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Experiment Safety Review Form
Review Number: PS-ESR-1-140-2012

PRINCIPAL INVESTIGATOR: Zhiqiang Chen
GROUP: Geoscience, Stony Br
EXT: 5343 **E-MAIL: zchen@bnl.gov** **LIFE NUMBER: X9678**

Project Title: High Pressure Sample Loading Laboratory	
Location(s): 0725	
Area(s): 0725-FIRST-1-140	
Proposed Start Date and Duration: 3/5/2011 - 4 years	

SIGNATURES:

Principal Investigator: Zhiqiang Chen	**Date: 3/25/2011**
Experiment Review Coordinator: Lori Stiegler	**Date: 3/25/2011**
Co-PI or Alternate Contact (s): Xinguo Hong	**Date:**
Reviewer: Christopher Weilandics	**Date: 3/10/2011**
Reviewer: Frank Zafonte	**Date: 3/4/2011**
Reviewer: Deborah Bauer	**Date: 3/9/2011**
Reviewer: Brian Heneveld	**Date: 3/3/2011**
Reviewer: Mary Anne Corwin	**Date:**
Approval: Lori Stiegler	**Date: 3/25/2011**
Review/Approval (ERC) Comments: 03/15/2012 3:25 PM Performed annual review. No changes required. Extended one year. 03/25/2011 4:54 PM	
Walkthrough Signature:	**Date:**
Expiration Date (max 1 yr.): 3/25/2013	
FUA Change Required? No	
Fire Rescue Run Card Changes Required? No	
Has a NEPA Review been Performed for this Project? No	
Required Approvals (i.e., IACUC, IBC, etc.):	

Project Termination Acceptance Signature: Comments:	Date:

I. Define the Scope of the Work

A. Description

Sample Loading Lab for High pressure experiments at beamline X17C, X17B3, and U2A *etc.*

High-pressure experiments with Diamond Anvil Cell (DAC) are conducted delicately in sub-millimeter scale. Electrical Drilling Machine (12V output) and Mechanical Drilling Machine are used to drill hundred-micron size holes on steel gaskets. Methanol, Ethanol and Some mineral oils are used as pressure medium with 1ml per use. Soldering and small powered hand tools, such as dremel work center, on lab bench are composed of an electrical working station. Sonicor SC-50TH cleaner is used for cleaning sample containers and sample loading tools, using ethanol and acetone as the cleaning solvent (< 3ml/use). Glass slides are used for microscope and glass droppers are used for loading pressure medium.

Equipment manuals or procedures that are controlled documents:

N/A

B. Human Performance Factors

N/A

C. Waste Minimization/Pollution Prevention

The smallest quantities necessary are used.

D. Materials Used /Waste Generated

Materials Used	Disposal Method	Amount per Use	Amount per Year	Comments
Ethanol	Fugitive	5.00 ml	1000.00 ml	
Acetone	Fugitive	3.00 ml	900.00 ml	
Methanol	Fugitive	1.00 ml	100.00 ml	
Lead solder	Recycle	2.00 g	500.00 g	
Mineral oil	Other	0.00 gal	0.00 gal	Stored in room
Toxic metal samples	Other	0.00 gal	0.00 gal	Stored in room
Nonbiological sharps	Medical	0.00 lb	0.50 lb	Not medical waste, but managed through the Medical Dept.

II. Identify and Analyze Hazards Associated with the Work

The following hazards were identified:

Physical Hazards:

- Sharps (non medical)
- Powered Hand Tools
- Soldering of electronic components
- Flammable liquids

Chemical Hazards:

- Chemicals, Hazardous (General)
- Flammable liquids
- Toxic metals (e.g., As, Ba, Be, Cd, Cr, Hg, Pb, Se, Ag)

Ionizing and Non-ionizing Radiation Hazards:

- None

Biological Hazards:

- None

Offsite Work:

- None

Other Issues (Security, Notifications, Community, etc.):

- None

Significant Environmental Aspects

- None

III. Develop and Implement Hazard Controls and Assess Risk

A. Physical Hazards, Tasks and Controls

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Sharps (non medical)** **Default Controls:** Sharps including needles, razor blades and syringes (plastic and glass) must be disposed of in sturdy, rigid, sharps containers. Sharps containers cannot be more than 2/3 full.	**Negligible (0-20)**
Hazard: **Powered Hand Tools** **Default Controls:** Inspected for damage prior to use. Follow manufacturer's instructions. PPE: Safety glasses	**Negligible (0-20)**
Hazard: **Soldering of electronic components** **Default Controls:** Engineering Controls • Substitute non-lead solder when applicable to components. • Designate area (eg metal tray, or disposable liner). • Minimum PPE: Safety glasses **Task Specific Info:** Periodically wipe surface	**Negligible (0-20)**
Hazard: **Flammable liquids** **Default Controls:** As for chemicals, plus Store large quantities in Flam. cabinets as required	**Negligible (0-20)**

B. Chemical Hazards, Tasks and Controls

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Chemicals, Hazardous (General)** **Default Controls:** • All operations with large (>250ml, health hazard 3) quantities of hazardous chemicals (pouring, mixing, evaporation, etc) in hood, or use snorkel when hood is impractical • Register Commercial Chemicals in CMS • Work alone after hours only if permitted by supervisor or ESR • Identify containers so contents are identifiable unless being actively used (ex. 1 shift) • Food, beverage, smoking, and cosmetics are prohibited • Handle glassware properly: no mouth suction, no drinking from labware.	**Negligible (0-20)**
Hazard: **Flammable liquids** **Default Controls:** Use hazardous chemicals controls. Review large quantity storage with Fire Protection Engineer Note location on fire run card and hazard info. placard for storage of solids, greater than 40 pounds; liquids, greater than 5 gallons; gases, greater than 10 pounds **Task Specific Info:** Container size limited to 1L	**Negligible (0-20)**
Hazard: **Toxic metals (e.g., As, Ba, Be, Cd, Cr, Hg, Pb, Se, Ag)** **Default Controls:** As for chemicals, plus need for SHSD and OMC monitoring and surveillance must be evaluated BURF for Beryllium operation	**Negligible (0-20)**

C. Environmental Hazards, Tasks and Controls (include on/off site transportation and products/services)

None

D. Radiation Hazards, Tasks and Controls

None

E. Biological Hazards, Tasks and Controls

None

F. Offsite Work Hazards, Tasks and Controls

None

G. Other Issues (Security, Notifications to Other Organizations, Community Involvement, etc.)

None

H. Recommended Exposure Monitoring

- None

Description or comments:

I. EPHA Determination

Chemical Name	Quantity (lbs, gal)	Location (Bldg/Room#)

IV. Perform Work Within Controls

A. Recommended Training and Medical Surveillance Summary

- NSLS Lead Working (LS-LEADPRM)
- NSLS R2A2 for Lab Steward (LS-R2A2-LAB-STWD)
- NSLS R2A2 for Lab Steward Deputy (LS-R2A2-LAB-STWD-DEP)
- Laboratory Standard (HP-IND-220)
- Hand and Power Tool Safety (TQ-TOOLSAFE)

B. Personnel Training, Qualification, and Authorization List

Employee/Guest Name	Life/Guest#	Dept	Required Training Course(s)	Signed
Xinguo Hong	N7523	LU	Laboratory Standard (HP-IND-220) [EXPIRES: 7/6/2013] NSLS Lead Working (LS-LEADPRM) [EXPIRES: 7/6/2013] Hand and Power Tool Safety (TQ-TOOLSAFE) [EXPIRES: NEVER]	
Zhiqiang Chen	X9678	LU	Laboratory Standard (HP-IND-220) [EXPIRES: 11/21/2012] NSLS Lead Working (LS-LEADPRM) [EXPIRES: 11/1/2012] Hand and Power Tool Safety (TQ-TOOLSAFE) [EXPIRES: NEVER] NSLS R2A2 for Lab Steward (LS-R2A2-LAB-STWD) [EXPIRES: 1/18/2013]	

C. Emergency Procedures

Spill control supplies are located between beamline X16 and X17. Follow the building 725 Local Emergency Plan.

D. Transportation

None

E. Logistical Interactions

None

F. Termination/Decommissioning

All chemicals and equipment will be dispositioned or disposed when work is complete or transfer of Lab Steward.

V. Provide Feedback

None

VI. Attachments

Attached Files: