

UNITED STATES ATOMIC ENERGY COMMISSION  
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS. - Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1 (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code)		b. STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code)	
Monsanto Company 800 N. Lindbergh Blvd. St. Louis, Missouri 63166  Attn. Research Center Safety Dept.		Same as 1 (a)	
2 DEPARTMENT TO USE BYPRODUCT MATERIAL		3 PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)	
Central Research Department		24-1113-8 Amendment No. 3 (G67)	
4 INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)		5 RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)	
D. R. Beasecker W. E. Koerner R. M. Levy M. L. Unland  O. P. Tanner J. L. Ogilvie (See attached information)		L. C. Weger (See Items 8 and 9)	
6 (a) BYPRODUCT MATERIAL (Elements and mass number of each)		(b) CHEMICAL AND OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)	
Strontium-90 Tritium-3 Tin-119m Iodine-125 Tantalum-182 Tellurium-121m Tellurium-123m Tellurium-127m		60 millicuries 200 millicuries 75 millicuries (unsealed) 75 millicuries ( " ) 75 " " 75 " " 75 " " 75 " "	
7 DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)			
Strontium-90 - Each source to be used in a Barber-Colman Company Model A-4145 cell for use in a Barber-Colman Company Model 10 or 20 gas chromatograph. (As covered in previous license number 24-1113-8) (G 65)			
Tritium-3 - To be used in F&M Scientific Corporation Model 830K-810 detector for an F&M Model 810A-13N gas chromatograph.			
All other isotopes listed in 6(a) to be used in Mössbauer experiments.			

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(Continued on reverse side)

## TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4

Use supplemental sheets if necessary.

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	Oak Ridge		Yes <input checked="" type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input checked="" type="radio"/>
b. Radioactivity measurement standardization and monitoring techniques and instruments	" "		Yes <input checked="" type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input checked="" type="radio"/>
c. Mathematics and calculations basic to the use and measurement of radioactivity	" "		Yes <input checked="" type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input checked="" type="radio"/>
d. Biological effects of radiation	" "		Yes <input checked="" type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input checked="" type="radio"/>

## 9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Many isotopes ?		Oak Ridge National Laboratories	Two Years	Production of Isotopes

## 10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
Scintillation Counter	1	Gamma	0.005 to 5.00	1 - 1/2" x 1" NaI	Surveying

## 11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

Reference to uranium oxide standard

## 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

## INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes ☐ No ☒

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

Wipe testing kits provided by Health Physics Associates, Ltd., Highland Park, Ill.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

## CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date \_\_\_\_\_



Applicant named in item 1 \_\_\_\_\_

By: \_\_\_\_\_

Title of certifying official \_\_\_\_\_

**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.

Training and Experience of Individuals Named in Item 4

1. D. R. Beasecker

D. R. Beasecker has about five years' on-the-job experience in (a) principles and practices of radiation protection; (b) radioactivity measurement standardization and monitoring techniques and instruments, and (c) biological effects of radiation. This experience was gained at Monsanto Chemical Company, Central Research Department, Dayton, Ohio; 1944-1949. Research work was carried out involving the isotope polonium in connection with the Manhattan Project.

2. W. E. Koerner

W. E. Koerner has on-the-job training of (2) four months in principles and practices of radiation protection; (b) two months in radioactivity measurement standardization and monitoring techniques and instruments; (3) two months on-the-job as well as one semester course at the University of Wisconsin in the mathematics and calculations basic to the use and measurement of radioactivity; and (d) one semester of formal training at the University of Wisconsin in the biological effects of radiation. The above on-the-job training was at the Organic Chemicals Division of Monsanto Company where Dr. Koerner also accrued one year's experience in the use of carbon-14 (maximum 50  $\mu$ c) in analytical method development and purification of tagged compounds by gas chromatography.

3. R. M. Levy

R. M. Levy has about four years' experience at the Lawrence Radiation Laboratory of the University of California where he received on-the-job training in (a) principles and practices of radiation protection; (b) radioactivity measurement standardization and monitoring techniques and instruments; and (c) mathematics and calculations basic to the use and measurement of radioactivity. His experience ranges over many isotopes during that four-year period while conducting research on gamma radiation coincidence rates and nuclear alignment for his Ph.D. thesis.

4. M. L. Unland

M. L. Unland has had three years' on-the-job experience in (a) principles and practices of radiation protection; (b) radioactivity measurement standardization and monitoring techniques and instruments; and (b) biological effects of radiation. This experience was gained at Monsanto Company, Central Research Department, St. Louis, Missouri, and while a graduate student at the University of Illinois, Urbana, Illinois.

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5. O. P. Tanner

O. P. Tanner has had about five years' on-the-job experience in (a) principles and practices of radiation protection; (b) radioactivity measurement standardization and monitoring techniques and instruments; and (c) biological effects of radiation. This experience was gained at Monsanto Company, Central Research Department, St. Louis, Missouri.

6. J. L. Ogilvie

J. L. Ogilvie received formal training in a one-semester course at the University of Texas and in a two-week course given by the Tracerlab Company, Richmond, California. These courses covered (a) principles and practices of radiation protection; (b) radioactivity measurement standardization and monitoring techniques and instruments; (c) mathematics and calculations basic to the use and measurement of radioactivity and, (d) biological effects of radiation. Additional on-the-job experience of three years was obtained while working with carbon-14 and serving on the Radiological Safety Committee while employed by the Shell Oil Company, Houston Research Laboratory, Deer Park, Texas.



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