The only official copy of this file is the one online at https://fsd84.bis.bnl.gov/ESR/

Date Printed: Aug 10, 2012

Experiment Safety Review Form
Review Number: PS-ESR-1-167-2012

PRINCIPAL INVESTIGATOR: Sanjaya Senanayake
GROUP: Chemistry
EXT: 4343 **E-MAIL: ssenanay@bnl.gov** **LIFE NUMBER: 24030**

Project Title: Set up Lab for X6B, X7B, X8A
Location(s): 0725
Area(s): 0725-FIRST-1-167
Proposed Start Date and Duration: 6/24/2012 - 1 years

SIGNATURES:

Principal Investigator: Sanjaya Senanayake	**Date: 7/20/2012**
Experiment Review Coordinator: Lori Stiegler	**Date: 7/30/2012**
Co-PI or Alternate Contact (s): Bin Dong	**Date:**
Co-PI or Alternate Contact (s): Vesna Stanic	**Date:**
Reviewer: Christopher Weilandics	**Date: 7/20/2012**
Reviewer: Frank Zafonte	**Date: 7/24/2012**
Reviewer: Deborah Bauer	**Date: 7/27/2012**
Reviewer: Brian Heneveld	**Date: 7/20/2012**
Approval: Lori Stiegler	**Date: 7/30/2012**
Review/Approval (ERC) Comments: 07/30/2012 8:53 AM	
Walkthrough Signature:	**Date:**
Expiration Date (max 1 yr.): 7/30/2013	
FUA Change Required? No	
Fire Rescue Run Card Changes Required? No	
Has a NEPA Review been Performed for this Project? Yes	
Required Approvals (i.e., IACUC, IBC, etc.):	
Project Termination Acceptance Signature: **Comments:**	**Date:**

I. Define the Scope of the Work

A. Description

Beamline and experiment setup for X6B, X7B, and X8A.

Staff activities: use of hand tools, electronics, pumps to assemble and test beamline equipment. Safety glasses and work gloves are available in the lab. Soldering at lab bench: a labeled container for solder scraps is used. Cleaning apparatus using solvents such as acetone or alcohols: volumes > 500 mL are transferred only in fume hood with mandatory use of lab coats and isolation of laboratory space of persons not wearing correct PPE. Wastes are disposed of according to BNL policy. Strictly adhere to waste disposal and pay attention to 90day storage area procedures. Nitrile gloves and safety glasses are available in the lab. Sample prep and materials handling to be conducted at designated areas especially concerning nanoparticle containing materials. Glass/Quartz based equipment handled and disposed off in appropriate manner and not to be mixed with general waste as designated in sperate disposal container.

User activities: assembly of experimental apparatus and chambers, similar to staff activities described above. Preparation of powder or liquid samples by filling capillaries or mounting on films: the chemistry is done at the home institutions, but the benches in 1-167 may be used to transfer and mount these samples. Description and controls for User sample preparation will be documented in the Safety Approval Form. Non-biological sharps bins are present for glass capillary and silicon wafer scraps. Materials return to users' home institutions.

A Liquid nitrogen dewar may be brought into the lab occasionally by Users to aid in experimental set-up.

Compressed gas use: Nitrogen may be used for backfilling small chambers. Small gas cylinders if stored must be secured safely according to BNL policy, otherwise must be removed to gas storage area.

Equipment manuals or procedures that are controlled documents:

N/A

B. Human Performance Factors

Take care with chemical handling and sample mounting, avoid any spills and dispersion of materials on lab surfaces and in vicinity of drains. Clean any spills according to BNL procedure. Same applies with small mechanical and electrical equipment used for experimental setup. Practice good housekeeping to avoid clutter and build up of excess equipment and materials that are likely to hinder passage and work of others. Upon completion of experiments please take note to clean up and return the area to how it was prior to start of work. Isolate area with designated signs if chemical handling is taking place.

C. Waste Minimization/Pollution Prevention

Smallest quantities with the least hazards are used. Chemicals and sample handling must be performed with minimum risk of spills and dispersion of materials on lab surfaces and the vicinty of drains. Use fume hoods for appropriate chemicals quantities.

D. Materials Used /Waste Generated

Materials Used	Disposal Method	Amount per Use	Amount per Year	Comments
Methanol	Hazardous	10.00 ml	500.00 ml	
Ethanol	Hazardous	10.00 ml	500.00 ml	
Acetone	Hazardous	2.00 ml	200.00 ml	
Pump oil	Industrial	0.00	0.20 gal	
Non-RMW sharps	Other	0.00	1.00 lb	Disposed as Medical waste

Samples containing carcinogens	Other	0.00	0.10 lb	Samples with carcinogens may be stored

II. Identify and Analyze Hazards Associated with the Work

The following hazards were identified:

Physical Hazards:

- Sharps (non medical)
- Cryogens (any substance or device capable of producing temperatures <= 170K) (Areas: 0725-FIRST-1-167, 0725-FIRST-1-167)
- Powered Hand Tools
- Compressed gases (lecture bottles, cylinders, gas lines) (Areas: 0725-FIRST-1-167, 0725-FIRST-1-167)
- Soldering of electronic components
- Flammable liquids (Areas: 0725-FIRST-1-167, 0725-FIRST-1-167)

Chemical Hazards:

- Carcinogens (Areas: 0725-FIRST-1-167, 0725-FIRST-1-167)
- Flammable liquids (Areas: 0725-FIRST-1-167, 0725-FIRST-1-167)
- Storage of nanomaterial (fixed) samples (Other)

Ionizing and Non-ionizing Radiation Hazards:

- None

Biological Hazards:

- None

Offsite Work:

- None

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

- None

Significant Environmental Aspects

- Any amount of hazardous waste generation (Areas: 0725-FIRST-1-167, 0725-FIRST-1-167)
- Any amount of industrial waste generation (e.g., oils, vacuum pump oil)
- Production or use of, or waste containing, engineered nanomaterials

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: **Cryogens (any substance or device capable of producing temperatures <= 170K)** **Default Controls:** General Requirements: • Evaluate location oxygen deficiency • Store/transport only in approved containers (i.e. DOT/ASME or BNL LESHC) • Never pour from above chest level • PPE: Long Sleeve Shirt (or Lab Coat), long pants (or skirt covering ankles) and closed shoes Pressurized transfer to open (vented) container; Or-Pouring > 5 liter volumes of LN2 between open containers:	**Negligible (0-20)**

• Face shield along with either Safety Glasses (w/side shields) or Goggles • Gloves (Cryo or Heavy Leather) Pouring small (5 liters or less) volumes of LN2 between open containers: • Safety Goggles (face shield recommended if possible) • Gloves (Cryo or Heavy Leather) Work with samples immersed in LN2 in small (~1 liter) dewars: • Use Tongs (tools) to manipulate/handle cryogenic samples (do not touch with gloves)• Use insulated non-absorbent gloves with dexterity (cotton/nylon gloves under disposable nitrile gloves) • Safety Goggles	
Hazard: **Powered Hand Tools** **Default Controls:** Inspected for damage prior to use. Follow manufacturer's instructions. PPE: Safety glasses	**Negligible (0-20)**
Hazard: **Compressed gases (lecture bottles, cylinders, gas lines)** **Default Controls:** • Any systems >15psi must be SME Approved • Transport cylinders using a cylinder cart • Secure cylinders to a fixed object/wall • Use regulator, hoses, and components compatible with gas • Use hoses and clamps rated for maximum regulator output or use pressure relief device • Wear safety glasses with side shields when installing/removing/or adjusting regulator • Label piping/tubing	**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:** Solder dross to be collected in container labeled as scrap solder for recycling	**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: **Carcinogens** **Default Controls:** Use hazardous chemicals controls plus: Establish and post a "designated area" where used Note location on fire run card and hazard info. placard. Exposure monitoring to assure that action levels not exceeded Establish procedures for work area cleanup and decontamination	**Negligible (0-20)**
Hazard: **Flammable liquids**	**Negligible (0-20)**

	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	
Hazard:	**Storage of nanomaterial (fixed) samples (Other)** **Default Controls:** **Task Specific Info:** Samples are labeled with nanomaterial label, stored in sealed containers.	**Negligible (0-20)**

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

	Hazard, Default Controls, Task Specific Info	Risk Level
Hazard:	**Any amount of hazardous waste generation** **Default Controls:** Engineering Controls • Waste will be accumulated in chemically compatible containers that appropriately contain/protect the waste. • Waste containers will be closed in a tray (secondary containment) in the Satellite Accumulation Area (SAA). Administrative Controls • All hazardous waste containers will have a (red) “Hazardous Waste Label” that has the generator’s name and the chemical contents (trade name/formula not acceptable). • All waste will be accumulated in closed containers and kept in an established and posted SAA until ready for transfer to the 90-Day Haz Waste Area for pick-up by Waste Management. • For pick-up by Waste management, complete the Nonradioactive Haz Waste Control Form and consult the 90-Day Area Manager to gain access/transfer the waste to the 90Day Area. Training: Hazardous Waste Gen. (HP-RCRIGEN3). PPE: When handling waste materials follow PPE requirements specified for the specific materials. Comply with the SBMS Subject Area: “Hazardous Waste Management”.	**Negligible (0-20)**
Hazard:	**Any amount of industrial waste generation (e.g., oils, vacuum pump oil)** **Default Controls:** Engineering Controls • Store only compatible wastes together, in suitable containers. • Provide secondary containment for liquid wastes if potential for environmental release exists. • Keep containers closed and secured unless adding waste to container. Administrative Controls • Use a green industrial waste label, with generator’s name and chemical contents (trade name/formula NOT acceptable). Label oils “Used Oil”. • When full, complete and submit a WCF for pick up. The waste may be stored in the 90-day area. Training: Hazardous Waste Generator (HP-RCRIGEN3) Comply with the SBMS Subject Area: “Industrial Waste”.	**Negligible (0-20)**
Hazard:	**Production or use of, or waste containing, engineered nanomaterials**	**Negligible (0-20)**

Default Controls: - All waste in contact with UNPs must be disposed as hazardous waste (e.g., gloves, lab coats, swabs, Kimwipes, blotter paper, beakers, flasks, tape, sample holders). - Chemicals containing UNPs must NOT be released to the sink or disposed in the regular trash. - Waste containers and labeling: o Liquids must be stored in a rigid leak proof container. o Particulates must be stored in a rigid leak proof container or plastic bag of 6 mil or greater. o Spell out the chemical name (do not use formulas or trade names) on the RED Hazardous Waste Label. o The contents line on the label must contain the chemical composition and “Nanomaterials” NOTE: A second label, in addition to the Red Hazardous Waste Label, is required on the outside container/bag stating “Contains Nanomaterials”; see ESH Coordinator or 90-day area manager for labels.	

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

- Laboratory Standard (HP-IND-220)
- Cryogen Safety (HP-OSH-025)
- Hazardous Waste Generator (HP-RCRIGEN3)
- Compressed Gas Safety (TQ-COMPGAS1)
- 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
Elaine DiMasi	21321	PS	Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 8/3/2015] Laboratory Standard (HP-IND-220) [EXPIRES: 12/31/2012] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 9/26/2012]	7/30/2012 4:45:04 PM
			Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES:	

Bin Dong	D6102	LU	3/4/2013] Laboratory Standard (HP-IND-220) [EXPIRES: 8/23/2013] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 10/13/2012] Hand and Power Tool Safety (TQ-TOOLSAFE) [EXPIRES: NEVER]	7/30/2012 12:00:00 AM
Vesna Stanic	24703	PS	Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 2/13/2013] Laboratory Standard (HP-IND-220) [EXPIRES: 6/6/2014] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 6/5/2013]	8/8/2012 12:00:00 AM
Wenqian Xu	24788	CO	Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 10/21/2014] Laboratory Standard (HP-IND-220) [EXPIRES: 2/23/2014] Hazardous Waste Generator (HP-RCRIGEN3) [UNASSIGNED: EXPIRED: 2/23/2012] Hand and Power Tool Safety (TQ-TOOLSAFE) [UNASSIGNED: INCOMPLETE]	7/30/2012 11:39:49 AM
Rui Si	24431	CO	Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 12/15/2012] Laboratory Standard (HP-IND-220) [EXPIRES: 2/23/2014] Hazardous Waste Generator (HP-RCRIGEN3) [UNASSIGNED: EXPIRES: 4/13/2013] Hand and Power Tool Safety (TQ-TOOLSAFE) [UNASSIGNED: INCOMPLETE]	
Jonathan Hanson	D9270	CO	Cryogen Safety (HP-OSH-025) [UNASSIGNED: EXPIRES: NEVER] Compressed Gas Safety (TQ-COMPGAS1) [UNASSIGNED: EXPIRES: 8/18/2012] Laboratory Standard (HP-IND-220) [UNASSIGNED: EXPIRES: 2/23/2014] Hazardous Waste Generator (HP-RCRIGEN3) [UNASSIGNED: EXPIRES: 7/29/2013] Hand and Power Tool Safety (TQ-TOOLSAFE) [UNASSIGNED: EXPIRES: NEVER]	8/8/2012 2:10:02 PM

C. Emergency Procedures

Follow the NSLS Local Emergency Plan. Report any spills to the Control Room. Spill control supplies are located outside room 1-166.

D. Transportation

None

E. Logistical Interactions

None

F. Termination/Decommissioning

Any chemicals or equipment will be transferred or dispositioned if there is a transfer of lab steward or change in occupancy. All sample materials used for experiments will be returned to point of origin unless prior arrangements made for storage with lab steward.

V. Provide Feedback

Change in lab steward this year. Work has not changed.

VI. Attachments

Attached Files: