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DRAFT

MANAGEMENT OF HEALTHCARE HAZARDOUS WASTE

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INTRODUCTION

Healthcare facilities manage many types of waste, such as normal solid waste (paper), medical/infectious waste (red bag), hazardous waste, and radioactive waste. The purpose of this factsheet is to guide healthcare facilities in identifying and properly managing hazardous waste, in accordance with RCRA requirements. Healthcare facilities are also regulated by other federal, state, and local regulations, as referenced at the end of this factsheet.

FOR MORE INFORMATION CALL:

RCRA Hotline

U.S. Environmental Protection Agency at 800 424-9346 or TDD 800 553-7672.
In the Washington, DC, area: 703 412-9810 or TDD 703 412-3323.

www.epa.gov\region02\healthcare

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Frequently Asked Questions About RCRA

What Is RCRA?

The Resource Conservation and Recovery Act (RCRA) is a federal law that encourages environmentally sound methods for managing commercial and industrial waste as well as household and municipal waste. It regulates facilities that generate, transport, treat, store, or dispose of hazardous waste. Most healthcare facilities are considered hazardous waste generators.

The term "RCRA" is often used interchangeably to refer to the law, the regulations, and EPA policy and guidance. The *law* describes the waste management program mandated by Congress that gave EPA authority to develop the RCRA program. EPA *regulations* carry out the Congressional intent by providing explicit, legally enforceable requirements for waste management. EPA *guidance documents* and *policy directives* clarify issues related to the implementation of the regulations.

All of the RCRA hazardous waste regulations can be found in the *Code of Federal Regulations* (CFR), Title 40, Parts 260 to 280. The CFR can be purchased through the U.S. Government Printing Office (GPO) or is available online at http://www.access.gpo.gov/nara/cfr/cfr-table-search.html.

Who Is Regulated?

Any healthcare facility that generates solid waste is potentially subject to RCRA. You must conduct tests required by the regulations or use your knowledge of and familiarity with the waste you generate to determine whether it is hazardous waste (as opposed to other types of waste). You might be subject to substantial civil and criminal penalties if you fail to properly or completely identify hazardous waste generated by your business.

What Is Hazardous Waste?

To be considered hazardous waste, a material first must be classified as a solid waste. EPA defines solid waste as garbage, refuse, sludge, or other discarded material (including solids, semisolids, liquids, and contained gaseous materials). If your waste is considered solid waste, you must then determine if it is hazardous waste. Wastes are defined as hazardous by EPA if they are specifically named on one of four lists of hazardous wastes (listed wastes) or if they exhibit one of four characteristics (characteristic wastes). Each type of RCRA hazardous waste is given a unique hazardous waste code using the letters D, F, K, P, or U and three digits (e.g., D001, F005, P039).

Listed Wastes. Wastes are listed as hazardous because they are known to be harmful to human health and the environment when not managed properly, regardless of their concentrations. The lists include the following three types of waste:

- **Non-Specific Source Wastes.** These are material-specific wastes, such as solvents, generated by several different industries. Waste codes range from F001 to F039. Examples of healthcare facility wastes that fit this category are solvents often used in research laboratories, pharmacies, and morgues, such as methanol, acetone, and methylene chloride.
- **Specific Source Wastes.** These are wastes from specifically identified industries. Waste codes range from K001 to K161. Healthcare facilities typically do not produce specific source wastes.
- **Discarded Commercial Chemical Products.** Off-specification products, container residuals, spill residue runoff, or active ingredients that have spilled or are unused and that have been, or are intended to be, discarded. Waste codes range from P001 to P205 and U001 to U411. Examples of healthcare facility wastes that fit into this category are epinephrine (P042), ethylene oxide (U115), certain expired pharmaceuticals, etc.

STATE REQUIREMENTS

You may be regulated both by your state hazardous waste agency and EPA. RCRA allows states to receive legal permission, known as authorization, to implement the RCRA hazardous waste program. You must always contact your state authority to determine which state requirements apply to your business.

To operate a hazardous waste program, a state's regulations must be consistent with, and at least as stringent as, the federal program. Some states adopt more stringent requirements for facilities handling hazardous waste, which are considered part of the authorized program.

Characteristic Wastes. Even if your waste does not appear on one of the hazardous waste lists, it still might be regulated as hazardous waste if it exhibits one or more of the following characteristics:

- **Ignitability**. Ignitable wastes create fires under certain conditions or are spontaneously combustible, and have a flash point less than 60 °C (140 °F). Two examples are rubbing alcohol and paregoric. The waste code for these materials is D001 or are oxidizers.
- **Corrosivity**. Corrosive wastes are acids or bases that are capable of corroding metal containers, such as storage tanks, drums, and barrels. One example is compounding with glacial acetic acid or sodium hydroxide (with pH ≤2 or ≥12.5). The waste code for these materials is D002.
- **Reactivity**. Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when mixed with water. Examples include picric acid, lithium-sulfur batteries, and explosives. The waste code for these materials is D003.
- **Toxicity**. Toxic wastes are harmful or fatal when ingested or absorbed. When toxic wastes are disposed of on land, contaminated liquid may drain (leach) from the waste and pollute ground water. Toxicity is defined through a laboratory procedure called the Toxicity Characteristic Leaching Procedure (TCLP). Toxic healthcare wastes include chloroform, lindane, m-cresol, mercury and mercury compounds (thimerosal), and certain metals (such as arsenic and barium). The waste codes for these materials range from D004 to D043.

What Is Universal Waste?

There are four types of universal waste: hazardous waste batteries, hazardous waste pesticides that are recalled or sent to a collection program, mercury-containing thermostats, and spent fluorescent lamps and other hazardous lamps (e.g., with mercury or lead). EPA created the Universal Waste Rule (40 CFR §273) in May 1995 to encourage and streamline recycling. Labeling and storage requirements are less stringent than for hazardous waste. This allows hospitals to more easily recycle batteries, thermostats, and fluorescent lamps. The universal waste rule does not apply if state requirements are more stringent, or if waste crosses into more stringent states. For New York, Puerto Rico, and the U.S. Virgin Islands, federal rules apply. New Jersey has state universal waste laws that include recycling of computer monitors.

How Are Generators Regulated?

If your healthcare facility generates hazardous waste, you must manage it according to regulations for your specific generator type. Hazardous waste generators are divided into three categories, according to how much they generate in a calendar month:

- **Large Quantity Generators (LQGs)**. LQGs generate greater than or equal to 1,000 kg (approximately 2,200 lbs) of hazardous waste per month, or greater than 1 kg (approximately 2.2 lbs) of acutely hazardous waste per month.
- **Small Quantity Generators (SQGs).** SQGs generate greater than 100 kg (approximately 220 lbs) but less than 1,000 kg of hazardous waste, and/or 1kg (approximately. 2.2 lbs) of acutely hazardous waste per month.
- **Conditionally Exempt Small Quantity Generators (CESQGs)**. CESQGs generate less than or equal to 100 kg of hazardous waste per month, and less than or equal to 1 kg of acutely hazardous waste per month.

RCRA defines acute waste as P-listed wastes. Some states do not recognize the CESQG class. Contact your state environmental agency to find out if the CESQG status is recognized. **To find your appropriate state contact, call the RCRA Hotline at 800 424-9346.** In Region 2, New Jersey, New York, Puerto Rico, and the U.S. Virgin Islands all recognize the CESQG class.

MORE QUESTIONS?

Call the RCRA Hotline at 800 424-9346 or TDD 800 553-7672 for additional information about RCRA rules and regulations. In the Washington, DC, area, call 703 412-9810 or TDD 703 412-3323.

AM I REGULATED BY RCRA OR SUPERFUND?

RCRA regulates the treatment, storage, and disposal of hazardous waste being generated now and in the future. Superfund was created to pay for the identification, inspection, investigation, ranking, and cleanup of abandoned or uncontrolled hazardous waste sites that people responsible for contamination are unable or unwilling to clean up. Call the RCRA Hotline for more information.

More on Generator Status

Under the federal RCRA requirements, your generator status might change from one month to the next as the quantity of waste you generate changes. State requirements vary widely. You must comply with whichever standard is applicable for a given month. In many cases, small businesses that fall into different generator categories at different times choose to always satisfy the more stringent requirements (usually state requirements) to simplify compliance. Generators must "count" the amount of waste generated, which involves adding up the total weight of all quantities of characteristic and listed waste generated at a particular facility. Certain wastes, such as those that are reclaimed or recycled continuously on site, are not counted under the federal regulations but might be counted under some state regulations.

Do Exclusions Exist?

The RCRA regulations contain many exclusions for wastes and waste management practices that are not considered to be hazardous. Several exclusions and exemptions pertain specifically to healthcare facilities. Some states, however, do not recognize the federal exclusions.

Exclusions and Exemptions	Description
Nitroglycerine Formulation	As of August 14, 2001, federal policy exempted nitroglycerine formulations for hospital use.
Reverse Distribution of Pharmaceuticals **(see page 11)**	Waste and expired pharmaceuticals shipped to reverse distributors may be exempt from hazardous waste regulations. The materials may be shipped as product instead of waste.
Domestic Sewage Exclusion	Mixtures of domestic sewage and other wastes that pass through a sewer system to a publicly owned treatment works (POTW) for treatment are excluded from the definition of solid waste. Generators are encouraged to contact their local POTW for prior approval.
Point Source Discharge Exclusion	Point source discharges of industrial waste waters that are subject to regulation under §402 of the Clean Water Act are excluded from the definition of solid waste.
Wastewater Treatment Unit Exemption	Any hazardous waste tank system used to store or treat the wastewater that is managed at an onsite wastewater treatment facility with a National Pollutant Discharge Elimination System (NPDES) permit or that discharges to a POTW is exempt from the RCRA regulations.
Elementary Neutralization Unit Exemption	Tanks used for neutralizing waste that is hazardous solely because of its corrosive characteristic are excluded from the permitting requirements. Waste treated in these units is not considered hazardous while in the units.
De Minimis Exclusion	Small quantities of some solvents and other chemicals are exempt from the regulations when they are mixed with wastewater in a wastewater treatment system discharging according to the Clean Water Act.
Epinephrine Syringes	Federal policy exempted epinephrine syringes for hospital use.

Examples of Healthcare Waste Generation

	Examples of Healthcare Solid Waste Generation
WASTE GENERATED	Paper Non-returnable drums Normal palettes Construction and demolition debris (which can also be hazardous)
	Examples of Healthcare Hazardous Waste Generation
PHARMACY	Solvents and acids: thimerosals, methiolate, other mercury compounds, cumedin, methanol (U154), picric acid (D003). Expired pharmaceuticals (if not returned to the manufacturer under "reverse distribution"): see the sidebars on pages 9 and 10.
RADIOLOGY	Silver, lead aprons
ONCOLOGY	Lead pigs and aprons. Chemotherapy drugs: Chlorambucil (Leukeran), Cyclophosphamide, Daunomycin, Melphalan, Mitomycin C, Streptozotocin, Uracil Mustard, and Arsenic Trioxide (P012). See also the sidebars on pages 9 and 10
DIALYSIS	Formaldehyde (U122)
DENTAL CLINIC	Bitewings (contain lead) Cresol Amalgam (contains mercury) Other mercury-containing items (fillings) Lead aprons Lead shielding removed during renovation
GASTRO-ENTEROLOGY	GI tubes (used to expand esophagus, contain mercury)
MORGUE	Formaldehyde (U122), picric acid (D003) Bouin's solution (contains picric acid mixed with methanol (U154) and formaldehyde)
MATERIALS MANAGEMENT	Ethylene oxide (ETO) (U115) Acrylonitrile (U009) More chemicals are listed on the sidebars on pages 9 and 10.
PRINTING	Inks for forms and menus
BIOMEDICAL ENGINEERING	Defibrillators (mercury) Pacemakers (mercury) Aerosol cleaners Scintillation counters (lead and mixed waste) Lead shields Other components or equipment which must be dismantled and analyzed before disposal may contain additional hazardous waste. *Note: Batteries may be covered by the Universal Waste Rule.*

	Healthcare Hazardous Waste Generation (continued)
MEDICAL MONITORING/ COMPUTER SERVICES	Thermometers (mercury) Sphygmomanometers (mercury) Computers, computer monitors, batteries, and other electrical equipment *Note: Batteries may be covered by the Universal Waste Rule.*
LABORATORIES	Solvents and acids (see sidebars page 9 and 10). Scintillation counters (lead and mixed waste) Electronics Lead shields
OPERATING ROOMS	Disinfectants (see sidebars on pages 9 and 10) Anesthetic for humans or animals (fluoroethanes, haloethanes) Osmium tetroxide (P087) Picric acid (D003) Mercury fixatives Cacodylic acid (U136) See also the sidebars on pages 9 and 10.
FACILITY ENGINEERING	Paint Mercury and mercury compounds Lamps (may contain mercury) Chlorofluorocarbons (CFCs) Paint thinners (contain solvents) Solvent-based glues Asbestos *Note: Lamps may be covered by the Universal Waste Rule*
HOUSEKEEPING/ CLEANING	Phenolic cleaners Bleaches Caustics
	Example of Healthcare "Red Bag" Waste Generation
WASTE GENERATED	Human/animal pathological waste "Sharps" Blood and blood products Isolation wastes
	Example of Healthcare Hazardous Waste Management Practices
HAZARDOUS WASTE ROOM	Proper engineering controls (berm, secondary containment) Chemical storage by compatibility Weekly inspections Communications system Accumulation dates Gas cylinders (like oxygen) stored correctly with compatible materials
SATELLITE ACCUMULATION	Satellite collection: transfer materials within required time period.

Other Environmental Laws Affecting Healthcare Facilities

OCCUPATIONAL SAFETY AND HEALTH ACT

The Occupational Safety and Health Act (OSHA) was enacted by Congress to require employers to provide workplaces free from serious recognized hazards and compliance with occupational safety and health standards. OSHA protects healthcare workers from diseases such as the hepatitis B virus and the human immunodeficiency virus (HIV) through regulation of bloodborne pathogens. OSHA also requires healthcare workers to wear proper personal protective equipment and to use safe handling procedures. Many additional chemicals used by healthcare facilities may be considered hazardous chemicals as defined by OSHA. Contact your local OSHA office if you have questions about whether the chemicals used in your healthcare facility are considered hazardous under OSHA.

OSHA Resources:

- Internet access: www.osha.gov and www.osha.gov/SLTC/etools/hospital/mainpage.html

THE FORMER MEDICAL WASTE TRACKING ACT

The Medical Waste Tracking Act of 1988, which has since been rescinded but revived through Title 40 CFR Part 60, was part of a demonstration project to regulate national medical and infectious waste (also known as "red bag" waste) and provided standards for separating, packaging, and labeling red bag waste. This ruling also regulates air quality and emissions from incinerators of medical/infectious waste incinerators or "HMIWIs" (see Clean Air Act). Since red bag waste is mainly regulated on a state-level, healthcare facilities can find further information from their state environmental agencies.

Medical Waste Tracking Act Resources:

- State environmental agencies: www.h2e-online.org/tools/map.htm

NUCLEAR WASTE POLICY ACT

As a result of the Nuclear Regulatory Waste Policy Act, EPA and the Nuclear Regulatory Commission (NRC), among other agencies, oversee the storage and disposal of all commercially generated radioactive medical and infectious waste. Many healthcare facilities generate low-level radioactive waste as a by-product of administrating radiopharmaceuticals, radioimmunology, and nuclear medicine procedures.

NRC Resources:

- Internet access: www.nrc.gov/waste.html

THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

The Superfund Amendments and Reauthorization Act (SARA) of 1986 created the Emergency Planning and Community Right-to-Know Act (EPCRA). This law was designed to improve community access to information about potential chemical hazards and to facilitate the development of chemical emergency response plans by state and local governments. The EPCRA regulations establish several types of reporting obligations for facilities that store or manage specified chemicals. Hospital facilities are exempt from EPCRA Section 313 (the Toxic Release Inventory) unless they are federal facilities, but they are subject to all other EPCRA requirements. Certain notification requirements apply to healthcare facilities that use or store extremely hazardous substances, such as chemotherapy agents and ethylene oxide (ETO).

CFR GUIDE TO HAZARDOUS WASTE REGULATIONS

To review the RCRA regulations referred to in this document, consult the following citations in 40 CFR:

Part 260—Hazardous waste management system: general.

Part 261—Identification and listing of hazardous waste.

Part 262—Standards applicable to generators of hazardous waste.

Part 263—Standards applicable to transporters of hazardous waste.

Part 264—Standards for owners and operators of hazardous waste and specific types of hazardous waste management facilities.

Part 265—Interim status standards for owners and operators of TSDFs.

Part 266—Standards for the management of specific hazardous wastes and specific types of hazardous waste management facilities.

CFR GUIDE *continued*

Part 268—Land disposal restrictions.

Part 270—EPA administered permit programs: the Hazardous Waste Permit Program.

Part 272—Approved state hazardous waste management programs.

Part 273—Standards for universal waste management.

Part 279—Standards for the management of used oil.

Part 280—Standards for the management of Underground Storage Tanks (USTs)

EPA'S LIST OF LISTS

This consolidated compilation of chemicals lists those that are regulated under EPCRA and Section 112(r) of the CAA. It also has a list of the "Unlisted Hazardous Wastes" of RCRA: the D- and F-type wastes. See http://www.epa.gov/ceppo/pubs/title3.pdf.

EPCRA Resources:

- 40 CFR Parts 350 to 372
- The State Emergency Response Commission (contact available from RCRA Hotline)
- Internet access: www.epa.gov/tri and www.epa.gov/oswer/hotline/epara.htm

THE CLEAN AIR ACT

The Clean Air Act (CAA) regulates air pollution. It includes national emission standards for new stationary sources within particular industrial categories. It also includes national emission standards, which are designed to control the emissions of particular hazardous air pollutants (HAPs). The CAA seeks to prevent the accidental release of certain hazardous chemicals and to minimize the consequences of such releases. At hospitals, air emissions come from four primary areas: air conditioning and refrigeration, boilers, medical waste incinerators, and asbestos. Internet links with more information on these four areas are listed below.

CAA Resources:

- 40 CFR Parts 50 to 99
- Control Technology Center, Office of Air Quality, Planning and Standards, EPA, general information: 919 541-0800, publications: 919 541-2777
- Internet access: www.epa.gov/ttn/catc
- Region 2's Air Conditioning and Refrigeration Web Site: http://www.epa.gov/region02/cfc/
- EPA's Asbestos Web Site: http://www.epa.gov/asbestos/
- EPA's AirToxics Website (Rule/Implementation Info for Hospital/Medical/Infectious Waste Incinerators): http://www.epa.gov/ttn/atw/129/hmiwi/rihmiwi.html
- EPA's AirToxics Website (Rule/Implementation Info for Industrial/ Commercial/Institutional Boilers and Process Heaters): http://www.epa.gov/ttn/atw/boiler/boilerpg.html

THE CLEAN WATER ACT

The Water Pollution Control Act, commonly known as the Clean Water Act (CWA), is the federal program designed to restore and maintain the integrity of the nation's surface waters. CWA controls direct discharges to surface waters (e.g., through a pipe) from industrial processes or stormwater systems associated with an industrial activity. It also regulates indirect discharges, or discharges to POTWs, through a public sewer system. EPA established effluent limitations for hospitals with greater than 1,000 beds that discharge directly (for biochemical oxygen demand, total suspended solids, and pH). Hospitals that discharge to POTWs are subject to general standards that prohibit discharges that interfere with proper POTW operation. Hospitals should coordinate with their local POTW to ensure that what they pour down the drain does not interfere with POTW operation. Private hospitals are not required to have permits for storm water discharges unless they are operating a construction site covering greater than 1 acre. Public hospitals in urbanized areas must apply for a Phase II storm water permit or otherwise comply with Phase II storm water requirements, because they are considered municipal separate storm sewer systems (MS4s).

CWA Resources:

- 40 CFR Part 460 (direct discharges with >1,000 beds)
- 40 CFR Part 403 (all indirect discharges)
- 40 CFR Part 122 and 123 (stormwater discharges)
- Internet access: http://www.epa.gov/npdes
- EPA Office of Water: 202 564-5700
- Your state water authority, regional EPA office, and local POTW
- http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm

Oil Pollution Prevention Under the CWA

The Oil Pollution Prevention regulations were promulgated under the authority of the CWA. These regulations establish requirements for facilities to prevent oil spills from reaching the navigable waters of the United States or adjoining shorelines. The regulations apply to non-transportation-related facilities with a specific aboveground or underground oil storage capacity that, because of their location, can reasonably be expected to discharge oil into the navigable waters of the United States.

Under Oil Pollution Prevention regulations, hospitals with an oil storage capacity of greater than 1,320 gallons, or total completely buried oil storage capacity greater than 42,000 gallons must prepare and implement a Spill Prevention, Control, and Countermeasure Plan (SPCCP). Facilities with underground storage tanks (USTs) already regulated by federal UST guidelines and storage containers less than or equal to 55 gallons are exempt from storage capacity determination for SPCCPs.

Oil Pollution Prevention Regulation Resources:

- 40 CFR Part 112
- Internet access: www.epa.gov/oilspill

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA OR SUPERFUND)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly known as Superfund, authorizes EPA to respond to releases, or threatened releases, of hazardous substances that might endanger public health, welfare, or the environment, that might come from any source. Superfund also grants EPA the authority to force parties responsible for environmental contamination to clean it up or to reimburse response costs incurred by EPA. The most important part of this act applicable to healthcare facilities is the hazardous substance release reporting requirement. The person in charge at your business must report to the National Response Center (phone: 800 424-8802) any release of a hazardous substance that exceeds a designated "reportable quantity" for that substance within a 24-hour period.

Superfund Resource:

- Internet access: www.epa.gov/superfund

SAFE DRINKING WATER ACT

The Safe Drinking Water Act (SDWA) mandates that EPA establish regulations to protect human health from contaminants present in drinking water. Under the authority of SDWA, EPA developed national drinking water standards and created a joint federal-state system to ensure compliance with these standards. EPA also regulates underground injection of liquid wastes under the SDWA to protect underground sources of drinking water, including any hospital discharges to a septic system, drywell, or other type of Class V Shallow Well. Hospitals and doctors' offices must make sure that what they pour down a drain goes to a sewer, not a drywell or septic system. These devices are regulated by the underground injection control (UIC) program of the SDWA.

SDWA Resources:

- 40 CFR Parts 141 to 148
- SDWA Hotline: 800 426-4791
- Internet access: www.epa.gov/ogwdw
- Internet access: www.epa.gov/safewater/dwa/electronic/uic.html

COMMON U-LISTED HOSPITAL WASTE

(Note: This list is not exhaustive, but lists wastes commonly seen in hospitals, especially pharmacies.)

2-Chloroethyl Vinyl Ether (U042)
3-Methylchloranthrene (U157)
Acetone (U002)
Acetyl Chloride (U006)
Acrylonitrile (U009)
Aniline (U012)
Azaserine (U015)
Bromoform (U225)
Cacodylic Acid (U136)
Carbon Tetrachloride (U211)
Chloral Hydrate (U034)
Chlorambucil (U035)
Chlornaphazin (U026)
Chloroform (U044)
Creosote (U051)
Cresols (U052)
Cyclophosphamide (U058)
Daunomycin (U059)
Dichlorobenzenes (U070, U071, U072)
Diethylstilbesterol (U089)
Ethyl Acetate (U112)
Ethyl Carbamate (U238)
Ethyl Ether (U117)
Ethylene Oxide (U115)
Formaldehyde (U122)
Formic acid (U123)
Hexachloroethane (U131)
Hexachlorophene (U132)
Lindane (U129)
Maleic Anhydride (U147)
Melphalan (U150)
Mercury (U151)
Methanol/Methyl alcohol (U154)
Methylpyrilene (U155)
Methylthiouracil (U164)
Mitomycin C (U010)
Naphthalene (U165)
N-butyl alcohol (U031)
Paraldehyde (U182)
p-Chloro-m-Cresol (U039)
Phenacetin (U187)
Phenol (U188)
Reserpine (U200)
Resorcinol (U201)

COMMON U-LISTED HOSPITAL WASTE (CONTINUED)

Saccharin (U202)
Selenium sulfide (U205)
Streptozotocin (U206)
Tetrachloroethylene (U210)
Thiram (U244)
Trichloroethylene (U228)
Uracil mustard (U237)
Warfarin < 0.3% (U248)

COMMON P-LISTED HOSPITAL WASTE

(Note: This list is not exhaustive, but lists P-wastes commonly seen in hospitals, especially pharmacies.)

3-Benzyl Chloride (P028)
Arsenic (P012)
Arsenic Trioxide (P012)
Chloropropionitrile (P027)
Cyanide Salts (P030)
Epinephrine (P042)
Nicotine (P075)
Nitroglycerin (P081)*
Osmium Tetroxide (P087)
Phentermine (P046)
Phenylmercuric Acetate (P092)
Physotigmine (P204)
Physotigmine salicylate (P188)
Potassium Silver Cyanide (P099)
Sodium Azide (P105)
Strychnine (P108)
Warfarin > 0.3% (P001)

*Unless the state adopted the 2001 federal exemption for nitroglycerine formulations.

TOXIC SUBSTANCES CONTROL ACT

The Toxic Substances Control Act (TSCA) allows EPA to collect data on chemicals to evaluate, assess, mitigate, and control risks that might be posed by their manufacture, processing, and use. Healthcare facilities may be affected by some of the TSCA requirements.

TSCA Resources:

- 40 CFR Parts 702 to 799
- TSCA Hotline: 202 554-1404
- Internet access: www.epa.gov/oppts/

LEAD-BASED PAINT DISCLOSURE

Under the Residential Lead-Based Paint Hazard Reduction Act of 1992, sellers, landlords, and agents must provide purchasers and tenants with an EPA-approved lead hazard information pamphlet for housing built before 1978. If a hospital has housing on grounds (such as for attending physicians) that was built before 1978, they must provide lead-based paint disclosure pamphlets to all residents. Any contract to rent housing that was built before 1978 must also include or have attached to it a lead warning statement that describes the landlord or agent's responsibilities and the renters' rights.

Lead-Based Paint Resources:

- http://www.hud.gov/offices/lead/disclosurerule/index.cfm
- http://www.epa.gov/Region2/health/leadpoisoning.htm

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides federal control of pesticide distribution, sale, and use. EPA has authority under FIFRA not only to study the consequences of pesticide usage but also to require users (healthcare facilities, farmers, utility companies, and others) to register when purchasing pesticides.

FIFRA Resources:

- Internet access: www.epa.gov/pesticides/regulating/index.htm

Most Common Hospital Hazardous Waste Violations

- Labeling of HW not done or incorrect
- Not conducting proper weekly inspections of HW storage
- Improper disposal of chemotherapy drugs
- HW determination not done or incorrect
- No or inadequate HW manifest
- Throwing HW down the drain
- Improper management of expired pharmaceutical, paints, etc.
- Lack of contingency plan
- Lack of or inadequate training for employees in HW management
- Failure to ensure that HW meets Land Disposal Restrictions
- Failure to upgrade or close USTs by 12/22/1998
- Improper consolidation of wastes from nearby facilities

Best Management Practices

CHEMOTHERAPY DRUGS

Although only 8 chemotherapy drugs are currently listed as specific RCRA hazardous waste, it is best to handle all chemotherapy drugs the same way. It simplifies training staff to handle chemotherapy waste properly and ensures that personnel properly protect themselves. See www.h2e-online.org.

EXPIRED PHARMACEUTICALS

One way to simplify handling outdated pharmaceuticals is by using reverse distribution. There are close to 40 organizations that will take outdated pharmaceuticals, reprocess them when possible, and properly discard them if they cannot be used. The reverse distribution process minimizes the amount of pharmaceuticals that are needlessly discarded and maximizes the proper disposal of non-hazardous and hazardous waste. Reverse distribution may enable facilities to ship expired pharmaceutical as product, instead of waste. More information is available at the Returns Industry Association web page (http://www.returnsindustry.com).

TOP DOWN POLICY MAKING

The hospitals with the best environmental compliance records and minimized hazardous waste have top management commitment and support. If management commitment is seen as lacking, environmental concerns will not receive the priority they deserve. Top management should clearly communicate (both internally and externally) their commitment to a cleaner environment by:

- establishing a written environmental policy that includes a commitment to compliance with applicable federal, state, and local environmental regulations, continuous improvement in environmental performance, pollution prevention, and public outreach/community involvement;
- providing adequate resources to meet the above commitments, including skilled personnel, technology, and financial resources;
- designating a "Green Team" that consists of staff throughout the hospital (e.g., nurses, doctors, housekeeping, purchasing, laboratory managers, infection control staff, etc.) that will always be on the look out for ways to reduce packaging; provide safer materials for patients, staff, and the environment; reduce the amount of toxic materials used; purchase recycled goods; and reuse items rather than using disposable products; and
- reviewing and evaluating (at least annually) the hospital's progress toward environmental excellence and making any necessary changes to procedures/ policies.

REGULAR SELF-AUDITS

Hospitals should have a comprehensive compliance audit performed at their facility by an independent auditor at least every three years to ensure that they have adequate systems in place to maintain compliance. If violations are found, hospitals should consider taking advantage of EPA's audit policy to reduce or eliminate accompanying violations. Information on our policy can be obtained from EPA Region 2's compliance incentives website at www.epa.gov/region02/capp/cip.

GOOD EMPLOYEE TRAINING

Training employees about environmental management is important for two reasons

- Every employee can impact the environment. They need to know how their actions can affect the hospital's environmental performance and how to perform their work to prevent or mitigate the occurrence of environmental incidences
- Trained staff are more likely to offer suggestions on how the hospital can improve its environmental management program.

POLLUTION PREVENTION TIPS

Only buy what you need. You will store less waste and have less expired pharmaceuticals.

BEST MANAGEMENT PRACTICES

For more information on these and other best management practices for healthcare facilities, call the EPA Region 2 Compliance Assistance Hotline at (212) 637-4050 or visit www.epa.gov/region02/healthcare. Additional resources are on Page 14.

WHAT IS ENVIRONMENTALLY PREFERABLE PURCHASING (EPP)?

Environmentally Preferable Purchasing (EPP) means you buy products that don't contain hazardous waste and minimize environmental impact, including products that are:

- Mercury free and non-toxic (or less toxic)
- Recyclable or made of recycled material
- Packaged with less packing
- Energy Efficient
- Reusable
- Durable
- Safer for patients, workers, and the environment

Certain cleaners, copiers, and other electronic equipment are easier on the environment than others. For more information on EPP in general, visit http://www.epa.gov/oppt/epp. For hospital-specific EPP information, see http://www.h2e-online.org/tools/grnpurch/epp.htm.

Remember to train employees on a continuous basis to keep them abreast of new regulations, procedures, technological developments, new and emerging environmental and health concerns, etc. Explain why a certain environmental procedure is in place, not just what the procedure is.

OPERATING ROOM KITS: SMART USE

To minimize waste from operating rooms, hospitals should evaluate surgical and procedure kits to determine if all products are used in the standard kit and that kits don't expire before use due to one or two products. The hospital should adjust the contents of the kits to minimize excess, and have additional on hand if needed for a particular procedure. Ideally, the hospital should track their surgical materials by doctor and procedure to ensure that only needed tools are opened, used, and discarded.

ENVIRONMENTALLY PREFERABLE PURCHASING: PVC AND MERCURY FREE

To reduce harmful dioxin and mercury emissions from medical waste incinerators and reduce the incidence of mercury spills, hospitals should establish purchasing policies that prohibit the purchase of polyvinyl chloride (PVC) and mercury containing products where alternatives exist. They should also encourage manufacturers, vendors, and group purchasing organizations to identify and label products made from PVCs and mercury and to offer products and packaging materials that are mercury and PVC-free. Information on alternatives can be obtained from the Sustainable Hospitals Project http://www.sustainablehospitals.org/ and http://www.epa.gov/region2/p2/health.htm.

MINIMIZE PESTICIDES

Hospitals should minimize the use of pesticides and practice Integrated Pest Management (IPM) to minimize the exposure of these toxic substances to patients, staff, and the general public. More information on IPM can be obtained from the New York Coalition for Alternatives to Pesticides at www.altpest.org. Hospitals must also follow label directions and use pesticides, sterilants, and disinfectants for approved uses only (and at approved concentrations only).

MINIMIZE RED BAG WASTE

One of the best ways to reduce the amount of waste that needs to be sent to incinerators, autoclaves, or other medical waste treatment facilities is to keep non-infectious wastes out of the infectious waste stream. The best way to do this is to educate hospital employees on what the definition of "infectious waste" really is. Then, strategically place "red bag" garbage cans to discourage employees and visitors from putting regular trash in the infectious waste stream. The hospital should also label all containers clearly and consistently, make sure they have the right size container for the job (if clear bag bins fill too quickly, it's likely waste will get dumped in a red bag instead), have walk throughs to check up on the system on a regular basis, and where red bags are needed, keep red bag and clear bag containers next to one another to offer a choice.

KNOW WHERE YOUR WASTE IS: COMPUTER TRACKING

Hospitals should consider establishing a computer tracking system for monitoring chemical inventories and wastes (preferably by department) to ensure that excess chemicals are not purchased, that purchased materials are used in a first-in, first out order to avoid expiration of their shelf-life, that the most environmentally-friendly products are purchased, and that wastes are minimized to the maximum extent possible. It will also help you comply with the reporting requirements of the Emergency Planning and Community Right to Know Act and determine your hazardous waste generator status.

GREEN HOSPITALS

For remodeled or new hospital facilities, incorporate green design and construction goals and strategies. Using healthier building materials can improve public health and preserve the global environment. Use good energy design to cut utility costs, daylighting to improve productivity, good indoor air quality to improve recovery times and reduced staff absenteeism, and careful interior finish material selection to cut cleaning and maintenance cost. See http://www.epa.gov/region2/p2/health.htm.

Partnerships and Resources

HOSPITALS FOR A HEALTHY ENVIRONMENT

Hospitals for a Healthy Environment (H2E, www.h2e-online.org) is a voluntary program with goals of safer work places, reduced waste and disposal costs, and greener, more environmentally friendly hospitals. H2E educates health care professionals about pollution prevention opportunities through best managment practices, model plans for total waste management, resource directories, and case studies. H2E aims to provide tools to minimize waste and lessen the use of persistent, bioaccumulative, and toxic chemicals. Such practices should benefit the environment and reduce waste disposal costs.

The American Hospital Association, EPA, Health Care Without Harm, and the American Nurses Association all sponsor H2E. In addition, various state and local resources have also joined the effort to help health care facilities achieve the goals outlined in H2E.

SUSTAINABLE HOSPITALS

The Sustainable Hospitals Project (SHP, www.sustainablehospitals.org) supports the healthcare industry by providing technical resources for selecting products and work practices that eliminate or reduce occupational and environmental hazards, maintain quality patient care, and contain costs. The Lowell Center for Sustainable Production created SHP.

THE RESOURCE CONSERVATION CHALLENGE

EPA's Resource Conservation Challenge (RCC, www.epa.gov/rcc) is a voluntary, joint effort between EPA, businesses, and communities. RCC aims to find flexible, yet more protective ways of improving waste reduction, public health, and the environment. As part of the Resource Conservation Challenge, the EPA is asking the hospital industry to develop projects for the reuse and recycling of potentially harmful hospital items and the reduction of waste. See http://www.epa.gov/epaoswer/osw/conserve/clusters/hospital.htm.

Lead needed to protect a doctor from CatScan radiation, mercury in ultraviolet lamps, and residual or expired pharmaceuticals are just a few examples of the hospital waste that can harm the environment if disposed of improperly. EPA's RCC is committed to supporting projects that:

- Reduce the volume of non-hazardous solid waste (including paper) from health care industry;
- Eliminate all mercury waste from the health care industry waste stream; and
- Improve the management of pharmaceutical waste by reducing the amount of expired/unused pharmaceuticals that are disposed of in landfills.

PERFORMANCE TRACK

Performance Track (www.epa.gov/performancetrack) is a public/private partnership recognizing top environmental performance among participating U.S. facilities of all types, sizes, and complexity, public and private. Program partners are providing leadership in many areas, including preventing pollution at its source. Currently, the program has approximately 300 members and welcomes all qualifying facilities. Applications are accepted twice a year: February 1–April 30 and August 1–October 31.

HEALTHCARE WITHOUT HARM

Healthcare Without Harm (www.noharm.org) aims to eliminate the harm to human health and environment from the medical field. Over 400 organizations in 52 countries participate. Healthcare Without Harm offers information on mercury, polyvinyl chlorides (PVCs) and di-ethylhexyl phthalate (DEHP), medical waste, healthy building, pesticides and cleaner, and green purchasing.

PARTNERSHIPS AND RESOURCES

For more information on these and other related resources, call the EPA Region 2 Compliance Assistance Hotline at 202-637-4050 or visit www.epa.gov/region2/healthcare.

SELF AUDITING

EPA offers incentives to encourage self auditing. When businesses perform self-policing, discovery, disclosure, correction and prevention, EPA can at least partially lessen the gravity of any penalty for violation. Moreover, companies that self audit tend to have the best compliance records. Learn more at http://www.epa.gov/region02/capp/cip/policy.htm.

Contacts and Resources

HOTLINES AND INFORMATION CENTERS

RCRA Hotline/ Information Center

U.S. Environmental Protection Agency
RCRA Information Center (5305W)
1200 Pennsylvania Avenue, NW.
Washington, DC 20460
Phone: 800 424-9346
or TDD 800 553-7672
In the Washington, DC, area:
703 412-9810, or TDD 703 412-3323
E-mail: rcra-docket@epa.gov
Home page: <www.epa.gov/epaoswer/hotline>

Answers questions and provides information on matters related to RCRA solid waste, hazardous waste, and underground storage tanks, EPCRA, and CERCLA.

HEALTHCARE INTERNET ADDRESSES

Hospitals for a Healthy Environment
<www.h2e-online.org>

EPA Region 2 Compliance Healthcare
<www.epa.gov/region02/healthcare/index.html>

Sustainable Hospitals
<www.sustainablehospitals.org>

Pollution Prevention Resource Exchange
<www.P2rx.org/P2InfoNexpert/medical.cfm>

Healthcare Without Harm
<www.noharm.org>

EnviRN
<http://envirn.umaryland.edu>

EPA Environmentally Preferable Purchasing (EPP)
<www.epa.gov/oppt/epp>

Health Care EPP Network Information Exchange Bulletin
<www.state.ma.us/ota/otapubs.htm#eppnet>

Purchasing for a Healthy Environment
<http://www.hospitalconnect.com/jsp/article.jsp?dcrpath=AHA/NewsStory_Article/data/MATMANMAG360&domain=MATMANMAG>

Waste Reduction Activities for Hospitals
<www.ciwmb.ca.gov/bizwaste/factsheets/hospital.htm>

EPA Region 5 Mercury in Medical Waste Factsheet
<www.p2pays.org/ref/01/00792.htm>

PROACT Factsheet, Management of Medical/Infectious Waste
<www.afcee.brooks.af.mil/pro-act/fact/oct98b.asp>

US Army Center for Health Promotion and Preventive Medicine Hazardous Waste Management Program
<http://chppm-www.apgea.army.mil/hmwp/>

Occupational Health and Safety Administration (OSHA)

U.S. Department of Labor
OSHA
200 Constitution Avenue
Washington, DC 20210
Phone: 800 321-OSHA
Home page: <www.osha.gov>

Provides information on workplace safety and health issues.

U.S. Government Printing Office

Superintendent of Documents
P.O. Box 371954
Pittsburgh, PA 15250-7954
Phone: 202 512-1800
Fax: 202 512-2250
Home page: <www.gpo.gov>

Prints and distributes the *Code of Federal Regulations.* Title 40, Parts 260 to 299, contains most of the RCRA requirements.

National Response Center (NRC)

Phone: 800 424-8802
Home page: <www.nrc.uscg.mil>

In the event of a fire, explosion, or other release of hazardous waste that could threaten human health outside the facility, call the NRC to report the emergency. The NRC will evaluate the situation and help you make appropriate emergency decisions.

ADDITIONAL INTERNET ADDRESSES

Small Business Ombudsman Clearinghouse/Hotline
U.S. Environmental Protection Agency
Small Business Ombudsman (1808T)
1200 Pennsylvania Avenue, NW.
Washington, DC 20460
Phone: 800 368-5888
Fax: 202 566-2848
Home page: <www.smallbiz-enviroweb.org>
<www.epa.gov/sbo>

Helps private citizens, small businesses, and smaller communities with questions on all program aspects within EPA.

Pollution Prevention Information Clearinghouse (PPIC)
U. S. Environmental Protection Agency
Pollution Prevention Clearinghouse (PPIC)
1200 Pennsylvania Avenue, NW. (7407-T)
Washington, DC 20460
Phone: 202 566-0799
Fax: 202 566-0794
E-mail: ppic@epa.gov
<www.epa.gov/opptintr/library/ppicindex.htm>

Provides information on reducing and eliminating industrial pollutants.

EPA Home Page
<www.epa.gov>

EPA RCRA Hazardous Waste Resources
<www.epa.gov/osw/topics.htm>

Code of Federal Regulations
<www.gpoaccess.gov/cfr/index.html>

Envirosense
<http://es.epa.gov>
(contains technical, policy, and general information on pollution prevention topics)

EPA Library Resources
<www.epa.gov/natlibra/hqirc.html>

U.S. Nuclear Regulatory Commission
<www.nrc.gov>