

Environmental Basics for Safety Professionals

By Salvatore Caccavale, CHMM, CPEA

As early as the industrial revolution, both large and small businesses dumped pollution into our environment. No regulations or requirements controlled what we could discharge into the air, land or water.

The environmental revolution emerged during the 1940s and 1950s when scientists from around the globe wrote papers on how industry polluted the environment. But still no one listened. It was not until 1962 when Rachael Carson published the controversial book *Silent Spring*, a collaboration of these scientific papers, that the world saw how the use of chemical pesticides affected the environment.

For years, industries claimed they did not realize that what they put into the ground had any effect on our environment. Since the advent of the environmental disciplines in the mid-1960s, our society now realizes that approach was a mistake. Even today, EPA's Superfund program still cleans up abandoned industrial sites and misused landfills. However, industry was not the only culprit. Mom-and-pop shops, farmers, dry cleaning operations and other types of small businesses also polluted the environment.

This article discusses the basic federal regulations for water, air and solid waste. Today, federal laws controlling hazardous chemical exposure to human health and the environment fall into five categories: 1) occupational; 2) transportation; 3) chemical use; 4) environmental protection; and 5) cleanup.

Clean Water Act

The Safe Drinking Water Act of 1974 set standards for the level of contaminants in our drinking water and protected water wells and sole-source aquifers. The Clean Water Act (CWA) of 1977 was enacted to make the nation's waterways "fishable and swimmable," to ban toxic pollution and to eliminate the discharge of all pollution into the nation's "navigable waters."

The primary elements of the CWA included:

- minimal national effluent (discharge) standards based on specific industries;
- a system of water quality standards;
- National Priority Discharge

Elimination System (NPDES), a discharge permit program that provided enforceable limitations on discharges;

- provisions for toxic chemicals and oil discharges.

NPDES

- regulates industrial and municipal point-source discharges;
- establishes the level of performance the discharge must maintain;
- requires the discharge to self-report any failures;
- requires sampling activities (grab and composite);
- requires discharge monitoring reports (DMRs) to be completed;
- requires reportable quantities (RQs) of approximately 300 hazardous substances to be reported to appropriate regulatory agencies when released.

NPDES permits must be renewed every 5 years. Conventional pollutants monitored through NPDES permits include biological oxygen demand (BOD); chemical oxygen demand (COD); total suspended solids (TSS); pH; oil and grease; and fecal coliforms.

For discharges into public waterways such as rivers, lakes, streams and creeks, water quality standards are set based on the use of the water.

Industrial wastewater not directly discharged into waterways is sent to a public-owned treatment works (POTW) where it receives pretreatment (biological and/or chemical). Permits are issued from the municipality, and a slug plan (large massive system disruption into the wastewater stream) must be developed.

CWA's Oil Pollution Act (40 CFR Part 112) applies to onshore facilities not involved in transportation of petroleum-based products. These facilities must prepare a facility response plan if they handle, treat or store oil or could cause substantial harm, which is defined as any discharge to the water, shoreline or economic zone around the facility to the environment.

If a substantial spill occurs, notification must be made to the National Response Center (Coast Guard). The threshold quantity for oil is 1,320 gallons or aggregate in containers greater than 55

gallons or stored in underground storage tanks (USTs) of greater than 42,000 gallons. If the facility falls under the regulation, then a spill prevention control and countermeasure plan (SPCC) must be developed and certified by a professional engineer (P.E.). The SPCC is written to highlight location of oil storage, operating procedures to transfer materials and emergency response efforts.

Stormwater is the last major part of the CWA. Point-source discharge is stormwater associated with industrial facilities. Permit conditions usually consist of periodic sampling and analysis and the development of a stormwater pollution prevention plan (SWPPP). Non-point sources refer to runoff from the farm field, city streets and construction sites (salt, silt, pesticides).

Clean Air Act

The Clean Air Act (CAA) was enacted in 1970, and the National Ambient Air Quality Standards (NAAQS) were established. The CAA of 1990 amended the 1977 amendment and introduced industry to Titles III, V and VII of the regulation.

Title III established hazardous air pollutants (HAPs). In 1989, 189 HAPs—[aerosols, asbestos, carbon monoxide, chlorofluorocarbons (CFCs), criteria air pollutants, ground-level ozone, hydrochlorofluorocarbons (HCFCs), lead, mercury, methane, nitrogen oxides, particulate matter (PM), propellants, radon, refrigerants, substitutes, sulfur oxides and volatile organic compounds (VOCs)]—were identified, and industry had the opportunity to minimize the amount of air pollution these chemicals could generate.

HAPs can deplete the earth's ozone layer. An industrial facility that emits greater than 10 tons per year of a HAP is classified as a minor source, while facilities which generate greater than 25 tons per year of any combination of HAPs are considered a major source. Installation of control technologies such as thermal oxidizers, scrubber systems or simple air filtration is also required.

Title V of the CAA created a new federal and state permitting system with a

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nationwide structure of fees. The new permits included minimum tonnage levels for regulated pollutants. The permitting process was long and tedious, and some permits took more than 2 years to attain. The federal agency turned over jurisdiction to approve and birdog these permits to the state as long as they could get approval.

Finally, CAA Title VII established the enforcement authority with both criminal and civil penalties to be assessed. Title V permits were made public through state Internet homepages, and each applicant was required to place a public notice in the local printed media and to hold public meetings. Many private citizen groups took exception to this permitting process. Penalties for noncompliance of the permits could range from \$25 to \$200,000 per day per violation. Inspectors also had authority to issue "tickets" of up to \$5,000 per day for minor infractions.

Under the CAA, national ambient air quality standards (NAAQSs) were also established for each state. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation and buildings.

Six critical pollutants were included in this regulation, including nitrous dioxide, sulfur oxides, ozone, particulate matters, lead and carbon monoxide. Power plants, smelting operations and gasoline-powered engines generate these pollutants.

Major cities established attainment and nonattainment areas that at any given time could exceed the satisfactory level. For example, to control carbon monoxide in the air, carpool programs were formed in most major metropolitan areas and the use of gas-powered devices such as lawnmowers and edgers were curtailed during the hottest part of the day.

A new source performance standards (NSPS) process was also established to identify what environmental impact would occur when a new pollutant source was built such as a coal-generating power plant. It not only reviewed what the environmental impact would be in the surrounding area but also in neighboring states.

Solid & Hazardous Waste

With the advent of the industrial revolution, the world was treated to many wonders that we now take for granted. Clothing, transportation, power tools, sports equipment and other products have made life easier.

The flipside of these achievements is the generation of waste. Today, consumer product companies try to minimize waste by offering many different types of reusable packaging. Recycling has taken on a larger role in society, with many states and communities implementing mandatory programs to reduce the amount of solid waste in landfills.

In the early days of the industrial revolution, no treatment, storage and disposal facilities (TSDFs) existed to manage and destroy a company's hazardous waste. Companies were not even required to determine whether the waste they generated at the end of the production line was categorized as hazardous, and most of the waste generated was buried on company property. Some companies had the environmental insight to apply liners, either natural (clay) or manmade (plastic or cloth) before dumping their waste in an attempt to capture the leachate.

Advent of RCRA

In the early 1970s, Love Canal, a housing development built over a capped industrial dumpsite in suburban Niagara Falls, NY, received much publicity. Concern for this type of event happening in "our backyard" led to public demand for regulations that would ensure the proper management of industrial wastes.

In 1965, Congress passed the Solid Waste Disposal Act (SWDA) to improve solid waste disposal methods. SWDA was amended several times, most significantly by the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. Collectively, these acts are known as RCRA.

RCRA established a national program to protect U.S. natural resources from the improper handling and storage of hazardous wastes. Codified RCRA regulations can be found in 40 CFR Parts 240 through 282.

The main components of RCRA include the identification of hazardous waste, "cradle-to-grave" manifest tracking, operating standards for generators,

transporters and treatment, storage and disposal facilities, a permit system for TSDFs and state authorization to assist in implementing the program.

Three main goals set forth by the establishment of RCRA include protection of human health and the environment; waste reduction; conservation of energy and natural resources; and reduction or elimination of hazardous waste generation.

To achieve these goals, three distinct yet interrelated sections (called subtitles) exist under RCRA. Other subtitles exist in the RCRA regulation, but these three are most prevalent in industry:

- Subtitle C. This section establishes a system for controlling hazardous waste from the time of generation until ultimate disposal.

- Subtitle D. This section establishes a system for controlling solid (primarily nonhazardous) waste, such as household.

- Subtitle I. This section, established by HSWA, regulates toxic substances and petroleum products stored in underground storage tanks.

Although RCRA creates a framework for the proper management of hazardous and nonhazardous solid waste, it does not address the problems of hazardous waste encountered at inactive or abandoned sites or those resulting from spills that require an emergency response. The Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA) (40 CFR Part 280.12), otherwise known as Superfund, addresses these issues.

Subtitle C (Hazardous Waste Management)

Subtitle C establishes a comprehensive cradle-to-grave program to regulate hazardous waste generation through proper disposal or destruction. Generators of hazardous waste are the first link in the cradle-to-grave chain of hazardous waste. Generators of more than 100 kg (220 lbs) of hazardous waste or one kg (2.2 lbs) of acutely hazardous waste per month must comply with all generator requirements under Subtitle C (40 CFR Part 262).

Subtitle D (State or Regional Solid Waste Plans)

SWDA established grant programs for the development of solid waste plans by states and/or interstate agencies.

Subsequent amendments to SWDA have substantially increased EPA's involvement in solid waste management. However, state and local governments continue to implement the Subtitle D (40 CFR Part 255) program.

The term "solid waste" used in Subtitle D refers almost exclusively to nonhazardous solid waste. The primary objectives of Subtitle D are to encourage environmentally sound solid waste management practices, maximize the reuse of valuable recoverable resources and foster resource conservation.

Subtitle I (Regulation of Underground Storage Tanks)

Congress enacted Subtitle I (40 CFR Part 280) to control and prevent leaks from underground storage tanks (USTs). The UST program broke new ground for RCRA because for the first time the RCRA program applied to products as well as to wastes. Specifically, Subtitle I regulates underground tanks storing regulated substances, including petroleum products (e.g., gasoline and crude oil) and Superfund-defined hazardous substances. Tanks storing hazardous waste, however, are regulated under Subtitle C.

Land Disposal Restrictions (40 CFR 268)

One major impact HSWA had on the implementation of RCRA is the restriction of land disposal for certain wastes. These restrictions are commonly referred to as "land ban," and the hazardous wastes affected are called restricted wastes. EPA banned land disposal for certain hazardous wastes that can mitigate through soil and pollute ground water. Hazardous wastes covered by the land ban include liquid metals, free cyanides, dioxin-containing wastes and discarded chemical products like xylene, formic acid and methyl alcohol. The ban also prohibits land disposal of diesel fuel, hydrochloric acid and used solvents without proper treatment or certification of limited recycling operations.

Generator

The level of regulatory burden placed on a hazardous waste generator is determined by the amount of hazardous waste generated on a monthly basis. The three categories of generators are:

- 1) conditionally exempt small-quantity generators (CESQGs);
- 2) small-quantity generators (SQGs);
- 3) fully regulated or large-quantity generators (LQGs).

A generator is classified CESQG (40 CFR Part 261.5) if it generates less than or equal to 100 kg (220 lbs) per month of hazardous waste, less than or equal to 1 kg (2.2 lbs) of acutely hazardous waste or no more than 1,000 kg (2,200 lbs) of hazardous waste. [Note: Acutely hazardous

The national priority list is a list that prioritizes cleanup sites based on the greatest environmental risk. A hazard-ranking system via property assessment develops a numerical ranking. The higher the number, the more health and environmental risk the property poses, and the cleanup ranks a higher priority.

wastes, listed in 40 CFR 261.30, are those wastes that in small doses are capable of causing death or significantly contributing to irreversible and/or incapacitating illness (i.e., phosgene).] Regulatory relief for the CESQG includes no EPA identification number required, no waste manifest necessary during shipments and no land disposal restrictions.

A generator classified as SQG (40 CFR 262.34(d)) generates greater than 100 kg but less than 1,000 kg in a month of hazardous waste, no more than 6,000 kg (13,200 lbs) of hazardous waste and never more than 1 kg (2.2 lbs) of an acutely hazardous waste. Regulatory relief for SQGs includes no required written contingency and training plans and no air emission control requirements under 40 CFR 265 Subpart CC. Hazardous waste may accumulate for up to 180 days (270 days if waste must be shipped more than 200 miles).

An LQG (40 CFR 262.34(a)) generates greater than or equal to 1,000 kg per month of hazardous waste. Allowances for a LQG include no limit in the amount of waste, which can be accumulated onsite. The LQG can also accumulate onsite up to 90 days without a permit or interim status. Requirements for a LQG include a written contingency plan, a written training program and the control of air emissions per 40 CFR 265 Subpart CC.

A generator's status and specific requirements may change from month to month depending on chemicals used and subsequent waste generated. Rather than border on the regulatory definition of SQG and LQG, most facilities choose to take the conservative approach and file as an LQG. The benefits of being within consistent compliance of the LQG regulations outweighs the benefits of juggling SQG status on a monthly basis and the possibility of being out of compliance when an inspector shows up.

For all generators of hazardous waste, the following requirements (40 CFR Part 262) must be established as part of a companies or facilities RCRA program:

- recordkeeping practices that accurately identify the quantities, composition and disposal of hazardous waste generated;
- labeling practices for containers used in the storage, transportation or disposal of such hazardous waste;
- using appropriate containers for hazardous wastes;
- providing accurate information on general chemical composition of hazardous waste to persons transporting, treating, storing or disposing of such wastes;
- using a manifest system and any other reasonable means necessary to ensure that all such hazardous waste generated is designated for treatment, storage or disposal in and arrives at TSDf for which a permit has been issued;
- submission of reports to the administrator at least every 2 years describing:
 - 1) quantity and nature of hazardous waste generated during the year;
 - 2) disposition of all hazardous wastes report under A;
 - 3) efforts taken during the year to reduce the volume and toxicity of waste generated;
 - 4) the changes in volumes and toxicity of waste actually achieved during the

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reporting year in question in comparison to previous years.

A generator of hazardous waste must determine where the company/facility fits into the regulation by the amount of hazardous waste generated. A solid pollution prevention program helps minimize both environmental liability to a company and costs associated with disposal of hazardous wastes.

Under 40 CFR 262.12, a generator of hazardous waste must not treat, store, dispose of, transport or offer for transportation without having received an EPA identification number from the administration. A facility must apply using EPA Form 8700-12 for an assignment of identification number. These forms are available at www.epa.gov. Also, the generator must not offer hazardous waste to a transporter or TSDF that has not received an EPA identification number. It is important that the generator obtain an EPA ID number prior to the startup of a process or laboratory and ensure that the transporter and TSDF both have valid EPA ID numbers prior to offering your hazardous waste for shipment.

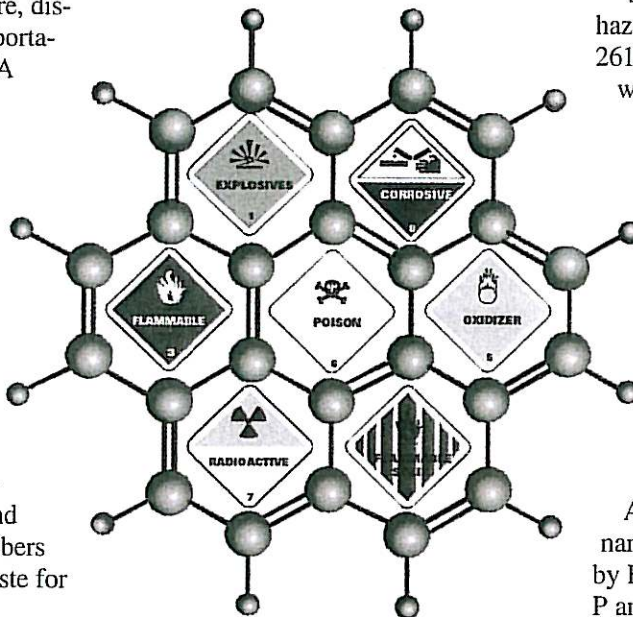
Transporter

A transporter of hazardous waste must comply with both the transporter's regulations (40 CFR 263) under the RCRA hazardous waste program (delivery, cleanup during transit, spill reporting) and the licensing procedures for each state through which the company will transport the hazardous waste. The transporter must accept waste only in accordance with the manifest system and comply with all U.S. Department of Transportation (DOT) regulations as they apply to hazardous waste shipments (e.g., driver qualifications, HazMat employee training, insurance). If the transporter stores waste at a transfer facility, the maximum amount of time for storage is 10 days or less. The transporter must retain its copy of the hazardous waste manifest for at least 3 years.

How Waste Is Characterized

RCRA provides both a regulatory and statutory definition of hazardous waste.

Hazardous wastes are a subset of solid waste; therefore, a material cannot be classified hazardous if it is not classified as a solid waste. RCRA defines solid waste as "Any garbage, refuse, sludge from a wastewater treatment plant or air pollution control facility and other discarded material, including solid, liquid, semisolid or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations and from community activities."



Materials can be classified as a solid waste in four other ways:

1) Destined for disposal (40 CFR 261.2(b)). If a material is disposed of, burned, incinerated, treated (but not recycled) or stored before being disposed of, burned or incinerated, then the material is considered a waste.

2) Recycled in certain ways (40 CFR 261.2(c)). If a material is recycled in a manner specified in 40 CFR 261.2(c), then it is considered a waste. Table 1 in 40 CFR 261.2 summarizes the types of recycling that make a material a waste against those that do not.

3) Inherently waste-like materials (40 CFR 261.2(d)). EPA lists a number of materials that are considered inherently waste-like materials. These materials are automatically wastes unless excluded and include specific discarded dioxins.

4) Military munitions (40 CFR 261.2(a)(4)).

The RCRA statutory definition of a hazardous waste is as follows:

"A solid waste, or combination of solid waste, which because of its quantity, concentration or physical, chemical or infectious characteristics may:

1) cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness;

2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of or otherwise managed."

Solid wastes are generally defined as hazardous wastes in two ways (40 CFR 261). First, solid wastes are hazardous wastes if they are listed by EPA as hazardous wastes in 40 CFR 261 Subpart D. Second, solid wastes are also hazardous wastes if they exhibit any of the four characteristics found in 40 CFR 261 Subpart C. These characteristics are ignitability, corrosivity, reactivity or toxicity [based on the toxicity characteristic leaching procedure (TCLP)]. Hazardous wastes can be both listed and characteristic.

Listed Wastes

A solid waste is hazardous if it is named on one of three lists promulgated by EPA. EPA developed these lists (F, K, P and U lists) by examining different types of wastes and chemical products to see whether they met any of the following criteria:

- exhibit one of the four characteristics of a hazardous waste;
- meet the statutory definition of a hazardous waste;
- are acutely toxic or acutely hazardous;
- are otherwise toxic.

Characteristic Wastes

Four generic properties or characteristics can cause a waste to be regulated as hazardous waste. Each has a specific regulatory definition (40 CFR 261 Subpart C):

- ignitability (D001)—wastes that can burn;
- corrosivity (D002)—acid or base that eats away at other things;
- reactivity (D003)—can explode when mixed with air, water or other chemicals;
- toxicity (D004-D043)—harmful to living organisms.

Toxicity includes any wastes that, when subject to TCLP, produce a leachate

which contains any one (or more) of 39 constituents listed (organic, metal or pesticide-bearing wastes) in Table 1 of 40 CFR 261.24 at concentrations equal to or greater than those specified in the table. The TCLP is designed to simulate landfill conditions. If a waste were to contaminate the groundwater with one or more of 39 constituents if placed in a landfill, then it exhibits the toxicity characteristic for each constituent that would leach out.

Onsite Accumulation Requirements

When we discuss accumulation requirements at a facility, understanding which hazardous waste generator classification a facility falls into is important. Remember that if a facility is classified as a CESQG [less than or equal to 100 kg (220 lbs) of hazardous waste per month] there are no accumulation time requirements. If a facility is classified as an SQG [greater than 100 kg and less than or equal to 1,000 kg (2,200 lbs) of hazardous waste per month], you can accumulate hazardous waste onsite for 180 days or less without a permit or for up to 270 days if you must transport the hazardous waste 200 miles or more. For an LQG (greater than 1,000 kg per month), accumulation of hazardous waste on site must not exceed 90 days.

For an LQG, a generator may accumulate hazardous waste on site for 90 days or less without a permit or without having interim status provided that:

- the waste is placed in containers, and the generator complies with Subpart I of 40 CFR 265 (Use and Management of Containers);
- date upon which each period of accumulation begins is clearly marked and visible for inspection on each container;
- while accumulated on site, each container and tank is labeled or marked clearly with the words "hazardous waste";
- the generator complies with the requirements for owners and operators in 40 CFR 265 Subparts C and D (Preparedness and Prevention, Contingency Plan and Emergency Procedures) and Part 265.16 (Personnel Training).

The regulations focus on ensuring hazardous waste containers are labeled properly; incompatible wastes are separated; accumulation area has secondary containment; accumulation area is inspected;

written emergency procedures are up-to-date; fire control and emergency response equipment are readily available; site personnel involved in any aspect of handling the hazardous waste are trained; and arrangements have been made with local authorities as to emergency response activities.

Satellite Accumulation Areas: 40 CFR 262.34(c)(1)

One feature of the RCRA that can work to a generator's benefit is satellite accumulation. Satellite accumulation is the accumulation of up to 55 gallons of hazardous waste or one quart of acutely hazardous waste (P-listed) in containers at or near the point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste provided that the generator:

- complies with 40 CFR 265.171, 265.172 and 265.173 of management of containers (e.g., containers in good condition, containers compatible with materials, containers always closed during storage, proper container handling);
- marks the containers either with the words "hazardous waste" or with other words that identify the contents of the container (e.g., waste styrene and water).

Once the 55-gallon container of hazardous waste or one quart of acutely hazardous waste has been accumulated, the generator must move the container to the facility's less-than-90-day accumulation area within 3 calendar days and place the accumulation start date on the container label.

With a satellite accumulation area, a facility can accumulate hazardous wastes that cannot be generated in a 55-gallon drum in less than a 90-day period. An example of a satellite accumulation area can usually be found in a laboratory area where a quality assurance lab accumulates one quart of mixed lab waste per 8-hour shift. At the end of the shift, a technician transfers the hazardous waste storage can to the 55-gallon drum stored outside the lab area.

Another example is a production facility with a raw material off-loading area. During disconnect of the railcars or tank trucks, a few drops of material fall into a spill pan. The operator takes the spill pan and pours the contents into a grounded 55-gallon accumulation drum.

In both scenarios, if the drums were

transferred to the less-than-90-day accumulation area following the transfer from lab can and the unloading from spill pan to drum, shipment of both drums would occur within 90 days. With the satellite accumulation allowance, both drums are allowed to be filled during normal operations that could take longer than 90 days without penalty.

Most regulatory inspectors will not give a definitive interpretation of at or near the point of generation because this is a subjective call. Your company's definition and the inspector's definition may differ, so as a rule of thumb, keep the distance from the work area to the satellite area within a reasonable walking distance (e.g., outside the door of a laboratory). Not only does it keep the span of control on the person filling the drum, it also reduces the liability associated with spills.

Hazardous Waste Manifests

The manifest is the tracking document behind the entire RCRA cradle-to-grave concept. It is the official DOT shipping document that tracks the hazardous waste shipment from the time it is loaded on the hazardous waste transporter vehicle until the waste is disposed of (e.g., incinerated, fuel-blended, landfilled, recycled). The manifest carries with it legal liability for the person who signs the document from the facility.

Distribution of the manifest copies is important as well to ensure that all applicable parties have received their respective copy in a timely fashion. The federal regulation changed on Sept. 5, 2006. Now the uniform hazardous waste manifest is used for all shipments throughout the U.S. The states no longer have their own individual manifests. The manifest will consist of six copies that will provide the generator, each transporter and the owner or operator of the designated TSDF with one copy for the records. When the hazardous waste shipment has been accepted at the TSDF, one signed manifest copy is then returned to the generator, while another is sent to the generator's state environmental agency.

The generator must designate on the manifest one facility that is permitted to handle the waste described. The generator can also designate one alternate facility in the event that an emergency prevents waste delivery. If the transporter cannot deliver the waste to the primary or alter-

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nate facility, the generator should designate another facility or instruct the transporter to return the waste to the originating facility.

The generator must sign the manifest certification by hand, obtain the handwritten signature of the initial transporter and date of acceptance on the manifest and retain three copies. The generator retains one copy, and the transporter takes the other three copies to serve as the shipping papers. One copy will be returned to the generator once the TSDF (signed) has accepted the wastes from the transporter.

The dates next to the signatures are critical. Limitations govern how long a waste can be in transit. If a generator does not receive a signed, completed manifest from the TSDF within 35 days of shipment, the generator must track the waste. If the waste is not found by 45 days for an LQG or 60 days for an SQG, an exception report must be provided to either EPA or state agency. It is best to establish a tickle file that flags waste shipment manifests not returned to you within a certain timeframe (20 days). This will enable you to contact either the transporter or the TSDF to determine the delay.

Sometimes, TSDFs reject shipments because the manifest does not have the right paperwork attached. For example, virtually all liquid hazardous wastes are banned from landfills until they are rendered nonhazardous. If you dispose of one of these materials, you will need to attach a land ban certificate to your manifest.

A TSDF may also not accept a waste stream after analysis of a waste sample if it does not meet the specifications of the waste profile agreed to prior to shipment of the waste. This can cause the TSDF operational and/or catastrophic (fire, explosion) problems.

The key to completing the manifest is to understand the DOT regulations (49 CFR 172) for proper shipping names. Most hazardous waste transportation company representatives can help you complete the manifest prior to shipment. This information is gathered from the waste profile already on record with the waste disposal company.

Another key element in completing the manifest is the DOT North American Emergency Response Guidebook (NAERG). Each material shipped across

North American highways and railroads is affixed with a United Nations (UN) or North America (NA) number. These numbers are located on the DOT class placards on the sides of railcars and trucks.

In the NAERG, chemicals are listed in both alphabetical order (blue section) and UN/NA numerical order (yellow section) for reference by emergency responders. Each UN/NA number has an associated emergency response guide number that alerts first responders on precautions to take during a hazardous materials incident.

The manifest also requires the generator to provide a 24-hour emergency response number for a person knowledgeable of the waste. Someone within your organization must be available to provide technical information in the event of an emergency scenario.

Comprehensive Environmental Response Compensation & Liability Act

CERCLA (commonly known as Superfund) provides a mechanism for response to cleanup activities of both accidental spills and abandoned sites. Passed in 1980, the law created a tax on both the chemical and petroleum industries to provide the federal government authority to respond directly to releases of hazardous substances that may endanger public health or the environment.

Three basic responses are removal, remedial actions and enforcement (monetary/civil). One of CERCLA's goals is to identify whom the primary responsible party (PRP) is to pay for the cleanup. If a PRP is identified, they can pay for the cleanup, or the federal government will pay for the cleanup and pursue legal action against the PRP.

The National Priority List (NPL) is a list that prioritizes cleanup sites based on the greatest environmental risk. A hazard-ranking system (HRS) via property assessment develops a numerical ranking. The higher the number, the more health and environmental risk the property poses, and the cleanup ranks a higher priority.

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) in 1986. SARA:

- stressed the importance of permanent remedies and innovative treatment technology in the cleanup of hazardous waste sites;

- increased focus on human health problems posed by hazardous waste sites;
- increased state involvement in every phase of the Superfund program;
- required Superfund activities to consider the standards and requirements found in other state and federal environmental laws and regulations.

SARA included five titles. Title III Emergency Planning and Community Right to Know (EPCRA) focused on two basis goals:

- 1) to increase public knowledge of and access to information on the presence of toxic chemicals in communities, releases of toxic chemicals into the environment and waste management activities involving toxic chemicals;
- 2) to encourage and support planning for responding to environmental emergencies.

To fulfill these goals, EPCRA established the Toxic Release Inventory (TRI) and the hazardous chemical inventory. This information enables state and local government agencies and the community to identify what must be done in an emergency scenario.

EPCRA emerged after the deadly incident that occurred in Bhopal, India in 1984. Compounded with the release of a toxic chemical in West Virginia, the public inquired about what could be released "beyond the fence line" of the thousands of chemical and petrochemical plants in the U.S.

EPA compiles all information obtained from the TRI (known as Form R) submittals each year and makes it available on the Internet. Currently, approximately 580 chemicals are reported in 30 chemical categories. TRI applies to operations with 10 or more employees and listed chemicals with a 25,000-lb threshold. The list of reporting chemicals can be found on www.epa.gov under EPCRA Section 313-Table II.

On March 1 of each year under the Community Right to Know portion of EPCRA, Tier I and Tier II reports are completed and forwarded to state emergency response commissions, local emergency planning commissions and the local fire department. Most states now require this submittal through a software program Tier2submit. Some still accept the submittal in hardcopy format.

Some fire departments want copies of

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MSDS, while others do not. So before submission, you must determine what your respective state, local emergency commission and local fire department require and in what format.

Tier I requires an aggregate of all chemicals onsite, the estimated average daily amount at the facility and the general location of the chemicals. Tier II reports require more specific information of the chemical to include the Chemical Abstract Service (CAS) number, the state of the chemical (gas, liquid, etc.), the number of days the chemicals are onsite and storage containers and locations.

Conclusion

Who must comply with environmental regulations? Anyone who emits potential pollutants into the air or waterways or who generates, transports, treats, stores or disposes of solid and hazardous waste. Many different types of environmental regulations are not covered.

I have tried to touch on the major regulations you may come across during your tenure as a person responsible for your company's environmental department. I always recommend to safety professionals learning the environmental requirements to attend local and state agency-based workshops. Most regulatory agencies will hold 1-day focused workshops on underground storage tanks or wastewater sampling. Use the Internet as well as all federal and state regulations. And when all else fails, call someone you know who can help. ■

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Regs & Legs

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per year of HAP or 25 tons per year of any combination of HAP.

Although emissions from boilers vary, some examples of HAP would be arsenic, cadmium, chromium, hydrogen chloride, hydrogen fluoride, lead, manganese, mercury and nickel. An HAP list is available at www.epa.gov/ttn/atw/188polls.html.

Units specifically excluded include:

- solid waste incinerators covered under section 129 of the CAA;
- units covered by another NESHAP under 40 CFR 63;
- hot water heaters, blast furnace stoves, temporary boilers;
- direct-fired combustion units where combustion gases come into contact with the process materials;
- research and development units.

Once you determine that the changes apply to you, you must determine which requirements apply. Requirements vary depending on whether the unit is considered new or existing, the type of fuel and possibly unit size.

As environmental professionals, we should check the *Federal Register* and EPA website regularly to stay abreast of new regulations. For more information, including *Federal Register* notices, visit EPA's website at www.epa.gov. ■

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