

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.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA,
NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH,
OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON,
AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS
TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

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 JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

☐ A. NEW LICENSE

☐ B. AMENDMENT TO LICENSE NUMBER

☒ C. RENEWAL OF LICENSE NUMBER 12-16249-01

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Morton Arboretum
Route 53
Lisle, IL 60532

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Same as 2.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Patrick D. Kelsey

TELEPHONE NUMBER

(312) 968-0074

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.

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) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR
TRAINING AND EXPERIENCE.**

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY 3.E. AMOUNT
ENCLOSED \$ 170.00

8508090716 850723
REG3 LIC30
12-16249-01 PDR

UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE

MADE ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION 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.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

George H. Ware

George H. Ware

Research Group Administrator 4-22-85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

<input type="checkbox"/>	<\$250K	\$1M-3.5M
<input checked="" type="checkbox"/>	\$250K-500K	\$3.5M-7M
<input type="checkbox"/>	\$500K-750K	\$7M-10M
<input type="checkbox"/>	\$750K-1M	>\$10M

**b. NUMBER OF EMPLOYEES (Total for
entire facility excluding outside contractors)**

80

c. NUMBER OF BEDS

**d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours)
ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE
PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit
it to protect confidential commercial or financial—proprietary—information furnished to
the agency in confidence)**

☐ YES

☐ NO

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

APPROVED BY

AMOUNT RECEIVED

CHECK NUMBER

DATE

CONTROL NO. 78769

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.
5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

Nuclear Materials License Renewal
License Number: 12-16249-01

Item 5: Radioactive Material.

- (1) Americium 188 sealed source with Beryllium.
- (2) Cesium 137
Americium 241 sealed source with Beryllium.
Maximum number of millicuries: 100.

Item 6: License Purpose.

Monitoring soil moisture fluctuations during the growing season in various plant communities.

Item 7: Radiation Training Program.

Patrick D. Kelsey. Completed Troxler Electronic Laboratories Training Course for the use of nuclear testing equipment. Number 5684.

A. Steven Messenger. Instruction in use and safety precautions re Nuclear Chicago P-21 moisture depth probe. Argonne National Laboratory and Illinois State Water Survey Division.

Item 8: User Training.

All employees who will be using the licensed material will attend the Troxler Electronic Laboratories course in radiologic safety and gauge operation. Additionally, in-house review will be carried out at the beginning of each growing season.

Item 9: Facilities and Equipment.

The nuclear gauge(s) to be stored at the Morton Arboretum are locked in a chemical storage room which has controlled access. Additionally, the gauge(s) is/are stored in a locked cabinet which contains only the gauge and gauge equipment. This cabinet can only be accessed by the individuals named in Item 7.
Gauges.

- (1) Troxler 1257 Moisture Depth Gauge.
- (2) Troxler 3411-B Surface Moisture - Density Gauge (proposed).

Item 10: Radiation Safety Program.

The radiation safety program will consist of the following:

- (1) Source will be stored in a protective shield when not in use.
- (2) When source is in use it slides into a soil moisture access tube without exposure to the open environment. Thus, reducing the possibility of human exposure.
- (3) Storage as listed in Item 9.
- (4) Leak testing using Troxler Leak Test Kit every six months during usage periods and annually during years of non-usage.
- (5) For the proposed gauge, Troxler 3411-B, the safety program will follow manufacturers suggested outline.
- (6) During growing season usage film badges will be used, if the NRC feels their is a need for this type of protection. Currently, use of the gauge is sporadic and monthly badge inventories would be costly and inefficient.
- (7) Procedures:

Operating Procedure

1. Make sure the scaler power switch is turned to OFF.
2. Connect probe to scaler with the cable.
3. Flip power switch to STDBY position and check battery indicator.
4. Place shield and standard containing the probe onto the 3" of access tube protruding above the soil surface after making sure that the inside of the tube is unobstructed and dry.
5. Lower the probe to the desired depth below the soil surface, remembering that the center of the sensitive volume is 6½" from the bottom of the probe.
6. Turn scaler power to ON position.
7. Make sure high voltage switch is turned to 1500 V.
8. Turn the rotary time selector switch to the 2 - minute position.
9. Push the START button.
10. Record the 2 - minute digital display reading and divide by two. Repeat at each depth.
11. Before removing shield and standard from access tube, make sure probe is all the way up into housing.
12. Before disconnecting cable, make sure power switch is turned to OFF.

Emergency Procedure

Situation A. Should the probe shield and standard become obviously damaged so that its shielding function is in question:

1. Notify Security and rope-off probe location so

Nuclear Materials License Renewal
License Number: 12-16249-01

- that at least 15 feet of distance separates the probe from any point on the perimeter.
2. Tell Security that perimeter must be guarded until NRC representative arrives.
 3. Notify NRC office at 799 Roosevelt in Glen Ellyn, IL 60137, telephone 312-790-5500.

Situation B. If the probe or shield is not obviously damaged, but probe cannot be retracted into shield:

Lower probe into access tube so that the center of the sensitive volume is at least one foot below the soil surface and follow the precautionary procedures outlined for Situation A.

(8) Transportation.

Transportation of gauge will be on the premises of the Morton Arboretum. Gauge will be carried in its travel case in pick-up or van and will be at least one meter away from any passengers.

Item 11: Waste Management

Gauge will be disposed of by giving the operating gauge to a university possessing a materials by-product license unless the source is damaged. In the event of a damaged source or faulty equipment, the device will be returned to the manufacturer.