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Managing Hazardous and Nonhazardous Waste: How To Do It

This checklist is based on existing Federal requirements. The U.S. Environmental Protection Agency (EPA) is considering changes in the hazardous waste regulations for waste generated by lead-based paint abatement activities. Until changes are formally adopted, however, those individuals producing hazardous and nonhazardous solid waste should comply with the existing regulations outlined in the Resource Conservation and Recovery Act (RCRA), Subtitles C and D. States should be consulted when determining how to manage abatement waste in a given locale. Although EPA has the authority to enforce the RCRA regulations, the States are the principal enforcement authorities.

1. Determine if the waste will result from an interim control or an abatement effort. Interim control waste from single and multifamily residences may be exempt from hazardous waste regulations, if the waste is generated as part of routine residential maintenance. Contact your State to determine whether interim control waste can be handled as household waste. Even if exempt from hazardous waste management requirements, interim control waste should be managed carefully in accordance with State regulations and other practices described in this chapter.
2. Waste from abatement activities must be evaluated for the RCRA Toxicity Characteristic. Contact State or local agencies to determine whether they have special regulations for abatement waste.
3. To minimize the total quantities of waste generated, conduct abatement efforts that generate reduced quantities of both hazardous and nonhazardous waste for disposal. For example, remove unpainted material (e.g., glass from windows) and unpainted wood, metal, concrete, and bricks from demolition waste, and separate painted waste that could be recycled. Do not use architectural components coated with lead-based paint as mulch or in any other construction unless lead-based paint has been properly removed.
4. As a preabatement screening step, make a RCRA hazardous waste toxicity characteristic determination (using existing knowledge or waste analysis data) for various components from each of the lead-based paint abatement waste categories. Depending on the hazardous waste determination, segregate hazardous abatement waste from nonhazardous waste, and accumulate accordingly in separate containers.
5. Separate abatement waste into the following four categories (described more fully in Table 10.1).

Category I:	Low Lead Waste (typically nonhazardous)
Category II:	Architectural Components
Category III:	Concentrated Lead Waste (typically hazardous)
Category IV:	Other Waste
6. Determine how much hazardous waste will be produced. If less than 100 kg (approximately 220 pounds or 1/2 of a 55-gallon drum) of hazardous waste per month will be generated, it is considered "conditionally exempt" abatement waste and may be managed as solid nonhazardous waste and delivered to a State-licensed or -permitted solid waste management facility. (HUD recommends that such waste not be incinerated.) The RCRA hazardous waste manifest is not required when shipping this waste to an offsite disposal facility.

- ◆ Obtain a Generator Identification Number before shipping the hazardous waste offsite facility for management, recycling, or disposal.
 - ◆ Accumulate hazardous waste in storage tanks or containers. Label storage units as "hazardous waste," recording the accumulation start date on the label. Train workers on waste handling and emergency procedures.
 - ◆ Maintain storage containers or tanks in compliance with the 40 CFR Part 265, Subpart I or J, standard.
 - ◆ If more than 1,000 kg per month of hazardous waste is generated at the site, do not accumulate hazardous waste for longer than 90 days. A hazardous waste storage permit is generally necessary when the waste must be stored for longer than 90 days. (See accumulation requirements for generators producing more than 100 kg and less than 1,000 kg of hazardous waste per month explained in Section IV.)
 - ◆ Engage the services of a licensed hazardous waste transporter and/or a management facility with proper permits.
 - ◆ Prior to shipment, package hazardous waste and properly label, mark, and placard the packaged waste according to U.S. Department of Transportation regulations.
 - ◆ Complete and sign the Uniform Hazardous Waste Manifest, and get the signature of the transporter on the manifest when releasing a load of hazardous waste. You must receive a signed manifest back from the designated hazardous waste facility within 35 days.
 - ◆ Comply with the RCRA Land Disposal Restrictions including notification and certification requirements.
 - ◆ Submit biennial reports describing waste generation and management activity when generating more than 1,000 kg per month of hazardous waste at each site.
 - ◆ Maintain all waste determination and handling records for at least 3 years.
9. HUD recommends that nonhazardous Category II architectural components be wrapped and sealed in plastic, covered during transport, and disposed of in a State-approved solid waste landfill. Such waste should not be burned in a municipal solid waste incinerator, recycled to produce mulch, or reused unless all lead-based paint is removed.
10. Nonhazardous solid waste must be discarded in accordance with State and local requirements.



Chapter 10: Hazardous and Nonhazardous Waste

I. Introduction

This chapter describes the Federal requirements and recommended practices that apply to managing waste generated by lead-based paint abatement or interim controls. Owners, abatement contractors, transporters, and disposal facilities are responsible for managing their waste properly. Improperly managed lead-contaminated waste can pose serious risks. For example, it can contaminate soil and groundwater. Discarded building components that are coated with lead-based paint may be inadvertently re-installed in other dwellings. In addition, workers may bring leaded dust into their homes if their work clothes are not cleaned or disposed of properly. Waste management regulations are strictly enforced; violators can be fined.

EPA is considering revising the existing hazardous waste regulations that govern waste generated from lead-based paint abatement activities. The primary Federal statute governing waste management from generation to disposal is the Resource Conservation and Recovery Act (RCRA). RCRA defines the criteria for hazardous and nonhazardous waste. While hazardous waste management must meet Federal standards, most States are authorized by the U.S. Environmental Protection Agency (EPA) to administer the basic RCRA hazardous waste program. Owners and lead hazard control contractors should observe the waste management practices described in this chapter and comply with State or local regulations. States and local governments may also institute hazardous waste requirements that are more stringent than Federal standards (EPA, 1990a).

II. Overview of Federal Requirements: Determining if a Waste Is Hazardous Under RCRA

RCRA regulates all “solid” waste, which is defined broadly to include liquid, solid, and some gaseous waste, except for certain waste that is regulated under other Federal law. Most abatement and interim control debris is likely to be solid waste, which can be either hazardous or nonhazardous. Waste water, such as mop and shower water, that is disposed of in a municipal wastewater treatment system, is regulated under the Clean Water Act and thus is exempt from RCRA. Local water departments are authorized to regulate water discharges from lead hazard control sites.

Solid nonhazardous waste is regulated at the Federal, State, and local levels. EPA has established mandatory minimum requirements for environmentally acceptable waste management facilities that receive nonhazardous solid waste (40 CFR Parts 257 and 258). States must establish comparable or more stringent standards.

RCRA Subtitle C regulations define a “generator” as any person at a particular facility or location whose act or process produces a hazardous waste. Both property owners *and* contractors involved in abatement/interim control actions can be considered generators. Generators must answer the following questions:

- ◆ Does the generator have knowledge that the waste is hazardous under RCRA regulations?
- ◆ Did a test define the material as a RCRA hazardous waste (“characteristic hazardous waste”)?
- ◆ Is the waste exempt from regulation as “hazardous” under RCRA rules?

For most abatement and interim control projects, the owner is a generator. Although the owner may designate the contractor to handle paperwork and hazardous waste management, the owner is ultimately responsible for proper waste disposal. Contractors must have a RCRA permit to transport hazardous waste and may combine such waste from different owners for transport only if each owner agrees and only if permitted by State and local regulations.

Generators must determine whether their waste is either listed as or characteristic of hazardous waste. Generators must test or use their existing knowledge of the waste to determine if it exhibits hazardous characteristics, unless it is otherwise exempted (see Section IV).

Waste exhibiting one or more of the following four characteristics is considered hazardous:

- ◆ Toxicity.
- ◆ Corrosivity.
- ◆ Ignitability.
- ◆ Reactivity.

A. Toxicity

Waste that exhibits the Toxicity Characteristic (TC) poses a substantial threat to human health and the environment. Waste toxicity is measured by using the Toxicity Characteristic Leaching Procedure (TCLP) (40 CFR 261.24). The TCLP extract is analyzed for lead (or other constituents) to determine if it is above or below the allowable TC regulatory threshold, which for lead is 5 ppm (milligrams/liter).

“Leachable” lead analysis differs from “total” lead analysis, which is typically performed on paint chips during a risk assessment or inspection, in that leachable lead is dependent on the type of lead compound present and the size of the particle (that is, its solubility). Because total

unlikely to help determine leachability. The total lead levels determined by a paint-chip analysis are usable in two circumstances:

- (1) total lead level that is very low (e.g., less than 100 ppm), indicates that waste should not exceed the TC regulatory threshold; and
- (2) total lead levels can be used in combination with total waste volume estimates to determine whether recycling for lead recovery is feasible.

Appendix 10 contains practical questions and answers about testing abatement waste using the TCLP and selecting a laboratory.

B. Corrosivity

Corrosive waste has a pH that is either less than or equal to 2 (highly acidic) or greater than or equal to 12.5 (highly basic), or which can corrode steel at a certain rate (40 CFR 261.22). Unneutralized caustic paint strippers and acidic paint strippers (including the resulting sludge) may be corrosive.

C. Ignitability

Ignitable waste generally includes liquids with flash points below 140°F (60°C), flammable solids and compressed gases, and oxidizers (40 CFR 261.21). Certain solvents from paint strippers (e.g., xylene) and the resulting sludge or slurry waste may be ignitable.

D. Reactivity

Lead-based paint hazard control projects are unlikely to produce reactive waste. Reactive waste includes substances that are capable of easily generating explosive or toxic gases, especially when mixed with water (40 CFR 261.23). These also include waste that is unstable and undergoes violent change without detonating.

E. Listed Wastes

Waste may also be hazardous under RCRA if included on EPA’s list of hazardous waste.



Lead-based paint hazard control jobs are extremely unlikely to generate “listed” waste. EPA’s current list, which can be found in 40 CFR 261.31 through 33, includes specific source waste (waste from specific industries), generic waste (waste from common manufacturing and industrial processes, such as solvents), and discarded or “out-of-spec” commercial chemical products (such as creosote and some pesticides).

III. Waste Management Procedures

Waste management procedures are summarized in Figure 10.1.

A. Interim Control Waste

The waste from interim controls may be exempt from RCRA hazardous waste regulations, under the exclusion for household waste (see 40 CFR 261.4(b)(1)). To be excluded, household waste should meet two criteria. First, the waste must be generated by individuals on the premises of a household, and second, the waste must be composed primarily of materials found in the waste generated by consumers in their homes. Solid waste generated *as part of routine residential maintenance* by a homeowner, resident, or contractor would generally be part of the “typical” household waste stream, and thus would be exempted from hazardous waste regulations under the RCRA household waste exclusion. Generators should contact State RCRA authorities for assistance in determining the limitations of the household waste exclusion for waste from interim controls at specific sites.

The State may determine that waste from interim controls is hazardous waste. In this case, if the waste is produced in small quantities (i.e., *less than 100 kg of hazardous waste per month*), it could be excluded as “conditionally exempt” under the small quantity generator exemption. (See Section III.D). Even if interim controls waste is exempted, waste with a high concentration of lead (e.g., high efficiency particle air (HEPA) vacuum debris and filters, sludges from filtering waste water, paint chips) should be handled carefully (i.e., contained in drums or

wrapped in plastic with taped seams, and covered during transport).

Waste water from mopping or cleaning operations, upon filtration, could be poured down the toilet provided that local authorities approve of such a practice. Waste water can be filtered effectively by using a 20 μm pore size filter, although a pump may be necessary to force the water through the filter. A coarse screen or cheesecloth is often used as a prefilter.

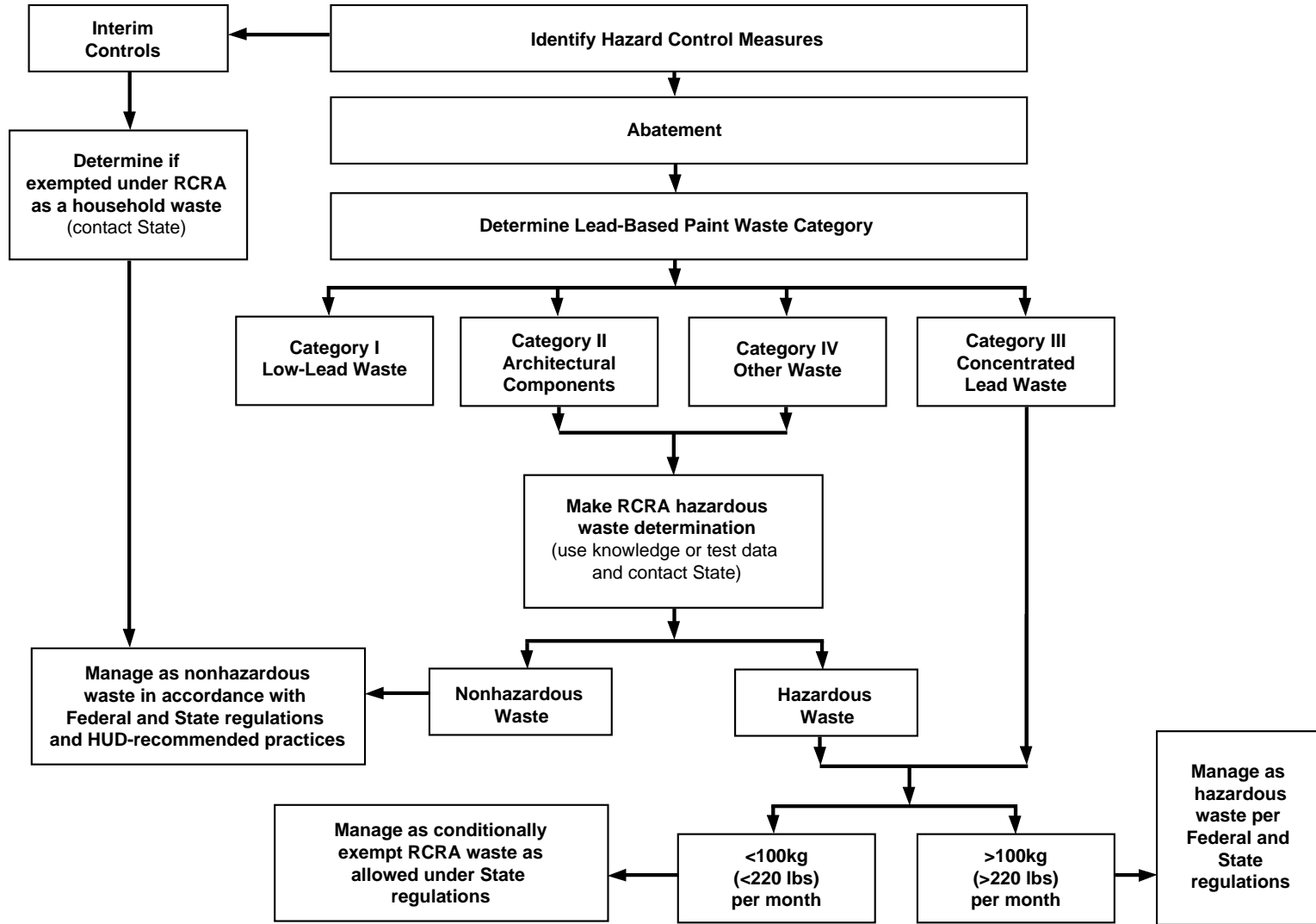
If significant quantities (10 gallons or more) of water are produced, owners should contact the local waste water treatment facility before discharging the liquid to determine if there are any specific pretreatment standards to be implemented, and inform the facility of the quantity of water to be discharged and its probability of containing phosphates or other cleaning agents.

B. Abatement Waste

Under RCRA, abatement waste is classified separately. The distinction primarily lies in the difference between routine maintenance and permanent control. Even though abatement waste may be similar to waste created from interim controls, it is typically generated from a one-time activity as opposed to temporary, routine maintenance. Abatement waste may also be stored until either work is complete or enough waste has been generated to make up a shipment load. Abatement waste, therefore, is not covered under the RCRA household waste exclusion.

Waste from abatement activities may be similar to waste from construction, demolition, and renovation. Waste generated from construction, demolition, and renovation do not meet the routine maintenance criteria (discussed in Section III.A). In 1984, EPA determined that the latter category of waste is not household waste (49 FR 44998, November 13, 1984). Some States may have special management standards for abatement wastes. Contact your State to determine the status of abatement waste under State regulations.

Figure 10.1 Waste Management Procedures.



The type of abatement waste management implemented depends upon the quantity and type of waste material. Some types of waste will always contain a high concentration of leachable lead, while others will differ by physical compo-

nent, depending on the abatement methods used at each job site. Waste should be physically separated into categories of "like materials." This practice prevents the contamination of nonhazardous waste with hazardous waste. A

Table 10.1 Categories of Abatement Waste

Category	Description	Examples of Wastes
I	Low Lead Waste	<p>Filtered personal and commercial wash water.</p> <p>Disposable personal protective clothing that has been HEPA vacuumed before disposal.</p> <p>Plastic sheeting cleaned prior to disposal (misted and wiped) and carpeting.</p> <p>Any waste that is determined to be nonhazardous by TCLP testing and is not an EPA-listed hazardous waste.</p>
II	Architectural Components	<p>Painted finish carpentry items, for example:</p> <ul style="list-style-type: none"> ◆ Doors. ◆ Windows. ◆ Window trim and sills. ◆ Baseboards. ◆ Railing. ◆ Moldings. <p>Other painted building components, for example:</p> <ul style="list-style-type: none"> ◆ Metal railings. ◆ Radiators. ◆ Walls. ◆ Stone or brick.
III	Concentrated Lead Waste	<p>Sludge from paint stripping.</p> <p>Lead-based paint chips and dust.</p> <p>HEPA vacuum debris and filter.</p> <p>Unfiltered wash water.</p> <p>Hazardous waste.</p> <p>Any waste included on EPA's list of hazardous waste.</p>
IV	Other Waste	<p>Material that cannot be determined, using knowledge of the waste, to be either hazardous or nonhazardous must be tested using the TCLP.</p>

renovated or demolished as part of the lead hazard control work, these categories are not applicable. In this instance, the demolition debris could be segregated into painted and unpainted waste material so that the latter category of waste could be recycled, if appropriate. The remaining lead-based paint demolition debris should be managed as one waste stream and evaluated to determine if it is hazardous.

C. Categories of Abatement Waste

RCRA rules and HUD recommended management practices are summarized in Table 10.1. The categories are based on EPA's study to determine which waste materials from abatement activities are likely to exhibit the hazardous waste characteristic of toxicity for lead (EPA, 1993). However, the study results were limited and inconclusive for some types of waste, and EPA concluded that additional confirmatory analysis would be needed. In lieu of testing, the generator may use the limited data from this study, or other studies, in making their hazardous waste determinations. However, the generator is ultimately liable for any improper disposal. All generators should retain documentation to substantiate their waste determinations.

1. Category I—Low Lead Waste

Contents

This waste category typically passes the TCLP because it exhibits concentrations of leachable lead below 5 ppm. It includes filtered personal wash water and mop water, disposable personal protective clothing that has been HEPA vacuumed before disposal, plastic sheeting that has been misted and cleaned before disposal, carpeting, and nonhazardous waste (EPA, 1993). Wash water does not include unfiltered spent stripper solutions, stripper sludges, or any other liquid paint removal products, all of which are Category III waste. In lieu of testing, generators may use the EPA report test results to supple-

mentors. If plastic is thoroughly cleaned (misted and swept or wiped to remove lead-based paint and dust), it will typically pass the TCLP (Aulson, 1992).

The ultimate responsibility for making the proper waste determination still rests with the generator. Generators should test any Category I waste that they believe might fail the TCLP.

RCRA Waste Management Rules

Category I waste should be disposed of in accordance with the applicable Federal requirements (40 CFR Part 257 or 258), in accordance with RCRA Subtitle D regulations and State and local solid waste requirements.

HUD Recommended Practices

HUD recommends that generators follow the following practices for nonhazardous abatement wastes.

- ◆ The waste should be wrapped in suitable plastic (6-mil polyethylene or equivalent), and all seams should be sealed with tape during storage and transport to the disposal facility. (Some disposal facilities do not accept waste wrapped in plastic. In this case, the waste should be covered in plastic during storage and transport only.)
- ◆ The waste should be stored in a designated secure (locked) area.
- ◆ Liquid waste water should be disposed of in the toilet after applicable pretreatment steps (e.g., filtering, gravitational separation), if any, have been satisfied. Waste water should not be poured into storm drains or onto the ground.
- ◆ Dumpsters should have lids and be padlocked. Wrapping and sealing in plastic may not be necessary if a covered transport vehicle is used and if plastic is used to line walkways to the vehicle during loading.

Wrapping and sealing waste materials in plastic, however, will minimize final cleanup and dust generation from abrasion of loose components coated with lead-based paint.

2. Category II— Architectural Components

Contents

This category includes waste defined as intact, discarded architectural components exceeding 60 mm (2.5 inches) in either width or length, which are often referred to as finish carpentry or painted building components. (The 60 mm cut-off is consistent with EPA's existing definition of hazardous debris in 57 FR 37223, August 18, 1992.)

Such components include painted doors, door trim, windows, window trim or sills, baseboards, soffits, facia, columns, railings, moldings, radiators, walls, and stone or brick. Paint chips that are removed or fall off these components are likely to be hazardous waste and are not included in this category. Category II does not include lead sheeting.

RCRA Waste Management Rules

EPA may revise the regulations that apply to architectural components. Until that time contractors and property owners must follow existing RCRA, State, and local requirements. Under current RCRA regulations, such material (as well as other solid waste) must be evaluated using knowledge of the waste or results from the TCLP. (See Appendix 10 for suggestions on selecting a laboratory to conduct the TCLP and minimizing the volume of architectural components that fail.)

Generators should contact State agencies for any information or data on the characteristics of lead abatement wastes in their area. In all cases, States must be consulted when generators are determining how to manage lead abatement wastes, since they are the principal enforcement authorities for the applicable regulations.

EPA waste-study results for lead-based paint architectural components are inconclusive, and EPA is currently gathering additional data on



Figure 10.2 Seal Abatement Debris in Plastic Before Transporting Offsite.

this type of waste in support of anticipated regulatory changes. Until these changes become final, current regulations require that the generator evaluate architectural components for their potential to be characteristic hazardous waste under RCRA.

Under RCRA (40 CFR 262.11(c)), generators may use their knowledge of the waste, in lieu of testing, to identify characteristic hazardous waste. When using knowledge or relevant information, the generator is responsible for supporting the claim that the waste is nonhazardous. In the case of architectural components, a variety of site-specific factors may affect the TCLP results of architectural components. Factors include the age of the building, thickness of the paint, sampling protocol, etc. For example, if certain types of painted components from several single-family houses (or several units of multifamily housing from a given period of construction (e.g., 1950–1960) in a given neighborhood are found to pass the TCLP, it may be reasonable to assume that such components in other houses or units of the same period and neighborhood would also pass.

HUD Recommended Practices

Even if classified as nonhazardous wastes, HUD recommends the following procedure for handling architectural components:

- ◆ Separate glass from windows for recycling.
- ◆ While it is still inside the work area, waste should be wrapped in 6-mil polyethylene plastic (or equivalent) and all seams should be taped shut. It should be confirmed in advance whether the selected disposal facility will accept waste wrapped in plastic. If not, the waste should be covered with plastic during storage and transport only.

- ◆ Waste should be stored in a designated and secure area separate from the work area. If material is stored or handled outside, 6-mil plastic sheeting should be placed underneath and on top of the material to prevent soil contamination. Plywood or other durable material should be placed on top of the plastic to prevent puncture of the plastic by nails or other fasteners.

- ◆ Waste should be transported in covered vehicles to minimize lead dispersal into the environment.

- ◆ Waste should not be disposed of in a solid waste incinerator and it should not be reused or recycled for mulch.

- ◆ Nonhazardous solid waste should be disposed of only in State-licensed or -permitted solid-waste landfills.

3. Category III— Concentrated Lead Waste

Contents

This category consists of “listed” hazardous waste, and any other waste exhibiting hazardous characteristics and likely to leach lead above 5 ppm and thereby fail the TCLP. Category III waste frequently includes paint strippings, lead paint chips and dust, HEPA vacuum debris and filter, and any other hazardous waste. TCLP results for these materials typically surpass the

Although it is extremely difficult to anticipate TCLP results for lead-contaminated soil using lead concentration, anecdotal evidence indicates that if lead in soil exceeds 5,000 ppm, such soil is likely to fail the TCLP and thus be considered hazardous waste (Spitler, 1994). The converse, however, is not necessarily true because total lead is not easily correlated with leachable lead.

RCRA Waste Management Rules

Category III abatement waste usually exhibits lead toxicity characteristics. In the absence of site-specific testing data to the contrary, Category III waste should be considered hazardous (EPA, 1993).

In lieu of relying on EPA data, generators may test the waste to make a site-specific determination. If the site-specific testing indicates that the waste passes the toxicity test, then the waste is not considered hazardous. For liability purposes, test records should be maintained for at least 10 years.

Some hazardous waste transporters and management facilities will require their own TCLP testing before accepting waste.

Waste management standards vary depending upon the quantity of hazardous waste produced. Under RCRA, generators producing less than 100 kg/month (about 220 pounds/month) of hazardous waste qualify as “conditionally exempt,” small-quantity generators and may handle such waste as nonhazardous, as described earlier in this section and also in Section IV.

HUD Recommended Practices

Even if the abatement waste is exempt from hazardous waste regulations under the small quantity exemption, HUD recommends the



following procedures for handling Category III waste:

- ◆ Wrap in plastic with seams sealed shut (if disposal facility allows).
- ◆ Cover during transport.
- ◆ Prohibit from being treated at a solid waste incinerator.
- ◆ Dispose only in a State-permitted or -licensed solid waste landfill.

4. Category IV—Other Waste

Category IV includes all waste that does not fall into one of the other three categories, such as excavated lead-contaminated soil. Category IV waste should be tested to determine if it exhibits any of the RCRA hazardous characteristics unless the generator has knowledge indicating that the waste should not be hazardous. (See Appendix 10 for guidance in selecting a laboratory to conduct the TCLP.) If the waste is determined to be hazardous, it should be handled as Category III waste; if nonhazardous, as Category I solid waste. For liability purposes, all test results should be retained for at least 10 years. Contact your State to determine whether any of the wastes belonging to this category are automatically, or could be determined to be, hazardous.

D. Quantity of Hazardous Waste

When determining the hazardous waste generator status (e.g., less than 100 kg per month or greater than 100 kg per month), generators must account for all hazardous waste generated on site, including nonabatement waste that may be hazardous. (See Section IV regarding steps that can be taken to minimize the quantity of waste.)

1. Less Than 100 kg of Hazardous Waste

Under RCRA, if less than 100 kg/month (approximately 220 pounds/month or 25 gallons of liquid) of hazardous abatement waste is produced (e.g., from small abatement jobs at single-family dwellings), then the generators

automatically qualify as “conditionally exempt, small-quantity generators.” Such waste, at a minimum, must be disposed of in State-licensed or -permitted solid waste management facilities or hazardous waste disposal facilities.

In addition, no more than 1,000 kg (approximately 2,200 pounds) of hazardous waste may be stored onsite at any one time. Generators should contact State waste management authorities for guidance in determining the applicability of the small quantity generator exemption under State regulations.

2. More Than 100 kg of Hazardous Waste

If more than 100 kg per month of hazardous waste is likely to be produced by abatement actions for a single owner at a single site, a hazardous waste manifest must be completed before the waste is shipped offsite (see Section IV for a discussion of the RCRA hazardous waste management requirements). Hazardous waste from a single-family dwelling may or may not exceed the 100 kg per month limit. The hazardous waste generated from a multifamily housing abatement project will most likely exceed the 100 kg per month generator limit and the generator will therefore be subject to applicable RCRA hazardous waste management requirements (e.g., accumulation time limit, packaging and shipping requirements, land disposal restrictions, and recordkeeping requirements from 40 CFR Part 262.)

TCLP tests can be performed on debris from pilot projects or debris generated by identical abatement procedures in identical structures to indicate whether the waste will be considered hazardous (see Appendix 10).

Generators producing more than 100 kg/month of hazardous waste must apply for and obtain an EPA identification (ID) number (from the appropriate agency) prior to shipping the hazardous waste offsite. Since the application process is lengthy, it is advisable to apply for the ID number several weeks prior to the start of a job. In most cases, the State waste management authority will issue EPA ID numbers to generators, and, for short-term abatement jobs, some States

that has an EPA identification number for the transportation and management of hazardous waste and to secure cost estimates for waste transportation, treatment to meet land disposal restrictions (discussed in Section IV below), storage, and disposal.

3. Waste Water

If significant quantities of waste water (greater than 100 gallons) will be produced, the local waste water treatment facility should be contacted to determine if special measures should be taken before the waste water is poured down the toilet. The treatment facility should be informed if phosphate detergent or other cleaners were used during cleaning. The water should not be discharged until the proper area authority has granted permission to do so. Waste water should never be poured onto the ground or pavement.

E. Lead-Based Paint Waste From Public Buildings

For nonresidential public buildings (e.g., schools, libraries), all waste from lead hazard control efforts should be managed according to the procedures described earlier for abatement waste. Such waste may be similar to residential abatement waste in many respects; however, since these buildings are not "households," the household waste exemption for interim control waste does not apply. EPA is considering this waste along with residential abatement waste for possible regulatory changes.

IV. RCRA Hazardous Waste Management Requirements

The requirements for generators producing more than 100 kg/month of hazardous waste are set forth in 40 CFR Part 262. Generators

large-quantity generators. The regulations for hazardous waste generators require:

- ◆ Obtaining an EPA identification number.
- ◆ Meeting specified pretransportation standards.
- ◆ Completing hazardous waste manifest forms.
- ◆ Complying with land disposal restriction notification and certification.
- ◆ Maintaining records.

A. EPA Identification Number (40 CFR 262.12)

Generators must apply for an EPA generator ID number for each abatement site. The 12-character number is used by EPA and the States to maintain a nationwide tracking system on hazardous waste activity. All hazardous waste generators, transporters, and treatment, storage, and disposal facilities must have EPA ID numbers. One number per worksite is required; multi-family housing units may not require separate numbers, if the housing project is a contiguous property (see the definition of "onsite" in 40 CFR 260.10).

To obtain an ID number, generators should call or write the State hazardous waste management agency or the nearest EPA regional office, and request EPA Form 8700-12, "Notification of Hazardous Waste Activity," or the appropriate State form. The form should be completed and submitted to the State hazardous waste contact listed in the accompanying information booklet before work begins.

B. Pretransport Requirements (40 CFR 262.30 Through 262.34)

1. Onsite Accumulation of Waste

Under certain conditions, small-quantity generators may accumulate up to 6,000 kg (approximately 13,200 pounds) of hazardous waste onsite for 180 days, or 270 days if the treatment, storage, or disposal site is more than 200 miles away. Large-quantity generators may store such waste onsite for only 90 days. Under temporary, unforeseen, and uncontrollable circumstances, the generator may seek an accumulation period extension of a maximum of 30 days from EPA (or an authorized State agency), if such extension is obtained prior to expiration of the 90-day storage period. Generators storing hazardous waste longer than these allowable time periods can be fined for violations, and will be considered storage facilities requiring RCRA regulation.

Generators storing hazardous waste onsite must meet certain requirements.

- ◆ Proper Storage: Both small- and large-quantity generators must label stored hazardous waste properly and indicate the accumulation start date (see Figure 10.3).
- ◆ Emergency Plan: Small-quantity generators must have in their possession basic safety information to be used during an emergency. Large-quantity generators must have a written emergency plan (see Figure 10.4).
- ◆ Personnel Training: Small-quantity generators must ensure that their employees are familiar with emergency spill and accident procedures. Large-quantity generators must have an established training program that includes the identification or availability of:
 - ◆ Waste handling procedures.
 - ◆ Emergency response actions/contingency plans.
 - ◆ Emergency contacts and equipment.
 - ◆ Medical treatment and supplies.
 - ◆ An emergency coordinator.

2. Waste Minimization Plans

Section 3002(b) of RCRA requires small- and large-quantity hazardous waste generators to develop written waste minimization plans. Since Federal regulatory requirements do not exist for these plans and existing EPA guidance is geared toward industry, HUD recommends that contractors develop a short written plan describing procedures to:

- ◆ Recycle, or otherwise dispose of, window glass and other unpainted solid waste as appropriate.
- ◆ Clean plastic sheeting used for containment by removing lead paint and dust.
- ◆ Avoid mixing hazardous and nonhazardous waste.
- ◆ Recycle lead-based hazardous waste at an RCRA Part B-permitted lead smelter when appropriate.
- ◆ Seek a waste management contractor with experience in waste minimization.
- ◆ Consolidate paint chips.
- ◆ Remove unpainted components from the hazardous waste stream.

3. Packaging

EPA has adopted the U.S. Department of Transportation's (DOT's) hazardous materials transport packing methods to prevent leakage of waste or release of dust during transport, and to mandate proper marking (or placarding) of the packaged waste to identify associated characteristics and dangers. Hazardous waste transporters or disposal facilities can provide advice on appropriate packaging methods.

4. Selecting a Transporter and Waste Management Facility

Since generators are liable for improper waste handling, it is critical to select a hazardous waste transporter and a management facility that have the proper EPA ID numbers and necessary permits.

Table 10.2 Management of Abatement Waste

Waste Management Practices	Category I: Low Lead Waste	Category II: Architectural Components ¹	Category III: Concentrated Lead Waste	Category IV: Other Waste
RCRA Requirements	Manage as nonhazardous solid waste.	Depending upon knowledge or TCLP testing results, manage as solid hazardous or nonhazardous waste.	If more than 100 kg/month manage as hazardous waste. If less than 100 kg/month manage as solid waste.	Use TCLP to determine if waste is considered hazardous.
HUD Recommended Practices	Applicable	Applicable if knowledge or TCLP testing indicates that it is <i>nonhazardous</i> .	Applicable if less than 100 kg/month otherwise subject to full RCRA regulations.	Only applicable if TCLP testing shows waste is <i>nonhazardous</i> .
◆ Wrapped in plastic; seal all seams with tape (if acceptable to the disposal facility).	X	X	X	X
◆ Stored in designated, secure area.	X	X	X	X
◆ Covered during transport.	X	X	X	X
◆ Prohibit cutting/breaking outside work area.	X	X	X	X
◆ Cover ground with 6-mil plastic if handling outside.	X	X	X	X
◆ Prohibit disposal in solid waste incinerators and reuse recycling for mulch.	X	X	X	X
◆ Recommend disposal in State-licensed/permitted solid waste landfill.	X	X	If appropriate	X

Generators should investigate the answers to the following questions about facilities under consideration:

- ◆ Do they have an EPA ID number?
- ◆ Have they successfully completed similar jobs?
- ◆ Can they supply references? How do the references describe their service?
- ◆ How long have they been in business?
- ◆ Has the firm been cited by EPA or State agencies for any environmental violations?
- ◆ How much waste are they capable of handling over a given period of time?
- ◆ Can they handle both solid and hazardous wastes?
- ◆ Are they willing and able to perform special management actions (such as covering vehicles during transport)?
- ◆ Do they have experience dealing with RCRA land disposal restrictions?
- ◆ Do they have insurance?

Generators should also check with other generators, trade associations, the Better Business Bureau, and the Chamber of Commerce regarding the firm's qualifications. Written contracts with transporters and management facilities, at a minimum, should provide for the following items:

- ◆ Scope of work and schedule, including waste-segregation procedures.
- ◆ Testing and analysis of waste.
- ◆ Emergency procedures.
- ◆ Cost estimates and the handling of overruns.
- ◆ Payment procedures.
- ◆ Liability and responsibility for claims.
- ◆ Quality assurance plan.

Figure 10.3 Hazardous Waste Container Label With Accumulation Start Date.

Property owners may want to consult with legal experts on RCRA before signing contracts.

C. Manifesting the Waste (40 CFR Part 262.20 Through 262.22)

A hazardous waste manifest must accompany all hazardous waste shipments (unless the waste is

The generator's signature certifies that (1) the manifest is complete and accurately describes the shipment, (2) the shipment is ready for transport, and (3) reasonable efforts have been made to minimize the amount and toxicity of the waste generated.

owner or operator of the disposal facility to determine the status of the shipment. If the signed manifest copy is not received within 45 days of shipment, the generator must send an exception report to the EPA Regional Administrator (or authorized State official). The exception report

Figure 10.4 Sample Emergency Plan.

The **emergency coordinator** is _____. If not at the site, he/she can be reached at _____ 24 hours/day. The backup coordinator is _____.

Emergency Procedures

In the event of a **fire**, call the local fire department immediately. Evacuate occupants and workers from the building to a safe location.

If liquid hazardous waste **spills onto soil or surfaces**, contain the spill and attempt to clean it up, while taking precautions to protect yourself.

If large quantities of liquid hazardous waste **spill directly into a stream or other surface water**, contact the National Response Center to report the spill.

Emergency Phone Numbers (Post these numbers near a telephone. If no phone is available onsite, post the numbers in a visible location and identify the nearest phone.)

Fire Department:

Police Department:

Local Emergency Response Coordinator:

Backup Local Emergency Response Coordinator:

National Response Center: 1-800-424-8802

Emergency Equipment

Have the following equipment onsite:

- ◆ Fire extinguisher.
- ◆ First aid supplies.
- ◆ Extra protective clothing and respirators.
- ◆ Material to contain and clean up spills.

Be sure all workers know where to locate these emergency supplies.



must include an explanation of the generator's effort to ascertain the whereabouts of the waste and the results of those efforts, as well as a copy of the signed manifest. The EPA or authorized State will then initiate the process to locate the missing waste. This regulation is strictly enforced.

The manifest form is often provided to the generator by the transporter or waste management facility. Blank manifest forms may also be obtained from the State hazardous waste agency (see Figure 10.5)

D. Land Disposal Ban Notification and Certification (40 CFR 268.7 and 40 CFR 268.9)

RCRA requires that all hazardous waste meet certain restrictions before it can be land disposed. Generators of more than 100 kg of hazardous waste per month must meet land disposal restrictions (LDRs). In general, these restrictions require that the waste be treated using a particular method, or that it be treated to meet a specific numerical standard, *before* being land-disposed. The hazardous waste transporter or management facility will assist in satisfying land disposal restrictions, including completing applicable paperwork.

Abatement projects producing hazardous lead waste containing particles that will pass through a 60 mm (approximately 2.5 inches) sieve must meet land disposal restrictions for RCRA hazardous waste code D008. Such waste includes paint chips, dust, sludges, and filter cake. To meet the concentration-based extract standard for lead, which is 5 ppm (see 40 CFR 268.42), land disposal restrictions require that D008 waste be treated before it is sent to a hazardous waste landfill (57 FR 37194, August 18, 1992). No technology is specified for treatment to meet this standard. On September 14, 1993 (58 FR 48092), EPA proposed alternative treatment standards for hazardous soil. When finalized, these standards would apply to any excavated soil that is considered hazardous.

Abatement projects that produce hazardous lead waste containing particles that will not

pass through a 60 mm sieve must meet the treatment standards for hazardous debris. Such debris includes painted bricks, concrete, wood and woodwork, metal, plaster board, uncleaned plastic covering, and vacuum and respirator filters. The land disposal restriction standards for hazardous debris provide two treatment alternatives:

- ◆ The waste may be "stabilized" to meet the predisposal treatment standard for lead (40 CFR 261.41 through 268.43) and then sent to a hazardous waste landfill (57 FR 37194, August 18, 1992).
- ◆ The waste may be treated using several different treatment methods: physical extraction, chemical extraction, thermal extraction, destruction, and immobilization (see 40 CFR 268.45 Table 1, 57 FR 37278, August 18, 1992). If one of these methods is used, the treated wood or metal debris is no longer considered hazardous and can be disposed of in a solid waste landfill. However, the residue from the treatment process must be treated to meet the concentration-based standard for lead (40 CFR 268.45(d), 57 FR 37278, August 18, 1992).

Prohibitions on storage of "restricted" hazardous waste (40 CFR 268.50) and requirements for treating "restricted" waste in onsite tanks or containers are applicable to hazardous lead waste (40 CFR 268.7).

The generator must either *notify* the hazardous waste treatment/disposal facility that the waste does not meet the land-disposal treatment standards or *certify* that the waste does meet the standards. All notifications and certifications must identify the restricted waste, applicable treatment standards, manifest number for the waste shipment, and any available waste analysis data. The treatment standards are listed in 40 CFR 268.41 through 268.43.

E. Recordkeeping (40 CFR 262.40 through 262.44)

Generators must maintain three categories of records, which are described below.

4. Incident Report Box: XXX-XXXX

5. Date of Incident: 11/12/81

6. Location: 14107821:6171514

7. Name of Company: Safety Heater

8. Name of Person: Disposal, Inc

9. Address: 1800 North Ave

10. City: Frederick, MD 21708

11. Description of Incident: Hazardous Waste Solid, N.O.S. (cont'd) 0 RM, E, N A 0189

12. Date of Incident: 11/12/81

13. Time of Incident: 1400

14. Weather: P

15. Name of Person: John Doe

16. Title: Supervisor

17. Name of Person: John Doe

18. Title: Supervisor

19. Name of Person: John Doe

20. Title: Supervisor

21. Name of Person: John Doe

22. Title: Supervisor

23. Name of Person: John Doe

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99. Name of Person: John Doe

100. Title: Supervisor

NOTE: THE ORIGINAL AND NOT LESS THAN TWO (2) COPIES MUST BE KEPT WITH THE HAZARDOUS WASTE SHIPMENT, ONCE DELIVERED, THE RECEPTIVE/RECEIVING FACILITY MUST RETURN THIS ORIGINAL COPY TO THE ORIGINATOR.



1. Biennial Reports

Large-quantity generators must submit a report every 2 years to the State hazardous waste agency or EPA regional office that details the generator's activities. Such reports are usually not required for abatement jobs of less than 2 years' duration.

2. Exception Reports

Generators must retain copies of all exception reports identifying instances when a signed manifest copy was not returned by the waste management facility designated to receive the waste shipment, and describing their efforts to locate lost shipments. The generator is responsible for notifying EPA or the appropriate State agency of lost shipments.

3. Three-Year Retention of Reports, Manifests, and Test Records

Generators are required to retain all manifests, results of hazardous waste testing, and land-disposal notifications/certifications for 3 years. However, for liability reasons, records should be kept for at least 10 years.

The following types of information should be retained.

- ◆ Type of waste.
- ◆ Weight of shipments.
- ◆ Number of drums or containers shipped.
- ◆ TCLP results.
- ◆ Laboratory name.
- ◆ Identity of person conducting TCLP sampling.
- ◆ Location of samples.
- ◆ Hazardous waste storage locations.
- ◆ Type of storage containers.
- ◆ Abatement method.
- ◆ Name of property owner and contractor.
- ◆ Name of project designer (if applicable).

V. Waste Management Case Study

The following is a case study of typical waste management practices in a lead hazard control job. A single-family dwelling has undergone a risk assessment. The home is a single-story building of approximately 1,500 square feet that contains three bedrooms and one bathroom. The risk assessor identified interim controls as an option for some surfaces and abatement as the only option for others. The owner decided to undertake a combination of interim control and abatement actions.

A. Lead Hazard Control Measures

Interim control measures consisted of cleaning and applying polyurethane to the wooden kitchen floor, replacing carpet in one bedroom, repainting certain areas, and treating friction surfaces on one door.

Abatement measures consisted of replacing selected woodwork (e.g., fascia, exterior trim board); replacing 17 windows and 1 exterior door; and wet scraping deteriorated paint from bathroom and kitchen walls and enclosing these areas with gypsum board and melamine, as appropriate.

B. Waste Generated and Management Steps Taken

Before work began, the owner and contractor held a meeting and agreed in writing that the contractor would handle all RCRA and other State waste management requirements. The owner agreed to sign the manifests prepared by the contractor.

1. Interim Control Waste

Interim control debris that was determined by the State to be a household waste was managed as solid nonhazardous waste and sent to a solid waste landfill. This waste included one HEPA vacuum filter, two respirator filters, cleaned plastic sheeting that had been used to contain the work area, discarded and rinsed tools, paint chips from limited scraping, discarded

and phosphate. The water was filtered and the solid material was disposed of as specified above. Filtered waste water was poured into the toilet after permission was granted by the local water authority.

2. Abatement Waste

In anticipation of the work, the contractor developed a waste minimization plan and conducted limited TCLP testing on the windows and exterior trim that were slated for removal. This information was used to estimate waste disposal costs, establish waste segregation procedures, and determine the necessity of obtaining an EPA ID Number. The contractor hired a laboratory to conduct TCLP testing (see Appendix 10 for guidance in selecting labs); the lab agreed to fax test results to the contractor within 36 hours of receiving samples. The contractor also identified a hazardous waste contractor to handle such waste, if necessary.

After having removed all loose paint, the contractor provided the laboratory with two core samples (core samples may be obtained using a hole saw) from the window and one exterior trim sample in a 9.5 mm square. The test results indicated that none of the samples leached lead in excess of 5 ppm and thus both the windows and exterior trim could be considered nonhazardous waste. The contractor estimated that Category III and IV waste was unlikely to exceed 220 pounds, and thus did not apply for an EPA ID Number. The contractor and property owner retained test results to document the waste characterization decisions and handling procedures.

The contractor also developed waste-minimization specifications for workers, directing them to sort the waste into three categories (after separating glass for recy-

cler or personal protective clothing that was HEPA vacuumed prior to its removal, windows (one pile stacked approximately 10 feet high, 6 feet long, and 5 feet wide), approximately 500 linear feet of window trim, one exterior door, cleaned plastic sheeting, and rinsed rags and mops.

Glass was removed from the windows and sent to a local permitted glass recycling facility. The remaining solid material was placed in 6-mil plastic or heavy-duty plastic bags and sealed shut with tape. The material was stored in a separate location and disposed of at a State-permitted solid waste landfill.

Filtered waste water was disposed of in the toilet.

RCCA hazardous waste was stored in a 55-gallon drum in a garage, separate from the other wastes. Hazardous waste included two HEPA filters, dust/debris from the HEPA vacuum, two respirator filters, and a small amount of paint chips. Total waste weighed less than 220 pounds (100 kg) and thus was managed as solid non-hazardous waste. The waste was disposed at a State-permitted landfill that met Federal design standards (40 CFR 258).

Wastes requiring TCLP testing included unrinsed rags and mops, samples of which were cut into small pieces and sent to the laboratory. TCLP testing results were as follows: sample leachable lead (ppm)—Rag 1 = 10.20, Mop 1 = 8.60.

These materials were added to the Category III RCCRA hazardous waste. Because the total hazardous waste amount did not exceed 220 pounds, it was sent to a State-permitted solid waste landfill. The property owner and contractor retained the TCLP test results to document waste characterization and handling decisions.