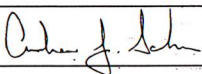
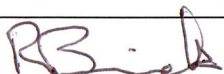


## LABORATORY PERSONAL PROTECTIVE EQUIPMENT (PPE) HAZARD ASSESSMENT GUIDE

<b>Principal Investigator's (PI) Name (print name):</b> R. Buick, E. Steig, K. Huntington, B. Alexander, P. Ward		<b>Department/Unit:</b> Earth and Space Sciences	
<b>Building(s):</b> Johnson Hall		<b>Room(s):</b> 302 / 303	
<b>Lab Manager's Name:</b> A. Schauer		<b>Lab Manager's Phone:</b> 206.543.6327	
<b>Completed by (print name):</b> A. Schauer		<b>Signature:</b> 	<b>Date</b> 7/16/2015
<b>Signature of PI:</b> 		<b>Date</b> 07/16/2015	

This form must be completed by the PI, Lab Manager, or their designee. This person must conduct a laboratory hazard assessment specific to operations in their laboratories. The laboratory hazard assessment identifies hazards to employees and specifies personal protective equipment (PPE) to protect employees during work operations. The completed document and associated training will satisfy the Dept. of Labor & Industries requirements for PPE in WAC 296-800-160. EH&S personnel are available to assist you with completing this form or with reviewing it after you have completed it. EH&S may be consulted by calling EH&S at 206-543-7388. PIs/Lab Managers are responsible for ensuring PPE requirements are followed.

This Assessment Guide consists of two sections.

- Section 1:** Laboratory PPE Hazard Assessment
- Section 2:** Conduct PPE Training

### Section 1: Laboratory PPE Hazard Assessment

In this section, the PI, Lab Manager or their designee will:

- Conduct a hazard assessment of the laboratory operations using the PPE Assessment guide. The guide will assist to identify operations when PPE is needed to protect lab staff from exposure to hazards. Describe the specific PPE your lab uses for each hazardous operation performed in your lab in the boxes you check off.
- Certify the hazard assessment for the laboratory by signing the table above after the PPE hazard assessment has been completed.

# CHEMICAL HAZARDS

**Minimum PPE: Lab coat, safety glasses, long pants or skirt, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves. Operations may need to be performed inside a fume hood.**

(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Check PPE Selected	Notes
X	Working with solids of low or moderate toxicity	Skin or eye damage; potential poisoning through skin contact	<input type="checkbox"/> Nitrile or other appropriate chemical-resistant glove <input type="checkbox"/> List any other lab-specific-PPE	
X	Working with very small volumes (<0.1L) of organic solvents, corrosives or other toxic liquids	Potential respiratory, skin, or eye damage; potential poisoning through skin contact	<input type="checkbox"/> Safety glasses <input type="checkbox"/> Safety goggles where splashing may occur <input type="checkbox"/> Nitrile or other chemical resistant gloves <input type="checkbox"/> List any other lab-specific-PPE	
X	Working with larger volumes (≥0.1L) of organic solvents, corrosives or other toxic liquids	Potential respiratory, skin, or eye damage; potential poisoning through skin contact	<input type="checkbox"/> Safety goggles <input type="checkbox"/> Face shield and/or apron where splashing may occur <input type="checkbox"/> Nitrile or other chemical resistant gloves <input type="checkbox"/> List any other lab-specific-PPE	
X	Working with particularly hazardous agents or procedures such as: <ul style="list-style-type: none"> <li>Chemicals of high acute toxicity (e.g. hydrogen fluoride, hydrogen cyanide)</li> <li>Human carcinogens, mutagens, and reproductive toxins</li> <li>Select Agent toxins</li> </ul>	Potential respiratory, skin, or eye damage; potential poisoning through skin contact.	<input type="checkbox"/> Refer to SOP <input type="checkbox"/> Safety glasses <input type="checkbox"/> Safety goggles where splashing may occur <input type="checkbox"/> Chemical resistant gloves <input type="checkbox"/> List any other lab-specific-PPE	IsoLab has HF, if your project requires its use, you must take the EHS hydrofluoric acid safety course.
X	Working with an apparatus with contents under pressure or vacuum _____ (mm of Hg, psi, or torr).	Eye or skin damage	<input type="checkbox"/> Goggles w/face shield- Use blast shield for high risk activities <input type="checkbox"/> Chemical-resistant gloves / apron if chemicals are involved <input type="checkbox"/> Refer to SOP	IsoLab has both vacuum and pressure systems. Make certain to read the appropriate SOP before using.
X	Working with air or water reactive chemicals	May give off toxic gases, heat, and energy. Potential inhalation, skin and eye damage, fire	<input type="checkbox"/> Work in inert atmosphere or inside glove box, where possible <input type="checkbox"/> Goggles w/ face shield <input type="checkbox"/> Chemical-resistant gloves <input type="checkbox"/> Flame retardant lab coat <input type="checkbox"/> Blast shield <input type="checkbox"/> Refer to SOP	

# CHEMICAL HAZARDS

**Minimum PPE: Lab coat, safety glasses, long pants or skirt, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves. Operations may need to be performed inside a fume hood.**

(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Check PPE Selected	Notes
	Working with pyrophoric materials	Fire, potential inhalation, skin and eye damage, severe burns	<input type="checkbox"/> Work in inert atmosphere or inside glove box <input type="checkbox"/> Goggles w/ face shield <input type="checkbox"/> Flame retardant lab coat and gloves with inner chemical-resistant gloves <input type="checkbox"/> Wear non-synthetic clothing <input type="checkbox"/> Refer to SOP	
	Working with potentially explosive chemicals	Detonation, flying debris, skin and eye damage, fire	<input type="checkbox"/> Safety goggles w/ face shield and blast shield <input type="checkbox"/> Chemical resistant gloves <input type="checkbox"/> Flame retardant lab coat <input type="checkbox"/> Refer to SOP	
X	Working with high temperature equipment or objects	Burns, fire	<input type="checkbox"/> Safety glasses <input type="checkbox"/> Thermal insulated gloves	
X	Working with cryogenic material	Burns, frostbite, eye damage	<input type="checkbox"/> Safety glasses w/ face shield <input type="checkbox"/> Thermal insulated gloves	
X	Minor chemical spill cleanup	Potential skin, eye, respiratory damage	<input type="checkbox"/> Safety glasses or goggles <input type="checkbox"/> Chemical-resistant gloves <input type="checkbox"/> Chemical-resistant apron <input type="checkbox"/> Refer to SOP for additional PPE requirements Contact EH&S for assistance.	
	Large chemical spill	Skin or eye damage, respiratory damage	Call 911. Report all injuries and fires. Call EH&S for assistance.	
	List any unique particularly hazardous lab tasks involving chemicals		<input type="checkbox"/> Refer to SOP <input type="checkbox"/> List PPE required by the lab	

RADIOLOGICAL HAZARDS				
Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves. Operations may need to be performed inside a fume hood.				
(√) If applies	Activity	Potential Hazard	Applicable PPE	Notes <span style="float: right;">N</span>
	Working with solid radioactive material or solid radioactive waste	Cell damage, potential spread of radioactive contamination	<input type="checkbox"/> Safety glasses <input type="checkbox"/> Impermeable gloves <input type="checkbox"/> Lab coat <input type="checkbox"/> Enclosed shoes <input type="checkbox"/> Long pants- No shorts <i>Note: This PPE not needed when using sealed radiation sources.</i>	
	Working with liquid radioactive material (in corrosives, flammables, aqueous liquids – including liquid radioactive waste) or radioactive powders	Cell damage or spread of contamination, plus hazards for the specific chemical	<input type="checkbox"/> Safety glasses (or goggles for splash hazard) <input type="checkbox"/> Impermeable gloves <input type="checkbox"/> Lab coat <input type="checkbox"/> Enclosed shoes <input type="checkbox"/> Long pants- No shorts <i>Note: Select glove type for the applicable chemical hazards.</i>	
	Working with ultraviolet radiation	Conjunctivitis, corneal damage, skin burns	<input type="checkbox"/> UV face shield and/or goggles <input type="checkbox"/> Lab coat <input type="checkbox"/> Nitrile gloves if hand exposure is possible	
X	Working with infrared-emitting equipment (e.g., glass blowing)	Cataracts, burns to cornea	<input type="checkbox"/> Appropriate polycarbonate infrared filter glasses <input type="checkbox"/> Lab coat	
NANOMATERIALS				
Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate impermeable glove. Work inside a fume hood or HEPA filtered vented enclosure.				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes <span style="float: right;">NNN</span>
	Working with engineered nanomaterials	Inhalation, chemical exposure, dermal exposure	<input type="checkbox"/> Use P100 dust respirators if working outside a vented enclosure <input type="checkbox"/> Nitrile gloves  <input type="checkbox"/> Review Guidelines for Handling Nanomaterials	

LASER HAZARDS				
Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves.				
(√) If applies	Activity	Potential Hazard	Applicable PPE	Notes
OPEN BEAM				
	Performing beam alignment, laser experiment, troubleshooting or maintenance that requires working with an open laser beam, and/or defeating the interlock(s) on any Class 3b or Class 4 laser system	Eye damage	<input type="checkbox"/> Appropriate laser safety goggles/glasses with optical density based on individual beam parameters <i>EH&amp;S to determine the needed optical density.</i>	
	Viewing a Class 3R laser beam <i>with magnifying optics</i> (including eyeglasses)	Eye damage	<input type="checkbox"/> Appropriate laser safety goggles/glasses with optical density based on individual beam parameters <i>EH&amp;S to determine the needed optical density.</i>	
	Working with a Class 3b open beam laser system with the potential for producing direct or specular (mirror-like) reflections	Eye damage	<input type="checkbox"/> Appropriately shaded goggles/glasses with optical density based on individual beam parameters <i>EH&amp;S to determine the needed optical density.</i>	
	Working with a Class 4 open beam laser system with the potential for producing direct, specular, <u>or</u> diffuse reflections	Eye damage, skin damage	<input type="checkbox"/> Appropriate laser safety goggles/glasses with optical density based on individual beam parameters <i>EH&amp;S to determine the needed optical density.</i> <input type="checkbox"/> Long sleeved shirt (tightly wound fabric) <input type="checkbox"/> Lab coat <input type="checkbox"/> Nitrile gloves	
NON-BEAM				
	Handling dye laser materials, such as powdered dyes, chemicals, and solvents	Cancer, explosion, fire	<input type="checkbox"/> Impermeable gloves <input type="checkbox"/> Safety glasses <input type="checkbox"/> Flame-resistant lab coat or coveralls	
	Maintaining and repairing power sources for Class 3B and Class 4 laser systems	Electrocution, explosion, fire	<input type="checkbox"/> Electrical isolation mat <input type="checkbox"/> Flame-resistant lab coat <input type="checkbox"/> Insulated gloves <input type="checkbox"/> Safety glasses <input type="checkbox"/> Coveralls <input type="checkbox"/> Implement Lockout/Tagout procedures <input type="checkbox"/> Refer to SOP Contact EH&S for assistance.	
PHYSICAL HAZARDS				
Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves.				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
X	Working with cryogenic liquids	Major skin, tissue, or eye damage	<input type="checkbox"/> Goggles and face shield <input type="checkbox"/> Cryogenic or loose fitting heavy leather gloves <input type="checkbox"/> Cryogenic apron	

X	Removing freezer cryovials from liquid nitrogen	Vials may explode upon rapid warming, cuts to face/neck and frostbite to hands	<input type="checkbox"/> Safety glasses or goggles and face shield <input type="checkbox"/> Cryogenic or loose fitting heavy leather gloves	
X	Working with very cold equipment or dry ice	Frostbite, hypothermia	<input type="checkbox"/> Safety glasses <input type="checkbox"/> Cryogenic or heavy leather gloves (possibly warm clothing)	
X	Working with hot liquids, heating equipment, open flames (autoclave, Bunsen burner, water bath, oil bath)	Burns resulting in skin or eye damage	<input type="checkbox"/> Safety glasses <input type="checkbox"/> Goggles for hot liquids <input type="checkbox"/> Autoclave gloves (impermeable insulated gloves for liquids, steam)	
X	Glassware washing	Lacerations	<input type="checkbox"/> Safety glasses <input type="checkbox"/> Cut resistant gloves	
X	Working with loud equipment, noises, sounds, alarms, etc.	Potential ear damage and hearing loss	<input type="checkbox"/> Earplugs or ear muffs as necessary <input type="checkbox"/> Contact EH&S for noise exposure assessment	
X	Working with a centrifuge	Imbalanced rotor can lead to broken vials, cuts, potential exposure to aerosols.	<input type="checkbox"/> Centrifuge rotor should be opened inside fume hood or biosafety cabinet if potential for broken vials exists <input type="checkbox"/> Goggles <input type="checkbox"/> Appropriate gloves	
X	Working with a sonicator	Ear damage, exposure to aerosols	<input type="checkbox"/> Place inside fume hood or biosafety cabinet to capture aerosols <input type="checkbox"/> Goggles <input type="checkbox"/> Impermeable gloves	
X	Working with sharps	Cuts, exposure to aerosols	<input type="checkbox"/> Use tongs for broken glass and designated sharps container for contaminated wastes <input type="checkbox"/> Cut resistant gloves (Kevlar) with nitrile underneath	
	Working with compressed gases inside environmental chambers	Asphyxiation or toxic gas exposure	NOT ALLOWED. Contact EH&S for guidance. Review SOP and install oxygen sensors inside chamber.	

<b>BIOLOGICAL HAZARDS</b> <b>Minimum PPE: Lab coat, closed-toed shoes, disposable 4-mil nitrile gloves.</b>				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
	Working with human blood, body fluids, cell lines (primary or established), tissues, or blood borne pathogens (BBP)	Exposure to infectious material	<input type="checkbox"/> Perform inside a Biosafety cabinet (BSC) <input type="checkbox"/> Latex or nitrile gloves <input type="checkbox"/> Lab coat or gown	
	Working with preserved animal and/or human specimens	Exposure to infectious material or preservatives	<input type="checkbox"/> Perform in a BSC <input type="checkbox"/> Safety glasses required if performed outside of a BSC <input type="checkbox"/> Impermeable glove for preserved specimens according to preservative used <input type="checkbox"/> Lab coat <input type="checkbox"/> Disposable gown	



<b>BIOLOGICAL HAZARDS</b> <b>Minimum PPE: Lab coat, closed-toed shoes, disposable 4-mil nitrile gloves.</b>				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
	Working with radioactive human blood, body fluids, or blood borne pathogens (BBP)	Cell damage, potential spread of radioactive contaminants, or potential BBP exposure to infectious material	<input type="checkbox"/> Perform in a BSC <input type="checkbox"/> Latex or nitrile gloves <input type="checkbox"/> Lab coat <input type="checkbox"/> Gown	
	Working with agents or recombinant DNA classified as Risk Group 1 and requiring Biosafety Level 1 containment	Biological agents that typically pose a minimal potential for infection via injection, skin exposure, ingestion or inhalation	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Latex or nitrile gloves <input type="checkbox"/> Lab coat <input type="checkbox"/> Disposable gown	
	Manipulation of recombinant DNA, cell lines, viruses, bacteria, or other organisms classified as Risk Group 2 and requiring Biosafety Level 2 (BSL-2)	Biological agents that pose a moderate potential for infection via injection, skin exposure, ingestion or inhalation	<input type="checkbox"/> Perform in a BSC <input type="checkbox"/> Latex or nitrile gloves <input type="checkbox"/> Lab coat <input type="checkbox"/> Surgical gown	
	Manipulation of infectious materials classified as Risk Group3 but manipulated in a BSL 2 facility with BSL-3 practices (BSL 2+)	Biological agents that pose a moderate/serious potential for infection via injection, skin exposure, ingestion, or inhalation	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Nitrile gloves (double) <input type="checkbox"/> Lab coat <input type="checkbox"/> Disposable gown (preferred) that ties in the back <input type="checkbox"/> Respirator if indicated	
	Manipulation of infectious materials classified as Risk Group 3 and requiring Biosafety Level 3 (BLS-3) containment	Biological agents that pose a serious or lethal potential for infection via injection, skin exposure, ingestion or inhalation	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Nitrile gloves (double) <input type="checkbox"/> Full disposable coverall suit (preferred) <input type="checkbox"/> Respirator <input type="checkbox"/> Shoe cover or dedicated shoe	

<b>BIOLOGICAL HAZARDS</b> <b>Minimum PPE: Lab coat, closed-toed shoes, disposable 4-mil nitrile gloves.</b>				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
	Working with live animals (Animal Biosafety Level 1, ABL-1)	Animal bites, allergies	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Nitrile or vinyl gloves for broken skin <input type="checkbox"/> Lab coat or gown <input type="checkbox"/> Consider need for wire mesh or Kevlar glove	
	Working with live animals (Animal Biosafety Level 2, ABL-2)	Animal bites, exposure to infectious material, allergies	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Nitrile or vinyl gloves <input type="checkbox"/> Disposable gown <input type="checkbox"/> Shoe covers <input type="checkbox"/> Consider need for wire mesh or Kevlar glove	
	Working with live animals (Animal Biosafety Level 2+, ABL-2+)	Animal bites, exposure to infectious material, allergies	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Nitrile or vinyl gloves <input type="checkbox"/> Disposable gown <input type="checkbox"/> Shoe covers <input type="checkbox"/> N-95 respirator as indicated <input type="checkbox"/> Consider need for wire mesh or Kevlar glove	
	Working with live animals (Animal Biosafety Level 3, ABL-3)	Animal bites, exposure to infectious material, allergies	<input type="checkbox"/> Safety glasses or goggles for protection from splash or other eye hazard <input type="checkbox"/> Nitrile or vinyl gloves <input type="checkbox"/> Disposable gown <input type="checkbox"/> Shoe covers <input type="checkbox"/> Respirator (N-95 or PAPR) <input type="checkbox"/> Consider need for wire mesh glove	



## Additional Guidance

1. When materials have a potential for becoming airborne, use a chemical fume hood or other engineering control whenever possible. Activities, with a potential to generate airborne contaminants, not conducted inside a chemical fume hood or with another engineering control (such as a local exhaust at the workbench) should be evaluated to determine if the activity presents a respiratory hazard. In this case a respirator may be required and a respiratory protection program must be in place per EH&S.

Guidance can be found [here](#).

2. Chemical-resistant gloves are to be selected based on the specific chemical(s) used and manufacturer's glove permeation and compatibility charts. (Provide link)

3. All PPE must be inspected prior to use, during, and after use. Re-usable equipment must be decontaminated or disposed if not feasible.

4. Use a biosafety cabinet to minimize exposure. Activities that cannot be conducted inside biosafety cabinet should be separately evaluated by the EH&S Biosafety Office. For BSL-3 or ABL-3 activities, the PPE requirements will be addressed by the BSL-3 facility.

## Section 2: Conduct PPE Training

PPE training consists of **lab specific training** conducted by the lab manager or PI. Documentation is required to indicate training has been conducted.

### Step 1

The PI or lab manager assures that the employees have completed all applicable safety training courses.

### Step 2

- a. The PI, lab manager, or their designee reviews the **completed Lab PPE Hazard Assessment Guide** (this document) with the employee. It describes the operations in the lab where employees need PPE to protect themselves from exposure to hazards. In this step, the hazard assessment is used as a training tool.
- b. While discussing lab operations and the associated hazards with lab staff, the manager will address how their lab obtains PPE, what types of PPE are used in the lab and for which tasks, where and how the PPE is stored and maintained, how to properly use the PPE, and discuss any limitations of the PPE. The manager should also discuss general PPE safety practices, including not wearing PPE outside of lab hazard areas (e.g. hallways and eating areas).
- c. Each research staff will sign below acknowledging that they have reviewed the PPE assessment tool.

### Step 3

Conduct and document refresher training whenever the hazard assessment is updated.

***PPE Hazard Assessment Tool Training Acknowledgement:***

**I have read, asked questions, and understand the PPE requirements for the activity/materials described herein.**

Trainer's Name (print)	Trainer's Name (signature)	Trainees Name (print)	Trainees Name (signature)	Date