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Emergency Response Waste: Now What Do We Do?

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MARCH 24, 2026

A long time ago in a galaxy far, far away...

s

960’s

1970’s

Looking Back

- Love Canal
- Valley of the Drums
- Times Beach, Missouri

https://www.courier-journal.com/picture-gallery/news/local/2024/12/21/valley-of-the-drums-superfund-site-historic-photos/76764006007/

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CERCLA and SARA - SUPERFUND

- Comprehensive Environmental Response, Compensation, and Liability Act (1980)
- Superfund Amendments and Reauthorization Act (1986)
- Feds respond directly to haz substance releases/threatened releases that may endanger public health or environment
- Liability of persons responsible for releases of hazardous waste at these sites
- PRP –

RCRA exempt or recycled hazardous wastes are still subject to CERCLA ("Superfund") liabilities

Commercial Implications

- "CERCLA makes RCRA work"
- Long term liability for disposal
- Customers want waste vendors with exemplary
  - Financial stability
  - Compliance history
  - Agency relations
- Customer Audit Handbooks
  - Permits
  - Compliance History
  - Audits
    - Customer, consultant, CHEWMEG

Resource Conservation and Recovery Act

October 21, 1976

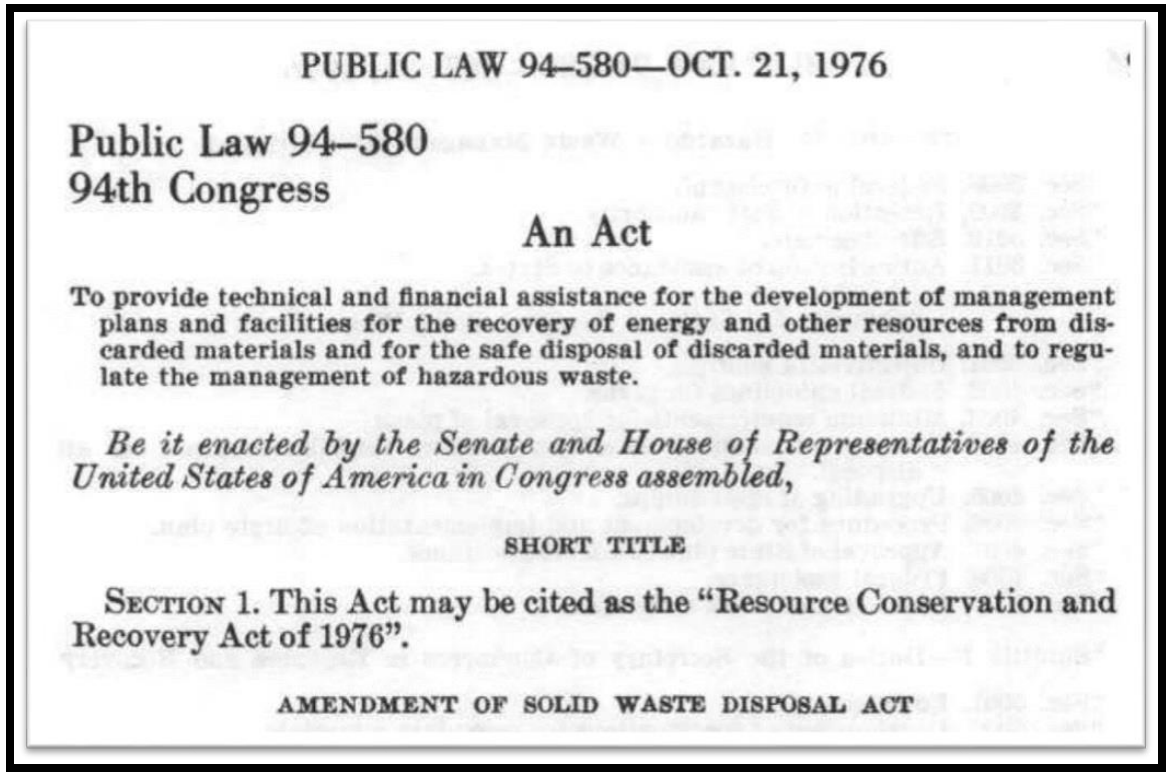
President Ford signed

May 19, 1980

Final Rule published in Federal Register

November 19, 1980

40 CFR 261-265 effective nationwide



PUBLIC LAW 94–580—OCT. 21, 1976

Public Law 94–580
94th Congress

An Act

To provide technical and financial assistance for the development of management plans and facilities for the recovery of energy and other resources from discarded materials and for the safe disposal of discarded materials, and to regulate the management of hazardous waste.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Resource Conservation and Recovery Act of 1976".

AMENDMENT OF SOLID WASTE DISPOSAL ACT

HW Identification Process

Is it a solid waste?

Is it excluded?

Is it a hazardous waste (listed or characteristic)?

epa.gov/hw/learn-basics-hazardous-waste#hwid

Federal Hazardous Wastes

Listed

- Non-Specific Source HW (F listed)
- Specific Source HW (K listed)
- Commercial Chemical Products (P and U listed)

Characteristic

- Ignitability (D001)
- Corrosivity (D002)
- Reactivity (D003)
- Toxicity (D004 – D043)

F-List Summary

Category of Waste	Waste Codes
Spent solvent wastes	F001-F005
Electroplating and other metal finishing operations wastes	F006-F012, F019
Dioxin bearing wastes (acutely toxic)	F020-F023 and F026-F028
Production of certain chlorinated aliphatic hydrocarbons wastes	F024 and F025
Wood preserving wastes	F032, F034 and F035
Petroleum refinery WWT sludges	F037 and F038
Multisource leachate	F039

F-List Examples

Indication of the Hazard

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Generic:		
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)*

40 CFR 261.31

K-List Summary

Manufacturing Process	Waste Codes
Wood preservation	K001
Inorganic pigment manufacturing	K002-K008
Organic chemicals manufacturing	K009 - K011, K013 - K030, K083, K085, K093 - K096, K103 - K105, K107 - K118, K136, K149 - K151, K156 - K159, K161, K174 - K175, and K181
Inorganic chemicals manufacturing	K071, K073, K106, and K176 - K178
Pesticides manufacturing	K031 - K043, K097 - K099, K123 - K126, and K131 - K132
Explosives manufacturing	K044 - K047
Petroleum refining	K048 - K052, and K169 - K172
Iron and steel production	K061 and K062
Primary aluminum production	K088
Secondary lead processing	K069 and K100
Veterinary pharmaceuticals manufacturing	K084 and K101 - K102
Ink formulation	K086
Coking	K060, K141 - K145, and K147 - K148

K-List Examples

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Wood preservation: K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
Inorganic pigments:		
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.	(T)
K003	Wastewater treatment sludge from the production of molybdate orange pigments	(T)
K004	Wastewater treatment sludge from the production of zinc yellow pigments	(T)
K005	Wastewater treatment sludge from the production of chrome green pigments	(T)
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).	(T)
K007	Wastewater treatment sludge from the production of iron blue pigments	(T)
K008	Oven residue from the production of chrome oxide green pigments	(T)
Organic chemicals:		
K009	Distillation bottoms from the production of acetaldehyde from ethylene	(T)
K010	Distillation side cuts from the production of acetaldehyde from ethylene	(T)
K011	Bottom stream from the wastewater stripper in the production of acrylonitrile	(R, T)
K013	Bottom stream from the acetonitrile column in the production of acrylonitrile	(R, T)
K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile	(T)
K015	Still bottoms from the distillation of benzyl chloride	(T)
K016	Heavy ends or distillation residues from the production of carbon tetrachloride	(T)
K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.	(T)

P & U Lists: Commercial Chemical Products

Do Apply

- Ger
  pro
  -
  -
- Res
  con
  liste
- Res
  water or other debris from a cleanup of a spill

Do Not Apply

Virgin chemical spill residues
Off-specification products
Manufacturing chemical intermediates
Excess/surplus inventory
Obsolete inventory
Expired products

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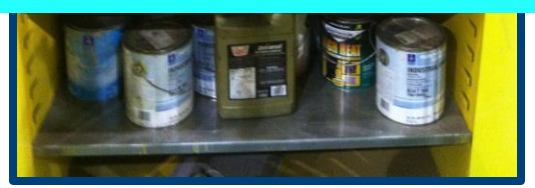
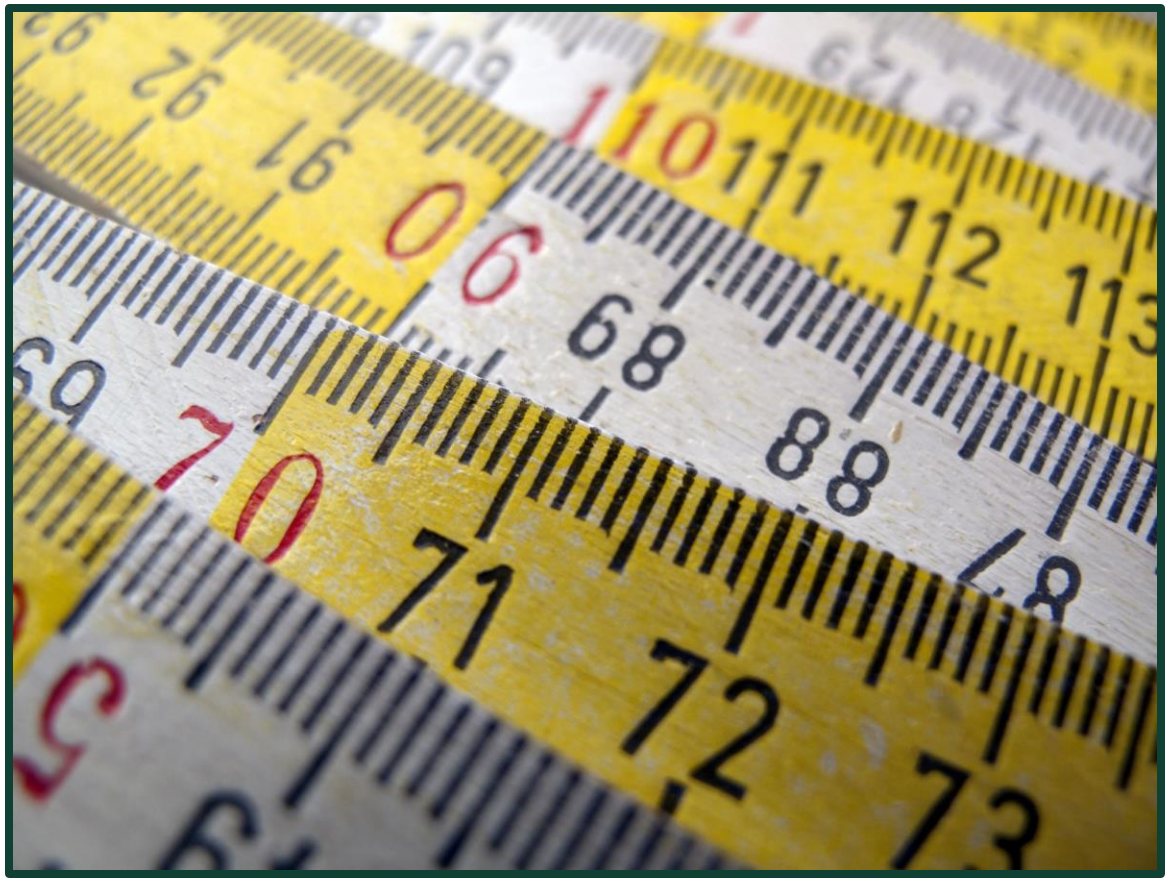


40 CFR 261.33(e)&(f); RCRA Online #13530

Units/Conversions

- mg/L, µg/L, ng/L – liquids result
- mg/kg, µg/kg, ng/kg – solids result
- ppm = mg/kg ≈ mg/L
- ppb = µg/kg ≈ µg/L
- ppt = ng/kg ≈ ng/L
- 10,000 ppm = 1%
- 1,000 ppm = 0.1%
- 1 kg ≈ 2.2 lbs.



D001: Ignitability Characteristic (I)

Not a Liquid

- Capable under standard temperature and pressure of causing fire through
  - Friction
  - Absorption of moisture
  - Spontaneous chemical changes
- When ignited, burns so vigorously and persistently as to create a hazard

Liquid

- Closed cup flashpoint <140°F
  - Not limited to mercury thermometers
- Note: if using the aqueous alcohol exclusion, must have >50% water (by weight)
  - Additional DOT regulations

Gas

- Ignitable compressed gas
  - DOT Division 2.1 (49 CFR 173.115(l))

40 CFR 261.21(a)(1-3)

D001: Ignitability Characteristic – Oxidizers

A substance such as chlorates, permanganates, inorganic peroxides and/or nitrates that yields oxygen to stimulate combustion of organic matter

Can also include:

* An organic compound containing bivalent –O-O- structure classed as an organic peroxide
* Meets definition of DOT 1.1 – 1.3
* Forbidden for transportation by 49 CFR 172.101

Predominant hazard containing an organic peroxide is other than an organic peroxide

D002: Corrosivity Characteristic (C)

Aqueous

- pH ≤2 or pH ≥12.5

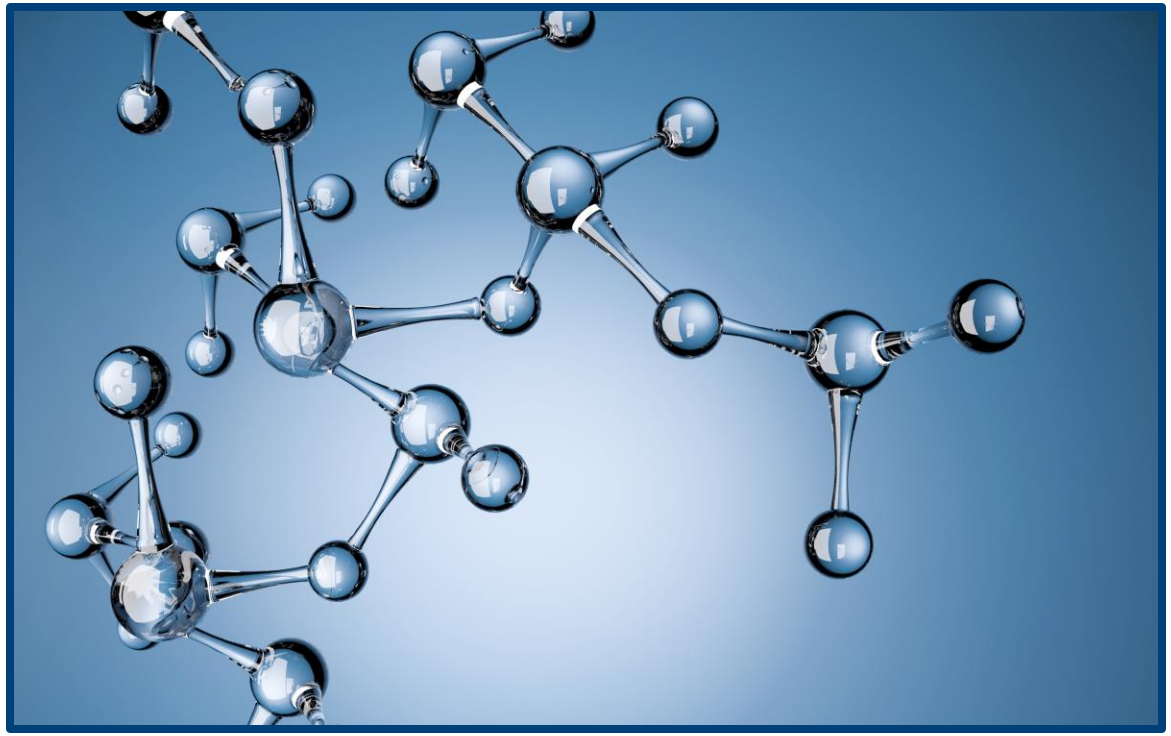
Liquid

- Corrodes SAE 1020 Steel >1/4" per year at 130°F

Non-hazardous does not mean not dangerous or unregulated

D003: Reactivity Characteristic (R)

- Any of the following properties:
  - Cyanide or sulfide bearing waste which, when exposed to pH >2 or <12.5 can generate toxic gases, vapors or fumes
  - Is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement
  - Is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure
  - Is a forbidden explosive under 49 CFR 173.54 or is a Class 1.1, 1.2, or 1.3

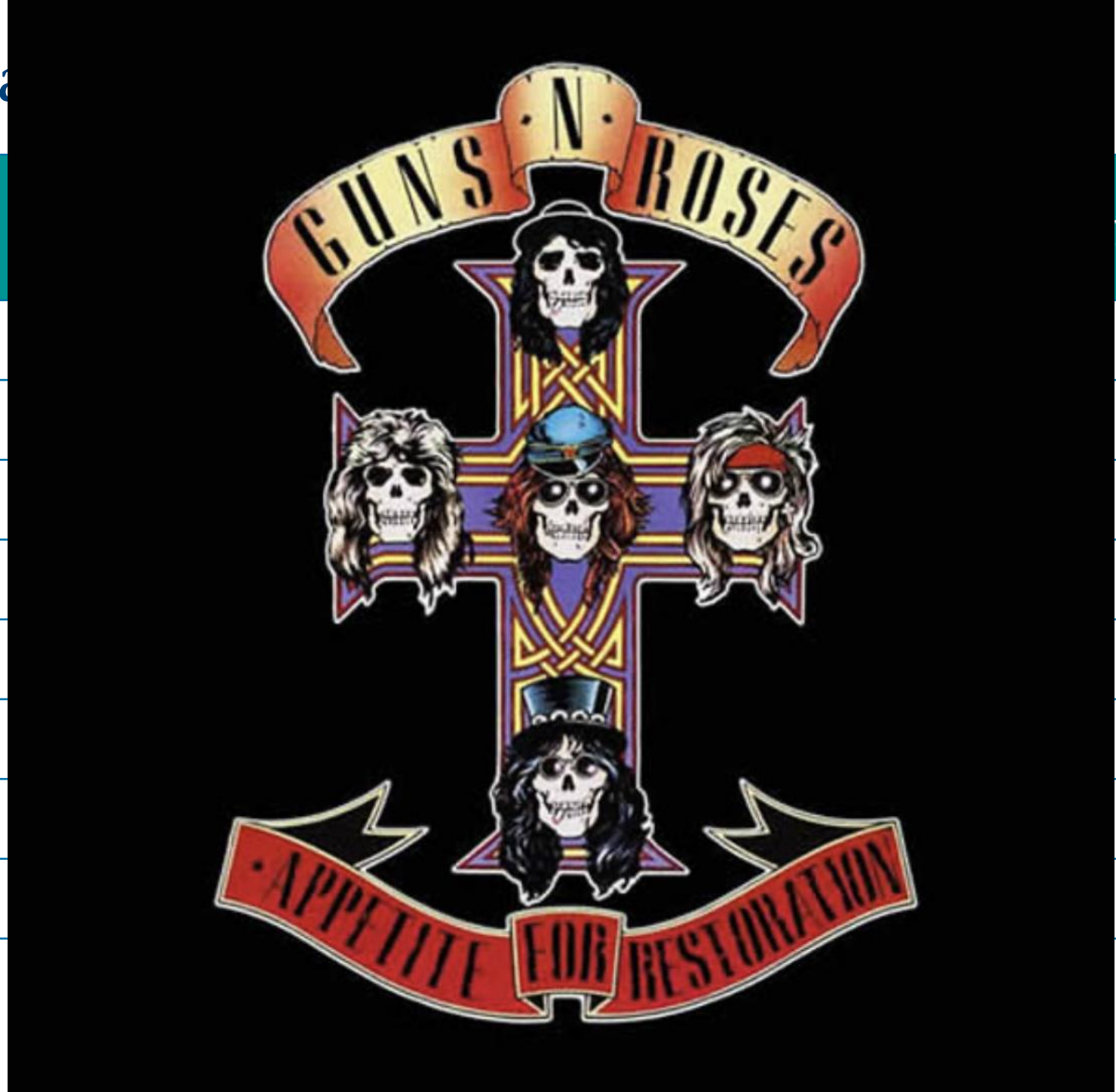


D004-D043: Toxicity Characteristic (T)

- Toxicity Characteristic Leaching Procedure (TCLP) extract of waste analyzed for specified heavy metals and toxic organics
- Zero Headspace Extraction (ZHE) required for VOCs

Toxicity Cha

Waste Code	y Threshold (mg/l)
D004	5.0
D005	100.0
D006	1.0
D007	5.0
D008	5.0
D009	0.2
D010	1.0
D011	5.0



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40 CFR 261.24

Toxicity Characteristic - D-Coded Volatiles/Semi

Waste Code	D-Coded Volatiles	Regulatory Threshold (mg/l)
D018	Benzene	0.5
D019	Carbon Tetrachloride	0.5
D021	Chlorobenzene	100.0
D022	Chloroform	6.0
D027	1,4-Dichlorobenzene	7.5
D028	1,2-Dichloroethane	0.5
D029	1,1-Dichloroethylene	0.7
D035	Methyl Ethyl Ketone (MEK)	200.0
D039	Tetrachlorethylene (PERC)	0.7
D040	Trichloroethylene (TCE)	0.5
D043	Vinyl Chloride	0.2

Waste Code	D-Coded Semi-Volatiles	Regulatory Threshold (mg/l)
D023	o-Cresol	200.0
D024	m-Cresol	200.0
D025	p-Cresol	200.0
D026	Cresol	200.0
D027	1,4-Dichlorobenzene	7.5
D030	2.4-Dinitrotoluene	0.13
D032	Hexachlorobenzene	0.13
D033	Hexachloro-1,3-butadiene	0.7
D034	Hexachloroethane	3.0
D036	Nitrobenzene	2.0
D037	Pentachlorophenol	100.0
D038	Pyridine	5.0
D041	2,4,5-Trichlorophenol	400.0
D042	2,4,6-Trichlorophenol	2.0

40 CFR 261.24

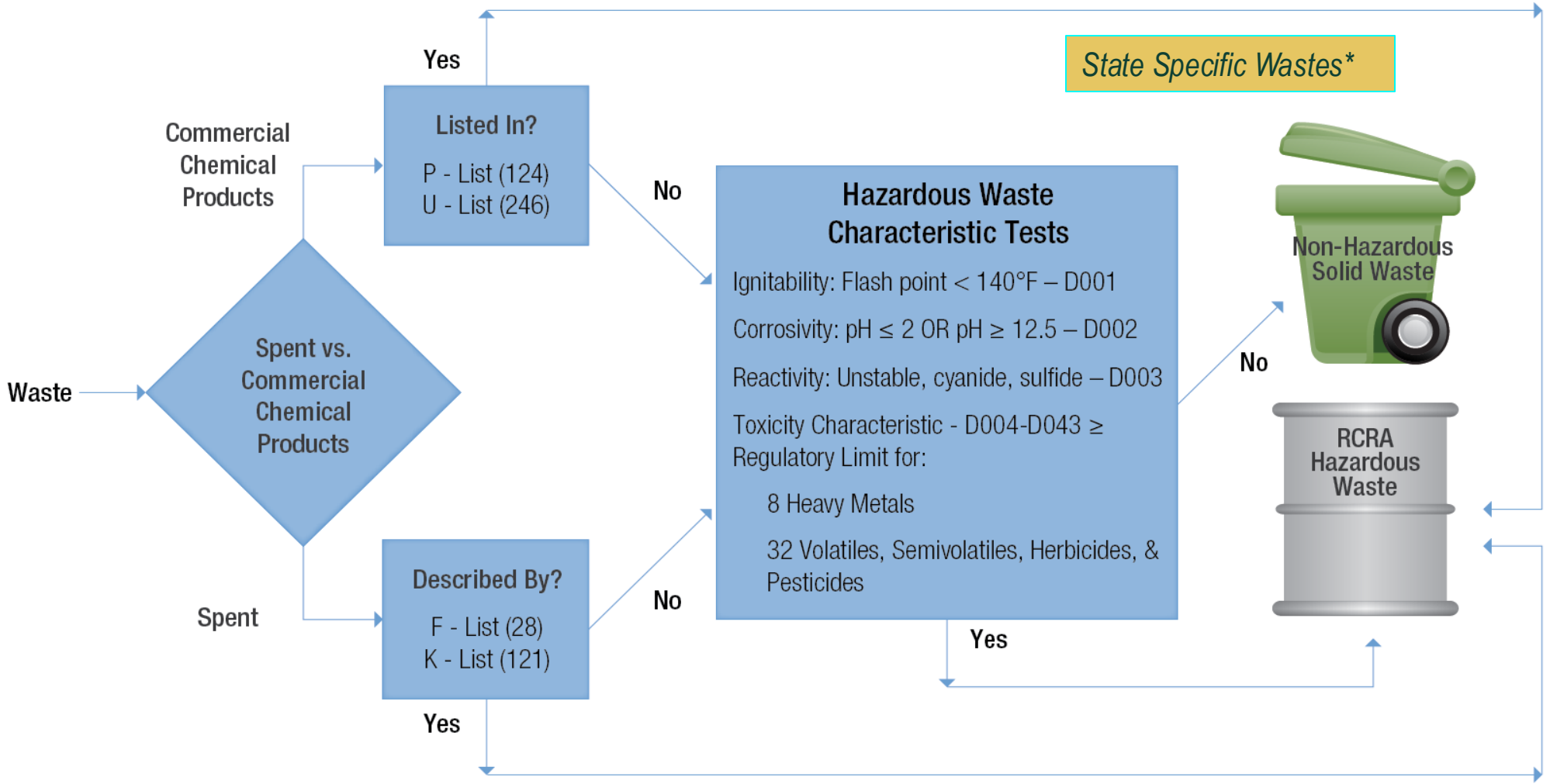
Toxicity Characteristic - D-Coded Pesticides/Herbicides

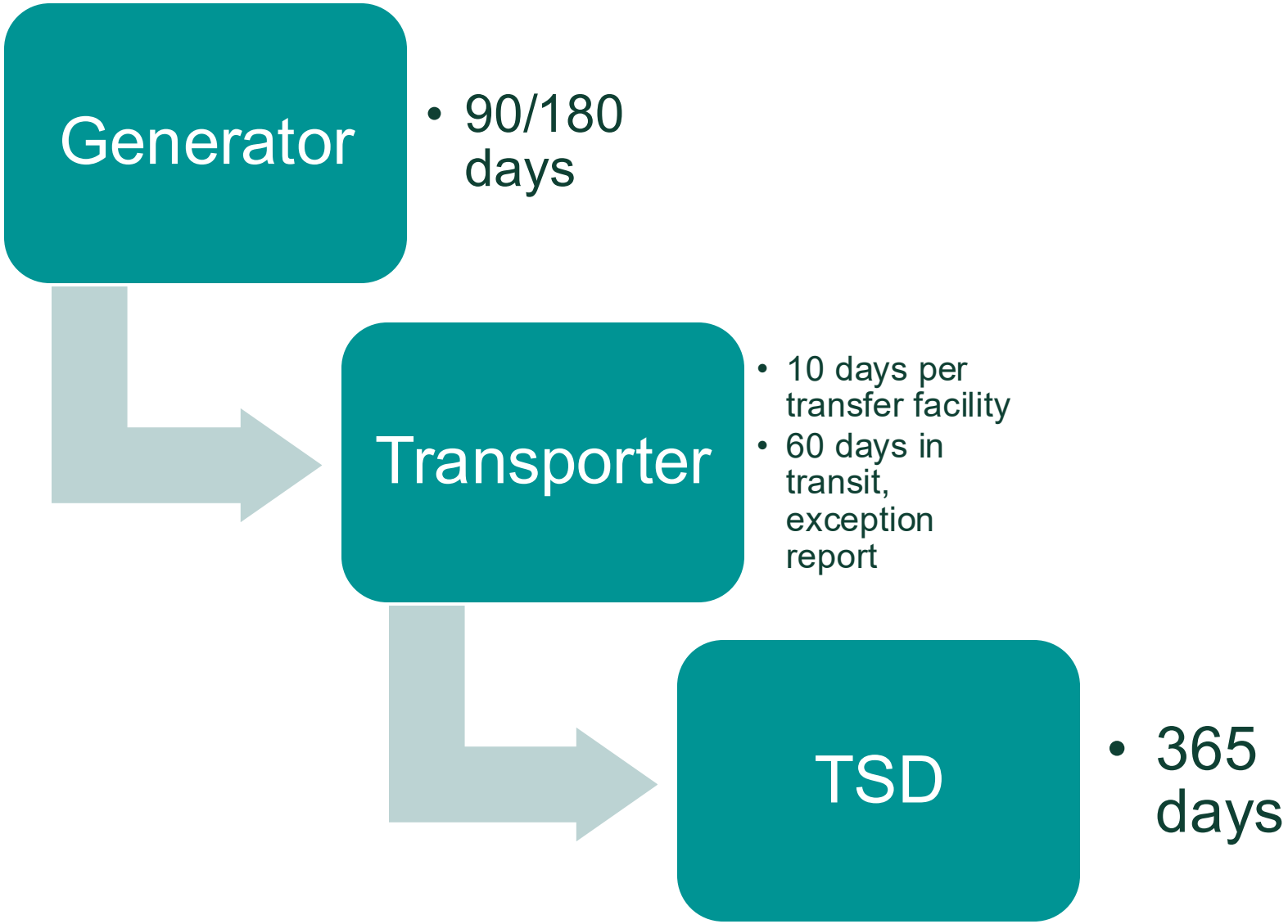
Waste Code	D-Coded Pesticides/Herbicides	Regulatory Threshold (mg/l)
D020	Chlordane	0.03
D016	2,4-D	10.0
D012	Endrin	0.02
D031	Heptachlor (and hydroxide)	0.008
D013	Lindane	0.4
D014	Methoxychlor	10.0
D015	Toxaphene	0.5
D017	2,4,5-TP (Silvex)	1.0

Universal Waste Standards

- Applies only if waste is first a characteristic or listed hazardous waste
- Five specific but widely generated categories:
  - Batteries
  - Pesticides
  - Mercury-containing equipment
  - Lamps
  - Aerosols*

Waste Determination Overview




Generator
• 90/180 days
Transporter
• 10 days per transfer facility
• 60 days in transit, exception report
TSD
• 365 days

§ 263.12 Transfer facility requirements.

(a) A transporter who stores manifested shipments of hazardous waste in containers meeting the independent requirements of § 262.30 of this chapter at a transfer facility for a period of ten (10) days or less is not subject to regulation under parts 264, 265, 267, 268, and 270 of this chapter with respect to the storage of those wastes.

Profile

- Permit Requirement
- Waste Determination Documentation
- Right Waste to Right Place
  - AKA LDR
- Safety
- DOT Packaging

Considerations Beyond RCRA

- CAA
  - NESHAPs
- CWA
  - Centralized Waste Treatment
  - NPDES/POTW Permits and Local Ordinances
- TSCA
  - CERCLA
  - TRI
  - PCBs
- Infectious
- Radioactive
- State and Local
- ATF
- Solvent Recycling
- APHIS
- DEA Controlled Substances include LEA
- DOT compliance and type of container

Example Profile Questions

- Common Name
- Process Generating Waste
- Color/Odor
- Form Code/Source Code
- DOT Shipping Description
- State and Federal Waste Codes
- Chemical Questions
  - Flash point
  - pH
  - BTU
  - Boiling Point
  - Density/Specific Gravity
  - Free liquids
  - Viscosity
  - Dumpable

10 Days Goes Very Quickly

- Complete profile
- Analytical Requirements
- SDS if release was unused chemicals
- Additional 10 day
- Templates

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E-Manifest

Project 2025

PRESIDENTIAL TRANSITION PROJECT

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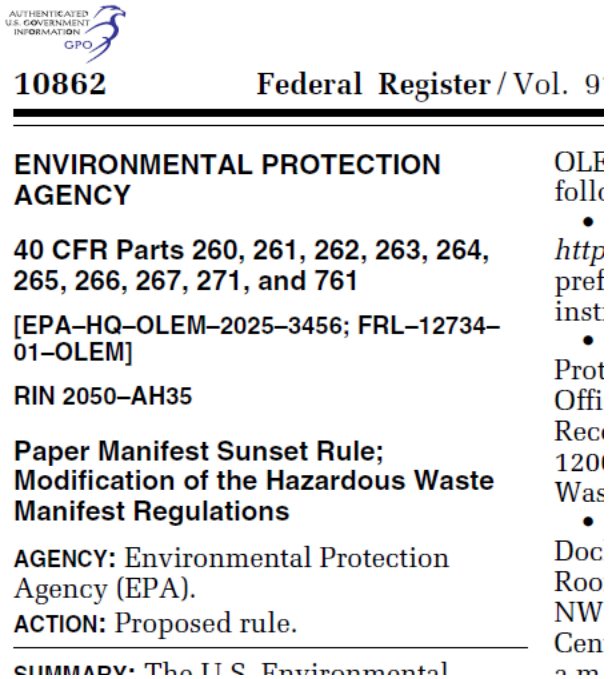
RCRA. To streamline waste management, the following changes are needed in the Office of Resource Conservation and Recovery (ORCR):

Create an RCRA post-closure care permit that is tailored only to post-closure obligations.

Modify regulations that impede resource efficiency, recycling, and reuse by providing clearly that these materials are not waste. This can be done by promulgating a rule that provides an alternative pathway to hazardous waste regulation to allow the transport of material to legitimate recyclers or back to manufacturers to support the recycling and reuse of material.

- Change the electronic manifest (e-manifest) regulations to a 100 percent electronic system and eliminate all paper manifests and manual filing and data input. This system should operate from a range of common handheld devices and could be expanded to accommodate solid waste and materials for reuse and recycling.

- Reassign regulation and enforcement of air emission standards under the authority of RCRA Section 3004[37] to OAR and revise and modernize the regulations to comport and integrate with CAA rules.



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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260, 261, 262, 263, 264, 265, 266, 267, 271, and 761

[EPA–HQ–OLEM–2025–3456; FRL–12734–01–OLEM]

RIN 2050–AH35

Paper Manifest Sunset Rule; Modification of the Hazardous Waste Manifest Regulations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The U.S. Environmental

Comments are due Star Wars Day!

2-Years to Paper Sunset