



**See following pages for forms:**

**Please contact the Office of Risk Management, if assistance is needed to fill out forms.**

Permit

Internal Radioisotope Permit Application (Open source)  
Internal Radioisotope Permit Application (Sealed source)  
Internal Radioisotope Permit Amendment application – Opens source

User Registration

New Radioisotope User Registration form- Opens source  
Application for Authorization to Access Radioisotope Laboratories (Non-Radioactive Users)  
Request to Access Radioactive Storage Room

Purchase

Radioisotopes Purchase Requisition

Use and Disposition

Inventory of Use and Disposition

Monitoring

Wipe Test Analysis  
Record of Contamination Monitoring Monthly Log

Leak Test

Sampling Certificate (Sealed Source)  
Measuring Certificate (Sealed Source)

Waste

Aqueous Liquid Waste Log  
Liquid Scintillation Waste Log  
Non-Aqueous Liquid Waste Log  
Radioactive Carcass Waste Log  
Radioactive Solid Waste Log

Decommissioning

Radiation Decommissioning Guide  
Radiation Decommissioning Form



**uOttawa**

L'Université canadienne  
Canada's university

# **Office of Risk Management**

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

January 2017

## 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 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 in collaboration with the Office of Risk Management (ORM). 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 Assistant Director, Radiation and Biosafety, at the Office of Risk Management. 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 Committee. Overall responsibility for the effective management of radiation safety lies with the Vice-Rector (Research).

While the Radiation Safety Committee oversees the development and implementation of the Radiation Safety Program, the Office of Risk Management 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 (OPEN SOURCE)

Appended to the Internal Radioisotope Permit Application (Open Source) is the "General Conditions: 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 Assistant Director, Radiation and Biosafety at 562-5800, ext. 3058.

# INTERNAL RADIOISOTOPE PERMIT APPLICATION

(OPEN SOURCE)

## A) PERMIT HOLDER INFORMATION

<b>Name:</b>		<b>Office Tel #:</b>	
<b>Position:</b>		<b>Lab Tel #:</b>	
<b>Department:</b>		<b>E-mail:</b>	
<b>Faculty:</b>		<b>Building:</b>	<b>Room #:</b>

## B) LIST OF RADIOISOTOPES

Please list the radioisotopes you plan on using.

RADIOISOTOPE	USE LIMIT (activity in millicuries)	USE ROOM(S)	STORAGE ROOM(S)

## 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.)

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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 #:</b>	
<b>Position:</b>		<b>Institution:</b>	
<b>Department:</b>		<b>Permit Number:</b>	

<b>Faculty:</b>		<b>CNSC Licence Number:</b>	
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**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.

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Who should be contacted in an emergency?

NAME	TELEPHONE NUMBERS		
	OFFICE	LABORATORY	HOME

**G) CONTAMINATION MONITORING**

Please indicate what form of contamination monitoring will be used:

WIPE TESTING <input type="checkbox"/>	HAND HELD CONTAMINATION METER <input type="checkbox"/>
These samples will be counted using the following equipment:  Type: _____ Make: _____ Model: _____ Location: _____	Radioisotopes to be detected: _____  Meter Type: _____ Model Number: _____ Probe Type: _____ Model Number: _____ Date Last Calibrated: _____

CERTIFICATION	
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>General Conditions: Open Sources Permit</i> provided by the Environmental Health and Safety Service.	
_____	_____
<i>Signature of Applicant</i>	<i>Date</i>
_____	_____
<i>Chair of Department</i>	<i>Date</i>

APPROVAL	
_____	_____
<i>Head, Radiation and Biosafety</i>	<i>Date</i>



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# **Office of Risk Management**

## **INTERNAL RADIOISOTOPE PERMIT APPLICATION (SEALED 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 CNSC regulations and applicable conditions. To ensure compliance with these requirements, the University issues internal radioisotope permits through the Office of Risk Management (ORM). Such a permit is required by anyone whose activities involve radioactive materials. Failure to comply with these requirements could result in the loss of the University's 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 Specialist who will process the application.

## COMPLETING THE INTERNAL RADIOISOTOPE PERMIT APPLICATION (SEALED SOURCE)

Appended to the Internal Radioisotope Sealed Source Permit Application is *the "General Conditions: Sealed Source Permit"* which outlines 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) Transfer, Importation and Exportation of Radioactive Material
- D) Persons Authorized to Work with radioisotopes
- E) Emergency Procedures
- F) Leak Testing

If you have any questions or concerns please do not hesitate to contact the Radiation Specialist at 613-562-5800 ext. 3057.

INTERNAL RADIOISOTOPE PERMIT APPLICATION - SEALED SOURCE

A) PERMIT HOLDER INFORMATION

<b>Name</b>		<b>E-mail</b>	
<b>Position</b>		<b>Office Room #</b>	
<b>Department</b>		<b>Office Tel. #</b>	
<b>Faculty</b>		<b>Main Lab. Room #</b>	
<b>Lab. Building</b>		<b>Lab. Tel. #</b>	
<b>Lab. Delegate</b>		<b>Delegate's Email</b>	

B) LIST OF SEALED SOURCE RADIOISOTOPES

Please list the sealed 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) 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

If you answered to the question above, list the individuals contact information:

<b>Name</b>		<b>Office Tel. #</b>	
<b>Position</b>		<b>E-mail</b>	
<b>Department</b>		<b>Institution</b>	
<b>License Number</b>		<b>License Expiry</b>	



- D) **PERSONS AUTHORIZED TO WORK WITH RADIOISOTOPES**  
Ensure that each individual who will work with radioisotopes under your supervision complete a Sealed Source Radioisotope User Registration Form.
- E) **EMERGENCY PROCEDURES**  
Briefly describe your laboratory's emergency procedures in case of an accident/incident.

Who should be contacted in an emergency?

Name	Telephone Numbers		
	Office	Laboratory	Home

- F) **LEAK TESTING**  
If any sealed source requires leak testing (activity > 50 MBq), please provide (attach) leak testing procedure. If it is to be contracted out, please provide contractor's contact information.

<b>CERTIFICATION</b>	
<p>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 General Conditions: Sealed Sources.</p>	
<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <i>Signature of Applicant</i>	<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <i>Date</i>
<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <i>Signature of Radiation Specialist</i>	<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <i>Date</i>
<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <i>Signature of Assitant Director, Radiation &amp; Biosafety</i>	<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <i>Date</i>



**NEW RADIOISOTOPE USER REGISTRATION FORM - OPEN SOURCE**

**A) USER INFORMATION**

Name: \_\_\_\_\_ Student # \_\_\_\_\_

Position: \_\_\_\_\_ Employee # \_\_\_\_\_

Department: \_\_\_\_\_ Permit Holder: \_\_\_\_\_

Office Tel: \_\_\_\_\_ Permit # \_\_\_\_\_

Who is your Employer (uOttawa; Ottawa General Hospital etc.): \_\_\_\_\_

**B) PERSONAL INFORMATION REQUIRED FOR DOSIMETRY**

DOB: \_\_\_\_\_ Province: \_\_\_\_\_ Place of Birth \_\_\_\_\_ Country: \_\_\_\_\_

Social Insurance # \_\_\_\_\_

Currently issued dosimeter at another institution?  Yes  No

**C) PROCEDURES**

Please list the procedures that you will be using in the table below. "Activity-Stock" is either the activity of the initial vial purchased or of a prepared stock solution from which aliquots are removed. "Activity-Procedure" is the maximum activity to be manipulated during a procedure. The disposal profiles are for the whole procedure from start to finish.

Radioisotope	Activity microcurie (μCi)		Procedure Name	Drain	Decay Can	Disposal Profile %		
	Stock	Procedure				Regular Waste	Liquid Scintillation	Animal Carcass

**D) TRAINING AND EXPERIENCE**

1) Experience: used to evaluate gap in knowledge based on past use practices and prior experimental procedures

i) Prior Radiation knowledge (if any) Institution: \_\_\_\_\_ Date: \_\_\_\_\_

ii) Number of years of experience: \_\_\_\_\_

iii) Describe briefly (radioisotope, activity, procedures): \_\_\_\_\_

2) Theoretical: University of Ottawa Radiation Safety course provides a base line of knowledge required by CNSC and outlines specific requirements by University of Ottawa and as such this course is **mandatory** for everyone who is using or planning to work with radiation materials.

Have you attended the University of Ottawa Radiation Safety Course? \_\_\_\_\_ Date: \_\_\_\_\_

3) Practical: Verifies that the training provided in the lab, aligns with CNSC and University of Ottawa requirements. For this reason the following table must be completed by the new user

**RADIATION SAFETY AREA**

**DESCRIBE HOW EACH OF THESE AREAS ARE BEING ADDRESSED IN YOUR CURRENT LAB**

*(examples)*

**ALARA**  
in house procedures for reducing exposures

**Dosimetry**  
*requirements, dosimeter exchange procedure, discontinue use of dosimeter procedures, how to receive dose records, applicability of nuclear energy worker (NEW) designation dosimeter*

**Inventory**  
*logs, recording of contamination monitoring of packaging*

**Monitoring**  
*using a survey/contamination meter, dose rates, contamination monitoring/leak testing, record keeping and maps*

**Purchasing**  
*procedures, records*

**Spill Response (Emergency Response)**  
*small & large spills: reporting requirements, implications associated with activity involved, volume of spill, aerosol/fine particulate contamination, dose implication, radiation field strength, range of possible contamination, frequency of monitoring, recording monitoring result, spill response kit, waste management.*

**Shipping and Receiving**  
*wipe testing, records, CNSC posters, procedures, TDG*

**Waste Management**  
*logs, disposal procedures, monitoring*

**Security**  
*measures to be taken by staff (lock door, Rad-Box, inventory, question strangers)*

**Web Site**  
*location, forms, information*

**Anticipated Date for use of radioactive:**

## E) OBLIGATIONS OF THE LICENSEES AND THE 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

29. (1) Every licensee who becomes aware of any of the following situations shall immediately make a preliminary report to the Canadian Nuclear Safety Commission (1-800-668-5284) and inform the Office of Risk Management (5411). The preliminary report should identify the location and circumstances of the situation and of any action that the licensee has taken or proposes to take with respect to it:

(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;

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.

## IMPORTANT

I declare that I have been informed of the requirement of the University of Ottawa Radiation Safety Program as they apply to my lab. I also agree to attend the next available radiation safety training, should I have not already done so. I hereby agreed to comply with the requirements of the Radiation Safety Program as communicated by the Office of Risk Management and by my supervisor.

I have read and understood the General Conditions: Open Source Permit:

New User's Name: \_\_\_\_\_

Date:

Permit Holder: \_\_\_\_\_

Date:

In-lab Trainer: \_\_\_\_\_

Date:

Print Form



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**UNIVERSITY OF OTTAWA**

Office of Risk Management

**APPLICATION FOR AUTHORIZATION TO ACCESS LABORATORIES  
CONTAINING RADIOACTIVE MATERIAL (For Non-Radioactive Users)**

Name		Student Number	
Department		Employee Number	
Telephone #		Permit Holder	
Email		Supervisor	
Graduation Date			

**Position**

<input type="checkbox"/>	Under-Graduate Student	<input type="checkbox"/>	Graduate Student	<input type="checkbox"/>	Post-Doctorate
<input type="checkbox"/>	Technician	<input type="checkbox"/>	Visitor	<input type="checkbox"/>	Volunteer
<input type="checkbox"/>	Other:				

**Access Location Required.**

Building: \_\_\_\_\_

Room: \_\_\_\_\_

**Research Activities**

Course Code: \_\_\_\_\_

Research Project: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Training**

Have you attended the University of Ottawa Radiation Safety Training?  No  Yes

Date: \_\_\_\_\_

## Conditions

### Reporting requirements:

**29. Every licensee who becomes aware of any of the following situations shall immediately call Office of Risk management:**

- (a) no eat or Drink in the laboratory
  - (b) no access authorized of anyone not on 1) permit, and 2) Authorized individual.
  - (c) a release, not authorized by the ORM, of a quantity of radioactive nuclear substance into the environment;
  - (d) no mixing waste. Do not put any non radioactive waste into a radioactive bucket.
  - (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) do not touch or handle any radioactive material
- (2) Every licensee who becomes aware of a situation referred shall file a full report of the situation, and report to ORM and 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;**

## Signature

I have read and understand the above General Conditions:

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Supervisor: \_\_\_\_\_ Signature: \_\_\_\_\_

Permit Holder: \_\_\_\_\_ Signature: \_\_\_\_\_

**DEMANDE D'ACHAT DE RADIOISOTOPES / RADIOISOTOPES PURCHASE REQUISITION**

Date:	Détenteur de permis/ Permit Holder:	Date requise/Date required:
	Numéro de permis/ Permit number:	

Numéro de bon de commande/Purchase Order Number:	Compte/Account:
	Numéro de centre/Cost Center:

Item	Quantité/ Quantity	Description					Coût unitaire/ Unit Cost	Coût total/ Total Cost
		Numéro de catalogue/ Catalogue number	Activité/Activity	µCi	mCi	Radioisotopes		

Commentaires/Comments	TOTAL PARTIEL/ SUBTOTAL	
	T.P.S/G.S.T.	
	T.V.P/P.S.T.	
	TOTAL	

**FOURNISSEUR/SUPPLIER**

Nom/Name:			
Adresse/Address:			
Ville/City:	Province:	Pays/Country:	Code postal/Postal Code:
Tél./Tel.:	Télécopieur/Fax:		

**ADRESSE DE LIVRAISON/ DELIVERY ADDRESS**

Nom/Name:		
Département/Department:		
Adresse/Address:	Pièce/Room:	
Ville/City:	Province/État/State:	Pays/Country:
Code postal/Postal Code:	Tél./Tel.:	Télécopieur/Fax:

Demandeur/Requested By:	Signature:
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<b>Approuvé/Approved By</b> : Agent de radioprotection/Radiation Safety Officer (Nom/Name, Institution)	<b>Signature:</b>
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# Wipe Test Analysis

Permit Holder: \_\_\_\_\_  
 Department: \_\_\_\_\_  
 Room Number: \_\_\_\_\_  
 Background:\* \_\_\_\_\_

Permit #: \_\_\_\_\_  
 Tel #: \_\_\_\_\_  
 Date: \_\_\_\_\_

\*Calculations already configured. Only enter Bkg & Gross cpm

Sample#	Sampling Location	Location Description	Gross* (CPM)	Net (CPM)	Activity (Bq/cm2)
1				0	0
2				0	0
3				0	0
4				0	0
5				0	0
6				0	0
7				0	0
8				0	0
9				0	0
10				0	0
11				0	0
12				0	0
13				0	0
14				0	0
15				0	0
16				0	0
17				0	0
18				0	0
19				0	0
20				0	0
21				0	0
22				0	0
23				0	0
24				0	0
25				0	0
26				0	0
27				0	0
28				0	0
29				0	0
30				0	0
31				0	0
32				0	0
33				0	0
34				0	0
35				0	0
36				0	0
37				0	0
38				0	0
39				0	0
40				0	0

Values are only calculated at a 50% counting efficiency.



## Appendix A: 3 easy steps to convert counts per minute (CPM) to Becquerel per centimeter squared (Bq/Cm<sup>2</sup>)?

### Step 1: Determine the Radionuclide Class

The CNSC has grouped radionuclide into 3 classes. The 3 classes are shown below:

#### Class A Radionuclide: are long-lived or emit alpha radiation

Na-22 Co-60

#### Class B Radionuclide: are long-lived or emit beta or gamma radiation

Rb-86 Co-58 I-131 Sr-90

#### Class C Radionuclide: are short-lived and emit beta or gamma radiation

C-14 Co-57 H-3 P-32

Ca-45 Cr-51 Ni-63 S-35

I-125 I-123 P-33 Cl-36

### Step 2: Determine the regulatory limit

Each of these has limits assigned in terms of unfixed contamination in either a radioactive use or storage area, or in an area where radioactive material is used.

Non - Fixed Contamination	Class A radionuclide	Class B radionuclide	Class C radionuclide
in all areas, rooms or enclosures where unsealed nuclear substances are used, or stored	3 Bq/cm <sup>2</sup>	30 Bq/cm <sup>2</sup>	300 Bq/cm <sup>2</sup>
in all other areas and packaging prior to disposal	0.3 Bq/cm <sup>2</sup>	3 Bq/cm <sup>2</sup>	30 Bq/cm <sup>2</sup>

### Step 3: Convert CPM to Bq/cm<sup>2</sup>

The readings from contamination meters and non-portable instruments are related to regulatory criteria if the efficiency of the instrument for a specific radioisotope is known.

Instrument efficiencies for specific radioisotopes can be obtained from the manufacturer or determined using an appropriate standard of known activity.

#### How is 'Becquerel per centimeter squared' calculated when using a Liquid Scintillation Counter?

For wipe testing: (Liquid Scintillation and Gamma Counters)

$$\text{Bq/cm}^2 = (\text{Cpm} - \text{Bkg}) / (\text{Ec} \times \text{Ew} \times 60 \times \text{A})$$

- where Cpm = counts per minute for the wipe,
- Bkg = counts per minute of the background (assume 40 cpm)
- Ec = scintillation counter efficiency (<http://www.uottawa.ca/services/ehss/LS.html>)
- Ew = wipe efficiency, assume 10% (0.1), and
- A = area wiped in cm<sup>2</sup>.

#### How is 'Becquerel per centimeter squared' calculated when from CPM when using a survey meter?

Calculating Contamination Level For Survey Meters:

$$\text{Bq/cm}^2 = (\text{Cpm} - \text{Bkg}) / (\text{Ec} \times 60 \times \text{A})$$

- where Cpm = counts per minute for the wipe,
- Bkg = counts per minute of the background (assume 30 cpm)
- Ec = GM efficiency (please refer to user manual) and
- A = area wiped in cm<sup>2</sup> (19.6 cm<sup>2</sup> for a pancake probe)



Université d'Ottawa  
University of Ottawa

SERVICE DE L'ENVIRONNEMENT ET DE LA SANTÉ-SÉCURITÉ AU TRAVAIL  
COMITÉ DE RADIOPROTECTION

ENVIRONMENTAL HEALTH AND SAFETY SERVICE  
RADIATION SAFETY COMMITTEE

CERTIFICAT D'ÉCHANTILLONNAGE (SOURCE SCELLÉE)  
SAMPLING CERTIFICATE (SEALED SOURCE)

Revised March 3, 2003

N° DE CERTIFICAT D'ÉCHANTILLONNAGE - SAMPLING CERTIFICATE NO.  
S -

RÉF.: RÉGLEMENTATION R-118 DE LA COMMISSION CANADIENNE DE SÛRETÉ NUCLÉAIRE  
SUR LES NORMES D'ÉPREUVES D'ÉTANCHÉITÉ DES SOURCES SCELLÉES DE RAYONNEMENT  
REF: REGULATORY DOCUMENT R-118 OF THE CANADIAN NUCLEAR SAFETY COMMISSION ON THE REQUIREMENTS FOR LEAK TESTING OF SELECTED SEALED RADIATION SOURCES

A	ÉCHANTILLONNEUR/ÉCHANTILLONNEUSE - SAMPLER :			
	NOM NAME		DÉPARTEMENT DEPARTMENT	
	ADRESSE ADDRESS		CODE POSTAL - POSTAL CODE K1N6N5	IND. RÉG & N° TÉL. - AREA CODE AND TEL NO.
B	TITULAIRE DU PERMIS DE LA CCSN - CNSC LICENSEE			
	UNIVERSITÉ D'OTTAWA UNIVERSITY OF OTTAWA		550 RUE CUMBERLAND STREET OTTAWA ON K1N6N5	
	N° PERMIS CCSN CNSC LICENCE NO.	07152-	PERSONNE-RESSOURCE CONTACT PERSON	LOIS SOWDEN-PLUNKETT IND. RÉG & N° TÉL. - AREA CODE AND TEL NO. (613) 582-5600, X3056
C	IDENTIFICATION DE LA SOURCE SCELLÉE - IDENTIFICATION OF SEALED SOURCE			
	IBOTOPE	ACTIVITÉ - ACTIVITY	(DATE DE RÉF. - REF. DATE)	N° DE SÉRIE - SERIAL NO.
	MARQUE - MAKE	MODÈLE - MODEL	ÉDIFICE - BUILDING	PIÈCE - ROOM
	DESCRIPTION DU DISPOSITIF OU PORTE-SOURCE (S'IL Y A LIEU) - DESCRIPTION OF DEVICE OR SOURCE HOLDER (IF APPLICABLE)			
	MARQUE - MAKE	MODÈLE - MODEL	N° DE SÉRIE - SERIAL NO.	
D	MÉTHODE D'ÉCHANTILLONNAGE - SAMPLING METHOD			
	<hr/> <hr/> <hr/> <hr/>			
E	IDENTIFICATION DE L'ÉCHANTILLON (DESCRIPTION ET CODE) - IDENTIFICATION OF SAMPLE (DESCRIPTION AND CODE)			
	<hr/> <hr/> <hr/> <hr/>			
F	DATE DE L'ÉCHANTILLONNAGE DATE OF SAMPLING	g	SIGNATURE	
			DATE	ÉCHANTILLONNEUR/ÉCHANTILLONNEUSE - SAMPLER



Université d'Ottawa  
University of Ottawa

SERVICE DE L'ENVIRONNEMENT ET DE LA SANTÉ-SÉCURITÉ AU TRAVAIL  
COMITÉ DE RADIOPROTECTION  
ENVIRONMENTAL HEALTH AND SAFETY SERVICE  
RADIATION SAFETY COMMITTEE  
CERTIFICAT DE MESURE (SOURCE SCELLÉE)  
MEASURING CERTIFICATE (SEALED SOURCE)

Revised March 3, 2003

RÉFÉRENCE - REFERENCE N° DE CERTIFICAT DE MESURE - MEASURING CERTIFICATE NO. <b>S-</b>
--

RÉF.: RÈGLEMENTATION R-116 DE LA COMMISSION CANADIENNE DE SÛRETÉ NUCLÉAIRE SUR LES NORMES  
D'ÉPREUVES D'ÉTANCHÉITÉ DES SOURCES SCELLÉES DE RAYONNEMENT

REF: REGULATORY DOCUMENT R-116 OF THE ATOMIC ENERGY CONTROL BOARD ON THE REQUIREMENTS FOR LEAK TESTING OF SELECTED SEALED RADIATION SOURCES

<b>A</b>	ÉCHANTILLONNEUR/ÉCHANTILLONNEUSE - SAMPLER :			
	NOM NAME		DÉPARTEMENT DEPARTMENT	
	ADRESSE ADDRESS		CODE POSTAL - POSTAL CODE K1N 6N6	IND. RÉG & N° TÉL. - AREA CODE AND TEL NO.
<b>B</b>	TITULAIRE DU PERMIS DE LA CCSN - CNSC LICENSEE			
	UNIVERSITÉ D'OTTAWA UNIVERSITY OF OTTAWA		500 RUE CUMBERLAND STREET OTTAWA ON K1N 6N6	
	N° PERMIS CCSN CNSC LICENCE NO.	07180	PERSONNE-RESSOURCE CONTACT PERSON  LOIS SOWDEN-PLUNKETT	IND. RÉG & N° TÉL. - AREA CODE AND TEL NO.  (513) 562-5800, X3058
<b>C</b>	MÉTHODE DE MESURE - MEASURING METHOD			
	<hr/> <hr/>			
<b>D</b>	DATE DE L'ÉTALONNAGE DE LA VÉRIFICATION LES PLUS RÉCENTS DES APPAREILS DE MESURE DATE OF LAST CALIBRATION AND VERIFICATION CHECK OF THE MEASURING EQUIPMENT			➤ _____ DATE
<b>E</b>	FOND NATUREL DE RAYONNEMENT AMBIANT RELEVÉ PAR L'APPAREIL DE MESURE LOCAL BACKGROUND RADIATION AS INDICATED BY MEASURING EQUIPMENT			➤ _____
<b>F</b>	VALEUR DES MESURES DE L'ACTIVITÉ DU TAMPON D'ÉCHANTILLONNAGE - WIPE SAMPLE MEASUREMENT VALUE			
	_____		_____	
<b>G</b>	CALCUL ET ÉVALUATION DE LA MESURE DE L'ACTIVITÉ DU TAMPON D'ÉCHANTILLONNAGE (Y COMPRIS LES FACTEURS DE COMPENSATION ET DE CONVERSION) CALCULATION AND EVALUATION OF THE WIPE SAMPLE MEASUREMENT (INCLUDING COMPENSATION AND CONVERSION FACTORS)			
	<hr/> <hr/>			
<b>H</b>	CONCLUSIONS/ ACTIONS			
	LA FUITE DE LA SOURCE EST SEALED SOURCE LEAKAGE IS	<input type="checkbox"/> INFÉRIEURE OU ÉGALE À LESS THAN OR EQUAL TO	<input type="checkbox"/> SUPÉRIEURE À GREATER TO	LA NORME DE 200 Bq DE LA CCSN THE CNSC LEAK TEST CRITERION OF 200 Bq
	SI LA FUITE DE LA SOURCE SCELLÉE EST SUPÉRIEURE À LA NORME DE LA CCSN IF THE SEALED SOURCE LEAKAGE IS GREATER THAN THE CNSC CRITERION	<input type="checkbox"/> TITULAIRE DU PERMIS AVISÉ LE LICENSEE NOTIFIED ON		_____ DATE
NOM DE LA PERSONNE AVISÉE NAME OF THE PERSON NOTIFIED		AVISÉE PAR NOTIFIED BY	<input type="checkbox"/> TÉLÉPHONE TELEPHONE	<input type="checkbox"/> TÉLÉCOPIEUR FAX
			<input type="checkbox"/> AUTRE OTHER	
<b>I</b>	DATE DE LA MESURE MEASURING DATE _____		<b>J</b>	SIGNATURE _____
				DATE _____













## **RADIATION DECOMMISSIONING GUIDE**

This guide provides an overview for the decommissioning process, including instructions for completion of the Radiation Decommissioning Form.

### **DECOMMISSIONING PROCESS**

The decommissioning process is comprised of verifying:

1. All inventory has been accounted for and has either been used, disposed of or transferred to an authorized person
2. Waste is appropriately managed (disposed of or transferred to an authorized person)
3. Contamination Monitoring has been conducted using equipment is calibrated and can detect the energy and activity to the limits set by CNSC
4. All personnel have either left the lab or will continue under another person's permit.
5. Signage is removed (symbols and wording)

Decommission can apply to either Permits, Locations, and or Equipment.

### **PART A SCOPE OF DECOMMISSIONING (or TRANSFER)**

Permits (unsealed or sealed in a device)

- complete Table I of Decommissioning Form

Room (or parts of room) to be decommissioned as an authorized use /storage area for radioactive material

- complete Table II of Decommissioning Form

Equipment

- complete Table III of Decommissioning form

### **PART B INVENTORY & WASTE**

Inventory is considered any material (stock, aliquot, or samples) that remain in the possession of the permit holder. The Office of Risk Management will provide the Permit Holder with the list of radioisotopes that have not yet been recorded as being disposed of. This list will identify each radioactive material and its current activity as of the date listed (decay is accounted for). Depending upon the age of the material it may have decayed to below regulated levels.

- For Unsealed sources, complete Table IV of the Decommissioning Form
- For Equipment, no requirements to complete

*Note: All Use and Disposition sheets must report activities and disposal in the SI units as required by CNSC. (Contact the Radiation Specialist to obtain forms that have embedded conversion equations.)*

Waste logs must be available and accurate.

## PART C CONTAMINATION MONITORING

- Only results using calibrated equipment which has been approved for monitor the specific radioisotope energies will be accepted.
- All areas where radioactive contamination may exist must be monitored. (Surfaces such as: bench tops, sinks, sink drains, fumehoods, fumehood ducts, floors near waste and use areas, refrigerators or another surfaces that may have become contaminated)
- A map must be submitted indicating use, storage and wipe test locations.
- Results for each area monitored must be recorded as Bq/cm<sup>2</sup>; CPM counts alone will not be accepted!
- Contamination monitoring must be performed for all decommissioning types (Permit, room & instrument) where unsealed and sealed sources have been used.
- If instrument has not been calibrated within the past month, either complete the Operational Check or prove by some method that the instrument is functioning properly and the results are accurate.

➤ For unsealed sources and equipment, complete Table V - Contamination Monitoring

### Operational Check Example

Calibration std.	Activity of Std. (dpm)	Activity Measured (cpm)	Known LSC Efficiency for radioisotope	Calculated Activity	In Agreement Yes/No
3H	254300	120395	50%	127150	Yes

$$\begin{aligned}
 \text{Calculated activity} &= \text{Activity of Std} * \text{Efficiency} \\
 &= 254300 * 0.5 \\
 &= 127150
 \end{aligned}$$

(For 14C the efficiency for most LSC is 97%)

### CNSC Monitoring Criteria:

Unfixed contamination (averaged over an area not exceeding 100 cm<sup>2</sup>) does not exceed:

- 0.3 Bq/cm<sup>2</sup> for all class A radionuclides,
  - 3 Bq/cm<sup>2</sup> for all class B radionuclides,
  - 30 Bq/cm<sup>2</sup> for all class C radionuclides, or
  - or the most stringent limit may be used.
- Fixed contamination must be reported to the Radiation Specialist who then must inform CNSC.
  - Contamination Monitoring Records: CNSC has stipulated in the regulations that the last 3 years of records must be available. You can either submit the originals or send us scanned records. If you are decommissioning your permit, the Radiation Specialist will retain the records. If you are decommissioning a room or location, you are responsible for keeping your last 3 years of records.

Monitoring equipment used must be:

- to be able to detect the limits prescribed by CNSC
- if a survey meter is used, it must be calibrated in the last year.
- in working order (calibration standards must be run along with samples.)

## **PART D PERSONNEL**

All personnel listed on the permit must be removed as an authorized user or transferred to another Permit ..

- For all decommissioning types, complete Table VI - Status of Authorized Users

## **PART E SIGNAGE**

All signs and symbols must be removed from all locations listed on your permit. Signage includes permits, CNSC poster, labels on waste containers etc.

- For all decommissioning types, respond to questions.

Finally, complete signature box, then send the completed form electronically ([rad.safety@uottawa.ca](mailto:rad.safety@uottawa.ca)) or by internal mail (Radiation Specialist, ORM , Suite 840, 1 Nicholas)

## UNIVERSITY OF OTTAWA RADIATION DECOMMISSIONING FORM (Permit, Room(s), Equipment)

Name of Permit Holder: \_\_\_\_\_ Permit/s #: \_\_\_\_\_

### PART A SCOPE OF DECOMMISSIONING

**Table I - DECOMMISSIONING OR TRANSFERRING A PERMIT**

Type of Radioisotope (unsealed or sealed within a device):	
Radioisotopes on permit:	
Use & Storage Locations:	
Permit being:	Transferred <input type="checkbox"/> or Decommissioned <input type="checkbox"/>
If transferred, list name & Permit #	

**Table II - DECOMMISSIONING A LOCATION (ROOM)**

Location (room) to decommission	Radioisotopes	
<b>For shared facilities:</b>		
Will room be decommissioned as an authorized radioactive material use/storage area?	Yes _____	No _____
Name other permit holders or researchers who will continue to use the room:		

**Table III - DECOMMISSIONING or TRANSFERRING EQUIPMENT**

Equipment /Instrument Type:	
Manufacturer:	
Model Number:	
Serial Number:	
Radioisotope:	
If being transferred, list name and permit #	

**PART B INVENTORY and WASTE:**

**Table IV - Inventory & Waste**

Radioactive material is being <b>kept</b> (and agrees with information in ORM database)	Yes	No	N/A
Radioactive material <b>disposed of</b> (and agrees with information in ORM Database)	Yes	No	N/A
If Radioactive Material is to be transferred, list name & Permit #:			
Use and disposition forms have been filed with ORM	Yes	No	N/A
Waste held for storage has been transferred to:			
Waste held for storage is labelled with radioisotope, activity, disposal date, disposal limit	Yes	No	N/A
Waste logs (LSW, Solid...) are retained and affixed to the waste pails	Yes	No	N/A
Does waste remain?	Yes	No	N/A



## PART C CONTAMINATION MONITORING

**Table V – Contamination Monitoring**

Contamination Monitoring Information					
By:			Date:		
Type of Monitor (eg. Liquid scintillation, Gamma cell, Handheld meter):					
Make:		Model:		Serial No.	
Last Calibration Date:			Company who performed calibration:		
Liquid Scintillation Counter (LSC) or Gamma Cell Information					
Energy Range Monitored:			Radioisotopes monitored with detector efficiencies:		
If LSC or gamma cell was not calibrated in the last month, complete the Operational Check (or prove instrument working properly):					
Operational Check					
Calibration std.	Activity of Std. (dpm)	Activity Measured (cpm)	Detector Efficiency for specific radioisotope	Calculated Efficiency (measured cpm / Std. dpm * 100)	In Agreement Yes/No

Summary of Contamination Monitoring Results		
Radioisotope monitored	Radioisotope Class	Maximum non-fixed contamination results - averaged over an area not exceeding 100cm <sup>2</sup> (Bq/cm <sup>2</sup> )*
Was fixed contamination found?		Yes <input type="checkbox"/> No <input type="checkbox"/>
If found, list locations:		
Action taken:		

**\*Requirements:**

- Non-fixed contamination shall not exceed the following limits for the radioisotopes listed above: Class A (0.3 Bq/cm<sup>2</sup>), Class B (3 Bq/cm<sup>2</sup>), and Class C (30 Bq/cm<sup>2</sup>)
- Results must be demonstrated meet Bq/cm<sup>2</sup>; CPM counts alone will not be accepted!
- Map and monitoring results are to be attached. Also, include all original instrument print outs such LSC print outs. All areas monitored must be identified. Surfaces to be monitored (where applicable) are: bench tops, sinks, sink drains, fumehoods, fumehood ducts, floors near waste and use areas, refrigerators or any other surfaces that may have become contaminated.
- Contamination monitoring records for last 3 years.  
CNSC has stipulated in the regulations that the last 3 years of records must be available. You can either submit the originals or send us scan records. If you are decommissioning your permit the Radiation specialist will retain the records. If you are decommissioning a room or location, you are responsible for keeping your last 3 years of records.
- If Instrument was calibrated within the past year, include calibration certificate

**PART D PERSONNEL**

**Table VI - Status of Authorized Users**

Persons listed on Permit	Will they remain as Users? Yes/No	If Yes, list Permit # they will work under

**PART E SIGNAGE**

All radioactive wording, signage, permits, posters have been removed ?     Yes  No.  
 For common rooms, your permit has been removed ?                                     Yes  No.

	<i>Signature</i>	<i>Date</i>
Decommissioning Activities Undertaken by:		
Reviewed and Accepted by Permit Holder:		
Approved by (Risk Management Specialist – Radiation):		