CVEN 4474/5474 Haz Waste Outline

- CERCLA (Superfund) Regulations
  - 1980 CERCLA Regulation
  - Legal responsibilities
  - 1986 SARA
  - Hazardous Ranking System
  - Superfund “process” (orig. & new optional)
  - Superfund progress

1980 Comprehensive Environmental Response, Compensation, & Liability Act (CERCLA) “Superfund”

- Defined hazardous substance
  - Based on other regs: RCRA, CWA, CAA, TSCA, etc.
- Method to rank the worst sites in U.S.
- Established “Superfund” of money
  - $1.8B 1980-1985
- Allowed EPA to clean-up, order abatement, and recover costs (< 3x actual)

Legal Terms

- Strict, joint & several liability
  - Strict = do not need to be “knowingly at fault”
  - EPA does not need to prove intent or negligence
  - Joint/Several = one held responsible for all
- Who pays?
  - “Deep pockets” those with money!
  - Can go bankrupt due to cleanup cost
  - Potentially Responsible Party (PRP)

Example: Municipal Landfill

- ~20% of Superfund sites are municipal landfills
  - Example: City of Boulder Marshall LF
- Who is liable?
  - “Cradle to Grave”

1986 Superfund Amendments & Reauthorization Act (SARA)

- Expanded $ in Superfund
  - $8.5B ‘86-‘91; $5.1B ‘91-‘94; LUST fund
- EPCRA Emergency Planning & Community Right-to-Know Act
- Agency for Toxic Substances & Disease Registry to conduct site health assessments
  - Do haz sites cause health problems?
- HRS re-evaluated
- Settlement changes - de minimus

Hazardous Ranking System (HRS) - 1980+1990 revisions

- Determines if site a “Superfund” site under federal jurisdiction (EPA)
- 4 Routes for Exposure (S)
  - Air (Sa) migration
  - Groundwater (Sgw) migration
  - Surface Water (Ssw) migration
  - Soil (Ss) direct contact
- Fire/Explosion Hazard target for Early Action
- Old hand worksheets; currently software “PRESCORE”
HRS (cont.)
- Exposure Pathway Information
  1. Release [LR; observed or not]
  2. Route characteristics [ex: depth to GW, precip, distance to SW]
  3. Waste characteristics (tox/mobility/persistence/bioaccum; qty)
  4. Containment of waste (Yes/no, amt, quality)
  5. Targets (# people, distance, sensitive eco)
  \[ S = \frac{(S_{a}^2 + S_{gw}^2 + S_{sw}^2 + S_{s}^2)}{4} \times 0.5 \]
  Cut-off 28.5 score (originally 400 sites)
  - Kept same cut-off even though scoring/eqns new!

HRS and Site Risk
- Does HRS correlate with site risk?
  - Not a true “risk assessment”
  - Data used less than needed for a good risk assessment
  - I haven’t seen attempt to correlate [ATSDR]
- How do the various sites rank?
  - Given change in scoring can’t compare pre 1990
  - Rank in 1990: Stringfellow #32; Love Canal #158; Times Beach #492

Superfund Process
- Site Discovery \rightarrow PA, SI \rightarrow HRS score \rightarrow Site on NPL \rightarrow Pub/PRP
- Remedial Investigation (RI) \rightarrow Feasibility Study (FS) \rightarrow Risk Assessment
- Record of Decision (ROD) \rightarrow Remedial Design (RD) \rightarrow Remedial Action (RA)
- O&M \rightarrow Longterm monitoring \rightarrow Closure \rightarrow NPL deletion \rightarrow Post-closure monitoring
- ROD = sets remedial alternative to use
- ROD = Applicable, Relevant & Appropriate Requirements

Preliminary Assessment (PA)
- Site Inspection (SI)
  - PA with historical records and existing data
  - SI to gather other information needed
  - GOAL: enough information to get the HRS score for the site WITHOUT spending lots of money

Remedial Investigation (RI)
- Determine extent of contamination & risk to human health & environment
  I. Problem ID and scoping
  - Use existing site information
  II. Problem Quantification
  - Collect site samples and field data to verify exposure pathways & compare alternatives
  III. Detailed Investigation
  - Bench and pilot studies

Feasibility Study
- ID possible remedial alternatives
- Screen technologies by feasibility, cost
- Select alternative R.A. and analyze each in detail
- ROD = sets remedial alternative to use
- ROD = Applicable, Relevant & Appropriate Requirements
- Risk-Based clean-up levels (RBCA)
Sites on the NPL
- ~20% municipal landfills (250)
- Surface impoundments (443)
- Commercial/industrial landfills (420)
- Containers/drums sites (300)
- Spills, electroplating, wood preserving, waste oil processing, solvent recovery, dry cleaning, landfarming; tire, drum, battery recycling
- Military testing, ordinance

1992 Superfund Accelerated Clean-up Model (SACM)
- Problem: site progress very SLOW!
  - Ave 8 yrs from NPL list to ROD
- Changes to stream-line process by building on experience
  - Non-duplicative site assessment
  - Prompt risk reduction
  - Cross-program coordination
  - Early enforcement & public participation
  - Presumptive remedies

Presumptive Remedies
- Municipal Landfill Sites
- Wood Treater Sites
- CERCLA Landfill Caps
- Sites With Volatile Organic Compounds in Soils
- Contaminated Groundwater at CERCLA Sites

SACM Process
- PA, SI, RI
- Regional Decision Team
- Early Action
- Long term Haz Rank
- Early Action complete
- Long term Action
- Deletion
- Long term Action complete

How is “Superfund” doing?
- 1560 total sites (proposed, final, deleted)
- 2002 1233 sites on NPL [1499 final&deleted]
  - RA not begun 50 [2000; 2002]
  - RI/FS underway 178
  - Remedy selected 39
  - Study/Design underway 61
  - Construction underway 417/381
  - Construction completed 546/384
  - Deleted (clean) 218/266

Contaminated sites.... beyond Superfund
- CERCLA 1560
- Dept. of Energy (DOE) ~4000
- Dept. of Defense (DOD) ~24,500
- Leaking Underground Storage Tanks (LUST) ~1,500,000
- CO non-SF or federal in CERCLIS ~155
- CO voluntary clean-up ~210

http://www.epa.gov/superfund/pubs.htm