

Land Disposal Restrictions (LDR)

Introduction To LDR

HSWA established deadlines for EPA to determine the conditions under which land disposal of hazardous waste is protective of human health and the environment. Without a determination, Congress prohibited land disposal of hazardous waste.

What is Land Disposal?

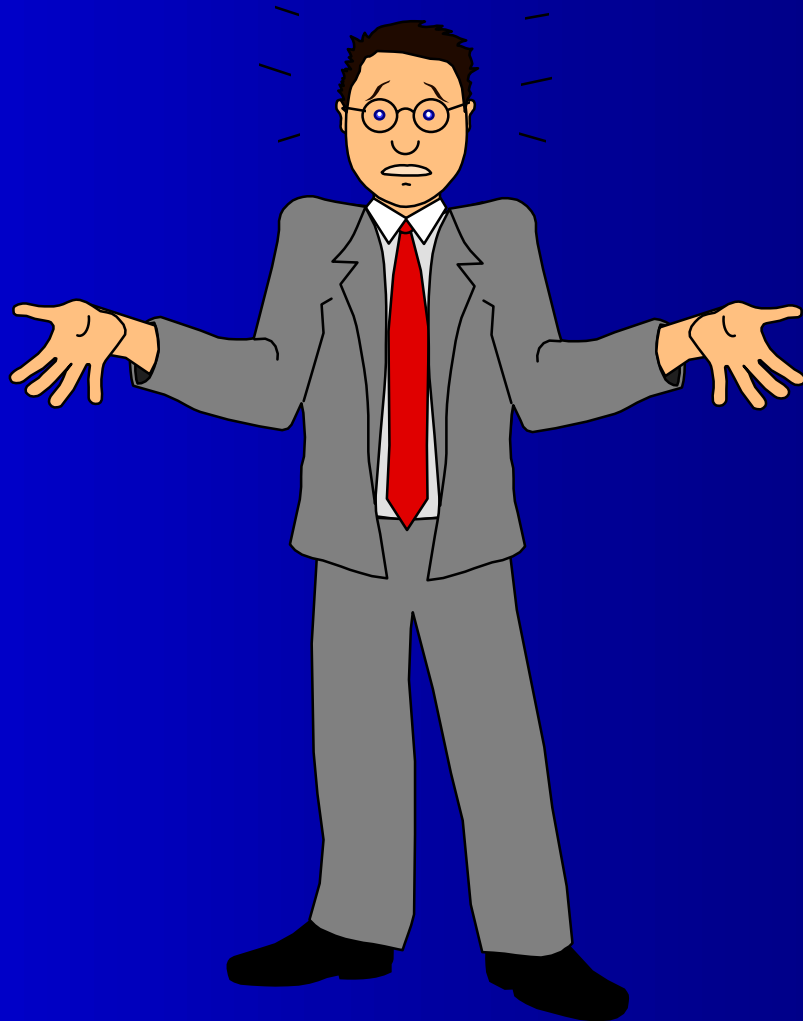
Disposal in land-based units such as:

- Landfills, surface impoundments, waste piles
- Salt bed and salt dome formations
- Injection wells
- Underground mines and caves
- Land treatment facilities
- Concrete vaults or bunkers

What Are LDRs?

- CRITERIA for land disposal that EPA has determined are protective of human health and environment, which include:
 1. Identifying all applicable hazardous waste codes, because each type of hazardous waste may pose a different risk; and
 2. Ensuring wastes are treated to comply with each wastes code's assigned treatment standard prior to land disposal or long-term storage.

CRITERION 1: WHAT, WHEN,
and HOW do I determine all
applicable hazardous waste
codes?



WHAT Treatment Standards Must be Met to Land Dispose?

- EPA establishes concentration-based or technology-based treatment standards based on Best Demonstrated Available Technologies (BDAT).
- Standards accommodate treatability groups.
- Treatability groups are based on waste number (e.g., D009), treatability subcategory (e.g., radioactive lead solids), and form (i.e., wastewater or nonwastewater).

Treatment Standards Also Include Underlying Hazardous Constituents

- 40 CFR 268.48 - Universal Treatment Standards (UTS) must be met for any underlying hazardous constituents present in the following wastes:
- Certain ignitable (D001) and corrosive (D002) characteristic hazardous wastes
 - Organic pesticide toxicity characteristic wastes (D012 - D017)
 - New organic toxicity characteristic wastes (D018-D043)

WHEN Must all Applicable Hazardous Waste Codes be Identified/Applied?

- From the initial point of generation through treatment and ultimate disposal (with a few exceptions)
- Whether the hazardous waste is being land disposed or not

HOW Does a Generator Know Which Treatment Standards Apply?

Refer To 40 CFR 268.40

- 40 CFR 268.40 - Treatment Standards for Hazardous Wastes
- Consolidates treatment standards for all waste codes, wastewater and nonwastewater forms, technology-based and concentration-based standards

Are All Hazardous Wastes Affected?

- The LDR apply to all wastes that were considered hazardous on or before Nov. 8, 1984.
- EPA must evaluate newly listed wastes within six months of listing.



Let's pause and
take a closer look at
LDR treatment standards

● **BACKGROUND:**

- “Spent” liquid scintillation cocktails (measure the activity of radionuclides)
- Principal organics are xylene and toluene, which were used to mobilize constituents (i.e., used for their solvent properties)
- Formulation contained greater than 10% toluene before use
- [Other hazardous constituents] = BDL (below detection limit)

● **EXERCISE:**

- Identify the applicable LDR treatment standard(s).

● **BACKGROUND:**

- Spent battery (sulfuric) acid
- pH < 2
- [Cd] (Cadmium) = 3.3 mg/l (TCLP)
- [Cr] (Chromium) = 3.2 mg/l (TCLP)
- [Pb] (Lead) = 22 mg/l (TCLP)
- [Other hazardous constituents] = BDL (below detection limit)

● **EXERCISE:**

- Locate the applicable treatment standard(s)

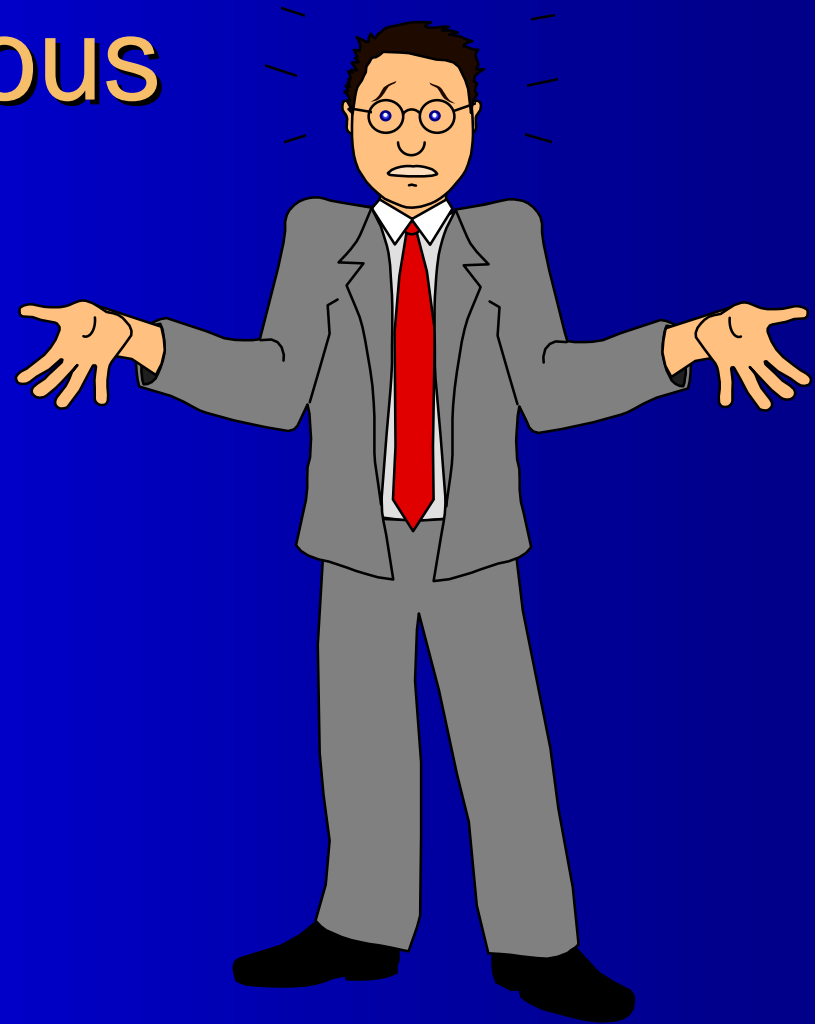
● **BACKGROUND:**

- Untreated “spent” petroleum naphtha (parts degreaser)
- Flash point = -60° F
- > 10% Total Organic Carbon (TOC) as generated
- [Cd] (Cadmium) = 0.1 mg/l (TCLP)
- [Cr] (Chromium) = 3.2 mg/l (TCLP)
- [Pb] (Lead) = 1.2 mg/l (TCLP)
- [Other hazardous constituents] = BDL (below detection limit)

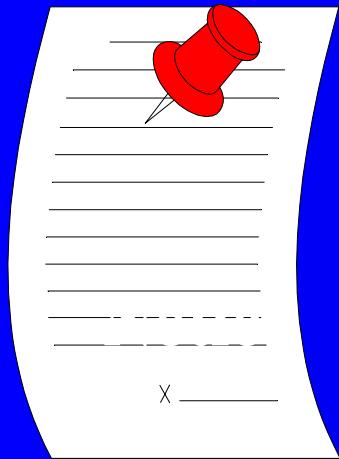
● **EXERCISE:**

- Identify the applicable treatment standard(s)

CRITERION 2: How do I ensure wastes are treated to meet all applicable hazardous waste codes?



How Does an Off-Site TSDF Know Which Standards Apply?



- Notify off-site TSDFs
 - shipment has a waste subject to LDR or
 - shipment has a waste subject to an exemption or variance
- Certify any claims that a waste meets its applicable treatment standards

Why is notification necessary?

- Manifests used to ship hazardous waste to off-site facilities only require proper shipping name
- Proper shipping name is typically based on greatest hazard, not necessarily on all LDR-regulated constituents present in the waste

How Does a Facility Verify Compliance With the Treatment Standard?

- EPA designates standards as either constituent concentrations or specified technologies.
- If EPA specifies a concentration, facilities must analyze waste to verify compliance with the concentration.
- If EPA specifies a technology, facilities must use the specified technology before disposing of the treatment residue.

Certification

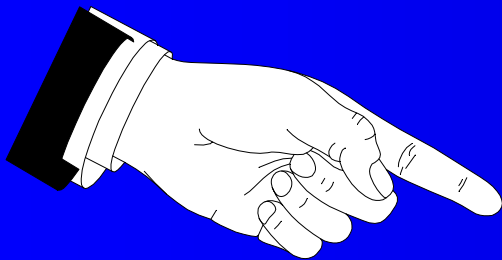


"I certify under penalty of law. . . I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false certification, including the possibility of a fine and imprisonment."

Does Treatment Reduce RCRA Compliance Requirements?

- Meeting the treatment standard for listed wastes allows treatment residues to be disposed in land-based, RCRA-permitted units.
- Meeting the treatment standards for characteristic wastes allows residues to be disposed in Subtitle D units, provided the residue no longer exhibits a characteristic hazard.

Do Generators and TSDFs have to work within an established framework?



Generators and TSDFs MUST:

- Not dilute wastes as a substitute for treatment unless it complies with 40 CFR 268.3.
- Do recordkeeping and waste analysis [also applies to treatment at accumulation points (40 CFR 268.7)].

Also, Storage is Prohibited Except:

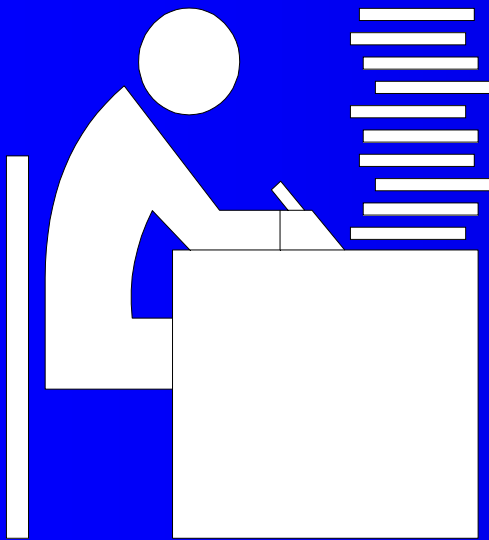


- Where accumulation is to facilitate treatment or recovery
- Where waste is subject to a variance, extension, or approved petition

Recordkeeping

- Retain records of:
 - notices/certifications
 - demonstrations/petitions
 - waste analyses
- *Generators* retention period of at least three years (five years in most authorized States), which is extended during an enforcement action
- *TSDFs* retain documents in operating record

Variances and Extensions

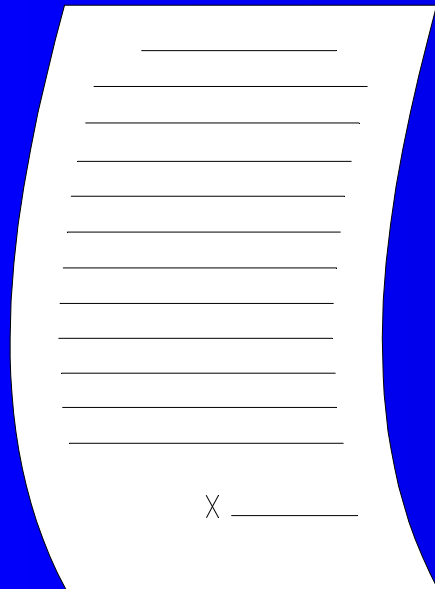


- National capacity variances
- Variances from the treatment standard
- Case-by case extensions
- "No-migration" petitions

Capacity Variance

EPA can grant a nationwide variance from the LDR because of inadequate treatment capacity.

Treatability Variance



Two types:

- Waste-specific
- Waste and site-specific

Case-by-Case Extension

- Regulatory process subject to publication in the *Federal Register* and to public comment
- Provides for a one-year extension of the deadline for imposing the LDR with a possible extension of an additional year

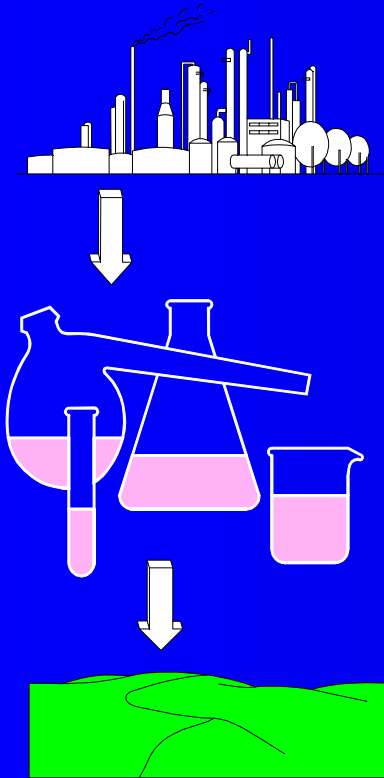
No-Migration Variance

- Must submit petition to the EPA Administrator
- Requires issuance of a public notice and provision of opportunity for public comment
- Requires establishing, with reasonable certainty, that there will be no migration from the unit for as long as the waste remains hazardous

Are LDR Requirements That Simple?

- LDR regulations constitute a complex framework with obscure points of regulation
- LDR requirements have been challenged in court several times
- Treatment standards have been revised in the course of making other changes

Summary



- Generate LDR waste
- Treat waste on-site or ship off-site for treatment to meet the applicable treatment standard
- Land dispose the residue