



*The City University of New York*

**HAZARDOUS WASTE  
SELF STUDY GUIDE**

*Queensborough Community College  
The City University of New York  
222-05 56<sup>th</sup> Avenue  
Bayside, NY 11364-1497*

## WHAT ARE THE REGULATIONS THAT GOVERN HAZARDOUS WASTE?

Hazardous waste regulations come from a Federal Environmental Protection Agency (EPA) law called the **Resource Conservation Recovery Act (“RCRA”)** which was created back in 1976. These regulations stemmed from environmental incidents and cases where uncontrolled hazardous waste sites created contamination to groundwater and land. RCRA also governs the management of hazardous waste from “cradle to grave” which means it regulates waste from the time it is generated to the point it is destroyed. These regulations are very strictly enforced and violations are very costly, both from a civil and criminal standpoint. A single EPA violation can cost an institution upwards of thousands of dollars.



## HOW DO YOU KNOW WASTE IS A HAZARDOUS WASTE?

In order to be “hazardous” according to RCRA, the waste has to meet one of four criteria.

1. Hazardous waste has to be discarded material. This means it has to be something meant to be **DISPOSED**. Waste meant to be reused or recycled is **NOT** “hazardous waste”.
  2. It has to be “solid”-- but the EPA's definition is not the same as the standard definition. See the next page for additional information.
  3. It has to be categorized as a hazardous waste. This means that the EPA has placed into several criteria that define it as a hazardous waste either due to its chemical characteristics or if it contains specific chemicals (etc. lead or mercury) that the EPA deems as “hazardous”.
  4. And finally it cannot fall into something the EPA specifically exempts as a hazardous waste (example, wastewater from a chemical facility—EPA exempts this from being a hazardous waste, although they regulate it under a different law). Waste that is going to be reused, recycled or speculatively collected also would not be considered a “Hazardous Waste” under RCRA.
- So in order to be an EPA regulated hazardous waste it has to meet one of the above criteria, otherwise it is not regulated. It may still have other dangerous characteristics but as far as the EPA is concerned, it is not regulated as a hazardous waste.



1. Spent chemicals from labs are a typical example of hazardous waste

## THE EPA'S DEFINITION OF SOLID WASTE

### Solid Waste-EPA Definition

**“Any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plan, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, commercial, mining, and agricultural operations and from community activities” (EPA RCRA Section 1004)**

This is the EPA's actual definition of “solid”. Note that “solid” can actually be any physical state. Think of it this way....hazardous waste may be in any physical state, but it is contained in a solid container. An example would be spent alcohol—it is a liquid material but it may be contained in a 1 gallon bottle, which is solid so it meets the EPA's definition of “solid”.

## CATEGORIES OF HAZARDOUS WASTE

Now that we know that hazardous waste has to be “solid”, it then has to fall under one of two categories—it is either a “Characteristic” hazardous waste or “Listed” hazardous waste.

### 1. CHARACTERISTIC WASTE

The first category is called “characteristic hazardous waste” because the hazardous waste may exhibit one or more of these characteristics. The waste may be:

- **Ignitable** (Flammable waste, has flash point of  $<140$  deg. F)-*example., acetone, isopropanol (isopropyl alcohol), propane*

\*Flash point is the temperature at which a material will ignite

- **Corrosive** (Will cause chemical burns, pH of  $<2$ , or  $>12.5$ )- *example, hydrochloric acid, ammonia solution, sulfuric acid, sodium hydroxide solution*

\* In order to be an EPA “Corrosive” waste, it has to be liquid, since solid materials do not pH.

- **Reactive waste** (will explode or produce flammable or toxic gases) *ex., old picric acid, sodium sulfide, dynamite*
- **Toxic waste** (will cause adverse health effects) *ex., lead, mercury, benzene*

### 2. LISTED WASTE (The “F, K, P, U” lists)

Next, we have what's known as a listed waste. The EPA has lists of chemicals that it automatically considers “hazardous”. The F list is a list of *used* chemicals that came from

*non* specific processes (example, used acetone is automatically given a waste code of "F003", regardless of where it came from), while the K list is specific to the process it came from (example, centrifuge and distillation residues from toluene diisocyanate production is given the waste code "K027")

The P and U lists are lists of unspent (unused) but discarded or off spec. chemicals. The P list is a list of unused acutely toxic chemicals (example, sodium cyanide gets waste code of P105). The U list is a list of unspent commercial chemicals. Example, a fresh reagent bottle of acetone that expired and is to be disposed gets the code "U002". Regardless of whether a chemical is a characteristic hazardous waste or a listed waste, if it falls into either category, and is meant to be disposed of, then, **according to the EPA and its RCRA regulation, it is a "hazardous waste"**



**2. Used propane is an example of ignitable hazardous waste**

## TYPICAL HAZARDOUS WASTE GENERATED AT QCC

Here are examples of hazardous waste typically generated at QCC laboratories:

- Mixed organic solvents from chemistry labs
- Mixed aqueous acid/bases solutions
- Diluted nitrate solutions
- Spent dyes and stains from Microbiology
- Various smaller bottles of reagents and solid waste
- Miscellaneous waste from Art studios

Other departments also generate other forms of hazardous waste, however the laboratories tend to be the largest generators.



**3. Much of the hazardous waste at QCC comes from chemical experiments**

## DISPOSAL PROCEDURES

THIS IS INFORMATION ON HOW TO PROPERLY MANAGE THE WASTE FROM YOUR EXPERIMENTS:

Once you are finished with your chemicals from your experiment, and it becomes waste, it is very important that it is managed correctly. If an empty chemical bottle is to be reused to contain waste liquids you must check to make sure it is compatible with the waste to be placed inside. The original labels must be removed, the container triple rinsed with a compatible solvent, a "Hazardous Waste" label **MUST** be placed on the container and a full description including any

special precautions must to be written on the label. All containers must be in good condition and kept closed unless material is being poured. If a consolidation container is used, these must also have the appropriate labels.

If the original material itself is to be discarded, then the hazardous waste tag may be placed on the other side of the bottle as to not cover up the original label; however the bottle itself must be in good condition.

If you are rinsing an empty bottle that previously contained a solvent, then the rinsate can go down the drain. The bottle must be completely removed of all original material before it can be rinsed. However, if acetone or another hazardous solvent is used to rinse a bottle, you must collect that material!

Note: Containers previously containing reactive or acutely (extremely) toxic materials such as cyanides, sodium azides, etc. should NEVER be reused!

**REMEMBER: ALL CONTAINERS MUST BE LABELED CORRECTLY. ALL CHEMICAL DESCRIPTIONS MUST BE SPELLED OUT WITH NO ABBREVIATIONS. REMEMBER TO KEEP THEM CLOSED AT ALL TIMES AND THAT INCLUDES THE FUNNELS ON TOP!**

- **Remove all original labels and replace with Hazardous Waste labels**
- **A complete description of waste must be written on label**
- **All hazardous waste containers must be placed in correct location (designated hazardous waste areas)**
- **All containers must be in good condition and compatible with waste**
- **All containers must be kept closed unless being filled**
- **Never pour incompatible chemicals into the same container**

**Hazardous Waste**  
Federal law prohibits improper disposal.  
Container must be securely capped at all times.

**Chemical Name(s):** \_\_\_\_\_  
(If a mixture, give approximate percentage of components) \_\_\_\_\_  
\_\_\_\_\_

**Characteristics:** \_\_\_\_\_

**Special Precautions:** \_\_\_\_\_

**Room & Telephone:** \_\_\_\_\_

Call x4462 for pick up when 80% full  
Start Date: \_\_\_\_\_ Accumulation Date: \_\_\_\_\_  
(date filled)

**4. Hazardous waste tag. Place this or a similar label on the waste container. All information must be filled out. Do not use abbreviations or formulas**

## WASTE STORAGE

### Satellite Accumulation Areas

The EPA also has very stringent rules on how hazardous waste is stored. The EPA allows chemical waste to be stored **at or near the point of generation**. These areas are called "**Satellite Accumulation Areas**" or SAA's. For the S410 research lab, the SAA is located inside the cabinet under the fume hood closest to the door. It is very important that hazardous waste be managed correctly when stored in these areas, since any non compliance can be grounds for an EPA violation.

Here are the storage rules for waste stored in the Satellite Accumulation Area.

Containers must be:

- **In good shape**
- **Kept closed except when being filled**
- **Labeled correctly**
- **Marked with the words “Hazardous Waste” and the contents (no formulas, abbreviations)**
- **Incompatible materials must be separated from each other (example, do not put acids and bases next to each other)**
- **Spill control materials must be available in lab**
- **Maximum volume of material stored cannot exceed 55 gallons**
- **Once a container is full, notify your instructor or call x5148 to arrange for removal**



5. Example of a Satellite Accumulation Area. This one is located under the hood in S410 lab.

#### Main Accumulation Areas

If the waste is taken out of the lab and brought to a central storage area then that area is called a **Main Accumulation Area**. More stringent rules apply when waste is brought to these areas, such as weekly inspections that need to be performed. Emergency spill equipment, fire suppression equipment and communication gear need be present. The waste cannot be stored for more than 180 days at these locations. Additionally these areas must be inspected weekly. All other rules also apply such as labeling, separation of incompatible materials and the containers must be kept closed. QCC is currently a “small quantity generator” of hazardous waste.

#### The Main Accumulation Area is a:

- **Central collection/consolidation area for hazardous waste (ex., waste brought into prep rooms)**
- **For Small Quantity Generators, such as QCC, waste can be stored up to 180 days**
- **Containers must be in good condition and kept closed**
- **Proper labeling is required including date on the tag**
- **Must be inspected weekly**
- **Must have emergency spill equipment & communication device available nearby**



6. Example of a main accumulation area, this one is located in the Chemistry prep room

## WHY WASTE SHOULD BE COMPATIBLE WITH THE CONTAINER

THIS IS AN EXAMPLE OF WHAT NOT TO DO:

This was waste that was picked up from some department. It was a liquid mixture of several different chemicals inside a metal can, none of which seemed particularly hazardous. It was placed in the waste storage area in the Medical Arts Building. During a weekly inspection I noticed a strange odor inside the storage room but could not determine where it was coming from. Finally upon closer inspection I discovered that the metal can the waste came in had been corroded by the liquid. Luckily the container was kept inside the spill tray. However it left a very nasty mess that I had to clean up

**Remember: Waste must be compatible with the container as incompatible containers may cause a chemical reaction!**



## UNIVERSAL WASTE

Another type of waste that is regulated by the EPA, though not under the RCRA law, is universal waste. This type of waste is typically handled by Buildings and Grounds, although if you have batteries for disposal (other than alkaline) contact Environmental Health and Safety.

**Universal wastes are:**

- **Generated in a wide variety of settings**
- **Have less stringent regulations than hazardous waste**
- **Typical examples: lamps, light bulbs, rechargeable batteries, mercury articles, pesticides**
- **Lamps contain small amount of mercury; batteries contain toxic metals (cadmium, lead)**
- **Exception: alkaline batteries w/ no mercury=trash**



7. Lamps are an example of universal waste

## WHAT TO DO IN CASE OF A FIRE, SPILL OR OTHER EMERGENCY

In the event of a fire, chemical spill or other incident, remember to:

- Stop chemical reactions in progress
- Close fume hood sashes
- Shut off any gas and any open flames
- Evacuate lab-report to your designated assembly area if building is evacuated
- From a safe area *immediately* notify Public Safety at **x6320/6384 (718.631.6320 / 6384)**

Do not clean up a chemical spill unless:

- You have been trained
- There are less than 4L of material
- You know what you are dealing with
- You have the appropriate protective equipment
- If unsure do not attempt!
- **Do not attempt to put out a fire yourself— GET OUT!**
- **Report all spills/incidents to EHS / Public Safety**



8. Do not attempt to clean up a chemical spill unless you have been trained.

## THE TOP TEN LIST: REMEMBER!

1. All waste containers must be in good condition and labeled correctly-do not use abbreviations.
2. All containers must be kept closed at all times, unless being filled. Do not leave the funnels on the containers.
3. All waste containers must be kept in the designated Satellite Waste areas, do not leave hazardous waste bottles lying all over the lab
4. The container must be compatible with the waste being stored.
5. Store incompatible chemicals away from each other.
6. Once the hazardous waste container is full, put the date on the container. Arrange for its disposal by calling extension 5148.
7. Never dump chemicals down the drain!
8. When in doubt ask your instructor, a technician or contact Environmental Health and Safety@ x 5148
9. The EPA can come to your lab at any time. Make sure you are prepared
10. In the event of a spill or fire get out and call for help!

## QUESTIONS?

Contact **Mel Rodriguez**, Environmental Health and Safety Officer, QCC  
**(718) 281 5148**    [Mrodriguez@qcc.cuny.edu](mailto:Mrodriguez@qcc.cuny.edu)    [www.qcc.cuny.edu/ehs](http://www.qcc.cuny.edu/ehs)





## HAZARDOUS WASTE AWARENESS REVIEW QUIZ:

This is to make sure you actually read and understand the information. All answers can be found in the guide. Select only one answer. When finished please put your information on the bottom, sign and date and then turn the quiz in to your advisor.

Thank you,  
Mel Rodriguez, Environmental Health and Safety Officer, QCC.

**1. Hazardous waste regulations are enforced by which Federal agency?**

- a. OSHA
- b. DOH
- c. EPA
- d. DOT

**2. RCRA stands for what?**

- a. Reclamation Cleanup Response Act
- b. Resource Conservation Recovery Act
- c. Remediation Conservation Recovery Act
- d. Really Clean Remediation Area

**3. Which one of the following would NOT make something a hazardous waste?**

- a. Discarded material
- b. Categorized as "hazardous waste"
- c. Solid material as defined by EPA
- d. Waste to be recycled

**4. Spent pure isopropanol (isopropyl alcohol) would be considered a(n) \_\_\_\_\_ hazardous waste**

- a. ignitable
- b. corrosive
- c. acutely toxic
- d. listed

**5. Which of the following must NOT be done as it may constitute a violation?**

- a. Containers with no labels
- b. Waste in incompatible containers
- c. Containers left open with funnels on top
- d. All of the above

**6. Which of the following is FALSE? At a Satellite Accumulation Area.....**

- a. Waste is stored at or near the point of generation
- b. Quantity MAY exceed 55 gallons total
- c. Waste must be labeled correctly
- d. Incompatible chemicals must be separated

**7. Waste should be placed in a compatible container because if not...**

- a. It may leak and cause a spill
- b. It will annoy Mel if he has to clean up a spill
- c. It may cause a chemical reaction
- d. All of the above

**8. Which of the following is defined as a "Universal Waste"?**

- a. Lamps
- b. Dead cats from Anatomy lab
- c. Gasoline
- d. Bone dry picric acid ready to explode

**9. Which of the following should you do in case of a fire or chemical spill?**

- a. Shut down your experiments or chemical reactions
- b. Call the emergency number for QCC
- c. Evacuate the lab
- d. All of the above

**10. The emergency number for QCC is?**

- a. 911
- b. 718 631 6320/6384 (ext.6320/6384)
- c. 718 631 6262 (ext. 6262)
- d. 718 507 TIXX

I have thoroughly read and have complete understanding of this Hazardous Waste Awareness Guide.

Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_