State of Georgia Radioactive Materials Program Telephone (404) 362-2675
Dept. Of Natural Resources 4220International Parkway Fax (404) 362-2653
Environmental Protection Div. Atlanta, GA. 30354

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APPENDICES

I. PURPOSE OF GUIDE

This guide describes the information needed by the Georgia Radioactive Materials Program (Department) to assist applicants and licensees in preparing applications for new licenses, license amendments, and license renewals for the use of sealed sources in portable gauging devices (portable gauges). An example of a portable gauge device is a moisture-density gauge that contains a gamma-emitting sealed source, cesium-137, and a sealed neutron source, americium-241-beryllium. Another example would be an x-ray fluorescence device or XRF, which might contain cadmium or americium or a combination of sealed sources. **If you will be using only XRF, you may follow Appendix I in preparing the license application.**

This regulatory guide is intended to provide you, the applicant or licensee, with information that will enable you to understand specific regulatory requirements and licensing policies as they apply to the specified services that you provide.

After you are issued a license, you must conduct your program in accordance with (1) the statements, representations, and procedures contained in your application, (2) the terms and conditions of the license, and (3) the Department of Natural Resources' regulations.

Rule 391-3-17-.01	**"**General Provisions. Amended."
Rule 391-3-17-.02	"Licensing of Radioactive Materials. Amended."
Rule 391-3-17-.03	"Standards for Protection Against Radiation. Amended."
Rule 391-3-17-.06	"Transportation of Radioactive Materials. Amended."
Rule 391-3-17-.07	"Notices, Instructions and Reports to Workers; Inspections. Amended."

Unless otherwise stated, all regulations cited in this guide are in Chapter 391-3-17, "Rules and Regulations for Radioactive Materials". You may request copies of the above documents from the Department at: Radioactive Materials Program, Atlanta Tradeport Suite 100, 4220 International Parkway, Atlanta, Georgia 30354 or from the World Wide Web at www.gaepd.org.

Before preparing your application for a license to use radioactive materials, you should be acquainted with the applicable regulations. It is your responsibility as an applicant and as a licensee to have copies of, to read, and to abide by each regulation. The Department will provide one copy of Chapter 391-3-17 for each license issued.

AS LOW AS IS REASONABLY ACHIEVABLE (ALARA) PHILOSOPHY

Rule.03 (4)(b) states, "The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA)." As an

applicant, you must have an ALARA plan that embraces this philosophy when developing plans for working with radioactive materials.

This radiation protection program must be reviewed at least annually for the effectiveness of implementation. Licensees are required to maintain records of their Radiation Protection Program until the Department terminates the pertinent license. Licensees must maintain records of audits and other reviews of program content and implementation for three years after the record is made.

II. FILING AN APPLICATION

Complete the form "Application for a Radioactive Materials License"(Appendix A). Complete Items 1. through 4. on the form itself. For items 5 through 13 submit the information on supplementary pages. On the application form, for item 7, insert only the individual's name. Each separate sheet or document submitted with the application needs to be identified and keyed to the item number on the application to which it refers. All typed pages, sketches, or drawings should be on 8-1/2 x 11 inch paper to facilitate handling and review. Complete all items in enough detail for the Department to determine that your equipment, facilities, training and experience, and radiation protection program are adequate to protect health and to minimize danger to life and property.

All license applications and documents submitted to the Department will be available for review by the general public. Do not submit proprietary information unless it is absolutely necessary for the Department to use for evaluation of your application. The Department may withhold any document or part of a document from public inspection if disclosures of its contents are not required by law.[1] Any request for withholding is subject to a determination by the State of Georgia as to whether the document may actually be withheld in accordance with applicable laws and regulations.

Personal information about employees should not be submitted unless it is necessary. For example, the training and experience of employees needs to be submitted to demonstrate their ability to manage radiation protection programs and to work safely with radioactive materials. Home addresses, home telephone numbers, dates of birth, social security numbers, and radiation dose information should not be submitted unless the Department specifically requests it.

Prepare the application and supplements in duplicate. Submit the original copy to the Radioactive Materials Program where it becomes a part of the license if approved and keep an exact copy for your records.

[1] A copy of the Georgia Open Records Law is available from the Georgia Law Library, for the cost of the photocopy. The telephone number for the library is (404) 656-3468.

III. CONTENTS OF AN APPLICATION

Item 1. License Information

Indicate whether this is an application for a new license, an amendment, or a renewal. If this is an amendment or a renewal, please identify the license number. An amendment request may be submitted in a letter form without using the application. For an amendment, the licensee must identify the radioactive material license number and give the business name. In all cases, a copy of the appropriate license fee must accompany the application in order for the review to begin. The original check should be sent to the address listed in Item 12. (See Appendix B, Fee Schedule, for the correct fee.) A copy of the check should be mailed with the application or letter.

Item 2.a. Name and Mailing Address of Applicant

Enter the applicant's name, mailing address, county, telephone number, and Internet address if applicable. The applicant should be the legal name of the corporation or other legal entity with direct control over the use of the radioactive material. If the applicant is an individual, the individual should be acting in a private capacity and the use of the radioactive material should not be connected to the individual's employment in a corporation or other legal entity.

Item 2.b. Street Address(es) of Use.

List each permanent facility used as a location of storage by the street address, city, and State, or other descriptive address (such as on Highway 10, 2 miles east of the intersection of Highway 10 and State Route 234, Any town, Georgia). The descriptive address should be sufficient to allow a Department inspector to find the location. A Post Office Box is not acceptable for Item 2.B. **A storage address must be in the State of Georgia.**

Identify the latitude and longitude of each storage facility(s), if known.

Indicate on your application if this is for a permanent or temporary facility. A permanent facility is a place where a portable gauge is used exclusively. A temporary facility is a place where a portable gauge is brought in to make necessary measurements and then removed from the facility (90 days or less).

If the device will be used at a permanent facility or facilities (90 days or more), give the specific address of each.

If you will conduct operations at temporary job-sites, you should specify temporary job-sites in the State of Georgia.

Item 3. Person to Contact

Enter the name and telephone number of the individual(s) responsible for this application and license. This individual should be familiar with the proposed radioactive materials program and be able to answer questions about the application. This individual is usually the person responsible for the radiation protection program and will serve as the point of contact during the review of the application and after issuance of the license. Notify the Department if the individual assigned function changes. Changing of the contact person does not require a license amendment unless the individual is the Radiation Safety Officer.

The individual named in Item 3 may or may not be the individual who signs the application in Item 13. The individual who signs the application in Item 13 should be someone in upper management who has the authority to make and implement commitments made to the Department.

Item 4. Record Location

Indicate where records are to be maintained. A copy of all records must be maintained at one Georgia address. If multiple locations are being requested, records for each site's operation must be maintained at the site(s) and at the main Georgia facility location as indicated in Item 2.a. or 2.b.

Item 5. Radioactive Material

1. Identify each radionuclide(s), the chemical or physical form, the number of sources, and the maximum activity requested. Specify activity in terms of Curies or Becquerels. For example, the maximum activity per source is 11 millicuries (0.41 gigabecquerels) of cesium 137 and 50 millicuries (1.9 gigabecquerels) of americium 241.

NOTE

The U.S. Nuclear Regulatory Commission (NRC) and the Agreement States has implemented increased controls for licensees that possess certain radioactive materials in quantities of concern. NRC has determined that additional requirements need to be implemented to supplement existing regulatory requirements in 10 CFR 20.1801-1802 (rules similar to Rule Chapter 391-3-17-.03(11)(a) and (b)). The increased controls are a matter of compatibility with NRC and must be implemented with essentially identical content to those being used by NRC for its licensees. To determine whether this is applicable to your application, **please refer to Appendix J for a list of radionuclides with Quantities of Concern.**

2. Identify the manufacturer's name and model number of each sealed source that will be used in each gauging device.

3. Identify the manufacturer's name and model number of each gauging device in which the sealed sources will be used.

NOTE: Consult with the proposed supplier for this information to be sure that the sources and devices conform to the sealed source and device designations registered with the NRC or an Agreement State.

Item 6. Purposes for Which Licensed Material will be Used

Specify the purposes for which the gauging devices you want to possess will be used. For example, a moisture-density gauge is normally used for measuring moisture and density of construction materials. In order for gauging devices to be used safely, the device should be used only for the purposes for which the device was designed and in accordance with the manufacturer's recommendations for use.

Also, specify whether the sealed source will be lowered into the ground more than the 1 to 3 feet common for most surface measurements. If you plan to make measurements at depths exceeding 3 feet, you will need appropriate provisions in your operating and emergency procedures (see Item 10.7.) to reduce the probability of the source becoming lodged in the hole and to recover a "stuck" source. Your license will require that you notify the Department if a sealed source becomes lodged in a hole and it becomes apparent that recovery efforts will be unsuccessful.

Item 7. Individual Responsible for Radiation Protection Program and their Training and Experience

State the name of the person designated by, and responsible to, the applicant's management as Radiation Safety Officer (RSO). This individual is responsible for the management and coordination of the Radiation Protection Program, who maintains the license and associated records, and who, in most instances, is the contact with the Department in administering the license.

The RSO should have a high school diploma or a general equivalency diploma as well as the training you will require of gauge users as described your response to Item 8. below. If the RSO has completed (or will complete) the gauge manufacturer's course, state in your application the title of the course and where and when (specific dates) the course was or will be completed. Submit a copy of the training certificate with the application.

If the RSO received training other than that provided by the gauge manufacturer, you should provide the information requested in Items 1 through 3 under Item 8.2. with evidence that the RSO successfully completed the course. You should state that the qualifications of the gauge manufacturer’s instructor meet the criteria in Part II of Appendix D of the “Licensing Guide for Portable Gauges, Revision 6”.

The RSO must have independent authority to: maintain an ALARA program; enforce radiation safety polices and procedures; suspend activities deemed unsafe; implement remedial action when necessary; make a decision relative to any and all licensed activities; and if designated as the primary contact with the Department, be delegated the authority to act as a duly authorized person to act for and on behalf of the applicant.

The RSO's duties and responsibilities should include those areas listed in Appendix C. In lieu of submitting the requested description, you may state, "The RSO's duties and responsibilities will be those listed in Appendix C of the "Licensing Guide for Portable Gauges, Revision 6". You should provide management's commitment that the RSO has independent authority to stop unsafe operations and will be given sufficient time to do his or her radiation safety duties and responsibilities.

Provide a copy of an organizational chart that shows the organizational structure as it relates to the RSO position to demonstrate that the RSO has sufficient independence and direct communication with responsible management officials. The chart should also show the position of the individual who signs the application in Item 13 of the Application Form.

Item 8. Training Provided To Other Users

Employees who will use the portable gauges will be required to have training in radiation safety and in the use of the gauge(s). You may request that trained employees be listed by name in the radioactive material license. Provide a training certificate for each named individual. As an alternative, you may request that employees not be named on the license. Provide a description of how you will ensure that only trained individuals will use the portable gauges. Also describe how records will be maintained of your approved users.

If training will be provided by other than the gauge manufacture, details of the alternate training will need to be provided.

8.1 Initial Training Received in a Gauge Manufacturer's Course

If gauge users receive training in a gauge manufacturer's course, you should provide the following:

1. A commitment that before an individual is permitted to use a gauge, the individual (a) will have successfully completed a gauge manufacturer's course that meets the criteria in Part I of Appendix D, of the "Licensing Guide for Portable Gauges, Revision 6", and the course instructor's qualifications meet the criteria in Part II of Appendix D, of the "Licensing Guide for Portable Gauges, Revision 6". (b) will have received copies of, and been trained in, the applicant's operating and emergency procedures, and (c) will have been designated as an authorized user by the RSO.

   For each individual trained after you have made the above commitment in an application to the Department, you should maintain records demonstrating that the

individual successfully completed a gauge manufacturer's course; that the course meets the criteria in Part I of Appendix D; that the course instructor's qualifications meet the criteria in Part II of Appendix D; that the individual received copies of and was trained in the applicant's operating and emergency procedures; and that the individual was designated as an authorized user by the RSO. These records should be maintained until three years after the individual terminates employment.

2. We recommend that refresher training be provided by the RSO to all gauge users at intervals not to exceed one year. This refresher training should include participating in "dry runs" of your emergency procedures and reviewing (1) operating and emergency procedures; (2) Department of Transportation requirements; (3) changes in applicable regulations or license conditions; and (4) deficiencies identified during the performance of annual audits of the radiation protection program. Refresher training may also include review of applicable Department Information Notices and Bulletins. Typically, refresher training lasts 1-3 hours; refresher training of shorter duration is acceptable provided it encompasses participation in "dry runs" and review of the items listed above.

   You should maintain records of the annual refresher training, including the date of the training, identity of the instructor, list of attendees, and topics covered. These records should be kept for at least three years.

8.2 Initial Training Received in an Alternate Course (i.e., Other than a Gauge Manufacturer's Course)

If gauge users receive initial training in an alternative course (i.e., other than a gauge manufacturer's course), you should provide the following.

1. A description of the alternate course, including its duration, the topics covered, the amount of time devoted to each topic;

2. The name and qualifications of each instructor;

3. A description of how the trainees' competency is ensured, including a description of tests to be administered and copies of sample tests with correct answers shown and a notation of the minimum "passing" grade;

4. A commitment that, before an individual is permitted to use a gauge, the individual (a) will have successfully completed the alternate course described in response to Items 1 through 3 above, (b) will have received copies of and been trained in the applicant's operating and emergency procedures, and will have been designated as an authorized user by the RSO.

   For each individual trained by an alternate course, you should maintain records demonstrating that the individual successfully completed the course described in response to items 1 through 3 above; that the course content and instructor

qualifications were as described in response to items 1 through 3 above; that the individual received copies of, and was trained in, the applicant's operating and emergency procedures; and that the individual was designated as an authorized user by the RSO. These records should be maintained until three years after the individual terminates employment.

5. A commitment that refresher training will be provided by the RSO to all gauge users at intervals not to exceed one year. The refresher training should include participating in "dry runs" of your emergency procedures and reviewing (1) operating and emergency procedures, (2) Department of Transportation requirements, (3) changes in applicable regulations or license conditions, and (4) deficiencies identified during the performance of annual audits of the radiation protection program. Refresher training may also include review of applicable Department Information Notices and Bulletins. Typically, refresher training lasts 1-3 hours; refresher training of shorter duration is acceptable provided it encompasses participation in "dry runs" and review of the items listed above.

You should maintain records of the refresher training, including the date of the training, identity of the instructor, list of attendees, and topics covered. These records should be kept for at least three years.

NOTE: An alternate training program should meet the criteria in Part I of Appendix D to this guide. The Department does not consider an alternate training program adequate if the only qualification of the instructor is completion of the device manufacturer's training program. In general, an instructor should have the training and experience outlined in Part II of Appendix D. The course instructor's qualifications are important in order to avoid "pyramid training" (i.e., persons with minimal training train new individuals who, in turn, train others). Individual qualifications will vary and authorization of trainers may be made on a case-by-case basis.

In a case-by-case review, the Department may consider the extent to which the following factors offset the need for some of the formal training outlined in Part II of Appendix D: possession of a Bachelors (or more advanced) degree in a physical science or engineering; possession of a license as a professional engineer; an extensive amount of field experience; use of instruction materials (e.g., instructor's notes, slides, handouts, videotapes, test questions) prepared by more highly qualified individuals (e.g., certified health physicist); grading of students' tests by more highly qualified individuals.

Item 9.1 Facilities and Equipment

Georgia Rule .01(2)(mmmm) defines a restricted area as "any area to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to sources of radiation and radioactive material. A restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area."

1. For each proposed permanent facility listed in Item 2.b. of the application form, specify whether the proposed facility currently exists, is under construction, or is planned for future construction. If the facility is under construction or planned for future construction, include the estimated completion date.

2. Describe the general location of each proposed permanent facility listed in Item 2.b. (e.g., located in an industrial park, an office complex, a private residence) and its current use. If any proposed permanent facility is a private residence, confirm that the use of licensed material does not conflict with local codes or zoning laws; provide diagrams of the facility that include the building, the proposed restricted area or areas and adjacent areas, including above and below the restricted areas; provide commitments that restricted areas do not include residential quarters; and explain how radiation levels in unrestricted areas will be controlled and monitored to comply with Rule .03(5)(i).

3. Describe the storage locations at each address listed in Item 2b. of the application and submit a diagram showing where the gauge will be stored when not at field locations. For example, is the storage location a closet, a separate room dedicated to the storage of gauges only, or locked cabinet?

Item 9.2 <u>Security Procedures</u>

The following security requirements apply to portable gauge licensees regardless of the location, situation, and activities involving the portable gauge. The security requirements apply to: (1) storage on vehicles; (2) storage at temporary facilities (e.g., residence, hotel, or job site trailer); and (3) storage at permanent facilities. At all times, licensees are required to either maintain control and constant surveillance of the portable gauge when in use and, at a minimum, use two independent physical controls to secure the portable gauge from unauthorized removal while in storage. The physical controls used must be designed and constructed of materials suitable for securing the portable gauge from unauthorized removal, and both physical controls must be defeated in order for the portable gauge to be removed. The construction and design of the physical controls used must be such that they will deter theft by requiring a more determined effort to remove the portable gauge. The security procedures used must ensure that the two physical barriers chosen clearly increase the deterrence value over that of a single barrier and the two physical barriers would make unauthorized removal of the portable gauge more difficult.

1. Describe the security measures that will be taken during storage of gauges at the addresses listed in Item 2.b.of the application form. The licensee is required to use a minimum of two independent physical controls to secure the gauges while being stored at a permanent location. For example, the portable gauge or transportation case containing the gauge is stored in a room with a locked door within a secured building or the portable gauge or transportation case containing the portable gauge

is stored in a separate secured area inside a secured mini-warehouse or storage facility.

If you plan to store gauges at a location (e.g. private residence) other than the permanent storage facility, provide your justification for not returning the gauge to the permanent place of storage (as listed in Item 2.b. of the application form) at the end of each workday. If you will be using gauges at local temporary job sites, either (1) commit to returning the gauges to a permanent storage facility as listed in Item 2.b. of the application form or (2) explain why the gauge is not returned, at the end of each work day, to a permanent storage location. Describe the steps you will take to ensure that the gauge is secured from unauthorized removal by using a minimum of two independent physical controls to secure the gauges while being stored. In addition, the areas are posted in accordance with the requirements of Rule .03(12)(b)5., that it does not present an "attractive nuisance"; and that members of the general public are not exposed to radiation in excess of the requirements of Rule .03(5)(i).

2. Describe how gauges will be secured while located in transport vehicles. The licensee is required to use a minimum of two independent physical controls to secure the gauges while in transport. For example, the locked transportation case containing the gauge is physically secured to a vehicle with brackets and a chain is wrapped around the case so it cannot be opened or two separate chains or steel cables attached independently to the vehicle in such a manner that the box cannot be opened without the removal of the chains or cables.

3. Describe how gauges will be controlled by the constant surveillance of authorized users when not in storage and how they will be secured while in storage at temporary job-sites (e.g., lunch time and off-duty hours). The licensee is required to use a minimum of two independent physical controls to secure the gauges while in temporary storage. For example, the gauge or transportation case containing the gauge is stored in a locked non-portable structure and is physically secured by a chain to the structure or stored in a locked garage, and is within a locked vehicle or is physically secured by a chain.

Keep in mind that the device needs to be in a secured storage area or kept under the physical surveillance and immediate control of authorized users at all times while the gauge is not in storage. It is not acceptable for a device to be chained to a post or be left lying unattended at the place of use during lunch or breaks. The device would then be accessible to unauthorized persons with a corresponding increased possibility of tampering, theft, or damage to the device by heavy equipment.

Item 10. <u>Radiation Protection Program</u>

As the licensee, you are responsible for the conduct of your radiation protection program at all facilities and for the actions of all your employees. If you list more than one facility as an authorized location of use or storage, you should design your radiation protection program

to be applicable to all listed facilities and all your employees. In addition, you are required by Rule to verify, at least annually, that your licensed activities are being conducted in compliance with Department's regulations and the terms and conditions of your license.

It is very important that you document all activities conducted under your license to demonstrate regulatory compliance. Records showing activities conducted under your license are evidence of your efforts to be in compliance. For example, during inspections, inspectors may request records of the receipt, transfer, and disposal of licensed material; and training for authorized users.

10.1 Personnel Monitoring Program

In accordance with Rule .03(8)(b), a personnel monitoring device is to be used by individuals entering restricted areas who are likely to receive a dose in excess of 10% of the dose specified in Rule .03 (5)(a). The specified annual dose to the whole body of adults is 5 rems (0.05 sievert). The whole body includes the head, trunk (including male gonads), arms above the elbow, and legs above the knee. The specified annual dose limit to the skin or any extremity (shallow dose equivalent) is 50 rems (0.50 sievert). The specified annual dose limit for minors is 10 percent of the annual dose limits specified for adult workers, and the specified occupational dose limit for the embryo/fetus of a declared pregnant woman is 0.5 rem (5 millisieverts).

All gauge users will need to wear a film badge, optically stimulated dosimeter (OSD), or thermoluminescent dosimeter (TLD), if required by Rule .03(8)(b). Personnel monitoring devices are not required if it can be demonstrated that individuals using the gauges are not likely to receive a radiation dose in excess of ten percent of the allowable limits.

Accordingly, you should provide the following information on your monitoring program, as appropriate.

1. Documentation of your evaluation that unmonitored gauge users are not likely to receive radiation doses in excess of 10 percent of the allowable limits,

OR

2. A commitment to monitor all gauge users with a film badge, OSD, or TLD when they use gauges, including:

    a. The name of the supplier of the monitoring equipment you will use or a commitment to use any supplier accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

    b. Identification of the type of personnel monitoring equipment that will be used (i.e., film badge, OSD, or TLD).

c. Specification of the frequency with which film badges, OSD, or TLD will be exchanged. Generally acceptable exchange frequencies are every three months for TLD and OSD and every month for film badges. Other exchange frequencies can be considered based on the frequency of using portable gauges. The personnel monitoring device vendor may recommend an exchange frequency based upon the type of monitoring equipment you will be using. If you want to be authorized to perform servicing of gauges that requires removal of the source from its shielded position or requires removal of the source rod from the gauging device, you should address the items listed in Appendix F, "Extended Maintenance," which includes the use of extremity monitors.

10.2 Radiation Detection Instruments

It is **not necessary** to have a radiation survey meter to make surveys during routine use of the device. However, each year there are a number of incidents involving gauges at construction sites (e.g., construction equipment running over the gauge) thus it is important to determine, as soon as possible after an incident, whether the radioactive source has been breached. In most cases the gauge is damaged but the source remains intact. If you do decide to possess a survey instrument, it needs to be calibrated at least annually in accordance with Rule .03(8)(a)2.

NOTE: If you plan to perform gauge servicing that requires removal of the source from its shielded position or removal of the source rod from the gauging device, you should address the items listed in Appendix F, one of which deals with the possession and use of radiation detection instrumentation.

10.3 Leak -Testing

A leak-test (i.e., a check for removable radioactive contamination) is required to be performed at 6-month intervals or an interval approved by the Department. The measurement of the leak-test sample needs to be quantitative, and the instrumentation used to analyze the sample needs to be sufficiently sensitive to 0.005 microcurie (185 Becquerel) of radioactivity.

The options for leak- testing are:

1. Engage the services of a consultant, commercial facility, or the gauge manufacturer to take, evaluate, and report sample results to you.

2. Use a commercial leak-test kit. In this case, you take the smear and send it to the kit supplier, who reports the results to you.

3. Perform the entire leak-test sequence yourself, including taking the smears, making the measurements, and calculating the results.

For Option 1, specify that leak-tests will be performed at intervals not to exceed 6 months (or an interval approved by the Department) and provide the name, address, and radioactive material license number of the consultant, commercial organization, or gauge manufacturer who will perform leak-tests for you.

For Option 2, specify that leak-tests will be performed at intervals not to exceed 6 months (or an interval approved by the Department) and provide the name, address, and license number of the kit supplier, the model number of the kit you will use, and your commitment to follow the supplier's instructions for collecting the leak-test sample. In addition, you should submit information on the supplier's procedures for analyzing samples collected using its kit and providing timely reports of the results to you. In your application, you should also state that the test samples will be taken by the individuals specified in Item 7. who are responsible for your radiation protection program or trained authorized users specified in item 8.

For Option 3, refer to the Department's Leak-Test Guide, which is also available on the Department's web site.

Note: Troxler and some Campbell Pacific Nuclear gauges require only a 12 month leak-test.

Item 10.4 Inventories

The Department requires that licensees must periodically account for all sealed sources and devices received and possessed under their license. Once your license is approved, there will be a condition stipulating that you, the licensee, must conduct six-month inventories. You should maintain records of the inventories for at least three years from the date of the inventory, and your inventory records should include:

- The radionuclide and amount (in units of Becquerel or Curies) of radioactive material in each sealed source,
- The manufacturer's name, model number, and serial number (if appropriate) of each device containing radioactive material; and
- The location of each sealed source and device, the date of the inventory, and the name of the individual who conducted the inventory.

Item 10.5 Maintenance

Any maintenance (e.g., cleaning) will always be performed with the radioactive source in the safe shielded position in accordance with the manufacturer's directions or recommendations. More extensive maintenance that requires removal of the source from its shielded position or removal of the source rod from the device will be performed only by the gauge manufacturer. Unless specifically authorized on your license, you may not do any maintenance or cleaning unless the source is safely shielded within the gauge.

If you wish to perform any maintenance or cleaning of the gauging device that requires the removal of the radioactive source from its shielded position or removal of the source rod from

the gauge, you should provide the information listed in Appendix F.

Item 10.6. Transportation of Devices to Field Locations

It is your responsibility as a licensee to become familiar with all applicable Department of Transportation (DOT) regulations help ensure safe transportation of radioactive materials. The applicable DOT regulations are outlined in **10 CFR 71.5**, "Transportation of Licensed Material." The major areas in the DOT regulations that are most relevant for transportation of typical portable gauges that are shipped as Type A quantities are outlined here.

Table of Hazardous Materials and Special Provisions, 49 CFR 172.101

49 CFR 172.101 -- Hazardous Materials Table [proper shipping name, hazard class, identification number]

Table 2, Appendix A, 49 CFR 172.101 -- List of Hazardous Substances and Reportable Quantities [for radionuclides]

Shipping Papers, 49 CFR 172.200

49 CFR 172.201 --General entries [on shipping papers]

49 CFR 172.202 --Description of hazardous material on shipping papers

49 CFR 172.203 --Additional description requirements

49 CFR 172.204 --Shipper's certification [if applicable]

Package Markings, 49 CFR 172.300

49 CFR 172.301 --General marking requirements for nonbulk packaging

49 CFR 172.304 --Marking requirements

49 CFR 172.310 –Class 7 (Radioactive) material [Type A or Type B]

49 CFR 172.324 --Hazardous substances in non-bulk packaging
[Designation of "reportable quantities" with the letters "RQ"]

Package Labeling, 49 CFR 172.400

49 CFR 172.400 -- General labeling requirements

49 CFR 172.403 -- Class 7 (Radioactive) materials [types and contents of labels]

49 CFR 172.406 -- Placement of labels

Emergency Response Information, Subpart G

49 CFR 172.600 -- Applicability and general requirements

49 CFR 172.602 -- Emergency response information

49 CFR 172.604 -- Emergency response telephone number

Training, Subpart H

49 CFR 172.702 -- Applicability and responsibility for training and testing

49 CFR 172.704 -- Training requirements (includes types of training, when it must be conducted, need for refresher training every 3 years, Record keeping)

Shippers -- General Requirements for Shipments and Packaging, 49 CFR 173

49 CFR 173.403 -- Definitions

49 CFR 173.410 -- General design requirements

49 CFR 173.412 -- Additional design requirements for Type A packages [includes package seals]

49 CFR 173.415 -- Authorized Type A packages [includes packaging certification requirements]

49 CFR 173.476 -- Approval of special form Class 7 (Radioactive) materials [includes requirement for documentation of special form status]

Carriage by Public Highway, 49 CFR 177

49 CFR 177.817 -- Shipping paper [location of shipping papers during transport]

49 CFR 177.842 -- Class 7 (radioactive) material [includes requirement for blocking and bracing during transport]

Appendix E, “Standard Operating and Emergency Procedures” to this guide provides a sample shipping paper for a typical portable gauge.

In response to Item 10.6, state that you have access to current copies of applicable DOT regulations and will develop and implement procedures for complying with applicable DOT regulations.

10.7 Operating and Emergency Procedures

The Department requires that all portable gauge licensees submit operating and emergency procedures to the Department for review. You should:

1. Commit to having and implementing operating and emergency procedures, as described in correspondence with the Department,

2. Commit to providing a copy of your operating and emergency procedures to all users of gauging devices before they begin using the gauges,

3. Commit to having a copy of your operating and emergency procedures at each job-site; and

4. Submit a copy of your operating and emergency procedures. Your procedures should include the requirements and prohibitions outlined in this guide in Appendix E, "Standard Operating and Emergency Procedures," but yours can be more detailed than those in Appendix E to accommodate your particular situation.

In addition, if the sealed source is to be lowered into the ground more than 3 feet, you should have (1) special procedures to minimize the possibility of the source being stuck or lost "down hole" because of collapse of dirt or concrete around the source, including procedures that require the use of piping, tubing, or other casing material to line the hole from the lowest depth to 12 inches above the surface, (2) emergency procedures to recover a "stuck" source, and (3) notification procedures to the Department when it becomes apparent that recovery efforts will be unsuccessful.

10.8 Annual Audit of Radiation Protection Program

Georgia's Rule .03(4) requires each licensee to:

- Develop, document, and implement a Radiation Protection Program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the regulations;
- Use procedures and engineering controls to achieve occupational doses and doses to members of the public that are ALARA; and
- Review, at least annually, the content and implementation of their radiation programs. Licensees are also required by Rule .03(14) to maintain records of their Radiation Protection Program.

You should submit:

- The name and radiation safety qualifications of the individual who will conduct audits,
- A description of the scope and extent of the audits,

- A commitment to conduct audits at intervals not to exceed 12 months and to maintain records of the audits for at least three years after the record is made,
- Management's commitment to review the documented results of the audit promptly after the audit's completion; and
- A commitment to take prompt action to correct deficiencies identified during audits and to inform all personnel (including those at other locations and those working under other licenses) of the deficiencies and the actions management expects its personnel to take to avoid similar deficiencies.

As noted in Appendix C, the RSO needs to ensure that annual audits are conducted, but does not necessarily need to conduct the audits himself. In fact, if the RSO is one of the authorized gauge users, it may be beneficial for a qualified individual (e.g., radiation safety consultant, the corporate radiation safety officer) who is not associated with day-to-day operations to conduct the audit. An example of an audit program is provided in Appendix G to this guide.

The audit should be sufficiently detailed to ensure that:

- The licensee is abiding by Department and DOT regulations and the terms and conditions of the license (e.g., periodic leak tests and inventories, only trained and approved individuals use gauges independently),
- The content and implementation of the licensee's radiation protection program achieve occupational doses and doses to members of the public that are ALARA; and
- The licensee maintains all appropriate records with all appropriate information (e.g., records of personnel exposure, leak tests, inventory, training of gauge users) sufficient to comply with Department requirements. Appendix G describes an audit program that is acceptable to the Department.

These audits may be conducted as "mini-inspections" similar to those conducted by the Department and may include observation of some or all of the licensee's authorized users during actual or simulated use of portable gauges. Department inspections have identified some common violations among portable gauge licensees, such as: failure to perform leak-tests or conduct inventories at the required frequency, failure to transport gauges in compliance with DOT regulations, unauthorized personnel using gauges independently, possession and use of sealed source or device combinations other than those specified on the license, and an unauthorized individual as RSO.

The results of the audit, identification of deficient areas, and recommendations for change should be documented and provided to licensee management who, in turn, needs to take prompt action to correct any deficiencies noted by the auditor. If the licensee conducts licensed activities under other licenses or at locations other than the one audited, its personnel (at the other locations or working under the other licenses) should be informed of the deficiencies noted during audits and of the actions management expects all personnel to take to avoid similar deficiencies.

10.9 Financial Assurance and Record keeping for Decommissioning

Pursuant to Rule .02(8)(g), certain licensees must provide financial assurance certification for decommissioning, or submit a decommissioning funding plan, and must maintain records important to decommissioning. The requirements for financial assurance are keyed to the types and quantities of radioactive material authorized on a license.

In order to avoid Financial Assurance Certification, the licensee may specify a maximum number of gauges they might possess, so that the licensee does not have to provide financial assurance mechanism. Please read .02(8)(g) for more details.

Item 11. Waste Management

Because of the nature of the licensed material contained in devices, your only option for disposal is to transfer the material to an authorized recipient. Authorized recipients are the original supplier of the device, a commercial firm licensed by the Department, NRC, or an Agreement State to accept radioactive waste from other persons, or another specific licensee authorized to possess the licensed material (i.e., whose license specifically authorizes the source and gauge by manufacturers' names and model numbers or similar designation). No one else is authorized to receive and dispose of licensed material.

Before transferring radioactive material, you must verify that the recipient is properly authorized to receive it by using one of the methods described in Rule .02(19)(d). In addition, you must package and ship the material in accordance with the Department and DOT regulations (see Item 10.6 above for regulatory references), and you must maintain records of the transfer as required by Rule .06(18). In response to Item 11, it is acceptable to state "disposal will be by transfer of the radioactive material to a person who is specifically licensed to receive and possess it."

Item 12. License Fees

The applicant should refer to the DNR Radioactive Materials License Fee Schedule (Appendix B) to determine the appropriate licensing fee and category. Note that, in addition to the application fee, licensees are required to pay annual fees and amendment fees. No action will be taken on applications filed without the proper fee. Checks for the fees should be made payable to the **Department of Natural Resources, Radioactive Materials Program**, and mailed to the following address:

Radioactive Materials Fees
P.O. Box 101161
Atlanta, Georgia 30392

Mail license applications, amendment, renewal requests, and terminations of license to the following address:

Radioactive Materials Program
4220 International Parkway
Atlanta TradePort, Suite 100
Atlanta, GA. 30354

Item 13. Certification

If you are an individual applicant acting in a private capacity, you must sign the completed application form. Otherwise, the application should be dated and signed by a representative of the applying corporation or legal entity. The representative must be authorized to make binding commitments and to sign official documents on behalf of the applicant and must certify that the application contains information that is true and correct to the best of the signer's knowledge and belief. Unsigned applications will not be reviewed and will be returned for proper signature.

IV. AMENDMENTS TO A LICENSE

After you are issued a license, you must conduct your program in accordance with (1) the statements, representations, and procedures contained in your application and correspondence with the Department, (2) the terms and conditions of the license, and (3) the Department's regulations.

It is your obligation to keep your license current. You should anticipate the need for a license amendment insofar as possible. If any of the information provided in your application or other correspondence is to be modified or changed, you should submit an application for an amendment. In the meantime, you must comply with the terms and conditions of your license until it is actually amended; Department regulations do not allow you to implement changes on the basis of a submission requesting an amendment to your license.

An application for a license amendment may be prepared either on the application form, Appendix A, or in a letter, and should be prepared in duplicate. Retain one copy. The license requires that you possess and use licensed material in accordance with the statements and representations in your amendment request and in any supplements to it.

Your application should state your license number and clearly describe the exact nature of the changes, additions, or deletions. References to previously submitted information and documents should be clear and specific and identify the pertinent information by date, page, and paragraph. For example, if you wish to change the RSO, your application for a license amendment should specify the proposed RSO's name, and include documentation of the individual's training and experience.

The appropriate fee for a license amendment should be sent to the address listed in Item 12 for Radioactive Materials Fees. A copy of the check should be included with the amendment request and sent to the Radioactive Materials Program address as listed in Item 12. The Department will not issue the amendment prior to receipt of the proper fee

as specified in the Fee Schedule, Appendix B.

Note: Nothing in your radioactive materials license, this guide, or Department regulations relieves you from complying with other applicable Federal and State requirements.

V. RENEWAL OF A LICENSE

Licenses are issued for a period of up to five years. In accordance with Rule .02(15), thirty (30) days prior to the expiration of your license, send an application for renewal to the address specified in Item 12 of this guide. Retain a copy. The license requires that you possess and use licensed material in accordance with the statements and representations in your renewal request and in any supplements to it.

You may submit an entirely new application for renewal as if it were an application for a new license without referring to previously submitted information. This is the preferred method of renewing a license, especially for those whose licenses reference a large number of documents or old documents. Submitting an entirely new application allows you to reevaluate your program periodically and consolidate the description of your program into one or two current documents. A new application ensures that your program contains all needed information as requested in current licensing guidance. As an alternative to a new application, you may:

1. Review your current license to determine whether the information about sealed sources and portable gauging devices accurately represents your current and anticipated program. Identify any necessary additions, deletions, or other changes and then prepare information appropriate for the required additions or changes.

2. Review the documents submitted to the Department in the past to determine whether the information is up to date and accurately represents your facilities, equipment, personnel, radiation safety procedures, locations of use, etc. The documents considered to represent your current program must be identified by date. Also identify any out-of-date and superseded documents and indicate the changes in them that are necessary to reflect your current program. Documents referenced in your license should not be older than 5 years unless all the information in the document accurately represents your current program. If you need to update information in documents 5 years old or older, you should submit a new application.

3. Review current Department regulations to ensure that any changes in the regulations are appropriately covered in your program description.

4. After you have completed your review in accordance with items 1, 2, and 3 above, submit a letter and attachments to the Department requesting renewal of your license. Retain a copy for your records.

5. Include the name and telephone number of the person to be contact about your renewal application and include a current mailing address if it is not indicated correctly on your license.

In accordance with Rule .02(15), you should file your application for license renewal at least 30 days before the expiration date of your license and include the appropriate fee for license renewal; your present license will automatically remain in effect until the Department takes final action on your renewal application. However, if you file an application less than 30 days before the expiration date and the Department cannot process it before that date, you will be without a valid license when your license expires.

If you do not wish to renew your license, see section VI. Termination of a License.

If you cannot dispose of all the licensed radioactive material in your possession before the expiration date, you must request a license renewal. The renewal is necessary to avoid violating the Department's regulations that do not allow possession of licensed material without a valid license.

VI. TERMINATION OF A LICENSE

You may request termination of your license at any time. This request should include a completed Department's form, "Request to Terminate Radioactive Materials License" (see Appendix H), with appropriate documentation certifying that all sources have been disposed of in accordance with Rule .02(19). An application for license termination does not relieve the licensee from its obligations to comply with Department's regulations and the terms and conditions of the license.

Documentation must be provided that shows the disposition of the sources prior to termination being granted. Documentation generally consists of a letter of receipt from the licensee who has received the material from your license whether it is for disposal or transfer to another authorized user.

Georgia Department of Natural Resources
Environmental Protection Division
Radioactive Materials Program
APPLICATION FOR RADIOACTIVE MATERIALS LICENSE

INSTRUCTIONS - Complete Items 1 through 13 if this is an initial application or renewal of a license. Use supplemental sheets where necessary. Item 13 on the application must be completed and signed. Retain one copy for your records. Submit original application to: Georgia Department of Natural Resources, Radioactive Materials Program, 4220 International Parkway, Suite 100, Atlanta, Georgia, 30354. Upon approval of this application, the applicant will receive a Georgia Radioactive Materials License. Georgia Radioactive Materials Licenses are issued in accordance with the general requirements contained in the Georgia Department of Natural Resources Rules and Regulations, Chapter 391-3-17. **The Department can be reached via e-mail. The address is rad_materials@dnr.state.ga.us.**

1.This is an Application for: (Check appropriate item) A.__ New License B. __ Amendment to License C. __ Renewal of License
If B or C , Please indicate GA. License Number __ _____

2.a. Name and Mailing Address of Applicant	2.b.Address where licensed material will be stored and/or used (Street Address)
Name: Address: City, State, Zip Code: County: Telephone Number ( ) _____ -_____ Internet Address:	A. Permanent B. Coordinates 1. Latitude: 2. Longitude: C. Temporary sites throughout Georgia? Yes _____ No_____
3. Person to Contact Regarding this Application Name: Title: Telephone Number ( ) _____ - _____ Radiation Safety Officer: Telephone Number( ) _____ - _____	4. Locations where records will be kept:

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL a. Element and mass number, b. Chemical and/or physical form; and c.. maximum amount, which will be possessed at any one time.	6.PURPOSE (S) FOR WHICH LICENSED MATERIAL WILL BE USED
7. INDIVIDUAL(S) RESONSIBLE FOR RADIATION PROTECTION PROGRAM AND THEIR TRAINING & EXPERIENCE	8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS
9. FACILITIES AND EQUIPMENT	10. RADIATION PROTECTION PROGRAM
11. WASTE MANAGEMENT	12. LICENSEE FEES (SEE DEPARTMENT'S FEE SCHEDULE) FEE CATEGORY : AMOUNT ENCLOSED $ CHECK MAILED _____ PLEASE INVOICE_____
MAKE CHECKS PAYABLE TO: DEPARTMENT OF NATURAL RESOURCES RADIOACTIVE MATERIALS PROGRAM	**MAIL FEES TO: RADIOACTIVE MATERIALS PROGRAM, P.O. BOX 101161 ATLANTA, GEORGIA 30392**

13. CERTIFICATION (Must be completed by the applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH GEORGIA DEPARTMENT OF NATURAL RESOURCES RULES AND REGULATIONS, DESIGNATED CHAPTER 391-3-17 AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

CERTIFYING OFFICER -- TYPED PRINTED NAME AND TITLE	SIGNATURE	DATE

Appendix B
Fee Schedule
Fee Category C.11

				Annual Fee		
License category	**Non-routine inspection fee**	**Application**	**Amendment**	**Nominal**	**Small Entity**	**Lower Tier**
Portable Moisture Density Gauges, Lead Paint Analyzer	$1200.00	$500.00	$380.00	$1000.00	$1000.00	$635.00

APPENDIX C
DUTIES AND RESPONSIBILITIES OF THE RADIATION SAFETY OFFICER

The Radiation Safety Officer (RSO) is responsible for implementing the radiation protection program and ensuring that radiation safety activities are performed in accordance with approved procedures and regulatory requirements.

The RSO's duties and responsibilities include:

1. Ensuring the licensed material possessed by the licensee is limited to the kinds (e.g., Cesium-137 as a sealed source) and quantities of byproduct material listed on the license.

2. Ensuring the devices are used only by individuals authorized by the license.

3. Ensuring the individuals using gauges are: properly trained; are designated by the RSO; receive refresher training at least annually, including participation in a "dry run" of emergency procedures and review of operating and emergency procedures, Federal Department of Transportation (DOT), and Georgia Department of Motor Vehicle Safety requirements; and are informed of all changes in regulatory requirements and deficiencies identified during annual audits.

4. Ensuring the personnel monitoring devices are used as required and the reports of personnel exposure are reviewed in a timely manner and to alert the radiation worker in the event of a high or unusual exposure, to notify the Radioactive Materials Program as required of the high or unusual exposure, and to investigate all such unusual exposures and take any necessary corrective action to prevent these incidents from occurring again.

5. Ensuring the gauges are properly secured against unauthorized removal at all times when gauges are not in use.

6. Ensuring that proper authorities are notified in case of accident, damage to gauges, fire, or theft.

7. Ensuring the audits are performed at least annually to ensure that (a) the licensee is abiding by Department regulations and the terms and conditions of the license (e.g., periodic leak tests, inventories, use is limited to trained, approved users); (b) the licensee's radiation protection program content and implementation achieve occupational doses and doses to members of the public that are ALARA; and (c) the licensee maintains required records with all required information (e.g., records of personnel exposure; receipt, transfer, and disposal of licensed material; gauge user training) sufficient to comply with Department requirements.

8. Ensuring the results of audits, identification of deficiencies, and recommendations for change are documented (and maintained for the next Departmental inspection) and

provided to management for review; ensure that prompt action is taken to correct deficiencies.

9. Ensuring that all incidents, accidents, and personnel exposure to radiation in excess of Rule .03(5)(a) are investigated and reported to the Department and other authorities, as appropriate, within the required time limits as required in Rule .03(15).

10. Ensuring the licensed material is transported in accordance with all applicable Federal DOT and Georgia Department of Motor Vehicles (DMV) safety requirements.

11 Ensuring the licensed material is disposed of properly.

12. Ensuring up-to-date copies of Department regulations, reviews new or amended Department regulations, and revises licensee procedures, as needed, to comply with Department regulations.

13. Ensuring the license is amended whenever there are changes in licensed activities, responsible individuals, or information or commitments provided to the Department in the licensing process.

APPENDIX D
CRITERIA FOR TRAINING COURSES AND INSTRUCTOR QUALIFICATIONS

Part I: Criteria for Acceptable Training Courses for Portable Gauge Users

Courses last at least 8 hours

Course provides instruction in the following topics (the hours next to each topic are suggestions):

1. Radiation Physics (0.5 hour)
   - Atomic and Subatomic Structure
   - Radioactivity and Types of Radiation
   - Sources of Radioactivity
   - Isotopes and Periodic Table
   - Units of Radiation Measurement and Half-Life

2. Radiation Safety (1.0 hour)
   - Biological Effects of Radiation
   - Occupational Dose Limits
   - ALARA
   - Methods To Reduce Dose
   - Personnel Monitoring

3. Regulatory Requirements (1.5 hours) of Licensing
   - Storage of Licensed Material
   - Constant Control and Surveillance of Radioactive Material Not in storage
   - Personnel Monitoring
   - Leak-Testing
   - Inventory
   - Maintenance
   - Operating and Emergency Procedures
   - Audits
   - Record keeping
   - Reciprocity
   - Disposal

4. Transportation (0.5 hour)
   - Requirements in 10 CFR 71.5 and 49 CFR
   - Transportation of Licensed Material in Vehicles
   - Shipping by Common Carrier
   - Letter of Intent

5. Gauge Theory, 0peration and Field Training (3.5) hour

6. Written Test and Test Review (0.5) hour

Successful completion of the course requires obtaining a score of at least 70 percent on a closed-book test consisting of at least 50 questions that have not been provided to the students before the test.

Course instructors meet the qualifications outlined in Part II.

Part II: Criteria for Qualifications for Instructors of Portable Gauge Users

Each instructor who trains individuals as portable gauge users:

- Bachelor's degree in a physical or life science or engineering,
- Successful completion of a portable gauge user course that meets the criteria in Part I above,
- Successful completion of an 8 hour radiation safety course; and
- 8 hours hands-on experience with portable gauges

OR

- Successful completion of portable gauge user course that meets the criteria in Part I above,
- Successful completion of 40 hour radiation safety course; and
- 30 hours of hands-on experience with portable gauges.

If training courses or qualifications of instructors do not meet the criteria in this Appendix, an applicant may submit to the Department the information requested in Item 8.2 of this regulatory guide. The applicant's proposal will be considered on a case-by case basis.

ATTACHMENT 1

TRAINING TOPICS FOR MOISTURE-DENSITY GAUGE USERS

Radiological emergency response procedures for a damaged moisture density gauge

Loss prevention, security, surveillance, and storage

Physical inventory, accountability

Notification of the Department regarding damaged devices and sources

Proper transfer/disposal of gauges to the manufacturer (to avoid inadvertent transfer of a gauge to a scrap-metal broker and a possible foundry contamination incident)

Transportation requirements for shipping papers, labels, markings, certification of packaging, and blocking and bracing

Radiation safety instruction for gauge users

Portable gauge accident scenarios, to avoid incidents and accidents with portable gauges

Proper use of personnel monitoring devices

The terms and conditions of the license and the occasions when it is appropriate to amend the license

APPENDIX E
STANDARD OPERATING AND EMERGENCY PROCEDURES

Operating Procedures

1. Before removing the gauge from its place of storage, check to make sure that the gauge source rod is in the shielded, locked position, then lock the transport case if possible.

2. Sign the gauge out in a utilization log, stating the dates of use, names of the authorized users who will be responsible for the gauge, and the temporary job sites where the gauge will be used.

3. Never leave the gauge unattended while in your custody.

4. Follow all applicable Federal DOT and Georgia DMV Safety requirements when transporting the gauge.

5. Do not touch the source rod with your fingers, hands, or any part of your body, and always make sure the source rod is in the shielded position after each measurement is made.

6. Always wear your assigned TLD, OSD, or film badge when using the gauge.

7. Never wear another person's TLD, OSD, or film badge.

8. Never store your TLD, OSD, or film badge near the gauge.

9. Always keep unauthorized persons away from the area where the gauge is to be used.

10. Always maintain constant surveillance and immediate control of the gauge when it is not in storage.

11. To make gauges more visible to operators of heavy equipment at construction sites, always "stake and flag" each gauge, being sure that the flags are tall enough to be seen by heavy equipment operators.

12. Never look under the gauge when the source rod is being lowered into the ground.

13. After each measurement, always return the source to the shielded position and lock it there.

14. When the gauge is not in use at a temporary job-site, place the gauge in a secured storage location using two independent physical controls.

15. Return the gauge to its proper storage location at the end of the work shift and secure the gauge using two independent physical controls.

16. When the gauge is returned to storage, so indicate in the utilization log.

EMERGENCY PROCEDURES

If the source fails to return to the shielded position (e.g., as a result of being damaged) or if any other emergency or unusual situation arises (e.g., the gauge is struck by a moving vehicle, is dropped, or is in a vehicle involved in an accident):

1. Immediately secure the area around the gauge.

2. Prevent unauthorized personnel from entering the secured area.

3. If any heavy equipment is involved, detain the equipment until it is determined there is no contamination present.

4. Notify licensee management of the situation, by having someone call company personnel in the order listed below. (Never leave the gauge unattended)

   NAME* WORK PHONE NUMBER* HOME PHONE NUMBER*
   1_____
   2_____
   3_____
   * List (and update, as needed) the names and telephone numbers of the RSO or other knowledgeable licensee staff to be contacted in case of emergency.

5. Follow the directions provided by the person contacted in step 4.

6. LICENSEE MANAGEMENT MUST:
   - Arrange for a survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. (This person could be a licensee employee using a survey meter located at the job-site or a consultant.)

   - Make necessary notifications to local authorities; notify the Department, as required. (Even if not required to do so, you may report ANY incident to the Department by calling the Department's Emergency Number at (404) 656-4863, which is staffed 24 hours a day, outside the Atlanta area use 1-800-241-4113. Department notification is required when gauges containing licensed material are lost or stolen, and when gauges are damaged or involved in incidents that result in doses in excess of the dose limits by Rule .03(15)(b).

   - Consider the timeliness of reports to the Department.

   - Review the reporting requirements, which are found in Rule .03(15)(a).

TRANSPORTATION INFORMATION

This part describes Shipping Paper information that MUST accompany the radioactive source during any transportation.

SHIPPER'S NAME: _____

ADDRESS: _____

PHONE NUMBER: _____

DEVICE: _____ MODEL: _____

ISOTOPE(S): _____

CHEMICAL AND PHYSICAL FORM: _____

ACTIVITY: _____

LABELING: _____

Proper Shipping Name: RADIOACTIVE MATERIAL, SPECIAL FORM, TYPE A PACKAGE, NON FISSILE
Hazard Class: Radioactive Material
Identification Number: UN3332

YELLOW II _____ YELLOW III* _____ TRANSPORT INDEX: _____

*PLACARDS REQUIRED in accordance with 49 CFR.

EMERGENCY NUMBERS: _____

OWNER OF DEVICE: _____

LOCAL LAW ENFORCEMENT: _____

This is to certify that the above-named materials are properly classified, described, packaged, marked, and is in proper condition for transportation according to the applicable regulations of the U.S. Department of Transportation.

GEORGIA EMERGENCY RADIOLOGICAL ASSISTANCE

BUSINESS HOURS: (404) 362-2675

24 HOUR ASSISTANCE: (404) 656-4863

OUTSIDE ATLANTA AREA: 1-800-241-4113

SIGNED: _____ TITLE: _____
DATE: _____

APPENDIX F
EXTENDED MAINTENANCE

If you are considering performing maintenance or cleaning of gauges that requires the removal of the radioactive source from the shielded position or removal of the source rod from the device (i.e., extended maintenance), you should keep in mind the radiation levels you may encounter. A typical moisture density gauge contains 10 millicuries (0.37 gigabecquerels) of cesium-137 and 40 millicuries (1.5 gigabecquerels) of americium-241. In about 9 minutes, an unshielded cesium-137 source of this activity can deliver 5 rems (0.05 sievert) to a worker's hands or fingers (extremities), assuming the extremities are 1 centimeter from the source. The threshold for extremity monitoring is 5 rems (0.05 sievert) per year.

Thus, to perform extended maintenance, you must have special training, follow special procedures, use a radiation survey meter, use special shields, use special personnel monitoring devices, and take appropriate radiation safety precautions. Accordingly, provide the following information:

1. Type of Work to be Performed

   Describe the types of work, maintenance, or cleaning that you wish to perform that necessitate removal of the radioactive source from the shielded position or the removal of the source rod from the device. Correlate with the specific manufacturer's name and model number of the gauges on which you will perform extended maintenance.

2. Training and Experience

   List the individuals who will perform extended maintenance and describe their training and experience in performing extended maintenance. Individuals are considered on a case-by-case basis. For each individual proposed to perform extended maintenance, list all radiation safety courses the individual has taken; the amount of hands-on experience the individual has involving extended maintenance, including a correlation of manufacturer's name and model number of the gauge with the type and frequency of extended maintenance performed; and the reason you consider the individual competent to perform extended maintenance safely.

3. Handling Procedures

   Submit your procedures for safe handling of the radioactive source while the source is outside the gauge. Your procedures should require the following:

   - The source rod will be handled only at the opposite end of the source,
   - The source end will immediately be placed in a shielded container (e.g., lead shield),
   - Unauthorized individuals will not be allowed into the areas where extended

maintenance is performed, and where the source rod is located,

- Containers shielding the source will be labeled "Caution Radioactive Material",
- The source will be under the constant surveillance of an authorized user when not in storage, and will be secured against unauthorized removal or access when in storage; and
- The manufacturer's instructions and recommendations for performing extended maintenance will be followed.

4. Personnel Monitoring

Describe how you will ensure that radiation exposure to individuals performing extended maintenance will not exceed Rule .03(5)(a) limits. An acceptable response is that individuals performing extended maintenance on gauges will always wear both whole body and extremity monitoring devices.

5. Survey Instrumentation

If you have already provided detailed information on survey instruments in response to Item 10.2, state, "See response to Item 10.2." Otherwise, list the type and ranges of survey instruments you will have available, state the frequency of calibration, and state who will perform the calibration. Also include how you will ensure that the survey instrument is working properly.

For example, you may state that a survey instrument capable of measuring between 0.1 millirem per hour (1 microsievert per hour) and 100 millirems per hour (1 millisievert per hour) will be used to perform the surveys and that the survey instrument will be calibrated annually by the manufacturer. In addition, you may state that, before each use of the instrument, you will check the response of the instrument with a dedicated check source that was supplied with the instrument. You should commit that, if the instrument does not respond properly, you will not perform extended maintenance on the gauges until the survey instrument is repaired and operable or until you obtain an operable instrument.

6. Surveys

Describe how you will ensure that radiation levels in areas where extended maintenance will take place do not exceed limits. For example, you may (1) commit to performing surveys with a survey instrument (as described above); (2) specify where and when surveys will be conducted during extended maintenance; and (3) commit to maintaining records of the survey (e.g., who performed the survey, date of the survey, instrument used, measured radiation levels correlated to location of those measurements), for three years from the date of the survey.

APPENDIX G
SAMPLE AUDIT PROGRAM

An audit is conducted, in part, to fulfill the requirements of Rule .03(4)(c) for an annual review of the content and implementation of the licensee's radiation protection program. It should also identify program weaknesses and allow licensees to take early corrective actions (before a Department inspection). During an audit, the auditor needs to keep in mind not only the requirements of Department regulations, but also the licensee's commitments in its applications and other correspondence with the Department. The auditor should also evaluate whether the licensee is maintaining exposures to workers and the general public as low as is reasonably achievable (ALARA), and if not, make suggestions for improvement.

The outline in this appendix can be used to document the annual audit of the radiation protection program. Guidance is provided on completing each section. Note any deficiencies that were identified and the corrective actions taken or to be taken.

1. Audit History. Enter the date of the last audit, whether any deficiencies were identified, and whether actions were taken to correct the deficiencies.

2. Organization and Scope of Program. Briefly describe the organizational structure, noting any changes in personnel. Describe the scope of licensed activities at the audited location. Check whether the RSO is the person identified in the license and fulfills the duties specified in the license.

3. Training, Retraining, and Instructions to Workers. Ensure that workers have received the training required by Rule .07(3). Be sure that, before being permitted to use a gauge, the user has received training (from the manufacturer or in an alternative course approved by the Department) and has a copy of, and training in, the licensee's operating and emergency procedures; records should be maintained. Note whether refresher training is conducted in accordance with licensee commitments. By interview and observation of selected workers, ensure that each has a copy of the licensee's operating and emergency procedures and can implement them properly.

4. Internal Audits. Verify that audits fulfill the requirements of record keeping requirements as outlined in Rule .03(14), are conducted in accordance with licensee commitments, and are properly documented.

5. Facilities. Verify that the licensee's facilities are as described in its license documents.

6. Materials. Verify that the license authorizes the sealed source/ device combinations that the licensee possesses. Verify that the licensee uses the source/device combinations in accordance with license provisions. Ensure that gauges are maintained in accordance with licensee commitments.

7. Leak-Tests. Verify that all sealed sources are tested for leakage at the prescribed frequency and in accordance with licensee commitments. Records of results should be maintained.

8. Inventories. Verify that inventories are conducted at least once every 6 months to account for all sealed sources; inventory records should be maintained.

9. Radiation Surveys. Verify that the licensee has at least one operable, calibrated survey instrument at each job-site and that the instruments are calibrated in accordance with licensee's commitments; calibration records must be retained for three years after the record is made. Alternatively, evaluate the licensee's arrangements for timely access to survey instruments in case of an incident. Check that radiation levels in the vicinity of use of the gauge and immediately outside areas used for gauge storage are within regulatory limits. Records of surveys must be retained for three years after the record is made.

10. Receipt and Transfer of Radioactive Material (Includes Waste Disposal). Verify that gauges received from others (e.g., new gauges) are received, opened, and surveyed in accordance with Rule .02(19). Records of surveys, receipt, and transfer must be maintained in accordance with Rule .03(14)(i).

11. Transportation. Determine compliance with DOT requirements. Verify that hazardous material training is conducted as required by 49 CFR 172.702-704. Verify that radioactive packages are prepared, marked, and labeled in accordance with 49 CFR Parts 172 and 173 requirements. Be sure that the licensee has records of performance testing of its special form sources and DOT-7A packages. Verify that shipping papers are prepared, contain all needed information, and are readily accessible during transport (49 CFR 172.200-204 and 177.817). Check that packages are blocked and braced (49 CFR 177.842). Check for any needed placarding (49 CFR 172.504); if overpacks are used, verify that they are properly marked and labeled (49 CFR 173.25).

12. Personnel Radiation Protection. Evaluate the licensee's determination that unmonitored personnel are not likely to receive more than 10 percent of the allowable limits. Alternatively, if personnel dosimetry is provided and required, verify that it complies with Rule .03(5) and licensee commitments. Review personnel monitoring records; compare exposures of individuals doing similar work; determine reasons for significant differences in exposures. If any worker declared her pregnancy in writing, evaluate the licensee's compliance with Rule .03(5)(h). Check whether records are maintained as required by Rule .03(14)(g) and .03(14)(g)4. See the Department's guide, "Instruction Concerning Prenatal Exposure."

13. Auditor's Independent Measurements if Made. If the licensee performs extended maintenance, the auditor should make independent measurements and compare the results with those made or used by the licensee. If the licensee does not perform extended maintenance, the auditor may, if desired, make independent measurements.

14. Notification and Reports. Check on the licensee's compliance with the notification and reporting requirements in Rule .03(15). Ensure that the licensee is aware of the emergency telephone numbers for the Department.

15. Posting and Labeling. Check for compliance with the posting and labeling requirements of Rule .03(12)(b).

16. Record keeping for Decommissioning. Check to determine compliance with Rule .02(8)(g).

17. Bulletins and Information Notices. Check to determine whether the licensee is receiving bulletins, information notices and other Department correspondence. Check whether the licensee took appropriate action in response to Department's mailings.

18. Special License Conditions or Issues. Verify compliance with any special conditions on the licensee's license. If the licensee has any unusual aspect of its work with portable gauges, review and evaluate compliance with regulatory requirements. If the licensee conducts licensed activities at locations other than the one being audited, consider the deficiencies identified at the other locations and ensure that the corrective actions implemented in response to those deficiencies have in fact been implemented at the audited locations.

19. Problems or Deficiencies Noted. Recommendations. This section is self-explanatory.

20. Evaluation of Other Factors. Evaluate management's involvement with the radiation protection program, whether the RSO has sufficient time to perform his/her duties, and whether the licensee has sufficient staff to handle the workload and maintain compliance with regulatory requirements.

APPENDIX H
GEORGIA DEPARTMENT OF NATURAL RESOURCES
RADIOACTIVE MATERIALS PROGRAM
REQUEST TO TERMINATE RADIOACTIVE MATERIAL LICENSE

1. Licensee Name _____ 2. License Number_____

3. Address _____
No. Street/ P. O. Box No. City State Zip code

4. Contact Person_____ 5. Telephone Number _____

6. Request is hereby made that the Radioactive Material License described above be terminated for the following reason:
_____
_____

7. Radioactive Material possessed under this license has been disposed of as indicated below:

__ No materials have been possessed or procured by the licensee under this licensee.

__ All material was used for the licensed purposes; none remains.

__ All material was leased, and has been returned to lessor.

Name of lessor: _____ License No _____

__ Lessor acknowledgement of receipt attached.

__ Material has been transferred to the following licensee:

Licensee Name _____ License No._____

Address _____
No. Street/ P. O. Box No. City State Zip code

Date of transfer: _____

__ Transferee acknowledgement of receipt attached.

__ Material has been disposed of in the following manner:
_____
_____

A radiation survey was conducted to confirm the absence of radioactive material and to determine whether any contamination remains at the facility covered by the license.

__ Copy of survey results attached.

8. Management Official or Radiation Safety Officer

_____ _____
Signature of certifying officer Date

_____ _____
Print name Title

Keep one copy for your records and send original to: GEORGIA DEPARTMENT OF NATURAL RESOURCES
RADIOACTIVE MATERIALS PROGRAM
4220 INTERNATIONAL PARKWAY, SUITE 100
ATLANTA, GEORGIA 30354

APPENDIX I
GUIDANCE FOR X-RAY FLUORESCENCE ANALYZER (XRF) USE ONLY

This Appendix to the Licensing Guide for Portable Gauges is provided to assist users of x-ray fluorescence (XRF) analyzers to prepare a license application. These devices are used to sample a variety of material.

Some XRF units are authorized for use as either a Generally Licensed device (verified through the Sealed Source and Device Registry with the Nuclear Regulatory Commission) or as a Specifically Licensed Device. The manner of use of the XRF device will determine the classification. If the device will be transported off-site to temporary locations of use then the device must be Specifically Licensed. This device must be identified on a license issued by the State of Georgia.

A device that will be used only at your facility (fixed-site) can be considered as Generally Licensed. The General License is a section of the Regulations (equivalent to Rule .02(6)(c)) that is provided to the customer by the device distributor and it describes the activities that the customer can and cannot perform.

Contents of an Application

(Refer to Section III of the Licensing Guide)

Items 1-6. Please respond to as stated in Licensing Guide.

Item 7. Individual Responsible For Radiation Safety Program And Their Training and Experience

State the name of the person designated by, and responsible to, the applicant's management as Radiation Safety Officer (RSO). This individual who maintains the license and associated records is responsible for the management and coordination of the Radiation Protection Program. In most instances, this individual is the contact person for the applicant in answering any questions or concerns about the license.

The RSO should have a high school diploma or a general equivalency diploma (GED) as well as the training you will require of the users as described in your response to Item 8. below.

Provide a copy of an organizational chart that shows the organizational structure as it relates to the RSO position to demonstrate that the RSO has sufficient independence and direct communication with responsible management officials. The chart should also show the position of the individual who signs the application in Item 13. of the Application Form.

Item 8. Training Provided To Other Users

If you do not propose to perform any maintenance or repair on the x-ray fluorescence analyzer, no specific training and experience in the use and handling of radioactive material is necessary for individuals who will use it or supervise its use. The only training required would be in the proper handling of the XRF unit.

Item 9.Facitities and Equipment

Please respond to as stated in Licensing Guide, with the following exception. XRF analyers are not required to have the minimum of two independent physical controls to secure the gauges while in transport. Describe how the devices will be secured while located in transport vehicles. For example, the device will be locked in the trunk of a car, hidden from view while in a locked van, or secured by a lock and chain while in an open bed truck.

Item 10.1. Personnel Monitoring Program

Users of these devices exhibiting low radiation levels at the surface of the device are not usually required to wear personnel monitoring devices. However, if you intend to perform extended maintenance on the devices, refer to the Licensing Guide.

Items 10.2-10.5. Please respond to as stated in Licensing Guide.

Item 10.6. Transportation of Devices to Field Locations

The device must be fully secured within the transportation vehicle and away from the passenger compartment. Transportation activities must be carried out according to the requirements of Rule. 06 and 49 CFR, U.S. Department of Transportation Regulations. Proper shipping papers are required for each transport, which must be kept in the vehicle within the immediate reach of the driver.

Items 10.7-10.9. Not applicable

Item 11.-13. Please respond to as stated in Licensing Guide.

Appendix J

INCREASED CONTROLS
QUANTITIES OF CONCERN

The following table contains a list of radionuclides of quantities of concern, which will be subject to the increased controls requirements. If your licensed activity requires radioactive source(s) as a single or sources located together (collocated) that may meet or exceed the quantities listed in the table below, please contact the Department for further information and direction.

Radionuclide	Quantity of Concern[1] (TBq)	Quantity of Concern[2] (Ci)
Am-241	0.6	16
Am-241/Be	0.6	16
Cf-252	0.2	5.4
Cm-244	0.5	14
Co-60	0.3	8.1
Cs-137	1	27
Gd-153	10	270
Ir-192	0.8	22
Pm-147	400	11,000
Pu-238	0.6	16
Pu-239/Be	0.6	16
Se-75	2	54
Sr-90 (Y-90)	10	270
Tm-170	200	5,400
Yb-169	3	81
Combinations of radioactive materials listed above[3]	See Footnote Below[4]	

[1] The aggregate activity of multiple, collocated sources of the same radionuclide should be included when the total activity equals or exceeds the quantity of concern.

[2] The primary values used for compliance with this Order are TBq. The curie (Ci) values are rounded to two significant figures for informational purposes only.

[3] Radioactive materials are to be considered aggregated or collocated if breaching a common physical security barrier (e.g., a locked door at the entrance to a storage room) would allow access to the radioactive material or devices containing the radioactive material.

[4] If several radionuclides are aggregated, the sum of the ratios of the activity of each source, *i* of radionuclide, *n*, $\mathbf{A_{(i,n)}}$, to the quantity of concern for radionuclide *n*, $\mathbf{Q_{(n)}}$, listed for that radionuclide equals or exceeds one. [(aggregated source activity for radionuclide A) ÷ (quantity of concern for radionuclide A)] + [(aggregated source activity for radionuclide B) ÷ (quantity of concern for radionuclide B)] + etc..... ≥ 1

Use the following method to determine which sources of radioactive material require increased controls (ICs):

- Include any single source equal to or greater than the quantity of concern in Table 1

- Include multiple collocated sources of the same radionuclide when the combined quantity equals or exceeds the quantity of concern

- For combinations of radionuclides, include multiple collocated sources of different radionuclides when the aggregate quantities satisfy the following unity rule: [(amount of radionuclide A) ÷ (quantity of concern of radionuclide A)] + [(amount of radionuclide B) ÷ (quantity of concern of radionuclide B)] + etc.....≥ 1