BROOKHAVEN NATIONAL LABORATORY

BNL Static Magnetic Fields Exposure Form

Part A: Source Hazard Assessment Record

I. Source Identification

Department:	Building:	Room or Area (location of source):
NSLS	725	X21A3

Identifier/ Name of Source:

Oxford High Field, 13 Tesla, Split Pair Superconducting Magnet

Status of Source Usage (check all that apply):

[ ] In use on frequent basis [ ] Planned use in the near future [ ] Possible future use [ ] No planned use

[X] Intermittent use [ ] One-time use [ ] Other:

2-3 weeks each cycle

3 cycles/year

Check or Describe Use or Process:

☐ Accelerator magnets
☐ Beam transport magnet
☒ Detector magnets
☐ Super-conducting coils
[ ] Other (specify):

☐ Nuclear Magnetic Resonance
☐ Magnetic Resonance Imaging
☐ Medical device
☐ Electron microscope
☐ Magnetometers

☐ Ion pumps
☐ Permanent magnet
☐ Electromagnet lifting device
☐ Tool Chuck/clamp

II. Exposure Summary [Complete Part B: Field Strength Measurement Record *or* attach documentation from manufacturer]

Target Body Area	BNL Exposure Limits**			
	TWA-8		Ceiling	
	(mT)	(G)	(mT)	(G)
Cardiac Pacemaker & Ferromagnetic Objects*			0.5	5
Whole Body (Torso or Head)	60	600	2,000 (2 T)	20,000
Extremities (Limbs)	600	6,000	5,000 (5 T)	50,000

*Ferromagnetic Objects (Ceiling), including medical implants and prostheses, may be affected by fields. Additional evaluation is required.

** TWA-8 = $(B_1 t_1 + B_2 t_2 + \ldots. + B_n t_n) / 480$ minutes (See Exhibit BNL Static Magnetic Field Exposure Limits for details.)

B = Flux Density [mT]

t = time of exposure [minutes]

Maximum Exposure Potential surveyed applicable to worker exposure (mT): 600 mT @ contact, 60 mT@1 foot; 0.5 mT @8 feet

III. Exposure Hazard Evaluation: Indicate worker exposure potential on the OMC Job Assessment Form or OMC Static Magnetic Field Questionnaire form.

Flux Density

1a. ☐ Flux Density ≥ 0.5 mT (5 Gauss). No potential for individuals with medical electronic devices or ferromagnetic implants/prostheses* to be exposed above 0.5 mT (5 Gauss).

1b. ☐ Flux Density ≥ 0.5 mT (5 Gauss). Access to > 5G for individuals with medical electronic devices or ferromagnetic implants/prostheses* is not permitted.

2a. ☐ Flux Density ≥ 60 mT (600 Gauss) - Whole Body. No potential to exceed the 8 hours TWA.

2b. ☒ Flux Density ≥ 60 mT (600 Gauss) - Whole body. Potential to exceed the 8 hours TWA. Controls must be used.

3a. ☐ Flux Density ≥ 600 mT (6000 Gauss) - Limbs. No potential to exceed the 8 hours TWA.

3b. ☐ Flux Density ≥ 600 mT (6000 Gauss) - Limbs. Potential to exceed the 8 hours TWA. Controls must be used.

4a. ☐ Flux Density ≥ 2T (ceiling) - Whole Body. No potential to exceed the BNL ceiling.

4b. ☐ Flux Density ≥ 2T (ceiling) - Whole Body. Potential to exceed the BNL ceiling. Controls must be used.

5a. ☐ Flux Density ≥ 5T (ceiling) - Limbs. No potential to exceed the BNL ceiling.

5b. ☐ Flux Density ≥ 5T (ceiling) - Limbs. Potential to exceed the BNL ceiling. Controls must be used.

* Medical electronic devices include cardiac pacemakers, electronic inner ear prostheses, and insulin pumps. Ferromagnetic implants/ prostheses include aneurysm clips, replacement hips.

4. **Describe job/task and potential for employee exposures** (e.g., type of work performed around source, method of control, time spent in fields [hours/day] and method of determining exposure):

This source is used to study field-induced effects in condensed matter systems

Samples will typically be inserted with the magnet at 0 Tesla, but samples may have to be aligned at highest magnetic field contact location. Extremities shall be used for this operation. NO CONTACT allowed with torso to the surface of the magnet.

Individuals operating the magnet will be listed on Experimental Safety Approval Forms or be resident members of the beamline Participating Research Team. All will have taken Beam Line Operator Safety Awareness for this beamline.

Area must be carefully cleared of all loose ferromagnetic objects prior to operation of the magnet.

For a description of the Oxygen Deficiency Hazard review, see NSLS General Review # 000400.

5. **Frequency of exposure** (e.g., # days per year or month, # tests per year, in continuous use, etc.):

Exposures to higher fields (60 mT or above) will typically be extremities only; ~5 -10 minutes/hour (<2 hours/day)

IV. Precautions / Engineering & Administrative Controls

Precautions During Use (check all that apply):

- ☒ Signs
- ☐ Lights
- ☐ Barriers
- ☐ Restricted access
- ☐ Rotation of workers
- ☒ Working when de-energized
- ☐ Use of nonferromagnetic tools
- ☐ Physical indicator of fringe fields (e.g., use of string with paper clips or equivalent)

☒ Other:
Inform adjacent beamline of operation schedule

Written Documentation:

- ☒ Experimental Review (Work Planning and Control for Experiments and Operations Subject Area)
- ☐ Work Planning and Control (Work Planning and Control for Experiments and Operations Subject Area)
- ☐ Written SOP (describe):

Other kinds of workers who may require information/written documentation/training to enter this area:

Checklist:

Employee training:	☒ Static Magnetic Fields Web Course	☐ Dept/Division-Specific Training
Supervisors training:	☒ Static Magnetic Fields Web Course	☐ Dept/Division-Specific Training

Training required to be linked to Job Training Analysis for affected workers:	☒ yes	☐ no
Worker evaluation required by OMC (all workers exposed to ≥ 5G)	☒ yes	☐ no
	☐ yes	☐ no

V. Initial Assessment

Completed by: Lori Stiegler & Christie Nelson	**Date: 10/20/08**
Reviewed by ES&H Coordinator: Lori Stiegler	**Date: 10/20/08**

Forward the original form to the Static Magnetic Fields Subject Matter Expert, copies to your ES&H Coordinator and Safety & Health Representative. Retain a copy in your files. Update and resubmit the assessment when changes occur.