

# MANAGEMENT OF SPILLS

Each Principal Investigator (PI) is responsible for providing a **Laboratory Spill Control Kit** appropriate for the variety and quantities of chemicals, biohazardous agents, and radioactive materials present in that research area. Consult the Material Safety Data Sheets (MSDSs) for specific spill control information and call **EHS** for assistance.

## Chemical Spills

Chemical use, storage, transportation, and disposal are fundamental activities in any research area. Laboratory workers should pay special attention to those procedures which have higher probabilities for accidents, and take steps to avoid problems. Some of these steps include the following:

- ! Storing chemicals safely on sturdy shelves and in the proper storage areas.
- ! Inspecting chemical storage areas periodically to ensure the physical integrity of the containers and their labels.
- ! Using secondary containment for acids, bases and other corrosives to provide additional control measures in the case of an accidental chemical release.
- ! Transferring chemicals from container to container with mechanical pumps where possible to prevent spillage.
- ! Reducing unnecessary clutter and obstructions in the work area to limit the number of random hazards (tripping, breaking glassware, knocking over equipment, etc.).
- ! Storing chemicals by chemical group or hazard class, not by alphabetical order.

## Simple Chemical Releases

A simple chemical release is generally small in quantity, gradual in dispersion, and easy to contain. Simple releases should be contained with the laboratory spill control kit. The PI or the laboratory supervisor must be informed when this type of release occurs. The following are some routine procedures to use with a simple chemical spill:

- ! *Neutralize acids and bases whenever possible.* Use baking soda (sodium bicarbonate) or some other appropriate neutralizer.
- ! *Control and absorb liquid releases.* Use absorbent materials (vermiculite, kitty litter, oil dry, etc.) to dike the contaminated areas and prevent the spread of a liquid release.
- ! *Store waste absorbent materials properly.* After cleaning the release area, place waste products in a properly labeled container and contact **EHS** for disposal.
- ! *Decontaminate the area and affected equipment.* Increase ventilation to the area by using fans or opening windows if available. Contact **EHS** for an indoor air quality assessment if necessary.

When dealing with a simple release, make sure to properly label all disposal bags with the names of the spilled chemicals and the approximate amounts. Also include on the label "contains broken glass," where appropriate. Always restock the spill control kit after completing clean-up to make sure the kit is ready for the next occurrence.

## Complex Chemical Releases

Complex chemical releases require outside assistance from properly trained individuals. These involve the release of large amounts of chemicals. Containment should not be attempted by laboratory personnel. Researchers should evacuate and isolate (close doors) the area and immediately contact Public Safety and **EHS**.

**EHS** has on file specific emergency response contingency plans for complex chemical releases for each of the four major campuses. These plans outline additional contact information, primary coordinators, and the appropriate procedures which are to be followed in the event of a major chemical release. Copies of these plans are maintained by **EHS**.

### **Accidental Release of Biohazardous Agents**

Laboratories in which biohazardous agents are used must have the ability to contain and control accidental releases of these agents. The laboratory spill kit must incorporate the appropriate items to accomplish containment which should include, but not be limited to, the following: an appropriate disinfectant/decontaminant, proper personal protective equipment (gloves, goggles, etc.), and **RED** biomedical waste disposal bags. Laboratory procedures and biohazardous agents present in a specific laboratory will determine what additional items may be necessary.

Examples of suggested disinfectants/decontaminants can be found in *Table IX* of the section on Employee Health. For more information concerning the use and disposal of biohazardous agents, see the section on the Disposal of Biomedical (Infectious) Waste.

### **Spills of Radioactive Substances**

The accidental release of radioactive substances falls into two primary categories:

- ! *Minor incidents* involving less than 10  $\mu\text{Ci}$  in a volume less than 10 ml or at a concentration less than 0.00045  $\mu\text{Ci/ml}$  and not involving personnel contamination or injury.
- ! *Major incidents* involving more than 10  $\mu\text{Ci}$  or a volume of more than 10 ml at a concentration of greater than 0.00045  $\mu\text{Ci/ml}$  or any incident involving personnel contamination or injury or any spill occurring outside of an approved area of use.

The procedures for dealing with both types of incidents include, but are not limited to, the following:

1. Notification of personnel in the affected region,
2. Containment of released substances, and
3. Decontamination of the affected area.

Surveys of the area for residual contamination are also required as well as reporting all accidental releases to the Radiation Control Center. See the section on Radioactive Substances for more information on managing accidental releases of radioactive materials.

### **Laboratory Spill Control Kit Contents**

*Table XI* presents a list of *suggested* materials for individual spill control kits. **Note: Not all the materials on this list are required to complete a spill control kit, only those which apply to a particular laboratory setting.**

**Table XI Suggested Items For Laboratory Spill Control Kits**

COMPONENTS	QTY <sup>1</sup>	PURPOSE
(1) Vermiculite (clay)	10 lbs.	absorbent for organic solvents
(2) Sodium Bicarbonate	10 lbs.	neutralizes acid (base) spills
(3) Oil Dry (oil absorbent)	10 lbs.	absorbent for oil spills
(4) Sodium Hypochlorite (bleach)	1 gal.	disinfectant for biohazardous spills
Plastic bucket	1 unit	hold items (1) to (4)
Absorbent pads/ paper	6 units	absorb radioactive/biohazardous spills
Sulfur	1 lb.	reactant for mercury spills
Mercury "sniffer" bottle	1 unit	pick-up mercury droplets
Nitrile or neoprene coated gloves	2 pairs	personal protective equipment
Disposable gloves	1 box	personal protective equipment
Safety Goggles	2 pairs	personal protective equipment
Whisk broom or bench brush	2 units	collect spill waste
Dustpan	2 units	collect spill waste
Polyethylene bags	6 units	collect and dispose waste
Impermeable red biomedical waste bags	6 units	dispose biomedical waste
Duct tape	1 roll	seal spill waste in bag
Other (as needed)		

<sup>1</sup>These quantities are the minimum suggested per laboratory. Items may be added to or deleted from the spill kit depending on the variety and quantities of chemicals in that laboratory. Additional items can include absorbent towels, spill pillows, mops, etc.

## **ACCIDENTS AND EMERGENCIES**

All laboratory personnel should know what to do in case of an emergency. Laboratory work should not be undertaken without knowledge of the following points:

- ! How to report a fire, injury, chemical spill, or other emergency.
- ! The location of emergency equipment such as safety showers and eyewash fountains.
- ! The location of fire extinguishers and spill control equipment.
- ! The locations of all available exits for evacuation from the laboratory.

The Principal Investigator should ensure that all employees are familiar with this information.

Laboratory workers should be aware of their level of expertise with respect to use of fire extinguishers and emergency equipment, dealing with chemical spills, and dealing with injuries. They should not take actions outside

the limits of their expertise but instead should rely on trained personnel.

Names and 24-hr telephone numbers of responsible individuals should be posted in a highly visible area in the laboratory (e.g., on the entrance door). General emergency information can be found on the inside cover of this Manual.