

# The Resource Conservation and Recovery Act: Hazardous Waste Management and Disposal

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# Background and Overview

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- Resource Conservation and Recovery Act (RCRA)
  - Waste management statute
  - Meant to prevent the creation of new CERCLA sites
  - Regulates:
    - Hazardous Waste Management (RCRA Subtitle C)
    - Solid Waste Management (RCRA Subtitle D)
    - Underground Storage Tanks (RCRA Subtitle I)

# Background and Overview

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- RCRA creates “cradle-to-grave” hazardous waste management system
  - Requirements for the characterization and handling of waste by waste generators
  - Detailed recordkeeping requirements for the tracking of waste
  - Imposes strict requirements on the ultimate disposal of waste
- RCRA Authority Largely Delegated to the States
  - State program must be at least as stringent as the federal program
  - Federal EPA retain authority to “overfile” as a backstop

# Parties Regulated

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- Generators
- Transporters
- Treatment, Storage, and Disposal Facilities

# What is Hazardous Waste?

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- “Hazardous wastes” are “solid wastes” (this term includes liquids and gases) that because of physical, chemical, or infectious characteristics pose a threat to human health or the environment.
- To be a solid waste, the material must be “discarded” (i.e., abandoned, burned, disposed, “inherently waste-like”.)
- Certain recycled materials are not “solid wastes” and are therefore excluded from regulation under RCRA.

# Identifying Hazardous Waste

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- EPA has promulgated regulations specifying two types of hazardous wastes:
  - Characteristic Hazardous Wastes
    - Wastes that exhibit one of four hazardous characteristics (Ignitable, Corrosive, Reactive, Toxic)



**FLAMMABLE**



**POISON**



**EXPLOSIVE**



**CORROSIVE**

# Identifying Hazardous Waste

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## – Listed Wastes

- F-Listed: Wastes from non-specific sources
- K-Listed: Wastes from specific sources (e.g., wastewater treatment sludge from the production of molybdate orange pigments)

## • Mixture Rule

- If a hazardous waste is mixed with non-hazardous wastes, the mixture is treated as a hazardous waste and regulated under RCRA
  - If a characteristic waste is mixed with non-hazardous waste and it loses the hazardous characteristic, it is not longer hazardous waste, but this is considered treatment of hazardous waste under RCRA

# Exclusions

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- From Hazardous Waste:
  - e.g., mining wastes, household wastes



- From Solid Waste:
  - e.g., domestic sewage, industrial wastewater discharges subject to Clean Water Act, recycled scrap metal



# Hazardous Waste Generators

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- A Generator is any facility that produces hazardous waste...

Industrial



Commercial



Institutional



# Generators - General Requirements

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- Identify and characterize hazardous waste streams
- Obtain a generator I.D. number from state or EPA
- Manage hazardous wastes safely
- Store hazardous waste appropriately and in accordance with time limits
- Manifest waste sent off-site for disposal
- Recordkeeping
- Employee training

# Generators – Storage

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- Containers
  - Must be in good condition (i.e., not leaking)
  - Must be closed except when adding or removing waste
  - Hazardous waste must be stored in a centralized location, except under the Satellite Accumulation Rule (up to 55 gallons of hazardous waste may be accumulated at or near the point of generation, provided certain conditions are met)
- Tanks
  - Must have secondary containment
    - Double walling
    - External liner
    - Vault

# Generators – Accumulation Time

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- The amount of time a generator may accumulate waste before shipping it off-site is determined by the generator classification
- Large Quantity Generator ( $> 1000\text{kg/month}$ ) – 90 days
- Small Quantity Generator ( $\geq 100$  to  $\leq 1000\text{kg/month}$ ) – 180/270 days (depending on how far waste must be transported)
- Conditionally Exempt Small Quantity Generator ( $< 100\text{kg/month}$ ) – indefinite

# Generators – Marking, Labeling & Manifests

- Must be labeled in accordance with Department of Transportation hazardous waste requirements
- Must be marked as “Hazardous Waste”

**HAZARDOUS WASTE**


**FEDERAL LAW PROHIBITS IMPROPER DISPOSAL.**  
IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

GENERATOR INFORMATION:  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_ PHONE \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
EPA ID NO. / MANIFEST DOCUMENT NO. \_\_\_\_\_ / \_\_\_\_\_  
ACCUMULATION START DATE \_\_\_\_\_ EPA WASTE NO. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

**HANDLE WITH CARE!**

HW1 

# Generators – Marking, Labeling & Manifests

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- Prepare and include a manifest with the waste
  - Contains generator's name, transporter's name, waste description and volume, and facility where waste is being shipped
  - Meant to ensure that waste gets to where it is supposed to go
  - Manifests can now be done electronically – “e-Manifest”

# Generators – Common Violations

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- Improper storage
- Improper recordkeeping and labeling
- Retaining manifests improperly
- Storage of hazardous waste greater than permissible accumulation periods
- Improper identification or characterization of hazardous waste

# Transporters

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- Primarily regulated by DOT (40 C.F.R. 170 – 179)
- Key RCRA Requirements
  - Must deliver entire quantity of hazardous waste to the designated facility listed on the manifest
  - Retain a copy of each manifest for three years
  - If waste is discharged during transportation, must take action to protect human health and the environment (e.g., notify local authorities, dike the discharge area)
- 10-day Rule
  - Transporters may store waste in transit at a “transfer facility” for a period of 10 days or less without becoming subject to TSD storage facility requirements



# Treatment, Storage, and Disposal Facilities

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- TSDs are generally the end point in the hazardous waste life cycle
- “Treatment” of hazardous waste means any process designed to change the composition or character of the waste so as to make it nonhazardous, safer for transport, amenable for recovery, or reduced in volume.

# Treatment, Storage, and Disposal Facilities

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- Permitting
  - Owners/Operators of TSDs must obtain a permit or interim status from state or EPA to operate
  - Interim status obtained by:
    - Being “in existence” on the effective date of the statutory or regulatory provisions subjecting the facility to RCRA
    - Notifying the government under RCRA Section 3010(a) of hazardous waste activity
    - Submitting Part A of the permit application
- Financial Assurance
  - Owners/Operators of hazardous waste facilities must establish financial assurance for the ultimate closure of the facility
    - Trust fund, surety bond, letter of credit, insurance

# Treatment, Storage, & Disposal Facilities

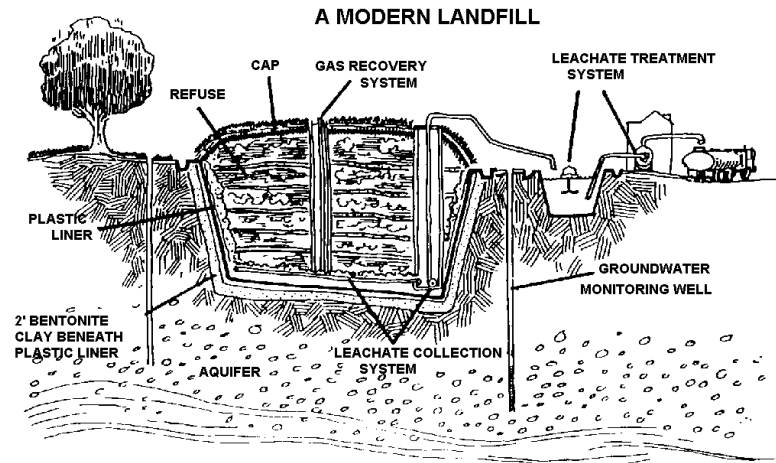
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- Waste Analysis
  - TSD owner/operator must obtain a detailed chemical and physical analysis of a representative sample of the wastes prior to storage, treatment, or disposal
  - The waste analysis must be repeated as necessary to ensure that it is accurate and up to date
  - TSD owner/operator must develop and follow a written waste analysis plan, which must be kept at the TSD
    - Parameters of analysis
    - Test methods to be used
    - Sampling method to be used
    - Frequency of analysis

# Disposal – Land Based Units

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- Land-based disposal units include:
  - Landfills
  - Waste piles
  - Surface impoundments
- All land-based disposal units are subject to minimum design standards
  - Double liners
  - Leachate collection
  - Groundwater monitoring



# Hazardous Waste Land Disposal Restrictions (Land Ban)

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- 1984 RCRA Amendments
- Hazardous wastes are prohibited from land disposal unless they are treated to specified levels or with specified technologies
- Dilution Prohibition – Can't dilute waste as a substitute for adequate treatment
- Storage Prohibition – Can't store waste to avoid treating it

# Disposal - Incinerators

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- Boilers and industrial furnaces
- Subject to destruction and removal efficiency of 99.99%
- Subject to National Emission Standards for Hazardous Air Pollutants



# TSD Facilities – Common Violations

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- Unauthorized treatment of hazardous waste
- Non-compliance with waste analysis plan
- Inadequate financial assurance
- Permit Shield Defense – If a facility is in compliance with the terms of its permit, then it is in compliance with the law

# Recycling of Secondary Materials

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- Materials are not a solid waste (and therefore not a hazardous waste) when they are recycled or reused
  - Used or reused as ingredients in an industrial process to make a product
  - Used or reused as substitutes in commercial products
  - Returned to the original process from which they were generated
  - Exceptions:
    - Used in a manner constituting disposal, or applied to the land (e.g., using material as a roadbed)
    - Burned for energy recovery



# Recycling of Secondary Materials

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- Must constitute “legitimate” recycling
  - Provides a useful contribution to the recycling process or to a product or intermediate of the recycling process
  - Recycling process must produce a valuable product or intermediate
  - Hazardous secondary material must be managed as a valuable commodity
  - Product of the recycling process must be comparable to a legitimate product in terms of hazardous characteristics and concentrations of hazardous constituents

# Used Oil

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- Used oil treated separately from hazardous waste
- Distinct set of regulations for management of used oil (40 C.F.R. Part 279)
- Even if used oil exhibits a hazardous characteristic, its disposal is still regulated under Part 279
- Used oil must be managed as a hazardous waste when mixed with a hazardous waste
  - Listed wastes: mixture rule
  - Characteristic wastes: if characteristic exhibited

# Universal Wastes

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- Batteries
- Pesticides
- Mercury-containing equipment
- Bulbs
- Standards meant to streamline hazardous waste management for commonly occurring hazardous materials
- Prohibits disposal of universal waste by handlers – must send to a “destination facility” for that type of waste
- Goal is to encourage recycling of these materials and divert them from MSW landfills

# Universal Waste – Handler Requirements

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- Relaxed requirements from typical RCRA regulations
  - No manifest
  - No generator I.D. number for Small Quantity Handlers (does not accumulate more than 5,000kg of universal waste at any one time)
  - Accumulation period: 1 year
  - Central accumulation area not required

# Underground Storage Tanks (USTs)

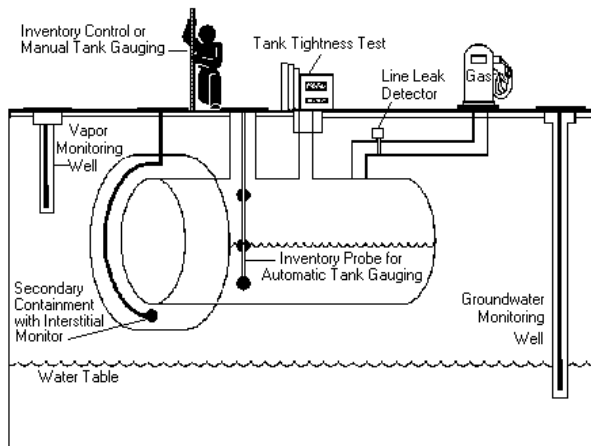
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- Ubiquitous (e.g., gas stations)
- Covers:
  - One or a combination of tanks (including underground pipes) that is used to contain regulated substances
- Excludes:
  - Farm or residential tanks of 1,100 gallons or less used for storing motor fuel
  - Septic tanks
  - Heating oil tanks
  - Tanks holding hazardous wastes
  - Wastewater treatment tanks
  - UST systems with capacity of 110 gallons or less

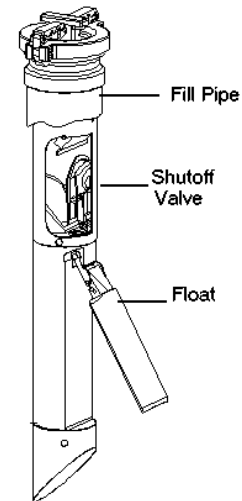
# USTs – Technical Requirements

- USTs required to meet corrosion prevention standards (i.e., fiberglass tank or cathodic protection) and have spill and overflow prevention equipment
- USTs must have leak detection systems

## Leak Detection



## Overflow Prevention



# RCRA Enforcement

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- States with approved RCRA programs have primary enforcement authority in their state but EPA retains backstop enforcement authority
- RCRA Enforcement Provisions
  - Section 3007 – Inspection and information gathering authority
  - Section 3008(a) - (c) – Administrative penalty and compliance orders
  - Section 3008(a) & (g) – Civil judicial actions
  - Section 3008(h) – Interim status corrective action orders
  - Section 3013 – Hazard monitoring, testing, and analysis orders
  - Section 3008(d) - (f) – Criminal enforcement

# RCRA Enforcement

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- Citizen Suits
  - Citizen suits to force agency to perform a non-discretionary duty
  - Citizen enforcement suits
    - Enforce for violations of any permits, standards, or regulation
    - Suits to abate imminent and substantial endangerment to health or the environment
  - Citizen suits precluded if being diligently prosecuted by the government



# Emerging Issues

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- Carbon Capture and Sequestration
  - EPA has determined that CO<sub>2</sub> streams injected underground are “solid wastes” but unlikely to be hazardous. But, has left open the possibility that they could be a characteristic waste.
- Targeting Big Box Retailers
  - Walmart – \$81 million to settle criminal and civil RCRA claims related to improper handling of pesticides, solvents, detergents, paints, aerosols, and cleaners.
  - Costco – \$3.6 million to settle claims that it failed to label and sort products containing hazardous materials returned by customers or that weren't sold.

# Emerging Issues

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- Pharmaceutical Waste from Healthcare Facilities
  - EPA currently developing a proposal to address pharmaceutical waste from doctors' offices, pharmacies, hospitals, etc.
  - 2008 EPA proposal to add these wastes to the universal waste program, but EPA backed down after public comments concerning lack of notification and tracking requirements.

Thank you!

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