

**LOCAL JOINT HEALTH AND SAFETY COMMITTEE
DEPARTMENT OF BIOMEDICAL SCIENCES
STANDARD OPERATING PROCEDURE**

for Rm: 1671B/1672-1675/1681 Bldg: EXT. 3

1. SAFE HANDLING OF RADIOISOTOPES

Effective Date: 1 March 2002

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Purpose: a) To protect staff, students and the general public from possible hazards associated with the use of radioactive materials and b) To ensure compliance with federal, provincial, local, and institutional regulations

2. REQUIREMENTS:

Applicable Legislation: The Canadian Nuclear Safety Commission (CNSC), established by the Nuclear Safety and Control Act (NSCA).

Applicable Standards: CNSC Licenses issued to the University of Guelph, CNSC Regulatory Guidance Documents.

Definitions: see University of Guelph Radiation Safety Policy 851.09.01

Approvals Required: University of Guelph Radiation Safety Committee, Radiation Safety Officer (Ms. E Niven ext. 54888), Local JHSC, Faculty Supervisor (Dr. J. LaMarre ext. 54935).

Local Requirements: All persons handling radioactive materials must have WHMIS training and have completed departmental safety orientation. They must also have completed the Radiation Safety Course given by Environmental Health and Safety and be issued with a dosimeter.

3. TASK:

Preparation:

1. Important – plan your experiments **carefully**. Check all reagents and equipment needed. Consider a “dry run” before commencing.
2. Reserve the room and equipment you anticipate needing.
3. Scan entire work area with hand monitor **before** starting any procedure. If you discover a contamination, consult the sign in log and inform the person who was working there previously. It is yours and their responsibility to clean up thoroughly and leave the workspace clean.
4. Appropriate protective clothing must be worn at all times, including lab coat, gloves (preferably double-gloved) and radiation dosimeter (if you are using phosphorous-32, phosphorus-33, or iodine-125)
5. Cover the designated work area with absorbent bench paper, marked with radioactive materials warning tape. If you are working with iodine-125 or sulfur-35, you must work in the fume hood. For other isotopes, work behind appropriate plexiglass shielding.
6. Register details on the “Sign In Log” and log out stock isotope materials on the corresponding “Open Source Radioactive Materials Inventory”. Both sheets are located on clip boards hanging next to the fume hood. When source is depleted or decayed, dispose of properly and record.
7. Work slowly and calmly, frequently monitoring the workspace and yourself with the Geiger counter.
8. Label everything to be stored in fridge or freezer with name, date, and contents of container. Place radioactive warning tape on containers.

9. If you leave the room for any reason, post a sign indicating “Experiment in Progress - Radioactive”

Clean Up

1. Monitor all laboratory work surfaces, glassware, equipment, yourself and clothing.
2. Decontaminate articles after use, before removal from the radioisotope lab.
3. When using radioactive decontaminates, wash off immediately afterwards with detergent and water. They frequently contain toxic substances that will strip the finish off the bench, eg. Radcon.
4. Any equipment/glassware that remains radioactive must be labelled with warning tape and either soaked overnight in decontaminate or set to one side in the lab to decay.
5. Change labmat and remove radioactive materials warning tape.
6. Complete and file proper wipe tests (see below)

Wipe Tests

Every worker is responsible for performing daily contamination monitoring and wipe tests after they have worked with radioactive material. In addition, the entire lab area is monitored weekly, by the supervising technician.

1. Use the supplied laboratory diagram as a guideline for areas to test. Fill out your name, date, and isotope used.
2. For 32-P, 3-H, etc. take a small piece of filter paper, roughly 2cm X 2cm and wipe in a back and forth manner, an area of about 20 X 20cm and place into a mini vial.
3. Dispense 4 mL of liquid scintillation fluid into the vial, and securely cap. Include at least one background sample, and a minimum of 6 spots, depending on area used.
4. Label all caps, and wipe exterior of vials with a damp Kim Wipe.
5. Count in the Liquid Scintillation Analyzer on Protocol 4 or 9. Record results and file into red wipe test binder in Rm. 1671B.
6. For 125-I use a Q-tip for a similar wipe area as above and place dry into a 12x 75mm plastic disposable tube.
7. Count in the mini gamma machine. Record results as above.
8. Any counts over $3 \times (\text{square root of the background}) + \text{background}$, are considered a contamination. The area must be cleaned up and retested until counts are in an acceptable range.

4. PROCEDURES FOR RADIOACTIVE CONTAMINATION INCIDENTS

1. Notify other persons in the room at once.
2. Survey for personnel contamination and allow only a minimum number of persons to deal with the spill. Wear protective gloves, a lab coat, and shoe covers.
3. Contain the source to minimize the spread of contamination. Attempt to prevent the spill from entering the drains, by building a “dam” with absorbing material.
4. Identify the contaminated area with masking tape or wax pencil.

Minor Spills:

1. Proceed to decontaminate using decontamination cleaning agents and absorbing materials. Start from the outermost edges of the contaminated area and work inwards.
2. Put all contaminated materials into protective isotope disposal containers (grey boxes).
3. Survey for any remaining contamination and conduct wipe tests until monitoring results meet the radioisotope licence criteria.
4. Check hands, clothing and shoes for contamination.
5. Report the incident to your supervisor.

Major Spills:

1. At this point ensure that you and all others in the room are not contaminated. Vacate the room, report to your supervisor, and call Environmental Health and Safety, ext. 54888. After hours and on weekends, call ext. 52000.+
2. Post a warning sign on the door stating "Radioactive Contamination - Stay Out"
3. Monitor personnel for contamination, remove and bag contaminated clothing, and commence washing up as necessary.
4. Wait for assistance and do not leave the area.

5. WASTE MANAGEMENT AND DISPOSAL:

1. Solid waste should be disposed of in one of the two solid radioactive waste containers in Rm. 1675. One is for phosphorus -32 contaminated waste; the other for all other contaminated waste.
2. Liquid waste is disposed of in the appropriate liquid waste container within the fume hood.
3. Liquid scintillation vials are stored, tagged, then disposed of separately.
4. The technician in charge of the isotope facility handles pick up of waste.

6. REFERENCES:

Radioisotope project 1-426-04-08.
University of Guelph Safety Policy Manual
Radiation Safety Training Manual, E. Niven, 2002
Laboratory Safety CSMLS Guidelines Fifth Ed. 2001
www.uoguelph.ca/HR/ehs/ Radiation Safety Program

7. DISTRIBUTION OF COPIES:

Technicians, Graduate Students working with radioactive materials in the lab
Dr. J. LaMarre, Faculty Supervisor
Environmental Health and Safety
Local JHSC, Department Biomedical Sciences

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Date: December 12, 2002