



UNIVERSITY OF  
**GEORGIA**

# Hazardous Waste Manual

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Version 2019.2.3

## Record of Revisions

Revision No.	Date	Revision Description
Original Document		
2.0	09/2013	Significant revisions to hazardous waste pickup procedures and hazardous waste disposal overview
2.1	10/2017	Updates to incorporate The New EPA Hazardous Waste Generator Improvements Rule
2.2	01/2018	Addition of sections on disposal of contaminated PPE and additional resources concerning hazardous waste disposal
2.3	01/2019	Addition of new hazardous waste email ( <a href="mailto:hazmat@uga.edu">hazmat@uga.edu</a> ), spill kit information, and changes to unknown procedure

## **Introduction**

The University of Georgia (UGA) considers the safety of its faculty, staff, students, and visitors to be of paramount importance. Consistent with [Academic Affairs Policy 6.01 and 6.02](#), UGA implements a comprehensive Environmental Health & Safety Management System (EHSMS) to ensure that the UGA community, including all stakeholders, has a safe place to live, work, study, conduct research, and engage in public service and outreach activities.

As a component of the EHSMS, the Hazardous Waste Manual provides detailed guidance and procedures outlining the safe and compliant generation, collection, and storage of hazardous waste. The procedures of this manual apply to all research, teaching, and public service laboratories as well as other UGA affiliated areas generating hazardous waste. The manual defines the roles and responsibilities for all UGA personnel as well as best management practices and details about the operational structures in place to maintain compliance with all federal, state, and local regulations.

Hazardous waste procedures at the University of Georgia are regulated under the Resource Conservation and Recovery Act (RCRA). United States' law describes a waste management program mandated by Congress that gives the Environmental Protection Agency (EPA) the authority to maintain the RCRA program. The term "RCRA" (pronounced rik-ruh) is often used interchangeably to refer to the law, regulations, and EPA policy. This manual outlines all UGA procedures in order to ensure compliance with all RCRA regulations. The manual is maintained and updated by the Environmental Safety Division along with the Office of Research Safety.

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## **AUTHORITY, RESPONSIBILITIES, & DUTIES**

### **Environmental Health & Safety Management System Committees**

UGA's Comprehensive Environmental Health and Safety Management System (EHSMS) was established in accordance with the [Academic Affairs Policies 6.01 and 6.02](#) and is intended to govern how UGA manages all aspects of environmental health and safety. The EHSMS serves as an integrated set of processes and procedures for managing the day-to-day EHS compliance operations to enhance the level of compliance and to increase efficiency of operations in a comprehensive manner. The EHSMS is governed by an Executive Committee and two Steering Committees with execution by a variety of operational units. This manual functions as a working document within the overall EHSMS for UGA.

#### **Executive Committee**

The EHSMS Executive Committee reviews and provides guidance on the design, development, and implementation of the EHSMS. The Executive Committee meets periodically to review and provide oversight on the EHSMS. In accordance with Academic Affairs Policy 6.02, the Executive Committee is tasked with forming standing committees and ad hoc committees as needed.

#### **Academic/Research Steering Committee**

The EHSMS Academic/Research Steering Committee guides the development and implementation of those aspects of the EHSMS that improve Environmental Health & Safety (EHS) programs and research compliance at UGA.

#### **Administrative/Operations Steering Committee**

The EHSMS Administrative/Operations Steering Committee guides the development and implementation of those aspects of the EHSMS that improve EHS programs and the compliance of administrative operations at UGA.

#### **Environmental Safety Division**

The Associate Vice President for Environmental Safety has been designated by the President as the primary point of contact and communication with external environmental regulatory bodies. Environmental Safety Division (ESD) personnel in the Hazardous Materials Group report to the AVP for Environmental Safety and provide guidance to UGA faculty, staff, and students concerning hazardous waste management. ESD responsibilities concerning hazardous waste management include:

1. Maintaining a level of expertise in hazardous waste regulations and programs
2. Providing pickup of hazardous waste from laboratories and all other generation points
3. Advising, consulting with, and assisting PIs and laboratory personnel in complying with the policies and guidelines of this manual

4. Assisting departments and laboratories in developing plans for the collection, storage, and disposal of hazardous waste and for the training of faculty and staff in ensuring those plans are compatible with University policy
5. Inspecting UGA hazardous waste generators for compliance with the policies and provisions of this manual as well as compliance with State and Federal laws and standards for the management of hazardous waste
6. Advising, as appropriate, PIs, deans, department/unit heads of discrepancies identified
7. Informing the EHSMS Executive Committee of continuing noncompliant or unsafe conditions in university laboratories or other areas generating hazardous waste.
8. Annually reviewing this manual and updating or revising the manual as necessary

## **Academic and Research Units**

### **Deans**

Responsibilities include:

1. Ensuring that all research and activities in the college or school are conducted in compliance with all applicable hazardous waste regulations and UGA policies and procedures
2. Remediating all non-compliance matters within all laboratory spaces that they oversee

### **Department Head/Center & Institute Director**

Responsibilities include:

1. Ensuring that all research and activities in the department or Center/Institute are conducted in compliance with all applicable hazardous waste regulations and UGA policies and procedures
2. Remediating all non-compliance matters within all laboratory spaces that they oversee and manage overall financial responsibility on such matters.
3. Assuming accountability for any hazardous material left temporarily without proper supervision or abandoned in any laboratory and assigning to a new PI or initiating disposal by ESD.

### **Principal Investigator (PI) and Work Unit Supervisor**

A principal investigator is defined as a faculty member (assistant professor, associate professor, professor, or instructor), a research professional, an academic professional, or laboratory director who is associated with or provides guidance to a laboratory or laboratories using chemicals or hazardous materials. Graduate students and postdoctoral associates will not be considered a PI except under special circumstances at the discretion of the unit head. Responsibilities include:

1. Train or provide for the training of all new personnel before allowing them to work in a laboratory or work area using hazardous materials. See **Training Requirements** section below.
2. Ensure that all laboratory personnel are entered into the Chematix database and records in this database are maintained and updated regularly.
3. When leaving the University, or terminating their PI position, the PI shall relinquish all hazardous chemicals in their possession by disposal or transfer to another PI who has facilities capable of safely handling the material in question. Refer to *UGA Chemical Laboratory Safety Manual*.

### **Laboratory Supervisor/Laboratory Coordinator**

Responsibilities include:

1. Provide day-to-day supervision of research and activities in the laboratory ensuring that those activities comply with all applicable hazardous waste regulations and UGA policies and procedures
2. Keep the PI informed of any potential compliance issues and assist the PI with all EHS matters.

### **Laboratory Personnel**

Laboratory personnel are any persons who work, teach, or observe activities within a designated research or instructional laboratory or field environment. This includes students, visitors, teaching assistants, and instructors. Responsibilities include:

1. Conduct activities in compliance with all hazardous waste regulations as well as all UGA policies and procedures

## **HAZARDOUS WASTE GENERATOR TRAINING REQUIREMENTS**

Training that covers the topics presented in this guidance document is required annually for all waste generators. The required training applies to faculty, staff, and students who are responsible for the generation or accumulation of hazardous waste. Requirements include:

- a. Reading of this manual as well as the Laboratory Specific Chemical Safety Plan
- b. Successful completion of UGA [Hazardous Waste Management Training](#) on the UGA PEP System
- c. Job specific safety protocol for chemicals, equipment, and personal protective equipment (PPE)
- d. [Right-to-Know Training](#) required by the Georgia Public Employee Hazardous Chemical Protection and Right to Know Act of 1988 and the University right-to-know compliance plan
- e. Directions for notifying the proper authorities in the event of an emergency or accident

## **HAZARDOUS WASTE DEFINED**

A hazardous waste is a waste that causes, or significantly contributes to, an increase in mortality or an increase in serious, irreversible or incapacitating illness; or poses a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed. Hazardous waste can be either a “listed” waste or exhibit one of four hazardous waste characteristics as described below. All UGA waste **must** be labeled with its correct hazard characteristic as soon as generation begins.

### **Listed Hazardous Waste:**

- K listed waste from specific sources
- F listed waste from non-specific sources
- U listed wastes which are off-spec or discarded commercial chemicals
- P listed wastes which are off-spec or discarded commercial chemicals which have been designated as acutely hazardous.

Please contact ESD if working with P-Listed waste at [hazmat@uga.edu](mailto:hazmat@uga.edu). This list can be found on the [ESD website](#) as well as the EPA website.

### **Hazardous Waste Characteristics:**

#### Ignitable

- Any liquid with a flashpoint of less than 140°F
- All oxidizers and flammable solids
- Ignitable compressed gas

#### Corrosive

- Liquid wastes with a pH less than or equal to 2 or greater than or equal to 12.5

#### Reactive

- All water reactive chemicals
- Gives off toxic gases (e.g. cyanides and sulfides)
- Capable of explosion under normal conditions

#### Toxic

- On the EPA’s TCLP (Toxicity Characteristic Leaching Procedure) list in any concentration, see appendix
- Does not fit any other category



## **HAZARDOUS WASTE DETERMINATION**

A proper Hazardous Waste Determination starts with determining whether a material is a waste. A waste is generally defined as a material which is intended to be discarded. This includes materials that are spent or that are “inherently waste like”, i.e. compromised the containers integrity or exhibit characteristics including rust, crystallization, etc. Materials that are being used for their intended purpose or are otherwise still reusable are not considered waste. A waste can be a solid, liquid, semisolid or contained gaseous material.

After determining that your material is a waste, those responsible for generating the waste **must** determine if the waste is a hazardous waste. Refer to the previous section or the attached *Hazardous Waste Determination Flow Chart* to determine if your waste is hazardous. For additional assistance in making a hazardous waste determination, please contact the Environmental Safety Division (ESD).

If your waste falls into either the *listed* or *characteristic* categories it **must** be treated as a hazardous waste. Hazardous waste **cannot** be disposed of by pouring down a drain or by discarding in the general trash. There are significant fines and penalties involved when hazardous waste is disposed of illegally. In addition to the regulatory concerns, hazardous wastes disposed down the sink or in the trash may cause environmental harm and can also create an unacceptable risk to human health.

There may occasionally be a waste generated that does not meet the listing or characteristic criteria for a hazardous waste, but that is still considered a risk to human health. In this case, ESD will provide a determination form and the waste will be labeled as “non-hazardous” waste. All UGA policies will still apply to the safe maintenance of this waste. If you think this applies to waste in your area, please contact ESD for assistance.

Additionally, there may be a waste generated that does not meet the listing or characteristic criteria that the generator, based on their knowledge, believes to be safe for drain or trash disposal. These situations can be evaluated on a case by case basis by ESD and a determination form will be provided to the generator.

## **DETERMINATION OF PERSONAL PROTECTIVE EQUIPMENT (PPE) AND OTHER LAB DEBRIS**

A hazardous waste determination **must** also be made on any PPE or other lab debris (gloves, wipes, towels, etc.) If PPE or other lab debris comes in contact with any amount of hazardous materials, then it becomes hazardous waste and must be collected and stored in an appropriate container with a tightly fitting lid that remains closed except when waste is being added by the generator. ESD provides Red Cans for this specific purpose. All PPE and other lab debris determined to be hazardous must be labeled as “Hazardous Waste” and submitted for pickup by ESD through Chematix. There is a global waste card option “Chemically Contaminated Lab Debris” in the Chematix system.

In addition, containers used to collect PPE and other lab debris determined to be non-hazardous must be labeled as “Non-Hazardous”. This includes trash cans or other waste containers in the work area. These procedures ensure that a hazardous waste determination has been made and materials are disposed of properly. Please contact ESD for further assistance in making a hazardous waste determination.

## **EMPTY CONTAINERS**

Completely empty containers can be disposed of in regular trash receptacles. ESD recommends that containers are defaced and placed in trash bags prior to disposal.

A container that has held any hazardous waste (except a compressed gas or an acute hazardous waste) is considered empty if all wastes have been removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, etc.

An empty container that has held an acute hazardous waste (P-Listed) should be treated as hazardous waste and a request for pickup by ESD submitted through Chematix.

Contact ESD for assistance with disposal of compressed gas cylinders.

## **HAZARDOUS WASTE GENERATOR STATUS**

According to EPA regulations, there are three categories of hazardous waste generators each with a specific set of rules. Generator status is determined by the amount of waste produced in one month's time.

- **Large Quantity Generator:** Produces more than 1000 Kg (2200 lbs) per month.
- **Small Quantity Generator:** Produces between 100 Kg (220 lbs) and 1000 Kg per month and less than 1Kg acutely hazardous waste (P list).
- **Very Small Quantity Generator:** Generates less than 100 Kg (220 lbs) per month and less than 1 Kg (2.2 lbs) acutely hazardous waste (P list).

The University of Georgia main campus is split into several zones based on the waste produced in the respective zones. The Environmental Safety Division maintains each zone according to generator status. Contact ESD Hazardous Materials with questions or for more information on UGA's specific zones.

## **ACCUMULATION TIME LIMITS**

Satellite Accumulation Areas (SAA): There is no time limit on waste collected in SAAs provided that the volume is less than 55 gallons and the containers are properly labeled and maintained. If the volume of waste reaches 55 gallons or one quart of acutely hazardous waste is collected, the waste must be dated and moved to a Central Accumulation Area within three days.

Central Accumulation Areas (CAA): Waste is usually transported to the CAA after being picked up from the SAA. Storage time limits for CAAs are based on generator status; 90 days for large quantity generators, 180 days for small quantity generators, and no time limit for very small quantity generators. UGA adheres to time limits based on the generator status of each zone. All CAAs are operated and controlled exclusively by ESD. No other units are authorized to set up or operate a CAA.

## **SATELLITE ACCUMULATION AREA (SAA) MANAGEMENT**

SAs are individual research, clinical and teaching laboratories/classrooms, or other rooms in which hazardous waste generation occurs. The hazardous waste containers in an SAA must always remain at or near the point of generation (i.e., at or near the bench–top or within the room itself). It is also required that the waste be under the control of the operator of the process generating the waste at all times until they are picked up by ESD personnel.

At no time may more than 55 gallons of hazardous waste or 1 quart of acute hazardous waste (i.e., “P-Listed”) accumulate in a SAA prior to pick up by ESD personnel. Any waste in excess of the 55-gallons or 1 quart limits must be removed from the SAA within 3 calendar days. If you have concerns about your amount of hazardous waste, please contact ESD Hazardous Materials at [hazmat@uga.edu](mailto:hazmat@uga.edu).

All hazardous waste storage areas within UGA laboratories and other work areas (such as areas that dispose of paint or photographic chemicals) are considered SAs unless otherwise noted. UGA personnel are responsible for properly maintaining individual SAs.

Requirements include:

- SAs must be visible from the work station where the waste is generated
- SAs must be marked clearly and located close to the point of generation
- Avoid having SAs near sinks or drains or other water sources
- All waste in an SAA must be properly closed and labeled (See *Container Management* section)
- There should be NO DATES on anything in the SAA
- Containers should be placed in secondary containment and incompatible waste should be separated by a physical barrier
- There should always be less than 55 gallons of hazardous waste and less than one quart of P-Listed waste stored. P-List available on [ESD website](#).

## **CONTAINER MANAGEMENT**

All hazardous waste satellite accumulation areas are required to follow proper container management practices while accumulating hazardous wastes.

- Use containers compatible with the waste collected (ESD provides a carboys)
- Place only compatible wastes in the same container
- All containers holding hazardous waste must be labeled exactly as "Hazardous Waste"
- Label all containers with the associated hazard of the waste
  - i.e. ignitable, corrosive, reactive, toxic
- Label all containers with the **detailed contents** of the container
- Containers in SAs should **not** be dated
- Containers must be kept **tightly closed** when not being actively used

- Keep containers of incompatible wastes physically separate
- Use secondary containment as a best management practice
- Use appropriate personal protective equipment (PPE) when handling waste
- Contaminated PPE should be treated as hazardous waste (ESD provides red cans for this)

Special precautions must be taken when handling water reactive, air reactive and explosive materials that are no longer wanted. If this situation applies to you, please contact the ESD Hazardous Materials Team for further instructions and assistance with these specific wastes.

### **DISPOSAL OF HAZARDOUS WASTE FROM SATELLITE ACCUMULATION AREAS**

Filled hazardous waste containers may only be moved from the SAA to designated storage areas by trained personnel. To have containers removed by ESD you must complete a hazardous waste pickup request in Chematix, UGA's hazardous waste tracking system. **A WASTE CARD MUST BE ON EACH CONTAINER PRIOR TO PICK-UP BY ESD.** The generator is responsible to insure the waste is properly labeled and closed before pick up.

#### **How to create waste card labels for waste containers**

1. Login to Chematix using your UGA credentials (<https://chematix.uga.edu>)
2. Select the waste tab
3. Click the Create Waste Card link (all training must be current for these links to be visible)
4. Choose the Waste Card type
5. Enter all information requested
6. Enter chemical constituents
7. Click Generate Waste Card
8. Print the Waste Card, sign it, and affix it to the waste container

#### **How to request a waste pickup (after all waste containers have been labeled – see steps above)**

1. Login to Chematix using your UGA credentials (<https://chematix.uga.edu>)
2. Select the waste tab
3. Click the Create Pickup Worksheet link (all training must be current for these links to be visible)
4. Select the lab location—the available waste cards for that lab location will appear at the bottom of the page
5. Checkbox each waste card to be picked up and click Add Selections to Worksheet
6. Be sure to add your alternate contact telephone number in the instructions box provided
7. Click Save & Submit for Pickup

### **Spill Control Procedures**

All areas generating hazardous waste must have spill control measures in place to address chemical spills. Spill kits should be readily accessible to those working in the area. ESD provides spill kits at no charge to UGA personnel. For more information and guidance about how to handle a chemical spill please see the [UGA Chemical Laboratory Safety Manual](#).

## **UNKNOWN CHEMICALS (“UNKNOWNNS”)**

Federal and State regulations specifically prohibit the transportation, storage, or disposal of hazardous waste of unknown identity. Generators have strict liability for all waste they generate from “cradle to grave” and must have a detailed understanding of the contents of all waste containers. There are very significant penalties, both civil and criminal, for offering hazardous waste for transportation or disposal without an accurate identification of the waste.

Although generators are allowed to rely on generator knowledge to make waste determinations, they must have a solid basis for their determination and they must have documentation to support their determination. All possible steps can and should be taken to avoid or minimize the generation of unknown chemicals and identify unknown chemicals when they are discovered. It is important that all lab personnel are properly trained and follow all of the above procedures in order to avoid unknowns.

Prevent the generation of unknowns by:

- Label all containers (including beakers and test tubes) properly. This should be done even when creating reagent solutions for temporary use. Labelling will also prevent using the wrong material accidentally.
- Inspect containers and labels periodically and replace fading or deteriorating labels. Expired chemicals should be properly discarded.
- Label containers with chemical names, not abbreviations, chemical structure or formulae.
- Maintain an accurate inventory.
- Require all reaction mixtures stored in lab glassware to be labeled with chemical composition, the date they were formed, the name of the lab worker responsible and a note book reference. This information will help with the disposal of the mixture in the event the lab worker is not available.
- Require departing lab workers to properly identify any unknown material before leaving

Identifying Unknowns:

- Consult with the Principal Investigator (PI) or Lab Supervisor about the type of work that was being conducted or is routinely conducted in the laboratory.
- Ask area personnel about the container. Someone may remember its contents.
- Contact groups that previously used the area and see if they can recall the container’s identity.
- Simple test such as pH may aid in identification.
- Check reagents present; this waste could have been derived from them.

If generator knowledge does not sufficiently characterize the material, label the unknown container with an ESD provided hazardous waste sticker, check all four hazard boxes, and write “pending analysis” in the contents section. Please contact ESD as soon as possible for assistance in making a waste determination concerning an unknown.

### **EPA TCLP LIST**

The TCLP, or Toxicity Characteristic Leaching (not Leachate) Procedure is designed to determine the mobility of both organics and inorganics present in liquid, solid, and multiphasic wastes. This is used to determine if a waste may meet the definition of EPA Toxicity under RCRA. If your waste is listed here, please follow UGA procedures and submit for pick up as Hazardous Waste.

<b>Chemical</b>	<b>CAS Number</b>
<b>Arsenic</b>	<b>7440-38-2</b>
<b>Barium</b>	<b>7440-39-3</b>
<b>Benzene</b>	<b>71-43-2</b>
<b>Cadmium</b>	<b>7440-43-9</b>
<b>Carbon tetrachloride</b>	<b>56-23-5</b>
<b>Chlordane</b>	<b>57-74-9</b>
<b>Chlorobenzene</b>	<b>108-90-7</b>
<b>Chloroform</b>	<b>67-66-3</b>
<b>Chromium</b>	<b>7440-47-3</b>
<b>o-Cresol</b>	<b>95-48-7</b>
<b>m-Cresol</b>	<b>108-39-4</b>
<b>p-Cresol</b>	<b>106-44-5</b>
<b>Cresol</b>	<b>--</b>
<b>2,4-D</b>	<b>94-75-7</b>
<b>1,4-Dichlorobenzene</b>	<b>106-46-7</b>
<b>1,2-Dichloroethane</b>	<b>107-06-2</b>
<b>1,1-Dichloroethylene</b>	<b>75-35-4</b>
<b>2,4-Dinitrotoluene</b>	<b>121-14-2</b>
<b>Endrin</b>	<b>72-20-8</b>
<b>Heptachlor (and its epoxide)</b>	<b>76-44-8</b>

<b>Hexachlorobenzene</b>	<b>118-74-1</b>
<b>Hexachlorobutadiene</b>	<b>87-68-3</b>
<b>Hexachloroethane</b>	<b>67-72-1</b>
<b>Lead</b>	<b>7439-92-1</b>
<b>Lindane</b>	<b>58-89-9</b>
<b>Mercury</b>	<b>7439-97-6</b>
<b>Methoxychlor</b>	<b>72-43-5</b>
<b>Methyl ethyl ketone</b>	<b>78-93-3</b>
<b>Nitrobenzene</b>	<b>98-95-3</b>
<b>Pentachlorophenol</b>	<b>87-86-5</b>
<b>Pyridine</b>	<b>110-86-1</b>
<b>Selenium</b>	<b>7782-49-2</b>
<b>Silver</b>	<b>7440-22-4</b>
<b>Tetrachloroethylene</b>	<b>127-18-4</b>
<b>Toxaphene</b>	<b>8001-35-2</b>
<b>Trichloroethylene</b>	<b>79-01-6</b>
<b>2,4,5-Trichlorophenol</b>	<b>95-95-4</b>
<b>2,4,6-Trichlorophenol</b>	<b>88-06-2</b>
<b>2,4,5-TP (Silvex)</b>	<b>93-72-1</b>
<b>Vinyl chloride</b>	<b>75-01-4</b>

**LIST OF COMMON INCOMPATIBLE WASTE**

Below is a list of common chemicals and their respective incompatible chemicals. Please make sure to separate any waste containing these from one another with a physical barrier in order to prevent potential reactions. Please contact the Chemical Lab Safety Team with any questions.

<b>CHEMICAL</b>	<b>INCOMPATIBLE CHEMICAL(S)</b>
<b>Acetic acid</b>	aldehyde, bases, carbonates, hydroxides, metals, oxidizers, peroxides, phosphates, xylene
<b>Acetylene</b>	halogens (chlorine, fluorine, etc.), mercury, potassium, oxidizers, silver
<b>Acetone</b>	acids, amines, oxidizers, plastics
<b>Alkali and alkaline metals</b>	acids, chromium, ethylene, halogens, hydrogen, mercury, earth nitrogen, oxidizers, plastics, sodium chloride, sulfur
<b>Ammonia</b>	acids, aldehydes, amides, halogens, heavy metals, oxidizers, plastics, sulfur
<b>Ammonium nitrate</b>	acids, alkalis, chloride salts, combustible materials, metals, organic materials, phosphorous, reducing agents, urea
<b>Aniline</b>	acids, aluminum, dibenzoyl peroxide, oxidizers, plastics
<b>Azides</b>	acids, heavy metals, oxidizers
<b>Bromine</b>	acetaldehyde, alcohols, alkalis, amines, combustible materials, ethylene, fluorine, hydrogen, ketones (acetone, carbonyls, etc.), metals, sulfur
<b>Calcium oxide</b>	acids, ethanol, fluorine, organic materials
<b>Carbon (activated)</b>	alkali metals, calcium hypochlorite, halogens, oxidizers

<b>Carbon tetrachloride</b>	benzoyl peroxide, ethylene, fluorine, metals, oxygen, plastics, silanes
<b>Chlorates</b>	powdered metals, sulfur, finely divided organic or combustible materials
<b>Chromic acid</b>	acetone, alcohols, alkalis, ammonia, bases
<b>Chromium trioxide</b>	benzene, combustible materials, hydrocarbons, metals, organic materials, phosphorous, plastics
<b>Chlorine</b>	alcohol's, ammonia, benzene, combustible materials, flammable compounds (hydrazine), hydrocarbons (acetylene, ethylene, etc.), hydrogen peroxide, iodine, metals, nitrogen, oxygen, sodium hydroxide
<b>Chlorine dioxide</b>	hydrogen, mercury, organic materials, phosphorous, potassium hydroxide, sulfur
<b>Copper</b>	calcium, hydrocarbons, oxidizers
<b>Cyanides</b>	acids, alkaloids, aluminum, iodine, oxidizers, strong bases
<b>Hydroperoxide</b>	reducing agents
<b>Flammable liquids</b>	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
<b>Fluorine</b>	alcohols, aldehydes, ammonia, combustible materials, halocarbons, halogens, hydrocarbons, ketones, metals, organic acids
<b>Hydrocarbons (Such as butane, propane benzene, turpentine, etc.)</b>	acids, bases, oxidizers, plastics



<b>Hydrofluoric acid</b>	metals, organic materials, plastics, silica (glass), (anhydrous) sodium
<b>Hydrogen peroxide</b>	acetylaldehyde, acetic acid, acetone, alcohol's carboxylic acid, combustible materials, metals, nitric acid, organic compounds, phosphorous, sulfuric acid, sodium, aniline
<b>Hydrogen sulfide</b>	acetylaldehyde, metals, oxidizers, sodium
<b>Hypochlorites</b>	acids, activated carbon
<b>Iodine</b>	acetylaldehyde, acetylene, ammonia, metals, sodium
<b>Mercury</b>	acetylene, aluminum, amines, ammonia, calcium, fulminic acid, lithium, oxidizers, sodium
<b>Nitrates</b>	acids, nitrites, metals, sulfur, sulfuric acid
<b>Nitric acid</b>	acetic acid, acetonitrile, alcohol's, amines, (concentrated) ammonia, aniline, bases, benzene, cumene, formic acid, ketones, metals, organic materials, plastics, sodium, toluene
<b>Oxalic acid</b>	oxidizers, silver, sodium chlorite
<b>Oxygen</b>	acetaldehyde, secondary alcohol's, alkalis and alkalines, ammonia, carbon monoxide, combustible materials, ethers, flammable materials, hydrocarbons, metals, phosphorous, polymers
<b>Perchloric acid</b>	acetic acid, alcohols, aniline, combustible materials, dehydrating agents, ethyl benzene, hydriotic acid, hydrochloric acid, iodides, ketones, organic material, oxidizers, pyridine
<b>Peroxides</b>	acids (organic or mineral)
<b>Phosphorus (white)</b>	oxygen (pure and in air), alkalis

<b>Potassium</b>	acetylene, acids, alcohols, halogens, hydrazine, mercury, oxidizers, selenium, sulfur
<b>Potassium chlorate</b>	acids, ammonia, combustible materials, fluorine, hydrocarbons, metals, organic materials, sugars
<b>Potassium perchlorate (also see chlorates)</b>	alcohols, combustible materials, fluorine, hydrazine, metals, organic matter, reducing agents, sulfuric acid
<b>Potassium permanganate</b>	benzaldehyde, ethylene glycol, glycerol, sulfuric acid
<b>Silver</b>	acetylene, ammonia, oxidizers, ozonides, peroxyformic acid
<b>Sodium</b>	acids, hydrazine, metals, oxidizers, water
<b>Sodium nitrate</b>	acetic anhydride, acids, metals, organic matter, peroxyformic acid, reducing agents
<b>Sodium peroxide</b>	acetic acid, benzene, hydrogen sulfide metals, oxidizers, peroxyformic acid, phosphorous, reducers, sugars, water
<b>Sulfides</b>	acids
<b>Sulfuric acid</b>	potassium chlorates, potassium perchlorate, potassium permanganate

**FIGURE 1: HAZARDOUS WASTE DETERMINATION FLOW CHART**

