

■ Major outbreaks in the States

1) Love Canal (Niagara, NY)

- a) ca. \$250 million spent.
- b) **chlorinated chemicals**; dioxin, trichlorophenol, lindane, chlorobenzenes.

1890s W.T. Love initiated the construction for hydroelectric power.
1905 Hooker Electrochemical opened chlorine manufacturing plant.
1942-53 Hooker dumped 25,000 tons of waste in the Canal.
1953 Hooker sold the Canal property to Niagara Falls School Board for \$1.
1960s Complaints from local residents for strong odors.
1977 Heavy rain; NYS and EPA began sampling.
1978 State and Federal emergency declared. Evacuation began.
1979 Lawsuits between Occidental Chemical and NYS and the US.
1980 **CERCLA**...Extensive evacuation.
1984 On-site remediation completed.
1985 Long-term monitoring program began.
1989 Occidental agreed to complete remediation of Love Canal and dispose of hazardous wastes collected.

2) *Exxon Valdez* (Prince William Sound, AK): Biodegradation. 1992. 3:315-335.

- a) **Oil spill** in marine and coastal regions (March, 1989).
- b) Bioremediation used as a supplemental cleanup technology.
- c) **Oleophilic fertilizer** used (oil-miscible liquid carrier + N and P).
- d) **Biodegradation indicator**; ratio of readily biodegradable normal alkane (C17, C18) to branched alkane (pristane, **phytane**).
- e) Cleanup action finished. Ecological and toxicological studies left.

■ Regulations by government

US EPA can restrict, use and disposal of any organic or inorganic chemical substances under various acts.

- 1) FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act, 1972)
- 2) TSCA (Toxic Substances Control Act, 1976)
- 3) **RCRA** (Resource Conservation and Recovery Act, 1976)
 - a) a cradle-to-grave system for the management of hazardous waste.
 - b) requires a manifest system for the generation, transportation, treatment, storage, and disposal of hazardous wastes.
 - c) requires permits for the treatment, storage, or disposal.
 - d) applies mainly to **active facilities**.
 - e) **management of current waste and prevention of release**.
** Solid wastes under RCRA: include liquid, contained gas as well as solid*
- 4) **CERCLA** (Comprehensive Environmental Response, Compensation, and Liability Act, 1980)
- 5) **SARA** (Superfund Amendments Reauthorization Act, 1986); as an amendment
 - a) provides for **remedial action at inactive or abandoned hazardous waste disposal sites**.
 - b) provides for removal (also cleanup) of spills of hazardous wastes.
 - c) provides for reporting releases to the environment of wastes
 - d) provides for natural resource damage assessments.
 - e) **remediation of existing hazardous waste sites**.
- 6) Pollution Prevention Act (1990)