BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA

Environmental Health and Safety Manual

Hazardous Waste Management

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HAZARDOUS WASTE MANAGEMENT

The Board of Regents of the USG is dedicated to ensuring proper management and disposal of all hazardous wastes generated within the USG during research, teaching and facilities maintenance operations. Safe and environmentally sound management of hazardous waste is an integral part of the USG's mission. This commitment allows the System to meet its compliance obligations concerning federal, state, and local regulations pertaining to the management of chemical, biological, radioactive and other potentially hazardous waste.

Responsibility for compliance with hazardous waste regulations begins with the individual researchers and employees who generate the waste material, and continues through the transportation and disposal process.

Escalating public concern for environmental quality and continued tightening of federal and state regulations are two primary driving forces behind the need for USG institutions to ensure that all their hazardous wastes are properly managed. Each unit of the USG is individually responsible for directing their institution's hazardous waste management activities. These responsibilities include managing the collection, processing, consolidation and disposal of chemical wastes and providing adequate resources for other potentially hazardous materials and environmental compliance responsibilities.

The purpose of this section is to provide information and guidance on hazardous waste generation, consolidation, packaging, record development and maintenance and general management of hazardous and non-hazardous chemical wastes. Each institution is expected to review, understand and implement the information and guidance provided in this manual.

The two (2) primary regulatory drivers for hazardous waste at USG institutions are the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Rules and the Georgia Environmental Protection Division (EPD) Rules for Hazardous Waste Management. A brief summary of these rules follows in Sections A.1 and A.2.

1. Resource Conservation and Recovery Act (RCRA); Title 40 of the Code of Federal Regulations (40 CFR), Parts 260-268, 273 and Part 279 and Parts 124 or 270. In 1976, Congress adopted RCRA to actively take

responsibility for promoting the recovery and reuse of wastes as important resources and ensuring the proper disposal of hazardous and non-hazardous wastes. In essence, RCRA is the Federal regulatory program for *waste management*. As with many federal statutes, certain individual states are delegated the responsibility to implement the regulations and manage wastes, but the EPA still provides oversight.

RCRA was designed for the management of both hazardous and non-hazardous wastes. RCRA introduced the concept of "cradle to grave" responsibility for hazardous waste. RCRA includes requirements for:

a. *Identifying the characteristics of hazardous wastes:* Any wastes meeting certain characteristics (ignitable, corrosive, reactive, or toxic) are considered “hazardous waste” and must be managed as such. These are often referred to as “characteristic wastes”.

b. *Specifying certain contaminants and process streams as hazardous waste:* These are often referred to as “listed wastes”. Lists of hazardous wastes identified by the EPA are as follows:

    i. Source-specific list (e.g. wastes from petroleum refining, metal fabrication, etc.; these are often referred to as K-wastes)
    ii. Non-source-specific list (e.g. degreasing solvents, etc.; these are often referred to as F-wastes)
    iii. Discarded commercial chemical products and spill residues (these are often referred to as P- and U-wastes; P-wastes are also known as “acutely hazardous wastes”)

The standards are applicable to generators and transporters of hazardous waste and operators of treatment, storage, and disposal facilities.

Hazardous waste is defined as any solid waste (including liquids, sludges, gases, etc.) that meet the following criteria (materials that will be used in a product are exempted, provided that all of the material is so used):

a. Waste that causes, or significantly contributes to, an increase in mortality or serious irreversible or incapacitating reversible illness, or

b. Waste that poses a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hazardous waste generators are responsible for identifying whether their wastes are listed or if they have specific hazardous characteristics. Mixing hazardous wastes with non-hazardous wastes, to dilute them, causes the entire mixture to be classified as hazardous waste. Some solid waste is exempt from being classified as hazardous waste, including household waste, overburden and spoil returned to the original mine site, petroleum exploration drilling waste, agricultural waste returned to the soil as fertilizer, etc.

RCRA requires that hazardous waste be tracked and managed from the point of generation ("cradle") to its ultimate disposal point ("grave"). The waste generator is the principal party responsible for meeting the requirements of this law. Generators must obtain a "generator ID number" (discussed in Section 6) from either the EPA or the state-delegated regulatory entity (in Georgia, the EPD). This number must be listed on hazardous waste manifests for all hazardous wastes shipped off-site. The manifest also requires a certification statement that all efforts have been taken to minimize the waste quantity and associated hazards. The manifest accompanies the waste to its disposal site, and copies are returned to the generator and the appropriate agency.

Federal and state laws prohibit the disposal of untreated hazardous wastes in landfills. Locations disposing of those wastes must notify their waste haulers and treatment, storage and disposal facilities about how to treat their wastes before disposing of them. The purpose of this restriction is to prevent health and environmental threats caused by leaking landfills. Land Disposal Restrictions (LDR) apply to wastes that exhibit specific characteristics or are listed in the regulations as a hazardous waste (discussed later in the section entitled "Making the Waste Determination"). The EPA has set standards for treating hazardous wastes before land disposal. The standards require that either one or more specific treatment methods are used or that wastes are treated until hazardous constituents are reduced to specific concentrations.

LDR requirements for notification and recordkeeping for hazardous waste generators can be found in 40 CFR 268.7 (a). Please note that conditionally exempt small quantity generators (discussed later in section entitled "Determining Generator Status") are exempt from LDR. Most waste management companies will require you to sign one of their own LDR forms as part of their service procedures. Before you ship hazardous waste, contact the waste management company to see if they require use of their own LDR forms. Whether you use your own form or one provided by a waste management company, you are ultimately responsible for

completing a LDR for each hazardous waste shipment. Recyclable materials used in a manner constituting disposal are not subject to LDR if such products meet applicable standards of RCRA.

Any facility that treats, stores or disposes of hazardous waste, also known as Treatment, Storage, and Disposal Facilities (TSDFs), must obtain a RCRA permit to do so. The vast majority of USG facilities are not involved with TSDF activities and therefore do not need to obtain a permit. The only permitted TSDF currently in the USG is located at the University of Georgia (UGA) in Athens, GA. TSDFs are subject to LDR standards and must comply with notification, certification, waste analysis, and record keeping requirements. 40 CFR 268.7(b) contains the requirements for treatment facilities.

2. Georgia Environmental Protection Division; Rules for Hazardous Waste Management, Chapter 391-3-11. The U.S. Environmental Protection Agency has granted authority to the Georgia Environmental Protection Division (EPD) to implement and enforce hazardous waste management rules within the state of Georgia. EPD has implemented rules that establish policies, procedures, requirements, and standards to implement the Georgia Hazardous Waste Management Act, O.C.G.A. 12-8-60, et seq. These rules essentially adopt the federal RCRA regulations and are promulgated for the purpose of protecting and enhancing the quality of Georgia's environment and protecting the public health, safety and well being of its citizens.

Georgia Environmental Protection Department of Natural Resources

3. Making the Waste Determination. The first step in the management of hazardous waste is to determine whether a material is a “waste” and whether it is “hazardous”. Subsequent steps are used to properly classify the waste and determine the action necessary for proper management of the waste.

   Simply defined, a hazardous waste is a material with properties that make it dangerous or capable of harming humans or the environment if not properly managed. Making the determination of whether a waste is hazardous is complicated and requires an extensive understanding of such information as the waste constituents, how it was generated, the material's chemical and physical characteristics, an understanding of EPA and GA EPD regulations, and experience classifying waste products.

   A material is considered to be a hazardous waste if the EPA or the State of Georgia specifically lists it as a hazardous waste, or if it exhibits a hazardous characteristic (as outlined under section 1 above).

Two methods can be used to determine if the waste exhibits hazardous "characteristics"; (1) testing or (2) applying "generator knowledge". Testing must be done following strict regulatory protocols established by the GA EPD or EPA. Generator knowledge involves applying an understanding of the hazardous nature or characteristics of the waste based on the materials or processes used to generate the waste.

If a waste is not listed as an EPA hazardous waste or does not exhibit any of the hazardous waste characteristics, it is a non-regulated solid waste.

Materials are usually considered "waste" when the generator has determined that the material has no further use and will be discarded. Hazardous waste regulations apply to any material that will be discarded, or will likely be discarded. (The latter point is important because materials that have no further use and will eventually be discarded may be considered hazardous waste by regulatory agencies even though there are no current plans to discard the material. Therefore, it is imperative that the department of EH&S or the Hazardous Waste Coordinator be consulted if materials will be stored for long periods without use or if the use of a material is not anticipated for extended periods.)

Waste materials can be solid, liquid, semi-solid or compressed gas. All such materials must be evaluated to determine if the hazardous waste regulations apply.

4. Determining Generator Status. The next step in the management of hazardous waste is to determine the institution's "generator classification". Each generator category has specific generation, accumulation and storage requirements and corresponding time limits. Knowledge of the generator category enables the institution to ensure that the quantity of waste generated, how the waste is accumulated and storage time limits, comply with EPA / GA EPD requirements. The following outlines the three generator categories:

    a. *Conditionally Exempt Small Quantity Generator (CESQG).* This is the most desirable category due to the fact that fewer regulatory requirements apply. This category applies to a generator of hazardous waste that generates less than 100 kilograms (220 lbs) of hazardous waste and less than one (1) kilogram (2.2 lbs) of acutely hazardous waste per calendar month.

    b. *Small Quantity Generator (SQG).* This category applies to a generator of hazardous waste that generates more than 100 kilograms (220 lbs), but less than 1,000 kilograms (2,200 lbs) of hazardous waste and less than 1 kilogram (2.2 lbs) of acutely hazardous waste per calendar month.

c. *Large Quantity Generator (LQG)*. This category applies to a generator of hazardous waste that generates more than 1,000 kilograms (2,200 lbs) of hazardous waste OR greater than 1 kilogram (2.2 lbs) of acutely hazardous waste per calendar month.

The following table summarizes the specific requirements for each generator classification.

TABLE 1

GEORGIA EPD & U.S. EPA REGULATIONS FOR HAZARDOUS WASTE GENERATORS			
	Conditionally Exempt Small Quantity Generators	**Small Quantity Generators**	**Fully Regulated (Large) Quantity Generators**
Quantity Limits for Waste Generation	(261.5) <100 Kg/mo (<220 lbs/mo) < 1 Kg acute (<2.2 lbs/mo)	(262.44) 100 - 1000 Kg/mo (220 – 2200 lbs/mo)	1,000 Kg/mo or greater (>2200 lbs/mo)
Manifest/Continuation Pg.	*Not Required	(262 subpart B and appendix) Manifest Required; Continuation Sheet Authorized	
TDSF Requirement Manifest copy to Generator	(264.71(a)(5)) - 30 days after delivery		
Exception Report	If manifest is not received within 35 days, contact TSDF or transporter to determine status. If not received within 45 days, submit Exception Report. (262.42)		
Biennial Report	Not Required		Required; submit by march 1 of each even numbered year. (262.41)
Additional Reporting	Not Required	(262.43) Upon request of Administrator on quantity and disposition of wastes.	
EPA ID#	*Not Required	(262.12) Required	
Change of Generator Status	Notify appropriate state or regional office and comply with all applicable requirements of new generator status.		
On-Site Storage Limits	May Accumulate up to 999 Kg.	May accumulate up to 6000 Kg. for up to 180 days or 270 days if waste is to be transported over 200 miles. (262.34 (d))	May accumulate any quantity of waste up to 90 days. (262.34 (a))
Storage Requirements	None	Basic requirements for containers and tanks (Part 265 - technical standards)	Full compliance for the management and use of containers and tanks. (Part 265 subparts 1 and])
Satellite Accumulation	Not Applicable	(262.34(c)) up to 55 gal. of waste or 1 qt. of acute at or near pt. of generation.	
Waste Codes	(261 Subparts C & D) U, P, F, K, and D waste types		
Personal Training	Not Required	Basic Training Required	Required (264.16)
Contingency Plan	Not Required	Basic Plan Required	Required (264 Subpart D)

* Although not required under RCRA, many transporters and TSDFs can not accept hazardous waste without a manifest or waste from a generator without an EPA ID#.

5. Obtaining a US EPA Hazardous Waste Generator Identification Number. The EPA requires all hazardous waste generators to register their generator status by obtaining an EPA identification number. This number is used to track waste from generation to ultimate disposal, and beyond. Each institution in the USG must obtain an EPA ID number before treating, storing, disposing, or transporting (or offering for transport) hazardous waste. EPA ID numbers are site-specific numbers assigned to generators, transporters, and TSDFs and need only be obtained once.

   Each EPA ID number consists of three letters and nine digits. The first two letters are simply the two-letter abbreviation for the state in which the facility is located. The third letter is either a "D" for facilities with permanent ID numbers or a "T" for a facility with a temporary number. A nine-digit number, uniquely associated with each site, follows the three letters (i.e. GAD000123456).

6. Areas Where Campuses May Generate Hazardous Wastes. Areas where hazardous wastes may be generated on campus might include, but are not limited to, the following:

   a. *Science Labs* (i.e. spent or expired chemicals from chemistry, biology or other labs; abandoned compressed gases, etc.)

   b. *Arts Departments* (i.e. paints, thinners, photo developing chemicals, glazes, contaminated brushes/rags, etc.)

   c. *Physical Plant Shops* (i.e. paints, thinners, solvents, certain pressurized aerosol spray cans, spent fuels, spent mercury-containing fluorescent lamps, unless properly recycled, which is discussed later in this manual.)

   d. *Automotive Shops* (i.e. spent solvents, degreasers, antifreeze, lead acid batteries, oil spill cleanup residue, etc.)

   e. *Other Areas* (i.e. wastes generated from research and teaching processes in schools of pharmacy, medicine, dentistry, veterinary medicine, etc.)

7. Hazardous Waste Accumulation / Consolidation Areas. Hazardous waste should be temporarily staged in Satellite Accumulation Areas (SAA). Satellite accumulation is the *temporary storage* of hazardous waste at or near the initial point of generation of the hazardous waste. “At or near the point of generation” means that the SAA shall be located in the same or adjacent room or work area and shall be under the control of the generator. RCRA regulations governing the management of hazardous wastes allow the accumulation of up to 55 gallons of hazardous waste or

one quart of acutely hazardous waste for up to one year at or near the point of generation without obtaining a permit.

Each waste container in the SAA shall have an appropriate label identifying it as hazardous waste, radioactive waste, or mixed waste. When waste is first placed in a container, the waste generator shall record the accumulation start date on the label.

When a container is full or has reached the allowable time limit, the container must be moved to a central accumulation area or disposed of within three (3) days.

8. Transportation and Disposal of Hazardous Wastes. When contracting for hazardous waste disposal services, it is critical for USG institutions to contract with reputable, qualified and permitted vendors for hazardous waste packaging, transportation and disposal services. As the generator, the institution is responsible for the waste even after it has been taken to the final disposal location. USG institutions in the CESQG or SQG category should generally arrange for hazardous waste pick-up and disposal services at least twice a year since the maximum allowable storage time for full containers is 180 days (while mandatory for SQGs, this is a recommended practice for CESQGs). LQGs will need to arrange for more frequent pick-up and disposal services (perhaps monthly, bi-monthly or quarterly).

   The USG typically maintains a "state agency contract", through one of the member institutions, with a particular vendor (or vendors) to assist in streamlining the hazardous waste disposal process. The vendor(s) and contract number(s) can be obtained by contacting the BOR Environmental Affairs office.

9. "Universal Wastes" and Used Oil. Other areas of concern regarding Hazardous Waste Management involve "Universal Waste" and Used Oil.

   a.. The EPA issued an amendment to the RCRA regulations which created a "Universal Waste Rule" (adopted by GA EPD; 391-3-11-.18). This rule was designed to reduce the amount of hazardous waste items in the municipal solid waste (MSW) stream, encourage recycling and proper disposal of certain common hazardous wastes, and reduce the regulatory burden on waste generators.

Universal wastes include batteries such as nickel-cadmium (Ni-Cd) and small sealed lead-acid batteries, agricultural pesticides that have been recalled or banned from use, are obsolete, have become damaged, or are no longer needed due to changes in cropping patterns or other factors, thermostats**,** which can contain as much as 3 grams of liquid mercury, and lamps**,** which typically contain mercury and sometimes lead (common types of lamps include fluorescent, high intensity discharge (HID), neon, mercury vapor, high pressure sodium, and metal halide lamps). Campuses were once required to handle these materials as hazardous wastes.

The Universal Waste Rule eases the regulatory burden and it streamlines the requirements related to notification, labeling, marking, prohibitions, accumulation time limits, employee training, responses to releases, offsite shipments, tracking, exports, and transportation. For example, the rule extends the amount of time that facilities can accumulate these materials on site. It also allows transport of universal wastes with a common carrier, instead of a hazardous waste transporter, and no longer requires a manifest.

The rule does not apply to campuses that generate less than 100 kilograms of universal wastes per month (Conditionally Exempt Small Quantity Generators); however, the Board of Regents strongly encourages these campuses to participate voluntarily in collection and recycling programs.

Although lamp ballasts are technically not defined as universal waste, the Board of Regents recommends, as a best practice, that all ballasts (PCB and non-PCB containing) also be included in the institution's recycling program.

The State of Georgia maintains contracts with vendors providing universal waste recycling services. Please contact the Georgia Department of Administrative Services (DOAS), the agency responsible for managing the essential business services for state and local governments, for more information on the most recent editions of the contracts. (DOAS State Purchasing Office; 200 Piedmont Avenue, SE, Suite 1308 West Tower Atlanta, Georgia 30334-9010; Phone: 404-657-6000 Fax: 404-657-8444) The vendor(s) and contract number(s) can also be obtained by contacting the BOR Environmental Affairs office.

b. Used oil is another area covered under the federal hazardous waste regulations and is addressed by EPA's Used Oil Management Standards (and adopted by GA EPD; 391-3-11-.17). Used oil is any oil that has been refined from crude oil or any

synthetic oil that has been used and as a result of such use is contaminated by physical or chemical impurities. Simply put, used oil is exactly what its name implies--any petroleum-based or synthetic oil that has been used. During normal use, impurities such as dirt, metal shavings, water, or chemicals can get mixed in with the oil, so that in time the oil no longer performs well. Eventually, this used oil must be replaced with virgin or re-refined oil to do the job at hand. EPA's used oil management standards include a three-pronged approach to determine if a substance meets the definition of used oil. To meet EPA's definition of used oil, a substance must meet each of the following three criteria:

i. Origin — the first criterion for identifying used oil is based on the origin of the oil. Used oil must have been refined from crude oil or made from synthetic materials. Animal and vegetable oils are excluded from EPA's definition of used oil.

ii. Use — the second criterion is based on whether and how the oil is used. Oils used as lubricants, hydraulic fluids, heat transfer fluids, buoyants, and for other similar purposes are considered used oil. Unused oil such as bottom clean-out waste from virgin fuel oil storage tanks or virgin fuel oil recovered from a spill, do not meet EPA's definition of used oil because these oils have never been "used." EPA's definition also excludes products used as cleaning agents or solely for their solvent properties, as well as certain petroleum-derived products like antifreeze and kerosene.

iii. Contaminants — the third criterion is based on whether or not the oil is contaminated with either physical or chemical impurities. In other words, to meet EPA's definition, used oil must become contaminated as a result of being used. This aspect of EPA's definition includes residues and contaminants generated from handling, storing, and processing used oil. Physical contaminants could include metal shavings, sawdust, or dirt. Chemical contaminants could include solvents, halogens, or saltwater.

Once oil has been used, it can be collected, recycled, and reused. When contracting for used oil reuse and recycling services, it is critical for USG institutions to contract with reputable, qualified and GA EPD permitted vendors for such services.

There are certain good housekeeping practices that must be followed. EPA developed practices, called “management standards,” for facilities that handle used oil. The management standards are common sense, good business practices designed to ensure the safe handling of used oil, to maximize recycling, and to minimize disposal. The standards apply to all used oil handlers,

regardless of the amount of the oil they handle. Although different used oil handlers may have specific requirements, the following requirements are common to all types of handlers. These requirements relate to storage and to cleaning up leaks and spills, as follows:

i. Label all containers and tanks as Used Oil.

ii. Keep containers and tanks in good condition. Don't allow tanks to rust, leak, or deteriorate. Fix structural defects immediately.

iii. Never store used oil in anything other than tanks and storage containers. Used oil may also be stored in units that are permitted to store regulated hazardous waste. Tanks and containers storing used oil do not need to be RCRA permitted, however, as long as they are labeled and in good condition. Storage of used oil in lagoons, pits, or surface impoundments that are not permitted under RCRA is prohibited.

If used oil is mixed with hazardous waste, it will have to be managed as a hazardous waste. The only way to be sure your used oil does not become contaminated with hazardous waste is to store it separately from all solvents and chemicals and not to mix it with anything.