

HAZARDOUS MATERIALS PLAN: MANAGEMENT, HANDLING, DISPOSAL, and REPORTING

Any chemicals (this includes veterinary drugs, anti-bacterial agents, etc.) ordered for use at PPRL, the Diagnostics Lab, or field studies must have an MSDS (Material Safety Data Sheet) or a statement from the company that says these compounds are not hazardous under OSHA regs. If you have chemicals on hand that do not have an MSDS, let Terrie (the Chemical Hygiene Officer for PPRL) know. After the chemicals have arrived and Pat has checked them in, let Terrie know the details of the chemical (product name, manufacturer, amount, where stored, and who ordered it). She will enter these details into the computer chemical inventory. A hard copy of the inventory is printed twice each year; the chemicals are physically inventoried at least once each year. The majority of the chemicals will be stored in the Dry Chemical Storage room (Room 229). The bulk solvents and flammable solids are stored in Building 45 (ex-Goat Shed), which is also locked.

Before using a chemical for the first time, read the MSDS and talk with your supervisor. He or she will know the hazards presented by the chemical (and the process it's used in) and will inform you of the precautions to take and the personal protective equipment (PPE) you should use. You can also talk with Dale or Terrie for further information on the subject; we also have the latest edition of the Merck Index, *At the Bench: A Laboratory Navigator*, and other information sources on chemical handling and hazards. All MSDS are kept in binders in the Library (Room 201). In addition, they are also available via computer. We have access to the USU database of MSDS from a number of chemical companies (Sigma, Baker, Acros, Mallinckrodt, etc.) plus a number of sites on the World-Wide Web. These will be accessed through the safety computer (Terrie's office, Room 127).

Certain classes of chemicals are more heavily regulated. You must keep track of amounts used, when, under what conditions, and who used it. Currently, the only substances we have requiring this type of recordkeeping are the controlled substances and radioactive material. Kip and Bryan are the only ones authorized to purchase such chemicals. The records for controlled substances and radioactive material records are in the Animal Surgery area (Building 25) and Room 135, respectively.

We have an agreement with Utah State University Environmental Health & Safety Office for hazardous waste disposal. Under their EPA license, we are considered a satellite accumulator. Let Terrie know whenever you have any hazardous waste for disposal. She will arrange with USU EH&S for pickup. We have a 55 gallon drum for collection of non-halogenated solvent waste; 5 gallon carboys for halogenated and non-halogenated solvent waste; and 5 gallon carboys for collection of formaldehyde and other aldehydes. Each time you add waste to one of these, write down the compound (or mixture with percentages of each solvent), the amount, and date, and initial the entry. Terrie checks these weekly and will dispose of them as the carboys get filled up or once a quarter. If you will be generating other classes of hazardous wastes, let Terrie know *before* you do so; she will arrange for appropriate waste collection containers and subsequent disposal. We are able to reclaim a good deal of the solvents used in our large scale extraction and chromatography

procedures. Talk with Dale for more information on this and for the protocol to use. All records of hazardous waste disposals are kept in the Safety Files. An important part of waste reduction is to order only the quantity needed for the experiment or procedure. Any initial savings from buying in bulk are lost when the substance must be disposed of. Check the chemical inventory before buying to see what is present.

The PPRL also participates in the USU recycling program. Collection barrels for mixed paper waste are located on both floors of the main lab. Break down cardboard boxes and place them next to the paper barrel in the Mailroom for recycling. In addition, aluminum cans are also collected and taken to a recycler downtown.

Spills and chemical releases will inevitably happen. Always keep in mind how you will respond to such incidents. Usually, spills are minor (a few drops or maybe a couple of ounces) and are easily dealt with. Keep in mind, though, any hazards presented by the spilled chemical. When planning an experiment, an important part of the protocol is how you will respond to spills or releases. Make sure this is covered before you start the experiment! The MSDS is an important source of information on spill response. When working with large quantities (such as the large-scale plant extractions using dichloromethane), wear proper PPE at all times and have on hand spill control/clean-up equipment to handle the worst-case scenario. If you don't feel you can handle the spill, or if it is large (quantity should be determined before the procedure is even started), we can call the USU Emergency Response Team. Again, the proper response is highly dependent on the hazard/s present.

A number of chemicals have TPQ (threshold planning quantity) and RQ (reportable quantity) values established. For example, chemical A has a TPQ of 10,000 lbs and an RQ of 100 lbs. If you have over 10,000 pounds, this must be listed on an annual community right-to-know report. If you have a spill that releases 101 lbs, this must be reported to the EPA or appropriate state and municipal organizations. Accurate chemical inventories are important in aiding the Chemical Hygiene Officer (CHO; Terrie Wierenga) in determining what reports need to be submitted. Information on hazards, limit values, etc. is found in 29 CFR 1910, Subpart Z, as well as other source documents located in the Safety Files (Room 127). The CHO is responsible for reviewing the chemical inventories and determining if community right-to-know reports need to be filed with the appropriate emergency personnel. Currently, PPRL inventories have been low enough that no reports have ever needed to be filed. An Emergency Response notebook has been developed with the assistance of the USU Environmental Health & Safety Office that has been distributed to the USU and City of Logan Police Departments, the Logan Fire Department, the USU EH&S Office, and the Cache County Emergency Planning Committee. This notebook contains diagrams of all buildings and rooms at PPRL with an inventory listing the category and approximate amounts of hazards (explosive, flammable, corrosive, electrical, etc.) that are present. The information is reviewed or updated at least annually. PPRL's copy of the notebook is located in the Safety Office (Room 127, Terrie's office).

The following pages outline waste handling, spill response procedures, and recycling. Before beginning any procedure, especially those using large quantities of chemicals or particularly hazardous ones, decide how you will respond to spills. If any hazardous waste accidentally goes into the sewer, immediately notify the CDSO and Logan City (Lynn Miller at 716-9756 or Brad Jones at 716-9757). In addition, the TOMP (Toxic Organics Management Plan) is attached.

CHEMICAL PROCUREMENT FOR WASTE MINIMIZATION

Currently all chemical purchases are made by location employees that have been issued a purchase card or from the USU chemical warehouse operated by the USU Chemistry Department, making it impossible for the CDSO to provide pre-ordering oversight over chemicals and pesticides that are added to our location inventories. Therefore, prior to any chemical or pesticide product purchase and upon receipt, the purchaser will bear all responsibility for knowing shipping, handling, usage, and storage conditions and proper disposal methods. Purchasers are expected to know the potential hazards of substances ordered and to determine if our location facilities and staff are adequately trained and capable of handling these materials. When ordering chemicals or pesticides, order quantities appropriate for intended uses and the minimum practical quantity needed when working with highly toxic and carcinogenic materials. Most chemical suppliers now offer “just-in-time” delivery, so that users can order only the amount of chemical needed for a current task and receive the order at the time it is needed.

The location’s chemical inventory is maintained by the CDSO and is available for employees to review to minimize the amounts of chemicals being stored by preventing unnecessary duplicate purchases. Purchasing excess quantities of chemicals or pesticides above what is actually needed to conduct research that eventually results in the subsequent disposal of large amounts of unused material that may result in a direct charge-back cost to the purchasing researcher. Time-sensitive chemicals such as peroxide formers (diethyl ether, tetrahydrofuran) are to be ordered with a six-month supply as an upper quantity limit.

HAZARDOUS WASTE MANAGEMENT PROCEDURES

Hazardous Waste Determination

Each principal investigator or user of chemicals, pesticides, or materials discarded at the location will be responsible for accurately determining if these wastes are hazardous. Hazardous waste determinations will be conducted using the following resources:

- (1) Reviewing the manufacturer's Material Safety Data Sheet to identify chemical hazards and recommended disposal procedures.
- (2) Determining if the material is found on the EPA "listed" wastes found in 40CFR261 - Subpart D.
- (3) Should a waste not be "listed" by EPA, a determination of the waste's hazard characteristics of corrosivity, reactivity, ignitability, or toxicity will be made (40CFR261 - Subpart C).
- (4) Contacting the Hazardous Waste Manager, Utah State University Office of Environmental Health and Safety Office (USU EHS).
- (5) Contacting the location Collateral Duty Safety Officer (Terrie Wierenga).

Hazardous Waste Storage in the Laboratory

All hazardous waste will be stored in chemically compatible containers matching the anticipated volume of waste to be generated. Radioactive wastes will be stored separately from chemical or pesticide wastes. Likewise, hazardous wastes should never be combined together without prior approval of the Collateral Duty Safety Officer. Each hazardous waste container will be labeled with the words "Hazardous Waste", a list of the hazardous contents, name of the generator, and an accumulation date when the collection container is full. Terrie will put labels on each waste container that clearly show what type of waste is allowed to be placed therein. All hazardous waste containers will remain closed at all times other than times when waste is being added. Any hazardous waste collection area in the laboratory will be posted as a "Satellite Accumulation Area".

Hazardous Waste Removal from the Laboratory

Generators of hazardous waste will notify the Collateral Duty Safety Officer whenever full hazardous waste containers, containers holding hazardous wastes that will no longer be generated, or excess unusable hazardous chemicals that are properly labeled as hazardous waste (see above) are transported and stored in the marshaling areas (Building 45) or waste storage cabinets.

Hazardous Waste Storage in the Hazardous Waste Storage Cabinets / Rooms

This area is located in Building 45 and is maintained under restricted access under the control of the Collateral Duty Safety Officer. All hazardous wastes transported to any waste storage cabinet or accumulation room must be inventoried. Each waste container will be logged into the hazardous waste inventory listing the contents, container size and type, and remaining waste volume in the container. The location's hazardous waste inventory will be maintained and under the control of the CDSO. Hazardous wastes will be segregated and stored in waste cabinets or rooms by chemical compatibility. Periodic inspection of waste containers stored in the marshaling building will be conducted by the Collateral Duty Safety Officer.

Our location is classified as a satellite accumulation waste generator under Utah State University which is classified as a Large Quantity Generator (LQG) based upon the quantity of

waste typically generated on a monthly basis. As a satellite accumulation waste generator, each waste storage area is permitted to accumulate up to 55 gallons or 1 kg (2.2 lbs) of acutely toxic P-listed waste. However, this location will adhere to the management practice of ensuring that the USU EHS is contacted for pickup and disposal at more frequent intervals to avoid accumulating dangerous levels of hazardous wastes on site.

Procedures for Collection of Waste from the Satellite Accumulation Areas

When a determination has been made by the CDSO that sufficient waste quantities have been accumulated in waste cabinets or satellite accumulation areas, a hazardous waste inventory listing hazardous wastes stored will be prepared and submitted to the USU EHS. On the day of the scheduled pickup, the Collateral Duty Safety Officer will be onsite to provide answers to any waste profile questions that may arise or provide Material Safety Data Sheets if needed. The CDSO will point out the nearest safety shower / eyewash unit location near the waste pickup points and the nearest telephone that may be utilized in the event of an emergency. Following pickup, all hazardous wastes will be packaged (lab packed), labeled, transported, manifested, and disposed of by a licensed hazardous waste contractor supplying services to Utah State University.

Procedures for Review and Filing of Hazardous Waste Manifests

The USU EHS office will review the hazardous waste manifests and services rendered statement for accuracy and will sign these documents. All hazardous waste manifests will be forwarded to the appropriate waste destination states. All hazardous waste manifests will remain in a centralized hazardous waste file at the USU EHS office for a minimum of thirty years, but preferably as long as the University is in operation. In addition, the CDSO will maintain indefinitely the waste manifests showing what was picked up by USU EHS.

Note: Work is underway to construct a building immediately south of the main lab that will be used for bulk chemical storage, large scale plant extractions, hazardous waste storage/marshaling area, and tissue storage (tissues in neutral buffered formalin). Once this building is in place, bulk and flammable chemicals and any hazardous waste will be moved from Building 45 and an area will be clearly marked for marshaling of hazardous waste containers. This new building should be in place by spring of 2006.

SPILL RESPONSE

PRE-INCIDENT

1. Inventory all chemicals in laboratory or work area.
2. Obtain MSDS (Material Safety Data Sheets) for all chemicals in the lab.
3. Become familiar with the chemical hazards in your work areas.
4. Determine classes or categories of chemicals based on spill response needs, i.e., acids, caustics, flammables, mercury.
5. Determine where readily available appropriate clean-up equipment can be obtained. The CDSO has placed portable spill cleanup kits in each area where chemicals are used or stored.
 - a. spill media
 - b. PPE (Personal Protective Equipment)
 - c. brooms, aspirators, etc.
 - d. containers
 - e. waste labels
6. Understand the use and limitations of equipment.
7. Know how to contact additional help for high hazard releases or injury.
 - a. Emergency - 911
 - b. USU Safety Office - 797-2892
 - c. CDSO (Terrie) – 770-9061 or ext 1127 during work hours
 - d. Logan City – Lynn Miller (716-9756) or Brad Jones (716-9757)

POST-INCIDENT

PROTECT HUMAN HEALTH AND SAFETY FIRST, THEN ENVIRONMENT

1. Immediate actions to be taken by all involved employees.
 - a. Clear the affected area.
 - b. Check for individual involvement.
 - c. Isolate the spill (if safe to do so).
 - d. Contact Emergency (911) if any personal contamination or injury.

2. Determine the level of risk.
 - a. What chemical is involved?
 - b. How much is involved?
 - c. Where is the location of the spill?

For LOW RISK situations, follow step 3.

For HIGH RISK situations, follow step 4.

3. Low risk spills
 - a. Do not work alone; use a minimum of two workers.
 - b. Inform supervisor, principal investigator, and/or emergency personnel including the Safety Team or Safety Office and Logan City Environmental Department of the spill and the status of the response.
 - c. Use proper protective equipment:
 - Air-purifying respirator
 - Proper gloves
 - Body protection, i.e., tyvek
 - Chemical-resistant footwear
 - Proper spill control media
 - Appropriate clean-up equipment

4. High risk spills
 - a. Activate Campus Emergency Response Team by contacting the Safety Office at 797-2892 and/or Campus Emergency at 797-3333.
 - b. If other local professional emergency response is necessary, call 911 and request support from:
 - Fire Department
 - Police
 - Ambulance
 - c. Remain available to provide information to response team.
5. Ensure personal safety of response personnel.
6. Clean-up, containerize, and decontaminate the area.
 - a. Control source of leak.
 - b. Contain free liquids by diking and absorbing, if appropriate.
 - c. Place all spill residues in an appropriate container. Maintain fire protection as necessary.
 - d. Label waste for pick-up and disposal.
 - e. Decontaminate and salvage equipment, as needed.
7. Analyze the affected area for proper decontamination and safety.
 - a. Use monitoring and detection equipment, if needed.
 - b. Check area equipment for unresolved problems.
 - c. Check area floors, walkways for hazards.
8. Secure all response equipment.
 - a. Restock spill supplies.
 - b. Restock PPE and other equipment, as needed.
9. Release area for resumption of activities.



QUICK RECYCLING GUIDE

You are responsible for recycling the waste you generate at work. Please take your recyclables to an appropriate collection site or contact the individual listed as described below.

Aluminum cans: Take to a central collection site (breakroom); crush in can crusher. *Cans only. NO aluminum foil.*

Batteries: Take small electronics batteries, to include alkaline and nickel cadmium, and automotive batteries to Terrie for disposal/recycling.

Cardboard: Take boxes to dumpster area outside; break down flat and place in large bins. Small pieces from mail can be placed in “Cardboard” receptacles at central collection sites (mailroom).

Catalogues and Magazines: See “Paper”.

Computer equipment: See Terrie. Most of this can be recycled through USU.

Fluorescent light bulbs: See Terrie.

Freon: See Terrie before disposing of refrigerators or freezers. Landfills or other sites require certificates stating that Freon has been properly collected and the system purged.

Furniture/Equipment: See Terrie. All furniture and equipment purchased by the government is on an inventory even though there may not be a bar code tag affixed. There are certain procedures that must be followed before disposal or resale.

Newspaper: See “Paper”.

Packing/styrofoam peanuts: Currently, we have no central site for storage of these items. Each lab generally collects some for their own use. *Peanuts and pellets only. NO bulk styrofoam or mailing coolers allowed.*

Paper to Include catalogues & magazines, envelopes, all glossy paper (ads, inserts, flyers, etc.), newspaper, and all office paper (copy paper, printer paper, white paper, colored paper. Place in any receptacle labeled “Everything Paper”. Please remove shrink wrap or any bubble wrap, paper clips, or spiral and comb bindings before you place it in a receptacle. You do not need to separate paper products except for cardboard.

Plastic pesticide containers: Dispose of according to label directions. Eric has been certified as a non-commercial applicator and will be able to help you with more information.

Printer cartridges: Contact Chris.

Used Motor Oil: See Al or Danny. Most of the oil changes are done at the USU Motor Pool; therefore, they will be responsible for collection. Any used motor oil from PPRL will be taken to the Logan Landfill & Recycling Center.

Vacuum pump oil: Contact Terrie.