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EPA

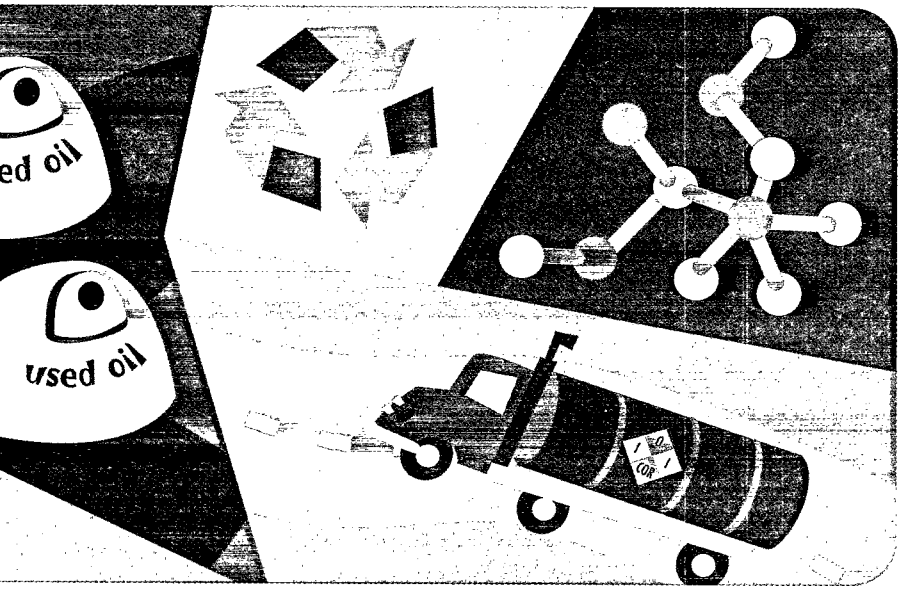
Safe Hazardous Waste Recycling

The mission of the U.S. Environmental Protection Agency (EPA) is to protect human health and safeguard the environment. One way EPA helps fulfill its mission is by regulating the management and disposal of hazardous wastes under the Resource Conservation and Recovery Act (RCRA). RCRA has the following three general goals: to protect human health and the environment; to reduce waste while conserving energy and natural resources; to reduce or eliminate the generation of hazardous waste.

Hazardous waste recycling activities include combustion for energy recovery, use constituting disposal, reclamation, and direct use and reuse. EPA also regulates the recycling of the following hazardous materials: used oil, precious metals, and scrap metal.

Recycling hazardous waste fulfills two of RCRA's goals by reducing the consumption of raw materials and energy and by reducing the volume of waste materials that must be treated and disposed of. There are many benefits of recycling; however, it must be conducted in a way that ensures the protection of human health and the environment.

During the development of RCRA, EPA looked at recycling practices throughout the United States and determined that certain practices would pose a threat to human health and the environment if they were not properly conducted.



Hazardous waste recycling frequently requires the accumulation of large quantities of hazardous waste prior to processing. Improper storage of those materials might cause spills, leaks, fires, and contamination of soil and drinking water.

To encourage hazardous waste recycling while protecting health and the environment, EPA developed regulations to ensure recycling would be performed in a safe manner.

EPA varies the degree to which a recyclable material or recycling activity is regulated under RCRA based on the threat it poses to human health and the environment. Recycling activities that pose a significant threat are subject to the same strict regulations as hazardous waste treatment, storage, or disposal. Other hazardous waste recycling activities that resemble production processes, with checks and balances that ensure safe management, are subject to less stringent regulations. In addition, a hazardous material destined for recycling must be identified by type and recycling process in order to determine its level of regulation.

In other cases, EPA has set special standards for commonly recycled hazardous materials to reduce the regulatory burden on handlers and to encourage recycling.

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Through other resource conservation initiatives, EPA encourages handlers of hazardous waste to adopt practices and choose materials that will reduce the amount of waste generated, thus preventing pollution at its source. In each case, the public derives significant benefits from EPA's safe hazardous waste recycling regulations.

Combustion for Energy Recovery

Combustion for energy recovery involves burning the hazardous waste directly as a fuel or using it as an ingredient to produce a fuel. Used solvents, for example, are frequently burned to produce heat or generate electricity. Because of the potential for release of harmful constituents from burning these wastes, EPA regulates this recycling activity as strictly as any other type of hazardous waste combustion. EPA requires combustion units that burn hazardous waste for energy recovery to obtain a permit and meet certain performance and operating standards under the boiler and industrial furnace regulations.

Use Constituting Disposal

Use constituting disposal involves applying a hazardous waste directly to the land or incorporating it into a product that will be applied to the land. Examples include using hazardous waste as fertilizer or as an ingredient in asphalt. EPA strictly regulates land disposal of hazardous waste, due to the potential for soil and ground-water contamination. Recycling a hazardous waste in a manner that constitutes disposal (land application) presents similar risks. The harmful constituents in hazardous wastes must be treated to reduce their toxicity and ability to leach into soil and ground water before the wastes are applied to the land. When a hazardous waste is used as an ingredient in a product, EPA will evaluate its use to ensure that it serves a legitimate purpose in the function of the product. If it does not, EPA considers this practice "sham" recycling; placing such a product on the land would be illegal.

Reclamation

Reclamation is processing a material to recover a useable product, such as recovering mercury from broken thermometers, or regenerating a material, such as cleaning used solvents to make them pure again. Reclamation activities are regulated differently depending on the type of hazardous waste to be recycled. Certain reclaimed materials enjoy "relief" from all hazardous waste regulations. Other materials, however, are subject to full regulation when reclaimed. EPA made this distinction based on the level of threat posed by common industry practices associated with reclaiming different types of materials.

Other Resource Conservation Initiatives

In addition to the special standards mentioned above, EPA implements two other resource conservation initiatives: universal waste rules and waste minimization. These intiatives also accomplish the goals of RCRA by striking a balance between protecting human health and the environment and encouraging recycling.

Universal Waste

Universal wastes include batteries, mercury thermostats, and certain pesticides. EPA regulates these wastes by using less stringent standards than other hazardous wastes to encourage recycling. Because the Agency found that large and diverse communities generate universal wastes that might be present in large quantities in the nonhazardous waste stream, EPA developed ways to encourage recycling.

EPA found that the hazardous waste regulations, as they are normally applied, discouraged collection, recycling, and proper management of universal wastes. To facilitate these activities, EPA streamlined the regulations that apply to universal waste handlers and transporters. Universal waste handlers, for example, can accumulate universal waste for up to 1 year, while hazardous waste generators can only accumulate waste for a fraction of that time. This extended period allows a universal waste handler to accumulate enough batteries, for example, to make recycling an economically viable option. Many recycling operations require large quantities of wastes to operate economically. Universal waste transporters can transport without a manifest or EPA identification number, while hazardous waste transporters must have both. EPA fully regulates universal waste destination facilities (i.e., where the waste is ultimately disposed of or recycled) in the same way hazardous waste treatment, storage, or disposal facilities are regulated, because the risks of recycling or disposing of universal wastes are similar to other hazardous waste management activities.

Direct Use and Reuse

The final type of hazardous waste recycling activity is using a waste directly (without reclamation) as an ingredient in an industrial process to make a product or using a waste directly as a substitute for a product. Under this activity, a facility will use a hazardous waste directly in place of a product, if the waste is similar enough to function in a similar manner. Since direct reuse of the material presents a low risk to human health and the environment, EPA does not regulate these activities, unless the waste will be burned or placed on the land. EPA will evaluate the legitimacy of a recycling practice by ensuring that it is not an attempt to avoid proper treatment or disposal and that the material is recycled in a timely manner.

Special Standards

To encourage recycling of certain common hazardous wastes, such as used oil, precious metal-bearing waste, and scrap metal, EPA developed different standards for their recycling and management. EPA regulates those materials differently because industry standards already encourage careful management. In addition, some of these materials have considerable value and there is an economic incentive to manage them safely. These special standards reduce the regulatory burden on recyclers while ensuring safe recycling. The public benefits from reducing materials that are disposed of and the amount of raw materials and energy required to produce new materials.

Used Oil

Used oil is crude or synthetic-based oil that has been used and includes impurities or contaminants such as dirt, metal scrapings, water, or chemicals. The most common example is used motor oil from automobile engines, but the term also includes industrial oils such as metal working fluids, hydraulic fluids, and oil from refrigerator compressors. Used oil is easily recycled; about 380 million gallons are recycled annually. Recyclers can re-refine used oil and return it to its original purpose, process it to create different products, or burn it for energy recovery.

To encourage used oil recycling, EPA developed less stringent standards for used oil handlers than for hazardous waste handlers. Used oil generators can store any quantity of used oil indefinitely and need only ensure that it is stored in tanks or containers that are in good condition.

Waste Minimization

While EPA encourages safe recycling practices, its ultimate goal is to promote the minimization of waste before it is generated. EPA encourages generators of hazardous waste to choose materials and practices that will reduce the volume and toxicity of their waste streams. Waste minimization is not just about reducing total waste quantities, but rather about reducing the amount of chemicals in wastes, particularly those chemicals that pose the greatest environmental concern.

To ensure that hazardous waste generators practice waste minimization, they must certify, with every shipment of hazardous waste they send for treatment or disposal, that they have a program in place to ensure waste reduction. Those facilities that treat, store, and dispose of hazardous wastes also are required to regularly certify they have a waste minimization program.

Here are some general examples of how a facility that generates hazardous waste can accomplish waste minimization:

Waste Minimization Case Study

A military equipment manufacturer used 8,250 gallons of a hazardous solvent each year. By substituting a nonhazardous solvent for the hazardous solvent, it saved more than $100,000 in disposal, purchasing, and regulatory compliance costs in less than 10 years.

- Set explicit goals for reducing the volume and toxicity of waste.
- Conduct periodic waste minimization assessments.
- Substitute nonhazardous raw materials for hazardous ones.
- Redesign equipment to produce less waste.
- Install systems that reuse waste materials directly in the process.

Used oil transporters do not need to carry a shipping manifest, which EPA requires hazardous waste transporters to carry. Used oil processors and re-refiners do not need permits to operate, while hazardous waste treatment, storage, and disposal facilities do. Used oil burners are regulated only if the quantity of harmful constituents in the used oil is above specifications.

To address the risks to human health and the environment associated with used oil recycling, EPA set minimum good housekeeping standards to ensure safe recycling. EPA requires that used oil be stored in tanks and containers that prevent releases to soil and ground water. EPA requires used oil transporters, marketers, processors, and re-refiners to keep records of the quantity, origin, destination, and date of shipment or acceptance of any shipment of used oil, to ensure that the oil is actually recycled. And, finally, EPA set standards for the cleanup of releases during storage and transit.

Precious Metals

Hazardous wastes can contain significant amounts of precious metals such as gold, silver, platinum, palladium, iridium, osmium, rhodium, and ruthenium. The precious metal components of such wastes can be reclaimed. One example is photographic fixer, which contains silver. Since precious metals are valuable commodities, businesses usually handle them very carefully. EPA standards for handling precious metal waste that will be recycled are significantly less stringent than for other hazardous wastes.

Scrap Metal

Scrap metal is bits and pieces of metal parts or metal pieces that can be recycled, such as auto bodies, used wire, and metal pieces from manufacturing and assembly operations. Scrap metal does not include materials generated from smelting and metal refining operations or materials that contain a significant liquid component. Reclaimed scrap metal is exempt from all hazardous waste regulations. EPA determined this activity does not pose a threat similar to other types of waste management.

Would You Like More Information?

RCRA, Superfund, and EPCRA Hotline

Call 800 424-9346 or 703 412-9810 in the Washington, DC area. For the hearing impaired, the number is TDD 800 553-7672. You also can access information via the hotline's Internet site at <www.epa.gov/epaoswer/hotline>.

Additional Documents

These additional documents can help you learn more about the requirements for hazardous waste recycling. These documents are free and can be ordered from the RCRA Hotline. Reference the EPA document number *(EPA530...)* when ordering.

Environmental Fact Sheet: Final Streamlined Regulations for Collecting and Managing Universal Wastes, (EPA530-F-95-011).

Managing Used Oil: Advice for Small Businesses, (EPA530-F-96-004).

Waste Minimization National Plan: Reducing Toxics in Our Nation's Waste, (EPA530-F-97-028).

RCRA Orientation Manual: 1998 Edition, (EPA530-R-98-004).

Contact Your State

Although EPA regulations set the national standard for compliance, states often have more stringent regulations. Contact your state about specific regulations. State environmental contacts are available from the hotline.