ILLINOIS EMERGENCY MANAGEMENT AGENCY

INSTRUCTIONAL SET NO. 29.8 **REVISION 1**
March 1995

Instructions for Preparing Applications
for Radioactive Material Licenses Authorizing the

USE OF RADIOACTIVE MATERIAL IN GAS CHROMATOGRAPHS AND NON-PORTABLE X-RAY FLUORESCENCE ANALYZERS

BUREAU OF RADIATION SAFETY
Radioactive Materials Section
1035 Outer Park Drive
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I. INTRODUCTION

A. General

The Illinois Emergency Management Agency (herein referred to as IEMA or the Agency) regulates the possession and use of radioactive material. Certain uses of radioactive material require a specific license to be issued by the Agency pursuant to 32 Illinois Administrative Code 330 (the IEMA administrative rules, herein referred to as 32 Ill. Adm. Code or the regulations).

The Agency usually issues a single radioactive material license to cover an entire radioactive material program. Separate licenses are not normally issued to different agencys of a facility, nor are they issued to individuals associated with the facility. Facilities with more than one license may wish to combine those licenses where feasible.

Typically, equipment containing radioactive material as addressed by this instructional set which is procured from the manufacturer may be possessed and used pursuant to a general license as described in 32 Ill. Adm. Code 330.220. As such, an application for a specific license may be unnecessary. Questions regarding the need for specific licenses or general licenses should be directed to the Licensing Section of the Radioactive Materials Section.

B. Purpose of Instructions

These instructions describe the information needed by the Agency's Radioactive Materials Section staff to evaluate an application for a specific license for the possession and use of radioactive material contained in gas chromatographs or non-portable x-ray fluorescence analyzers.

Prior to submitting an application for use, the applicant should carefully study these instructions and the regulations listed in Section I.D., and submit all applicable information requested. The Radioactive Materials Section staff will request additional information when necessary to ensure that the applicant has established an adequate radiation safety program (see 32 Ill. Adm. Code 330). Such requests for additional information will delay final action regarding the application and may be avoided by a thorough study of the regulations and these instructions prior to filing the application.

These instructions are intended only for general guidance in the preparation of the license application and should not be considered as a substitute for the applicant's careful evaluation of the proposed use of radioactive material. Applicants must

assure that the application correctly and adequately describes radiation safeguards and procedures to be followed in their radioactive material use program.

C. Purpose of Appendices to these Instructions

The regulations require licensees to develop and implement written policies and procedures which ensure compliance with 32 Ill. Adm. Code. This instructional set's appendices provide sample radiation safety procedures which the licensee may choose to use in their radiation safety program. Applicants should carefully read the applicable regulations and sample procedures and then decide if the sample procedures are appropriate for their specific radiation safety needs. In the application, applicants may certify that they will follow a sample procedure or develop and submit an equivalent procedure for Agency review. If a sample procedure is to be followed, applicants must ensure that references to that procedure are clear and specific (e.g., references should include instructional set number, revision number, revision date and appendix identification).

D. Applicable Regulations

The following portions of the regulations are applicable to the use of radioactive material found in gas chromatograph electron capture detectors and non-portable x-ray fluorescence analyzers and should be used in conjunction with these instructions:

1. 32 Ill. Adm. Code 310 - "General Provisions"

2. 32 Ill. Adm. Code 330 - "Licensing of Radioactive Material"

3. 32 Ill. Adm. Code 331 - "Fees for Radioactive Material Licenses"

4. 32 Ill. Adm. Code 340 - "Standards for Protection Against Radiation"

5. 32 Ill. Adm. Code 400 - "Notices, Instructions, and Reports to Workers; Inspections"

The Agency may amend these regulations periodically. The licensee will be notified of these changes as they occur and must incorporate them into their program, if applicable.

E. Retention of Records

The licensee must maintain certain records for specified periods of time for compliance purposes. These intervals have been established in order for the inspection staff and other authorized entities to have access to these documents as required by the 32 Ill. Adm. Code. Appendix A of this instructional set contains the retention requirements for these documents.

F. Radiation Protection Program

As specified in 32 Ill. Adm. Code 340.110, the licensee must develop, document, and implement a radiation protection program. Specifically, this program should include provisions for ensuring compliance with the requirements of Part 340 of the regulations, the license, the license conditions with all active amendments and for establishing an ALARA program and for performing reviews of the program at 12 month intervals. In developing a radiation protection program, the licensee should design the program based on the size of the facility, potential hazards associated with radiation exposure, the potential for intake of radioactive material, and the physical characteristics of the radionuclides. The commitments made to the Agency, which lead to the issuance of the license, the regulations and the complete license document are considered the applicant's radiation protection program.

Active control over the radiation protection program should be exercised by management personnel in positions of authority. In addition, management should be aware that the assignment of duties to individuals (e.g., the Radiation Safety Officer) does not relieve management of the responsibilities to review and control the licensed activities.

G. As Low As is Reasonably Achievable (ALARA)

Persons engaged in activities authorized by radioactive material licenses issued by the Agency must to the extent practicable, make every reasonable effort to maintain the release of radioactive material and the total effective dose equivalent (TEDE), ALARA, for both workers and members of the public. License applicants must give consideration to the ALARA philosophy when designing facilities, procuring equipment and for developing procedures for work with radioactive material. The ALARA concept is a key element in establishing any radiation protection program as described above. The definition of ALARA may be found in 32 Ill. Adm. Code 310.20.

H. Systéme International (SI) Units

In accordance with State and federal policy, the Agency is making an effort to implement the SI system of units. If applicants wish to utilize SI units in their application, please feel free to do so. However, this conversion is by no means mandatory at this time. The Agency will continue to recognize SI and special units. Appendix B of this instructional set has been included to assist applicants in the use of SI units.

II. FILING AN APPLICATION

A specific license application for the use of sealed radioactive sources contained in gas chromatographs or non-portable x-ray fluorescence analyzers should be submitted on the, "Application Form for Radioactive Material License for Gas Chromatographs and Non-Portable X-ray Fluorescence Analyzers", in accordance with 32 Ill. Adm. Code 330.240(a) (see exhibit A). All items on the application form must be completed in sufficient detail for the Agency staff to determine if the applicant's equipment, facilities, and radiation protection program are adequate to protect health and minimize danger to life and property.

Since the space provided on the application form is limited, separate 8.5 by 11 inch sheets of paper may be appended for Items 6 through 18 listed on the form. Each separate sheet should contain the item number and the application date in the lower right corner.

The application should be completed in triplicate. The original and one copy of the application, along with duplicate copies of supporting documents, must be mailed to:

Illinois Emergency Management Agency
Radioactive Materials Section
Licensing Section
1035 Outer Park Drive
Springfield, Illinois 62704

At least one copy of the submitted application, with all attachments, must be retained by the applicant. When issued, the license will require, as a condition, that the licensee possess and use radioactive material described in all schedules of the license in accordance with statements, representations, and procedures contained in, or enclosed with, the application and supporting documentation. The regulations contained in 32 Ill. Adm. Code: Chapter II, Subchapters b and d shall govern unless the statements,

representations, and procedures set forth in the licensee's application and correspondence are more restrictive than the regulations.

Unless the applicant is exempt, an application fee is required for radioactive material licenses. Refer to 32 Ill. Adm. Code 331 to determine the appropriate fee that must accompany the application. Review of the application will not begin until the proper fee is received by the Agency. Also, please note that 32 Ill. Adm. Code 330.320(c) requires licensees to submit either a renewal application or a termination request no less than 30 days before the expiration date of an existing license.

III. CONTENTS OF AN APPLICATION

The following paragraphs explain the information requested on the "Application Form for Radioactive Material License for Gas Chromatographs and Non-Portable X-Ray Fluorescence Analyzers" (Exhibit A).

Note: if the applicant wishes to perform their own source removal, exchange, and installation, authorization from the Agency must be obtained. Additional information requested in items, 5, 6, 12, and items 16, 17, 18 and 19 must be addressed.

Item 1 - Type of Application

Indicate, by checking the appropriate box, if the application is for a new license, an amendment to an existing license, or renewal of an existing license. If the application is for an amendment to or renewal of an existing license, please specify the existing Illinois Radioactive Material License Number in the space provided.

Item 2 - Applicant's Name and Mailing Address

The "applicant" is the organization or person(s) legally responsible for possession and use of the licensed radioactive materials specified in the application. The applicant's mailing address may or may not be the same as the address where radioactive material will be used. An individual should be designated as the applicant only if that individual is acting in a private capacity and the use of radioactive material is not connected with their employment with a corporation or other legal entity. Enter the name, mailing address (including ZIP code) and telephone number (including area code) of the applicant in the space provided.

Item 3 - Person to Contact Regarding this Application

The applicant should name a qualified individual who is authorized by the applicant's management to answer questions and make commitments regarding the application and the radiation safety program. This individual, usually the Radiation Safety Officer (RSO) or a principal radioactive material user, will serve as the point of contact during the application's review. In the space provided, enter the name, address and telephone number (including area code) of the individual to be contacted regarding the application.

Item 4 - Address(es) Where Radioactive Material will be Used and/or Stored

Specify all the addresses and physical locations where licensed radioactive material will be used and/or stored. Each location description should include the street address, city and other descriptive information (e.g., building name/number, suite, room or floor number) to allow specific facility identification. If multiple addresses will be used, then specify the extent of use at each location. Do not specify a post office box number as a use location. If the applicant does not own the use/storage location(s), written approval from the owner for the use/storage of radioactive material on this property must be submitted with the application.

Item 5 - Individuals Who Will Use Radioactive Material

List the full names of all individuals who will use or directly supervise the use of radioactive material in gas chromatographs or non-portable x-ray fluorescence analyzers.

Persons who will use or directly supervise the use of radioactive material must have radionuclide training and experience commensurate with the proposed radioactive material use. Evidence of training and experience must be submitted to the Agency. A person specifically listed as an authorized user on an existing radioactive material license may submit a copy of that license (or reference an Illinois Radioactive Material License Number) as evidence of training and experience.

NOTE: If an authorized user will remove or exchange sources or detector cells, additional information regarding their training, appropriate to these activities, must be submitted.

Item 6 - Radiation Safety Officer (RSO)

State the name and job title of the RSO. This person is designated by, and responsible to, the applicant's management for the coordination of the applicant's radiation safety

program and for ensuring compliance with the applicable parts of the regulations and license provisions.
Submit a resume of the RSO's training and experience relative to radiological safety. The resume should include the type (on-the-job or formal course work), location, and duration of the training. Training should cover standard principles and practices of radiation safety as well as the manufacturer's operating, maintenance and emergency procedures. It is possible for a person with a minimum of training in radiation safety, but with a technical knowledge of gas chromatography, x-ray fluorescence, and detector cell maintenance procedures to safely work with these types of radioactive material. The RSO should be familiar with the basic principles of radiation protection in order to properly discharge their responsibilities.

In addition, the duties and responsibilities of the RSO must be specified. These duties and responsibilities should include, at a minimum, the duties and responsibilities listed in Appendix C. Either indicate that the RSO will commit to these duties and responsibilities or submit an alternate program for Agency review.

If the RSO will remove or exchange sources or detector cells, additional information regarding their training appropriate to these activities must be submitted.

Item 7 - Radioactive Material

Submit a detailed description of the radioactive material for which a license is desired. This description should allow the Division of Radioactive Material staff to determine specific information regarding the source and the device in which the source is installed:

A. Identify the radionuclide that will be used in the gas chromatograph or x-ray fluorescence analyzer.

B. Identify the physical form of the source (i.e., foil source, plated source, or sealed source).

C. Identify the manufacturer and model designation of the foil source, plated source, or sealed source that will be used in the gas chromatograph or x-ray fluorescence analyzer.

D. Specify the amount of radioactivity that will be in each foil source, plated source, or sealed source.

E. Designate the maximum number of sources for which authorization is requested.

F. Identify the manufacturer and model of the device in which the source is installed.

G. Describe the purpose for which the gas chromatograph or x-ray fluorescence analyzer will be used. Any deviations from the manufacturer's recommended use must be described in detail.

The information specified above is available from the manufacturer or distributor of the gas chromatograph or x-ray fluorescence analyzer.

For example, a sample description may read: Ni-63, plated source, ABC Company electron capture detector model 123456, 15 mCi, 2 units, one installed in an ABC Company model 4660 gas chromatograph for analysis of samples with a second electron capture detector unit in storage for exchange/replacement as necessary.

Item 8 - Facilities and Equipment

Devices containing licensed material and detector cells not contained in a device must be stored in such a manner as to prevent unauthorized removal or unauthorized use as required by 32 Ill. Adm. Code 340.810. Submit an annotated sketch or sketches of all use and/or storage area(s), showing the relationship of the use and/or storage area to other adjoining areas and the direction of north. Also provide a description of the security measures taken to limit access to the use and/or storage areas to authorized personnel only (e.g., areas locked when an authorized user is not physically present and keys possessed by authorized users only).

Provisions for venting the detector exhaust ports, if necessary, should also be provided due to the possibility of work area contamination from radioactive vapor emissions especially for detector cells containing tritium (H-3) foils.

Storage areas for material such as spare detector cells must also be specified. Those areas must be secured in such a manner as to ensure against unauthorized removal or use of radioactive material as required by 32 Ill. Adm. Code 340.810. The room, laboratory, or area in which the radioactive material is located should be:

A. Accessible only to persons authorized to use the radioactive material; and

B. Locked when an authorized user is not physically present.

For each separate facility, submit a letter from the owner of that property which verifies that the owner understands that radioactive material will be stored and/or used on that property. Alternately, if the applicant owns the property, this should be stated.

Item 9 - Personnel Training Program

For individuals who may enter a restricted are, training outlined in 32 Ill. Adm. Code 400.120 must be provided. The content of the training program, the frequency at which it is provided as well as its form and duration must be reviewed by the Agency. This training must be commensurate with the radiological health protection problems associated with the radioactive material.

Item 10 - Procedure for Ordering and Receiving Radioactive Material

Specify the individuals authorized to order radioactive material and ensure that requested radioactive material does not exceed the limits authorized by the license. Typically, this person is the RSO.

Submit a description of procedures for the receipt of radioactive material. In the procedures, address the receipt of radioactive material during and after normal working hours and the individuals authorized to receive the material. If radioactive material will not be received after normal working hours, so indicate. These procedures should be adequate to meet the requirements of 32 Ill. Adm. Code 340.960, to ensure that possession limits are not exceeded, to ensure that radioactive material is secured at all times against unauthorized removal, to ensure that radiation levels in unrestricted areas do not exceed the limits specified in 32 Ill. Adm. Code 340.310, and to ensure that all receipts are properly documented.

Item 11 - Procedure for Safely Opening Radioactive Material Packages

Submit procedures for examining incoming packages for leakage, contamination, or damage, and for safely opening packages in accordance with 32 Ill. Adm. Code 340.960. Package inspection should be performed as soon as practicable after receipt. This procedure may vary depending on the type and quantity of radioactive material received, but it should include instructions for inspecting packages, wearing gloves while opening packages, and verifying the contents of packages of radioactive material, not only against the packing slip, but also against the amount, type and form of material ordered. Please note although, 32 Ill. Adm. Code 340.960 exempts certain packages from monitoring, it is necessary that procedures be established for safely opening all radioactive material packages.

Appendix E contains a sample procedure for safely opening packages of radioactive material. Either indicate that the procedures contained in Appendix E will be followed or submit an alternate procedure for Agency review.

Item 12 - General Rules for the Safe Use of Radioactive Material

Submit the general radiation safety procedures to be followed by all personnel while working with radioactive material. The procedures should be in the form of written instructions to users and should cover the following items:

A. Assurance that users will follow the written procedures provided by the device manufacturer for operation and maintenance of the device. If the applicant will follow a procedure other than the one provided by the device manufacturer, submit equivalent procedures for Agency review.

B. Procedures or methods for preventing unauthorized access, use or removal of the device from permanent facilities. Instructions should state that individual users are never to leave a device unattended unless the device is secured from unauthorized access (e.g., room locked when authorized users not physically present).

C. Emergency procedure to be followed in case of accidents involving damage or loss of radioactive material (see Item 13. of this instructional set).

D. Specific instructions to users informing them that any maintenance on the devices involving dismantling, removal of sources from their respective source holder(s), repair, etc., must be performed only by the manufacturer or other persons specifically authorized to perform such operations by the Agency, another Agreement State, a Licensing State or the U.S. Nuclear Regulatory Commission.

E. Procedures specifying the maximum temperature at which detector cells will be operated and prohibiting users from operating gas chromatographs at temperatures greater than the maximum operating temperature for the radioactive detector cell used in that device.

F. Procedures or methods for preventing unauthorized access to detector cells removed from devices and kept in storage in other facility locations (e.g., detector cells properly secured against unauthorized access and labeled as in storage).

Appendix F contains sample rules for safely using radioactive material. Either indicate that the rules contained in Appendix F will be followed or submit an alternate procedure for Agency review.

Please note, for applicants who wish to perform their own source removal, exchange and installation, the specific procedures to be followed must be submitted for review in addition to the above information. If the manufacturer's procedures will be utilized, these instructions must be submitted.

Item 13 - Emergency Procedure

Submit a copy of an emergency procedure. A copy of this procedure should be posted in all areas where radioactive material is used/stored and should:

a. Describe immediate action to be taken after an incident in order to prevent contamination of personnel and work areas (e.g., turning off the ventilation, area evacuation, and containment).

b. List the names and telephone numbers of the responsible persons (e.g., RSO) to be notified in case of an emergency. The Agency's 24-hour telephone number should be included in this section (217/785-0600).

c. Instruct personnel on appropriate methods for re-entering and decontaminating contaminated areas.

d. Describe action to be taken in the event of fire, theft, or loss involving radioactive material. This response must include the notification of this Agency in accordance with 32 Ill. Adm. Code 340.1210 and 340.1220.

Appendix G contains a sample emergency procedure. Either indicate that the procedures contained in Appendix G will be followed or submit an alternate procedure for Agency review.

Item 14 - Waste Disposal or Transfer

Describe the specific method(s) to be used to dispose or transfer the device(s) containing radioactive material when the device(s) are no longer usable or wanted. This can be accomplished by transfer to an individual specifically licensed to receive the material (e.g., return to the manufacturer or another facility or transfer to a licensed commercial low level radioactive waste disposal firm).

Item 15 - Testing of Sealed Sources for Leakage and/or Contamination

Testing of sealed sources for leakage and/or contamination shall be performed only by persons who are specifically licensed by either the Agency, another Agreement State, a Licensing State or the U.S. Nuclear Regulatory Commission (NRC) to perform such services. In establishing a program for testing for leakage and/or contamination, three alternatives are available from which to choose:

A. You may utilize the services of a consultant or commercial organization to take the necessary test samples and report the results back to you. When using a licensed

service you should maintain a copy of that company's license which authorizes that service.

B. You may be licensed by the Agency to use a commercially available leak test kit. Your application should: (1) specify the kit to be used; (2) indicate that the kit will be used in accordance with the instructions provided; and, (3) identify the source or equipment to be tested with the kit. A copy of the leak test kit instructions should be submitted with your application.

C. You may be licensed by the Agency to perform your own leak tests, including the taking and the evaluation of the tests. The information as outlined in Appendix H should be submitted in support of your application.

Specify the frequency at which tests for leakage and/or contamination will be performed for sealed sources used in gas chromatographs or x-ray fluorescence analyzers. Most sources used in these types of devices are evaluated and approved for a six month test frequency. Note that detector cells containing tritium (H-3) are not required to be tested for leakage and/or contamination.

For those applicants who wish to be authorized to remove, install and exchange sources from their devices, items 16, 17 and 18 must be addressed. Other applicants may skip to item 19 regarding license fees.

Item 16 - Instrumentation

For source or detector cell removal, exchange, and installation, the radiation detection instruments available must be described.

Specify by manufacturer, model and serial number, all radiation measuring/monitoring instruments and detectors to be used at the facility. This list shall include, but is not limited to, instruments used for analysis of wipe tests and instruments for performing area radiation surveys. Instrumentation for performing physical area monitoring must have a range such that 0.516 μC/kg (2 mR) per hour through 12.9 μC/kg (50 mR) per hour can be measured.

Exhibit B is a form that may be used to describe the applicant's instrumentation. If this form is not used, then submit equivalent information.

Item 17 - Instrument Calibration and Operability Checks

The licensee must ensure that the survey instruments used to demonstrate compliance with 32 Ill. Adm. Code 340 are calibrated prior to first use, at intervals not to exceed 12 months thereafter, and also following repair. Specify if survey instruments will be calibrated by a service company specifically licensed to perform survey instrument calibrations as a customer service or by the applicant using specified procedures.

If survey instruments are to be calibrated by the applicant, then the applicant must submit the information requested in Appendix I. If a consultant or other licensed firm will perform the calibration of the survey instruments, then the applicant should maintain a copy of the radioactive material license which authorizes that entity to perform survey instrument calibrations as a customer service.

In addition, the Agency requires the licensee to check instrument operability by using a dedicated check source, and maintain records of these checks. These instrument operability checks are required to be performed on each day that the instrument is used; however, a record of these checks is required only after repair, battery change or instrument calibration, and at intervals not to exceed three months. If any check source reading varies greater than 20% from the reading measured immediately after calibration, the licensee shall require that the instrument be repaired or recalibrated before use for compliance surveys.

For these instrument operability checks, the term "dedicated check source" means that:

a. The sealed source used must contain a radionuclide with a relatively long half-life (e.g., greater than five years).

b. The sealed source used to check an instrument's operability must remain the same throughout the time period between survey instrument calibrations or repairs (e.g., the source must be the same model and serial number used previously for that particular model and serial number survey instrument).

   Note that this does not prohibit the licensee from using the same sealed source as the dedicated check source for more than one survey instrument. It only requires that the sealed source used initially by the licensee upon return of that survey instrument from repair or full calibration, must remain the same until that survey instrument is later calibrated.

Item 18 - Personnel Monitoring

32 Ill. Adm. Code 340.520(a) specifies when personnel monitoring equipment is necessary. On the application, indicate the type(s) of personnel monitoring device(s) to be used (e.g., whole-body and/or finger device) and the frequency at which the device will be exchanged and evaluated. Certain persons must wear a dosimeter unless it can be demonstrated by calculation and/or procedures that the radiation exposures will not exceed 10% of the applicable limits set forth in 32 Ill. Adm. Code 340. Each applicant using a film badge or TLD service must also ensure that the service meets the requirements of 32 Ill. Adm. Code 340.510(c).

Item 19 - License Fees

Refer to 32 Ill. Adm. Code 331 and the appropriate fee schedule to determine the correct fee. Applications will NOT be processed until the correct fee is received by this Agency. Questions concerning fees should be directed to the Radioactive Materials Section Licensing Section staff.

Item 20 – Financial Assurance

(((THIS SECTION NEEDS TO BE COMPLETED)))

Item 21 - Certification

The application must be signed and dated by the applicant if acting as an individual, or by an individual who is authorized by management to sign on behalf of a company. A statement signed by corporate management granting authority to sign license requests and related documents is required for applications not signed by an officer of the corporation. Unsigned applications will be returned for proper signature.

IV. LICENSE AMENDMENT

Licensees are required to conduct their programs in accordance with the regulations, and statements, representations, and procedures contained in the license application and supporting documents. The license must be amended if the licensee plans to make any changes in the facilities, equipment, procedures, authorized users (if specific individuals are listed on the license), radiation safety officer, or radioactive material used.

Applications for license amendments may be filed on the application form or in a letter format. The application must identify the license by number and clearly describe the exact nature of the changes, additions or deletions requested. References to previously

submitted information and documents must be clear and specific and identify the applicable information by date, page, and paragraph. An original and two copies of the application for amendment should be prepared. The original and one copy must be submitted, along with all applicable license fees, and the licensee must retain one copy with all attachments.

V. LICENSE RENEWAL

An application for license renewal, including the applicable fee payment must be received by the Agency at least 30 days prior to the expiration date. This filing will ensure that the license does not expire until final action on the application has been taken by the Agency as provided for by 32 Ill. Adm. Code 330.330.

Renewal applications should be filed on the "Application Form for Radioactive Material License for Gas Chromatographs and Non-Portable X-Ray Fluorescence Analyzers", appropriately supplemented, contain complete and up-to-date information about the applicant's program, and meet all licensing and regulatory requirements in effect at the time of renewal. Renewal applications must also include the users' training and experience (if specific individuals are to be listed on the license) or make a clear and specific reference to previous applications on which individual users received approval.

Renewal applications should be submitted without reference to documentation and information previously submitted, except for previously approved users. If such references cannot be avoided, they are acceptable provided:

A. The reference is made in response to a particular item of required information (e.g., emergency procedures);

B. The reference is clear and specific (e.g., title of document, date of submission, page and paragraph); and

C. The referenced document contains all information required for a particular item at the time of renewal.

Renewal applications should be submitted in accordance with the procedures outlined in Section II (Filing an Application) of these instructions.

VI. LICENSE TERMINATION

A licensee may request termination of a radioactive material license at any time. To terminate a license, the licensee must meet the requirements of 32 Ill. Adm. Code 330.320(d), which include:

A. Transfer or disposal of all licensed radioactive material in the licensee's possession in accordance with 32 Ill. Adm. Code 340;

B. Completion of IEMA form KLM.007, "Certificate - Termination and Disposition of Radioactive Material" (see Exhibit B); and

C. Performance of radiation surveys or the equivalent in accordance with 32 Ill. Adm. Code 330.320(d)(1)(E).

Submit the completed IEMA form KLM.007 and a copy of any applicable radiation surveys to the Agency at least 30 days before the expiration date of the license or upon termination of all licensed activities . Until the Agency issues a termination amendment for the radioactive material license, the licensee remains responsible for maintaining the program as licensed. Routine license terminations do not require a fee.

APPENDIX A

RETENTION OF DOCUMENTS

Document	Retention Interval
32 Ill. Adm. Code	Until termination of license
License, all active amendments and supporting documents (including the application)	Until termination of license
Annual ALARA Reviews	5 years
Receipt, Transfer and Disposal	Until disposal is authorized by the Agency
Survey Instrument Calibration	5 years
Tests for Leakage and/or Contamination	5 years
Inventories	5 years
Utilization Logs	Until disposal is authorized by the Agency
High Radiation Area Control Devices or Alarm Systems	Until disposal is authorized by the Agency
Training and Testing Records	Until disposal is authorized by the Agency or 3 years after termination of employment
Personnel Monitoring Records and Pocket Dosimeter Readings	Until disposal is authorized by the Agency
Pocket Dosimeter Calibrations	5 years
Radiation Surveys	5 years or until disposal is authorized by the Agency if a survey was used to determine an individual's exposure

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APPENDIX B

GUIDE TO SI UNITS

RADIATION DOSE EQUIVALENT

OLD *(rem)*	NEW *(sievert)*
0.1 mrem	1 µSv
0.25	2.5
0.5	5
0.75	7.5
1.0 mrem	10 µSv
2.5	25
10 mrem	100 µSv (0.1 mSv)
100 mrem	1 mSv
500 mrem	5 mSv
1 rem	10 mSv
1.5 rem	15 mSv
5	50
10 rem	100 mSv
15 rem	150 mSv
50 rem	500 mSv
100 rem	1 Sv

AMOUNT OF RADIOACTIVE MATERIAL

OLD Ci *(curie)*	NEW Bq *(becquerel)*
1 pCi	37 mBq
27 pCi	1 Bq
1 nCi	37 Bq
27 nCi	1 kBq
1 µCi	37 kBq
27 µCi	1 MBq
1 mCi	37 MBq
27 mCi	1 GBq
1 Ci	37 GBq
27 Ci	1 TBq

SURFACE ACTIVITY LEVELS

µCi/cm^2	Bq/cm^2	(kBq/m^2)
10^{-6}	0.037	0.37
3×10^{-6}	0.1	0.1
10^{-5}	0.37	3.7
3×10^{-5}	1	10
10^{-4}	3.7	37
3×10^{-4}	10	100
10^{-3}	37	370
3×10^{-3}	100	1000
10^{-2}	370	3700

(1 m^2 = 10^4 cm^2)

CONVERSIONS

100 rem = 1 Sv

100 rad = 1 Gy (gray)

1 ton = 1 Mg

1 ton = 1000 kg

1 kg = 1000 g

1 MBq/ton = 1 Bq/g

RADIATION DOSE RATES

µSv/h, mSv/h

e.g.,

7.5 µSv/h

25 µSv/h

DERIVED AIR CONCENTRATION (DAC)

Units: Bq m^{-3}

Conversion:

µCi cm^{-3} x 3.7 x 10^{10} = Bq m^{-3}

$$\frac{\text{dpm m}^{-3}}{60} = \text{Bq m}^{-3}$$

CONCENTRATION IN SOLUTION

µCi	kBq/dm^3 (kBq/l)
1	37
10	370
100	3700

1 m^3 = 10^3 dm^3 = 10^3 l or 10^3 L

1 mBq/m^3 = 1 kBq/dm^3

PREFIXES FOR UNITS:

a	atto	10^{-18}	
f	femto	10^{-15}	
p	pico	10^{-12}	trillionth
n	nano	10^{-9}	billionth
µ	micro	10^{-6}	millionth
m	milli	10^{-3}	thousandth

k	kilo	10^3	thousand
M	mega	10^6	million
G	giga	10^9	billion
T	tera	10^{12}	trillion
P	peta	10^{15}	
E	exa	10^{18}	

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APPENDIX C

DUTIES AND RESPONSIBILITIES OF THE RADIATION SAFETY OFFICER

Among the specific duties and responsibilities of the radiation safety officer are the following:

A. Assure that radioactive material possessed by the licensee conforms to the material authorized by the license.

B. Assure that only individuals authorized by the license use the radioactive material.

C. Assure that radioactive material is properly secured against unauthorized removal at all times when not in use.

D. Be immediately available to serve as a point of contact with the Agency and give assistance in case of emergency (e.g., damage, fire, theft, etc.).

E. Assure that the proper authorities (i.e., IEMA, local police, U.S. Department of Transportation, etc.) are notified promptly in case of accident, damage, theft or loss.

F. Assure that the terms and conditions of the license (such as periodic tests for leakage and/or contamination) are met and that the required records (such as calibration, accountability, etc.) are maintained and periodically reviewed for compliance with IEMA regulations and license conditions.

G. Instruct personnel in proper radiation safety practices

H. Assure that the Radiation Protection Program is implemented and reviews are performed in accordance with the regulations.

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APPENDIX D

SAMPLE MINIMUM DETECTABLE ACTIVITY CALCULATIONS

Several references contain discussions of counting statistics for radiation measurements. For purposes of this guide, the discussion contained in NCRP Report No. 58 appears to be the simplest to use. The formula the Agency recommends is the one for determining a measurement at the 95% confidence level. The formula for this level is:

$$LLD = \frac{2.71 + 4.65\sqrt{B}}{EFF}$$

where:

LLD = Lower Limit of Detection (dpm, divide by 2.2 E+6 for μCi)
B = Background counting rate (counts/minute), and
EFF = Counting efficiency.

The sample counting time and background counting time must be equal to one minute. The counting efficiency must be determined by using a standard source of known activity that emits photons of approximately the same energy as the contaminant to be detected. The counting rate for the standard is divided by the standard activity to determine the counting efficiency. When dividing, the two values must be in compatible units. A standard activity in μCi must be converted to dpm by multiplying by a factor of 2.2 E+6.

For a copy of the full discussion of the theory and limitations of this test, refer to pages 307-311 in NCRP Report No. 58, A Handbook of Radioactivity Measurement Procedures, issued February 1, 1985 by the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814.

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APPENDIX E

Procedure for Safely Opening Radioactive Material Packages

For radioactive materials received under the specific license, the following procedures for inspecting and opening each package will be performed in an area controlled for radiation protection purposes as soon as practicable after receipt, but no later than 3 hours after receipt if received during normal working hours or within three hours of the next business day if received after normal working hours.

1. Put on disposable gloves to prevent hand contamination.

2. Visually inspect the package for any sign of damage (e.g., wetness, crushing, rupture). If damage is noted, stop the procedure and notify the supplier.

3. Open the outer package (following the supplier's directions, if provided) and remove the packing slip. Verify content by comparison of the requisition to the packing slip and the contents listing. Visually check integrity of source holder, if readily observable. Check also that the shipment conforms to the licensed form, quantity, radionuclide, model identification and other specified restrictions.

4. Maintain records of receipt, inspection results and manufacturer's initial wipe test results prior to shipment.

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APPENDIX F

General Rules for Safe Use of Radioactive Materials

A. Authorized users will follow the written procedures provided by the device manufacturer for operation of the instrument. Maintenance and repair not involving the radioactive source or its holder will also be in accordance with the manufacturer's instructions.

B. Individual users are never to leave a device unattended unless the device is secured from unauthorized access (e.g., room locked when authorized users not physically present).

C. Any maintenance on the devices involving dismantling, removal of sources from their respective source holder(s), repair, etc., must be performed only by the manufacturer or other persons specifically authorized to perform such operations by the Agency, another Agreement State, a Licensing State or the U.S. Nuclear Regulatory Commission.

D. Precautions will be taken to prevent exceeding the manufacturer's specified minimum and maximum temperature at which the instrument can be safely operated.

E. Access to detector cells and replacement sources for use in devices and kept in storage must be limited by properly securing the material in a locked cabinet or drawer. The source will be properly identified as being in storage.

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APPENDIX G

Emergency Procedure

a. NOTIFY: Notify persons in the area that a release has occurred.

b. PREVENT CONTAMINATION OF PERSONNEL AND WORK AREAS - Secure the area if possible. Limit access to the area only to the minimum number of personnel necessary to assess the situation.

c. SHIELD THE SOURCE: If possible, the source should be shielded, but only if it can be done without further contamination or without significantly increasing radiation exposure.

d. ADMINISTER FIRST AID - Life threatening problems must be addressed first regardless of potential for contamination. The sources of radioactive materials do not present an immediate health threat.

e. **LOSS, THEFT, OR DAMAGE TO A SOURCE OF RADIOACTIVE MATERIAL**

In addition to following the applicable procedures outlined above, notify the RSO immediately and the Illinois Emergency Management Agency **(217) 785-0600**.

RADIATION SAFETY OFFICER (RSO):_____

OFFICE PHONE:_____HOME PHONE:_____

ALTERNATE NAMES AND TELEPHONE NUMBERS DESIGNATED BY RSO:

_____

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APPENDIX H

TESTING SEALED SOURCES FOR LEAKAGE AND/OR CONTAMINATION

Distributors of sealed sources usually supply a certificate with each source giving the results and the date of the last test for leakage and/or contamination performed on such sources. If such a certificate is not received with a source, the source is not to be used until a test for leakage and/or contamination is performed and the results of the test are received showing that the source is not leaking or contaminated. Thereafter, the source must be tested for leakage and contamination at intervals not to exceed six months, or as otherwise authorized by the Agency, an Agreement State, a Licensing State or the U.S. Nuclear Regulatory Commission. Records of the testing of each source must be maintained for Agency inspection.

Applicants who wish to perform their own tests for leakage and/or contamination, including the procurement and the analysis of the test samples, must submit the following descriptive information in support of the application:

1. Describe all instrumentation which will be used for the analysis of the test samples. The descriptive information should include:

    a. The manufacturer, model, and serial number of each instrument;

    b. The types and energies of detectable radiation, as applicable to each instrument;

    c. The efficiency of each instrument, for each type of radioactive material to be tested, including the supportive calculations documenting such efficiency; and

    d. The minimum sensitivity of each instrument, for each type of radioactive material to be tested, including the supportive calculations documenting such minimum sensitivity. At a minimum, the instrument used must be capable of detecting 0.185 kBq (0.005 μCi) of the radioactive material being tested.

2. Identify the calibration standards to be used in the analysis of each radioactive material to be tested. The identification should include the manufacturer, model, radionuclide and activity of each standard. Such standards should be traceable to a national standard.

3. Describe the calibration procedures and the frequency of calibration for each instrument.

4. Describe the material or leak test kit to be used in collecting the samples.

5. Describe in detail the procedure for performing the analysis of the samples.

6. Submit sample calculations showing the conversion of the raw counting data to units of bequerels or microcuries.

7. Describe the method for disposing of contaminated samples.

8. Describe the training and experience of each person who will analyze and evaluate the results of the samples.

9. Describe the records to be maintained for each test for leakage and/or contamination. These shall include:

    a. The location of the source which was tested for leakage and/or contamination;

    b. The date the sample was collected;

    c. The individual collecting the sample;

    d. The person performing the analysis;

    e. The date the analysis was performed;

    f. The unique identification of the source tested; e.g., manufacturer, model, serial number, etc.

    g. The radionuclide and the activity of radioactive material contained in the source; and

    h. The results of the test expressed in units of kilobequerels or microcuries. Actual test results shall be reported unless such results are less than 0.185 kBq (0.005 μCi).

APPENDIX I

METHOD FOR CALIBRATING RADIATION SURVEY INSTRUMENTS

1. Application For a Licensee to Perform Radiation Survey Instrument Calibrations

When radioactive material is used to calibrate radiation survey instruments, the person or organization performing the calibration must be specifically authorized by the Agency, another Agreement State, a Licensing State or the U. S. Nuclear Regulatory Commission.

An application for a licensee to perform radiation survey instrument calibrations should contain the following information:

a. The manufacturer's name and model of the source(s) to be used.

b. The radionuclide and activity of the radioactive material contained in the source(s).

c. The accuracy of the source(s) activity; documentation that the determination of each source activity is traceable to the National Institute of Standards and Technology - NIST (previously National Bureau of Standards - NBS) or other national standard.

d. A description of the facilities to be used.

e. The name and applicable experience of each individual who will perform the calibrations.

f. Calculations related to the calibration procedures.

g. The step-by-step calibration procedures, including associated radiation safety procedures.

h. Copies of records that will be maintained (see Item 4).

i. Verification that the requirements outlined in this appendix will be followed.

2. Recommended Methods For Calibration of Radiation Survey Instruments

The calibration of radiation survey instruments shall be performed in accordance with the following:

a. The radionuclide sources used for calibration shall approximate point sources.

b. The source activities shall be traceable* within ±5% accuracy to the NIST (previously NBS) calibrations.**

c. The frequency of calibration shall be at intervals not to exceed one year and after servicing/repair.

d. Each scale of the radiation survey instrument shall be calibrated at least at two points such that: (a) one point is in each half of the scale; and (b) the two points are separated by 50-60% of full scale. Logarithmic and digital readout radiation survey instruments with only a single readout scale shall be calibrated, at a minimum, at one point near the midpoint of each decade.

e. The exposure rate measured by the radiation survey instrument should not deviate more than ±10% from the calculated or known value for each point checked. (Read appropriate section of the radiation survey instrument manual to determine how to make necessary adjustments to bring the radiation survey instrument into calibration.) Readings within ±20% will be considered acceptable if a calibration chart or graph is prepared and attached to the radiation survey instrument. If the radiation survey instrument cannot be adjusted so that each reading falls within the ±20% range, it shall be taken out of service and sent to the manufacturer or to a qualified radiation survey instrument laboratory for repair.

f. If an electronic device is used to calibrate instruments, the instrument must still be checked for response to a known source of radiation.

NOTE: Sources of cobalt-60, cesium-137, or radium-226 are appropriate for use in calibrations. The radioactivity of the calibration standard should be sufficient to calibrate the radiation survey instruments on all ranges, or at least up to 1 Roentgen per hour on the higher range radiation measurement instruments. If there are higher ranges, they should be checked for operation and approximately correct response to radiation.

---

* For purposes of this document, the amount of radioactivity in a source is said to be traceable to a national standard when its radioactivity was determined by comparison with a source of the same radionuclide (or a proper simulated source, isotopically) the activity of which is certified by the NIST.

** In lieu of using a traceable radioactive source, a transfer instrument traceable to the NIST, within ±5%, may be used as an alternative standard. For purposes of this document, a transfer instrument shall meet the definition as contained in the American National Standard Institute publication, ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration."

3. Use of a Reference Check Source for Operational Checks

A reference check source of a long half-life (e.g., greater than five years) shall be used to obtain a radiation survey instrument response by the licensee. The reading shall be taken with the check source placed in a specific geometry relative to the detector, and:

a. Shall be taken before use on each day the instrument is used;

b. Shall be taken after calibration by the licensee or after return to the licensee of a radiation survey instrument sent for calibration by a specifically licensed firm authorized to perform radiation survey instrument calibrations as a customer service;

c. Shall be taken after maintenance and/or each battery change; and

d. Shall be taken at least quarterly.

If any operational check reading using the reference check source, with the same geometry, is not within ±20% of the reading measured immediately after calibration (or upon receipt from a calibration firm), the radiation survey instrument shall be removed from service and recalibrated.

4. Records

Records for Items 2, 3.b, 3.c, and 3.d of this procedure shall be maintained.

a. Records for Item 2 shall include, at a minimum:

1) Radionuclide used;
2) Activity and assay date of source;
3) Present activity;
4) Calculated and measured radiation values, including the percentage of difference;
5) Respective distance from source for each calculated and measured radiation value;
6) Necessary scale correction factors (required if calculated and measured radiation values do not agree within ±10%);
7) Make, model and serial number of radiation survey instrument being calibrated;
8) Name of individual performing the calibration; and
9) Date radiation survey instrument calibration was performed.

b. Records for Items 3.b, 3.c, and 3.d of this procedure shall include, at a minimum:

1) Radionuclide used;
2) Activity and assay date of the radionuclide used;
3) Reading of check source at time of calibration;
4) Geometry of check source relative to detector (position);
5) Date of calibration;
6) Make, model and serial number of the radiation survey instrument;
7) Date reference check was performed; and
8) Name of individual who performed the reference check.

5. Use of Inverse Square Law and Radioactive Decay Law

a. A calibrated source will have a calibration certificate giving its output at a given distance measured on a specific date by the manufacturer or National Institute of Standards and Technology (NIST).

1) The Inverse Square Law may be used with any point source to calculate the exposure rate at other distances.

2) The Radioactive Decay Law may be used to calculate the output at other times after the specified date.

b. INVERSE SQUARE LAW:

S (R_1) (R_2)

* - - - - -P_1

* - - - - - - - - -P_2

Exposure rate at P_2:

$$R_2 = \frac{(P_1)^2 \times (R_1)}{(P_2)^2}$$

where:

S is the point source

R_1 and R_2 are the exposure rates at P_1 and P_2 in the same units (e.g., mR/hr or R/hr).

P_1 and P_2 are the distances from the point source in the same units (centimeters, meters, feet, etc.)

c. RADIOACTIVE DECAY LAW:

$$R_t = R_o \, e^{-(0.693 \, t / T_{1/2})}$$

where:

R_o and R_t are in the same units (e.g., mR/hr or R/hr)

R_o is exposure rate on specified calibration date (initial time)

R_t is exposure rate "t" units of time later

$T_{1/2}$ and t are in the same units (years, months, days, etc.)

$T_{1/2}$ is half-life of the radionuclide

t is the time elapsed between the source calibration (assay) date and the radiation survey instrument calibration date (present time)

d. Example: Source output is given by calibration certificate as 100 mR/hr at 1 foot on March 10, 1985. Radionuclide half-life is 5.27 years.

Question: What is the output at 3 feet on March 10, 1987 (2.0 years later)?

1) Output at 1 foot, 2.0 years after calibration date:

$$R_{(1\ ft)} = 100\ mR/hr\ [\exp^{-((0.693 \times 2.0)/5.27)}]$$

$$= 100\ mR/hr\ (0.77)$$

$$= 77\ mR/hr \text{ at } 1 \text{ foot on March } 10, 1987$$

2) Output at 3 feet, 2.0 years after calibration date:

$$R_{(3\ feet)} = \frac{(1\ foot)^2}{(3\ feet)^2}\ (77\ mR/hr)$$

$$= 1/9\ (77\ mR/hr)$$

$$= 8.6\ mR/hr \text{ at } 3 \text{ feet on March } 10, 1987$$

ILLINOIS EMERGENCY MANAGEMENT AGENCY

1035 OUTER PARK DRIVE
SPRINGFIELD, ILLINOIS 62704

APPLICATION FORM FOR RADIOACTIVE MATERIAL LICENSE FOR GAS CHROMATOGRAPHS AND NON-PORTABLE X-RAY FLUORESCENCE ANALYZERS

Complete all items if this is an initial application for renewal of a license. Use supplementary sheets where necessary. Retain one copy and submit the original and one copy of the entire application to the Illinois Emergency Management Agency.

This state agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under 32 Ill. Adm. Code 330. Disclosure of this information is required. Failure to provide any information may result in denial of a radioactive material license. This form has been approved by the State Forms Management Center.

ITEM 1. Type of application (Check one)

☐ NEW LICENSE ☐ RENEWAL ☐ AMENDMENT Radioactive Material License #_____

ITEM 2. Applicant's Name and Mailing Address (Applicant must be the legal entity or individual responsible for the license.)	**ITEM 3. Person to Contact Regarding This Application:**
Phone #:	Phone #:
Fax #:	Fax #:
E-mail:	E-mail:

ITEM 4. Address(es) Where Radioactive Material Will Be Used ☐ Stored ☐ Used and Stored ☐

Phone #:	Phone #:

ITEM 5. Individual(s) Who Will Use Radioactive Material

List names and requested uses of material. (Attach evidence of appropriate Training and Experience).

Name: _____ Use: _____

Name: _____ Use: _____

Name: _____ Use: _____

Name: _____ Use: _____

Name: _____ Use: _____

ITEM 6. Radiation Safety Officer (RSO)
(Attach evidence of Training and Experience)

Name: _____ Phone #: _____

☐ Duties are as stated in Appendix C of Instructional Set 29.8 dated June 1995.

☐ Duties and responsibilities are attached.

ITEM 7. Radioactive Material

Information		
Element and Mass Number		
Chemical and Physical Form	Sealed Source	Sealed Source
Source Manufacturer and Model		
Maximum Activity per Source		
Number of Sources Requested		
Device Manufacturer and Model		
Intended Use		

ITEM 8. Facilities and Equipment

☐ Diagrams of radioactive material use and storage area are attached.

ITEM 9. Personnel Training Program

☐ Description of training program, including frequency, form, and duration is attached.

ITEM 10. Procedure for Ordering and Receiving Radioactive Material

☐ Procedure for ordering and receiving radioactive material is attached.

ITEM 11. Procedure for Safely Opening Radioactive Material Packages (Check one)

☐ We will use the procedure identified in Appendix E of Instructional Set 29.8 dated June 1995.

☐ Procedure is attached.

ITEM 12. General Rules for the Safe Use of Radioactive Material

☐ We will use the procedure identified in Appendix E of Instructional Set 29.8 dated June 1995.

☐ Procedure is attached.

☐ Procedure for exchange of source is attached.

ITEM 13. Emergency Procedure

☐ We will use the procedure identified in Appendix G of Instructional Set 29.8 dated June 1995.

☐ Procedure is attached.

ITEM 14. Waste Disposal or Transfer (Check one)

☐ We will use the manufacturer or other commercial service for disposal or transfer of our sealed sources. We will maintain a copy of the commercial service's license authorizing such services.

☐ Alternate disposal methods are detailed in an attachment to this application.

ITEM 15. Testing Sealed Sources for Leakage and/or Contamination (Check one)

☐ We will use a commercial service to perform analysis of leakage and/or contamination samples. We will maintain a copy of the commercial service's license authorizing such services.

☐ We will perform our own sample analysis for source leakage and/or contamination. Procedure is attached, which contains all information requested in Appendix H of Instructional Set 29.8 dated June 1995.

☐ **Note: Information for items 16, 17 & 18 are not submitted. We are not requesting authorization to remove, exchange, or install sources.**

ITEM 16. Instrumentation

☐ Complete Exhibit B from Instruction Set 29.8 dated June 1995 or equivalent is attached.

ITEM 17. Instrument Calibration and Operability Checks (Check one)

☐ Radiation survey instruments will be calibrated by a service company authorized to perform such services. We will maintain a copy of the company's license authorizing such services.

☐ We will calibrate radiation survey instruments in accordance with the attached procedures, which contain all information requested in Appendix I of Instructional Set 29.8 dated June 1995.

ITEM 18. Personnel Monitoring (Check all that apply)

TYPE	EXCHANGE FREQUENCY	FILM	TLD	OSL
☐ Whole body	_____	☐	☐	☐
☐ Extremity	_____	☐	☐	☐

ITEM 19. License Fees (Refer to 32 Ill. Adm. Code 331)

Please do not submit your fee payment. New applicants will be billed a prorated fee for the portion of the billing year remaining from the date the application is received. Licensees adding sites or changing fee categories will be billed when the license is amended. Existing licensees and applicants are also subject to annual bills as specified in 32 Ill. Adm. Code 331.

Fee Category_____

ITEM 20. Financial Assurance

The applicant must satisfy applicable financial assurance requirements as described in 32 Ill. Adm. Code 326.

NEW APPLICANT (Check one)

☐ Exempt ☐ $25,000 arrangement will be provided at a later date ☐ Reclamation plan/cost estimate attached

RENEWAL OR AMENDMENT (Check one)

☐ Exempt ☐ Existing document reviewed – no changes necessary ☐ Limiting condition applies

☐ Updated reclamation plan/cost estimate attached

ITEM 21. Certification

EACH APPLICANT MUST COMPLETE SECTION A:

A. I have reviewed the above items and hereby certify that my radiation protection program meets the current 32 Ill. Adm. Code, radioactive materials license with active amendments, operating procedures and ALARA Program, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of my knowledge and belief.

SIGNATURE:_____ DATE:_____

NAME:_____ TITLE:_____
(Print or Type)

COMPLETE THIS SECTION IF THE APPLICANT IS AN INDIVIDUAL:

B. If you are applying as an individual, rather than as a corporation or other legal entity, you must provide the following information in order to process your application:

Have you defaulted on an educational loan guaranteed by the Illinois Student Assistance Commission? Yes ☐ No ☐

I certify, under penalty of perjury, that I am not more than 30 days delinquent in complying with a child support order. Failure to certify may result in a denial of the license and making a false statement may subject you to contempt of court. (5 ILCS 100/10-65)

I declare that all information either included with or appearing on this application is accurate and true to the best of my knowledge.

SIGNATURE:_____ DATE:_____

APPLICANT'S SOCIAL SECURITY NUMBER:_____

EXHIBIT B

INSTRUMENTATION FORM

1. Portable Radiation Detection Survey Instruments
(0.1 mrem/hr to 50 mrem/hr or 1 μSv/hr to 500 μSv/hr):
to convert mr/hr to μC/kg, multiply by 0.258
Manufacturer: _____

Model: _____

Available: _____

Range: _____

Window Thickness: _____
(mg/cm^2)

Detector Type: _____
(G-M, Ion Chamber, etc.)

2. Portable Radiation Measurement Survey Instruments
(1 mrem/hr to 1000 mrem/hr or 10 μSv/hr to 10 mSv/hr):

Manufacturer: _____

Model: _____

Available: _____

Range: _____

Window Thickness: _____
(mg/cm^2)

Detector Type: _____
(G-M, Ion Chamber, etc.)

3. Fixed Area Monitor

Manufacturer: Not Applicable

Model: _____

Available: _____

Range: _____

4. Liquid Scintillation Counter (If used to analyze wipes*)

Manufacturer: _____

Model: _____

Minimum Detectable Activity*: _____

5. Well Counter (If used to analyze wipes*)

Manufacturer _____

Model: _____

Minimum Detectable Activity*: _____

6. Instrument Used for Analysis of Wipe Tests*

(Generic Description) _____

Manufacturer: _____

Model: _____

Minimum Detectable Activity*: _____

7. Thyroid Bioassay Probe

Manufacturer: Not Applicable

Model: _____

Range/Minimum Detectable Activity*: _____

8. Other Instruments (Continue on separate sheet if necessary.)

(Generic Description) _____

Manufacturer: _____

Model: _____

Range: _____

* Submit calculations as described in Appendix D.

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EXHIBIT C

Illinois Emergency Management Agency

Radioactive Materials Section
1035 Outer Park Drive
Springfield, Illinois 62704

This State agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under 420 ILCS 40/1-40/44. Disclosure of this information is required. Failure to provide any information will result in this form not being processed. This form has been approved by the Forms Management Center.

CERTIFICATE
TERMINATION AND DISPOSITION OF RADIOACTIVE MATERIAL

LICENSEE:	**LICENSE NUMBER:**
ADDRESS:	
	TELEPHONE NUMBER:

The following information is provided in accordance with 32 Ill. Adm. Code 330.320, "Expiration and Termination of Licenses."
This regulation appears on the back of this form. Check all that apply below.

☐ 1. All use of radioactive material authorized under the above referenced license has been terminated.

☐ 2. Radioactive contamination has been removed to the level outlined in 32 Ill. Adm. Code 340.Appendix A, to the extent practicable.

☐ 3. All radioactive material previously procured and/or possessed under the authorization granted by the above referenced license has been disposed of as follows:

☐ Transferred to (Name and Address): _____

_____

_____

_____

who is authorized to possess such material under License Number _____

issued by (Licensing Agency): _____

☐ Decayed, surveyed and disposed of as non-radioactive waste.

☐ Licensed under License Number: _____

issued by (Licensing Agency): _____

☐ No radioactive material has ever been procured and/or possessed by the licensee under the authorization granted by the above referenced license.

☐ Other (Attach additional pages).

☐ 4. Attached are radiation surveys or the equivalent as specified in 32 Ill. Adm. Code 330.320(d)(1)(E).

☐ 5. Records required to be maintained for the license requested to be terminated are available at the following location:

Name: _____

Address: _____

_____

_____

Telephone No.: _____ Contact Person: _____

☐ 6. Additional remarks. (Attach additional pages.)

THE UNDERSIGNED, ON BEHALF OF THE LICENSEE, HEREBY CERTIFIES THAT LICENSABLE QUANTITIES OF RADIOACTIVE MATERIAL UNDER THE JURISDICTION OF THE ILLINOIS EMERGENCY MANAGEMENT AGENCY ARE NOT POSSESSED BY THE LICENSEE. IT IS THEREFORE REQUESTED THAT THE ABOVE REFERENCED LICENSE BE TERMINATED.

SIGNATURE: _____ DATE: _____

NAME: _____ TITLE: _____
(print or type)

Section 330.320 Expiration and Termination of Licenses

a)Except as provided in Section 330.330(b), the authority to engage in licensed activities as specified in the specific license shall expire at the end of the specified day in the month and year stated therein. Any expiration date on a specific license applies only to the authority to engage in licensed activities. Expiration of a specific license shall not relieve the licensee of responsibility for decommissioning its facility and terminating the specific license.

b) Each licensee shall notify the Agency immediately, in writing and request termination of the license when the licensee decides to terminate all activities involving radioactive materials authorized under the license. This notification and request for termination shall include the documents required by subsection (d) below and shall otherwise substantiate that the licensee has met all of the requirements in subsection (d) below.

c)No less than 30 days before the expiration date specified in the license, the licensee shall either:

1) Submit an application for license renewal under Section 330.330; or

2) Notify the Agency, in writing, if the licensee decides not to renew the license. The licensee requesting termination of a license shall comply with the requirements of subsection (d) below.

d) Termination of Licenses

1) If a licensee does not submit an application for license renewal under Section 330.330, the licensee shall, on or before the expiration date specified in the license:

A) Terminate use of radioactive material;

B) Remove radioactive contamination to the level outlined in 32 Ill. Adm. Code 340.Appendix A, to the extent practicable;

C) Properly dispose of radioactive material;

D) Submit a completed Agency Form KLM.007; and

E) Submit a radiation survey report to confirm the absence of radioactive materials or to establish the levels of residual radioactive contamination, unless the licensee demonstrates the absence of residual radioactive contamination in some other manner. The radiation survey report shall specify the instrumentation used and certify that each instrument was properly calibrated and tested. The licensee shall, as applicable, report levels or quantities of:

i) Beta and gamma radiation at 1 centimeter from surfaces in units, multiples, or subunits of sieverts or rem per hour;

(Source: Amended at 18 Ill. Reg. 5553, effective March 29, 1994)

ii) Gamma radiation at 1 meter from surfaces in units, multiples, or subunits of sieverts or rem per hour;

iii) Removable radioactivity on surfaces in units, multiples, or subunits of becquerels or curies per 100 square centimeters of surface area, or in disintegrations (transformations) per minute per 100 square centimeters of surface area;

iv) Fixed radioactivity on surfaces in units, multiples, or subunits of becquerels or curies per 100 square centimeters of surface areas or in disintegrations (transformations) per minute per 100 square centimeters of surface area;

v) Radioactivity in contaminated liquids such as water, oils or solvents in units, multiples, or subunits of becquerels or curies per milliliter of volume; and

vii) Radioactivity in contaminated solids such as soils or concrete in units, multiples, or subunits of becquerels or curies per gram of solid.

2) If no residual radioactive contamination attributable to activities conducted under the license is detected, the licensee shall submit a certification that no detectable radioactive contamination was found. The Agency will notify the licensee, in writing, of the termination of the license.

3) If detectable levels or residual radioactive contamination attributable to activities conducted under the license are found:

A) The license continues in effect beyond the expiration date, if necessary, with respect to possession of residual radioactive material present as contamination until the Agency notifies the licensee in writing that the license is terminated. During this time the licensee is subject to the provisions of subsection (e) below.

B) In addition to the information submitted under subsections (1)(D) and (1)(E) above, the licensee shall submit a plan for decontamination, if required, as regards residual radioactive contamination remaining at the time the license expires.

e)Each licensee who possesses residual radioactive material under subsection (d)(3) above, following the expiration date specified in the license, shall:

1) Limit actions involving radioactive material to those related to decontamination and other activities related to preparation for release for unrestricted use; and

2) Continue to control entry to restricted areas until they are suitable for release for unrestricted use and the Agency notifies the licensee in writing that the license is terminated.