

EH&S FACT SHEET

Environment, Health and Safety Information for the Berkeley Campus

Hazardous Waste Management

University of California, Berkeley (UC Berkeley)'s hazardous waste is divided into four categories: 1) chemical, 2) biological (e.g., recombinant DNA and biohazardous), 3) radioactive, and 4) sharps. This fact sheet will help you understand how to use the Office of Environment, Health & Safety (EH&S) online "Hazardous Waste Program" (HWP) to manage your hazardous wastes, and find other related guidance on the EH&S web site. (Hyperlinks are used frequently so it is best to read this fact sheet online at <http://ehs.berkeley.edu/sites/default/files/lines-of-services/hazardous-materials/52hazardouswaste.pdf>).

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Training

Prior to using the Hazardous Waste Program, you must complete the fifteen minute, online Hazardous Waste Management training. This satisfies the legal training requirement for UC Berkeley personnel who generate, label, store, treat or dispose of hazardous waste. Go to www.ehs.berkeley.edu, enter your CalNet ID, and take the one time training. If you do not have a CalNet ID, see your department administrator or go to the [CalNet ID](#) web site.

Chemical Waste Labeling, Treatment and Storage



Label

Step 1: Characterize Your Waste

Prior to generating hazardous waste, you must characterize it by determining the hazardous properties. By doing this first, you will be able to choose a compatible container to collect the waste, know how to label the container and stay within the accumulation time limits (described below under "[Store](#)"). For assistance, refer to [Appendix X of the California Code of Regulations](#) for a list of chemicals which are presumed to be hazardous waste, read the MSDS for each chemical component, and understand that a chemical waste is hazardous if it meets any of the following hazardous waste characteristic definitions:



Flammable/Ignitable. (1) Liquids (with less than 50% water by weight) with a flashpoint of less than 140 F° (60° C) (e.g., gasoline, benzene, alcohols, acetone, and ethers); (2) solids that can cause fire through friction, absorption of moisture, or spontaneous chemical changes, and when ignited burn so vigorously and persistently that it creates a hazard; and (3) ignitable compressed gases.

Corrosive. (1) Liquids with a pH of less of ≤ 2 (e.g., sulfuric acid); (2) liquids with a pH ≥ 12.5 (e.g. potassium hydroxide); (3) solids, that when mixed with an equivalent weight of water, produce a solution having a pH ≤ 2 or ≥ 12.5 (e.g., hydrated lime, acetamide, cupric bromide).

Reactive. (1) Liquids or solids that are normally unstable and readily undergo change without detonation, react violently with water, or generate toxic gases or fumes when mixed with water; (2) chemicals containing cyanide or sulfur and which generate toxic gases when exposed to pH conditions between 2 and 12.5; (3) chemicals which are capable of detonation if subjected to a strong initiating source, or heated under confinement; or (4) chemicals capable of detonation at standard temperature and pressure. Examples: pyrophoric liquids, sodium cyanide, potassium sulfide, potassium metal, dry picric acid.

Toxic. This is the default hazard waste characteristic for chemical waste that is not flammable, corrosive or reactive. Unless you have documentation, such as a toxicity assessment or bioassay testing, which clearly shows that the waste is non-toxic, label your waste as toxic and manage it through the HWP. EH&S staff can assist you with sampling and waste analyses.

Oxidizer. *Oxidizer is a secondary hazardous property.* Indicate on the waste label the primary hazard of the oxidizer in addition to "Oxidizer" (e.g., Piranha waste is a corrosive acid and an oxidizer). Oxidizers cause or enhance the combustion of other materials and are a fire hazard if stored or transported incorrectly. Review the booklet "[Safe Storage of Hazardous Chemicals](#)" for examples and precautions.

Step 2: Print a Label

You are required to label your container of chemical hazardous waste just before you add any amount to the container.

Go to www.ehs.berkeley.edu and enter your Cal Net ID. Click on "Create Label" and select "Chemical Waste." Enter the required data fields for your container of waste. Enter the type of chemical using the drop down menu (preferred), or type in the name of the chemical.



Free label holders are available - order from the HWP

If your waste is in the drop down, the HWP will automatically select the hazard property. You should revise the selection if you know it to be inaccurate. If you don't select a hazard, the HWP by default selects "toxic."

Print a copy of your label. Fold the label as instructed and place it inside a label holder so the phrase "Hazardous Waste" is clearly visible.

Peel the backing off of the adhesive and affix the label to the container. If the holder is too large to conveniently affix, put your waste container inside a larger container. A Ziploc® bag might be convenient.



Store

Accumulating different chemical wastes into a single container is permitted as long as the chemicals are similar and compatible. For example, mixing high-BTU organic solvent waste is acceptable but you would never add mercury (this renders solvents non-recyclable and expensive to dispose). As contents are added to the container, write them on the label (or nearby clipboard) or enter them into the HWP so that you will be able to account for 100% of the chemical constituents. Do not depend on your memory when it is time to request a pick up!

The "accumulation start date" is automatically included on the container label when you print it. Submit a pick-up request,

- 1) within 6 months of the accumulation start date, OR
- 2) immediately if the quantity of any single waste type is approaching 55 gallons, OR
- 3) immediately if the chemical is acutely or extremely hazardous and if the quantity is approaching 1 quart or 2.2 pounds. Note that the HWP will warn you if your waste contains an acutely or extremely hazardous waste.

1. Store chemical waste in containers that are compatible with the waste, that are in good condition, and are kept closed.
2. To avoid spills due to overfilling or chemical expansion, please fill waste containers no more than 80% of their capacity.
3. Segregate incompatible chemicals to minimize the risk of dangerous reactions (see the [EH&S Safe Storage of Hazardous Chemicals Booklet](#)) and segregate unknown chemicals from all other chemicals.
4. Place containers of compatible chemicals in secondary containment, such as plastic tubs.
5. Store chemical waste as "close as practical" to where it is being generated. The expectation that the container is being routinely monitored by the person generating the waste, and so moving the container too far from the laboratory may be a violation.
6. Store chemicals that off-gas (e.g., piranha waste) in containers with vented caps to avoid high pressure build up in the container over time. Containers and vented caps are made available upon request from the HWP. Store containers with vented caps in a fume hood.
7. Request a pickup of your chemical waste before reaching the quantity and time limits.

Treat (optional)

Performing an operation to render a hazardous waste non- or less-hazardous is optional. Laboratory personnel may neutralize or precipitate, or perform other treatment, and then dispose of the non-hazardous component down the drain or in the municipal trash, but only under certain conditions. Some residues from treating laboratory hazardous waste may still be hazardous, and need to be disposed of as such. Treatment is heavily regulated and the requirements are described in a separate EH&S fact sheet, "[Bench Top Treatment of Laboratory Hazardous Waste](#)."



If you determine that your aqueous waste is not hazardous, it still might be legally prohibited from drain disposal. You need to understand the drain disposal restrictions prior to disposing of chemicals in the drain. Please read the [Guidelines For Drain Disposal Of Chemicals at University of California, Berkeley](#). Drain disposal of laboratory and shop waste is limited to occasional disposal of small amounts of non-hazardous waste chemicals.

EH&S sends email reminders to generators when containers are nearing the 6 month storage time limit. Follow the HWP on-line instructions to submit a request for pick up.

You are not required to package your waste containers into cardboard boxes. EH&S will pick up your hazardous waste from your storage/containment location. Designating a waste storage area in your laboratory or shop, such as a chemical storage cabinet, will assist our staff in locating the chemicals.

Setting up a Recharge Account. At the time of disposal, you will select the appropriate recharge account from a drop down list of accounts associated with your department. Only authorized, financial staff members are able to modify or create new accounts at <http://ehs.berkeley.edu/recharge>. EH&S recharges for waste disposal and recharge rates change periodically. The HWP automatically estimates the cost when you make a pick up request if you enter a chemical name that is in our or in the municipal trash, but **only under certain conditions**. Some residues from treating laboratory hazardous waste may still be hazardous, and need to be disposed of as such. Treatment is heavily regulated and the requirements are described in a separate EH&S Fact Sheet, "..."

If you determine that your aqueous waste is not hazardous, it still might be legally prohibited from drain disposal. You need to understand the drain disposal restrictions prior to disposing of chemicals in the drain. Please read the [Drain Disposal Restrictions for Chemicals at University of California, Berkeley](#). Drain disposal of laboratory and shop waste is limited to occasional disposal of small amounts of non-hazardous waste chemicals.



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You are not required to package your waste containers into cardboard boxes. EH&S will pick up your hazardous waste from your storage/containment location. Designating a waste storage area in your laboratory or shop, such as a chemical storage cabinet, will assist our staff in locating the chemicals.

Setting up a Recharge Account. At the time of disposal, you will select the appropriate recharge account from a drop down list of accounts associated with your department. Only authorized, financial staff members are able to modify or create new accounts at <http://ehs.berkeley.edu/recharge-services>.

EH&S recharges for waste disposal and [recharge rates](#) change periodically. The HWP



automatically estimates the cost when you make a pick up request if you enter a chemical name that is in our database. If you enter a chemical that is not in our database, review the [recharge rates](#) or call EH&S at 642-3073 for an estimate of your disposal costs. The recharge cost estimates are based on how you describe the waste. If EH&S determines that the composition of your waste is different than described, the final recharge cost may be adjusted up or down.

Universal Wastes

Universal wastes include household-type batteries, electronic wastes, burned-out fluorescent light tubes and CFLs, mercury-containing devices and non-empty aerosol cans. Various campus departments assist with the collection and management of these items:

Universal Wastes Picked up by EH&S

Use the Hazardous Waste Program to manage and dispose of batteries, mercury-containing devices and non-empty aerosol cans. Select "Universal Waste" (instead of "Chemical Waste") and enter the required information to print a label.

Universal Wastes Picked up by Other Departments

Physical Plant-Campus Services (PPCS) collects electric lighting and fluorescent light tubes removed during building maintenance operations. Overstock and Surplus collects electronic devices and CRTs. Please do not enter these items in the EH&S HWP. Instead, fill out a [PPCS work order](#) or go to the [Excess & Surplus web page](#) to request a pick up. (Note that broken CRT glass is a hazardous chemical waste handled by EH&S.)

Unknown Chemicals

Unknown chemicals are wastes for which there is incomplete information about the chemicals comprising the waste. If one or all of the components making up the waste are not known, create a label for chemical waste and enter "unknown" as the sole component **OR** enter it along with the known components. Any information that you can provide will make identification and disposal safer, and less costly. Segregate unknown chemicals from all other chemicals. The hazardous property of "toxic" is automatically assigned for labeling purposes. You may override the toxic designation if you know the hazardous property, and EH&S will assign the most appropriate hazards after further testing the waste.

Controlled Substances

Controlled substances are drugs and are highly regulated. Disposing of controlled substances requires the completion of the Schedule II or III-V forms and Client Information forms, provided on the EH&S Controlled Substances Disposal Program web site. Send completed forms to EH&S and please refer to the "[Managing and Disposing of Unwanted Controlled Substances](#)" fact sheet. The HWP also allows users to enter controlled substances and print out the forms. Filling out the forms via HWP does not require completing a Client Information form. The controlled substances quantities cannot be entered via HWP and must be entered by hand when printed.

EH&S arranges a time to pick up the materials typically within 10 days of receiving the faxed form. Keep the controlled substances locked up until you "release" them to EH&S.



Recombinant DNA and Biohazardous Waste

Recombinant DNA waste must be autoclaved or disinfected in a white autoclave bag prior to disposal as regular trash. Refer to the "[Management of BSL1 Recombinant DNA Waste](#)" fact sheet. If you generate recombinant DNA waste from biosafety level 1 research, and do not have access to an autoclave, you may place it in a red bag and manage it as biohazardous waste.

Biohazardous waste management is described in the EH&S fact sheet, "[Biohazardous Waste and Recombinant DNA Waste Management in Biosafety Level 2 and 3 Laboratories](#)."

In general, store biohazardous waste in red bags inside closed, rigid containers. Both the bags and outer container must be marked with the words "Biohazardous Waste" (or "BIOHAZARD" and the international biohazard symbol). If you work in a building with a central biohazardous material pickup location (see the fact sheet noted above for a list of buildings), do not use the HWP to label or dispose of your biohazardous waste. Instead, take the waste to the biohazardous waste storage room in your building (you must affix a bar code label to the outer container first, available by contacting EH&S at ehs@berkeley.edu).

If you work in a building without a biohazardous waste storage room, use the HWP to create a label for biohazardous and sharps waste and request an EH&S pick up directly from your laboratory.

Radioactive Waste and Radioactive Mixed Waste

Radioactive Waste

Procedures for managing and disposing of radioactive wastes remain the same, using the [Radiation Safety Inventory System \(RSIS\)](#). Please reference the [Radiation Safety Manual](#) for detailed instructions.

Radioactive Mixed Waste

When radioactive materials and hazardous chemicals are combined, the resultant mixture is a radioactive mixed waste. Radioactive mixed wastes are the most difficult and expensive waste to dispose and manage. You will be recharged at full cost for mixed waste disposal fees.

In addition to the standard Radioactive Waste Program requirements for disposal, mixed waste disposal requires that the waste container be labeled as hazardous waste when the first drop of material is generated. To complete a hazardous waste label you will use the Hazardous Waste Program. To use the HWP you will need a CalNet ID and you will complete the ~15 minute hazardous waste training. Once completed, follow these steps:

- 1) Create a label by filling in the required fields and write "MIXED RADIOACTIVE WASTE" in the comments field.
- 2) Print the label, and affix it to each container of mixed waste.
- 3) Request a pick up of the mixed waste before 6 months has elapsed. Use the [Radiation Safety Information System \(RSIS\)](#) to request a pick up of radioactive and mixed waste, not the HWP. When requesting a pickup in RSIS another label will be printed with the radioactive and chemical details. Both labels must be affixed to the waste container.
- 4) After pick up, EH&S will delete the waste item from the HWP tracking system.

Small quantities of mixed waste may be rendered non- or less- hazardous by meeting laboratory "Bench Top" treatment regulations. See the [Bench Top Treatment](#) fact sheet for



more details.

Sharps

Sharps are items that pose a physical hazard such as puncture to or cutting of the skin. Examples are broken glass, needles, razor blades, or pipettes. There are two classes of sharps waste: 1) contaminated with chemical, biohazardous, or radioactive materials, and 2) uncontaminated. The proper management of contaminated and uncontaminated sharps is thoroughly explained in the EH&S "[Sharps: Handling and Disposal](#)" fact sheet and summarized below:

Sharps Contaminated With Chemical, Biohazardous, or Radioactive Materials

Dispose of chemically contaminated sharps as chemical waste.

Place biohazardous waste sharps into an appropriate sharps container marked with the words "Sharps Waste" (or with the word "BIOHAZARD" and the international biohazard symbol). If you work in a building with a centralized, biohazardous waste storage area, you may dispose of sharps containers in a container that is provided inside the biohazardous waste storage room (you must affix a bar code label to the outer container first, available by contacting EH&S at ehs@berkeley.edu).

Dispose of radioactive material contaminated sharps as radioactive waste. If your sharps are contaminated with a combination of chemical, biohazardous, or radioactive materials, please contact EH&S for disposal guidance.

Uncontaminated Sharps

Needles and blades, even if they are uncontaminated, must be placed into a sharps container and disposed of as biohazardous waste. Uncontaminated sharps other than needles and blades are disposed of by placing them into a puncture proof container and labeling the container with the words "Non-hazardous Sharps."

How to Label Waste Manually

If the HWP is temporarily unavailable when you need a label, you must still label your hazardous waste container with specific information. If the EH&S web site is functional, you may print a blank label and write in the start date, the hazardous characteristic, physical property, and the chemical components. The label can be found at: <http://ehs.berkeley.edu/sites/default/files/hazardous-materials/blankhazwastelabel.pdf>. If the EH&S website is down, call EH&S at 642-3073 to have a label faxed or emailed to you. As soon as possible, enter the information into the HWP so that you receive an email reminding you to have the waste picked up within the allowable accumulation times.

