### Appendices

### Appendix 1

**Instructions for an Application for a Permit for the Use of Radioactive Material**

**Section 1 – Identification**

This is general information about the applicant, including contact information.

**Section 2 – Program Intent**

Include a very brief summary of your research program intent.

**Section 3 – Sources Required and Location**

Only fill out the appropriate sections. Use the appropriate Radioisotope Safety Data Sheets (available here: <http://nuclearsafety.gc.ca/eng/resources/radiation/radionuclide-information.cfm>) to help complete these sections:

Items to consider:

* Radioisotope – specify all radioisotopes required
* Maximum vial size required - indicate the maximum amount of radioactive material (in MBq) which would be contained in a single vial. Normally, this is the contents of the stock vial.
* Possession Limit – this is the maximum amount of isotope (in MBq) which would be required. Its value should include waste as well as unused isotope.
* Exemption Quantity – the exemption quantities for each isotope can be found on the CNSC website
* Annual Limit of Intake – This number can generally be found in the Radioactive Safety Data Sheet (RSDS).
* Type of radioactive emission – This can also be found in the RSDS.
* Energy of Radioactive Emission – RSDS
* Half-Life – RSDS
* Critical Organ – RSDS
* A description of the premises in which the prescribed substance is to be located and of any equipment in connection with which it is to be used.

*The description of the premises will include the room number(s) and building as well as a description of how this room is related to or connected to other spaces such as student laboratories. Any special renovations or facilities designed for the handling of radioactive materials should be included. Handling and measuring equipment will also be described. A description of the design requirements for radioisotope laboratories, as issued by CNSC, is available from the Radiation Safety Office. For low levels of isotopes all of the special facilities or modifications may not be necessary, so discuss your needs with the Radiation Safety Officer.*

* A description of the measures to be taken to prevent theft, loss or any unauthorized use of the prescribed substance.

*This regulation requires that the radioactive material be stored in a locked place such as a cupboard, fridge or safe, and that the laboratory itself be kept locked when not in use. The keys to the laboratory should be restricted to authorized persons only. Describe the precautions to be taken to meet these requirements.*

**Section 4 - Security**

Only fill out the appropriate sections if additional security strategies are required. For example, actively using sources in a shared teaching lab.

**Section 5a – Hazard Identification**

Identify any hazards present and how you plan to mitigate them. Identify how equipment will be maintained. Please attach appropriate equipment SOPs to this application.

Items to consider:

* The nature and quantity of the prescribed substance and the purpose for which it is required.

*This involves a description of the proposed project, the isotope to be used and the physical and chemical form of the isotope. This information is necessary for the determination of the facilities and the nature of the laboratory space required as well as the hazards involved. There must be enough detail to allow those evaluations.*

* The maximum quantity of the prescribed substance likely to be required at any one time for the purpose set out in the application.

*This will show the results of a calculation starting with the initial activity of the system and resulting in the activity remaining in the material to be counted. It is done to justify the possession limit requested and to show that the end product will be measured satisfactorily by the equipment to be used. The maximum possession limit may be based on the results of these calculations as well as on the nature of the laboratory facilities. Estimates should be made of the maximum number of experiments likely to be done at one time, and allowance made for reordering isotopes while old stock is still on hand. A proposed ordering plan should be presented and any cost benefits which may be realized by ordering larger than the minimum requirement should be described.*

* A description of the qualifications, training and experience of any person who is to use the prescribed substance. Formal training in the theory or radioactivity and in safe use of radioactive material should be listed. Experience with the use of radioisotopes should be outlined.

**Section 5b – Emergency Response**

A description of the measures to be taken, including any plan in case of accident, to prevent the receipt by any person of a dose of ionizing radiation in excess of any dose specified in respect of such a person in Schedule II.

*Shielding and special handling equipment directed to dose reduction should be described here. Rules for working with radioisotopes must be posted in the laboratory. These are available from the CNSC, through the Radiation Safety Officer, in poster form. It is also advisable to have charts posted in the laboratory giving the characteristics, special hazards and special precautions to be used with each isotope in that laboratory. Some of these are available from the Radiation Safety Officer.*

*A summary of general procedures to be followed in case of an incident or emergency are outlined in Section 8 and Section 9 of the Radiation Safety Program. These should be modified for your particular facilities as necessary and developed as a concise Emergency Procedure to be posted in the working area.*

**Section 6 – Dosimetry**

Based on dose calculations, will dosimetry be required?

**Section 7 – Waste Disposal**

A description of the method of disposing of the prescribed substance.

The disposed material falls into two broad categories, the radioactive material itself which may be in solid or in liquid form, and the contaminated materials such as pipettes, paper wiping material or bench coverings. The latter may be of large volume. Before the permit is issued you must describe disposal procedures that have been worked out with the Radiation Safety Officer. If some radioactive material must be disposed to the sewage system during the course of experiments, the amount and concentration must be estimated.

### Appendix 2

**Application for a Permit for the Use of Radioactive Material**

**Section 1 Identification**

|  |  |
| --- | --- |
| **Principal Investigator** | |
| Name: |  |
| Faculty/ Department: |  |
| Office Phone: |  |
| After Hours Phone: |  |
| Email: |  |
| Office Room Number: |  |

|  |  |  |
| --- | --- | --- |
| **Authorized User List** | | |
| Please list all your current laboratory staff, students and volunteers. | | |
|  | |  |
| **Name** |  | **Faculty, Staff, Student, or Volunteer** |
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**Section 2 Program Intent**

Please include a brief summary of your research program intent:

**Section 3 Sources Required and Location**

List open source radioactive materials which be required:

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Radio-isotope** | **Max. vial size required**  **(MBq)** | **Possession limit required (MBq)** | **Exemption Quantity**  **(MBq)** | **Annual Limit of Intake**  **(MBq)** | **Type of Radioactive Emission** | **Energy of Radioactive Emission** | **Half Life** | **Critical Organ** |
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Has the laboratory been commissioned for radioactivity use? What Laboratory Level is the lab?

List sealed sources which will be required. If source is to be used for calibration of a device or is to be incorporated into a device, provide make, model and serial number of device.

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| --- | --- | --- | --- | --- | --- | --- |
| **Radioisotope** | **Activity** | **Exemption Quantity** | **Type of Radioactive Emission** | **Energy of Radioactive Emission** | **Half Life** | **Make, Model, S/N of Device (if applicable)** |
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List any sealed sources/sealed sources in devices that need to be leaked tested? What is the frequency?

Please indicate where the project activities will be located; please include storage (e.g. fridge, freezer, cabinet, and vault locations), shared equipment rooms (e.g. teaching labs, etc.), and if appropriate how security will be maintained:

|  |  |  |  |
| --- | --- | --- | --- |
| **Building** | **Room** | **Room Use (e.g. storage, manipulations, waste disposal, etc.)** | **Security Considerations** |
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*\* Please attach additional pages if necessary*

**Section 4 Security**

Indicate below if additional mitigation strategies are required to manage security of your materials:

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| --- | --- |
| **Security Risk** | **Mitigation Strategies Required** |
| Physical Security |  |
| Personnel Suitability and Reliability |  |
| Material Accountability |  |
| Incident and Emergency Response |  |
| Information Security |  |

*\* Please attach additional pages if necessary*

**Section 5a Hazard Identification**

Describe proposed use of radioactive materials, include dose calculations where they can be evaluated. Identify any hazards present and how you plan to mitigate them. This includes any hazards in addition to radioisotopes (e.g., physical, electrical, chemical, etc.). Attach extra pages as required. Please attach appropriate equipment SOPs to this application. Please include operation, training requirements, preventative maintenance, etc.

Include make, model and serial numbers of radiation detection equipment which will be used in the course of this research (i.e., survey meters, contamination monitors, wipe tests, etc.).

How will equipment be maintained? Attach applicable SOPs.

**Section 5b Emergency Response**

Please identify what incidents and emergencies have the potential to occur (e.g., theft, spills, exposure, loss, etc.) Attach applicable emergency response SOPs .

**Section 6 Dosimetry**

Will dosimetry be required? What specific types of dosimeters (personal, area, TLDs, neutron) are required?

**Section 7 Waste Disposal**

What type of radioactive waste will you create (e.g., liquid, solid, radioisotope + chemicals, etc.)? What frequency of disposal will you require? Will waste be stored for decay or require third-party Disposal Company?

As the Principal Investigator on this project, I declare that I am familiar with the contents of the University of Regina Radiation Safety Program, and that the above describes my research with regards to the use of radioactive materials, in its entirety.

As the legally responsible individual I will ensure that all research and/ or teaching conducted under my direction in the above laboratories and by the personnel listed, conforms to the standards set out in the University of Regina Radiation Safety Program and all applicable Canadian Nuclear Safety Commission Acts and Regulations. Any major deviation from the project, as originally approved, will be submitted to the Radiation Safety Committee via the Radiation Safety Officer for approval prior to its implementation.

**Principal Investigator’s Signature**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Dean of Faculty’s Signature**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Radiation Safety Committee Approval**

Approved □ Yes □ No

Radiation Safety Chair Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Radiation Safety Chair Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_

RSO Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

RSO Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_