**Lab-Specific Standard Operating Procedures for General Hazard Classes: Toxic Materials**

**Introduction**

The hazard class Standard Operating Procedures (SOPs) provided by the Department of Environmental Health and Safety (DEHS) are intended as a voluntary resource to provide general guidance on how to work with these materials and to provide a template for laboratories to customize to fit their needs.

These SOPs templates should be used for materials with one hazard class and for procedures and materials requiring only basic PPE (i.e., lab coats, goggles, and nitrile gloves).

For more complex procedures and materials with multiple hazards these templates can be used as guidance when conducting your lab’s own risk assessment, and writing procedure specific SOPs.

If you have any questions about writing Standard Operating Procedures, chemical safety, hazard assessment, or any other research safety questions, contact your Departmental Safety Officer (DSO) or call your DEHS Research Safety Professional (612) 626-6002.

**Instructions**

All text or spaces in yellow are intended for customization by your laboratory. Fill in the information needed, customized for your lab’s accepted practices, materials used, available resources, etc. Consider which materials your lab uses in the hazard class, and what your lab is experienced with and feels comfortable handling. You can also add any specific information, best practices, or other lab-specific information you would like.

If you are unsure if a specific material or procedure requires its own SOP, contact DEHS for guidance.

When complete, ensure the SOP is approved by the lab’s PI and added to your lab’s safety manual and annual training. SOPs should be reviewed with all lab members annually, and should be reviewed and updated at a minimum of every 3 years.

**Lab-Specific Standard Operating Procedure**

**Safe Use and Handling of Toxic Materials**

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| ***PI:*** | *Scully, D.* | ***Lab Location:*** | *Boynton W-132* |
| ***Issue Date:*** | *9/12/2016* | ***Revision Date:*** | *9/12/2019* |
| ***Prepared by:*** | *Mulder, F.* | ***Approved by:*** | *Skinner, W.* |

***Hazard Identification***

Toxic material containers must be labeled at a minimum with the name of the contents and the word “Toxic” or the GHS pictogram for toxic materials, pictured below. Information on the particular hazards of specific materials can be found in their SDS.

Examples of toxics in use in the Scully lab include:

* Example 1
* Example 2
* Example 3

***Risk Assessment***

The primary risk of working with toxic materials is the potential for inhalation or skin absorption. Toxic liquids may be ingested or generate inhalable vapors, dusts/powders may be aerosolized or inhaled, gases may be inhaled, and all forms may potentially be absorbed through the skin.

This SOP should be used for any Globally Harmonized System (GHS) Category 2, 3 or 4 – Acute Toxicity. Chemical specific SOPs should be written for use or handling of (GHS) Category 1 Acute Toxicity materials and for Toxic gases. The GHS information can be found on the Safety Data Sheet (SDS) for the material.

Toxics may have additional hazards associated with them, such as flammability. Materials with more than one hazard class are not addressed in this SOP, though it can be used as guidance on developing a material-specific SOP.

***Control Plan***

*Storage and Transport*

* Limit the amount of toxics you have stored in your lab to the minimum amount possible. Avoid having more than one open container of the same material. Check inventory before ordering more.
* Store all toxics in a dedicated area in secondary containment that is labeled “Toxic”. Consider limiting access to toxic material to designated lab personnel.
* Toxic gas cylinders must be used and stored in a ventilated gas cabinet or chemical fume hood.
* When transporting toxic materials outside of the lab, containers should be fully enclosed so the contents would be contained if the bottle was dropped or broken.
* Dispose of unused or expired toxics as soon as possible.

*Set-Up and Active Work*

* Designate an area where toxic materials will be used and label it appropriately. Ensure this area is not used for other work.
* Handle all toxic solutions over plastic backed absorbent sheets. After each use, dispose of absorbent sheets, wipe down area and all equipment used.
* Remove PPE and wash hands thoroughly after work.
* At the end of a project, thoroughly clean the designated area before resuming normal laboratory work in the area. Use specific decontamination procedures if appropriate, or refer to procedure-specific SOP.
* If you use a toxic material with a carrier agent such as DMSO, contact your Departmental Safety Officer for consultation.

*Exposure Controls*

* It is best practice to use two pairs of disposable gloves, with the outer one covering the gown cuff whenever there is risk of exposure to toxics. Two pairs of gloves must be worn when working with highly toxic materials or chemotherapeutics.
* Toxics with a higher potential for inhalation (such as crystals, powders, free nanoparticles, etc.) must be handled and weighed out in a chemical fume hood or similar exhausted enclosure. If you do not have a fume hood, consult your supervisor or DEHS before beginning work – you may need to wear a respirator and participate in the University of Minnesota’s Respiratory Protection Program.
* To reduce the chance of accidental injection, syringes and IV sets with Luer-LokTM fittings must be used for preparing and administering toxics.

**Minimum PPE Requirements**

PPE requirements include:

* Lab coat (if applicable to your lab)
* Safety glasses/goggles (if applicable to your lab)
* Nitrile gloves (if applicable to your lab)
* Additional PPE (if applicable)

If procedure or material-specific PPE is required beyond the minimum listed above, another SOP should be available for that procedure or material. (Example: cartridge respirator, neoprene gloves, etc.)

***Spill & Accident Planning/What-If***

During lab-specific training, researchers should be informed where fire extinguishers, safety showers, alarm pull stations, and egress routes are. All labs are set up so that this emergency equipment is readily available and near exits.

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| **Lab-Specific Emergency Response Procedures** | |
| **Spill** | *List the maximum amount of spill that your lab is comfortable with and prepared for cleaning up yourselves. Describe your lab-specific response procedures.* |

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| **Physical/Health Hazards** | **Signs/Symptoms of Exposure\*** | **First Aid/Response** |
| **Inhalation** | Dizziness, nausea, light-headedness, headache, confusion | Move person to fresh air. Seek medical attention if symptoms do not improve. |
| **Eye Absorption/Contact** | Splashes into eyes, burning, stinging | Use emergency eyewash and rinse eyes for a minimum of 15 minutes. |
| **Skin Contact** | Numbness, irritation | Remove contaminated gloves or clothing, wash with soap and rinse. If major exposure, use safety shower. |
| **Ingestion** | Ingestion is unlikely in the standard lab setting. | Seek medical attention. |
| **Injection** | Sharp pain, broken glove, bleeding, swelling | Seek medical attention. |
| \*Signs and symptoms may vary depending on the toxic agent involved. Be sure to customize this information with any specific signs/symptoms that may occur based off the toxic materials your lab uses. | | |

All fires, injuries, or damage to the facility must be reported to and investigated by DEHS. Injuries which require medical treatment require a First Report of Injury (FROI) to be filed.

***Waste Storage and Disposal***

* Disposable lab supplies (e.g., gowns, gloves, benchtop pads, etc.,) should be collected in a solid hazardous waste bin or a yellow bag for incineration.
* Needles and sharps must be disposed of in a separate sharps container that is labeled “Toxic Sharps”, sealed and placed in a yellow bag for incineration or disposed of as hazardous waste.
* Materials contaminated by toxic materials during a spill clean-up should be placed in a leak proof container for disposal as hazardous waste following procedures detailed in the Hazardous Waste Guidebook.
* More information on hazardous waste procedures and pick-up can be found here: [www.z.umn.edu/hazwaste](file:///U:\UHS%20All\Lab%20&amp;%20Research%20Safety\7%20Projects\SOP%20Templates\www.z.umn.edu\hazwaste)

In the Scully lab, hazardous waste is stored: *list the location of your hazardous waste storage area(s).*