

## MATERIALS LICENSE

Amendment No. 15

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

## Licensee

1. U. S. Department of the Interior  
Geological Survey2. National Center Stop 990  
Reston, Virginia 22092In accordance with application dated  
March 7, 19843. License number 45-15923-01 is amended in  
its entirety to read as follows:

4. Expiration date June 30, 1990

5. Docket or  
Reference No. 030-100346. Byproduct, source, and/or  
special nuclear material7. Chemical and/or physical  
form8. Maximum amount that licensee  
may possess at any one time  
under this license

A. Hydrogen 3

A. Titanium tritide foils  
and contaminated neutron  
generator equipment

A. 30 curies total

B. Hydrogen 3

B. Target in sealed tube

B. 1.5 curies total

C. Hydrogen 3

C. Gas adsorbed on getter  
and target of sealed  
tube

C. 5 curies total

D. Hydrogen 3

D. Gas and occlusion in  
target of sealed tubeD. Not to exceed 8  
curies per tube

E. Cobalt 60

E. Sealed sources

E. Not to exceed 16 micro-  
curies total

F. Cobalt 60

F. Any

F. 500 microcuries total

G. Nickel 63

G. Sealed or plated  
sourcesG. Not to exceed 15 milli-  
curies per sealed or  
plated source

H. Barium 133

H. Any

H. 500 microcuries total

I. Cesium 137

I. Sealed sources

H. Not to exceed 20 micro-  
curies total

J. Thulium 170

J. Sealed source  
(custom made)J. 1 source of 60 milli-  
curies

K. Protactinium 231

K. Any

K. 10 microcuries total

L. Neptunium 237

L. Any

L. 10 microcuries total

ML20  
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- |   |                                  |  |
|---|----------------------------------|--|
| 6. Byproduct, source, and/or special nuclear material | 7. Chemical and/or physical form | 8. Maximum amount that licensee may possess at any one time under this license   |
| M. Californium 252                                    | M. Sealed sources                | M. 1 source of 60 millicuries<br>1 source of 13 millicurie<br>1 source of 4 millicuries<br>1 source of 1 millicurie<br>2 sources of 0.6 millicuries each |
| N. Any byproduct material                             | N. Activated samples             | N. 530 millicuries total   |
| O. Americium 241                                      | O. Any                           | O. 500 microcuries total   |
| P. Americium 241                                      | P. Sealed sources (custom made)  | P. 2 sources not to exceed 40 millicuries total  |
| Q. Hydrogen 3   | Q. Any                           | Q. 2 millicuries total   |
| R. Carbon 14  | R. Any                           | R. 1 millicuries total   |
| S. Phosphorus 32                                      | S. Any                           | S. 1 millicurie total  |
| T. Phosphorus 33                                      | T. Any                           | T. 1 millicurie total  |
| U. Sulphur 35   | U. Any                           | U. 2 millicuries total   |

## 9. Authorized use

- A and B for storage only.  
C and D for use in laboratory and borehole analysis studies.  
E. For use in the testing, evaluation, and calibration of detectors.  
F. For use in laboratory tracer studies.  
G. For use in gas chromatographs for sample analysis.  
H. For use in laboratory tracer studies.  
I. For use in the testing, evaluation and calibration of detectors.  
J. For use in X-ray fluorescence studies.  
K and L for use in laboratory tracer studies  
M. For use in neutron activation and analysis studies.  
N. For possession incident to neutron activation and radioactive dating studies.  
O. For use in laboratory tracer studies.  
P. For use in X-ray fluorescence studies  
Q through U for use in laboratory tracer studies

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## CONDITIONS

10. Licensed material may be used at the licensee's Physics Building, Lot "O" off South Lakes Drive and the National Center 12201 Sunrise Valley Drive, Reston, Virginia, except the licensed material specified in Items 6.D and 6.M may also be used at temporary job sites of the licensee anywhere in the United States.
11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision of, Allan B. Tanner, Frank E. Senftle, Jon L. Mikesell, Danny W. Dotson, Philip A. Baedecker, John W. Morgan, Curtis A. Palmer, Louis J. Schwarz, Gregory A. Wandless, John F. Sutter, Michael J. Kunk, or David J. Shultz except the licensed material specified in Items 6.Q through 6.U may also be used by or under the supervision of Derek R. Lovley or Ronald R. Cohen.
13. The Radiation Protection Officer for the activities authorized by this license is Allan B. Tanner.
14. A.
  - (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
  - (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
  - (3) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

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- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the U.S. Nuclear Regulatory Commission, Region II, Division of Radiation Safety and Safeguards, Nuclear Materials Safety Section, 101 Marietta Street, Suite 2900, Atlanta, Georgia 30323, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
15. Sealed sources containing licensed material shall not be opened.
16. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(A)(1), Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
17. A. Each chromatograph detector containing Nickel 63 shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a detector received from another person shall not be put into use until tested.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the surfaces of the device in which the foil is mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the foil from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the U.S. Nuclear Regulatory Commission, Region II, Division of Radiation Safety and Safeguards, Nuclear Material Safety Section, 101 Marietta Street, Suite 2900, Atlanta, Georgia 30323, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.



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18. The licensee shall conduct a physical inventory every six (6) months to account for all foils, sealed sources, plated sources, and generator tubes received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of licensed material, location of the foils, sealed sources, plated sources and generator tubes and the date of the inventory.
19. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."
20. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in letter dated October 7, 1980, application dated March 7, 1984; and letter dated April 18, 1985. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

PAUL R. GUINN

Date JUN 11 1985

By

Region II, Nuclear Materials  
Safety Section  
101 Marietta Street, Suite 2900  
Atlanta, GA 30323