



Environmental Analysis Program

Pomona College
Biogeochemistry Laboratory

SOP-L004

Chemical Spill Response

Standard Operating Procedure

SOP Number	SOP-L004
Revision	1.1
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Date	2026-06-26
Organization	EA Program, Pomona College

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1. Purpose

This SOP provides step-by-step procedures for responding to chemical spills in EA Program laboratories. It covers how to classify a spill, when to clean it up yourself vs. when to evacuate, how to clean up minor spills by chemical class, and how to document and report the incident. This SOP is designed to be a quick reference during an emergency; read it in advance so the procedures are familiar before you need them (National Research Council, 2011; Occupational Safety and Health Administration, 2012).

For general chemical safety, storage, and waste disposal, see [SOP-L003 Hazardous Materials Handling](#). For general lab emergency procedures (fire, earthquake, medical), see [SOP-L002 Laboratory Safety](#).

2. Scope

- **Applies to:** All chemical spills in EA Program laboratories (SGM 133, 134, 135)
- **Does not apply to:** Radioactive material spills; biological spills (BSL-2 organisms); field spills (handle per [SOP-F001](#) and local regulations)
- **Location:** All EA Program laboratory spaces

3. Responsibilities

Role	Responsibility
All Lab Personnel	Assess the spill, protect themselves, initiate response
Lab Manager	Oversee cleanup of minor spills; report major spills
Lab PI	Ensure training; review incident reports
Campus Safety	Respond to major spills; coordinate with fire department

4. Emergency Contact Information

Post this information near every laboratory phone and exit.

Contact	Number / Method
Campus Safety	x72000 (from campus phone) or 909-621-8170
Pomona College Facilities	x18383
Poison Control	1-800-222-1222
911	For life-threatening emergencies
Lab Manager	<i>TBD – post current contact</i>
Lab PI (Marc Los Huertos)	<i>TBD – post current contact</i>

Refer also to (Pomona College, 2024).

5. Definitions

- **Carcinogen:** A substance capable of causing cancer with repeated or prolonged exposure; minor spills of carcinogens (e.g., acrylamide, formaldehyde, chloroform, benzene) require extra precautions including respiratory protection and disposal as hazardous waste regardless of volume (National Research Council, 2011).
- **Corrosive:** A chemical that causes visible destruction or irreversible alteration of skin, eye, or mucous membrane tissue on contact, or that corrodes steel or aluminum; includes strong acids ($\text{pH} < 2$) and strong bases ($\text{pH} > 12$); neutralized before disposal with appropriate Spill-X material (Occupational Safety and Health Administration, 2012).
- **Emergency eyewash station:** A plumbed or pressurized portable fixture that delivers a continuous flow of clean water to both eyes simultaneously; required to be within 10 seconds of unobstructed travel from any hazardous chemical work area; must be activated for at least 15 minutes for any eye chemical contact (Occupational Safety and Health Administration, 2012).
- **Flammable liquid:** A liquid with a flash point below $60\text{ }^{\circ}\text{C}$ ($140\text{ }^{\circ}\text{F}$); includes common laboratory solvents such as ethanol, methanol, acetone, hexane, and isopropanol; minor spills of flammables must be cleaned up with absorbent pads, not paper towels, and all ignition sources must be extinguished immediately (National Research Council, 2011).
- **Flash point:** The minimum temperature at which a liquid produces sufficient vapor to ignite momentarily in the presence of a flame or spark; the key property for classifying a spilled liquid as a flammable hazard.
- **Major spill:** A spill that cannot be safely managed by lab personnel; any spill meeting the criteria in §5.2 – including spills involving injury, unknown chemicals, large volumes, or highly toxic/reactive materials – requires evacuation and a call to Campus Safety; do not attempt to clean up a major spill.
- **Minor spill:** A small spill of a known chemical with known hazards that trained lab personnel can safely clean up using available PPE and spill control materials; all criteria in §5.1 must be met before treating a spill as minor.
- **Safety Data Sheet (SDS):** A standardized 16-section document describing a chemical's identity, hazards, safe handling, first aid, spill response, and disposal; Section 6 (Accidental Release Measures) is the primary reference for spill response; must be accessible in the laboratory at all times (Occupational Safety and Health Administration, 2012).
- **Secondary containment:** A tray, cabinet, or other physical barrier that holds spilled or leaked chemical if the primary container fails; required under all liquid chemical containers in storage; prevents spills from spreading and simplifies cleanup.
- **Spill-X-A / Spill-X-C / Spill-X-S:** Commercial spill control kits manufactured by Ansul (Johnson Controls): A = acid neutralizer (for strong acids), C = caustic/base neutralizer (for strong bases), S = solvent absorbent (for flammable organic solvents); each kit changes color when neutralization is complete.
- **Universal absorbent:** An inert granular or pad material (e.g., diatomaceous earth, Zorb-All pads) that absorbs chemical spills without reacting; suitable for a wide range of chemicals but does not neutralize acids or bases.

6. Spill Classification

Before responding, classify the spill. Your response depends on the classification (Occupational Safety and Health Administration, 2012).

6.1. Minor Spill

A spill is **minor** if ALL of the following are true:

- The chemical and its hazards are known (you have read the SDS)
- The volume is small (less than approximately 500 mL of liquid or 100 g of solid)
- No one is injured or exposed
- The spill is confined to a small area (benchtop or floor, not spreading)
- You have the proper PPE and spill control materials on hand
- The chemical is not highly toxic, volatile, flammable, or reactive at the spilled quantity

Action: Clean it up yourself using the procedures in Section 7.

6.2. Major Spill

A spill is **major** if ANY of the following are true:

- Someone is injured, contaminated, or experiencing symptoms
- The chemical is unknown
- The volume is large (more than approximately 500 mL or 100 g)
- The spill involves a highly toxic, volatile, flammable, or reactive material at any quantity
- The spill is spreading and cannot be easily contained
- You do not have proper PPE or cleanup materials
- You are unsure whether you can handle it safely

Action: Evacuate and call for help (Section 6).

7. Major Spill Response

7.1. If in Doubt, Get Out

If you are unsure whether a spill is minor or major, treat it as major. Your safety is more important than preventing property damage.

1. Protect yourself and others.

- Alert everyone in the lab. Help anyone who is injured or contaminated only if you can do so without endangering yourself.

- If chemicals are on someone's skin or in their eyes, begin flushing with water immediately (safety shower for body, eyewash for eyes). Continue flushing for at least 15 minutes (Occupational Safety and Health Administration, 2012).
- Remove contaminated clothing while flushing.

2. **Evacuate.**

- Clear all personnel from the room and close (do not lock) doors.
- Activate the building fire alarm if there is a fire risk or if toxic vapors require building evacuation.

3. **Call for help.**

- Call Campus Safety: x72000 or 909-621-8170.
- For life-threatening emergencies: 911.
- Notify the lab manager and PI.

4. **Stay available.**

- Wait near the lab entrance (not inside) to brief first responders.
- Bring the SDS for the spilled chemical to the responders.

8. Minor Spill Response

8.1. General Procedure

1. Put on appropriate PPE before approaching the spill: gloves, safety glasses, lab coat at minimum; add face shield for large acid/base spills (National Research Council, 2011).
2. Inform others in the lab that you are cleaning up a spill.
3. Select the correct cleanup material (Section 7.2–7.4).
4. Apply cleanup material from the outside edge of the spill toward the center to prevent spreading.
5. Allow sufficient time for neutralization (Spill-X-A and Spill-X-C change color when complete).
6. Scoop up the spent absorbent and place in a labeled waste container (hazardous waste).
7. Wipe the area with a damp paper towel; dispose of used paper towels as hazardous waste.
8. Remove PPE carefully; wash hands.
9. Document the spill (Section 9).

8.2. Acid Spills

Use **Spill-X-A** (acid neutralizer). Apply the powder to the spill and mix gently with a spatula. When the color indicator shows neutralization is complete, sweep or scoop into a waste container. For spills involving HF (hydrofluoric acid): treat as a major spill regardless of volume; HF causes deep, potentially lethal burns with delayed onset.

8.3. Base Spills

Use **Spill-X-C** (caustic neutralizer). Apply and mix as for acid spills. Monitor for heat generation; some base reactions with neutralizer can be exothermic.

8.4. Flammable Organic Solvent Spills

1. Extinguish all ignition sources immediately (no open flames, turn off hot plates, do not use electrical switches).
2. Increase ventilation (open sash of fume hood, turn on exhaust fan).
3. Use **Spill-X-S** absorbent pads or granular universal absorbent. Do not use paper towels (can generate static or wick the solvent).
4. Collect all absorbent material in a waste container.
5. If vapors persist, evacuate and call Campus Safety (National Research Council, 2011).

8.5. Toxic or Unknown Chemicals

If the chemical is toxic (acutely hazardous, carcinogenic, or unknown): treat as a major spill and call Campus Safety. Do not attempt to clean up acutely toxic or carcinogenic spills without specific training and proper respiratory protection.

9. Spill Kits

The following spill kits are maintained in each laboratory. Inspect each kit at the start of every semester and after any use. Verify that all items are present and not expired. Replenish as needed and record the check date on the spill kit inspection log.

Kit Type	Location	Contents
Spill-X-A (acid)	SGM 133, fume hood	Neutralizing powder, scoop, bag, PPE
Spill-X-C (base)	SGM 133, fume hood	Neutralizing powder, scoop, bag, PPE
Spill-X-S (solvents)	SGM 133, bench shelf	Absorbent pads, bag, PPE
Universal absorbent	SGM 134	Granular absorbent, scoop, bags

10. Body and Eye Exposure Response

10.1. Skin Contact

1. Remove contaminated clothing immediately.
2. Flush the affected area with large volumes of water for at least 15 minutes (Occupational Safety and Health Administration, 2012).
3. Do not apply neutralizing agents directly to skin.
4. Seek medical attention.

10.2. Eye Contact

1. Immediately go to the eyewash station.
2. Hold eyelids open and flush both eyes continuously for at least 15 minutes.
3. Call Campus Safety or 911; all chemical eye exposures require medical evaluation.

11. Documentation and Reporting

After every spill, including minor ones that were cleaned up successfully:

1. Complete the EA Program Spill/Incident Report Form (posted on the lab shared drive).
2. Record: date, time, location, chemical name and CAS number, volume spilled, who was involved, any exposures or injuries, actions taken, waste disposal method.
3. Submit the form to the PI within 24 hours.
4. The PI submits a report to Pomona College EH&S for any spill that resulted in an exposure or injury, required evacuation, or involved a reportable quantity of a regulated chemical (Pomona College, 2024).
5. Review the incident with the lab group within one week to identify how to prevent recurrence.

12. References

- Occupational Safety and Health Administration (2012)
- National Research Council (2011)
- Pomona College (2024)

National Research Council. (2011). *Prudent practices in the laboratory: Handling and management of chemical hazards* (Updated). National Academies Press. <https://doi.org/10.17226/12654>

Occupational Safety and Health Administration. (2012). *Laboratory safety guidance* (OSHA 3404-11R). US Department of Labor.

Pomona College. (2024). *Emergency instructions*. <http://www.pomona.edu/sites/default/files/emergency-instructions.pdf>

13. Related SOPs

SOP	Title	Relationship
L002	Laboratory Safety	General emergency procedures
L003	Hazardous Materials Handling	Chemical safety, storage, waste
L005	Chemical Inventory Management	Inventory affected by spills

14. Training Record

Before working independently in the lab, all personnel must:

1. Read this SOP in full
2. Complete [SOP-L002](#) and [SOP-L003](#) training
3. Locate all spill kits, the safety shower, and the eyewash station in their assigned lab
4. Walk through a simulated minor spill cleanup with the lab manager
5. Be signed off by the lab manager or PI