Best Practices in Hazardous-Waste Management

A waste generator can reduce the risks of incurring financial penalties and damage to its reputation by implementing these hazardous-waste determination, vendor management and document control programs.

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Environmental regulations in the U.S. place the burden of properly managing and disposing of hazardous waste on the companies that generate the waste. These companies bear significant liability—which can be mitigated, but never entirely eliminated. The consequences of mismanaging hazardous waste include substantial financial penalties and severe damage to an organization's public image. Fortunately, the most common waste-management violations can be avoided by implementing basic programs that reduce a generator's risk profile. These include rigorous hazardous-waste determination, vendor management, and document control.

Determining whether a waste is hazardous

In the United States, the rules and regulations for managing any discarded material, including nonhazardous materials, are outlined in the Resource Conservation and Recovery Act (RCRA). This regulation places the responsibility of determining if the waste is hazardous squarely on the person generating the waste (40 CFR Section 262.11).

Although determining whether a material is hazardous may seem like the simplest part of a hazardous-waste management program, it is actually at the root of most hazardous-waste violations. RCRA (42 USC Section 6903) lists the specifications that define hazardous waste. The accuracy of the identification and classification of hazardous waste will have a direct impact on the generator's ability to comply with mandated labeling, storage, segregation and disposal requirements for that waste.

Many companies classify major waste streams properly, but fail to consider others that, if overlooked, could end up in a municipal landfill or sewer. Misclassifying hazardous waste as nonhazardous can result in huge fines. Conversely, over-classifying nonhazardous waste as hazardous could unnecessarily squander valuable dollars and increase company liability.

To ensure that a hazardous-waste program is under control and efficient:

- review all waste generated on-site – anything discarded to drains, trash or recycling bins
- treat any unknown material as hazardous waste, and store it in a closed container that is labeled and dated
- document evaluations of both hazardous and nonhazardous waste.

Different types of waste. The first step in classifying waste is determining whether the material is solid waste. If the material is not a solid waste, by definition it cannot be termed hazardous waste.

It is important to understand that the statutory definition of a solid waste is completely independent of the physical form of the waste (liquid, solid or gas). A material is defined as a solid waste if it is a solid, semi-solid, liquid, or contained gaseous material that is discarded and is not exempted by the regulations. Some materials that are

compliance related to U.S. Dept. of Transportation (DOT) and RCRA transportation requirements, as well as preparation of hazardous-waste manifests. The following tips can help minimize a generator's risk and liability exposure:

- Vendors should be available on both a scheduled and emergency basis.
- Any subcontractors used by the vendor should undergo a comprehensive examination process that includes recertification on an annual basis.
- The best vendor is not necessarily the least-expensive one, especially if choosing one trades short-term cost savings for long-term liabilities.

Qualifying vendors. When assessing vendors, insist on receiving:

- a statement of qualifications that includes company history and experience
- a listing of hazardous-waste response capabilities and equipment, including types of wastes handled (*e.g.*, chemical, pharmaceutical, biological, etc.)
- geographical areas covered, a full list of locations and 24-hr contact numbers
- and, perhaps most importantly, customer references.

Hazardous-waste vendors should meet a minimum standard of insurance coverage, including: worker's compensation; employer's liability; commercial general liability; automobile liability; contractor's pollution liability; and professional errors and omissions liability. If the vendor subcontracts any of the work, review the subcontractor's insurance coverages as well.

Vendors should commit to a regular review of other performance measures, including:

- financial stability indicators, such as financial history, bankruptcies, and mergers and acquisitions
- compliance records, including reported violations and fines
- certification that they hold all licenses, permits and registrations that are required to legally handle, store, transport or dispose of hazardous waste within the jurisdictions they service
- regulatory compliance, as evidenced by current licenses, permits and/or registrations
- and customer service records, which are based on industry referrals, customer references, and personal experiences.

Finally, it pays to be an educated consumer, especially when qualifying vendors. Know where wastes will end up and specify approved treatment, storage, and disposal facilities (TSDFs). Some vendors are waste brokers while other vendors transport wastes to their own TSDFs. Knowing where and how your wastes are disposed of is essential to controlling your liability.

Simplifying data and document management

Hazardous-waste regulations require that generators retain specific records related to hazardous-waste generation and disposal. Waste analysis records, hazardous-waste manifests, biennial reports, and exception reports must be maintained for a minimum of three years. Additionally, land disposal restriction (LDR) notifications and certifications must be maintained for a minimum of five years.

Accurate retention, organization and recall of these waste-related documents can directly impact compliance. Electronic records systems that provide instant accessibility to hazardous-waste documentation meet EPA requirements for document retention and accessibility. These types of document-management systems eliminate the potential for lost paperwork and can aid in identifying missing documentation and ensuring that exception reports are filed in a timely fashion.

Importing data from hazardous-waste documents into document-management systems can provide instant access for analysis of critical data to support waste-management needs, such as facilitating the filing of biennial reports and benchmarking data to compare performance with other facilities. This type of data can also be used to monitor changes to the generator's status and the potential impact of waste-management programs that have been implemented, as well as demonstrate effective cost-management implications and justification for environmental health and safety (EH&S) initiatives. Similarly, looking at waste streams and disposal methods over time can help to develop effective waste-minimization strategies.

Closing thoughts

Companies that generate or handle hazardous waste must meet a wide range of constantly expanding and changing compliance obligations. Managing hazardous wastes can be a very involved and daunting task. Ensuring that you have solid fundamental programs in place will directly correlate to the success of your waste-management programs and the mitigation of risk and liability. CEP

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excluded from the definition of solid waste (and therefore are not hazardous waste) include domestic sewage and industrial wastewater discharges.

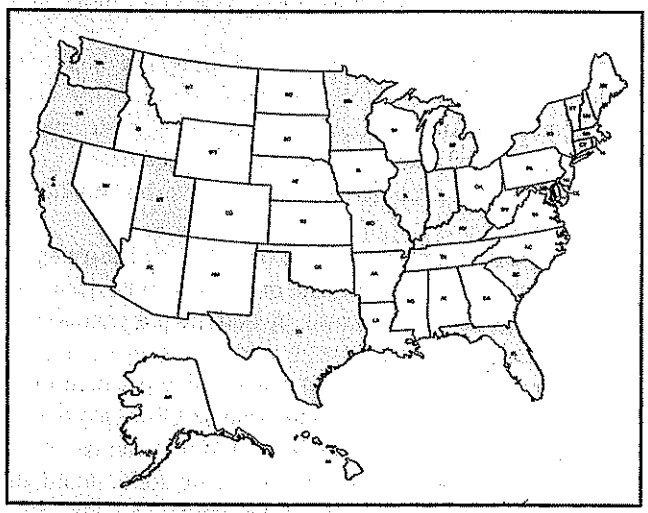
The U.S. Environmental Protection Agency (EPA) also excludes some materials that are solid waste from the hazardous-waste regulations if certain conditions are met. These materials include household waste, some agricultural wastes that are returned to the soil as fertilizer, and fossil fuel combustion wastes. Used oil that exhibits hazardous characteristics can be excluded as well, if it is recycled.

If a waste is not excluded, the generator must determine if the waste meets one or more of the listed hazardous-waste descriptions found in 40 CFR Part 261 or if it exhibits any of the four characteristics of a hazardous waste: ignitability, corrosivity, reactivity or toxicity.

The EPA has assigned a specific description to every category of hazardous waste that it regulates. These categories are identified by a four-digit waste code consisting of a letter (F, K, U or P for listed waste; D for characteristic waste) followed by a three-digit number for each subcategory. For example, ignitable wastes will carry a hazardous-waste code of D001. Hazardous wastes can carry more than one code. There are over 568 codes that a waste can carry.

A listed waste is automatically considered a hazardous waste based on its chemical constituents and the process that generated it. These wastes are organized into four categories, and are incorporated into lists published by the EPA:

- *F-List:* wastes produced by non-pecific sources, including wastes generated by general industry, manufacturing, and maintenance operations, such as solvent degreasers and metal finishing waste (F001-F039)
- *K-List:* wastes produced by specific industrial processes, such as chemical manufacturing, iron and steel production, and explosives manufacturing (K001-K181)
- *U-List:* unused off-specification chemical products, such as discarded commercial chemical products that are toxic, *e.g.,* such as acetone, toluene and xylene (U001-U411)
- *P-List:* acutely toxic unused off-specification chemical products, such as discarded commercial chemicals like epinephrine, nitric oxide, strychnine and some pharmaceutical and chemotherapy wastes (P001-P205)



■ Figure 1. Highlighted states have their own requirements for hazardous-waste management, beyond those at the federal level.

Characteristic wastes are determined by their defining characteristics, specifically:

- *ignitability*: liquids that ignite at temperatures less than 140°F, and solids that ignite by friction (D001)
- *corrosivity*: pH <2 or pH >12.5 (D002)
- *reactivity*: unstable or water-reactive chemicals, cyanides, or explosive(s) (D003)
- *toxicity*: liquid wastes that contain, and solid waste that can leach out, threshold or higher concentrations of specific metals, organics or pesticides (D004-D043)

State authorization. It is also important to remember that state programs have the option to be more stringent than the federal standards (40 CFR Part 271). State hazardous-waste regulations often include additional materials, such as waste oils and polychlorinated biphenyls (PCBs), on their lists of hazardous waste. Of even greater consequence, some states have added entire classes of hazardous waste, such as California's aquatic toxicity criteria.

As shown in Figure 1, at least 19 states have their own definitions for hazardous waste, including the five most populated states in the country: California, Texas, New York, Florida and Illinois.

Best practices. Waste generators generally have two options when identifying waste. One is to apply "process knowledge" information about the raw materials and processes generating the waste— from product material safety data sheets (MSDSs) or other sources.

Alternatively, generators may conduct laboratory analyses of the waste after its generation. Although such analysis provides a definitive basis for classification, it can be quite costly to perform.

Vendor management

Many companies rely heavily on vendors to remove and dispose of their hazardous waste. However, the generators of the waste themselves are ultimately responsible for their wastes from "cradle to grave." Thus, it is very important to select vendors carefully, considering reliability and long-term liability as well as cost. Many reputable hazardous-waste vendors can provide valuable advice regarding the most cost-effective and environmentally preferred disposal options. Transporters of hazardous waste can also help with