



## **Office of the Chief Risk Officer**

# **INTERNAL RADIOISOTOPE PERMIT APPLICATION (UNSEALED/OPEN SOURCE)**

## INTRODUCTION

The University of Ottawa has been issued a consolidated radioisotope license by the Canadian Nuclear Safety Commission (CNSC). This license incorporates numerous conditions relating to radioactive material possession, use, importation and exportation.

To maintain this license, the University must ensure that activities involving radioactive substances and equipment be carried out in accordance with the CNSC regulations and applicable conditions. To ensure compliance with these requirements, the University has instituted an internal radioisotope permit process through the Radiation Safety Committee (RSC) in collaboration with the Office of the Chief Risk Officer (OCRO). Such a permit is required by anyone whose activities involve radioactive materials. Failure to comply with these requirements could result in the loss of our license and thus have detrimental implications on the University's teaching and research activities.

This application is to be completed and sent to the Radiation Safety Officer, at the OCRO. The details of the Radiation Safety Program will be explained to you upon approval of this application.

Internal Radioisotope Permits are an important component of the University's Radiation Safety Program which is managed by this Service and overseen by the RSC. Overall responsibility for the effective management of radiation safety lies with the Vice-President (Research).

While the RSC oversees the development and implementation of the Radiation Safety Program, the OCRO is responsible in developing management systems to ensure the University and individual requirements are met. This Program also supports the academic community in ensuring adequate health and safety measures are in place, and that related activities are carried out in an environmentally appropriate manner. Major areas of the Program include: inventory control, training, dose and contamination monitoring.

## COMPLETING THE INTERNAL RADIOISOTOPE PERMIT APPLICATION (UNSEALED/OPEN SOURCE)

Appended to the Internal Radioisotope Permit Application (Unsealed/Open Source) is the "*General Conditions: Unsealed/Open Source Permit*" which outline the responsibility of the permit holder. Please read these conditions prior to completing this application.

The following application form includes seven categories:

- A) Permit Holder Information
- B) List of Radioisotopes
- C) Research Involving Animals
- D) Transfer, Importation and Exportation of Radioactive Material
- E) Persons Authorized to Work with Radioisotopes
- F) Emergency Procedures
- G) Contamination Monitoring

If you have any questions or concerns please do not hesitate to contact the Radiation Safety Officer (RSO): [rad.safety@uottawa.ca](mailto:rad.safety@uottawa.ca)

**INTERNAL RADIOISOTOPE PERMIT APPLICATION - UNSEALED/OPEN SOURCE**

**A) PERMIT HOLDER INFORMATION**

<b>Name</b>		<b>E-mail</b>	
<b>Position</b>		<b>Office Room No.</b>	
<b>Department</b>		<b>Office Tel. No.</b>	
<b>Faculty</b>		<b>Main Lab. Room No.</b>	
<b>Lab. Building</b>		<b>Lab. Tel. No.</b>	
<b>Lab. Delegate</b>		<b>Delegate's Email</b>	

**B) LIST OF UNSEALED/OPEN SOURCE RADIOISOTOPES**

Please list the unsealed/open sources you presently own or plan to acquire

<b>RADIOISOTOPE</b>	<b>USE LIMIT Bq (Ci)</b>	<b>USE ROOM(S)</b>	<b>STORAGE ROOM(S)</b>

**C) RESEARCH INVOLVING ANIMALS**

Are any of the radioisotopes, listed above, to be used on animals?

No                      Yes    (If yes, please specify which radioisotope and the activity to be used.)

Has this project been approved by the Animal Care Committee?

No                      Yes    Approval Number: \_\_\_\_\_

**D) TRANSFER, IMPORTATION AND EXPORTATION OF RADIOACTIVE MATERIAL**

Will your work require the importation or exportation of radioactive material (other than from a direct purchase from the supplier)?                      No                      Yes

Are you familiar with the regulatory requirements for the transfer, importation, or exportation of radioactive material?                      No                      Yes

Please provide the following information pertaining to individuals to/from which radioactive material would be transferred:

<b>Name</b>		<b>Office Tel. No.</b>	
<b>Position</b>		<b>E-mail</b>	
<b>Department</b>		<b>Institution</b>	
<b>CNSC Licence No.</b>		<b>Licence Expiry</b>	

**E) PERSONS AUTHORIZED TO WORK WITH RADIOISOTOPES**

Ensure that each individual who will work with radioisotopes under your supervision complete a *Radioisotope User Registration Form*. A copy of this latter form is appended to this application; use one copy per person.

**F) EMERGENCY PROCEDURES**

Briefly describe your laboratory’s emergency procedures in case of an accident/incident, e.g., spill.

Who should be contacted in an emergency?

Name	Telephone Numbers		
	Office	Laboratory	Cell Phone

**G) CONTAMINATION MONITORING**

Please indicate what form of contamination monitoring will be performed:

WIPE TESTING INSTRUMENT

Radioisotopes to be detected: \_\_\_\_\_

Type: \_\_\_\_\_  
 Make: \_\_\_\_\_  
 Model: \_\_\_\_\_  
 Location: \_\_\_\_\_

PORTABLE SURVEY METER

Radioisotopes to be detected: \_\_\_\_\_

Meter Type: \_\_\_\_\_  
 Model Number: \_\_\_\_\_  
 Probe Type: \_\_\_\_\_  
 Model Number: \_\_\_\_\_  
 Date Last Calibrated: \_\_\_\_\_

<b>CERTIFICATION</b>	
I, ....., certify that the information given in this application is true, correct, and complete. I agree to use radioisotopes only in the manner for which they have been authorized. I have read and will adhere to the <i>Unsealed/Open Source Permit Conditions</i> .	
_____ <i>Signature of Applicant</i>	_____ <i>Date</i>
_____ <i>Signature of Departmental Chair</i>	_____ <i>Date</i>
_____ <i>Signature of Radiation Safety Officer(OCRO)</i>	_____ <i>Date</i>



## **UNSEALED (OPEN) SOURCE PERMIT CONDITIONS** **(applies to Permit Holders and Users)**

### **GENERAL**

- This permit shall be conspicuously posted in all locations listed on the permit.
- It is the responsibility of the permit holder to ensure that all information listed on the Internal Radioisotope Permit is accurate and up to date. The permit holder shall request an amendment to the permit before said amendments are adopted.

### **USE LIMITS**

- The quantity of radioisotopes in use shall be less than or equal to the Use Limit specified on the Internal Radioisotope Permit and usage shall conform to requirements in the Radiation Safety Manual.
- The activity of the stock vial may not exceed 5 times the Annual Limit on Intake (ALI) in the case of a Basic Level Laboratory, or 50 times the ALI in the case of an Intermediate Level Laboratory.
- The activity of each stock vial may not exceed the Use Limit specified on the Internal Radioisotope Permit.
- Radioisotope procedures in excess of 5 times ALI shall be carried out in a fume hood.
- Office of the Chief Risk Officer (OCRO) on behalf of the permit holder shall obtain written approval from the Canadian Nuclear Safety Commission (CNSC) before starting any work that requires the use of more than 10,000 Exemption Quantities (EQ) of a radioisotope at a single time.

### **RADIATION PROTECTION MEASURES**

- Each permit holder shall establish, implement and maintain procedures designed to ensure that all occupational radiation doses are as low as reasonably achievable (ALARA).
- Each permit holder or their designate shall ensure the dose rate at any occupied location outside the storage area, room or enclosure resulting from the substances or devices in storage does not exceed 2.5  $\mu\text{Sv/hr}$ . Appropriate shielding shall be used in order to reduce field strength to a level below 2.5  $\mu\text{Sv/hr}$ .
- The permit holder shall instruct authorized users under their authority of any specific hazards associated with a particular procedure within their laboratory.

### **TRAINING**

- All users shall complete the New User Registration Form and not work with radioactivity until their form is approved by OCRO Radiation Safety Officer (RSO).
- The permit holder shall ensure that all persons working with radioisotopes under the authority of their Internal Radioisotope Permit are properly trained in safe handling, storage, and disposal procedures, and are informed of the associated hazards of radioactive materials.
- All inexperienced individuals participating in experiments or procedures using radioactive materials shall be closely supervised and instructed in safe handling and disposal procedures.
- The permit holder shall allow any authorized user under their authority to attend any radiation protection courses offered by the University. In cases where instruction is deemed necessary to ensure the safety of such users, attendance shall be considered paid time.
- OCRO's Radiation Safety Training is mandatory for all the individual working with radioactivity.

### **PERSONNEL MONITORING**

- The permit holder or their designate shall ensure that all authorized users, if required by the Internal Radioisotope Permit, are provided with dosimeters, and that such dosimeters are used and stored



properly. The dosimeters must be supplied and read by a dosimetry service licenced by the CNSC.

- Any authorized user that becomes pregnant, may forthwith inform the permit holder and OCRO (RSO). The authorized user may participate in any additional dosimetry programs that OCRO deems appropriate. The authorized user and the permit holder shall comply with any additional protective measures that may be prescribed which may include a modified work program for the duration of the pregnancy.
- Authorized users conducting radioiodination procedures with activities that require thyroid monitoring shall participate in monitoring programs. The permit holder or their designate shall inform OCRO (RSO) of their intent to carry out such procedures.

### **SIGNING/POSTING**

- A radiation warning sign, trefoil with the wording “Rayonnement – Danger – Radiation” shall be mounted on all doors leading into radioisotope laboratories where there is a radioisotope in a quantity greater than 100 times exemption quantity (EQ), or there is a reasonable probability that a person will be exposed to an effective dose rate greater than 25 $\mu$ Sv/hr.
- The appropriate CNSC Basic or Intermediate Level Laboratory Rules poster shall be posted in each room where radioisotopes are used or stored. The name and phone number of the responsible contact person shall be entered in the space provided. The permit holder and all authorized users shall comply with these rules.
- All signage will be in accordance with the “Signage Requirements” section 2.4 in the Radiation Safety Manual.

### **PURCHASE, RECEIPT & SHIPMENT OF RADIOACTIVE MATERIAL**

- All radioactive materials shall be ordered using the Radioisotope Purchase Requisition Form.
- Each Radioisotope Purchase Requisition shall have all the required information, be signed by the permit holder or their designate and be approved by OCRO (RSO) prior to ordering.
- All shippers’ declarations, packing slips and accompanying documentation shall be forwarded to OCRO (RSO).
- All radioactive materials offered for transport shall be directed through OCRO (RSO) and documented using a Radioactive Material Transfer Form.
- The permit holder shall communicate their intent to transfer radioisotopes to another permit holder, institution, or destination outside Canada, to OCRO (RSO). The permit holder shall not transfer radioisotopes until approval is granted by OCRO and shall comply with any requirement imposed by OCRO.
- The permit holder shall inform OCRO (RSO) of the receipt of radioactive materials from another permit holder, institution, or importation across an international border.

### **INVENTORY & DISPOSITION**

- The acquisition, use, and disposal profile of every unsealed sample shall be documented on the Inventory of Use and Disposition Form. All sections of the form are to be completed. A copy of the completed form shall be forwarded to OCRO (RSO) upon total disposition of the radioisotope. The permit holder shall retain the original records.
- Waste disposal shall be in accordance with the procedures outlined in the Radiation Safety Manual or any other practice agreed upon by OCRO.

### **CONTAMINATION MONITORING**

- Upon receipt of a package, the package is monitored to ensure the radioisotope source is not leaking



and that there is no contamination. Results are documented on the newly created Use and Disposition Form.

- Each permit holder or their designate shall initially construct a laboratory plan of all rooms under the exclusive control of the permit holder, where radioisotopes are used. The exact locations where radioisotopes are used or stored, including waste storage shall be specified on the plan. The plan shall be updated to maintain on going accuracy.
- Contamination monitoring shall be conducted weekly, in the case of a Basic Level laboratory, or immediately following procedures using quantities in excess of 5 times ALI. Results of monitoring shall be documented on the Contamination Monitoring Monthly Log and shall be cross-referenced to the laboratory plan.
- When results averaged over an area not exceeding 100 cm<sup>2</sup>, indicate contamination levels in excess of 3 Bq/cm<sup>2</sup> for Class A radionuclides, 30 Bq/cm<sup>2</sup> for Class B radionuclides, 300 Bq/cm<sup>2</sup> for Class C radionuclides, the responsible individual shall forthwith decontaminate such areas, and shall document decontamination results the Contamination Monitoring Monthly Log. As a “Best practice”, OCRO defines contamination levels as not exceeding 0.3 Bq/cm<sup>2</sup>.
- Monitoring shall be conducted by wipe testing, or, by using a contamination survey meter. If a contamination survey meter is used, its detection efficiency for the radioisotope being monitored must be at least 20%.
- The permit holder or their designate is not required to conduct monitoring when radioisotopes have not been used in the previous seven calendar days. To document this non-use, "no radioisotope use" must be marked on the Contamination Monitoring Monthly Log.
- Permit holder shall maintain accurate contamination monitoring records and keep the record infinitely until they decommission their Radioisotope Permit.

## DECOMMISSIONING

- If the permit holder no longer needs a Radioisotope Permit due to retirement or resignation, or the radioisotope use and storage are going to be relocated, it is the permit holder’s responsibility to inform OCRO (RSO) and complete the decommissioning of their area.
- The permit holder shall ensure that prior to decommissioning any area, room or equipment that the levels of contamination levels when averaged over an area not exceeding 100 cm<sup>2</sup>, are not greater than 0.3 Bq/cm<sup>2</sup> for class A radionuclides, 3 Bq/cm<sup>2</sup> for class B radionuclides, 30 Bq/cm<sup>2</sup> for class C radionuclides. The results must be documented using the Radiation Decommissioning Form. As a “Best practice”, OCRO defines decommissioning as levels of contamination not exceeding 0.3 Bq/cm<sup>2</sup>.
- Contamination monitoring records shall be transferred to OCRO when the permit is decommissioned.
- The permit holder shall ensure that all nuclear substances (including waste) and radiation devices have been transferred or disposed of and reported in accordance with the procedures outlined in the Radiation Safety Manual or any other practice agreed upon by OCRO.
- The permit holder shall ensure that all radiation warning signs have been removed or defaced.

## REPORTING

- The permit holder shall inform OCRO (RSO) of their intent to discontinue radioisotope use whether permanently or temporarily (i.e., sabbatical). The permit holder shall comply with any requirement imposed by the OCRO regarding decommissioning, disposition of retained records, and disposition of existing stocks of radioisotopes.
- The permit holder shall forthwith report any required modifications/amendments to the Internal Radioisotope Permits.
- All workers shall immediately inform the OCRO of any losses, thefts, damage of radioactive materials,



any situation where a breach of security or sabotage is possible, when an overexposure may have occurred, or any accident/incident.

## SECURITY

- Only authorized persons may have access to radioactive materials. Radioactive materials that are stored or used in areas common to both authorized and unauthorized personnel must be secured at all times from unauthorized personnel.
- When a room containing radioactive material (stocks, samples or waste) is unoccupied, the room must be locked.
- Keys to laboratory must be returned prior to departure.

## PROHIBITIONS

- The permit holder shall not allow the storage or consumption of food, beverages; or equipment for the preparation of food or beverages; or the application of cosmetics within areas where radioisotopes are used or stored.
- The permit holder shall not transfer radioisotopes to a person not authorized to receive such radioisotopes and includes individuals having had such privileges suspended by way of sanction under statutory law.
- The permit holder shall not permit under-aged individuals into areas where radioisotopes are used or stored.
- Radioisotopes shall not be transported in a private motor vehicle on a public road, either by the permit holder, their designate, or by the University transport.

## OBLIGATIONS OF LICENSEES AND WORKERS

The General Nuclear Safety and Control Regulations outline the obligations of the Licensees and the Workers. With regards to ensuring security and reporting any potential breaches or threats, there are three significant sections: Sections 12 - Obligations of the Licensee, Section 17 - Obligation of the Worker, and Section 29 - General Reports. Summary of Key Clauses are:

### Section 12 - Obligations of the Licensee

- (c) take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities and of nuclear substances;
- (h) implement measures for alerting the licensee to acts of sabotage or attempted sabotage anywhere at the site of the licensed activity;
- (j) instruct the workers on the physical security program at the site of the licensed activity and on their obligations under that program;

### Section 17 - Obligation of the Worker

- (b) comply with the measures established by the licensee to protect the environment and the health and safety of persons, maintain security, control the levels and doses of radiation, and control releases of radioactive nuclear substances and hazardous substances into the environment;
- (c) promptly inform the licensee or the worker's supervisor of any situation in which the worker believes there may be
  - (i) a significant increase in the risk to the environment or the health and safety of persons,
  - (ii) a threat to the maintenance of the security of nuclear facilities and of nuclear substances or an incident with respect to such security,





- (iii) a failure to comply with the Act, the regulations made under the Act or the licence,
- (iv) an act of sabotage, theft, loss or illegal use or possession of a nuclear substance, prescribed equipment or prescribed information, or
- (v) a release into the environment of a quantity of a radioactive nuclear substance or hazardous substance that has not been authorized by the licensee;

#### Section 29 - General Reports

(1) Every licensee who becomes aware of any of the following situations shall immediately make a preliminary report to the CNSC of the location and circumstances of the situation and of any action that the licensee has taken or proposes to take with respect to it:

- (c) a release, not authorized by the licence, of a quantity of radioactive nuclear substance into the environment;
- (d) a situation or event that requires the implementation of a contingency plan in accordance with the licence;
- (e) an attempted or actual breach of security or an attempted or actual act of sabotage at the site of the licensed activity;
- (f) information that reveals the incipient failure, abnormal degradation or weakening of any component or system at the site of the licensed activity, the failure of which could have a serious adverse effect on the environment or constitutes or is likely to constitute or contribute to a serious risk to the health and safety of persons or the maintenance of security;
- (g) an actual, threatened or planned work disruption by workers;
- (h) a serious illness or injury incurred or possibly incurred as a result of the licensed activity;
- (i) the death of any person at a nuclear facility.

(2) Every licensee who becomes aware of a situation referred to in subsection (1) the report shall contain the following information:

- (a) the date, time and location of becoming aware of the situation;
- (b) a description of the situation and the circumstances;
- (c) the probable cause of the situation;
- (d) the effects on the environment, the health and safety of persons and the maintenance of security that have resulted or may result from the situation;
- (e) the effective dose and equivalent dose of radiation received by any person as a result of the situation;  
and
- (f) the actions that the licensee has taken or proposes to take with respect to the situation.