contaminants
  - Pre-test feedstock sources
  - Post signs
  - Track all incoming feedstock by load
  - Visually inspect loads as they are received
  - Charge addition fees for contamination
  - Remove contaminants before processing

Compost Facility Management

- Plastic Contaminant
  - Yard Waste
    - Separate at curbside
    - Change to paper or bio-degradable bags

Compost Facility Management

- Plastic Contaminant
  - Post Process Removal
    - Separate at scre
    - Bu over

Komptech Hurricane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