Waste Disposal

Reading
- Today: Ch 15 (to pg 386)
- Next Monday: Ch 16

Solid Wastes
Sources and Composition

Municipal Solid Waste

Solid Waste Disposal on Land

Older “Dumps”
Landfill disposal rates

State Land Disposal Rates

Source: BioCycle Magazine, April 1999

Solid Waste Degradation – Leachate and Gas

Aerobic Processes
Organics + Oxygen
CO₂ + Water

Anaerobic Processes
Organics
CO₂ + Methane, H₂S

Solid Waste - Leachate Escape

Landfill Gas

Green Power Purchases
Total = 97 megawatts (MW)

Other renewable energy
Hydrogen
Wind power
Fossil fuel

Landfill gas

13
2 MW
36 MW
**Landfill Siting**

Some Considerations:
- Outside of floodplains
- Far from rivers or lakes
- Far from airports
- Far from water wells
- Avoid steep slopes
- Avoid shallow water tables
- Low permeability soils
- Low permeability bedrock

**Biggest constraint - NIMBY**

**Composting of Yard Waste**

**Solid Waste Incineration**

Air quality

Land disposal or alternative use

**Solid Waste Incineration Rates**

- 6 municipal waste incinerators in WI
- 10 “Waste-to-energy” facilities in NY
**Ocean Dumping**

Continued dumping of dredge spoils

**Solid Wastes and Climate Impacts**

- **Virgin Inputs**
- **Life Cycle Stage**
- **GHG Emissions**
- **Sink & Emission Offsets**

**Waste Reduction - Recycling**

- Reusables rather than disposables
- Bulk food rather than fast food
- Home Composting

**Waste Reduction – More Options**
Hazardous Wastes

- WI Superfund Sites
- “Secure” Landfill
- High T Incineration

Liquid Waste Ponds or Trenches

- Ground Water Plumes at Rocky Mountain Arsenal

Liquid Waste Injection

- Denver Earthquakes

Sewage – On-site Disposal

- Composting toilet
Sewage – Municipal Treatment

Municipal Treatment Products

Land Application of Composted Sludge

Treated Effluent to Streams