

## Management of Hospital Hazardous Wastes

### Technical Guidance

The Arizona Rules of Hazardous Waste Management (Rules) found in the Arizona Administrative Code [AAC R18-8-260 et seq.](#) adopt the federal Resource Conservation and Recovery Act (RCRA) regulations, which are designed to ensure that the generation, transportation, treatment, storage and disposal of hazardous wastes are conducted in a manner that provides maximum protection to human health and the environment. This guidance document was developed to assist you in determining if you generate hazardous waste, and if so, the hazardous waste rules that your hospital must follow to meet the regulatory requirements of the law.

**NOTE:** The handling of hospital wastes that meet the definition of biomedical waste in Arizona’s Solid Waste Management Rules, [AAC R18-13-1401](#), are regulated by the solid waste rules and not the hazardous waste rules discussed in this guide. Biomedical wastes are defined as any solid waste which contains pathological or biological waste, discarded medical equipment, cultures, and stocks of infectious agents and associated biologicals.

The hazardous waste rules that Pima County hospitals must follow are determined by the total amount of hazardous waste the hospital generates each calendar month. Generator status is divided into three separate categories, based upon the total pounds of hazardous waste generated monthly:

- *Very Small Quantity Generator* (VSQG) - generates no more than 220 pounds of hazardous waste in a calendar month (see [40 CFR Part 262.14](#)).
- *Small Quantity Generator* (SQG) - generates more than 220 pounds, but less than 2200 pounds of hazardous waste in a calendar month (see [40 CFR Part 262](#)).
- *Large Quantity Generator* (LQG) - generates 2200 pounds or more of hazardous waste or more than 2.2 pounds of acute hazardous waste in a calendar month (see [40 CFR Part 262](#)).

Based on your hazardous waste generator status, you must follow certain requirements to:

- Identify all waste streams generated by your hospital;
- Examine each waste stream to determine if the waste is a hazardous waste;

- Count the total amount of hazardous waste generated by the hospital each calendar month; and comply with certain requirements pertaining to on-site storage of hazardous waste, off-site shipment of your hazardous waste, and record keeping and reporting.

**STEP # 1:** Determine whether the material in question is a solid waste.

A material must meet the definition of a solid waste before it can be a hazardous waste. A solid waste is any material, including liquids and gases, that is discarded or:

- Abandoned - which means thrown away, disposed of, burned, or incinerated; or
- Recycled - used, reused, or reclaimed; or
- Inherently waste-like - materials that may pose a threat to human health and the environment, such as dioxin-containing wastes.

**STEP # 2:** Determine whether the waste is excluded from regulation.

A few examples of materials that are defined as a solid waste but excluded from solid waste regulation (see [40 CFR 261.4](#)) are:

- Domestic sewage or a mixture of domestic sewage and solid waste discharged to a permitted Public Owned Treatment Works (POTW) (see [40 CFR 261.4\(a\)\(1\)](#));
- A point source discharge into the waters of Arizona regulated under a NPDES Permit (see [40 CFR 261.4\(a\)\(2\)](#));

- A radioactive waste regulated as a low-level mixed waste (hazardous/radioactive) and managed as radioactive waste in accordance with Nuclear Regulatory Commission (NRC) regulations ([see 40 CFR 261.4\(a\)\(4\)](#)); and
- Excluded scrap metal, such as bits and pieces of rods, sheets, or wire, that is recycled ([see 40 CFR 261.1\(c\)\(9\)](#)).

**STEP # 3:** Determine whether the solid waste exhibits a hazardous waste characteristic or is a listed hazardous waste.

**Characteristic Hazardous Waste:**

Waste that exhibits one or more of the following hazardous waste characteristics of ignitability, corrosivity, reactivity or toxicity listed in [40 CFR Sections 261.21, 261.22, 261.23 and 261.24](#):

**Ignitability:** A liquid with a flash point less than 140° F (60° C), an oxidizer, or an ignitable compressed gas as defined by the U.S. DOT regulations. The flash point is defined as the temperature at which vapor will ignite when exposed to an ignition source. An example of ignitable waste would be waste mineral spirits; (Waste Code D001);

**Corrosivity:** A waste is corrosive if it is aqueous and its pH is less than or equal to 2 or greater than or equal to 12.5; or it is a liquid and it corrodes steel at a rate of more than 0.25 inches per year. An example of corrosive waste would be waste Muriatic or Sulfuric Acid; (Waste Code D002);

**Reactivity:** A waste exhibits reactivity if it is explosive or is unstable and explodes or produces fumes, gases, and vapors when mixed with water or under other conditions such as heat or pressure. An example of reactive waste would be certain Cyanide or Sulfide-bearing wastes; (Waste Code D003);

**Toxicity:** The Toxicity Characteristic is determined by having a certified laboratory analyze a representative sample of the waste using the Toxicity Characteristic Leaching Procedure (TCLP); the results are compared to the regulatory levels of 40 constituents found in [40 CFR Part 261](#).

If the levels meet or exceed the regulatory level, the waste is a hazardous waste for that contaminant. An example of toxic waste would be certain tissue stain solutions contaminated with mercury or pyridine; (Waste Codes D004 through D043).

**Listed Hazardous Wastes:**

The EPA has listed certain wastes in [40 CFR Part 261](#) because of their toxic or hazardous nature. The following hazardous waste listings are for various processes, specific sectors of industry, or wastes in the form of specific chemical formulations:

**F-Listed** - Hazardous waste from non-specific sources listed in [40 CFR Section 261.31](#). Examples include certain spent solvents, such as Xylene, and certain wastewaters, such as treatment sludges from certain electroplating operations and chemical conversion coatings.

**K-Listed** - Hazardous waste from specific sources listed in [40 CFR Section 261.32](#), such as wood preserving.

**U-Listed** - Commercial and/or off-spec chemical products listed in [40 CFR Section 261.33](#). Examples include chloroform, Coumadin, diethylstilbestrol, formaldehyde, lindane, mercury, resorcinol, phenol and saccharin.

**P-Listed** - Acute hazardous wastes listed in [40 CFR Section 261.33](#). Examples include epinephrine, nicotine, nitroglycerine, sodium azide, strychnine, arsenic and cyanide compounds, and certain chemotherapy drugs. Amounts exceeding 1kg (2.2 pounds) are subject to LQG rules.

**Step #4:** Determine if the hazardous waste is exempt or excluded from regulation under the hazardous waste rules.

Some hazardous wastes are excluded from the Rules if the waste is legitimately reclaimed, reused, recycled or properly managed under other EPA rules, such as water and air protection rules. (If, however, these wastes are not reclaimed, they must be counted).

Examples include:

- Residues (except for P-listed waste) that may be left in the bottom of empty containers that have been thoroughly emptied through normal means such as pouring or pumping (see [40 CFR 261.7](#));
- Waste Chlorofluorocarbon Refrigerants if the CFCs are recycled, such as being reclaimed for reuse (see [40 CFR 261.4\(b\)\(12\)](#));
- Dirty Solvents that are recycled for reuse over and over, as long as the solvent is counted once prior to reclamation;
- Used Oil that is stored in containers for recycling (see [40 CFR 279](#));
- Silver recovered from solutions and X-ray film (see [40 CFR 266.70](#));
- Industrial Ethyl Alcohol (Reagent Alcohol) if the alcohol is reclaimed for reuse (see [40 CFR 261.6\(a\)\(3\)](#));
- Caustic and Acidic Solutions if the waste does not fail for any other hazardous waste characteristics and the wastes are neutralized immediately upon generation (see definitions in [40 CFR 260.10](#));
- Mercury-containing bulbs, thermostats and certain batteries if the wastes are sent to a permitted recycling facility (see [40 CFR Part 273](#)).

**Step #5:** Counting and recording the amount of regulated hazardous waste generated each calendar month.

Exempt and excluded hazardous wastes do not count towards determining your hazardous waste generator status (see step #4). The key is making sure that you have identified every waste stream and determined whether each waste stream is a hazardous waste (see step #3).

**Typical Waste Streams that May be Hazardous**

Facilities Management/Engineering

- Medical waste incinerator ash
- Waste Mineral Spirits from parts washers
- Waste fluorescent, metal halide, HID bulbs, Bili-light/warmer
- Used oil and filters

- Waste batteries containing toxic metals such as Cadmium, Lead, Lithium, Mercury and Silver
- Used TV monitors and computer equipment
- Discarded equipment containing Mercury, such as thermostats and switches
- Housekeeping wastes
- Discarded aerosol cans containing ignitable and chlorinated solvents or ignitable propellants

Laboratory/Histology/Pathology

- Waste solvents from tissue processing (e.g. Xylene, Ethanol, Isopropanol, Hemo DE, Formalin)
- Waste tissue stains containing Mercury
- Waste fixatives containing Mercury (e.g. Zenker's Solution, Helly, Ohlamer, Carnoy-Lebrun, Shardin)
- Discarded or waste diagnostic test reagents preserved with Thimerosal
- Unused compressed gas cylinders (Hydrogen, Oxygen)

Pharmacy

- Outdated or discarded chemotherapy drugs that are listed hazardous waste (e.g. Chlorambucil, Uracil, Mustard, Cyclophosphamide, Daunomycin, Mitomycin C)
- Outdated or discarded pharmaceuticals that are listed hazardous waste (e.g. Nicotine, Nitroglycerine, Epinephrine, Coumadin, Resorcinol, Lindane-containing shampoos)
- Waste solvents (e.g. Acetone, Ethyl Alcohol, Phenol)

Radiology

- Spent developer/fixer solution not immediately treated in an on-site waste water silver recovery system
- Discarded X-ray film not sent off-site for silver recovery

Surgical Services

- Chemical sterilants (Ethylene Oxide, Chlorine Dioxide, Formaldehyde, Glutaraldehyde)
- Chemical disinfectants (Methanol, IPA, >3% H2O2)

Patient Rooms/Other Areas

- Sphygmomanometers (device used to measure blood pressure)
- Bougies or barometers
- Miller-Abbot tubes
- Esophageal dilators

**Common Hazardous Waste Violations:**

- Disposal of mercury-containing devices such as fluorescent bulbs and mercury thermometers in the trash
- Failure to identify all waste materials and determine if they are hazardous or non-hazardous waste, and dispose of accordingly
- Failure to label containers accumulating hazardous waste with the words “Hazardous Waste”

- Failure to maintain signed copies of hazardous waste manifests for three years
- Failure to train employees that manage hazardous waste at least annually to respond to hazardous waste emergencies
- Failure to conduct and document weekly inspections of all areas where hazardous waste is being accumulated
- Failure to post emergency contact information at phones near the hazardous waste accumulation areas
- Failure to pay annual hazardous waste fees (LQG and SQG only)
- Failure to document arrangements with the local fire department, police department and hazmat team for response to emergencies

**Note:** Please also see TGD HW15 – Disposal of Chemotherapy Waste.

For additional information regarding proper management of solid or hazardous waste in Pima County, you may contact the Pima County Department of Environmental Quality (PDEQ) at (520) 724-7400, at the address at the beginning of this document, or visit the PDEQ website at <http://www.deq.pima.gov/waste/index.html>.

Updated 12/2019