

KENT STATE UNIVERSITY

Waste Disposal Requirements

Office of Compliance
and Risk Management

Harbourt Hall

Kent, OH 44240

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INTRODUCTION

Kent State University is dedicated to the maintenance of a safe, healthy and productive workplace environment. As part of our commitment to environmental health and safety, we strive to ensure that our students, faculty, staff and visitors meet or exceed state and federal regulations concerning hazardous waste, laboratory management and worker safety. Proper storage and disposal of laboratory waste is a key element in this commitment. Individuals that generate or handle waste, are required to follow the established guidelines concerning the proper disposal of hazardous waste. To ensure compliance with these rules, the University performs routine inspections of the waste area and laboratories. The EPA can also perform unannounced inspections of our laboratory facilities and hazardous waste storage areas. Violations can result in substantial fines, or even the closing of the laboratory.

There are many types of waste generated at Kent State University. In an effort to support these activities and remain in compliance with The U.S. and Ohio Environmental Protection Agencies (EPA) along with Resource Conservation and Recovery Act (RCRA), Clean Water Act (CWA), Toxic Substances Control ACT (TSCA) and other Federal, State or Local regulations waste will be handled and disposed of in a streamlined manner according to regulations set forth by these governing agencies.

The purpose of this document is to provide the requirements for proper management and disposal of hazardous waste which includes, chemical, biological, radioactive, universal and other environmental hazardous waste at Kent State University. If there are any questions regarding waste disposal, please contact the Office of Compliance and Risk Management at 330-672-1950 or 330-672-4996.

SECTION 1: HAZARDOUS WASTE

HAZARDOUS WASTE DEFINITION

A hazardous waste is any material or chemical that meets one or more of the following criteria or is classified as dangerous to human safety or the environment.

Flammable or Ignitable: Any material having a flashpoint of 140° Fahrenheit or 60° Celsius. This will include most non-halogenated solvents. Water soluble solvents such as ethanol or acetone are covered under this regulation if the flashpoint of the material or mixture is below 140° Fahrenheit or 60° Celsius. Flammable solids such as Sodium metal, Naphthalene (solid) and Nitrocellulose are also covered under this classification.

Toxic: Any material which in which its active ingredients is considered to be a poison, carcinogen, mutagen or other reproductive hazard, or is capable of causing harm to the environment.

Corrosive: Any material having a pH of less than 2 or more than 12.5 must be treated as hazardous waste and cannot be disposed of in the sanitary sewer without first being neutralized, provided it has no other dangerous properties such as toxicity.

Reactive: Any material that is unstable, explosive, water or air reactive, strong oxidizer, organic peroxide, cyanide and sulfide bearing materials that release toxic gases in contact with acid.

Listed Waste: EPA Listed Hazardous Waste

F-Listed Waste: Non-specific sources. This list identifies wastes from common manufacturing and industrial processes, such as solvents that have been used in cleaning or degreasing operations.

K-Listed Waste: Specific sources. This list includes certain wastes from specific industries, such as petroleum refining or pesticide manufacturing.

U-Listed: Discarded commercial chemical products. This list includes specific commercial chemical products in an unused form.

P- Listed: Acutely hazardous discarded commercial chemical products. This list includes specific commercial chemical products in an unused form.

CONTAINERS

The original containers are the best type of hazardous waste container. One gallon glass or five gallon polyethylene containers are acceptable as long as the containers and any residue inside are compatible with the waste material. The manufacturer label must be removed or blanked out. All containers must be in good condition (No leaking, bulging or rust) and have tight-fitting lids, no corks or ground glass stoppers. Parafilm is not a substitute for a tight fitting lid.

The cap to all waste containers must be securely fastened unless there is waste being added to the container. Funnels are not to be left in the container. The **only exception** to this rule is for processes such as the High Pressure Liquid Chromatography (HPLC) or Inductively Coupled Plasma (ICP) that adds waste to the container continuously while the instrument is in operation. Once the operation of the instrument is completed the waste container must be capped securely.

Adequate head space must be maintained in the container. The container should not be filled beyond the bottom of the neck of the container or 4 inch head space for 55 gallon drums.

Empty Container Disposal

A container must be empty as much as possible before disposal. RCRA lists the definition below, but this is only for hazardous waste.

RCRA defines an empty container as:

- A container < 3% by weight of material and a capacity ≤ 110 lbs.



- A container that contains < 0.3% by weight of material and has a capacity > 110 lbs.

To discard empty bottles, remove or blank out label and mark container empty and dispose of in normal trash. **Note:** If the container material is acutely hazardous (EPA P-List - See Appendix C), dispose of container as hazardous waste.

CONTAINER LABELS

All hazardous waste container labels must have (KSU Hazardous Waste Labels are in Appendix B):

“HAZARDOUS WASTE” Designation

Only the words **“Hazardous Waste”** can be used for chemical hazardous waste containers. The terms "Organic Waste", "Xylene Waste" or " Waste" etc. is **unacceptable** to the EPA or OSHA. If a material is not waste, do not use the word "waste" on the bottle. Label it as "Used".

Initial Date of Accumulation

The **Date of Accumulation** must be completed as soon as any material is added to the container. The accumulation date establishes the time limit in which hazardous waste must be removed from the university site which is why it is **very important** to complete this field when waste is added to the container. Waste containers must be disposed of within 180 days.

Chemical Names

List the chemicals that have been added to the container. **Do not** use abbreviations or chemical formulas.

Hazard Classification

Indicate the waste classification on the container label.

Waste Types: Reactive, Corrosive, Toxic, Oxidizer, Flammable, Non- Halogenated Solvents, Halogenated Solvents, Acids or Bases.

CHEMICAL COMPATIBILITY

Mixed hazardous waste can produce effects that are harmful to human health and the environment. When storing hazardous waste the materials must be properly segregated within the container and in the storage area to ensure that no fire or explosion or violent reaction occurs that could cause harm to individuals or damage the environment. Hazardous waste containers should always be stored in secondary containment if containers cannot be stored in separate cabinets in the event of a spill or broken container.

For a list of incompatible chemicals see **Appendix A**.

Below is a chart of incompatible chemical classes. The classes of chemicals listed below **should never be stored together**.

NOTE: If in doubt of the proper segregation, consult the Safety Data Sheet (SDS), supervisor or the Office of Compliance and Risk Management for assistance.

Chemical Incompatibility Table

These are recommended guidelines that may be used in combination with container labels, MSDS, user knowledge for storing and segregating chemicals. An EH&S Industrial Hygienist may also be consulted.



Represents Unsafe Storage Combinations



Represents Safe Storage Combinations

	Acids, inorganic	Acids, oxidizing	Acids, organic	Alkalis (bases)	Oxidizers	Poisons, inorganic	Poisons, organic	Water- reactives	Organic solvents
Acids, inorganic			X	X		X	X	X	X
Acids, oxidizing			X	X		X	X	X	X
Acids, organic	X	X		X	X	X	X	X	
Alkalis (bases)	X	X	X				X	X	X
Oxidizers			X				X	X	X
Poisons, inorganic	X	X	X				X	X	X
Poisons, organic	X	X	X	X	X	X			
Water- reactives	X	X	X	X	X	X			
Organic solvents	X	X		X	X	X			

CHEMICAL WASTE STORAGE

Waste generated from Smith, Science Research Building (SRB) and Williams Hall labs are to be stored in the hazardous waste storage room in the basement of Williams Hall near the loading dock.

Waste generated from Cunningham Hall and Cunningham Annex labs are to be stored in the Waste Storage Room in the Cunningham Annex (A013) basement.

Wastes from the Liquid Crystal Institute (LCI) building, Centennial Park, Lowry Hall, McGilvrey Hall and the Aeronautics and Technology Building (ATB), Center for the visual Arts (CVA) and Art Building are to be kept in the generating lab until picked up by the waste hauler.

Unknown waste presents a significant hazard due to the unknown composition and characteristics. They also cost the University additional monies to dispose of because they have to be analyzed to determine their contents which is why the university emphasizes **labeling of all containers** with the name of the substances to avoid this situation.

SATELLITE ACCUMULATION AREA REQUIREMENTS

A satellite accumulation area (SAA) is a term that refers to the storage location of hazardous waste at another location that is either at or near the point of hazardous waste generation which is owned and operated by the generator of the hazardous waste.

Satellite accumulation areas are regulated under the Environmental Protection Agency (EPA) and the Resource Conservation and Recovery Act (RCRA) hazardous waste management program.

Satellite Accumulation Area Rules and Responsibilities

1. All waste must be labeled with the designation **“HAZARDOUS WASTE”**.
2. The **Accumulation Date Field** on the label must be filled in as soon as any waste is added to the container.
3. All containers must be labeled with contents.
4. Do not mix incompatible materials in containers. Storage containers must be separated by a partition or wall.
5. There should never be more than 55 gallons of hazardous waste allowed to accumulate in any satellite accumulation area.
6. Hazardous waste should never be poured drains or sinks.
7. Hazardous waste should never be stored over drains or in the sinks.
8. Hazardous waste must be stored in the immediate vicinity of the laboratory or work area and kept behind lock and key. The hazardous waste storage location should always be clean and inspected on regular routine basis.
9. Hazardous waste should not be stored with facility chemicals. Only compatible hazardous wastes are permitted to be stored together in the same containers as waste accumulates.
10. Transfer full hazardous waste containers to permanent waste storage room.
11. Waste from discontinued projects, experiments, cleanouts and storage areas should always be transferred to the permanent waste storage area. **Note:** For large scale cleanouts (ex. laboratories) prior arrangements must be made with the Office of Compliance and Risk Management.

HAZARDOUS WASTE TRANSPORT

The transportation of hazardous waste between buildings, rooms on campus or through hallways and other public spaces always poses a risk of accidental release or exposure. To minimize the risk of hurt or harm to faculty, staff, students, visitors and the environment the following guidelines listed below will be used for transporting hazardous waste by University personnel, visitors or students. Contact the Office of Compliance and Risk Management at x330-672-1950 or 330-672-4996 if there are any questions.

ALL waste containers have a proper "**HAZARDOUS WASTE**" label with **Initial Accumulation Date**.

ALL contents are listed. List the pH on the disposal tag.

The bottle or jar has a cap that fits tightly.

There are no old or extraneous labels on the container.

There is at least 1" to 2" of head space in liquid containers to allow for expansion and reduce the potential for spillage.

The outside of the bottle is clean and dry.

Use secondary containers or utility service carts to transport waste to designated area.

Note: If transporting individual waste bottles outside of the laboratory always use secondary containment (Ex. Plastic Paint or Nalgene Buckets with secure lids, Rubber Bottle Carrier or Original Shipping Containers).

If transporting multiple, large or heavy containers use a utility service cart with large wheels that are 4 to 6 inches in diameter and have a chemical resistant tray or surface and 3 inch lips on all sides to keep chemicals from sliding off the cart.

Always wear the appropriate personal protective equipment (PPE) for the chemicals being transported in the event of a spill or splash to the skin or eyes.

CHEMICAL WASTE PICKUP

Kent State University utilizes a waste hauler service approximately every 90 days to dispose of hazardous waste on campus. Email notifications are sent out by the Office of Compliance and Risk Management to notify all departments of the waste pickup schedule. Arrangements should be made with the Office of Compliance and Risk Management at that time to dispose of chemical waste.

WASTE MINIMIZATION

Reduction in hazardous waste volumes is essential to protecting human health and the environment. Kent State University strongly encourages all faculty, staff and students to utilize chemical minimization methods to reduce the quantity of chemical waste generated on campus. Reducing the chemical waste also reduces the disposal costs that are incurred by the university. Below are waste minimization strategies that can be implemented to reduce waste:

Substitution - replacing toxic or other hazardous materials used in processes with less hazardous substances. Example: using Alconox® instead of acid glass cleaners.

Micro Chemistry - using minute quantities and small scale chemistry instead of large amounts of chemicals in laboratory experiments.

Accurate Chemical Inventory – maintaining an accurate chemical inventory will reduce excess chemical purchasing.

Redistilling - reclaiming solvents for reuse by a distilling process in the laboratory.

Recycling/Redistribution - redistributing unused or unopened chemicals to other labs or work areas for use.

Laboratory Destruction – neutralization of chemicals during an experiment. This **must** be done according to recognized methods. Ex. Neutralization of strong acids or bases with a buffering solution.

SECTION 2: INFECTIOUS WASTE

INFECTIOUS WASTE

Infectious waste is any waste or combination of waste that include cultures and stocks of infectious agents and associated biological, human blood and blood products, and substances that were or are likely to have been exposed to or contaminated with or are likely to transmit an infectious agent or zoonotic agent.

Infectious agent

A type of microorganism, pathogen, virus or prions that can cause or significantly contribute to disease in or death of human beings.

Zoonotic agent

A type of microorganism, pathogen, virus or prion that causes disease in vertebrate animals, is transmissible to human beings and can cause or significantly contribute to disease in or death of human beings.

Infectious or zoonotic agents can be found in:

Laboratory Wastes

Pathological Wastes

Animal Blood and Blood Products

NOTE: "Blood products" does not include patient care waste such as bandages or disposable gowns that are lightly soiled with blood or any other waste materials the generator designates as infectious wastes.

Animal Carcasses and Parts

Sharp wastes used in the treatment of human beings or animals, or sharp wastes that have or are likely to have come in contact with infectious agents.

Waste materials generated in the diagnosis, treatment, or immunization of human beings or animals, research pertaining to

the immunization of human beings or animals, or in the production or testing of biologicals, that the public health council identifies as infectious wastes.

PACKAGING AND LABELING

Package all biohazardous waste in bags that are designed to protect the waste from escaping into the environment until disposal. Biohazardous waste bags must be constructed of strong material that prevents tearing, bursting and ripping under normal conditions. It must also be waterproof. Full bags must be tied or secured tightly to prevent leakage during handling, transport or storage.

Infectious waste must be placed in biohazard bags with the international biohazard symbol and placed inside a second sealed plastic bag or one single bag within a fully enclosed, and sturdy container. Infectious waste containers must be labeled with the international biohazard symbol on two opposite sides.

Materials not packaged or labeled properly may be refused.

DISPOSAL PROCEDURES

Infectious wastes should be treated prior to disposal using methods such as sterilization, autoclaving or disinfection with bleach or other suitable disinfectant. Treatment and disposal of infectious waste is regulated by federal and state agencies. Infectious waste handling will be managed using the guidelines below to prevent release to faculty, staff, students, visitors and the community. Questions regarding these procedures should be directed to the Office of Compliance and Risk Management at 330-672-1950 or 330-672-4996.

Sharps

Contaminated sharps are to be placed in rigid, puncture resistant closable leak proof containers labeled with the “**SHARPS**” designation and biohazard symbol. Sharps containers must be disposed of when $\frac{3}{4}$ full. Filled sharps containers must be disposed of according to departmental procedures. Recapping of sharps is highly discouraged and dangerous. If recapping must be done, use the one handed capping technique or a recapping device.

All sharps (hypodermic, intravenous, or other needles and syringes; Pasteur pipettes; scalpel or razor blades; blood vials; glass microscope slides and coverslips; and any other broken laboratory glassware) must be placed into a sharps disposal container immediately after use. **Note:** Non-Contaminated sharps must be in a puncture resistant container before disposal in normal trash.

Medical Waste

Waste generated in diagnosis, treatment, or immunization; in research pertaining thereto; or in the production or testing of biologicals, including animals and animal parts used in laboratory research.

Cultures, Stocks & Disposable Laboratory Supplies

All laboratory materials utilized in experiments with biological materials that are **not** considered sharps (e.g., microorganisms, recombinant DNA, animal or human tissues, cell cultures, etc.) must be treated prior to disposal by an approved decontamination method such as autoclaving. When autoclaving waste materials, all items should be put in a **clear autoclave bag** and stored in a container displaying the international biohazard label.

NOTE: Do not use red or orange biohazard bags to autoclave biohazardous waste since these bags cannot be disposed of in regular trash. The red or orange biohazard bags should only be used to dispose of biological waste that cannot be autoclaved.

Research Animals

All tissues or organs from small research animals (e.g., cats, dogs, rabbits, rats, mice, birds, etc.) must be disposed of using a third party waste hauler. **NOTE: There are no exceptions to this policy without prior notification and approval by the Biological Safety Committee.**

Bedding

Contaminated animal bedding must be rendered innocuous through autoclaving prior to disposal. If the bedding cannot be autoclaved double bag it in a biohazardous bag and secure bag with packaging tape and take to the designated storage location. **Note:** Animal bedding that has not been exposed to infectious waste can be discarded in normal trash.

Regulated Medical Waste

Regulated medical waste is handled by a third party medical waste hauler service.

Examples of regulated medical waste are listed below:

Blood or other potentially infectious materials liquid or semi-liquid blood or other potentially infectious materials. (Greater than 20 ml)

Contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed.

Items that are coated with dried blood or other potentially infectious materials and are capable of releasing these materials during handling.

Pathological and microbiological wastes containing blood or other potentially infectious materials. (Ex. animals or animal parts).

Record Keeping

Each department that generates infectious waste must maintain a monthly log to establish the amount of infectious waste being generated. Each department should remain below fifty pounds of infectious waste in any one month.

SECTION 3: RADIOACTIVE WASTE

RADIOACTIVE WASTE

All radioactive waste is picked up and disposed of through the radiation safety office. Any lab that needs to dispose of radioactive waste, call 330-672-4996. Please refer to the radiation safety manual for specific information regarding segregation and disposal of radioactive waste [Radiation Safety Manual](https://www.kent.edu/node/261916) OR (<https://www.kent.edu/node/261916>).

Solid Radioactive Waste

Solid radioactive waste generally consists of dry contaminated laboratory materials, equipment, and supplies such as paper, glass and plastic products. All solid radioactive waste should be placed in cardboard boxes or containers lined with two plastic bags. Do not put liquids into the solid waste container. Use different containers for each isotope. Do not overfill boxes and do not exceed 20 pounds total weight per box. Do not put syringes, needles or broken glass into cardboard boxes.

Liquid Radioactive Waste

Use separate carboys for each isotope. Use separate carboys for aqueous and non-aqueous solutions. Liquid waste containers must have secondary containment, such as a plastic tray, to contain leaks or spills.

Sink Disposal

Sink disposal should be followed by repetitive flushing with water and can only be performed in the designated radioactive disposal sink in the laboratory. Sink disposal log sheets must be completed for each radioactive material sink discharge. The log must record the date, amount, activity, and responsible person.

Shielded Radioactive Material Waste

Shield ^{32}P waste with Plexiglass. Metal waste containers used for ^{32}P waste must be shielded with Plexiglass.

Iodine Isotope (^{125}I)

All iodination waste must be handled and stored in the fume hood in tightly closed containers. Solid iodination waste must be put in double plastic bags immediately after generation.

SECTION 4: UNIVERSAL WASTE

UNIVERSAL WASTE

Universal wastes are hazardous wastes that are generated in large quantities by university facilities. They are exempt from the hazardous waste regulations, but must still be managed separately from general trash. Universal waste removal is handled by University Facilities Management (UFM) on campus. A work order must be put into [Flash Track](#) or <https://solutions.kent.edu/flashtrack/> so that the universal waste can be removed from the area.

Universal waste is managed under four categories:

- Lamps**
- Pesticides**
- Mercury-Containing Equipment**
- Rechargeable Batteries**

Examples of Universal Waste

- Fluorescent Lamps**
- Neon Lamps**
- Metal Halide Lamps**
- Mercury Vapor Lamps**
- Nickel Cadmium Batteries**
- Metal hydride**
- Lead Acid Batteries**

Packaging and Labeling

All universal waste containers must be labeled with the designation “**Universal Waste**” and date. All containers for universal waste must be structurally sound to prevent damage to the contents.

Lamps

Lamps must be stored in containers or packages that are structurally sound and compatible with contents while providing adequate protection against breakage. Examples, fiber box or drum. Containers and packages must remain closed unless adding or removing lamps.

Rechargeable Batteries

Batteries must be stored in an approved 5 gallon plastic container or a large structurally sound container or box. The label must have the words “**Universal Waste-Batteries**” and must be **dated**.

Pesticides

Pesticides must be contained in a properly labeled and structurally sound container that remains closed when not actively being used. The container must be compatible with the pesticide, and lack evidence of leakage, spillage, or damage that could lead to release under reasonably normal conditions.

Mercury Containing Equipment (MCE)

Mercury-Containing Equipment (MCE) is any device or part of a device that contains elemental mercury integral to its function. The MCE must be labeled with the words “**Universal Waste – Mercury-Containing Equipment**” and the date they became a waste.

Mercury Containing Equipment Examples

Thermometers

Thermostats

Barometers

Manometers

Temperature Pressure Gauges

Mercury Switches

Appendix A

Incompatible Chemicals

A wide variety of chemicals react dangerously when mixed with certain other materials. Some of the more widely-used incompatible chemicals are given below, but the absence of a chemical from this list should not be taken to indicate that it is safe to mix it with any other chemical!

Chemical	Incompatible chemicals
acetic acid	chromic acid, ethylene glycol, nitric acid, hydroxyl compounds, perchloric acid, peroxides, permanganates
acetone	concentrated sulphuric and nitric acid mixtures
acetylene	chlorine, bromine, copper, fluorine, silver, mercury
alkali and alkaline earth metals	water, chlorinated hydrocarbons, carbon dioxide, halogens, alcohols, aldehydes, ketones, acids
aluminium (powdered)	chlorinated hydrocarbons, halogens, carbon dioxide, organic acids.
anhydrous ammonia	mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid
ammonium nitrate	acids, metal powders, flammable liquids, chlorates, nitrites, sulphur, finely divided organic combustible materials
aniline	nitric acid, hydrogen peroxide
arsenic compounds	reducing agents
azides	acids
bromine	ammonia, acetylene, butadiene, hydrocarbons, hydrogen, sodium, finely-divided metals, turpentine, other hydrocarbons
calcium carbide	water, ethanol
calcium oxide	water
carbon, activated	calcium hypochlorite, oxidizing agents
chlorates	ammonium salts, acids, metal powders, sulphur, finely divided organic or combustible materials
chromic acid	acetic acid, naphthalene, camphor, glycerin, turpentine, alcohols, flammable liquids in general

chlorine	see bromine
chlorine dioxide	ammonia, methane, phosphine, hydrogen sulfide
copper	acetylene, hydrogen peroxide
cumene hydroperoxide	acids, organic or inorganic
cyanides	acids
flammable liquids	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
hydrocarbons	fluorine, chlorine, bromine, chromic acid, sodium peroxide
hydrocyanic acid	nitric acid, alkali
hydrofluoric acid	aqueous or anhydrous ammonia
hydrogen peroxide	copper, chromium, iron, most metals or their salts, alcohols, acetone, organic materials, aniline, nitromethane, flammable liquids, oxidizing gases
hydrogen sulphide	fuming nitric acid, oxidizing gases
hypochlorites	acids, activated carbon
iodine	acetylene, ammonia (aqueous or anhydrous), hydrogen
mercury	acetylene, fulminic acid, ammonia
mercuric oxide	sulphur
nitrates	sulphuric acid
nitric acid (conc.)	acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulphide, flammable liquids, flammable gases
oxalic acid	silver, mercury
perchloric acid	acetic anhydride, bismuth and its alloys, ethanol, paper, wood
peroxides (organic)	acids, avoid friction or shock
phosphorus (white) potassium	air, alkalis, reducing agents, oxygen carbon tetrachloride, carbon dioxide, water, alcohols, acids
potassium chlorate	acids
potassium perchlorate	acids
potassium permanganate	glycerin, ethylene glycol, benzaldehyde, sulphuric acid

selenides	reducing agents
silver	acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
sodium	carbon tetrachloride, carbon dioxide, water
sodium nitrate	ammonium salts
sodium nitrite	ammonium salts
sodium peroxide	ethanol, methanol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
sulphides	acids
sulphuric acid	potassium chlorate, potassium perchlorate, potassium permanganate (or compounds with similar light metals, such as sodium, lithium, etc.)
tellurides	reducing agents
zinc powder	sulphur

Appendix B

KSU HAZARDOUS WASTE LABELS



White Label is used for containers without a manufacturer label.
Yellow Label is used for chemicals that have their manufacturer label.

Hazardous Waste

Date of Accumulation: _____

Bldg: _____ Room: _____ Department: _____

Caution

Contents (Circle)

Non-Halogenated Solvents	Halogenated Solvents	Acids	Bases
FLAMMABLE	REACTIVE	OXIDIZER	CORROSIVE TOXIC

List of Chemicals Added:

HAZARDOUS WASTE START DATE _____

Appendix C

EPA P-Listed Waste

Waste Code	CASRN	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P002	591-08-2	1-Acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P203	1646-88-4	Aldicarb sulfone.
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-Aminopyridine
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P099	506-61-6	Argentate(1-), bis(cyano-C)-, potassium
P010	7778-39-4	Arsenic acid H3 AsO4
P012	1327-53-3	Arsenic oxide As2 O3
P011	1303-28-2	Arsenic oxide As2 O5
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl-
P036	696-28-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P067	75-55-8	Aziridine, 2-methyl-
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro-
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2 (methylamino) ethyl]-, (R)

Waste Code	CASRN	Substance
P046	122-09-8	Benzene ethanamine, alpha,alpha-dimethyl-
P014	108-98-5	Benzenethiol
P127	1563-66-2	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate.
P188	57-64-7	Benzoic acid, 2-hydroxy-, compd. With (3a <i>S</i> -cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3- <i>b</i>]indol-5-yl methyl carbamate ester (1:1).
P001	1\81-81-2	2 H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium powder
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine (methylthio)-, O-[(methylamino) carbonyl] oxime
P021	592-01-8	Calcium cyanide
P021	592-01-8	Calcium cyanide Ca(CN) ₂
P189	55285-14-8	Carbamic acid, [(dibutylamino)-thio]methyl-, 2,3-dihydro-2,2-dimethyl- 7-benzofuranyl ester.
P191	644-64-4	Carbamic acid, dimethyl-, 1-[(dimethyl-amino) carbonyl]- 5-methyl-1H- pyrazol-3-yl ester.
P192	119-38-0	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H- pyrazol-5-yl ester.
P190	1129-41-5	Carbamic acid, methyl-, 3-methylphenyl ester.
P127	1563-66-2	Carbofuran.
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P189	55285-14-8	Carbosulfan.
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P026	5344-82-1	1-(o-Chlorophenyl)thiourea
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide
P029	544-92-3	Copper cyanide Cu(CN)
P202	64-00-6	m-Cumenyl methylcarbamate.
P030	Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P033	506-77-4	Cyanogen chloride (CN)Cl
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P016	542-88-1	Dichloromethyl ether
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin

Waste Code	CASRN	Substance
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropylfluorophosphate (DFP)
P004	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8 abeta)-
P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6a alpha,7beta, 7aalpha)-
P051	\\ 72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6 abeta,7beta, 7aalpha)-, & metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P191	644-64-4	Dimetilan.
P047	\\ 534-52-1	4,6-Dinitro-o-cresol, & salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramidate, octamethyl-
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P039	298-04-4	Disulfoton
P049	541-53-7	Dithiobiuret
P185	26419-73-8	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O- [(methylamino)- carbonyl]oxime.
P050	115-29-7	Endosulfan
P088	145-73-3	Endothall
P051	72-20-8	Endrin
P051	72-20-8	Endrin, & metabolites
P042	51-43-4	Epinephrine
P031	460-19-5	Ethanedinitrile
P194	23135-22-0	Ethanimidothioic acid, 2- (dimethylamino)-N-[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester.
P066	16752-77-5	Ethanimidothioic acid, N-[(methylamino)carbonyl]oxy]-, methyl ester
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethyleneimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide

Waste Code	CASRN	Substance
P058	62-74-8	Fluoroacetic acid, sodium salt
P198	23422-53-9	Formetanate hydrochloride.
P197	17702-57-7	Formparanate.
P065	628-86-4	Fulminic acid, mercury(2+) salt (R,T)
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyl tetraphosphate
P116	79-19-6	Hydrazinecarbothioamide
P068	60-34-4	Hydrazine, methyl-
P063	74-90-8	Hydrocyanic acid
P063	74-90-8	Hydrogen cyanide
P096	7803-51-2	Hydrogen phosphide
P060	465-73-6	Isodrin
P192	119-38-0	Isolan.
P202	64-00-6	3-Isopropylphenyl N-methylcarbamate.
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P196	15339-36-3	Manganese, bis(dimethylcarbamodithioato-S,S[prime])-
P196	15339-36-3	Manganese dimethyldithiocarbamate.
P092	62-38-4	Mercury, (acetato-O)phenyl-
P065	628-86-4	Mercury fulminate (R,T)
P082	62-75-9	Methanamine, N-methyl-N-nitroso-
P064	624-83-9	Methane, isocyanato-
P016	542-88-1	Methane, oxybis[chloro-
P112	509-14-8	Methane, tetranitro- (R)
P118	75-70-7	Methanethiol, trichloro-
P198	23422-53-9	Methanimidamide, N,N-dimethyl-N[prime]-[3-[[[(methylamino)- carbonyl]oxy]phenyl]-, monohydrochloride.
P197	17702-57-7	Methanimidamide, N,N-dimethyl-N[prime]-[2-methyl-4-[[[(methylamino)carbonyl]oxy]phenyl]-
P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10, 10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
P059	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P199	2032-65-7	Methiocarb.
P066	16752-77-5	Methomyl
P068	60-34-4	Methyl hydrazine
P064	624-83-9	Methyl isocyanate
P069	75-86-5	2-Methylactonitrile
P071	298-00-0	Methyl parathion
P190	1129-41-5	Metolcarb.
P128	315-8-4	Mexacarbate.
P072	86-88-4	alpha-Naphthylthiourea
P073	13463-39-3	Nickel carbonyl
P073	13463-39-3	Nickel carbonyl Ni(CO)4, (T-4)-

Waste Code	CASRN	Substance
P074	557-19-7	Nickel cyanide
P074	557-19-7	Nickel cyanide Ni(CN) ₂
P075	\1\ 54-11-5	Nicotine, & salts
P076	10102-43-9	Nitric oxide
P077	100-01-6	p-Nitroaniline
P078	10102-44-0	Nitrogen dioxide
P076	10102-43-9	Nitrogen oxide NO
P078	10102-44-0	Nitrogen oxide NO ₂
P081	55-63-0	Nitroglycerine (R)
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P085	152-16-9	Octamethylpyrophosphoramidate
P087	20816-12-0	Osmium oxide OsO ₄ , (T-4)-
P087	20816-12-0	Osmium tetroxide
P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3- dicarboxylic acid
P194	23135-22-0	Oxamyl.
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	51-28-5	Phenol, 2,4-dinitro-
P047	\1\ 534-52-1	Phenol, 2-methyl-4,6-dinitro-, & salts
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P128	315-18-4	Phenol, 4-(dimethylamino)-3,5-dimethyl-
P199	2032-65-7	Phenol,(3,5-dimethyl-4-(methylthio) methylcarbamate
P202	64-00-6	Phenol, 3-(1-methylethyl)-, methyl carbamate.
P201	2631-37-0	Phenol, 3-methyl-5-(1-methylethyl)-,methyl carbamate.
P092	62-38-4	Phenylmercury acetate
P093	103-85-5	Phenylthiourea
P094	298-02-2	Phorate
P095	75-44-5	Phosgene
P096	7803-51-2	Phosphine
P041	311-45-5	Phosphoric acid,diethyl 4-nitrophenyl ester
P039	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P044	60-51-5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P043	55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
P089	56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P040	297-97-2	Phosphorothioic acid,O,O-diethylO-pyrazinyl ester

Waste Code	CASRN	Substance
P097	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl] O,O-dimethyl ester
P071	298-00-0	Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester
P204	57-47-6	Physostigmine.
P188	57-64-7	Physostigmine salicylate.
P110	78-00-2	Plumbane, tetraethyl-
P098	151-50-8	Potassium cyanide
P098	151-50-8	Potassium cyanide K(CN)
P099	506-61-6	Potassium silver cyanide
P201	2631-37-0	Promecarb
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P203	1646-88-4	Propanal, 2-methyl-2-(methyl-sulfonyl)-O-[(methylamino)carbonyl] oxime.
P101	107-12-0	Propanenitrile
P027	542-76-7	Propanenitrile, 3-chloro-
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55-63-0	1,2,3-Propanetriol, trinitrate (R)
P017	598-31-2	2-Propanone, 1-bromo-
P102	107-19-7	Propargyl alcohol
P003	107-02-8	2-Propenal
P005	107-18-6	2-Propen-1-ol
P067	75-55-8	1,2-Propylenimine
P102	107-19-7	2-Propyn-1-ol
P008	504-24-5	4-Pyridinamine
P075	\1\ 54-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-(S)-, & salts
P204	57-47-6	Pyrrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-methylcarbamate (ester),(3aS-cis)-
P114	12039-52-0	Selenious acid, dithallium(1+) salt
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide
P104	506-64-9	Silver cyanide Ag(CN)
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide
P106	143-33-9	Sodium cyanide Na(CN)
P108	\1\ 57-24-9	Strychnidin-10-one, & salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	\1\ 57-24-9	Strychnine, & salts
P115	7446-18-6	Sulfuric acid, dithallium(1+) salt
P109	3689-24-5	Tetraethyldithiopyrophosphate
P110	78-00-2	Tetraethyl lead
P111	107-49-3	Tetraethyl pyrophosphate
P112	509-14-8	Tetranitromethane (R)
Waste Code	CASRN	Substance

P062	757-58-4	Tetraphosphoric acid, hexaethyl ester
P113	1314-32-5	Thallic oxide
P113	1314-32-5	Thallium oxide Tl ₂ O ₃
P114	12039-52-0	Thallium(I) selenite
P115	7446-18-6	Thallium(I) sulfate
P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P045	39196-18-4	Thiofanox
P049	541-53-7	Thioimidodicarbonic diamide [(H ₂ N)C(S)] ₂ NH
P014	108-98-5	Thiophenol
P116	79-19-6	Thiosemicarbazide
P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P072	86-88-4	Thiourea, 1-naphthalenyl-
P093	103-85-5	Thiourea, phenyl-
P185	26419-73-8	Tirpate.
P123	8001-35-2	Toxaphene
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Vanadic acid, ammonium salt
P120	1314-62-1	Vanadium oxide V ₂ O ₅
P120	1314-62-1	Vanadium pentoxide
P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-concentrations greater than 0.3%
P205	137-30-4	Zinc, bis(dimethylcarbamodithioato-S,S[prime])-
P121	557-21-1	Zinc cyanide
P121	557-21-1	Zinc cyanide Zn(CN) ₂
P122	1314-84-7	Zinc phosphide Zn ₃ P ₂ , when present at concentrations greater than 10% (R,T)
P205	137-30-4	Ziram.

\\ CAS Number given for parent compound only.