



United States Department of the Interior *114582*

U.S. GEOLOGICAL SURVEY  
South Carolina Water Science Center  
720 Gracern Road, Suite 129  
Columbia, South Carolina 20210

February 1, 2007

*03034267*  
~~X~~

Sam Nunn Atlanta Federal Center  
U.S. Nuclear Regulatory Commission, Region II  
61 Forsyth Street, S.W. Suite 23T85  
Atlanta, GA 30303

License No. 39-25372-01  
Expiration date: 03/31/2007  
Program Code: 03620  
Docket No. 03-34267

Dear Sir or Ms:

Enclosed are two copies of NRC form 313 for the renewal of our license to use radioactive materials. If you have any questions or comments, please contact:

Francis H. Chapelle  
Hydrologist  
U.S. Geological Survey  
720 Gracern Road, Suite 129  
Columbia, SC 29210

pH: 803-750-6116  
email: [chapelle@usgs.gov](mailto:chapelle@usgs.gov)

Thank you for your consideration.

Sincerely,

Francis H. Chapelle  
Hydrologist

RECEIVED  
REGION I  
2007 FEB -5 AM 10: 15

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NRC/REGION I MATERIALS-002

(8-2000)  
10 CFR 30, 32, 33,  
34, 35, 36, 38, and 40

Estimated burden per response to comply with this mandatory collection request: 7.4 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0000), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

### APPLICATION FOR MATERIAL LICENSE

**INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.**

**APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:**

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY  
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

**ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:**

**IF YOU ARE LOCATED IN:**

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION  
NUCLEAR MATERIALS SAFETY BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19408-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

SAM NUUN ATLANTA FEDERAL CENTER  
U. S. NUCLEAR REGULATORY COMMISSION, REGION II  
61 FORSYTH STREET, S.W., SUITE 23185  
ATLANTA, GEORGIA 30303-8631

**IF YOU ARE LOCATED IN:**

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
801 WARRENVILLE RD.  
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TX 78011-8084

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PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

<p>1. THIS IS AN APPLICATION FOR (Check appropriate item)</p> <p><input type="checkbox"/> A. NEW LICENSE</p> <p><input type="checkbox"/> B. AMENDMENT TO LICENSE NUMBER</p> <p><input checked="" type="checkbox"/> C. RENEWAL OF LICENSE NUMBER <u>39-25372-01</u></p>	<p>2. NAME AND MAILING ADDRESS OF APPLICANT (include ZIP code)</p> <p><i>Francis H. Chapelle</i>  <i>U.S. Geological Survey</i>  <i>720 Gracem Rd, suite 129</i>  <i>Columbia, SC 29210</i></p>
<p>3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED</p> <p><i>U.S. Geological Survey</i>  <i>720 Gracem Rd, suite 129</i>  <i>Columbia, SC 29210</i></p>	<p>4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION</p> <p><i>Francis H. Chapelle</i></p> <p>TELEPHONE NUMBER <i>803-750-6116</i></p>

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

<p>5. RADIOACTIVE MATERIAL</p> <p>a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.</p>	<p>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</p>		
<p>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.</p>	<p>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</p>		
<p>9. FACILITIES AND EQUIPMENT.</p>	<p>10. RADIATION SAFETY PROGRAM.</p>		
<p>11. WASTE MANAGEMENT.</p>	<p>12. LICENSE FEES (See 10 CFR 170 and Section 170.31)</p> <table border="1"> <tr> <td>FEE CATEGORY</td> <td>AMOUNT ENCLOSED \$</td> </tr> </table>	FEE CATEGORY	AMOUNT ENCLOSED \$
FEE CATEGORY	AMOUNT ENCLOSED \$		

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 38, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

<p>CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE</p> <p><i>Francis H. Chapelle, Hydrologist</i></p>	<p>SIGNATURE</p> <p><i>Francis H. Chapelle</i></p>	<p>DATE</p>
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**FOR NRC USE ONLY**

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	

140049

## 5. Radioactive Material

a. Element and mass number.  $^{14}\text{C}$  Carbon

b. Chemical form                      c. Maximum amount possessed at any one time ( $\mu\text{Ci}$ )

UL TNT	223
UL 2,6 DNT	806
UL 2,4 DNT	95
1-Acetate	900
UL-Toluene	50
UL-Benzene	100
Formate	50
1,2-Vinyl chloride	916
1-Methyl tert butyl ether	193
UL Methyl tert butyl ether	435
UL trichloroethene	100
UL tert butyl alcohol	503
UL 1,4 Dichlorobenzene	22
Methane	400
UL Ethene	1000
UL Ethanol	18
UL RDX	729
Methyl-nitrosodimethyl amine (NDMA)	880
o-methyl tert amyl methyl ether (TAME)	1000
8-methyl caffeine	50
1-methyl caffeine	50
U-ring L nonylphenol	50
n-methyl nicotine	50
n-methyl cotinine	50
n-methyl erythromycin	50
4- estrone	50
4- estradiol	50
4- testosterone	<u>50</u>
	8.87 mCi

6. Purpose for which licensed material will be used.

These radiolabeled compounds are used in laboratory studies of biodegradation pathways. A typical experiment involves microcosm experiments in which a matrix (usually water or soil) is placed in a 20-ml vial and amended with a  $^{14}\text{C}$  labeled chemical and incubated over time. The fate of the  $^{14}\text{C}$  label is traced by radiometric

detection coupled to gas or liquid chromatography. These experiments are carried out by one investigator, Dr. Paul M. Bradley, Hydrologist, U.S. Geological Survey.

7. Individual responsible for radiation safety program and training.

Francis H. Chapelle, Hydrologist, U.S. Geological Survey

8. Training for individuals working in or frequenting restricted areas.

Only individuals with radiation safety training have access to the restricted laboratory where biodegradation studies with radiolabeled compounds are performed.

9. Facilities and equipment.

The laboratory is a 1,500 square-foot room to which access is limited to radiation-safety trained individuals by code-locked doors. The laboratory includes liquid and gas chromatographs equipped with radiation detectors. In addition, the laboratory is equipped with a scintillation counter and two geiger counter survey devices. Radiolabeled materials are handled inside a vented hood.

10. Radiation safety training program

Radiation safety training is provided to U.S. Geological Survey personnel by the University of South Carolina Radiation Safety Officer.

11. Waste Management

Laboratory wastes are disposed of according to procedures outlined by the Radiation Safety Manual, prepared by Ray-Safe Associates, Michael L. Terpilak, certified health physicist (American Board of Health Physics), for the U.S. Geological Survey. Liquid wastes are disposed of via the sanitary sewerage system with an annual limit of 1 Ci of  $^{14}\text{C}$ , or less than 2.74 mCi per day. Solid wastes are containerized in a 55-gallon steel drum for disposal by a licensed broker at a licensed disposal facility.

This is to acknowledge the receipt of your letter/application dated

2/1/2007, and to inform you that the initial processing which includes an administrative review has been performed.

- Relevant 39-25372-01 There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.
- Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number 140049.  
When calling to inquire about this action, please refer to this control number.  
You may call us on (610) 337-5398, or 337-5260.