

WELCOME TO DOE'S *RCRA ORIENTATION FOR FACILITY MANAGERS* COURSEWARE

Background This module comprises one component of courseware materials that were developed by DOE's Office of Environmental Policy and Assistance, RCRA/CERCLA Division, EH-413, in response to a request from the Deputy Assistant Secretary for Nuclear and Facility Safety (EH-3). The original course was titled *RCRA Orientation for Nuclear and Facility Safety* and was presented on March 5, 1997, at Germantown, MD. Presentation materials were derived from the more formal three-day course titled DOE's *RCRA Orientation Workshop*, which was developed by EH-413 under a joint funding venture that included the Savannah River Site and the Albuquerque Operations Office.

Courseware Content Although derived from the three-day workshop, DOE's *RCRA Orientation for Nuclear and Facility Safety* (now titled *RCRA Orientation for Facility Managers*) was expanded by developing two new modules to meet the needs of Nuclear Safety Managers. One of the new modules (*Corrective Action*) compares and contrasts RCRA closure and corrective action with CERCLA remedial action by using Oak Ridge Reservation as an example of a radioactively contaminated site closed under RCRA, but undergoing remediation under CERCLA. The other module (*Emerging Issues*) offered a snapshot of the emerging regulations that were expected to impact the Department most dramatically. The remaining courseware modules include:

- Introduction to RCRA and Liability Overview,
- Overview of Solid Waste Determination,
- Overview of Hazardous Waste Determination, and
- Permitting.

PDF "Handout" files only, which contain the aforementioned modules, are designed to serve as stand-alone resources and are equipped with: (1) A list of module contents, (2) Module-specific enabling objectives; (3) Self-assessment questions and answers; (4) A module-specific regulatory citation/key word index; and (5) A module-specific cross-link table that identifies hypertext links to additional Internet resources for hazardous waste-related information.

Using the Courseware Materials Within the PDF Handout modules, users are encouraged to examine the module's Regulatory-Statutory Citation/Key Word Index to identify the availability and location of topics of interest. In contrast, users can simply "dig-in" and sequentially examine the courseware's content. For less extensive reviews or to download additional course presentation materials as needed, users can return to the [RCRA Orientation for Facility Managers Home Page](#) to access electronic files containing the remaining PDF Handout and/or Vugraph files.

To assist users in accessing additional Internet resources, where possible, module-specific hypertext links have been inserted into select points within each of the six PDF Handout courseware modules. Hypertext links appear in both the slide and notes portions as either *blue italicized text* (the first time a link to a particular resource is offered in a given module) or *green italicized text* (each subsequent link to that same resource) and have been assigned to terms and phases for which additional Internet resources such as other EH-413 guidance documents, other Internet Websites, etc. are available. Upon identifying a highlighted term or phase of interest, users generally can access the additional Internet resources by clicking on the highlighted text, which will then hypertext link to another Internet resource. Additional information for obtaining those resources that are not Internet-accessible as well as the objectives, content and organization, use, list of acronyms, Internet resources, and master index is presented in the [Front-End Materials section](#) (first section).

**Feedback
And
Contacts**

If you have difficulty in downloading or reviewing modules comprising DOE's *RCRA Orientation for Facility Managers*, [contact our Webmaster](#) and please [provide us with feedback](#). If you are interested in attending the three-day *RCRA Orientation Workshop*, please contact the [National Environmental Training Office](#). Additional questions concerning this courseware or the information presented therein may be directed to Atam Sikri of my staff by:

- Calling at (202) 586-1879,
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- Communicating electronically, via Internet, to atam.sikri@eh.doe.gov.



Introduction to RCRA and Liability Overview -- Module I

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Introduction Module Statutory-Regulatory Citation/Key Word Index	I-56
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Additional Resources Cited in this Module (Internet-Accessible Unless Otherwise Noted)

Environmental Protection Agency Home Page; <http://www.epa.gov/>

OEPA Environmental Law Summary: Resource Conservation and Recovery Act;
http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM

New Federal Regulatory Initiatives; <http://tis-nt.eh.doe.gov/oepa/regulate.html>

DOE Office of Environmental Policy and Assistance (OEPA) Website; <http://tis-nt.eh.doe.gov/oepa/>
OR

OEPA Mirror Website; <http://homer.hsr.ornl.gov/oepa/>

DOE Consolidated Comments - Resource Conservation and Recovery Act;
<http://tis-nt.eh.doe.gov/oepa/comments/rcra.htm>

OEPA Environmental Law Summary: Federal Facility Compliance Act
http://tis-nt.eh.doe.gov/oepa/law_sum/FFCA.HTM

OEPA Environmental Law Summary: Land Disposal Program Flexibility Act of 1996 (P.L.104-119);
http://tis-nt.eh.doe.gov/oepa/law_sum/ldpfa.htm

OEPA Environmental Law Summary: Atomic Energy Act;
http://tis-nt.eh.doe.gov/oepa/law_sum/AEA.HTM

U.S. Department of Energy Home Page; <http://www.doe.gov/>

Mixed Waste Focus Area; <http://wastenot.inel.gov/mwfa/index.html>

DOE Directives; <http://www.explorer.doe.gov:1776/htmls/directives.html>

DOE RCRA Guidance Manual, RCRA Subtitle I Regulated Underground Storage Tanks (USTs) [not available on the OEPA Website]

Solid Waste Landfills Under RCRA Subtitle D, DOE/EH-0512;
[Not available on OEPA Website]

Automated Underground Storage Tank Guidance (Macintosh Version);
<http://tis-nt.eh.doe.gov/oepa/programs/ust.html>

Petroleum USTs, DOE/EH-231-012d/0593;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/petro.pdf>

Hazardous Substance USTs, DOE/EH-231-012e/0593;
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/haz_sub.pdf

General Requirements for RCRA Regulatory Hazardous Waste Tanks, DOE/EH-413-065/1195;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gentank.pdf>

Deferred USTs, DOE/EH-231-012c/0593; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/defer.pdf>

Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997);
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf

RCRA Definitions of Solid and Hazardous Waste Automated Guidance (Windows Version);
<http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html>

Overview of the Identification of Hazardous Waste under RCRA, DOE/EH-231-007/1291;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf>

Ignitable, Corrosive, Reactive, and Incompatible Wastes; DOE/EH-231-054/1294;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ignit.pdf>

Questions and Answers on the RCRA Toxicity Characteristic, DOE/EH-2331-003/0291;
[Not available on OEPA Website]

Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings,
DOE/EH-231-008/1291; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf>

Transportation of RCRA Hazardous Wastes, DOE/EH-231-013/0394 (revised);
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/trans_rv.pdf

Special Requirements Applicable to Hazardous Waste Automated Guidance
(Windows Version); <http://tis-nt.eh.doe.gov/oepa/programs/special.html>

Exclusions and Exemptions from RCRA Hazardous Waste Regulation;
DOE/EH-231-034/0593; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf>

Standards for Non-municipal, Non-hazardous Waste Disposal Units Receiving Hazardous Wastes from Conditionally Exempt Small Quantity Generators (CESQGs);
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cesqg_rb.pdf

Federal Environmental Notification & Reporting Requirements Handbook, Chapter 6. RCRA, OEPA [HNDBK] 001/11/96 (REV); http://tis-nt.eh.doe.gov/oepa/guidance/caa/rpt_req6.PDF

Manifest Requirements, DOE/EH-231-038/0394 (revised);
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/manif_rv.pdf

Guide to Selecting Compliant Off-Site Hazardous Waste Treatment, Storage and Disposal Facilities, DOE/EH-0427; http://tis-nt.eh.doe.gov/oepa/guidance/cercla/sel_tsdf.pdf

Requirements for Satellite Accumulation Areas, DOE/EH-231-026/0593;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/satellite.pdf>

Management of Hazardous Waste Containers & Container Storage Areas under RCRA, DOE/EH-0333; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/container/contain_all.pdf

Resource Conservation and Recovery Act Hazardous Waste Tank Systems, DOE/EH-413/9716;
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/tanks/tanks_all.pdf

Inspections of RCRA Container Storage Areas, DOE/EH-231-033/0893;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/inspect.pdf>

RCRA Closure and Post-Closure Plans, DOE/EH-231-009/1291;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/pcplans.pdf>

OSHA Training Requirements for Hazardous Waste Operations, DOE/EH-0227P
[Not available on the OEPA Website]

Preparation of RCRA Contingency Plans, DOE/EH-0274
[Not available on the OEPA Website]

RCRA Contingency Plans and Emergency Procedures, DOE/EH-231-006/0991
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cplans.pdf>

RCRA Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf>

Closure of Hazardous and Mixed Waste Management Units at DOE Facilities, DOE/EGD(RCRA)-002/0690 [not available on the OEPA Website]

General Facility Standard Requirements, DOE/EH-043/1294
[Not available on the OEPA Website]

RCRA Permitting Guide for Hazardous and Radioactive Mixed Waste Management Facilities, DOE/EH(RCRA)9705; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permit_a.pdf

Pre-Transport Requirements for Waste Generators, DOE/EH-231-037/0494
[Not available on the OEPA Website]

RCRA Hazardous Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf>

Types of RCRA Permits, DOE/EH-413/9715; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permits.pdf>

RCRA Clean Closure Equivalency Demonstrations, DOE/EH-231-010/1291;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/equivdem.pdf>

RCRA Post-Closure Permits, DOE/EH-231-021/0593
[NOT available on the OEPA Website]

RCRA Corrective Action Program Guide (Interim), DOE/EH-0323;
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/program/program_all.pdf

CAMU/TU Final Rule Issued, RCRA Regulatory Bulletin, May 12, 1993;
http://tis-nt.eh.doe.gov/oepa/guidance/rcra/camu_tu.pdf

Corrective Action Management Units and Temporary Units, DOE/EH-231-043/0394;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/camu.pdf>

A Comparison of the RCRA Corrective Action and CERCLA Remedial Action Processes, DOE/EH-0365; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/rcracomp.pdf>

Selected EM Cleanup and Compliance Agreements, <http://www.em.doe.gov/ffaa/index.html>

LDR Program Overview, DOE/EH-231/005-0293;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf>

Environmental Standards: EnviroSearch, <http://tis-nt.eh.doe.gov/oepa/standards/>

Waste Management and the Land Disposal Restriction Storage Prohibition, DOE/EH-231-011/0592;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/storage.pdf>

RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDf) Process Vents, DOE/EH-231-020/0193; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/vents.pdf>

RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Equipment Leaks, DOE/EH-231-019/0193;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/equipmnt.pdf>

Organic Air Emission Standards; Revised Final Rule Issued, RCRA Regulatory Bulletin;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ccregbl2.pdf>

RCRA Subpart CC Organic Emission Standards Technical Amendment: Questions and Answers, DOE/EH(RCRA)9701; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/subpart.pdf>

RCRA Subpart CC Organic Air Emission Standards: Tanks, DOE/EH-413/9805;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ccinfobrief.pdf>

RCRA Subpart CC Organic Air Emission Standards: Containers, DOE/EH-413/9806;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cccontainers.pdf>

Office of Enforcement and Compliance Assessment; <http://es.epa.gov/oeca/ore/red/rcra.pdf>

Federal Facility Compliance Act Implications for RCRA Corrective Action, DOE/EH-231-015/0994;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/impl.pdf>

DOE Environmental Policy and Guidance, Safe Drinking Water Act;
<http://tis-nt.eh.doe.gov/oepa/guidance/sdwa.htm>

DOE Environmental Policy and Guidance, Clean Water Act/Oil Pollution Act;
<http://tis-nt.eh.doe.gov/oepa/guidance/cwa.htm>

DOE Environmental Policy and Guidance, Clean Air Act;
<http://tis-nt.eh.doe.gov/oepa/guidance/caa.htm>

DOE Environmental Policy and Guidance, CERCLA/EPCRA;
<http://tis-nt.eh.doe.gov/oepa/guidance/cercla.htm>

OEPA's ARARs Website, <http://tis-nt.eh.doe.gov/oepa/arars>

DOE Environmental Policy and Guidance, Radiation Protection (Atomic Energy Act);
<http://tis-nt.eh.doe.gov/oepa/guidance/aea.htm>

RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Process Vents, DOE/EH-231-020/0193;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/vents.pdf>

RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Equipment Leaks, DOE/EH-231-019/0193;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/equipmnt.pdf>

Organic Air Emission Standards; Revised Final Rule Issued, RCRA Regulatory Bulletin;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ccregbl2.pdf>

RCRA Subpart CC Organic Emission Standards Technical Amendment: Questions and Answers, DOE/EH(RCRA)9701; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/subpart.pdf>

RCRA Subpart CC Organic Air Emission Standards: Tanks, DOE/EH-413/9805;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ccinfobrief.pdf>

RCRA Subpart CC Organic Air Emission Standards: Containers, DOE/EH-413/9806;
<http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cccontainers.pdf>

Office of Enforcement and Compliance Assessment; <http://es.epa.gov/oeca/ore/red/rcra.pdf>

Federal Facility Compliance Act Implications for RCRA Corrective Action, DOE/EH-231-015/0994; <http://tis-nt.eh.doe.gov/oepa/guidance/rcra/impl.pdf>

DOE Environmental Policy and Guidance, Safe Drinking Water Act;
<http://tis-nt.eh.doe.gov/oepa/guidance/sdwa.htm>

DOE Environmental Policy and Guidance, Clean Water Act/Oil Pollution Act;
<http://tis-nt.eh.doe.gov/oepa/guidance/cwa.htm>

DOE Environmental Policy and Guidance, Clean Air Act;
<http://tis-nt.eh.doe.gov/oepa/guidance/caa.htm>

DOE Environmental Policy and Guidance, CERCLA/EPCRA;
<http://tis-nt.eh.doe.gov/oepa/guidance/cercla.htm>

OEPA's ARARs Website, <http://tis-nt.eh.doe.gov/oepa/arars>

DOE Environmental Policy and Guidance, Radiation Protection (Atomic Energy Act);
<http://tis-nt.eh.doe.gov/oepa/guidance/aea.htm>

Introduction to the Resource Conservation and Recovery Act and Liability Overview

This module is divided into thirds. The first third provides an introduction to the Resource Conservation and Recovery Act (RCRA), its subtitles, the rulemaking process, a history of DOE compliance, a preliminary definition of solid and hazardous waste, and the types of hazardous waste.

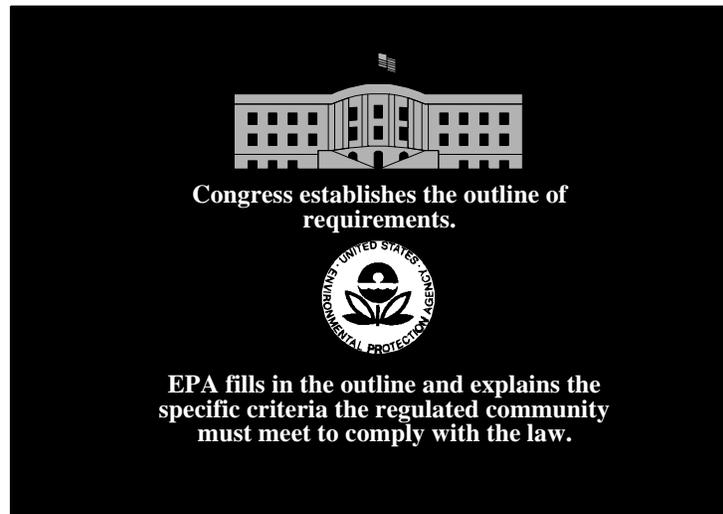
The second third covers generators, categories of generators, satellite accumulation areas, 90-day accumulation requirements, permits, closure, and corrective action. Also covered are the manifesting, transporting, packaging, labeling, and marking of hazardous waste.

The last third covers land disposal restrictions, air emissions, civil and criminal sanctions, and the relationship of RCRA with other laws.

By the end of this module, you should be able to:

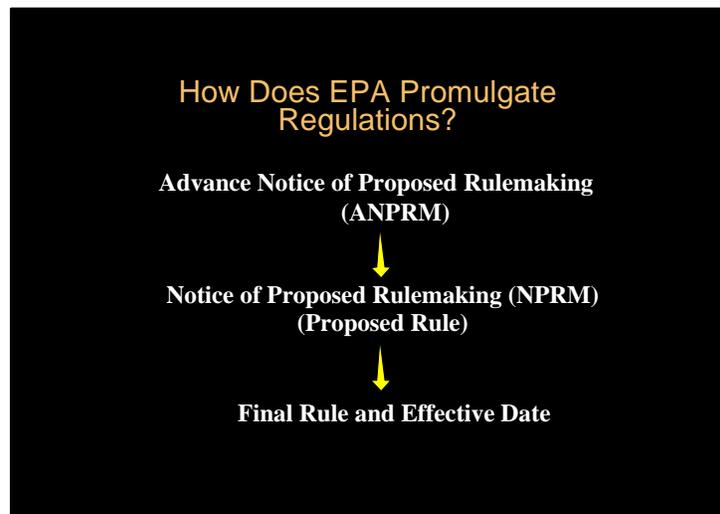
1. List the three steps in the rulemaking process; (p. I-4)
2. State the objective of RCRA; (p. I-5)
3. Recognize the implications of the Federal Facility Compliance Act and Land Disposal Program Flexibility Act on RCRA; (p. I-6)
4. Specify the three most important subtitles of RCRA; (pp. I-7 to I-9)
5. Identify how radioactive mixed waste is regulated; (p. I-10)
6. Restate the steps to determining whether a solid waste is hazardous waste; (pp. I-13 to I-14)
7. List the four characteristics of hazardous waste; (p. I-15)
8. Restate two criteria used by EPA to identify listed waste; (p. I-16)
9. Define and categorize a generator of hazardous waste; (pp. I-18, 19)

10. List five responsibilities of a generator; (p. I-20)
11. Recognize the conditional storage requirements of satellite accumulation areas; (p. I-21)
12. List three units that are acceptable for 90-day accumulation; (p. I-23)
13. List the requirements governing 90-day accumulation areas; (p. I-23)
14. Identify the role of the generator in the "cradle-to-grave" management of waste; (p. I-25)
15. List four responsibilities of the generator in manifesting hazardous waste; (p. I-26)
16. Recognize the Environmental Protection Agency (EPA), the Department of Transportation (DOT), and Nuclear Regulatory Commission (NRC) joint jurisdiction of the over transportation of hazardous waste and nuclear materials; (p. I-27)
17. Specify the four general requirements of DOT in transporting hazardous waste; (p. I-28)
18. Identify the three activities that require a permit; (p. I-30)
19. Recognize that permits may require closure, post-closure, and/or corrective action; (pp. I-31, 32)
20. Describe at least six types of land disposal; (p. I-36)
21. Recognize the two general elements that comprise the land disposal restrictions (LDR) program; (p. I-37)
22. Restate the LDR storage prohibition; (p. I-37)
23. Identify at least three air emission sources that are subject to Subtitle C regulation; (p. I-39)
24. Distinguish between a civil and criminal sanction; (pp I-41 to I-42)
25. List three criminal offenses under RCRA; (p. I-43)
26. Explain how states receive authorization to enforce RCRA; (p. I-45)
27. List at least five laws with which RCRA overlaps and explain some of the overlaps. (p. I-46)



Before looking at legislative history, we should understand the origin of legislation. Congress defines the broad framework of requirements in legislation and authorizes an implementing agency, such as the U.S. *Environmental Protection Agency (EPA)* to provide and defend the details of the broad requirements. For example, *RCRA* Sec. 3005 [42 *United States Code (USC)* 6925] mandated that EPA promulgate [i.e., “to put (law) into action or force” according to Webster’s] regulations requiring permits for treatment, storage, and disposal of hazardous waste and imposed a deadline for development of these regulations. RCRA also imposed requirements on the duration of permits and on specific types of units. Nevertheless, the section of law does not explain the process to follow in obtaining a permit, the contents of the permit application, or how the permit process differs for existing vs new facilities. In other words, without more detailed regulations, facilities would have no way to obtain a permit.

The regulations, therefore, provide the detailed process and criteria that must be met to obtain a permit. The regulations define the scope and applicability of the permitting requirements. Scope and applicability, however, must be within the Congressional mandate established in the law, RCRA.



EPA develops specific regulations to ensure compliance with the law. Scientific and technical data provide the foundation for many decisions on environmental regulations. EPA then proposes regulatory requirements for public comment in the daily *Federal Register* (*FR*). EPA receives comment from any interested party and must evaluate comments received. When EPA publishes a final rule, it must explain how it accommodated, or chose not to accommodate, public comment.

EPA publishes its planned agenda of regulatory actions semiannually in the *FR*. Thus, the regulated community can keep track of issues EPA intends to address in the future and be prepared to comment.

This slide shows the process. The process usually begins with EPA's publishing a notice of proposed rulemaking (NPRM). Sometimes EPA publishes an advance notice of proposed rulemaking (ANPRM). The ANPRM is often used to request data from the regulated community that can be considered in the NPRM.

FR notices are also used to notify the public of meetings, to assemble working groups, and to provide corrections to published actions.

As part of its ongoing operations, DOE's *Office of Environmental Policy and Assistance* (EH-41) *monitors* and *responds to EPA proposed rulemakings* and other regulatory items.



The objective of RCRA is “to promote the protection of health and the environment and conserve valuable material and energy resources . . .” 42 USC 6902

Congress mandated the following means to meet the objectives of RCRA by:

- providing technical assistance to state and local governments to improve solid waste management;
- providing training grants in occupations involving the design, operation, and maintenance of solid waste disposal systems;
- prohibiting open dumping;
- assuring hazardous waste management practices that are protective of human health and the environment;
- requiring proper hazardous waste management from point of generation to reduce the need for future cleanup;
- minimizing generation and land disposal of hazardous waste by encouraging process substitution, materials recovery, recycling and reuse, and treatment (in that order of preference for management);
- establishing a viable federal-state partnership in administering the SWDA;
- providing for promulgation of guidelines for solid waste management and resource recovery;
- promoting national research and development in solid waste management and resource recovery;
- promoting demonstration, construction, and application of solid waste management resource recovery, and resource conservation systems; and
- establishing a cooperative effort among the federal, state, and local governments and private enterprise to recover materials and energy from solid waste.

Highlights of RCRA History

- 1965 Solid Waste Disposal Act
- 1970 Resource Recovery Act
- 1976 Resource Conservation and Recovery Act (RCRA)
- 1984 Hazardous and Solid Waste Amendments (HSWA)
- 1992 Federal Facility Compliance Act (FFCAct)
- 1996 Land Disposal Program Flexibility Act

The *Solid Waste Disposal Act (SWDA)* was the legislative foundation for hazardous and solid waste management requirements. The SWDA, as enacted in 1965, gave states responsibility for developing solid waste management plans. Today, as a result of this long-standing concern for solid waste, some states have well-developed solid waste management programs. States are also in the process of gaining authority to implement the federal municipal solid waste permitting standards.

The Resource Recovery Act funded resource recovery programs and represented an early effort to encourage resource conservation and recycling programs.

RCRA amended the SWDA and clearly established authority for EPA to designate hazardous wastes and impose stringent requirements for their management. RCRA established a “cradle-to-grave” system for managing hazardous waste. The acronym “RCRA” is commonly used to refer to the overall framework of the SWDA, as amended. RCRA will be used as the acronym to refer to the SWDA for the remainder of this course.

The *Hazardous and Solid Waste Amendments (HSWA)* to RCRA introduced stringent new requirements to minimize the future risks from hazardous waste management practices.

The *Federal Facility Compliance Act (FFCAct)* waived sovereign immunity under RCRA. Federal agencies are now subject to monetary penalties.

The *Land Disposal Program Flexibility Act* provides an exemption from LDR requirements for certain low-risk wastes.

RCRA's Ten Subtitles Are:

- **A: General Provisions**
- **B: Authority of the Administrator**
- **C: Hazardous Waste Management**
- **D: State or Regional Solid Waste Plans**
- **E: Duties of the Secretary of Commerce in Resource Recovery**

Subtitle A includes general information, such as Congressional findings, that gave rise to RCRA. Subtitle A also includes the objective of the law, definitions, integration with other laws, financial disclosure, and solid waste management information and guidelines.

Subtitle B established various panels and committees (e.g., resource recovery and conservation panel) and the authority of the administrator.

Subtitles C and D are covered in a later slide.

Subtitle E established the responsibilities of the Secretary of Commerce, the requirement to develop specifications for secondary materials, and the development of markets for recovered materials. The responsibilities of the Secretary of Commerce include encouraging commercialization of proven resource recovery technology by providing accurate specifications for recovered materials, stimulation of development of markets for recovered materials, promotion of proven technologies, and provision of a forum for exchange of technical and economic data relating to resource recovery facilities.

RCRA's Ten Subtitles Are
(cont'd):

- **F: Federal Responsibilities**
- **G: Miscellaneous**
- **H: Research, Demonstration and Development**
- **I: Underground Storage Tanks**
- **J: Demonstration Medical Waste Tracking Program**

Subtitle F addresses the applicability of RCRA to federal agencies and establishes criteria for federal procurement of recycled goods.

Subtitle G addresses some important miscellaneous provisions such as employee protection, citizen suits, and response to imminent hazard.

Subtitle H addresses research, demonstrations, and training.

Subtitle I is covered in more detail in a later slide.

Subtitle J established a demonstration program addressing tracking and inspections of medical waste management activities in New York, New Jersey, Connecticut, the states contiguous to the Great Lakes, and any state petitioning to be included. States could elect not to participate. Subtitle J did not directly affect many DOE installations. It, however, does reflect growing concern for management of medical waste. This growing concern is also evident from the implementation of state medical waste management rules in some states.

Subtitle F: Federal Responsibilities

Federal agencies “shall be subject to and comply with, all Federal, state, interstate, and local requirements, both substantive and procedural . . . including the payment of reasonable service charges.” Federal agencies are *not “immune or exempt* from any process or sanction of any State or Federal Court with respect to the enforcement of any such injunctive relief.” 42 USC 6962

History of DOE Compliance

- **1980: DOE interpreted that RCRA did not apply to DOE**
- **1982: DOE Order required compliance with technical but not administrative requirements**
- **1984: LEAF vs. Hodel**
- **July 3, 1986: EPA notice on mixed waste**
- **May 1, 1987: DOE published “byproduct rule”**

SWDA Section 1004(27) excludes source, special nuclear, and byproduct material as defined by the *Atomic Energy Act (AEA)* of 1954, as amended, from the definition of solid waste. Thus, RCRA does not regulate source, special nuclear, and byproduct materials. Further, SWDA Section 1006 states that nothing in the Act shall apply to activities subject to the AEA, except to the extent that such application is not inconsistent with requirements of the AEA. These passages were likely foundations for the assumption that the U.S. *Department of Energy (DOE)* was exempt from RCRA.

The 1982 DOE Order did require compliance with technical standards of RCRA. It should also be noted that some DOE facilities did attempt to meet administrative as well as technical requirements. This order was canceled in 1987.

LEAF (Legal Environmental Assistance Foundation) vs. Hodel made clear that RCRA applies to hazardous waste activities at AEA facilities. It, however, did not completely resolve uncertainty regarding the regulation of the hazardous waste component of *mixed waste* (i.e., wastes containing both hazardous and radioactive components).

The uncertainty regarding RCRA’s applicability to mixed waste (MW) was eliminated in July 1986 when EPA notified states that they must modify their programs to include regulating MW or lose authority to regulate hazardous waste under RCRA. Both EPA’s notice and DOE’s “byproduct material” rule clarified that only the radioactive component of MW is excluded from RCRA. The hazardous waste component of MW is subject to RCRA regulation.

The hazardous waste component of MW generated in the DOE system is subject to the hazardous waste management requirements discussed in the RCRA Orientation as well as to *DOE Order 5820.2A*.

RCRA Orientation Focus

- **Subtitle D:** Solid waste management
- **Subtitle I:** *Underground storage tanks*
- **Subtitle C:** The “cradle-to-grave” hazardous waste mgmt provisions

Subtitle D establishes federal objectives for state or regional solid waste management planning and authorizes EPA to establish criteria for *sanitary landfills*.

The Subtitle I program addresses requirements for the installation, management, and closure of *underground storage tanks* that contain *petroleum products* or *hazardous substances*, as that term is defined under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). *Underground tanks containing hazardous wastes* are *deferred* from the Subtitle C program and, rather, must comply with the management standards established under Subtitle C.

This course focuses on Subtitle C’s hazardous waste management provisions. The complex regulations implemented under the legal authority of Subtitle C are the source of the majority of Notices of Violation (NOVs) at federal facilities. Under the FFCAct, such deficiencies are subject to fines and penalties that can have substantial impact on the operating budgets of federal facilities.



Hazardous waste regulation is often referred to as “cradle-to-grave” waste management. That phrase has come to be associated with hazardous waste requirements because they affect waste from the point of generation to the point of ultimate disposal.

So the first element of RCRA you need to understand is the “birth” of a hazardous waste. Activities that give rise to wastes that qualify as hazardous waste are usually referred to as hazardous waste **generation**. The facility that generates hazardous waste is called a *hazardous waste generator*. If you throw away anything on your installation (which we all do), you are a **waste generator**, but not necessarily a **hazardous waste generator**.

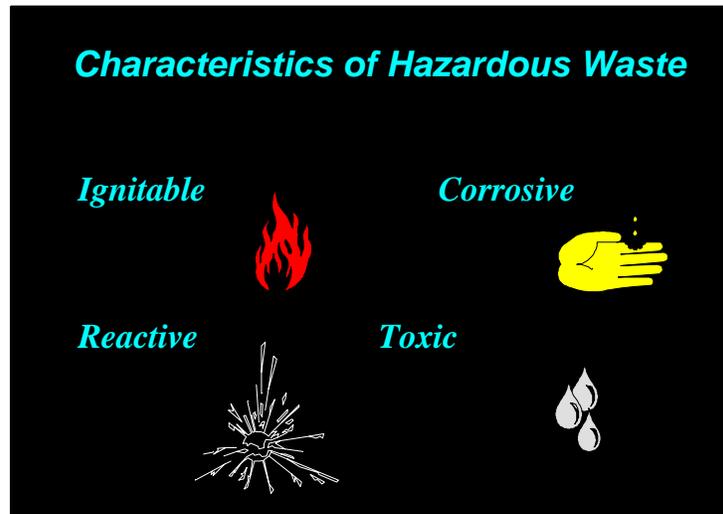
So the first question that must be asked to determine how RCRA affects you is “Do you generate hazardous waste?”



RCRA's hazardous waste management requirements only apply to materials that have served their original intended purpose and are, therefore, discarded from their immediate use. These standards **may** also apply when the discarded material is reused elsewhere. Because management requirements only apply to certain discarded materials, understanding which discarded materials are regulated is essential to ensuring compliance with RCRA. The stepwise *determination of whether a material qualifies as solid waste* and, then, whether the solid waste qualifies as hazardous waste will be discussed in more detail in the next two modules.

Steps To *Determine If Solid Wastes Are Hazardous Waste*

- Is the waste excluded?
- Is the waste listed?
- Is the waste a characteristic hazard?
- Is the waste subject to special rules that make it hazardous waste?
 - Is it a mixture?
 - Is it a treatment residue?
 - Is it a container that held hazardous waste?



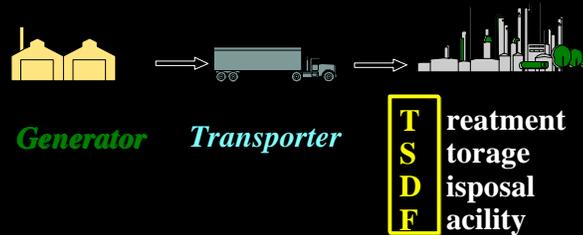
Subpart C of 40 CFR Part 261 contains criteria for identifying *characteristically hazardous wastes*. The characteristic hazards are defined relative to criteria, such as ignitability, that are associated with chemical properties that many different kinds of waste constituents can exhibit.

Listed Hazardous Waste

- Listed by EPA because waste possesses one or more of the identified characteristics *OR*
- Listed by EPA based on the presence of a constituent that has toxic, carcinogenic, mutagenic, or teratogenic effects on humans/animals.

40 CFR 261 Subpart D contains *listings of hazardous waste*. Under Subpart D, EPA designates wastes as hazardous because of the presence of certain chemical constituents.

“Cradle-to-Grave” Management



RCRA imposes stringent administrative and management requirements on *those who generate hazardous waste*. The administrative requirements ensure accountability for waste from the point of generation to the point of ultimate disposal.

Regulatory requirements are organized around the key players in this cradle-to-grave management system that are outlined on the slide.

What Is A *Generator*?

Under 40 CFR 260.10, a generator is “any person, by site, whose act or process produces hazardous waste identified or listed in Part 261 of this chapter or whose act first causes a hazardous waste to become subject to regulation.”

A specific DOE facility may qualify as a generator. If a DOE facility has off-site facilities such as laboratories, EPA or a state can require that they be viewed as individual sites having to meet the *generator requirements* outlined in this section.

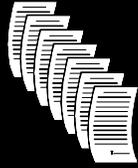
Generator Categories

- **Conditionally Exempt Small Quantity Generators (CESQG) generate:**
 - < 100 kg/month or
 - < 1 kg of acute hazardous waste/month
- **Small Quantity Generators (SQG) generate 100 to 1000 kg/month**
- **Large Quantity Generators (LQG) generate:**
 - 1000 kg/month or more, or
 - > 1 kg of acute hazardous waste/month

Generator requirements depend on generation category. **Generation category** depends on how much waste is generated each calendar month and how much is accumulated on-site at one time. 40 CFR 261.5 defines the *conditionally exempt small quantity generator* (CESQG) category. In most states, **CESQGs** are not subject to substantive provisions of RCRA, provided they determine whether their wastes are hazardous and ensure *appropriate disposition* according to 40 CFR 261.5(e), (f), and (g). They must be able to verify that they are CESQGs.

SQGs must meet most of RCRA's standards. However, they have longer to accumulate waste on-site and do not have to report their hazardous waste management activities in a biennial report. 40 CFR 262.34(d), (e), and (f) outline the limitations on on-site accumulation. SQGs can accumulate waste without a permit for up to 180 days (or 270 days, if the off-site facility to which the SQG will send the waste is more than 200 miles away). Section 262.44 outlines the reduced reporting and record keeping requirements for SQGs.

LQGs, the focus of this course, are subject to all RCRA generator provisions.



Generators Must

(40 CFR 262)

- Determine whether solid waste is hazardous
- Obtain an EPA identification number
- Have waste transported, treated, stored, or disposed of only by other persons with EPA identification numbers
- Submit reports of hazardous waste activities
- Retain records

After a **generator** determines that its waste is hazardous waste, the generator must notify the EPA/state of its hazardous waste management activities. As a result of the notification, the facility receives an identification number that must be used on its **reports** and **manifests**.

The generator must also document its hazardous waste management activities. Record keeping (i.e., documentation) is a fundamental element of accountability under the RCRA program. Documentation of hazardous waste activities includes producing and maintaining manifests that accompany off-site shipments of wastes. Generators must also submit reports to the EPA/state that include the types and quantities of wastes generated and the on-site and off-site management of these wastes. Generators must ensure that **off-site management facilities** and **transporters** comply with RCRA's hazardous waste management standards.

Accumulation Provisions **Satellite Areas**



- Store “at or near point of generation”
- Store under control of the process operator
- Comply with specified storage conditions
 - ➔ chemical compatibility
 - ➔ management/labeling
- Store no more than 55 gallons of hazardous waste in one satellite area

To qualify as *satellite accumulation*, storage must meet the standards outlined on this slide [40 CFR 262.34(c)]. Regulatory interpretations vary on what constitutes compliance with some of these elements. EPA Headquarters limits accumulation to 55 gallons of hazardous waste or 1 quart of acute hazardous waste at one satellite accumulation area. EPA does not prohibit, however, designation of multiple satellite accumulation areas in one building. Designating multiple satellite accumulation points in one physical area can, however, be construed as a means of avoiding 90-day accumulation requirements. Therefore, generators must have some practical guidelines that can be confirmed with state and regional regulators.

Similar problems with interpretations are associated with what constitutes “at or near the point of generation.” Some take that language to indicate that wastes must be accumulated in the immediate area rather than in an adjacent room or on the other side of a door. An alternative interpretation considers the impact of requirements such as safety and occupational exposure standards. Under the alternative interpretation, placing a satellite drum in an adjacent room would be defensible if such placement enhances safety by, for example, reducing fire risks.

The concept of process operator controlling the accumulation appears clear. Nevertheless, some facilities assert that the process operator is not a single person. The operator is instead an organizational entity that could include several people.

How can you resolve these differing interpretations? Contact your state and your EPA region to verify their views on these provisions. Also, remember that some states impose substantially greater requirements for on-site accumulation. For example, California requires an accumulation start date for satellite points. Therefore, refer to state as well as federal regulations when developing guidance for your installation.

Accumulation Provisions 90-Day Areas



- *Container* storage areas
- *Tanks*
- **Containment buildings**



Container means any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled (40 CFR 260.10).

Tank means a stationary device designed to contain an accumulation of hazardous waste that is constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic), which provide structural support (40 CFR 260.10).

Containment building means a hazardous waste management unit that is used to store or treat hazardous waste under the provisions of 40 CFR 264 or 265 Subpart DD (40 CFR 260.10).

Accumulation Provisions 90-Day Requirements (cont'd)

- Label with the words “Hazardous Waste”
- Mark the waste accumulation start date
- *Inspect* the accumulation area
- Meet specified *closure requirements*
- Conduct *training*
- Prepare a *contingency plan*
- Provide *emergency response* equipment



Containers and *tanks* must be marked with the words “hazardous waste” [40 CFR 262.34(a)(3)].

Containers must be clearly marked with the date accumulation begins [40 CFR 262.34(a)(2)]. Specific requirements vary with the type of unit.

Waste management units must be inspected for leaks and deterioration on the frequency specified in regulation (i.e., weekly for *containers*, each operating day for *tanks*) [40 CFR 262.34(a)(1)] .

Although *closure standards* do not apply to all 90-day units, applicability of closure must be considered for certain units (i.e., tanks, drip pads, and containment buildings) [40 CFR 262.34(a)(1)].

Personnel must be trained within 6 months of assuming duties at a 90-day area and must work under a trained supervisor until training is received. Initial training must be followed by annual refresher training (40 CFR 262.34(a)(4) referencing 40 CFR 265.16).

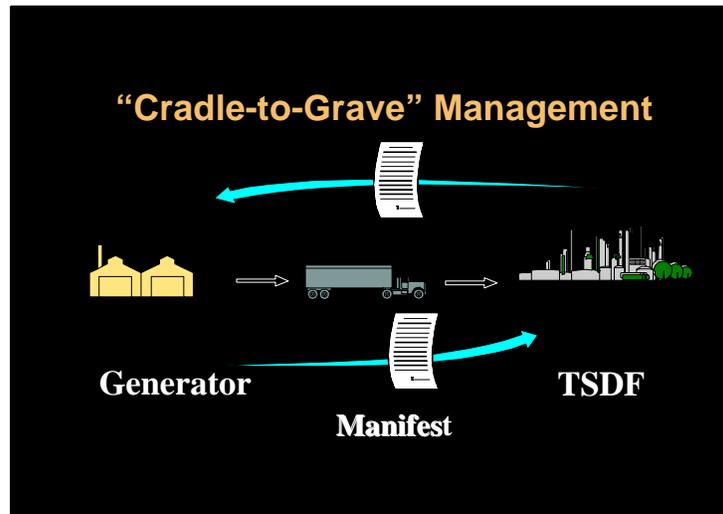
The 90-day area must have a *plan outlining steps to be taken* to respond to an emergency (e.g., fires, explosions, releases), location and capability of emergency response equipment, evacuation routes, and emergency coordinators (40 CFR 262.34(a)(4) referencing 40 CFR 265 Subpart D).

The operator of the 90-day area must provide *emergency response* equipment, including that specified in the contingency plan (40 CFR 262.34(a)(4) referencing 40 CFR 265 Subpart C).



Storage for longer than 90-
days or in units other than the
types specified requires a
permit or *waste shipment off-site*
to a permitted facility.





Accountability begins with the generator of hazardous waste in the cradle-to-grave waste management system.

Manifest: A Key Element in Accountability

- Unless traveling within or along the boundary of a facility, manifests must accompany wastes on public roads.
- Generator and authorized TSD facility must be identified.
- Wastes must be *packaged and marked* to comply with DOT regulations.
- Failure to receive completed manifest requires filing an exception report within 45 days.
- Generators must certify that they have a waste minimization program in place.

An important element of accountability in the overall waste management system is the hazardous waste *manifest*. The hazardous waste manifest is a “chain-of-custody” document. After being prepared by the *generator*, all parties handling the waste verify that they transfer all waste listed on the manifest to the next party who will manage it. When the ultimate TSD facility receives the waste, it must send a signed copy of the manifest back to the generator. Receipt of the signed manifests indicates to the generator that the wastes have been properly transferred from the point of generation to the next point of waste management. A breakdown in this chain of accountability (i.e., waste not received, manifest not returned, or proper quantity of waste not received) must be reported to the EPA/state in a generator exception report.

Another important aspect of the hazardous waste manifest is the generator's certification that it has a waste minimization program in place. EPA clarified these requirements in “Guidance for Hazardous Waste Generators on the Elements of a Waste Minimization Program” (58 FR 31114).

Transporters Must

(40 CFR 263)



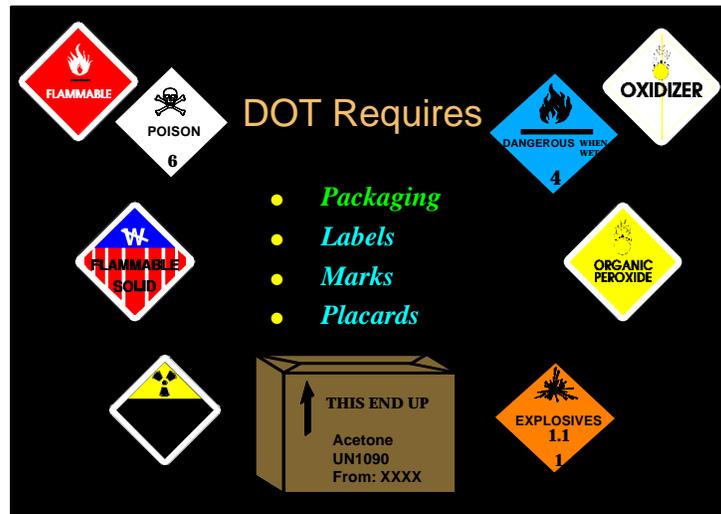
- Comply with DOT standards under the Hazardous Materials Transportation Act.
- Comply with manifest system and retain records for 3 years.
- Comply with radioactive waste transport requirements.
- Be responsible for cleanup in event of a spill.

Most of the *pre-transport regulations* are promulgated and enforced through an arrangement (a memorandum of understanding) between EPA and the Department of Transportation (DOT). Under RCRA authority, EPA establishes standards that are consistent with the regulations promulgated by DOT under the Hazardous Materials Transportation Act (HMTA) and the Hazardous Materials Transportation Uniform Safety Act (HMTUSA).

One of EPA's responsibilities in this shared authority is to monitor generators and operators of TSDFs for compliance with RCRA regulations. EPA also is in charge of enforcing transportation regulations when the violation is ancillary to the disposition of the waste. For instance, EPA will prosecute a "midnight dumper" because *transportation* is ancillary to the disposal in that case.

DOT is responsible for conducting inspections of hazardous materials transporters on an ongoing basis to ensure compliance with HMTUSA regulations, and will also conduct investigations based on EPA reports of suspected violations of HMTUSA. Likewise, any information in DOT's possession that indicates a RCRA violation will be passed on to EPA for enforcement action.

The DOE, DOT, and Nuclear Regulatory Commission (NRC) all regulate radioactive materials. DOT has jurisdiction over DOE shipments of commercial radioactive materials but not defense nuclear materials. For transportation of these materials, DOT and DOE have agreed that DOE may certify itself, using NRC standards.



Packaging requirements are included in The Hazardous Materials Transportation Table (HMT) in 40 CFR 172. The table identifies authorized packaging for each hazardous material and includes “packing group” (i.e., whether the material is considered a great danger, medium danger, or minor danger.)

Labels provide easily recognized symbols to indicate operational instructions and potential hazards associated with the package. They are diamond-shaped, brightly colored warning devices, 4 square inches in size, that are placed on the outside of hazardous material packages. Each package, overpack, or freight container in which hazardous materials are shipped must be labeled (as appropriate) with information from the HMT in 49 CFR 172.101.

The HMT specifies the information that must be included on the label based on the proper shipping name, including hazard class, identification number of the chemical, the packing group, type of label required (e.g., “corrosive,” “poison,” etc.), any special provisions, packaging authorizations, and restrictions (if any) pertaining to particular modes of transportation.

The information on the label includes the information on the hazardous waste manifest: proper shipping name, hazard class, and identification number.

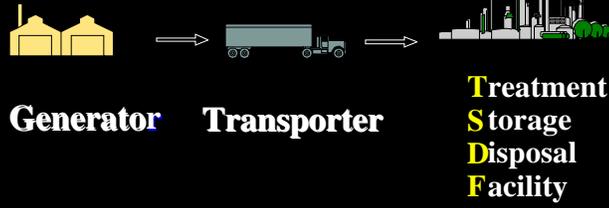
Marking means “a descriptive name, identification number, instructions, cautions, weight, specification, or UN marks, or combinations thereof, required. . . on outer packagings of hazardous materials.” [49 CFR 171.8]

In addition to the proper shipping name (PSN) and the material ID number, the regulations also require:

- consignee’s or consignor’s name and address,
- the reportable quantity (RQ),
- other identification such as the name of the hazardous substance,
- other hazard notification such as “Inhalation Hazard,”
- gross weight and type of packaging (if radioactive), and
- a label reading: “This Side Up” or “This End Up” (if liquid).

The **placard** is selected by the shipper based on the hazards present and the quantity of each hazard (49 CFR 172.504). The HMT lists the hazard class and the label(s) required.

“Cradle-to-Grave” Management



RCRA Requires a *Permit* for TSDFs

- **Treatment:** Changing physical, chemical, or biological character or composition.
- **Storage:** Holding waste temporarily before treatment, disposal, or storage elsewhere.
- **Disposal:** Discharging, depositing, injecting, dumping, spilling, leaking, or placing any solid or hazardous waste into or on land or water.

Facilities that treat, store, or dispose of hazardous waste and do not meet any of the *exclusions from permitting* must have a hazardous waste permit/interim status. Activities encompassed by the referenced definitions, therefore, require a *permit/interim status*, unless specifically excluded under 40 CFR 264.1/265.1 and 270.1.

**“Cradle-to-Grave” Also Includes
Closure And Post-Closure Care**

Closure and post-closure care requirements are imposed in the permitting process.

RCRA regulates hazardous waste management units during their active lives, but RCRA’s requirements do not end when the facility is taken out of service. In fact, specific requirements must be met to take a unit out of service (i.e., close the unit). Closure of the unit must be conducted according to an approved *closure plan*, and a registered professional engineer must certify that the unit is closed according to the closure plan.

Closure can involve removal of remaining wastes and decontaminating and/or disposing of all structures associated with the unit so that no residues remain. Such closure is referred to as a *clean closure*, and RCRA requires no further monitoring or management for the unit. Although the precise meaning of decontamination is currently determined on a case-by-case basis, if structures or equipment are destined for land disposal, hazardous debris treatment technologies (e.g., chemical extraction) that result in a “clean debris surface” may be appropriate. If, however, wastes remain in the unit (as they likely would remain in a landfill), RCRA requires management of the unit under a *post-closure care permit*. Facilities must monitor the closed unit for releases from the unit and maintain the closed unit during a performance period of at least 30 years. A release occurring during that period may result in extension of the post-closure care period.



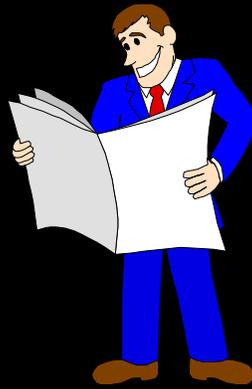
Corrective Action: RCRA's Cleanup Program

- Required for permitted hazardous waste management units, such as landfills, that release
- Required for unregulated units on a site obtaining a permit

Corrective action rules were proposed July 27, 1990 (55 FR 30798). A final rule addressing the concepts of *corrective action management units* and *temporary units* was published February 16, 1993 (58 FR 8658). A proposed rule to introduce EPA's strategy for promulgating additional corrective action regulations was published May 1, 1996 (61 FR 19432).

It should be noted that some federal facilities have both a RCRA permit **and** are on CERCLA's National Priority List. Such facilities must conduct cleanup activities in *compliance with both RCRA and CERCLA*. CERCLA is almost exclusively a federal program. RCRA, on the other hand, can be implemented by an authorized state. Thus, states and EPA could disagree on remedial actions. For federal facilities that are subject to both sets of requirements, responsibilities are assigned through *federal facility agreements (FFAs)*, also referred to as interagency agreements (IAGs).

More To Come On
Permitting And
Corrective Action



Additional Requirements Applicable Generators and TSDFs

- Land Disposal Prohibition
- Air Emissions from TSDFs

LDR: Purpose

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

The *land disposal restrictions (LDR)* have had widespread impact on compliance at DOE facilities because development of treatment technology for RMW lags behind that for nonradioactive 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

LDR provisions affect land-based units such as those on the slide.

What Are The **LDRs**?

- **Treatment standards** that must be met before land disposal:
 - ➔ treatment concentrations or
 - ➔ treatment technologies.
- **Administrative requirements to ensure compliance:**
 - ➔ notification of off-site TSDF,
 - ➔ certification of compliance with the standard, and
 - ➔ waste analysis and record retention requirements

In general, to verify compliance with numeric treatment standards, facilities must analyze the constituent concentration in wastewaters or the constituent concentration in the waste extract for nonwastewaters.

For nonwastewaters, the Toxicity Characteristic Leaching Procedure (a leaching procedure defined by *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846) is used to obtain the waste extract, which is then analyzed for the appropriate constituents.

If the waste or the waste extract meets the treatment standard, the treatment residue may be land disposed.

To verify compliance with a specified technology, facilities must document use of the specified technology.

Also, **Storage Prohibited Except:**



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

RCRA Section 3004(i) **prohibits the storage of wastes** that have been prohibited from land disposal, unless that storage is for the purpose of accumulating sufficient quantities of hazardous waste to facilitate proper treatment and subsequent disposal. This language is codified in 40 CFR 268.50.

One of the common misconceptions about the storage prohibition is when it applies. Some think that storage is allowed for 1 year. This is not the case. For storage that has occurred less than a year, EPA must prove that the storage is for some purpose other than facilitating treatment or recycling and proper disposal of the resulting residue. If the storage exceeds 1 year, the facility must prove that its only purpose for storage is to facilitate treatment or recycling and ultimate disposal of the residue.

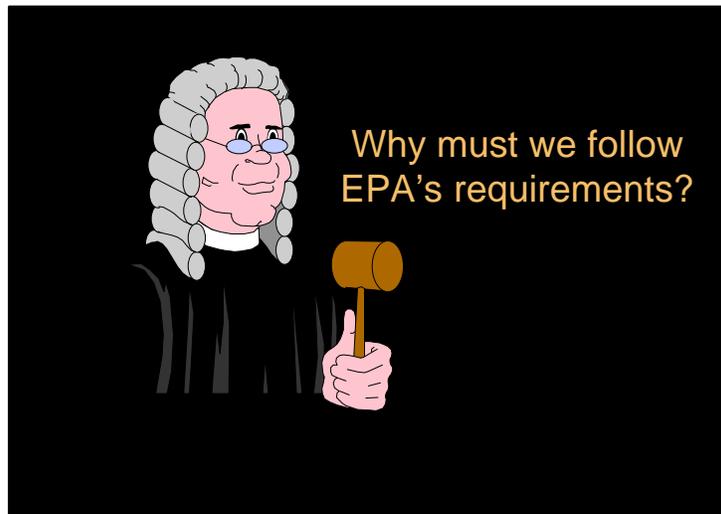
Air Emissions From TSDFs



- Phase I: Air emissions from *vents* and *equipment leaks*.
- Phase II: Control of volatile organic emissions from hazardous waste *surface impoundments, tanks, and container storage*.

HSWA provisions directed EPA to develop regulations for monitoring and controlling air emissions from hazardous waste TSDFs. EPA finalized Phase I rules on June 21, 1990 (55 FR 25454). Phase I rules are designed to reduce organic emissions from *process vents* associated with the treatment of hazardous wastes by distillation, fractionation, thin-film evaporation, solvent extraction, steam stripping, and air stripping, as well as from leaks in certain *pipings and equipment* used for hazardous waste management processes.

EPA finalized Phase II rules on December 6, 1994 (59 FR 62896). The Phase II final rule addresses *management of volatile organics* in surface impoundments, miscellaneous units, *tanks*, and *containers* at TSDFs. Management of such wastes in generator 90-day (i.e., permit-exempt) tanks and containers is also regulated. Requirements focus on design and operational controls to minimize emissions. Examples of such controls include floating roofs for large aboveground storage tanks and the use of DOT-approved containers at 90-day accumulation points. The Phase II final rule was effective December 6, 1996 (61 FR 59932).



The law authorizes EPA to enforce against individuals and facilities that fail to comply with RCRA.



“Civil” enforcement is used for failure to meet environmental regulatory requirements when the actions are not criminal. The most important of these enforcement tools is a fine. Fines are similar to traffic fines where cost increases with how much a driver is over the speed limit.

\$ Federal Enforcement
(Civil)

- Suspend or revoke permit
- Fine up to \$25,000/day

Section 3008(a) of RCRA provides for (1) the issuance of compliance orders requiring compliance immediately or after a specified period and (2) the assessment of penalties for the failure to comply. In assessing such penalties, Congress authorized EPA to consider the seriousness of the violation and good faith efforts to comply. The *RCRA Civil Penalty Policy* provides guidelines for determining appropriate penalties.

Potential enforcement actions include revoking a permit, which could have substantial impact on a facility by shutting down operations that generate the wastes managed in the previously permitted unit.

In the past, EPA's authority to fine other federal agencies has not been clear. Cases in different federal district and circuit courts have resulted in different determinations with some deciding that the federal government is immune to such penalties and others deciding that the *waiver of sovereign immunity* under RCRA allows EPA to fine federal agencies.

The *FFC Act of 1992* eliminated uncertainty over EPA's authority to assess civil penalties against federal agencies. It makes clear that federal agencies are subject to monetary penalties to the same degree as the private sector for violations of federal, state, and local solid and hazardous waste laws.



Criminal Sanctions for Knowing

- **Transport without a manifest**
- **Treat, store, or dispose without a permit**
- **Falsify records**

Criminal sanctions under RCRA depend on establishing some level of knowledge of the action (i.e., the knowing standard). Establishing that the person (or corporation, etc.) knew that his action violated RCRA is not as difficult as one might think.

“Several courts have accepted the government reading of environmental statutes and have imposed direct liability on officers whose participation in wrongful acts is, at best, marginal. Courts have been willing to ignore traditional limits on corporate liability, and are holding corporate officers directly liable not only for their participation in or authorization of wrongful acts, but also imposing liability where the officers merely had power to control, or authority over, an activity.” (J.F. Seymour. *Civil and Criminal Liability of Corporate Officers under Federal Environmental Laws*. May 9, 1989. Bureau of National Affairs, *Environment Reporter*)

Enforcement of criminal violations, however, also depends on prosecutorial discretion. The Department of Justice policy on prosecutorial discretion is outlined in “Factors in Decisions on Criminal Prosecutions for Environmental Violations in the Context of Significant Voluntary Compliance or Disclosure Efforts by the Violator,” July 1, 1991. The policy is

“intended to give the regulated community a sense of how the federal government exercises its criminal prosecutorial discretion with respect to such factors as the defendant's voluntary disclosure of violations, cooperation with the government in investigating the violations, use of environmental audits and other procedures to ensure compliance with all applicable environmental laws and regulations, and use of measures to remedy expeditiously and completely any violations and the harm caused thereby.”

Maximum Criminal Penalties



- **First Offense: \$50,000 per day; 2 to 5 years**
- **Second Offense: double penalties**
- **Knowing Endangerment: \$250,000/day; 15 years**

A maximum penalty of 5 years, for the first offense, is associated with knowing (1) transport or causing to be transported to an unpermitted facility, and (2) treatment, storage, or disposal without a permit or in violation of a material condition of a permit or interim-status requirements.

Knowing endangerment is a knowing violation that places another person in imminent danger of death or serious bodily injury.

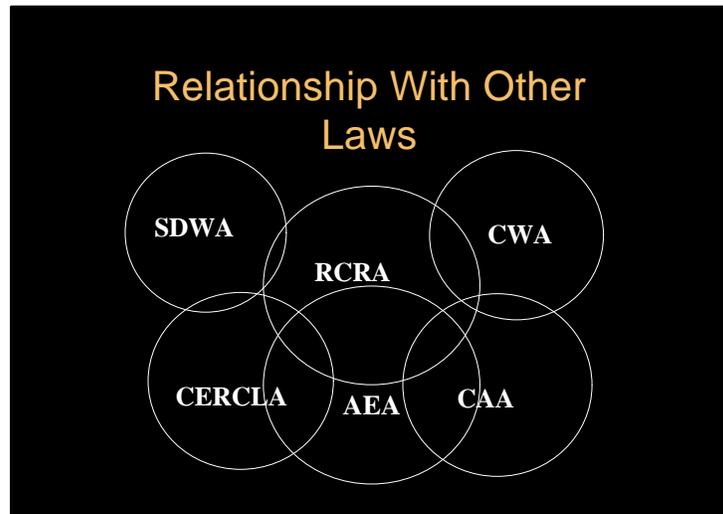
Who Has Enforcement Authority?

- Authorized states manage the hazardous waste program in lieu of EPA.
- To gain authority, states must have:
 - a permitting mechanism and a manifest system
 - adequate administrative and enforcement resources
 - program consistent with federal program.
- To gain full authority, states must be authorized for base program and HSWA provisions

To gain authority to implement RCRA, states must submit their programs to EPA for review and approval. The program must include all elements of the federal program, but can be more stringent. Differences between the state and federal programs, however, cannot create conflicts between the two; thus, state programs must be consistent with the federal program.

HSWA provisions have been implemented over a period of time. Consequently, states have gained authority over different provisions (e.g., corrective action, land disposal restrictions, etc.) in a piecemeal fashion.

It is important to remember that granting a state authority to administer the RCRA program does not preclude EPA from taking enforcement action. Generally, the most stringent interpretation of a regulation should be viewed as the governing standard.



Two of the more difficult compliance issues for facilities are (1) identifying the overlapping requirements under different environmental laws and (2) ensuring that these requirements, even when duplicative, are met.

RCRA's requirements overlap with those of several other environmental laws. Under the *Safe Drinking Water Act (SDWA)*, EPA has authority to permit underground injection wells. If those wells manage hazardous waste, those wells can be granted a *permit-by-rule* under RCRA. Under the permit-by-rule provisions, EPA deems a facility to have a RCRA permit without actually going through the RCRA permitting process.

Several overlaps exist between RCRA and the *Clean Water Act (CWA)*. Some *exclusions* from hazardous waste regulation are based on the assumption that compliance with the CWA is sufficiently protective.

RCRA and the *Clean Air Act (CAA)* overlap in their respective authorities over volatile organic emissions. RCRA facilities must also have CAA permits in some cases. A RCRA permit alone does not satisfy permitting requirements under the CAA.

Last, the *overlap* between *CERCLA* and RCRA is substantial. Both can address cleanup. Further, RCRA is an *applicable or relevant and appropriate requirement (ARAR)* to consider in developing cleanup standards under CERCLA.

However, for nuclear safety managers, the overlap between the *AEA* and RCRA is of great concern. Although RCRA excludes source, special nuclear, and byproduct materials from hazardous waste management requirements, mixed waste is subject to both AEA and RCRA because the radioactive component is subject to AEA, while the hazardous waste component is subject to RCRA.

Summary

- Origin and objectives of the law
- History
- Hazardous waste “cradle-to-grave” management system
- Enforcement
- Relationship with other laws

Origin and Objectives of the Law: The objective of RCRA is protection of human health and the environment by pollution prevention and effective waste management.

History: History has proven that DOE is subject to RCRA requirements for both hazardous waste and RMW.

Hazardous Waste “Cradle-to-Grave” Management System: The key elements of the hazardous waste management system include *waste determination*, generator requirements, transportation requirements, and TSDF standards. Some requirements cross these boundaries, such as the land disposal restrictions and air emissions standards.

Enforcement: Authorized states as well as EPA may take enforcement action. Nevertheless, states normally are the primary enforcement agent when they have been delegated authority. DOE is subject to fines and penalties for noncompliance just as any other party.

Self-Assessment Questions: Introduction Module

I. Circle the correct answers.

- The objectives of RCRA are:
 - To protect human health
 - To conserve material resources
 - To protect the environment
 - To conserve energy resources
- Which of the following are the three most important subtitles of RCRA for DOE:
 - Subtitle A
 - Subtitle C
 - Subtitle I
 - Subtitle B
 - Subtitle D
 - Subtitle J
- Indicate which of the following apply to radioactive mixed waste:
 - RCRA
 - Atomic Energy Act
 - Solid Waste Disposal Act
 - DOE "by product rule"
- Which of the following steps are **not** used to determine if a waste is hazardous:
 - Is the waste excluded?
 - Is the waste listed?
 - Is the waste a characteristic hazard?
 - Can the waste be reclaimed or recycled?
 - Is the waste a commodity?
- Which of the following are responsibilities of the generator:
 - Notify EPA/state of hazardous waste activity
 - Ensure off-site TSDF complies with RCRA
 - Report a spill made during waste transport
 - Determine if waste is hazardous
 - Keep records
 - Manifest hazardous waste
- 90-day accumulation areas must meet all of the following requirements except:
 - Labeling
 - Inspection
 - Training
 - Mark with start date
 - Location at or near point of generation
 - Contingency plan and emergency response equipment
- Which of the following has jurisdiction over the transport of hazardous waste:
 - EPA
 - DOT
- Which of the following activities do not require a RCRA permit:
 - Storage for 90 days or less
 - Treatment
 - Storage for more than 90 days
 - Disposal
- Which of the following are land-based disposal units?
 - Satellite accumulation area
 - Injection well
 - Concrete vault or bunker
 - Underground mine or cave
 - Surface impoundment
 - Waste pile
 - Salt dome
 - Container storage area

Self-Assessment Questions: Introduction Module

10. Circle the two general types of land disposal restrictions:
- a. Permitting
 - b. Treatment standards
 - c. Closure and Post-closure care
 - d. Administrative requirements
11. The following sources of air emissions are subject to RCRA regulation:
- a. Vents and process leaks
 - b. Transport vehicles
 - c. Tanks, container storage, and surface impoundments
 - d. Wastewater pre-treatment
12. Which of the following laws overlap with RCRA?
- a. SWDA
 - b. HSWA
 - c. CWA
 - d. ARAR
 - e. SDWA
 - f. CAA
 - g. CERCLA
 - h. AEA

II. Complete the following:

1. List in order the three steps that occur in rulemaking:
- a. _____ b. _____ c. _____
2. List the four characteristics of hazardous waste:
- a. _____ b. _____ c. _____ d. _____
3. Accountability begins with the _____ in the cradle-to-grave cycle of managing hazardous waste. An important element of accountability is the _____, a “chain of custody document,” which must be prepared by the _____ or his/her agent. The _____ or his/her agent must package and mark the wastes to comply with Department of Transportation regulations before shipping the wastes. If the _____ or his/her agent does not receive the completed “chain of custody” document, the _____ or his/her agent must file an exception report within 45 days. The _____ must also certify that he/she has a _____ in place.
4. Identify three of the four general requirements of DOT in transporting hazardous waste:
- a. _____ b. _____ c. _____
5. List four land-based disposal units:
- a. _____ c. _____
b. _____ d. _____

Self-Assessment Questions: Introduction Module

- 6. Storage of wastes prohibited for land disposal is also prohibited except for two instances:
a _____ b _____
- 7. List three criminal offenses under RCRA:
a _____ b _____
c _____
- 8. Explain how states are authorized to enforce RCRA:

III. Complete the Matching Set

<ul style="list-style-type: none">___ 1. Federal Facilities Compliance Act___ 2. Land Disposal Program Flexibility Act___ 3. Listed waste___ 4. Conditionally Exempt Small Quantity Generator___ 5. Small Quantity Generator___ 6. Large Quantity Generator___ 7. Satellite Accumulation Area___ 8. Requires closure and/or post-closure care___ 9. Clean closure	<ul style="list-style-type: none">a. Less than 100 kg/month of hazardous waste or less than 1 kg/month of acute hazardous wasteb. Permitc. Exempts certain characteristic waste from Land Disposal Restrictionsd. No more than 55 gallons of hazardous waste or 1 quart of acute hazardous wastee. 100 to 1000 kg/monthf. Waived sovereign immunity under RCRAg. 40 CFR 261 Part Dh. 1000 kg/month or more of hazardous waste or more than 1 kg/month of acute hazardous wastei. Removal of all wastes, decontamination, and disposing of all structures associated with a hazardous waste management unit
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IV. True/False

- 1. ___ Subtitle C governs the management of nonhazardous wastes.
- 2. ___ A hazardous waste is also a solid waste.

Self-Assessment Questions: Introduction Module

3. ___ A waste with one or more identified characteristics of a hazardous waste can be a listed waste
4. ___ A satellite accumulation area may be in an adjacent room or other side of a door.
5. ___ Closure applies to all 90-day accumulation areas.
6. ___ Nuclear Regulatory Commission and Department of Transportation but not EPA have jurisdiction over transport of all commercial and defense nuclear materials.
7. ___ If (1) both CERCLA and RCRA apply to a site and (2) the EPA and the state disagree over the remedial actions, the CERCLA requirements take precedence because Federal requirements preempt state requirements.
8. ___ RCRA requirements end when hazardous management units are withdrawn from service.
9. ___ Civil and criminal offenses are distinguished mainly by “knowing standard.”

Self-Assessment Answers: Introduction Module

I. Circle the correct answers.

- The objectives of RCRA are: [see p. I-5]
 - To protect human health
 - To conserve material resources
 - To protect the environment
 - To conserve energy resources
- Which of the following are the three most important subtitles of RCRA for DOE: [see pp. I-7 to I-9]
 - Subtitle A
 - Subtitle C
 - Subtitle I
 - Subtitle B
 - Subtitle D
 - Subtitle J
- Indicate which of the following apply to radioactive mixed waste: [see p. I-10]
 - RCRA
 - Atomic Energy Act
 - Solid Waste Disposal Act
 - DOE “by product rule”
- Which of the following steps are **not** used to determine if a waste is hazardous: [see p. I-14]
 - Is the waste excluded?
 - Is the waste listed?
 - Is the waste a characteristic hazard?
 - Can the waste be reclaimed or recycled?
 - Is the waste a commodity?
- Which of the following are responsibilities of the generator: [see p. I-20]
 - Notify EPA/state of hazardous waste activity
 - Ensure off-site TSDF comply with RCRA
 - Report a spill made during waste transport
 - Determine if waste is hazardous
 - Keep records
 - Manifest hazardous waste
- 90-day accumulation areas must meet all of the following requirements except: [see p. I-23]
 - Labeling
 - Inspection
 - Training
 - Mark with start date
 - Location at or near point of generation
 - Contingency plan and emergency response equipment
- Which of the following has jurisdiction over the transport of hazardous waste: [see p. I-27]
 - EPA
 - DOT

Self-Assessment Answers: Introduction Module

8. Which of the following activities do not require a RCRA permit:
[see pp. I-24 and I-30]
- a. **Storage for 90 days or less**
 - b. Treatment
 - c. Storage for more than 90 days
 - d. Disposal
9. Which of the following are land-based disposal units?
[see p. I-36]
- a. Satellite accumulation area
 - b. **Injection well**
 - c. **Concrete vault or bunker**
 - d. **Underground mine or cave**
 - e. **Surface impoundment**
 - f. **Waste pile**
 - g. **Salt dome**
 - h. **Container storage area**
10. Circle the two general types of land disposal restrictions: [see p. I-37]
- a. Permitting
 - b. **Treatment standards**
 - c. Closure and Post-closure care
 - d. **Administrative requirements**
11. The following sources of air emissions are subject to RCRA regulation:
[see p. I-39]
- a. **Vents and process leaks**
 - b. Transport vehicles
 - c. **Tanks, container storage, and surface impoundments**
 - d. Wastewater pre-treatment
12. Which of the following laws overlap with RCRA? [see p. I-46]
- a. SWDA
 - b. HSWA
 - c. **CWA**
 - d. ARAR
 - e. **SDWA**
 - f. **CAA**
 - g. **CERCLA**
 - h. **AEA**

II. Complete the following:

1. List the three steps in order that occur in rulemaking: [see p. I-4]
- a. **advance notice of proposed rulemaking**
 - b. **final rule and effective date**
 - c. **notice of proposed rulemaking**
2. List the four characteristics of hazardous waste: [see p. I-15]
- a. **Ignitable**
 - b. **Corrosive**
 - c. **Reactive**
 - d. **Toxic**
3. Accountability begins with the generator in the cradle-to-grave cycle of managing hazardous waste. An important element of accountability is the manifest, a “chain of custody document,” which must be prepared by the generator or

Self-Assessment Answers: Introduction Module

his/her agent. The generator or his/her agent must package and mark the wastes to comply with Department of Transportation regulations before shipping the wastes. If the generator or his/her agent does not receive the completed “chain of custody” document, the generator or his/her agent must file an exception report within 45 days. The generator must also certify that they have a waste minimization plan in place. [see p. I-26]

4. Identify three of the four general requirements of DOT in transporting hazardous waste: [see p. I-28]
 - a. packaging
 - b. labeling
 - c. marking
 - d. placarding

5. List four land-based disposal units: [see p. I-36]
 - a. landfills, surface impoundments, waste piles
 - b. underground mines and caves
 - c. land treatment facilities
 - d. salt bed and salt formations
 - e. injection wells
 - f. concrete vaults or bunkers

6. If wastes are prohibited from land disposal, they also are prohibited from storage except for two instances: [see p. I-38]
 - a. accumulation to facilitate treatment or recovery
 - b. variance, extension, or approved petition

7. List three criminal offenses under RCRA: [see p. I-43]
 - a. transport without a manifest
 - b. falsify records
 - c. treat, store, or dispose without permit

8. Explain how states are authorized to enforce RCRA: [see p. I-45]

States must submit their programs to EPA for review and approval. State programs must be at least as stringent as Federal programs to be approved.

Self-Assessment Answers: Introduction Module

III. Complete the Matching Set

- | | |
|---|--|
| <p><u>f</u> 1. Federal Facilities Compliance Act [see p. I-6]</p> <p><u>c</u> 2. Land Disposal Program Flexibility Act [see p. I-6]</p> <p><u>g</u> 3. Listed waste [see p. I-16]</p> <p><u>a</u> 4. Conditionally Exempt Small Quantity Generator [see p. I-19]</p> <p><u>e</u> 5. Small Quantity Generator [p. I-19]</p> <p><u>h</u> 6. Large Quantity Generator [p. I-19]</p> <p><u>d</u> 7. Satellite Accumulation Area [p. I-21]</p> <p><u>b</u> 8. Requires closure and/or post-closure care [p. I-31]</p> <p><u>i</u> 9. Clean closure [p. I-31]</p> | <p>a. Less than 100 kg/month of hazardous waste or less than 1 kg/month of acute hazardous waste</p> <p>b. Permit</p> <p>c. Exempts certain characteristic waste from Land Disposal Restrictions</p> <p>d. No more than 55 gallons of hazardous waste or 1 quart of acute hazardous waste</p> <p>e. 100 to 1000 kg/month</p> <p>f. Waived sovereign immunity under RCRA</p> <p>g. 40 CFR 261 Part D</p> <p>h. 1000 kg/month or more of hazardous waste, or more than 1 kg/month of acute hazardous waste</p> <p>i. Removal of all wastes, decontamination, and disposing of all structures associated with a hazardous waste management unit</p> |
|---|--|

IV. True/False

1. T Subtitle C governs the management of nonhazardous wastes. [see p. I-7]
2. T A hazardous waste is also a solid waste. [see p. I-13]
3. T A waste with one or more identified characteristics of a hazardous waste can be a listed waste [see p. I-16]
4. T A satellite accumulation area may be in an adjacent room or other side of a door. [see p. I-21]
5. F Closure applies to all 90-day accumulation areas. [see p. I-23]
6. F Nuclear Regulatory Commission and Department of Transportation but not EPA have jurisdiction over transport of all commercial and defense nuclear materials. [p. I-27]
7. F If (1) both CERCLA and RCRA apply to a site and (2) the EPA and the state disagree over the remedial actions, the CERCLA requirements take precedence because Federal requirements preempt state requirements. [see p. I-32]
8. F RCRA requirements end when hazardous management units are withdrawn from service. [see p. I-31]
9. T Civil and criminal offenses are distinguished mainly by “knowing standard.” [see p. I-43]

**INTRODUCTION TO RCRA AND LIABILITY OVERVIEW MODULE
REGULATORY-STATUTORY CITATION/KEY WORD INDEX**

Statutory/Regulatory Citations

<u>Citation(s)</u>	<u>Page Number(s)</u>
40 CFR 260.10	I-18, I-22
40 CFR Part 261	I-18
40 CFR 261.5(e), (f), and (g)	I-19
40 CFR Part 262	I-20
40 CFR 262.34(a)(1), (2), (3), (4)	I-23
40 CFR 262.43(d), (e), and (f)	I-19
40 CFR 262.44	I-19
40 CFR Part 263	I-27
40 CFR 264.1	I-30
40 CFR 265.16	I-23
40 CFR Part 264, Subpart DD	I-22
40 CFR Part 265, Subpart C	I-23
40 CFR Part 265, Subpart D	I-23
40 CFR Part 265, Subpart DD	I-22
40 CFR Part 265.1	I-30
40 CFR 268.50	I-38
40 CFR 270.1	I-30
49 CFR Part 172	I-30
49 CFR 172.8	I-30
49 CFR 172.101	I-30
49 CFR 172.504	I-30
RCRA Section 3004(i)	I-38
RCRA Section 3005	I-3
SWDA Section 1004(27)	I-10
SWDA Section 1006	I-10

Alphabetical Listing

<u>Key Word(s)</u>	
Accumulation area, 90-day	I-22 to I-24 and I-39
Advance Notice of Proposed Rulemaking (ANPRM)	I-4
Air emissions	I-39
Atomic Energy Act (AEA)	I-10 and I-46
"By product" Rule	I-10 and I-46
CERCLA	I-11, I-32, and I-46
Characteristic waste	I-14 to I-15
Clean Air Act	I-46
Clean Water Act	I-46

Clean closure	I-31
"Clean debris surface"	I-31
Closure	I-23, I-31
Closure plan	I-31
Commercial nuclear materials	I-27
Conditionally exempt small quantity generators (CESQG)	I-19
Container	I-22 to I-24 and I-39
Containment buildings	I-22 to I-24
Contingency planning, 90-day area	I-23
Corrective action	I-32 and I-45
Corrective action management unit	I-32
Definition of soiled and hazardous waste	I-13 to I-16
Defense nuclear materials	I-27
Department of Transportation	I-27
DOE Order 5820.2A	I-10
Emergency response equipment, 90-day area	I-23
Energy recovery	I-5
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Equipment leaks	I-39
Excluded waste	I-14 and I-46
Exclusion from permitting	I-30
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Underground storage tanks (USTs)	I-11
Volatile organics	I-39 and I-46
Waste minimization	I-5, I-26

Introduction Module Cross-Links

Module Page/Line	Cross-Link Language	Resource/Document
I-3/Notes, Line 4	“Environmental Protection Agency (EPA)”	Environmental Protection Agency Home Page; http://www.epa.gov/
I-3/Notes, Line 5	“RCRA”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oeпа/law_sum/RCRA.HTM
I-4/Notes, Line 4	“ <i>Federal Register</i> ”	New Federal Regulatory Initiatives; http://tis-nt.eh.doe.gov/oeпа/regulate.html
I-4/Notes, Lines 18-19	“Office of Environmental Policy and Assistance (EH-41)”	DOE Office of Environmental Policy and Assistance (OEPA) Website; http://tis-nt.eh.doe.gov/oeпа/ or DOE Office of Environmental Policy and Assistance Mirror Website; http://homer.hsr.ornl.gov/oeпа/
I-4/Notes, Line 19	“monitors”	New Federal Regulatory Initiatives; http://tis-nt.eh.doe.gov/oeпа/regulate.html
I-4/Notes, Line 19	“ responds to EPA rulemakings”	DOE Consolidated Comments - Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oeпа/comments/rcra.htm
I-5	N/A	N/A
I-6/Notes, Line 1	“Solid Waste Disposal Act”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oeпа/law_sum/RCRA.HTM
I-6/Notes, Line 9	“RCRA”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oeпа/law_sum/RCRA.HTM
I-6/Notes, Line 14	“Hazardous and Solid Waste Amendments”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oeпа/law_sum/RCRA.HTM
I-6/Notes, Line 17	“Federal Facility Compliance Act (FFCAct)”	OEPA Environmental Law Summary: Federal Facility Compliance Act http://tis-nt.eh.doe.gov/oeпа/law_sum/FFCA.HTM
I-6/Notes, Line 19	“Land Disposal Program Flexibility Act”	OEPA Environmental Law Summary: Land Disposal Program Flexibility Act of 1996 (P.L. 104-119); http://tis-nt.eh.doe.gov/oeпа/law_sum/ldpfa.htm

I-7/Slide, Line 1	“RCRA’s Ten Subtitles”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM
I-8/Slide, Line 1	“RCRA’s Ten Subtitles”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM
I-9/Slide, Line 1	“Subtitle F”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM
I-9/Slide, Lines 7-8	“not `immune or exempt”	OEPA Environmental Law Summary: Federal Facility Compliance Act http://tis-nt.eh.doe.gov/oepa/law_sum/FFCA.HTM
I-10/Notes, Line 2	“Atomic Energy Act”	OEPA Environmental Law Summary: Atomic Energy Act; http://tis-nt.eh.doe.gov/oepa/law_sum/AEA.HTM
I-10/Notes, Line 8	“Department of Energy”	U.S. Department of Energy Home Page; http://www.doe.gov/
I-10/Notes, Line 16	“mixed waste”	Mixed Waste Focus Area; http://wastenot.inel.gov/mwfa/index.html
I-10/Notes, Line 26	“DOE Order 5820.2A”	DOE Directives; http://www.explorer.doe.gov:1776/htmls/directives.html
I-11/Slide, Line 3	“Underground storage tanks”	DOE RCRA Guidance Manual, RCRA Subtitle I Regulated Underground Storage Tanks (USTs) [NOT available on the OEPA Website]
I-11/Notes, Lines 2-3	“sanitary landfills”	Solid Waste Landfills Under RCRA Subtitle D, DOE/EH-0512; [NOT available on OEPA Website]
I-11/Notes, Line 5	“underground storage tanks”	Automated Underground Storage Tank Guidance (Macintosh Version); http://tis-nt.eh.doe.gov/oepa/programs/ust.html
I-11/Notes, Line 6	“petroleum products”	Petroleum USTs, DOE/EH-231-012d/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/petro.pdf
I-11/Notes, Line 6	“hazardous substances”	Hazardous Substance USTs, DOE/EH-231-012e/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/haz_sub.pdf
I-11/Notes, Line 8	“Underground tanks containing hazardous wastes”	General Requirements for RCRA Regulatory Hazardous Waste Tanks, DOE/EH-413-065/1195; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gentank.pdf
I-11/Notes, Line 8	“deferred”	Deferred USTs, DOE/EH-231-012c/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/defer.pdf
I-12/Notes, Line 8	“hazardous waste generator”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf

I-13/Notes, Line 7	“determination of whether a material qualifies as solid waste”	Definitions of Solid and Hazardous Wastes (Computer Automated Guidance), Version 1.0, April 1997 [supersedes DOE/EH-273, August 1992]; http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
I-14/Slide, Lines 1-2	“Determine if Solid Wastes Are Hazardous Wastes”	Definitions of Solid and Hazardous Waste (Computer Automated Guidance), Version 1.0, April 1997 [supersedes DOE/EH-273, August 1992]; http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
I-15/Slide, Line 1	“Characteristics of Hazardous Waste”	Overview of the Identification of Hazardous Waste under RCRA, DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
I-15/Slide	“Ignitable” “Corrosive” “Reactive”	Ignitable, Corrosive, Reactive, and Incompatible Wastes; DOE/EH-231-054/1294; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ignit.pdf
I-15/Slide, Line 3	“Toxic”	Questions and Answers on the RCRA Toxicity Characteristic, DOE/EH-2331-003/0291; [NOT available on OEPA Website]
I-15/Notes, Line 2	“characteristically hazardous waste”	RCRA Definitions of Solid and Hazardous Waste (Computer Automated Guidance), Version 1.0, April 1997 [supersedes DOE/EH-273, August 1992]; http://tis-nt.eh.doe.gov/oepa/programs/rcradef.html
I-16/Slide, Line 1	“Listed Hazardous Waste”	Overview of the Identification of Hazardous Waste under RCRA, DOE/EH-231-007/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/define.pdf
I-16/Notes, Line 1	“listings of hazardous waste”	Identification of Certain RCRA Wastes — the F-Spent Solvent, P, and U Listings, DOE/EH-231-008/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/spent.pdf
I-17/Slide, Line 2	“Generator”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-17/Slide, Line 2	“Transporter”	Transportation of RCRA Hazardous Wastes, DOE/EH-231-013/0394 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/trans_rv.pdf
I-17/Notes, Line 2	“those who generate hazardous waste”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-18/Slide, Line 1	“Generator”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-18/Notes, Line 3	“generator requirements”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf

I-19/Slide, Line 1	“Generator Categories”	Special Requirements Applicable to Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/special.html
I-19/Notes, Line 1	“Generator requirements”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-19/Notes, Line 1	“Generation category”	Special Requirements Applicable to Hazardous Waste Automated Guidance (Windows Version); http://tis-nt.eh.doe.gov/oepa/programs/special.html
I-19/Notes, Lines 3-4	“conditionally exempt small quantity generator”	Exclusions and Exemptions from RCRA Hazardous Waste Regulation; DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
I-19/Notes, Line 6	“appropriate disposition”	Standards for Non-municipal, Non-hazardous Waste Disposal Units Receiving Hazardous Wastes from Conditionally Exempt Small Quantity Generators (CESQGs); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cesqg_rb.pdf
I-20/Slide, Line 1	“Generators”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-20/Notes, Line 1	“generator”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-20/Notes, Line 4	“reports”	Federal Environmental Notification & Reporting Requirements Handbook, Chapter 6. RCRA, OEPA [HNDBK] 001/11/96 (REV); http://tis-nt.eh.doe.gov/oepa/guidance/cao/rpt_req6.PDF
I-20/Notes, Line 4	“manifests”	Manifest Requirements, DOE/EH-231-038/0394 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/manif_rv.pdf
I-20/Notes, Lines 11-12	“off-site management facilities”	Guide to Selecting Compliant Off-Site Hazardous Waste Treatment, Storage and Disposal Facilities, DOE/EH-0427; http://tis-nt.eh.doe.gov/oepa/guidance/cercla/sel_tsdf.pdf
I-20/Notes, Line 12	“transporters”	Transportation of RCRA Hazardous Wastes, DOE/EH-231-013/0394 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/trans_rv.pdf
I-21/Slide, Line 2	“Satellite Areas”	Requirements for Satellite Accumulation Areas, DOE/EH-231-026/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/satellite.pdf
I-21/Notes, Line 1	“satellite accumulation”	Requirements for Satellite Accumulation Areas, DOE/EH-231-026/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/satellite.pdf

I-22/Slide, Line 3	“Container”	Management of Hazardous Waste Containers & Container Storage Areas under RCRA, DOE/EH-0333; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/container/contain_all.pdf
I-22/Slide, Line 4	“Tanks”	Resource Conservation and Recovery Act Hazardous Waste Tank Systems, DOE/EH-413/9716; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/tanks/tanks_all.pdf
I-22/Notes, Line 1	“Container”	Management of Hazardous Waste Containers & Container Storage Areas under RCRA, DOE/EH-0333; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/container/contain_all.pdf
I-22/Notes, Line 3	“Tank”	Resource Conservation and Recovery Act Hazardous Waste Tank Systems, DOE/EH-413/9716; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/tanks/tanks_all.pdf

I-23/Slide, Line 5	“Inspect”	Inspections of RCRA Container Storage Areas, DOE/EH-231-033/0893; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/inspect.pdf
I-23/Slide, Line 6	“closure requirements”	RCRA Closure and Post-Closure Plans, DOE/EH-231-009/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/pcplans.pdf
I-23/Slide, Line 7	“training”	OSHA Training Requirements for Hazardous Waste Operations, DOE/EH-0227P [NOT available on the OEPA Website]
I-23/Slide, Line 8	“contingency plan”	Preparation of RCRA Contingency Plans, DOE/EH-0274 [NOT available on the OEPA Website]
I-23/Slide, Line 9	“emergency response”	RCRA Contingency Plans and Emergency Procedures, DOE/EH-231-006/0991; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cplans.pdf
I-23/Notes, Line 1	“Containers”	RCRA Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf
I-23/Notes, Line 1	“tanks”	Resource Conservation and Recovery Act Hazardous Waste Tank Systems, DOE/EH-413/9716; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/tanks/tanks_all.pdf
I-23/Notes, Line 6	“containers”	Inspections of RCRA Container Storage Areas, DOE/EH-231-033/0893; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/inspect.pdf
I-23/Notes, Line 7	“tanks”	General Requirements for RCRA Regulated Hazardous Waste Tanks, DOE/EH-413-066/1195; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gentank.pdf
I-23/Notes, Line 8	“closure standards”	Closure of Hazardous and Mixed Waste Management Units at DOE Facilities, DOE/EGD(RCRA)-002/0690 [NOT available on the OEPA Website]
I-23/Notes, Line 11	“Personnel must be trained”	General Facility Standard Requirements, DOE/EH-043/1294 [NOT available on the OEPA Website]
I-23/Notes, Line 15	“plan outlining steps to be taken”	Preparation of RCRA Contingency Plans, DOE/EH-0274 [NOT available on the OEPA Website]
I-23/Notes, Line 19	“emergency response”	RCRA Contingency Plans and Emergency Procedures, DOE/EH-231-006/0991 http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cplans.pdf

I-24/Slide, Line 4	“permit”	RCRA Permitting Guide for Hazardous and Radioactive Mixed Waste Management Facilities, DOE/EH(RCRA)9705 http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permit_a.pdf
I-24/Slide, Line 4	“waste shipment off-site”	Guide to Selecting Compliant Off-Site Hazardous Waste Treatment, Storage, and Disposal Facilities, DOE/EH-0427; http://tis-nt.eh.doe.gov/oepa/guidance/cercla/sel_tsdf.pdf
I-26/Slide, Line 1	“Manifest”	Manifest Requirements, DOE/EH-231-038/0394 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/manif_rv.pdf
I-26/Slide, Line 8	“packaged and marked”	Pre-Transport Requirements for Waste Generators, DOE/EH-231-037/0494 [NOT available on the OEPA Website]
I-26/Notes, Line 2	“manifest”	Manifest Requirements, DOE/EH-231-038/0394 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/manif_rv.pdf
I-26/Notes, Line 3	“generator”	Hazardous Waste Generator Requirements, DOE/EH-231-055/1194 (Revised August 1997); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/gener_rv.pdf
I-27/Slide, Line 1	“Transporters”	Transportation of RCRA Hazardous Waste, DOE/EH-231-013/0494 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/trans_rv.pdf
I-27/Notes, Line 1	“pre-transport regulations”	Pre-Transport Requirements for Waste Generators, DOE/EH-231-037/0494 [NOT available on the OEPA Website]
I-27/Notes, Line 11	“transportation”	Transportation of RCRA Hazardous Waste, DOE/EH-231-013/0494 (revised); http://tis-nt.eh.doe.gov/oepa/guidance/rcra/trans_rv.pdf
I-28/Slide, Line 2	“Packaging”	Pre-Transport Requirements for Waste Generators, DOE/EH-231-037/0494 [NOT available on the OEPA Website]
I-28/Slide, Lines 3 to 5	“Labels, Marks, Placards”	RCRA Hazardous Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf
I-28/Notes, Line 5	“Labels”	RCRA Hazardous Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf
I-28/Notes, Line 17	“Marking”	RCRA Hazardous Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf
I-28/Notes, Line 28	“placard”	RCRA Hazardous Waste Container Labeling, Marking, and Placarding Requirements, DOE/EH-231-031/0793; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/labeling.pdf

I-30/Slide, Line 1	“Permit”	RCRA Permitting Guide for Hazardous and Radioactive Mixed Waste Management Facilities, DOE/EH(RCRA)9705; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permit_a.pdf
I-30/Notes, Line 2	“exclusions from permitting”	Types of RCRA Permits, DOE/EH-413/9715; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permits.pdf
I-30/Notes, Line 4	“permit/interim status”	RCRA Permitting Guide for Hazardous and Radioactive Mixed Waste Management Facilities, DOE/EH(RCRA)9705; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permit_a.pdf
I-31/Slide, Line 2	“Closure and Post-Closure Care”	Closure of Hazardous and Mixed Waste Management Units at DOE Facilities, DOE/EGD(RCRA)-002/0690 [NOT available on the OEPA Website]
I-31/Notes, Line 5	“closure plan”	RCRA Closure and Post-Closure Plans, DOE/EH-231-009/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/pcplans.pdf
I-31/Notes, Line 9	“clean closure”	RCRA Clean Closure Equivalency Demonstrations, DOE/EH-231-010/1291; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/equivdem.pdf
I-31/Notes, Line 16	“post-closure care permit”	RCRA Post-Closure Permits, DOE/EH-231-021/0593 [NOT available on the OEPA Website]
I-32/Slide, Line 1	“Corrective Action”	RCRA Corrective Action Program Guide (Interim), DOE/EH-0323; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/program/program_all.pdf
I-32/Notes, Line 1	“Corrective action”	RCRA Corrective Action Program Guide (Interim), DOE/EH-0323; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/program/program_all.pdf
I-32/Notes, Line 2	“corrective action management units”	CAMU/TU Final Rule Issued, RCRA Regulatory Bulletin, May 12, 1993; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/camu_tu.pdf
I-32/Notes, Line 2	“temporary units”	Corrective Action Management Units and Temporary Units, DOE/EH-231-043/0394; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/camu.pdf
I-32/Notes, Line 8	“compliance with both RCRA and CERCLA”	A Comparison of the RCRA Corrective Action and CERCLA Remedial Action Processes, DOE/EH-0365; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/rcracomp.pdf
I-32/Notes, Lines 11-12	“federal facility agreements”	Selected EM Cleanup and Compliance Agreements, http://www.em.doe.gov/ffaa/index.html

I-35/Slide, Line 1	“LDR”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
I-35/Slide, Line 2	“HSWA”	OEPA Environmental Law Summary: Resource Conservation and Recovery Act; http://tis-nt.eh.doe.gov/oepa/law_sum/RCRA.HTM
I-35/Notes, Line 1	“land disposal restrictions (LDR)”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
I-36/Slide, Line 1	“Land Disposal”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
I-37/Slide, Line 1	“LDRs”	LDR Program Overview, DOE/EH-231/005-0293; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ldr-over.pdf
I-37/Slide, Line 2	“Treatment standards”	Environmental Standards: EnviroSearch, http://tis-nt.eh.doe.gov/oepa/standards/
I-38/Slide, Line 1	“Storage Prohibited”	Waste Management and the Land Disposal Restriction Storage Prohibition, DOE/EH-231-011/0592; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/storage.pdf
I-38/Notes, Line 1	“prohibits the storage of wastes”	Waste Management and the Land Disposal Restriction Storage Prohibition, DOE/EH-231-011/0592; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/storage.pdf

I-39/Slide, Line 3	“vents”	RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Process Vents, DOE/EH-231-020/0193; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/vents.pdf
I-39/Slide, Line 3	“equipment leaks”	RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Equipment Leaks, DOE/EH-231-019/0193; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/equipmnt.pdf
I-39/Slide, Lines 6-8	“surface impoundments, tanks, and container storage”	Organic Air Emission Standards; Revised Final Rule Issued, RCRA Regulatory Bulletin; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ccregbl2.pdf
I-39/Notes, Line 4	“process vents”	RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Process Vents, DOE/EH-231-020/0193; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/vents.pdf
I-39/Notes, Line 6	“ piping and equipment”	RCRA Air Emission Standards for Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Equipment Leaks, DOE/EH-231-019/0193; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/equipmnt.pdf
I-39/Notes, Line 9	“management of volatile organics”	RCRA Subpart CC Organic Emission Standards Technical Amendment: Questions and Answers, DOE/EH(RCRA)9701; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/subpartcc.pdf
I-39/Notes, Line 10	“tanks”	RCRA Subpart CC Organic Air Emission Standards: Tanks, DOE/EH-413/9805; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/ccinfobrief.pdf
I-39/Notes, Line 10	“containers”	RCRA Subpart CC Organic Air Emission Standards: Containers, DOE/EH-413/9806; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/cccontainers.pdf
I-42/Notes, Line 5	“RCRA Civil Penalty Policy”	Office of Enforcement and Compliance Assessment; http://es.epa.gov/oeca/ore/red/rcra.pdf
I-42/Notes, Line 13	“waiver of sovereign immunity”	Federal Facility Compliance Act Implications for RCRA Corrective Action, DOE/EH-231-015/0994; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/impl.pdf
I-42/Notes, Line 15	“FFCA of 1992”	OEPA Environmental Law Summary: Federal Facility Compliance Act http://tis-nt.eh.doe.gov/oepa/law_sum/FFCA.HTM

I-46/Notes, Line 5	“Safe Drinking Water Act (SDWA)”	DOE Environmental Policy and Guidance, Safe Drinking Water Act; http://tis-nt.eh.doe.gov/oepa/guidance/sdwa.htm
I-46/Notes, Line 7	“permit-by-rule”	Types of RCRA Permits, DOE/EH-413/9715; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/permits.pdf
I-46/Notes, Line 10	“Clean Water Act”	DOE Environmental Policy and Guidance, Clean Water Act/Oil Pollution Act; http://tis-nt.eh.doe.gov/oepa/guidance/cwa.htm
I-46/Notes, Line 11	“exclusions”	Exclusions and Exemptions from RCRA Hazardous Waste Regulations, DOE/EH-231-034/0593; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/exclude.pdf
I-46/Notes, Line 13	“Clean Air Act”	DOE Environmental Policy and Guidance, Clean Air Act; http://tis-nt.eh.doe.gov/oepa/guidance/caa.htm
I-46/Notes, Line 17	“overlap”	A Comparison of the RCRA Corrective Action and CERCLA Remedial Action Processes, DOE/EH-0365; http://tis-nt.eh.doe.gov/oepa/guidance/rcra/rcracomp.pdf
I-46/Notes, Line 17	“CERCLA”	DOE Environmental Policy and Guidance, CERCLA/EPCRA; http://tis-nt.eh.doe.gov/oepa/guidance/cercla.htm
I-46/Notes, Lines 18-19	“applicable or relevant and appropriate requirement (ARAR)”	OEPA's ARARs Web site, http://tis-nt.eh.doe.gov/oepa/arars
I-46/Notes, Line 21	“AEA”	DOE Environmental Policy and Guidance, Radiation Protection (Atomic Energy Act); http://tis-nt.eh.doe.gov/oepa/guidance/aea.htm