New Mexico State University

Environmental Health Safety & Risk Management

# NMSU Chemical Hygiene Plan

New Mexico State University

EHS&RM

575-646-3327

safety.nmsu.edu

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# 1. PURPOSE

The purpose of New Mexico State University's Chemical Hygiene Plan is to establish a written program that provides for and describes the procedures, equipment, personal protective equipment, and work practices for protecting laboratory personnel from potential health hazards of using hazardous chemicals in university laboratories. The information presented in this plan represents best practices and provides a broad overview of the information necessary for the safe operation of laboratories that use hazardous chemicals.

The Chemical Hygiene Plan is prepared in accordance with the requirements of the Occupational Safety and Health Administration (OSHA) regulation *29 CFR 1910.1450 - Occupational Exposure to Hazardous Chemicals in Laboratories Standard* (OSHA Lab Standard). The best practices and recommendations cited in *1910.1450 Appendix A: National Research Council Recommendations Concerning Chemical Hygiene in Laboratories* and the National Research Council's *Prudent Practices for Handling Hazardous Chemicals in Laboratories* (2011) as well as other sources.

# 2. SCOPE AND APPLICABILITY

Under the OSHA Lab Standard, NMSU is required to develop and maintain a written Chemical Hygiene Plan for the safe use of hazardous chemicals in laboratories and to implement the provisions of the plan capable of:

1. Protecting employees from health hazards associated with the laboratory use of hazardous chemicals and,
2. Keeping laboratory worker exposures below permissible exposure limits to the substances specified in *29 CFR 1910, subpart **Z***.

Under the standard *§1910.1450(b)* a *Laboratory* is defined as:

> *"a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis"*

*Laboratory use* of hazardous chemicals means the handling or uses of chemicals where:

1. Chemical manipulations are carried out on a laboratory scale;
2. Multiple chemical procedures or chemicals are used;
3. The procedures involved are not part of a production process, nor in any way simulate a production process; and
4. Protective laboratory practices and equipment are made available and in common use to minimize the potential for employee exposure to hazardous chemicals.

*Laboratory scale* is defined as:

> *"Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials."*

These definitions, and the provisions of the NMSU CHP, are applicable to the majority of NMSU teaching and research laboratories where hazardous chemicals are being used.

All NMSU faculty, staff, and students are responsible for:

1. Participating in mandated safety training programs provided by NMSU Environmental Health Safety & Risk Management (NMSU EHS&RM), supervisors and instructors.
2. Properly using university-supplied materials and equipment.
3. Using good judgment in carrying out work assignments and following established procedures.
4. Promptly reporting unsafe conditions, environmental health hazards, as well as injuries and illnesses to their supervisor or program director.
5. Giving due consideration to personal safety and the safety of others while performing assigned tasks.
6. Strictly adhering to all applicable federal, state and university safety requirements and guidelines.

**All NMSU Faculty, staff, and students acknowledge that any disregard for or chronic negligence of established policies and procedures described within the NMSU Chemical Hygiene Plan may result in disciplinary action.**

### 2.1. Exclusions

The plan does not cover activities where radioactive material or hazardous biological agents are used. Institutional procedures for working with these materials are addressed under the Radiation Safety and Biological Safety programs, respectively. Other, non-chemical hazards, commonly found in university laboratories, such as lasers, are also not addressed in this plan, but are covered under other NMSU safety programs.

## 3. RESPONSIBILITIES

### 3.1. Laboratory Supervisor Responsibilities

The Laboratory Supervisor is the individual in charge of the laboratory. The laboratory supervisor may be faculty, principal investigators, instructors, laboratory managers or other staff depending on the management structure of the laboratory. This is the person who has primary responsibility for assigning work to staff and for the health and safety of laboratory personnel performing work in the laboratory. The laboratory supervisor may delegate safety duties to others, but they are still responsible for ensuring that any delegated safety responsibilities are carried out. The responsibilities of the Laboratory Supervisor include:

1. Identifying all hazardous chemicals and hazardous operations in their laboratory and defining what appropriate controls and procedures are required for personnel to perform work safely;
2. Establishing standard safety operating procedures (general and protocol or lab-specific) for hazardous activities in their laboratory;
3. Reviewing and providing prior approval to laboratory personnel that use high-risk chemicals, such as Particularly Hazardous Substances or highly reactive chemicals, or, are performing high-risk procedures and operations;
4. Providing the laboratory personnel under their supervision access to this plan as well as laboratory-specific Safety Plans, emergency procedures, chemical Safety Data Sheets and standard operating procedures for the work performed; and

5. Ensuring that laboratory personnel under their supervision have been adequately trained to work safely with hazardous chemicals, laboratory equipment and laboratory operations as described under the Training section of this plan. This includes:
    a. Ensuring that personnel complete appropriate formal safety training offered by EHS&RM,
    b. Providing and documenting in-house training provided on lab-specific safety plans / procedures and,
    c. Informing laboratory personnel of the location and availability of this plan and other information on hazards as described in this plan.
6. Ensuring that laboratory engineering controls (e.g., fume hoods, glove boxes) and laboratory safety equipment (e.g., emergency showers/eyewashes, fire extinguishers, chemical spill kits) are available, working and properly maintained;
7. Supplying workers with appropriate personal protective equipment (PPE) such as safety glasses, goggles, lab coats, splash aprons and disposable gloves;
8. Conducting periodic laboratory safety inspections and safety equipment checks;
9. Maintaining an inventory of hazardous chemicals stored in the laboratory and ensuring the inventory information is in the EHS&RM Safety Hub and is accurate and up to date.
10. Promptly reporting any laboratory accidents and injuries as outlined under applicable sections of this plan;
11. Making laboratory personnel available for any required medical surveillance or medical consultation / examination defined under applicable sections of this plan;
12. Informing facilities / maintenance personnel, non-laboratory staff, including outside contractors of potential hazards that may be encountered when they are working in the laboratory.
    a. The Laboratory Supervisor is responsible for ensuring that hazards are removed or minimized as much as possible before any facility maintenance or repair work is performed in their laboratory; and
13. Following NMSU Administrative Rules and Procedures regarding health and safety requirements for minors participating in approved, university-sponsored activities in their laboratory **(**ARP 16.77 Children in the Workplace).

## 3.2. Laboratory Personnel Responsibilities

All laboratory personnel who work with hazardous chemicals in teaching or research laboratories at NMSU are responsible for:

1. Understanding and following the NMSU Chemical Hygiene Plan, Department and laboratory-specific safety plans and emergency procedures;
2. Following all oral and written laboratory safety rules, regulations and standard operating procedures required for safely performing assigned tasks;
3. Keeping the work areas safe and uncluttered;

4. Reviewing and understanding the hazards of materials and processes prior to conducting work;
5. Stopping work and seeking advice if they do not understand an assigned task, an unexpected event occurs while performing procedures, or if they do not feel safe performing a procedure or process;
6. Using appropriate measures to control identified hazards, including consistent and proper use of engineering controls, administrative controls and personal protective equipment;
7. Understanding the capabilities and limitations of personal protective equipment issued to them;
8. Obtaining prior approval from their Laboratory Supervisors before using certain higher risk chemicals, such as Particularly Hazardous Substances, highly reactive chemicals, or prior to conducting certain higher risk experimental procedures as defined in this plan;
9. Promptly reporting all accidents and unsafe conditions to the Laboratory Supervisors and/or EHS&RM;
10. Completing all safety training required by NMSU and the Laboratory Supervisors
11. Participating in medical surveillance programs, when required; and
12. Informing their supervisor and EHS&RM of any work modifications ordered by a physician as a result of medical surveillance from an occupational injury or exposure, or change in health conditions that could make worker more susceptible to the effects of a chemical exposure.

## 3.3. Department Chemical Hygiene Officer / Designated Safety Personnel

Department Chemical Hygiene Officers or other staff members who are assigned similar laboratory safety functions for their administrative unit have the primary responsibility for helping their departments comply with and implement the requirements of the NMSU Chemical Hygiene Plan. Contact information for these individuals are listed in Appendix A. The responsibilities for these individuals include:

1. Serving as the primary liaison between department Laboratory Supervisors, department administration and NMSU EHS&RM on laboratory safety issues;
2. Staying current on and informing department Laboratory Supervisors and administrators of changes or updates to NMSU health and safety requirements that may affect department operations;
3. Assisting Laboratory Supervisors with the selection and evaluation of appropriate safety controls (engineering controls, administrative controls, and PPE), as needed;
4. Helping ensure that the Laboratory Supervisors have the resources needed to safely perform work in department laboratories by identifying gaps where resources are needed and communicating those needs to department administrators and NMSU EHS&RM;
5. Communicating laboratory safety training requirements to department personnel and assisting with the development and review of department-level and laboratory-specific training, as needed;
6. Conducting periodic safety inspections and walk-throughs of department laboratories and communicating any safety concerns identified to the Laboratory Supervisors, department administrators and/or NMSU EHS&RM, as appropriate;

7. Taking immediate steps to abate significant hazards found in department laboratories and contacting the Laboratory Supervisors, department administration, NMSU EHS&RM, and emergency responders, as appropriate;
8. Helping to develop, maintain, implement and enforce department-specific chemical safety plans and procedures needed to meet the requirements of the NMSU Chemical Hygiene Plan; and
9. Helping to develop and review other department-level and laboratory-specific safety plans, SOPs, hazard assessments or experiment safety plans, as needed.

## 3.4. NMSU EHS&RM / University Chemical Hygiene Officer

NMSU EHS&RM is responsible for administering and overseeing institutional implementation of this plan. EHS&RM provides technical guidance to personnel at all levels of responsibility on matters pertaining to laboratory use of hazardous chemicals. Specifically, EHS&RM is responsible for:

1. Maintaining and updating the NMSU Chemical Hygiene Plan, as needed to ensure it is current and reflects any changes in applicable government regulations or changes to NMSU administrative policies or procedures;
2. Reviewing and evaluating the effectiveness of the Plan annually;
3. Developing, distributing and updating relevant, mandatory laboratory safety training and other related safety training for faculty and staff. A current list and description of EHS&RM safety training offerings can be found on the EHS&RM web site.
4. Performing personnel and / or area chemical exposure monitoring, as needed;
5. Maintaining personnel exposure monitoring records;
6. Investigating reported or suspected chemical exposure incidents, laboratory accidents and injuries;
7. Assisting Laboratory Supervisors determine when medical surveillance is appropriate and required for laboratory personnel.
8. Coordinating with the appropriate medical service providers when laboratory personnel request to review their occupational health medical records related to NMSU activities.
9. Reviewing plans for new laboratory construction, renovations, or the installation of safety-related engineering controls in laboratories, as requested;
10. Assisting Laboratory Supervisors with the development and review of formal laboratory hazard assessments, experiment safety plans, SOPs, and emergency procedures, upon request; and
11. Assisting Laboratory Supervisors with identification and selection of appropriate safety controls (administrative, engineering, PPE), as requested.

### 3.5. Non-Laboratory Personnel / Support Staff

Non-lab staff such as custodians, maintenance staff, or other support staff often must enter laboratories to perform tasks such as cleaning, performing routine equipment or facility maintenance and repairs. Support staff are responsible for:

1. Following posted safety rules in laboratories;
2. Following the instructions and warnings of laboratory staff while working in the laboratories;
3. Wearing appropriate PPE for the work performed. Laboratory Supervisors and staff supervisor are responsible for notifying support staff of any special PPE requirements beyond the minimum requirements list below. The minimum PPE requirements for support staff working in a chemical laboratory include wearing:
    a. Safety glasses
    b. Long pants
    c. Closed-toe shoes
4. Stopping work and immediately notifying laboratory staff and their supervisor if they encounter anything unusual, unexpected or feel unsafe in a laboratory.

## 4. TRAINING AND HAZARD INFORMATION COMMUNICATION REQUIREMENTS

Laboratory personnel must receive both general and laboratory-specific safety training to work with hazardous chemicals in NMSU laboratories. Each Laboratory Supervisor is responsible for ensuring laboratory staff complete the appropriate required safety training and receive relevant safety information before authorizing staff to use hazardous chemicals or perform hazardous operations in their laboratory. Relevant safety information and training must be provided to workers:

1. At the time of initial assignment to the laboratory;
2. Before working with new hazardous chemicals or performing new hazardous processes;
3. Before working with an OSHA Particularly Hazardous Substance (PHS) or other highly hazardous chemical or process; and
4. Prior performing any hazardous operation or using unfamiliar equipment in the laboratory.

### 4.1. General Safety Training

Under State law, Federal law and NMSU policies, laboratory personnel working with hazardous chemicals must receive training and be familiar with the requirements of the NMSU Hazard Communication Program and the NMSU Chemical Hygiene Plan. EHS&RM has training programs designed to meet these requirements. At a minimum, all personnel working with a hazardous chemical in a NMSU laboratory must successfully complete the EHS&RM training offerings listed below or approved equivalent safety training:

1. Hazard Communication – May be combined with and included in Laboratory Safety training.
2. Laboratory Safety
3. Hazardous Waste Management Awareness

If a laboratory has a Hazardous Waste Accumulation Point, then the designated Waste Coordinator for the laboratory must also complete:

4. Hazardous Waste Management for Waste Coordinators training.

Additional safety training may also be required for laboratory personnel working with special hazards such as radioactive material, x-rays, hazardous biological material or lasers. A full list of available safety training can be found on the EHS&RM website or contact EHS&RM for additional information.

## 4.2. Department and Laboratory-Specific Safety Training

Laboratory workers must also be trained in any department and laboratory-specific safety procedures. Under NMSU policy, each department or administrative unit is required to have an Emergency Action Plan (EAP). All laboratory staff must be trained and familiar with the information contained in the department EAP.

Laboratory workers must also receive training on the specific chemical hazards and physical hazards they will be working with or could be exposed to while working in the laboratory. Training must also be provided on laboratory-specific emergency procedures and the location and operation of available emergency equipment. This training is typically provided by the Laboratory Supervisor or designee. Hands-on, proficiency training should also be provided before workers perform high hazard operations or use potentially hazardous laboratory equipment such as centrifuges, autoclaves, or other specialized equipment.

Department and laboratory-specific training must be documented per the Safety Training Documentation and Recordkeeping (Section 4.3). Required specific training depends on the specific duties of the worker but will likely include some combination of the following:

1. Review of applicable department-level safety plans and procedures, including the department EAP.
2. Review of laboratory-specific emergency procedures in a Laboratory Safety Plan.
3. Review of laboratory-specific Standard Operating Procedure(s) for a specific hazardous chemical, processes or equipment.

Documentation of the training is required as noted in Section 4.3 Safety Training Documentation and Recordkeeping. At a minimum, the following needs to be documented:

1. Worker name;
2. Training date;
3. Brief description of the training;
4. Name of the trainer name or person certifying that the training was completed.

## 4.3. Safety Training Documentation and Recordkeeping

Employee safety training records for NMSU EHS&RM training offering are maintained by NMSU Training Central. These records are accessible to supervisors and staff using NMSU Training Central procedures.

Required department and laboratory-specific employee safety training records must be maintained by the Laboratory Supervisor or department and be available for inspection by inspectors from NMSU EHS&RM inspectors or from external regulatory agencies.

## 4.4. Communication of Required Hazard Information

Relevant safety information must be readily available to laboratory personnel while working in laboratories. At a minimum, the Laboratory Supervisor must inform laboratory workers where and how they can access the following information:

1. OSHA Laboratory Standard (29 CFR 1910.1450)

This regulation was promulgated to protect laboratory personnel engaged in the laboratory use of hazardous chemicals. A hyperlink to this regulation is above or it can be found on the EHS&RM web site.

~~NM~~SU Chemical Hygiene Plan

Workers must have access to this plan. The OSHA Lab Standard requires employers with laboratories that meet the definition of a "laboratory" under the OSHA Laboratory Standard to have a written Chemical Hygiene Plan. This plan fulfills the regulatory requirement for NMSU. The latest revision of the core NMSU Chemical Hygiene Plan can be downloaded at on the EHS&RM website. Depending on how each unit is managed, each department, administrative unit or laboratory may add department and laboratory-specific safety information as appendices to the core plan.

2. Permissible Exposure Limits (OSHA PELs)

Workers must be provided information on the regulatory exposure limits for any hazardous chemicals they will be handling and could be potentially exposed to while performing their work in the laboratory. Chemical Safety Data Sheet (SDS) are one of the best sources for obtaining this information.

If an OSHA PEL has not been established for a specific chemical, then additional resources such as The American Conference of Governmental Industrial Hygienists' Threshold Limit Values (TLVs) should be followed. Contact EHS&RM for guidance, if necessary.

3. Chemical Safety Data Sheets (SDSs)

Access to the chemical manufacturer / distributor SDS must be readily available for all hazardous chemicals that are used or stored in the laboratory. Chemical SDSs must be reviewed by workers before handling a hazardous chemical. Detailed information about what chemical SDSs are, information they contain and how they should be used is available on the EHS&RM web site.

4. Written Standard Operating Procedures (SOPs)

The Laboratory Supervisor is responsible for writing Standard Operating Procedures (SOPs), with relevant health and safety information, for laboratory activities they direct and making the procedures available to lab workers. Priority for written SOP development should be given to any operation involving the use of chemicals classified as an OSHA Particularly Hazardous Substance (PHS), highly reactive or explosive chemicals, and high-risk laboratory procedures.

Workers who work autonomously or perform independent research are responsible for developing written SOPs for their own work. The EHS&RM web site contains tools to help with development of SOPs.

# 5. MINIMIZING THE RISKS OF EXPOSURE TO HAZARDOUS CHEMICALS IN LABORATORIES

## 5.1. General Safety Rules for Working in Chemical Laboratories

Below is a set of basic safety rules that must be followed when working in an NMSU laboratory containing hazardous chemicals.

1. Do not work alone, if working with hazardous materials or performing hazardous procedures, without prior approval of the Laboratory Supervisor.
2. Do not perform unauthorized experiments.
3. Pre-plan work, ensure all necessary safety equipment and controls are in place before beginning any hazardous operation.
4. Do not deviate from standard operating procedures without prior approval of the Laboratory Supervisor.
5. Always review the chemical SDS and chemical container label before using a hazardous chemical for the first time.
6. Wear all required personal protective equipment (PPE) for the operation to be performed. The minimum PPE for working with a hazardous chemical in a laboratory is:
    a. Laboratory apron or coat
    b. Eye protection (safety glasses or goggles)
    c. Appropriate gloves for the chemical being handled
7. Inspect all gloves for holes or other defects before using.
8. Do not eat, drink, use tobacco or apply cosmetics in areas where hazardous chemicals are used or stored.
9. Do not use water from laboratory sinks for drinking, food preparation or washing eating utensils.
10. Do not store food or drink in laboratory refrigerators or freezers.
11. Do not prepare food using laboratory microwave ovens or other household appliances used for laboratory purposes.
12. Use appropriate ventilation such as a chemical hood when working with volatile chemicals or chemicals that pose an inhalation exposure risk (i.e., fine powders or aerosols).

13. Contact the department Chemical Hygiene Officer, safety personnel or EHS&RM if you have questions about the adequacy of safety equipment or safety of the chemical procedures to be performed.
14. Know the location and proper use of the emergency safety equipment available in the laboratory (i.e., chemical spill kit, emergency eyewash, safety shower, fire extinguisher, first-aid kit, emergency telephone / telephone numbers, fire alarm pulls).
15. Maintain situational awareness. Be aware of the hazards posed by the work of others in the laboratory and any additional hazards that may result from contact between materials and chemicals from different work areas
16. Make others in the laboratory aware of the hazards associated with your work.
17. Notify your Laboratory Supervisor of any chemical sensitivities or allergies.
18. Report all injuries, accidents, incidents, and near misses as directed by this plan.
19. Do not allow unauthorized persons in the laboratory for liability, safety, and security reasons.
20. Make sure hazardous chemicals are secure at all times.
21. Report any unsafe conditions in the laboratory to your Laboratory Supervisor, Department Chemical Hygiene Officer and/or NMSU EHS.
22. Properly dispose of all hazardous chemical waste.
23. Immediately clean up any chemical spill using appropriate chemical spill procedures.

## 5.2. Safety Controls

A variety of control measures are used in laboratories to minimize the risk of an inadvertent exposure to hazardous chemicals or processes. Laboratory controls can be grouped into three general categories:

1. Engineering Controls
2. Administrative Controls
3. Personal Protective Equipment (PPE)

The use of proper PPE is important and mandatory but should be considered the last line of defense to control exposures to hazards in the laboratory. In the OSHA standard on Air Contaminants, (29 CFR 1910.1000), OSHA requires the use of either engineering or administrative controls before PPE if controls are feasible:

> *"...administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section."*

The use of controls is not mutually exclusive to one type of control. When controls are used in combination, they can provide a multi-layered level of protection for the laboratory workers.

### 5.2.1. Engineering Controls

Engineering controls are used to reduce or eliminate exposure to a chemical or physical hazard through the use of engineered machinery or equipment. Examples of common engineering controls include laboratory ventilation systems such as chemical fume hoods, flammable storage or acid-resistant storage cabinets self-capping syringe needles, safety interlocks on laboratory equipment.

**Laboratory Ventilation**

One the most common and most important type of engineering controls found in many NMSU laboratories are ventilation control systems. The use of ventilation engineering controls such as chemical fume hoods, glove boxes and other local exhaust systems (i.e., drop down flexible snorkel ducts) are often necessary to provide additional exposure protection. In general, laboratory fume hoods or similar engineering control must be used whenever handling hazardous chemicals that meet one or more of the following conditions:

1. Have a high degree of acute toxicity, are carcinogens, or are reproductive toxins, except where there is very low risk of exposure (e.g., use of minimal quantities in a closed system).
2. Have an OSHA PEL of less than 50 ppm (or 0.25 $mg/m^3$ for particulate matter).
3. Are appreciably volatile (e.g., solvents) or are easily dispersible in air (powders).

Engineering controls must be used properly to provide adequate protection. The most common type of ventilation control found in NMSU laboratories is the chemical fume hood. There is additional information on the types, proper use and limitations of different types of *laboratory ventilation systems* on the EHS&RM web site.

### 5.2.2. Administrative Controls

Administrative controls (or work practice controls) are procedures or administrative rules and practices such as written safety procedures, SOPs, supervision of laboratory staff, work schedules restrictions, and worker training requirements. As with engineering controls, administrative controls are put into place with the goal of reducing the duration, frequency, and severity of exposure to hazardous chemicals or hazardous situations in the laboratory. Examples of administrative controls for minimizing exposures to hazardous chemicals include:

1. Substitution - Substituting less hazardous chemicals when possible. For example, using proprietary detergents instead of chromic acid for cleaning glassware; or, using toluene instead of benzene for liquid-liquid extraction or chromatography.
2. Isolating or enclosing an experiment within a closed system (i.e., glove box, sealed chamber).
3. Scaling down the size of the experiment to reduce the amount of chemical needed and reduce the exposure hazard to workers.
4. Proper housekeeping. Reducing clutter reduces the chances for an accident and minimizes the effects if an accident does occur.

### 5.2.3. Administrative Controls

In addition to engineering and administrative controls, personal protective equipment (PPE) is necessary to ensure there is an adequate margin of safety for the laboratory worker in case of an incidental /

accidental chemical release or contact when working with hazardous chemicals. Detailed information about PPE and how to select the proper type is available on the NMSU EHS&RM web site under PPE Guidance.

# 6. HAZARDOUS CHEMICAL LABELING, STORAGE AND INVENTORY

## 6.1. Hazardous Chemical Container Labeling

A requirement of the NMSU Hazard Communication Program is that all containers of hazardous chemicals in the workplace must be properly labeled. There is specific information that must be included on both the original (manufacturer) label and on secondary container labels. Information on chemical container labeling requirements are available on the NMSU EHS&RM web site: *Chemical Container Labeling Procedure.*

## 6.2. Storage of Hazardous Chemicals in the Laboratory

Proper chemical storage minimizes the health and physical hazards posed by hazardous chemicals found in the laboratory. Good chemical storage techniques will:

1. Segregate incompatible chemicals to prevent accidental mixing;
2. Keep flammable materials away from sources of ignition;
3. Prevent hazardous vapors and gasses from entering common workplace air; and
4. Minimize worker exposure to health and physical hazards from chemicals that are not being used.

The basic requirements, additional information and guidance for the safe storage of the wide variety of hazardous chemicals found in NMSU laboratories are available on the NMSU EHS&RM web site: *Hazardous Chemical Storage Guidelines*

## 6.3. Hazardous Chemical Inventory

An inventory of hazardous chemicals stored in a laboratory must be maintained by the Laboratory Supervisor as required by the *OSHA Hazard Communication Standard* and NMSU Hazard Communication Program. Institutionally, NMSU EHS&RM has a regulatory obligation to track and monitor the inventory of hazard chemicals system-wide. Maintaining a chemical inventory is required by several state and federal regulations for a variety of reasons. For example, many hazardous chemicals have a quantity limit, which if exceeded; either trigger regulatory reporting requirements or require NMSU to implement enhanced security controls. For these reasons, it is important that NMSU EHS&RM maintain an accurate, institution-wide inventory of hazardous chemicals. Currently, management of the NMSU chemical inventory is done through a web-based program called the *EHS&RM Safety Hub*. Individual users can enter chemical inventory information for their areas into the system. Each laboratory must update their inventory of hazardous chemicals at least annually or whenever a new type of hazardous chemical is added.

# 7. WORKING WITH PARTICULARLY HAZARDOUS SUBSTANCES

## 7.1. Definition of a Particularly Hazardous Substances (PHS)

Under the OSHA Laboratory Standard, certain types of chemicals are defined as Particularly Hazardous Substances (PHS) and are subject to special precautions and restrictions. These include:

1. **Chemicals with a high degree of acute toxicity**:
    a. Chemicals that are considered to have a high degree of acute toxicity are those substances which are highly toxic or toxic as defined under the Hazard Communication Standard (§1910.1200) and may be fatal or cause damage to target organs as a result of a single exposure or exposures of short duration.
    b. For the purpose of this plan, on GHS-compliant Safety Data Sheets (SDSs) highly acutely toxic chemicals can be identified via the following hazard statements:
        i. H300: Fatal if swallowed
        ii. H310: Fatal in contact with skin
        iii. H330: Fatal if inhaled
2. **Select carcinogens** defined as a chemical that meets at least one of the following criteria:
    a. It is regulated by OSHA as a carcinogen
    b. It is listed as known to be carcinogenic in the latest *Annual Report on Carcinogens* issued by the Department of Health and Human Services, National Toxicology Program (NTP)
    c. It is listed under Group 1 (carcinogenic to humans) by the International Agency for Research on Cancer Monographs (IARC)
    d. It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
        i. After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 $mg/m^3$;
        ii. After repeated skin application of less than 300 (mg/kg of body weight) per week; or
        iii. After oral dosages of less than 50 mg/kg of body weight per day.
3. **Reproductive Toxins (Mutagens and Teratogens)**
    a. Chemicals that affect the reproductive capabilities including adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on the development of the offspring. Chemicals classified as reproductive toxins in accordance with the Hazard Communication Standard (§1910.1200) shall be considered reproductive toxins.

## 7.2. Special Provisions for Working with a PARTICULARLY HAZARDOUS SUBSTANCES (PHS)

When working with a PHS, the Laboratory Supervisor must evaluate, assess, and, when appropriate, implement additional provisions and precautions. Unless a formal hazard assessment shows otherwise, the basic requirements for working with a PHS include:

1. Establishment of designated use and storage area(s);
2. Use of containment devices such as chemical fume hoods or glove boxes;
3. Written standard operating / safety procedures;
4. Procedures for safe handling and disposal of contaminated wastes; and
5. Equipment and personnel decontamination procedures.

### 7.2.1. Particularly Hazardous Substance (PHS) Designated Use Areas

Designated area(s) for use of PHSs must be formally established and access to the area limited to authorized personnel who are informed of the hazardous substances used in the area and trained to work with the materials.

1. Designated use areas may be an entire laboratory, a specific lab bench, or a single chemical fume hood / glovebox. When a PHS is in use, access to the designated area must be restricted to only authorized personnel.
2. Use of the PHS must be limited to the designated area(s).
3. Hazard warning signs must be posted at designated work areas and chemical storage location. The wording must indicate the specific hazard listed below (or words with similar intent):
    a. WARNING, CANCER HAZARD – SELECT CARCINOGEN
    b. WARNING, REPRODUCTIVE TOXIN
    c. WARNING, HIGHLEY ACUTELY TOXIC CHEMICAL

### 7.2.2. Particularly Hazardous Substance (PHS) Storage Areas

Particularly Hazardous Substances (PHS)must be stored in designated, marked storage areas:

1. PHSs should be stored in a ventilated storage area, if possible;
2. Primary chemical containers must be tightly capped and stored in unbreakable, chemically resistant secondary containment;
3. Limit access to the stored PHS to only authorized personnel by using:
    a. Lockable storage cabinets, boxes, refrigerators, drawers, etc. or,
    b. Restrict access to the laboratory and keep the laboratory locked whenever no authorized personnel are present.
4. Post PHS storage (rooms, cabinets, refrigerators, etc.) with specific hazard warnings (see PHA warning sign wording under bullet 3 of section 7.2.1);

5. Remove PHSs from storage only when it is needed and return the container to storage as soon as practical; and
6. Follow any special storage requirements listed on the manufacturer instructions or chemical SDS.

### 7.2.3. Use of Engineering Controls and Other Controls for Particularly Hazardous Substances

Particularly Hazardous Substances (PHS)should generally be handled in a ventilated containment system such as a designated chemical fume hood, glovebox, or other closed ventilated system. Working with PHSs on an open lab bench is discouraged unless a hazard assessment has been performed demonstrating that the work can be done safely and the likely exposure risk to workers and/or the environment will be below established regulatory limits.

1. Using PHSs in a manner, which may produce vapors, dusts, mists, gases or other easily disbursable particulate and become an airborne hazard must be done in an appropriate ventilated containment system.
2. When a PHS is used outside of an established containment system, the general room ventilation must be maintained at negative pressure with respect to public areas.
    a. Exhaust air from ventilation containment systems must be vented externally; recirculation back into the lab or general building ventilation system is not permitted.
    b. Laboratory access doors leading to public areas must be kept closed when the chemical is in use.
3. PHS work surfaces should be stainless steel, chemically resistant epoxy, or other chemically impervious, material that is easy to clean / decontaminate.
    a. When possible, work should be performed in a spill tray lined with dry absorbent plastic backed paper or other chemically compatible disposable lining.
    b. If contaminated, liners should be replaced with a clean liner and the contaminated liner disposed of as hazardous waste.
4. Mechanical pipetting aids must be used for all pipetting procedures (no mouth pipetting).
5. Experiments using a PHS must be designed and performed in a manner which will safely maintain control of the PHS at all times.
    a. Written SOPs which include safe handling and hazard control information must be developed and laboratory staff trained to the specific procedures prior to performing the work.
    b. Additional safety controls may be required if there are additional hazards are involved (i.e., the PHS will be under pressure during part of the process).
6. Laboratory personnel should immediately stop work and consult their Laboratory Supervisor if an unexpected result or reaction occurs at any point in a process and they are uncertain of the potential hazards.
7. Personnel working in a PHS-designated area or laboratory must remove their PPE and wash their hands and forearms before leaving the laboratory.
8. Laboratory equipment used to work with a PHS must be decontaminated before being removed from the designated area.

9. Spill-proof secondary containment must be used whenever transporting a PHS outside of the designated use area or laboratory.

#### 7.2.4. Procedures for Safe Handling and Disposal of Particularly Hazardous Substances (PHS) Contaminated Waste

Follow all waste storage and disposal requirements listed on the manufacturer instructions or chemical SDS. Include any special requirements in the written SOPs for handling the PHS.

Follow the applicable sections of the EHS&RM procedures for handling and management of hazardous chemical waste. Detailed procedures are available on the EHS&RM web site on the **Waste Management** page.

#### 7.2.5. Particularly Hazardous Substance (PHS) Spill and Decontamination Procedures

Review and follow any special spill cleanup and decontamination procedures listed on the manufacturer instructions or chemical SDS. Include any special requirements in the written SOPs for handling the PHS.

General chemical spill response and decontamination procedures are available on EHS&RM web site on the **Hazard Spill Procedures** page.

# 8. PRIOR APPROVAL REQUIREMENTS

There are hazardous situations and processes that may occur in laboratories which require the Laboratory Supervisor or sometimes NMSU EHS&RM to formally approve the activity prior to it being performed. This section describes situations when formal prior approval is needed and the process for obtaining and granting prior approval. Prior approval must be obtained from the Laboratory Supervisor for the activities listed in the section.

## 8.1. New Work or New Processes using High Hazard Materials

New work or a new work process involving the use of an OSHA Particularly Hazardous Substances, highly reactive or explosive materials and toxic gases requires review and prior approval from the Laboratory Supervisor before proceeding.

## 8.2. Changes to an Established Procedure or Process

A change in an established procedure or process that may increase or change the known hazard(s) must be pre-approved by the Laboratory Supervisor. Examples include:

1. Substituting, adding, deleting or changing a chemical used in an established procedure.
2. Performing an operation on an open lab bench, which is normally performed inside a chemical fume hood or other ventilated containment system.
3. Scaling up or scaling down an experiment procedure or process.
4. Making a change to an established process or procedure where the impact of making the change is not completely known.

## 8.3. Unattended Laboratory Operations

The operation of laboratory equipment or processes involving the use of hazardous chemicals overnight or otherwise unattended is generally discouraged and must be avoided if possible. However, those

laboratory procedures that do need to run overnight, on weekends or at other times when no personnel are present to monitor the process must be carefully planned out to avoid hazards and mishaps caused by unexpected events such as utility failure, disruption of supply water or failure of laboratory equipment. For these reasons, the Laboratory Supervisor must review and approve all unattended operations in the laboratory that use hazardous chemicals or where an equipment failure could pose a danger to building personnel or damage to the facility. At a minimum, the following precautions must be followed when running unattended operations in the laboratory:

1. Obtain prior approval from the Laboratory Supervisor
2. Post a sign on laboratory entrances that includes information on:
    a. The nature of the experiment
    b. Hazards posed by the process
    c. Types and approximate quantities of hazardous materials in use (if applicable)
    d. Emergency Contact Information for the responsible individual

### 8.4. Working Alone in a Laboratory

Working alone in NMSU laboratories is generally discouraged. Working with hazardous chemicals, performing a hazardous operation or working with hazardous laboratory equipment when alone in a laboratory, especially after regular hours, poses a significant risk to life and property. If an accident occurs, the ability of a worker to respond appropriately can be severely impaired which could result in injury, death or catastrophic property damage. If the timing of the task cannot be changed and the work must be accomplished during a time when the laboratory is empty, the following requirements must be met:

1. The Laboratory Supervisor must review the activity and approve the activity prior it being performed;
2. A "buddy system" must be used where arrangements are made to have someone periodically check in with the worker either in person or by phone or radio; or,
3. A remote monitoring system, such as a web cam or closed circuit television be used to monitor the worker remotely.

If no one is available to accompany the worker or a "buddy system" and a remote monitoring system cannot be set up, then **do not proceed with the work**. The situation is unsafe. Consult with the Laboratory Supervisor or EHS&RM to review alternate options for completing the work.

## 9. LABORATORY INSPECTIONS

Routine laboratory inspections are an essential function to identify and address potential health and safety deficiencies and to fulfill regulatory compliance requirements.

### 9.1. Laboratory Self-Inspections

Laboratories should perform periodic self-inspections. A ***Laboratory Safety Checklist*** is available on the EHS&RM web site.

## 9.2. NMSU EHS&RM Laboratory Safety Inspections

Inspectors from EHS&RM perform annual safety inspections in most laboratories. The inspection reports are sent to the Laboratory Supervisor. If deficiencies are found, the Laboratory Supervisor must correct the deficiencies and return a written Corrective Action Response report back to EHS&RM within a prescribed time. Information on the EHS&RM inspection program can be found on the EHS&RM website under ***Laboratory Safety Inspections***.

## 9.3. Performance Verification of Engineering Controls and Safety Equipment

To ensure that primary engineering controls and safety equipment are working as designed, NMSU Facilities and Services provides performance verification and operational checks on a routine basis for the following equipment:

1. Annual check and certification of chemical fume hood performance.
2. Annual check and certification of emergency safety showers and emergency eyewashes.

Any problems encountered with laboratory control and safety equipment between the annual checks should be immediately reported to NMSU Facility and Services.

# 10. MANAGEMENT OF LABORATORY HAZARDOUS WASTE

Proper management of hazardous chemical waste is critical for both regulatory compliance and safety of laboratory personnel. Refer to the ***EHS&RM Waste Management*** web page for guidance on general waste management practices, segregation of waste, accumulation and storage of waste, labeling of waste, and how to request the pick-up and removal of waste.

A specialized training class is required for designated laboratory Hazardous Waste Coordinators but at a minimum, all laboratory personnel are required to know:

1. Hazards of the chemical waste generated and stored in the laboratory
2. How to properly contain, label, and store waste in the laboratory
3. What to do in an emergency involving hazardous chemical waste.

# 11. LABORATORY EMERGENCYS

All incidents involving hazardous chemical spills and personnel exposures require prompt action by laboratory staff, responders and the victims in order to control the effect of the chemical exposure to personnel and to minimize the impact to property and the environment.

## 11.1. Required Emergency Contacts and Area Postings for Laboratories

Each entrance into a laboratory must be posted with emergency contact information. The primary and secondary contacts listed must have knowledge about the chemical and physical hazards in the laboratory as well as general knowledge about the type of processes performed in the laboratory. Entry doors are also required to be posted with words and/or pictograms showing the general type of chemical and physical hazards that may be encountered in the area. In addition, any special entry or exit requirements (i.e., PPE donning / doffing requirements) must also be posted. A door sign template is available for download on the EHS&RM web site.

## 11.2. General Emergency Procedures

Each NMSU department / administrative unit is required to have an Emergency Action Plan (EAP), which covers areas under their administrative control. Unit-level EAPs include general emergency procedures and emergency contact information:

1. Department Emergency Coordinator contacts and other emergency contacts
2. Building escape / evacuation route maps and evacuation procedures
3. Evacuation assembly sites
4. Personnel evacuation verification and reporting methods
5. Procedures for assisting disabled personnel in an emergency
6. General emergency shutdown procedures for laboratories and other hazardous materials areas

The department EAP must be available to and reviewed by all laboratory personnel.

Additional emergency response information for employees for various types of emergencies (fire, explosions, serious injury, exposure to hazardous material, active shooter, etc.) is also available in the NMSU Quick-Flip Guide to Emergencies which is available for download from the Emergency Information web page.

## 11.3. Chemical Exposure and Spill Response Procedures

An accidental release of a hazardous chemical can occur in a laboratory at any time. The Chemical Exposure and Spill Response Procedure describes the proper response if a person exposed to a hazardous chemical and procedures for handling different types and sizes of chemical spills in a laboratory. The procedure also includes recommendations on the type of supplies that should be in a standard laboratory chemical spill kits.

## 11.4. Emergency Eyewashes and Safety Showers

All laboratories using hazardous chemicals must have immediate access to safety showers and eyewash stations. All lab personnel must be aware of the emergency shower and safety shower locations and know how to properly use them.

Laboratory personnel should flush eyewash stations at least weekly. This will keep the system free of sediment and prevent bacterial growth from reducing performance. The areas around and paths leading to emergency eyewashes and showers must be free of obstructions and have highly visible signs indicating their location.

If lab personnel are exposed to a hazardous chemical, they should dial 911 (or someone else in the lab not exposed should dial 911) and use the safety shower and/or eye wash unit for 15 minutes or until emergency responders arrive and begin treatment. If an uninjured individual is present, this person should assist with the decontamination of the affected individual.

NMSU Facility and Services performs an annual inspection of all campus safety shower and eyewash stations. This inspection evaluates the basic mechanical functionality of each station. If a safety shower or eyewash unit becomes inoperable at any time, notify the building monitor immediately so a repair work order can be submitted to NMSU Facility Services.

## 11.5. Laboratory Incident Reporting

Laboratory personnel must report all occupational injuries or illness to their Laboratory Supervisor as soon as practical. The supervisor and laboratory personnel must submit required forms to the EHS&RM or other departments in a timely manner. Detailed information and instructions are available on the EHS&RM Risk Management web page.

Laboratory personnel also are encouraged to report "near misses". Near misses are often precursors to an actual incident and reports of near misses as a learning tool to prevent future incidents.

### 11.5.1. Incident Follow-up

EHS&RM and the Laboratory Supervisor will conduct (or coordinate) an investigation of all incidents that occur in a laboratory. The goal of the investigation is to identify and address any deficiencies that may have contributed to the incident. EHS&RM can also assist in the follow-up of near misses, if requested.

# 12. CHEMICAL EXPOSURE ASSESSMENTS

Consistent adherence to general safe laboratory practices in conjunction with appropriate use of engineering and administrative controls are expected to keep exposures to laboratory chemicals at safe levels. The risk of exposure risk is more likely to increase when handling hazardous chemicals outside of a lab hood, especially those chemicals that:

1. Have a high degree of acute toxicity, are carcinogens, or are reproductive toxins, except where there is very low risk of exposure (e.g., use of minimal quantities in a closed system);
2. Have a permissible exposure limit of less than 50 ppm (or 0.25 mg/$m^3$ for particulate matter);
3. Are volatile or easily dispersible in air (i.e., fine powders); and
4. Are used in large volumes (e.g., greater than 1 liter).

Contact EHS&RM for assistance with chemical exposure assessments or any concern involving hazardous chemicals usage, including the above scenarios, or with help verifying adequate controls.

## 12.1. Employee Exposure Monitoring

EHS&RM will conduct monitoring if an employee may be exposed to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for the regulated substance could routinely exceed the action level or PEL. Examples where personal monitoring may be warranted include:

1. Handling volatile or acutely toxic chemicals outside of a chemical fume hood or other ventilated containment system.
2. Laboratory personnel develop signs or symptoms associated with a possible hazardous chemical exposure.

If initial monitoring indicates an employee exposure may be over the action level or PEL, exposure monitoring will be conducted and continue until it may be terminated per the provisions of the relevant regulatory standard. For more information about personal exposure monitoring, contact EHS&RM.

## 12.2. Employee Notification of Monitoring Results and Record Keeping

EHS&RM will, within 15 working days after the receipt of any monitoring results, notify the employee of the monitoring results in writing either individually or by posting results in an appropriate location that is accessible to employees. EHS&RM maintains copies of employee exposure monitoring records per applicable regulatory requirements.

# 13. MEDICAL CONSULTATIONS, EXAMINATIONS AND SURVEILLANCE

Laboratory personnel who work with hazardous chemicals will be provided the opportunity to receive medical attention/consultation when:

1. A worker develops symptoms or signs of exposure to a hazardous chemical;
2. Exposure monitoring reveals a potential overexposure;
3. A spill, leak, explosion or other occurrence results in a potential overexposure; and
4. A regulatory standard triggers a medical surveillance requirement.

If any of these conditions occur or apply, the Laboratory Supervisor and EHS&RM must be immediately notified.

If a medical follow-up or surveillance is necessary because of one or more of the conditions listed above, the medical examination(s) will be conducted by a licensed medical provider, at a reasonable time and place, at no cost to the worker. Occupational medical consultations and examinations are typically done through the NMSU Campus Health Center or other NMSU-approved medical provider.

## 13.1. Information given to a Medical Provider by NMSU

If the medical evaluation is for a suspected exposure, the worker, Laboratory Supervisor and/or NMSU EHS&RM will provide the following information to the physician:

1. Identity of hazardous chemical(s) and a copy of the appropriate chemical Safety Data Sheets, if available;
2. Conditions of the exposure, including exposure or monitoring data, if available; and
3. Signs and symptoms of the exposure.

## 13.2. Information Given to NMSU by Medical Providers

The medical provider will document and provide, as appropriate, a written report with the following information to EHS&RM:

1. Occupational exposure test results;
2. Any medical conditions that may place employee at an increased risk from exposures to hazardous chemicals in the workplace;
3. Statement that employee has been informed of the results; and
4. The written report shall not reveal any specific findings or results of diagnoses that are unrelated to occupational exposure.

The worker and EHS&RM are responsible for informing the Laboratory Supervisor and

department administration of any work modifications ordered by the clinician as a result of exposure.

## 13.3. Medical Record Retention and Employee Access to Medical Records

Employee medical records will be maintained by NMSU for the duration of the employee's employment with NMSU plus 30 years. Employees will be provided access to their medical records within 15 days of making the initial request.

# Appendices

# Appendix A – Laboratory Door Posting Example

| Building Name: Room Number | |
|---|---|
| **Department Name:** | |
| **General Hazards / Restrictions**<br>**(insert appropriate pictographs)**<br>  <br>  <br> | **General Hazards and Area Restriction Statements**<br>**(Insert appropriate hazard / restriction descriptions)**<br>**Compressed Gases**<br><br>**No Eating, Drinking, or Smoking** |
| **Primary Area Contact:** | Primary Contact Name<br>(xxx) xxx-xxxx (Main Phone) / (xxx) xxx-xxxx (After Hours) |
| **Secondary Area Contact** | Secondary Contact Name<br>(xxx) xxx-xxxx (Main Phone) / (xxx) xxx-xxxx (After Hours) |
| **Department / Division Head** | Department / Division Head Name<br>(xxx) xxx-xxxx (Main Phone) |
| **Facility / Building Safety Contact** | Safety Contact Name<br>(575) 646-3327 (Office) / (575) 312-6649 (Cell – After Hours) |
| **NMSU Environmental Health & Safety:** | (575) 646-3327 (Main Office)<br>(575) 646-3311 (NMSU Emergency Dispatch – After Hours) |
| **Fire/Police/Ambulance:** | **911** |

# Appendix B – Training Documentation Template

# In-House Employee/Student Training Record

| | | | |
|---|---|---|---|
| **Employee / Student Name:** | | | |
| **Aggie ID Number:** | **NMSU Email:** | | |
| **Department:** | | | |
| **Date** | **Training Description** | **Score or Pass / Fail** | **Trained By:** |
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# Appendix C – Standard Operating Procedure Template

# STANDARD OPERATING PROCEDURE

Use this form to document the Health and Safety information associated with the procedure.
Include attachments where applicable

**Procedure Title** __

**Dept** _____ **Bldg/Rm** _____ **Supervisor** _____

**Procedure Overview** (brief description of the project)

**Health and safety information for materials used (**briefly describe the hazards associated with the materials and/or equipment **OR** document your hazard assessment in Section II)

**Hazard Control Measures**

Please select which type of lab coat, eye protection, and hand protection will be used (Lab coat, eye and hand protection, and closed toe/heel shoes must be selected as required by Section D of the ISU Laboratory Safety Manual.)

| | | | |
|---|---|---|---|
| ☐ Latex gloves | ☐ Insulated gloves | ☐ Face Shield | ☐ Respirator |
| ☐ Nitrile gloves | ☐ Safety glasses | ☐ Lab Coat | ☐ Fume hood |
| ☐ Neoprene gloves | ☐ Vented goggles | ☐ Apron | ☐ Biosafety cabinet |
| ☐ Vinyl gloves | ☐ Splash goggles | ☐ Dust mask | ☐ Glove box |
| ☐ Closed Toe/Closed Heel Shoes | | ☐ Flame Resistant Lab coat | |

***Other Control Measures*** **Methods** (Include step by step instructions detailing the process or attach this document to an existing method.)

**Waste Disposal Procedures**

**First Aid Procedures**

**Spill/Release Containment, Decontamination, and Clean Up Procedures**

**Using Substances Requiring Special Procedures?** No ☐ Yes ☐

(If Yes; identify authorized personnel, designate a use area and specify specialized safety precautions here. Refer to Particularly Hazardous Substances (PAH) in the NMSU Chemical Hygiene Plan for details.)

**Written By** _____ **Date** _____

**Approved By** _____ **Date** _____

(PI or Lab Supervisor)

# I. HAZARD ASSESSMENT

Use the hierarchy of controls to document the hazards and the corresponding control measure(s) involved in each step of the procedure.

Consider *elimination or substitution* of hazards, if possible.

***Engineering Control(s):*** items used to isolate the hazard from the user (i.e. fume hood, biosafety cabinet).

***Administrative Control(s)****:* policies/programs to limit the exposure to the hazard (i.e. authorizations, designated areas, time restrictions, training).

***Required PPE***: indicate PPE including specific material requirements if applicable (i.e. flame resistant lab coat, type of respirator or cartridge).

| Hazard | Engineering Control(s) | Administrative Control(s) | Required PPE |
|---|---|---|---|
| | | | |
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# II. TRAINING RECORD

Use the following table to record the training associated with this Standard Operating Procedure.

| Print Name | Signature | Trained By | Date |
|---|---|---|---|
| | | | |
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| | | | |
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