Chemical Spill Response Guide

EMERGENCY CONTACT PHONE NUMBERS

<table>
<thead>
<tr>
<th>Contact</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Services</td>
<td>902 494 4109 (Halifax)</td>
</tr>
<tr>
<td></td>
<td>902 893 4190 (Truro)</td>
</tr>
<tr>
<td>Environmental Health and Safety Office</td>
<td>902 494 2495 (Halifax)</td>
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<tr>
<td></td>
<td>902 893 2446 (Truro)</td>
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INTRODUCTION

Chemical spills can occur in the laboratory, or when transporting chemicals. In either situation all personnel should be prepared to respond. Principal investigators, supervisors, staff, students, and any individual working with chemicals should be familiar with the chemical, physical, and toxicological properties of hazardous products in the laboratory or work area. Consult the label and the SDS prior to the initial use of each hazardous product. Planning ahead and equipping the laboratory or work area with the required equipment will ensure a quick, safe and effective response. In the event of an accidental chemical release or spill, personnel should refer to the following general guidelines.

HANDLING CHEMICAL SPILLS

Personnel should be able to clean up incidental spills of the materials they use. Any cleanup should be performed while wearing appropriate PPE (Personal Protective Equipment). Large spills, such as those equal to or greater than 4 L, may require materials, protective equipment, and special handling that make it unsafe for cleanup by laboratory workers themselves.

Personnel should know or have the following in place:

- Read and understand this document and/or complete the Chemical Spill Response training course
- Create or review the chemical spill response plan for the laboratory or work area

Be prepared to provide emergency responders with information on the chemical involved in the incident.

Spill Determinations

A Minor Spill requires a non-emergency response where an incidental release of a hazardous material can be absorbed, neutralized, or otherwise controlled at the time of release by personnel in the immediate area. This type of spill meets the following conditions:

- the material spilled is known
- the properties of the material are known or the SDS is accessible
- appropriate personnel protective equipment is available to be used (e.g. gloves, eye protection, booties)
- the necessary materials to clean up the spill are available
- personnel are trained to use the spill control kit for this material
A **Major Spill** is a situation that poses an immediate threat to personal safety and health, the environment, or property that cannot be controlled and corrected safely and easily by personnel at the scene. A major spill requires contacting Dalhousie Security for assistance, and is one in which any of the following conditions apply:

- someone has been injured
- a fire or explosion has, or is likely to occur
- the material spilled is highly toxic
- the spill is in a common area (e.g. hallway) or other area accessible to the general public
- the spill requires a specialized response (e.g. Hydrofluoric Acid)
- the material spilled is unknown
- a personnel are unsure whether the spill should be considered “Minor” or “Major”

**Chemical Spill Response**

It is important to only respond to spills within your capability. Establish whether this is a minor or major spill. If you feel confident of your ability to deal with the spill and you are sure that you and others in the building are not in danger:

- Assess the scene. Do not rush. Do not leave the spill unattended. Carefully plan cleanup.
  - Get SDS and determine appropriate cleanup procedures for the material.
- Decontaminate any victim at the nearest safety shower or eyewash station. Take other appropriate action as described in the SDS.
- Notify other personnel in the laboratory and/or surrounding area.
- Limit or restrict access to the area as necessary.
  - Do not allow unauthorized personnel to enter the contaminated area.
- Stop the source of the leak or spill.
  - Shut off gas cylinders to stop the flow of gas, if this is the fuel source.
- Eliminate all sources of ignition (e.g. flames, spark-generating equipment).
- Provide ventilation to capture or direct flow of vapours.
- Obtain the required spill supplies, put on appropriate protective equipment.
- Use a spill sock or absorbent to dike around floor drains and prevent contaminants from entering sanitary sewer.
- Remove other materials from around the spill area to prevent cross contamination and tripping hazards.
- Work in teams. One person cleans the spill; the other should remain outside of the contaminated area and hand supplies to person cleaning.
- Contain the spill by placing a ring of absorbent material around it.
- Using forceps or tongs, remove broken glass or sharp objects and place in a container.
• Place additional absorbent pads on the spill, starting at the edges and moving toward the center of the spill site. Add more absorbent pads if the spill area appears to be wet or there is still free liquid. Repeat until all liquid is absorbed.
• Place used absorbent pads in a plastic bag, along with other spill cleanup materials. Wipe the spill area with a damp paper towel and place in the plastic bag. Dispose of contaminated materials in accordance with the Chemical Waste Disposal Program.
• Report the spill immediately to your supervisor and submit an Accident/Incident Report to the EHS office.

If you cannot respond safely:

1. Secure the area without endangering yourself.
   • Turn off any electrical equipment.
   • Extinguish flames.
   • Shut off gas cylinders to stop the flow of gas.
   • Restrict access to the spill area and notify others in proximity.
2. Evacuate the area.
3. Close, but do not lock the door behind you.
4. Call Dalhousie Security. If there is a medical emergency, indicate that an ambulance is required. Provide the following information:
   • Your name and phone extension.
   • Exact location of spill (building and room number).
   • Name of material spilled.
   • Quantity of material spilled.
   • Information on injuries to personnel.

SPECIAL SPILL PROCEDURES

Biohazard Spill
Clean-up of biohazardous spills involves special considerations due to the potential for infectious aerosols. Refer to the Biosafety and Procedures Manual.

Radioactive Material Spill
Clean-up of radioactive materials involves some special consideration in regards to the monitoring of area to ensure effective clean-up. Refer to the Radiation Safety Program and Procedures Manual for details.

Hydrofluoric Acid Spill
Hydrofluoric acid (HF) has a number of physical, chemical, and toxicological properties that make it especially hazardous to handle. Handle with extreme caution. Use Calcium carbonate or Calcium bicarbonate to tightly bind the fluoride ion. Due to the corrosive
and toxic properties of HF, individuals working with HF must be appropriately trained to handle spills.

Mercury Spills
Mercury poses significant hazards to the environment and potential health hazards to the occupants of the space if not cleaned up properly. For small mercury spills a commercially available mercury spill kit may be used. For major spills involving mercury, a special mercury vacuum can be provided.

Physical removal processes are best for removing and collecting mercury.

- Collect the droplets by consolidating the small droplets to larger pieces by using a scraper or a piece of cardboard.
- Use commercial mercury spill cleanup sponges and spill control kits, such as Merconvap® (not stocked in general spill kits). These can be used for fine drops of mercury in inaccessible sites.
  - While powdered sulfur will help reduce mercury vapors, it is generally ineffective for spill cleanup.
- Dispose of waste mercury through the Dalhousie Chemical Waste Disposal Program.

Solid/powder Spills
Respond to the spill wearing the appropriate personal protective equipment: gloves, safety eye wear, and a lab coat or coveralls. If airborne dust is present, wear a respirator only if you have been successfully fit tested for that particular model.

- Collect the chemical using a dust pan and brush, being careful to avoid creating airborne dusts.
- Place the collected material in a securely closed container.
- Wash area of spill thoroughly with soap and water.

Water Reactive/Pyrophoric
Water reactive or pyrophoric materials can ignite readily upon contact with water or air, which makes them particularly hazardous to work with.

In the event of a spill, do not use combustible materials (i.e. paper towels) to clean up the spill, as this may increase the likelihood of ignition. Soda ash or dry sand should be used to completely cover and smother any spilled material. As soon as possible after the water reactive has been absorbed by a suitable absorbent, quench the cleanup debris based on established protocols.

In the case of a metal fire, smothering the fire is a better course of action than use of water. The recommended fire extinguisher is a standard dry powder (ABC) type. Class D extinguishers are recommended for combustible solid metal fires (e.g. sodium, LAH -
lithium aluminium hydride, but not for organolithium reagents. Do not use water to extinguish a reactive fire.

INJURIES
In the event of any chemical spill, attend to injuries first. The SDS must be consulted for guidance on appropriate spill response and first aid requirements. Move the victim only if the site of the incident is unsafe. Wear gloves and other protective equipment while tending to the victim to ensure your own safety. While attending to the victim, have someone call Dalhousie Security.

Eye Contact
If the victim’s eyes have come into contact with the chemical, flush the eyes with lukewarm water until medical assistance arrives, preferably at an emergency eye wash station located nearby. Encourage the victim to hold their eyelids open while flushing with water. After the initial flushing, ask the victim if they are wearing contact lenses, and if so, to remove them.

Skin Contact
If the chemical has come in contact with the victim’s skin, have them remove any contaminated pieces of clothing. Guide them to the nearest emergency shower and flush with copious amounts of water until medical assistance arrives. Do not place ointment, cream, or similar materials on skin that has been in contact with the chemical.

Inhalation or Ingestion
In the event of inhalation or ingestion, do not give the victim anything to eat or drink. Have the victim rinse their mouth thoroughly with lukewarm water if the chemical has been in contact with the mouth. Ensure that the victim does not swallow the rinse water. Provide supportive care until medical assistance arrives.

CHEMICAL SPILL PREVENTION
Note that the majority of chemical spills can be prevented or minimized by:

1. Maintaining a neat and organized work area;
2. Performing a laboratory procedure review prior to conducting new experimental procedures;
3. Use secondary containment. These can be used for storage and transportation of chemicals.
4. Keeping reagent chemical containers sealed or closed at all times, except when removing contents;
5. Ordering reagent chemicals in plastic or plastic coated glass containers whenever possible;

6. Performing frequent inspections of chemical inventory (e.g. container integrity, proper storage, etc.).

SPILL KIT LOCATION AND SUPPLIES
Dalhousie University’s Environmental Health and Safety Office supplies general chemical spill kits that are to be used in the event of Minor Spill. The shared spill kits are located in areas in proximity to laboratories where it can be easily accessed. The EHS Office will inspect the kits to ensure that required supplies are present and in good condition on an annual basis or more often if deemed necessary. Personnel should familiarize themselves with the location of the nearest spill kit.

*To open the kit, break open the tamper tape and pull lid off of drum.*

A standard shared chemical spill kit at Dalhousie University contains the following items:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency response guidebook</td>
<td>1</td>
</tr>
<tr>
<td>Goggles</td>
<td>1</td>
</tr>
<tr>
<td>Nitrile gloves</td>
<td>1 pair</td>
</tr>
<tr>
<td>Disposable bags</td>
<td>5</td>
</tr>
<tr>
<td>18”x18” absorbent pillows*</td>
<td>2</td>
</tr>
<tr>
<td>3”x12” absorbent sock*</td>
<td>1</td>
</tr>
<tr>
<td>3”x4” absorbent sock*</td>
<td>5</td>
</tr>
<tr>
<td>16”x20” absorbent pads*</td>
<td>15</td>
</tr>
<tr>
<td>Barrier gloves</td>
<td>1 pair</td>
</tr>
</tbody>
</table>

*Chemicals still retain their hazardous properties once absorbed by the absorbent materials. Additionally, the absorbent materials do not contain neutralizing components.*
Refer to the EHS Office website for the most up to date information regarding the location of the shared chemical spill kits. In short, they are located in all major buildings in which labs or research is conducted on the Agricultural and Halifax campuses.

*Note: Laboratory personnel should supplement their lab spaces with additional spill cleanup items based on the materials present in the laboratory or area. These supplement kits must be maintained by the individual responsible for that space.*