

Calvin College Spill Response Plan		Revision 1	
Prepared by: Heather Chapman	Date: 6/25/09	Approved by:	Date:

1.0 Purpose

This spill response plan provides guidelines on the response to a chemical spill on Calvin's campus.

2.0 Definitions

Emergency Spill: A hazardous material spill where any of the following are true:

- People have symptoms of exposure (dizziness, headaches, eyes are burning, breathing difficulties, skin is affected)
- Chemicals are mixing and heat or vapors are being released
- Spilled material can't be identified
- People involved are unsure of the spill type or how to respond
- Building has been evacuated
- The hazardous material is flammable, explosive, under pressure, radioactive, infectious or highly toxic

Flammable Liquid: A liquid with a flashpoint below 100F

Hazardous Material: Anything that can cause fire or explosion, skin or inhalation hazard, or environmental contamination)

High Hazard Spill: A spill/release that is immediately dangerous to life or health, involves a large area (i.e., an entire lab), there are injured personnel, involves material that is radioactive, infectious, toxic, corrosive or reactive. If you do not know the nature of the emergency or are in any way uncertain as to how to identify or classify the spill, use the Emergency Spill procedures and contact EHS immediately.

High-Risk Areas: Areas deemed to have a higher risk of a chemical spill. These areas include: Grounds, Paint, Transportation, Chemistry, Biology

Low Hazard Spill: A small (i.e., localized within a few square feet) spill that does not present a fire hazard or involves low to moderately toxic material. In this situation, employees who have received training may follow the precautions and procedures outlined in the chemical's MSDS to clean-up the spill after consulting with EHS.

Material Safety Data Sheet (MSDS): is a document that contains information on the potential health effects of exposure to chemicals, or other potentially dangerous substances, and on safe working procedures when handling chemical products.

Personal Protective Equipment (PPE): includes all clothing and other work accessories designed to create a barrier against workplace hazards.

Spill Advisory Team: Faculty and staff that have received training in emergency response and chemical hazards and have special knowledge and/or experience in chemical spill response. The team consists of Jennifer Ambrose, Heather Chapman, Dan Gordon, and Chad Tatko. These team members can serve as advisors in the event of a spill when determining if outside expertise is required.

3.0 Procedure

If the chemical spill is considered a low-hazard spill (as defined above), and you are properly trained and aware of the hazards presented by the spill, then follow the procedures outlined in Appendix A. If you are uncomfortable with the situation or need assistance, contact CS promptly.

If the chemical spill is considered a high-hazard or emergency spill (as defined above), do NOT attempt to clean up the spill. Evacuate the area and report the incident immediately to Campus Safety at x3-3333. Campus Safety & a member of the Spill Advisory Team determine the need for outside assistance.

4.0 Training

The Spill Advisory Team will go through tabletop exercises at least once every two years to review proper spill mitigation techniques for a variety of chemicals and situations.

All employees will receive training on spill response at the time of hire.

Employees working in areas considered high-risk for spills will go through training at least once every two years.

5.0 Appendices

Appendix A: Spill Mitigation Techniques

Appendix B: Internal Notifications & Emergency Phone Numbers

Appendix C: Campus Safety Spill Procedure Flow Chart

Appendix D: Hazardous Material Incident Form

6.0 History

Revision	Date	Description
1	6/1/09	Reformatted policy adding sections 1.0 – 6.0

Appendix A

Material Specific Clean Up Procedures

Flammable Liquids

1. Remove all potential sources of ignition, when possible. If, however, the vapors from a flammable spill are in the vicinity of an ignition source, such as a pump, it may be advisable to shut off power from a remote circuit breaker box, instead.
2. Wear appropriate PPE: gloves, clothing, goggles and possibly boots.
3. It is important to avoid breathing vapors from spilled solvents. Approach the spill from upwind. Use appropriate respiratory protection.
4. Have another responder in the area with a fire extinguisher in case a fire should break out during the spill treatment.
5. Apply SpillSolv Solvent Granules around the edge of the spill area. Take care not to splash.
6. When diking is complete, begin applying granules inward from the edges, working toward the center of the spill. Cover the entire spill.
7. Once the spill is absorbed, apply additional SpillSolv Solvent Granules to suppress vapors and elevate the flash point to safer levels. This will require the addition of approximately the same amount as used to absorb the spill.
8. Typically, 600-700 grams of SpillSolv Solvent Granules will absorb 1 liter of solvent. To elevate the flash point of spills to 140 degrees F for safe transport will require 3.5 – 4.5 kg of the material per liter of solvent.
9. Use non-sparking tools to sweep up material.
10. Never use a vacuum cleaner or shop vac to collect flammable liquids.
11. Contain spill cleanup materials in a sturdy plastic bag or lined plastic pail. Top off the container with additional granules.
12. Label with the date, contents and name of department person responsible.
13. Transferred to a sturdy hazardous waste drum in SB055.
14. Thoroughly ventilate the area when done.

Acids

1. Wear appropriate PPE: gloves, clothing, goggles and possibly boots.
2. It is important to avoid breathing vapors from spilled acid. Approach the spill from upwind. Use appropriate respiratory protection.
3. If possible, dilute a concentrated acid spill with water before using SpillSolv Acid Powder, to reduce the generation of heat and fumes.
4. Apply SpillSolv Acid Powder around the edge of the spill area. Take care not to splash.
5. One kilogram of SpillSolv Acid Powder will neutralize approximately:
 - a. 500 mL of Sulfuric Acid 96%
 - b. 550 mL of Phosphoric Acid 85%
 - c. 660 mL of Nitric Acid 70%
 - d. 1250 mL of Hydrochloric Acid 32%
6. When diking is complete, begin applying powder inward from the edges, working toward the center of the spill. Cover the entire spill.
7. The pink color will initially disappear, but the mixture will remain pink when sufficient SpillSolv Acid Powder has been applied to neutralize the spill.
8. Several minutes may be required for the chemical reaction to be completed. During this time, observe the spill area carefully for pools of liquid acid. If there are liquid areas remaining, they require additional treatment.

9. Some mild steaming and foaming will occur. This is normal, and it means that the SpillSolv Acid Powder is neutralizing the acid.
10. Once the steaming and foaming has stopped, carefully mix the slurry material with the scoop provided in the kit to be sure that all liquid is mixed with the powder. The mixture can be quite hot at this time.
11. Once the pink color has reappeared and the mixture has cooled, take a small sample of the material and test the pH.
 - a. Mix the residue sample with a small amount of water. If the indicator remains pink the spill has been thoroughly mixed with SpillSolv Acid Powder.
 - b. You may also place 10 cc of the cooled residue in a non-metallic container with 80-100 mL of distilled or deionized water to check the pH. Some foaming may occur and the mixture may become warm. Add an additional 50 mL of water slowly to the container. If there is severe foaming or a substantial amount of heat is generated, the test must be discontinued since the spilled material has not been neutralized. Additional powder should be applied to achieve neutralization.
 - c. Check the pH with pH paper or a pH meter. A pH of 7 or higher indicates that the acid spill has been neutralized.
12. After determining that the mixture is neutralized, scoop the material into appropriate containers and Label with the date, contents and name of department person responsible.
13. Transferred to a sturdy hazardous waste drum in SB055.
14. Thoroughly ventilate the area when done.

Caustics

1. Wear appropriate PPE: gloves, clothing, goggles and possibly boots.
2. It is important to avoid breathing vapors from the spilled caustic. Approach the spill from upwind. Use appropriate respiratory protection.
3. If possible, dilute a concentrated caustic spill with water before using SpillSolv Caustic Powder, to reduce the generation of heat and fumes.
4. One kilogram of SpillSolv Caustic Powder will neutralize approximately:
 - a. 1 L of Sodium Hydroxide 50%
 - b. 1.2 L of Potassium Hydroxide 45%
 - c. 2 L of Ammonium Hydroxide 30%
5. Apply SpillSolv Caustic Powder around the edge of the spill area. Take care not to splash.
6. When diking is complete, begin applying powder inward from the edges, working toward the center of the spill. Cover the entire spill.
7. The powder turns purple to pinkish purple initially, but the mixture will slowly turn yellow and remain yellow when sufficient SpillSolv Caustic Powder has been applied to neutralize the spill.
8. Several minutes may be required for the chemical reaction to be completed. During this time, observe the spill area carefully for pools of liquid caustic. If there are liquid areas remaining, they require additional treatment.
9. Some mild steaming will occur. This is normal, and it means that the SpillSolv Caustic Powder is neutralizing the caustic.
10. Once the steaming has stopped, carefully mix the slurry material with the scoop provided in the kit to be sure that all liquid is mixed with the powder. The mixture can be quite hot at this time.
11. Once the yellow color has reappeared and the mixture has cooled, take a small sample of the material and test the pH.

- a. Mix the residue sample with a small amount of water. If the indicator remains pink the spill has been thoroughly mixed with SpillSolv Caustic Powder.
 - b. You may also place 10 cc of the cooled residue in a non-metallic container with 80-100 mL of distilled or deionized water to check the pH. Some steaming may occur and the mixture may become warm. Add an additional 50 mL of water slowly to the container. If there is severe steaming or a substantial amount of heat is generated, the test must be discontinued since the spilled material has not been neutralized. Additional powder should be applied to achieve neutralization.
 - c. Check the pH with pH paper or a pH meter. A pH of 7 or lower indicates that the caustic spill has been neutralized.
12. After determining that the mixture is neutralized, an absorbant may be used for the remaining liquid to make disposal easier. Scoop the material into appropriate containers and Label with the date, contents and name of department person responsible.
 13. Transferred to a sturdy hazardous waste drum in SB055.
 14. Thoroughly ventilate the area when done.

Mercury

1. Evacuate the room place floor signs (available in Biology & Campus Safety) or yellow caution tape to prevent anyone from entering the room.
2. Contact Environmental Health & Occupational Safety officer (unless they are already involved in the clean up).
3. For a spill of less than 1cc (such as a thermometer) one person can be expected to perform the clean up.
4. For a larger spill, over 1cc, 2 trained people are expected to work together to perform the clean up.
5. Wear appropriate protective equipment:
 - a. Gloves and goggles for spills of less than 1cc.
 - b. Gloves, goggles and respirator for spills larger than 1cc.
6. Never use a vacuum cleaner to clean up mercury. A vacuum cleaner will spread mercury vapors and tiny droplets and increase the area of contamination.
7. Follow steps found in Mercury Spill Kit Instructions:
 - a. For larger spills collect free mercury using the mercury vacuum device that is available in Chemistry. Follow specific directions for use found in that kit.
 - b. Apply vapor suppressor (if available) as directed on package.
 - c. Sprinkle Hg Absorb powder over the surface of the mercury.
 - d. Wet the powder with water.
 - e. Work the Hg Absorb powder into mercury with scraper to form an amalgam.
 - f. Scrape residual amalgam into dustpan and place in disposal bag.
 - g. To pick up residual mercury wet a mercury Ag Absorb sponge with water to activate the coating.
 - h. Wipe contaminated surface with coated sponge to amalgamate all free mercury on surface.
 - i. Place sponge in disposal bag.
 - j. Sprinkle mercury indicator over surface that has been "cleaned".
 - k. According to package directions, wait for a color change that may indicate residual mercury.
8. The mercury amalgam disposal bag must be labeled with the date, contents and name of department person responsible, and transferred to a sturdy hazardous waste drum in SB055.
9. Coordinate follow-up cleaning with Physical Plant if necessary.

10. Replace mercury spill kit contents as needed.

Formaldehyde

1. Evacuate the room and place floor signs (available in Biology & Campus Safety) or yellow caution tape to prevent anyone from entering the room.
2. Contact Environmental Health & Occupational Safety officer (unless they are already involved in the clean up).
3. A spill of less than 2 liters can be cleaned up by 2 Calvin people who have training and expertise.
4. Spills greater than 2 liters may be cleaned up by 2 Calvin people who have training and expertise or the Grand Rapids Hazmat Response Team may be called in.
5. Turn off all ignition sources in the area.
6. Wear appropriate protective equipment.
 - a. Gloves, goggles, and respirator (other equipment such as boots and splash suit as deemed necessary).
7. Clean up procedure:
 - a. Contain spill with absorbents or socks.
 - b. Apply formaldehyde polymerizer according to package directions (available in Biology).
 - c. Scrape polymerized compound into dustpan and place in disposal bag.
 - d. Place all sorbants and other materials used in disposal bag
 - e. Clean the area completely with water.
8. The disposal bag must be labeled with the date, contents, and name of department person responsible and transferred to a sturdy hazardous waste drum in SB055.

Biological Spills

1. Don appropriate PPE for the potential infectious material encountered. This could include gloves, lab coat, face shield, goggles, dust mask, HEPA mask, etc. Think exposure routes and protect yourself accordingly.
2. If the spilled material can be transmitted via the inhalation route then clear the area and warn others of the spill. Wait a period of time and then enter the area. This will allow most of the aerosol to settle or be captured by the building exhaust.
3. Make sure the spill does not spread and contaminate other areas.
4. Cover the spilled material with absorbent towels and carefully pour a suitable disinfectant on the area. When pouring the disinfectant start at the edge and spiral in toward the center of the spill. When selecting a disinfectant for the kinds of material used in the lab one should make sure the label indicates that it is tuberculocidal. This designation indicates that the disinfectant has received an EPA approval and can be used on a myriad of agents.
5. Remember two factors are associated with proper disinfection: concentration of the disinfectant and contact time. Follow the manufacturer's directions for mixing disinfectants.
6. Carefully place all the materials in the proper medical waste container. Any contaminated glass should never be handled with hands. Use only tongs, dust pan and broom, hemostats, etc. and carefully place the broken glass in an approved sharps container. The rest of the spill clean up can then be placed in red bags for proper disposal as you normally would any other medical waste.
7. Place all disposable PPE in the medical waste container and complete the spill clean up by carefully washing hands with soap and water.
8. Report incident to lab manager as soon as possible and subsequently, EHS.

Appendix B Internal Notifications and Emergency Contact List

In the event of a spill that warrants internal notifications (such as emergency or high hazard spill), contact one of the following Spill Advisory Team members:

1. Environmental, Health & Occupational Safety
 - a. Heather Chapman, EHOS Officer
 - i. Office: 616-526-8591
 - ii. Cell: 616-299-2246
 - b. Jennifer Ambrose, EHOS Officer
 - i. Office: 616-526-6342
 - ii. Cell: 616-262-6254
2. Campus Safety
 - a. In an emergency, use x3-3333 (or 526-3333 from a cell phone)
 - b. In a non-emergency situation, contact Dan Gordon
 - i. Office: 616-526-6710
 - ii. Cell: 616-292-3748
3. Chemical Hygiene Officer
 - a. Chad Tatko, Chemistry Asst. Professor
 - i. Office: 526-7584
 - ii. Cell: 703-943-8019

Reference Numbers:

Contact	Name	Cell	Office	Home
To get POWER shut down	Marc Huizinga	299-3975	526-7074	784-0057
	Luke DeVries	262-6748	526-6859	949-7872
	Don Winkle	437-2643	526-6270	532-1663
To get RETURN AIR or HVAC shut down	Marc Huizinga	299-3975	526-7074	784-0057
	Dan Slager	262-5838	526-6267	896-9716
To get GAS shut off	Marc Huizinga	299-3975	526-7074	784-0057
	Clayt Meyer	262-5833	526-7439	795-2182
	Bob Vandenberg	262-6922	526-6851	531-0318
Campus Safety	Emergency (Dispatch) Office		526-3333 526-6452	
	Supervisor	862-0601	526-6711	
	Bill Corner	446-3927	526-6751	669-3544
	Dan Gordon	292-3748	526-6710	897-4205
Environmental Health & Safety	Heather Chapman	299-2246	526-8591	
	Jennifer Ambrose	262-6254	526-6342	669-3141
Chemical Hygiene Officer	Chad Tatko	703-943-8019 526-7584		
Young's Environmental Cleanup, Inc.	Primary 24-hour Emergency Response Contractor	800-496-8647		
C. Stoddard & Sons, Inc	Back-up Emergency	Office: 8:00a – 4:00p (269)-792-		

	Response Contractor	6591 After hours: 616-889-9944; secondary: 269-792-9556
24-hour HAZMAT communications center for emergency responders	CHEMTREK	1-800-262-8200
Expert treatment advice and assistance in case of exposure to poisonous, hazardous or toxic substances	Poison Control Center	1-800-222-1222

Appendix C

Regulatory Notifications Contact List

Certain chemical release or spill situations require reporting to regulatory agencies. The EHS Officer will ensure notifications as follows:

1. In the case of a spill that enters the sanitary sewer system, call:
 - a. The Grand Rapids Fire Department (911). Advise whether the spilled substances are explosive, radioactive, flammable or potentially harmful to public health.
 - b. The Grand Rapids Wastewater Treatment Plant at: office- 616-456-3639 or mobile– 616-262-5510. Both lines are operational 24/7.
 - c. Phil Beezhold, Director of Physical Plant at 616-299-3973
 - d. Marc Huizinga, Assistant Director Mechanical at 616-299-1338
2. If a major spill occurs, or a spill that could impact waterways (rivers, ditches) or storm sewers or meets the requirements of Release Notification in Michigan, the situation must be immediately reported to:
 - a. The Grand Rapids Fire Department - 911
 - b. The Michigan DEQ Pollution Emergency Alert System (PEAS) at 800-292-4706
 - c. MDEQ, Grand Rapids District Office at 616-356-0500

Appendix D
Hazardous Material Incident Report

Hazardous Material Incident Report

*This report should be completed each time a **Spill or Release of a Hazardous Material** occurs on Calvin's campus. After completion, the report must be sent to the Environmental Health & Occupational Safety office.*

If the answer to **one or more** of the following questions is "YES" this is an EMERGENCY SPILL

- | | | |
|--|-----|----|
| 1. Is the material flammable, explosive, under pressure, highly toxic, highly infectious, or radioactive? | YES | NO |
| 2. Is the identity of the material unknown? | YES | NO |
| 3. Are materials mixing and producing a reaction or vapors? | YES | NO |
| 4. Are there symptoms of exposure (affected skin, burning eyes, trouble breathing, dizziness or headaches) | YES | NO |
| 5. Has the building been evacuated? | YES | NO |
| 6. Are the people involved feeling uneasy or unsure of what to do? | YES | NO |

Emergency Spill _____ Non-emergency Spill _____

Name of person filing report _____ Position _____

Date of spill _____ Time _____ Who was notified? _____

Location of spill _____

Name & amount of material spilled (if known) _____

Describe the situation that lead up to the spill _____

Any injuries? No ___ Yes ___ Describe injuries & what was done to assist the injured

People involved in clean-up _____

PPE (Personal Protective Equipment) worn by those involved in the clean-up _____

Supplies used for clean-up _____

How were clean-up materials disposed of? _____