

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

Page 1 of 1 Pages

License Number 11-00197-03

Amendment No. 10

University of Idaho
Department of Agricultural Biochemistry
and Soils
Moscow, Idaho 83843

In accordance with application dated June 26, 1967, License
Number 11-00197-03 is amended as follows:

The expiration date in Item 4 is changed to July 31, 1972.

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions b
FOIA- 2002-0051

JUL 19 1967

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For the U. S. Atomic Energy Commission

Original Signed by *JEB*

John E. Bowyer 7-18-67

by Isotopes Branch

Division of Materials Licensing
Washington, D. C. 20545

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U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet

Page 1 of 1 Pages

License Number 11-00197-0

Amendment No. 09

University of Idaho
Department of Agricultural Biochemistry
and Soils
Moscow, Idaho 83843


In accordance with letter dated June 24, 1966, signed by Dr. Duane Le Tourneau, License Number 11-00197-03 is amended as follows:

Condition 13 is amended to read:

13. Byproduct material shall be used by, or under the supervision of, Dr. Duane Le Tourneau or Dr. Denny V. Naylor.

Date

JUL 28 1966

wfh/sc 

For the U. S. Atomic Energy Commission

Original Signed By
John E. Bowyer

by Isotopes Branch

Division of Materials Licensing
Washington, D. C. 20545

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary SheetPage 1 of 1 PagesLicense Number 11-197-3
(G67)

Amendment No. 8

University of Idaho
Department of Agricultural Biochemistry
and Soils
Moscow, Idaho 83843

Attention: Dr. Duane Le Tourneau Dr. James R. Wright

In accordance with application and letter dated March 17, 1965, License No. 11-197-3 is amended as follows:

Item 1 (Name) is changed to read as shown above from: Agricultural Chemistry
Department

Item 3 is amended to change symbol below the license number from (G65) to (G67).

Item 4 is amended to extend expiration date from July 31, 1965 to July 31, 1967.

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radio- activity which licensee may possess at any one time
P. Scandium 46	P. Any	P. 50 millicuries

9. Authorized use

P. Tracers in soil and plant studies in replicated field experiments. Calibrate instruments and evaluate methodology.

CONDITIONS

Condition 13 is amended to read:

13. Byproduct material shall be used by, or under the supervision of, Dr. Duane Le Tourneau or Dr. James R. Wright.

Date

APR 27 1965

For the U. S. Atomic Energy Commission
Isotopes Branch, Division of Materials
Licensing

by

Original Signed by
Cecil R. Buchanan

WASHINGTON, D. C. 20545

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U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Page 1 of 2 Pages

License No. 11-197-3

Amendment No. 7 (G65)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated May 27, 1963	
1. Name	University of Idaho	3. License number 11-197-3 is amended in its entirety to read as follows:	
2. Address	Agricultural Chemistry Department Moscow, Idaho	4. Expiration date	July 31, 1965
		5. Reference No.	
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time	
A. Hydrogen 3	A. Any	A. 90 millicuries	
B. Carbon 14	B. Any	B. 2 millicuries	
(See page 2)			
9. Authorized use			
A. through G. Laboratory studies on plants, animals, and lower organisms. Soil chemistry and instrument calibration.			

(See page 2)**CONDITIONS**

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. Byproduct materials D, G, and L may also be used at branch experiment stations of the University of Idaho and outlying experimental plots under the jurisdiction of the University of Idaho.
12. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter I, "Standards For Protection Against Radiation."
13. Byproduct material shall be used by, or under the supervision of, Duane Le Tourneau or Harvey P. Hermanson.
14. Byproduct material shall not be used in or on human beings or in products distributed to the public.
15. The licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his applications dated March 27, 1956; December 13, 1957; January 22, 1958; May 26, 1959; October 16, 1961 and May 27, 1963, and in related documents and amendments as follows:

(Continued)

MATERIAL LICENSE

Supplementary Sheet

Continued From Page 1

License Number 11-197-3
(G65)

Amendment No. 7

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
C. Sodium 24	C. Any	C. 5 millicuries
D. Phosphorus 32	D. Any	D. 1 curie
E. Silicon 31	E. Any	E. 2 millicuries
F. Silicon 32	F. Any	F. 2 millicuries
G. Sulfur 35	G. Any	G. 1 curie
H. Chlorine 36	H. Any	H. 2 millicuries
I. Potassium 42	I. Any	I. 15 millicuries
J. Calcium 45	J. Any	J. 20 millicuries
K. Zinc 65	K. Any	K. 20 millicuries
L. Strontium 85	L. Any	L. 1 millicurie
M. Rubidium 86	M. Any	M. 2 millicuries
N. Strontium 90	N. Any	N. 2 millicuries
O. Cesium 137	O. Any	O. 2 millicuries

9. Authorized use

- B, D, G, I through M. Greenhouse studies with soils and plants.
D, G, L. Tracers in soil and plant studies in replicated field experiments.

CONDITIONS

Condition 15 continued

- A. Administrative instructions entitled "Regulations Governing the Safe Handling of Radioactive Isotopes at the University of Idaho" submitted with letter from Duane Le Turneau dated September 30, 1959.
- B. Letter dated January 13, 1958 from J. V. Jordan.
Letter dated January 15, 1962 from Duane Le Turneau.
16. Written instructions referenced in Item 15.A. covering radiological protection, control, and security of byproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for use of such material. Any changes in the written instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

JUL 15 1963

Date _____

For the U. S. Atomic Energy Commission

DUPLICATED
by
FOR DIV. OF COMPLIANCE

Original Signed by 7-15-63
John E. Bowyer
Isotopes Branch

Division of Licensing and Regulation
Washington 25, D. C.

1 BWC/Harris *[Signature]*

U. S. ATOMIC ENERGY COMMISSION

Page 1 of 3 Pages

BYPRODUCT MATERIAL LICENSE 11-197-3 AMENDMENT NO. 6

(F63)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<p>Licensee</p> <p>1. Name University of Idaho Agricultural Chemistry Department</p> <p>2. Address Moscow, Idaho</p>		<p>In accordance with application dated October 16, 1961</p> <p>3. License number 11-197-3 is amended in its entirety to read as follows:</p> <p>4. Expiration date June 30, 1963</p> <p>5. Reference No.</p>	
<p>6. Byproduct material (element and mass number)</p> <p>(see page 2)</p>	<p>7. Chemical and/or physical form</p> <p>(see page 2)</p>	<p>8. Maximum amount of radioactivity which licensee may possess at any one time</p> <p>(see page 2)</p>	

9. Authorized use

(see page 2)

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. Byproduct material may also be used at Branch Stations at Sandpoint and Deery, Idaho.
12. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards For Protection Against Radiation".
13. Byproduct material shall be used by, or under the direct supervision of, Duane Le Tournau or Harvey P. Hermanson.
14. Byproduct material shall not be used in or on human beings or in products distributed to the public.

(see page 2)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSEPage 2 of 3 Pages

Supplementary Sheet

License Number 11-197-3
(F63)

AMENDMENT NO. 6

Continued from page 1

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radio- activity which licensee may possess at any one time
A. Calcium 45	A. Any	A. 20 millicuries
B. Sodium 24	B. Any	B. 5 millicuries
C. Sulfur 35	C. Any	C. 1 curie
D. Chlorine 36	D. Any	D. 2 millicuries
E. Phosphorus 32	E. Any	E. 1 curie
F. Strontium 90	F. Any	F. 2 millicuries
G. Cesium 137	G. Any	G. 2 millicuries
H. Carbon 14	H. Any	H. 2 millicuries
I. Strontium 85	I. Any	I. 1 millicurie
J. Strontium 89	J. Any	J. 100 millicuries
K. Rubidium 86	K. Any	K. 1 millicurie
L. Potassium 42	L. Any	L. 15 millicuries
M. Bromine 82	M. Any	M. 250 millicuries
N. Hydrogen 3	N. Any	N. 90 millicuries

9. Authorized use

- A. through N. Laboratory studies on plants, animals, and lower organisms. Soil Chemistry and instrument calibration.
- A, C, E, H, J, K, and L. Greenhouse studies on plants and lower animals.
- C, E, and J. To be used as tracers in soil and plant studies in replicated field experiments at University of Idaho experimental stations and experimental plots.

Conditions

15. The licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in his applications dated March 27, 1956; December 13, 1957; January 22, 1958; May 26, 1959; and October 16, 1961, and in related documents and amendments as follows:

- A. Administrative instructions entitled "Regulations Governing the Safe Handling of Radioactive Isotopes at the University of Idaho" submitted with letter from Duane Le Tourneau dated September 30, 1959.

(see page 3)

U. S. ATOMIC ENERGY COMMISSION
HYPRODUCT MATERIAL LICENSE

Page 3 of 3 Pages

Supplementary Sheet

License Number 11-197-3
(F63)

Continued from page 2

AMENDMENT NO. 6

Conditions

15. B. Letter dated January 13, 1958 from J. V. Jordan.
Letter dated January 15, 1962 from Duane Le Tournneau.
16. Written instructions referenced in Item 15-A covering radiological protection, control, and security of hyproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for use of such material. Any changes in the written instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

Date January 19, 1962

DUPLICATED
FOR DIV. OF COMPLIANCE

For the U. S. Atomic Energy Commission

Original Signed By James R. Mason 1-19-62
by Chief, Isotopes Branch

Division of Licensing and Regulation
Washington 25, D. C.

J E M / Wagner

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Page 1 of 1 Pages

Supplementary Sheet

License Number 11-197-3

AMENDMENT NO. 5 (F63)

University of Idaho
Agricultural Chemistry Department
Moscow, Idaho

Attention: Duane J. Le Tourneau

In accordance with application dated June 12, 1961, License No. 11-197-3 is amended as follows:

Item 3 is amended to change the expiration symbol below the License No. from (F61) to (F63)

Item 4 is amended to change the expiration date from June 30, 1961 to June 30, 1963.

DUPLICATED
FOR DIV. OF COMPLIANCE

Date June 23, 1961

For the U. S. Atomic Energy Commission

Original Signed By James R. Mason 6-30-61
by [Signature] **Chief, Isotopes Branch**

Division of Licensing and Regulation
Washington 25, D. C.

L. J. E. / Carey

U. S. ATOMIC ENERGY COMMISSION
YPRODUCT MATERIAL LICENSING
Supplementary Sheet

Page 1 of 1 Pages

License Number 11-197-3
(F61)

Amendment No. 4

University of Idaho
Agricultural Chemistry Department
Moscow, Idaho

Attention: D. J. Le Tournear

In accordance with letter dated February 21, 1961, from D. J. Le Tournear, License No. 11-197-3 is amended as follows:

Condition 13 is amended to read:

13. Byproduct material shall be used by, or under the direct supervision of,
B. J. Le Tournear.

DUPLICATED
FOR DIV. OF COMPLIANCE

Date MAR 31 1961

SAMS
W. S. Kaufman

For the U. S. Atomic Energy Commission

Original Signed By 3-30-61
James R. Mason
by *gm* ~~Chief, Inspection Branch~~
Division of Licensing and Regulation
Washington 25, D. C.

U . ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Page 1 of 1 Pages

Supplementary Sheet

License Number 11-197-3
(F61)

AMENDMENT NO. 3

University of Idaho
Agricultural Chemistry Department
Moscow, Idaho

Attention: J. V. Jordan
D. J. Le Fournier

In accordance with letter dated August 24, 1960 and signed by J. V. Jordan, License No. 11-197-3 is amended as follows:

Condition 13 is changed to read:

13. Byproduct material shall be used by, or under the direct supervision of, J. V. Jordan or D. J. Le Fournier.

DUPLICATED
FOR DIV. OF INSP.

Date August 31, 1960

J. V. Jordan

For the U. S. Atomic Energy Commission

Original Signed By
James R. Mason

8-31-60

by *JRM* Chief, Licensing Branch
Division of Licensing and Regulation
Washington 25, D. C.

BYPRODUCT MATERIAL LICENSE , 11-197-3 Amendment No. 2
(F61)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated May 26, 1959
1. Name	University of Idaho Agricultural Chemistry Department	
2. Address	Moscow, Idaho	3. License number 11-197-3 is amended in its entirety to read as follows:
		4. Expiration date June 30, 1961
		5. Reference No.
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Calcium-45	A. Any	A. 20 millicuries ✓
B. Sodium-24	B. Any	B. 5 millicuries ✓
(See page 2)	(See page 2)	(See page 2)

9. Authorized use

A. & B. To study calcium and sodium ion movement in alkali spot soils.

(See page 2)

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

11. Byproduct material may also be used at Branch Stations at Sandpoint and Deary, Idaho.

12. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards For Protection Against Radiation".

13. Byproduct material shall be used by, or under the direct supervision of, J. V. Jordan or G. D. Wyer.

14. Byproduct material shall not be used in or on human beings nor in products distributed to the public.

(See page 2)

DUPLICATE

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSEPage 2 of 2 Pages

Continued from page 1

Supplementary Sheet

License Number 11-197-3
(F61)

Amendment No. 2

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radio- activity which licensee may possess at any one time
C. Sulfur-35	G.	G. 100 millicuries +
D. Chlorine-36	D.	D. 2 millicuries
E. Phosphorus-32	E.	E. 3 curies
F. Strontium-90	F.	F. 2 millicuries
G. Cesium-137	G.	G. 2 millicuries

9. Authorized Use

C. D. & E. To be used as tracers in soil and plant nutrient studies in replicated field experiments, in the laboratory and in greenhouses.

E. Also for agricultural field studies.

F. & G. Instrument standardization.

CONDITIONS

15. The licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his applications dated March 27, 1956; December 13, 1957; January 22, 1958 and May 26, 1959 and in related documents and amendments as follows:

A. Letter dated January 13, 1958 from J. V. Jordan.

B. Administrative instructions entitled "Regulations Governing The Safe

Handling Of Radioactive Isotopes At The University Of Idaho" submitted with letter from D. J. Le Barsman dated September 30, 1959.

16. Written administrative instructions referenced in Item 15.B. covering radiological protection, control, and security of byproduct material shall be followed and a copy of instructions shall be supplied to each individual using or having responsibility for the use of such material. Any changes in the administrative instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

FOR DIV. OF INSP
RECEIVED

Amend 4 2-61
3-2-59

Date October 8, 1959

For the U. S. Atomic Energy Commission
Original Signed By

James R. Mason

by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

1. WSY/Conner

REB 12/5/77

U. S. ATOMIC ENERGY COMMISSION
BY PRODUCT MATERIAL LICENSE

Page 1 of 1 Pages

Supplementary Sheet

University of Idaho
Agricultural Chemistry Department
Moscow, Idaho

License Number 11-197-3060

AMENDMENT NO. 1

Attention: Mr. J. V. Jordan

In accordance with Application for Byproduct Material License dated March 26, 1958,
License No. 11-197-3060 is hereby amended to add:

CONDITIONS

17. Byproduct materials shall be used by, or under the supervision of, J. V. Jordan.

For the U. S. Atomic Energy Commission

Original Signed By

James R. Mason

by

JRM
Chief, Isotopes Branch
4-16-58
Division of Licensing and Regulation
Washington 25, D. C.

Date April 15, 1958

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U. S. ATOMIC ENERGY COMMISSION
B BYPRODUCT MATERIAL LICENSEPage 1 of 1 Pages

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1. Name University of Idaho	3. License number 11-197-3060	
2. Address Agricultural Chemistry Department	4. Expiration date March 31, 1960	
2. Address Moscow, Idaho	5. Reference No. 11-197-1	
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Calcium 45	A. Any	A. 20 millicuries
B. Sodium 24	B. Any	B. 5 millicuries
C. Sulfur 35	C. Any	C. 100 millicuries
D. Chlorine 36	D. Any	D. 3 millicuries
E. Phosphorus 32	E. Any	E. 3 curies
9. Authorized use		
A. and B. : To study calcium and sodium ion movement in slick spot soils.		
C., D. and E.: To be used as tracers in soil and plant nutrient studies in replicated field experiments, in the laboratory and in greenhouses.		
E. : Also used for Agricultural field studies.		

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. Byproduct materials may also be used at Branch Stations at Sandpoint, and Deary, Idaho.
12. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation".
13. This license supersedes License No. 11-197-1 issued April 3, 1956.
14. Written administrative instructions covering radiological protection, control, and security of byproduct material shall be supplied to each individual using or having responsibility for use of such material.
15. Byproduct material shall not be used in or on human beings.
16. Byproduct material shall not be used in products distributed to the public.

Amend No 1 4-16-58 To add new glass
Am # 2 4-8-58 WSC

Date April 4, 1958

For the U. S. Atomic Energy Commission

Original Signed By

by *JRM* James R. Mason *4-7-58*Division of Licensing and Regulation
Washington 25, D. C.*Harris 1205*

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.)	
University of Idaho, Dept. of Agricultural Biochemistry & Soils, Moscow, Idaho 83843		At 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.)	
1. (a)		Renewal of 11-197-3 (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 resums of his training and experience as in Items 8 and 9.)	
Dr. Duane LeTourneau Dr. Denny V. Naylor		Individual Users	
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.)	
A. Hydrogen-3 B. Carbon-14 C. Sodium-24 D. Phosphorous-32 E. Silicon-31 F. Silicon-32 G. Sulfur-35 H. Chlorine-36 I. Potassium-42 J. Calcium-45 K. Zinc-65 L. Strontium-85 M. Rubidium-86 N. Strontium-90 O. Cesium-137 P. Scandium-46		A. any 90 millicuries B. any 2 millicuries C. any 5 millicuries D. any 1 curie E. any 2 millicuries F. any 2 millicuries G. any 1 curie H. any 2 millicuries I. any 15 millicuries J. any 20 millicuries K. any 20 millicuries L. any 1 millicurie M. any 2 millicuries N. any 2 millicuries O. any 2 millicuries P. any 50 millicuries	

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.)

All materials will be used as tracers for laboratory studies in soil chemistry and plant nutrition, to calibrate instruments and evaluate methodology, and to study metabolic pathways in biological material such as fungi, bacteria, and higher plants and animals. They will also be used in green-house studies to trace nutrient movement in soils and uptake by plants. Materials D, G, and L will also be used in replicated field experiments at branch stations of the agriculture experiment station of the University of Idaho as tracers in soil and plant studies.

95360 T10

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

Page Two

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	See: Additional Sheets		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		See: Additional Sheets		

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 ²)	USE (Monitoring, surveying, measuring)
See: Additional Sheets					

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

See: Additional Sheets

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

See: Additional Sheets

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

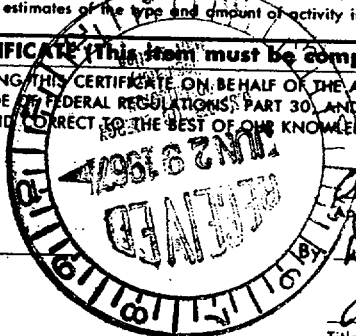
14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation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

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 June 26, 1967



Ag. Biochem. & Tox., U. of Idaho
 Applicant named in item 1
Denny V. Naylor, Ph.D.
 Assistant Professor
 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.

Items 11, 12, 14, and 15

Refer to renewal application from H. P. Hermanson, dated May 27, 1963.

Item 13

Laboratory facilities include fume hoods, running distilled water, storage cans for waste "hot" materials, an A.E.C. lead container, 2 wooden storage cabinets with planchet trays, metal trays and absorbent material for lining them, Nuclear Chicago adsorber kit, various warning signs and labeling tape, disposable and rubber gloves, spare batteries for the survey meters, lead bricks, and a library on the use of radio-isotopes including methods, radiation safety, nuclear chemistry, and a bibliography.



UNIVERSITY OF IDAHO

MOSCOW, IDAHO



College of Agriculture

DEPARTMENT OF AGRICULTURAL BIOCHEMISTRY AND SOILS

June 26, 1967

U.S. Atomic Energy Commission
Division of Materials
Licensing
Washington, D.C. 20545

Reference: DML: IB: 37
Materials license 11-197-3

Gentlemen:

Enclosed are two copies of completed Form AEC-313 for renewal of our byproducts material license 11-197-3. I trust they are in order and on time.

I regret Dr. LeTourneau is out of town since he has supervised our license for some time and I am new on the staff. He will return to campus on July 5, so if there is a need for more information after that time, he will be available for consultation.

Sincerely yours,

Denny V. Naylor
Assistant Professor of Soils

DVN:pj
Encl.

DUPLICATED
FOR DIV. OF COMPLIANCE

95360

UNIVERSITY OF IDAHO

MOSCOW, IDAHO



College of Agriculture

DEPARTMENT OF AGRICULTURAL BIOCHEMISTRY AND SOILS

June 24, 1966

1 copy of all

Division of Licensing and Regulation
U.S. Atomic Energy Commission
Washington 24, D.C.

RE: AEC Byproducts Material
License 11-197-3(G67)
Amendment 8

Gentlemen:

As a result of some changes in our faculty, we would like to amend our Byproducts Material License 11-197-3(G67). Our current license (amendment No. 8) is dated April 27, 1965.

Under the conditions of this license it states that "Byproduct material shall be used by, or under the supervision of, Dr. Duane Le Tourneau or Dr. James R. Wright." We would like to change these conditions as follows:

1. Delete the name of Dr. James R. Wright. Dr. Wright is no longer an employee of the University of Idaho.
2. Add the name Dr. Denny V. Naylor.

Dr. Naylor received his B.S. and M.S. degrees from the University of Idaho in [redacted] and [redacted] respectively. He received his Ph.D. [redacted] from the University of California, Berkeley, with a major in the Department of Soils and Plant Nutrition. Dr. Naylor joined our faculty April 1, 1966, as assistant professor and assistant soil scientist. His training and experience with isotopes as requested on form AEC-313 is as follows:

EX 6

8. Type of Training	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSES
a. Principles and practices of radiation protection.	Univ. of Cal. (Berkeley)	2 1/2 yr.	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> No
b. Radioactivity measurement standardization and monitoring techniques and instruments	Univ of Idaho Univ. of Cal. (Berkeley)	5 years	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> Yes

78438

June 24, 1966

8. Type of Training continued

	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSES
c. Mathematics and calculations basic to the use and measurement of radio-activity	Univ. of Idaho Univ. of Cal. (Berkeley)	5 years	Yes	Yes
d. Biological effects of radiation	-----	-----	---	---

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE
1. P^{32}	0.1 millicuries	Univ. of Idaho	6 months
2. Sn^{85}	250 millicuries	Univ. of Cal. (Berkeley)	1 Year
3. Na^{22}	0.1 millicuries	Univ. of Cal. (Berkeley)	6 months

TYPE OF USE
1. Anion exchange studies.
2a. Uptake and translocation studies into plants.
b. Cation exchange studies in soils.
3. Cation exchange studies in soils.

We are currently making plans for a new wing to our present Agricultural Science Building. In connection with these plans, we are requesting space for a new radioisotopes laboratory facility. We would like information concerning AEC regulations, recommendations and specifications for the design and construction of a laboratory and counting room. We are particularly interested in information on hoods, laboratory benches, floor covering, and storage facilities. Recently Mr. McFall of your Denver inspecting office visited us. He indicated that he would attempt to get such information for us but that we might also contact your office.

We have also been attempting to keep an up-to-date file of regulations as published in the Federal Register, particularly Title 10, part 20 and Title 10, part 30. While the Radiological Safety Officer for the University

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Division of Licensing and Regulation

June 24, 1966

of Idaho, Professor G. A. McKean, Engineering Experiment Station, University of Idaho, receives such information, our department has not received any recent information. Mr. McFall indicated that departments with individual licenses may also be placed on the mailing list to receive such information. If this is possible, would you please place my name on your mailing list to receive such information. ~~If this is possible, would you please place my name on your mailing list to receive such information?~~

Some departments at the University of Idaho holding individual or departmental licenses are interested in the possibility of the University obtaining one general or broad license. I would like to obtain information concerning the procedures for requesting such a license and the regulations governing a general license.

I will appreciate any assistance or information you can provide me relative to the change of our license and the other information requested in this letter.

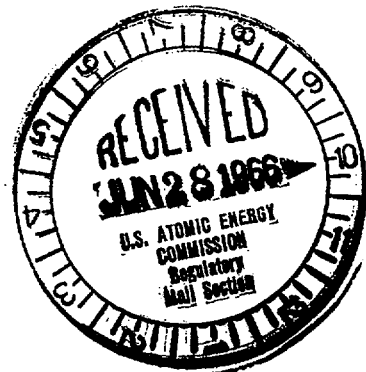
Very truly yours,



Duane Le Tourneau
Professor and Agricultural Biochemist

DLeT/bmm

cc: Professor G. A. McKean
Mr. Eugene McFall



78438

UNIVERSITY OF IDAHO

MOSCOW, IDAHO



College of Agriculture

DEPARTMENT OF AGRICULTURAL BIOCHEMISTRY AND SOILS

March 17, 1965

Mr. Richard E. Cunningham
Chief, Isotopes Branch
Division of Licensing and Regulation
U.S. Atomic Energy Commission
Washington 25, D.C.

Dear Mr. Cunningham:

We are requesting that at additional isotope, Scandium-46, in the amount of 50 millicuries be added to our AEC by-product material license. Our current by-product material license number is 11-197-3(G65) Amendment No. 7 and does not expire until July 31, 1965.

In support of this request, we are submitting Form AEC-313. Note that Dr. Harvey Hermanson is no longer at the University of Idaho and that Dr. James Wright has taken his place. The experience of Dr. Wright is provided in sections 8 and 9.

It is further requested that the name of license be changed to University of Idaho, Department of Agricultural Biochemistry and Soils. This is in accordance with a recent name change which has occurred. See item 1 (a) of Form AEC-313.

The rest of the information is as stated in License No. 11-197-3(G65), Amendment No. 7, dated July 15, 1963.

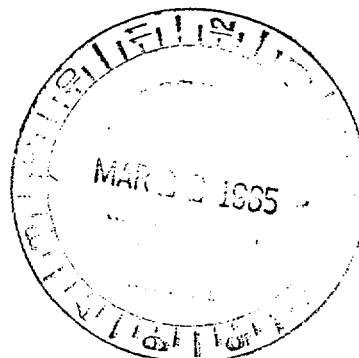
Very truly yours,

A handwritten signature in cursive script that reads "James R. Wright".

James R. Wright
Acting Assistant Professor of
Agricultural Biochemistry and
Assistant Agricultural Biochemist

JRW/bmm

enclosure



66813

TRAINING A		EXPERIENCE OF EACH INDIVIDUAL NAMED IN I		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	University of Idaho	4.5 months	Yes (No)	(Yes) No	
b. Radioactivity measurement standardization and monitoring techniques and instruments	University of Idaho	4.5 months	Yes (No)	(Yes) No	
c. Mathematics and calculations basic to the use and measurement of radioactivity ..	University of Idaho	4.5 months	Yes (No)	(Yes) No	
d. Biological effects of radiation			Yes No	Yes No	

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
¹⁴ C ²¹⁰ Pb etc.	Trace amounts	Formal course in Lab. Techniques with radioisotopes	3-4 months	Routine laboratory experiments.

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 ²)	USE (Monitoring, surveying, measuring)
Same as License No. 11-197-3(G-65) Amendment No. 7 Dated July 15, 1963					

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

16

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

10

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

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 10

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. 10

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. 10

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 March 17, 1965

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.

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tenn. Attention: Isotopes Extension, Division of Civilian Application. 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.) University of Idaho Department of Agricultural Biochemistry and Soils Moscow, Idaho 83843	(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).) University of Idaho Department of Agricultural Biochemistry and Soils Moscow, Idaho 83843
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Agricultural Biochemistry and Soils	3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.) 11-197-3 (G-65) Amendment No. 7
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.) Dr. Duane Le Tourneau, Professor of Agricultural Biochemistry Dr. James R. Wright, Acting Assistant Professor and Agricultural Biochemist	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.) Dr. James R. Wright
6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.) Add. P. Scandium-46	(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.) P. Any 50 millicuries

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.)

Above isotope will be used in laboratory either to calibrate instrument and evaluate methodology or as tracer in studies of soil chemistry and nutrient uptake from the soil material. ^{Isotope} will also be used in outlying experimental plots under the jurisdiction of the University of Idaho.

66813

UNIVERSITY OF IDAHO

MOSCOW, IDAHO



College of Agriculture

DEPARTMENT OF AGRICULTURAL CHEMISTRY

May 27, 1963

Mr. Richard E. Cunningham
Chief, Isotopes Branch
Division of Licensing and Regulation
U.S. Atomic Energy Commission

Dear Mr. Cunningham:

We are submitting Form AEC-313 to renew our AEC byproduct material license.

The changes in the program is as follows:

Item 6a:

Add: Silicon-31, silicon-32 and zinc-65.
Drop: Strontium-89 and bromine-82.

Item 7:

The intent of previous applications had been to ask permission to do field work in soil science at the University of Idaho Branch Experiment Stations. It appeared that the intent of the license was that we be permitted to use the materials only at the Sandpoint station. We are no longer doing tracer work at Sandpoint and Deary, Idaho, but have plans to begin some phosphorus-32 or sulfur-35 work at Tetonia Agricultural Experiment Station. Of course the proper precautions involving surveillance, access to area, and disposal of waste will be taken.

Item 8 and 9:

The training and experience of Le Tourneau and Hermanson has changed little since the initial information was supplied you.

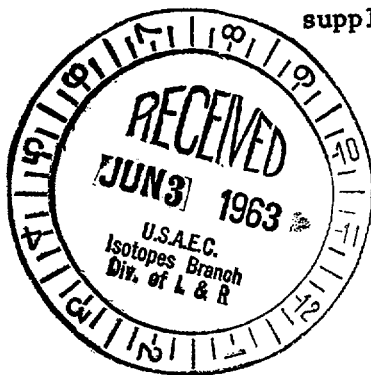
Items 10 to 15:

See the enclosed supplements.

Very truly yours,

H. P. Hermanson

H.P. Hermanson
Asst. Prof. & Asst. Ag. Chemist



DUPLICATED
FOR DIV. OF COMPLIANCE

HPH/bas
Enclosure

ACKNOWLEDGED

51784

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027.4.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.) Agricultural Biochemistry and Soils University of Idaho Moscow, Idaho	(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).) At 1a and Radioisotopes Laboratory University of Idaho Moscow, Idaho
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Agricultural Biochemistry and Soils	3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.) Renewal 11-197-3 (F63) with amendment 1, 2, 3, 4, 5 & 6.
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.) Duane Le Tourneau Harvey P. Hermanson	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.) Harvey P. Hermanson

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.) A Hydrogen-3 B Carbon-14 C Sodium-24 D Phosphorus-32 E Silicon-31 F Silicon-32 G Sulfur-35 H Chlorine-36 I Potassium-42 J Calcium-45 K Zinc-65 L Strontium-85 M Rubidium-86 N Strontium-90 O Cesium-137	(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.) A Any .90 millicuries B " 2 millicuries C " 5 " D " 1 curie E " 2 millicuries F " 2 " G " 1 curie H " 2 millicuries I " 15 " J " 20 " K " 20 " L " 1 " M " 2 " N " 2 " O " 2 "
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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.)

All of the above isotopes will be used in the laboratory either to calibrate instruments and evaluate methodology or as tracers in studies of soil chemistry, nutrient uptake from the soil, and metabolic pathways in biological material such as bacteria, fungi, higher plants, and animals. In addition, B, D, G, I, J, K, L and M listed under 6a above will be used in greenhouse studies with soils and plants. Materials D, G, and L will also be used in replicated field experiments at branch experiment stations of the University of Idaho, (Sandpoint, Lewiston, Parma, Caldwell, Aberdeen, Tetonia, and Moscow) and outlying experimental plots under the jurisdiction of the University of Idaho.

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			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

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 ²)	USE (Monitoring, surveying, measuring)
See supplement					

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

See supplement

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

See supplement

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

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 No14. 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.
See supplement

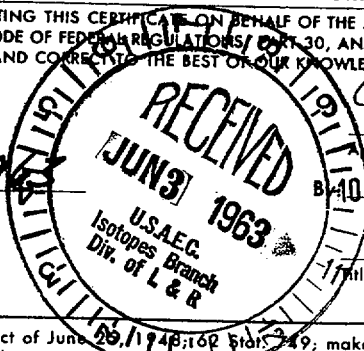
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. See supplement

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

27 May 1963



Applicant named in Item 1

A.C. Wise, Head
Dept. Ag. Biochem & Tox

J.W. Ward

BUSINESS MANAGER, UNIVERSITY OF IDAHO

Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 162 Stat. 249; 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.

Item 10

Radiation Detection Instruments

Type of Instruments	Number	Radiation Detected	Sensitivity mr/hr	Window Thickness	Use
Survey meters-El Tronics, sm-3	1	beta, gamma	0-0.2 0-2.0 0-20	less than 2 mg/cm ²	monitoring surveying
Tracerlab, Su-14	2	"	0-0.25 0-2.5 0-25	less than 2 mg/cm ²	"
Atomic Accessories, Model SM-131	2	"	0-5 0-50 0-500	less than 2 mg/cm ²	"
Baird-Atomic Model 414, Logarithmic	1	beta, gamma	3-3000	0.9 mg/cm ²	"
Auto Scaler, Tracerlab SC-1B	1				measurement
RCL Scaler, Radiation Counter Laboratories, Mark 13, Model 1	1				"
Baird-Atomic Model 123 G-M Scaler	5				"
Baird-Atomic Model 2010 Scaler	1				"
Windowless Flow Counter, Radiation Counter Labs		alpha, beta, gamma			"
Scintillation Detector, Nuclear Chicago	1	beta, gamma			"
Baird-Atomic Model, 810A wall type scintillation detector.	1	"			"
Pulse Height Analyzer, Tracerlab, RL1-6SR					"

Radiation Detection Instruments

Type of Instruments	Number	Radiation Detected	Sensitivity mr/hr	Window Thickness	Use
Baird-Atomic Model, A-2-17B Single Channel Scintillation Spectrometer	1				measurement
Rate Meter, Tracerlab, Sc34Bd	1				"
Carbon Counter, Tracerlab, TGC-14	1	beta, gamma		0.9 mg/cm ²	"
Windowless Flow Counter, Tracerlab Sc166	1	alpha, beta, gamma			"
Baird-Atomic Model 822B Stand and End Window GM Tubes	5	"		less than 2 mg/cm ²	"
Baird-Atomic Model 821B Micro-Thin End Window Flow Counter	1	"			"
Baird-Atomic Model 410 Count Rate Meter	1				"
Atomic Accessories Model RSC-5A Chromatogram Scanner with Recorder	1				"
Atomic Accessories Model ND-191-BF ³ Neutron Counter	2	neutrons			"
Dosimeter Charger, Nuclear-Chicago model 906	1				
Dosimeters, Nuclear-Chicago model NC-402	4		0-200		Health

Item 11. Flow counters, carbon counters and GM tubes will be calibrated once a day, when in use, against standards in New England Nuclear Model 1225 Beta Reference Source Sets or against other comparable secondary standards. Scintillation detectors will be calibrated, once a day when in use, against standards in a New England Nuclear Model 1230 Gamma Reference Source Set. The survey meters will be calibrated against suitable secondary standards once a day when in use and will be calibrated against the 1 mc. Co⁶⁰ sealed source at least once a semester.

Item 12. A film badge service from Radiation Detection Co., Palo Alto, Cal., will be contracted for Hermanson's personal monitoring. Several self-reading 0-200 mr dosimeters will be on hand for personal monitoring of temporary assistants and general dose determination. Records and reports required by the Atomic Energy Commission's regulation 10 CFR Part 20 will be made.

Item 14. An Eltronics SM3 survey meter, Tracerlab, Su-14, survey meter, or Nuclear-Chicago, Model 1615, ratemeter with cathode follower in conjunction with thin end window GM tubes, are used to survey the working area and equipment after use of radioisotopes. Whenever particulate radioactive matter is suspected, dust masks will be worn and a rotameter, vacuum source and vacuum filter system will be used to verify low radioactive dust contamination in the inhalation zone. The recommendations of the Atomic Energy Commission's regulation 10 CFR Part 20 will be followed.

Item 15. Disposal of waste will be carried out according to the Atomic Energy Commission's regulation 10 CFR Part 20. Short lived radioisotopes will be held until the activity is low enough for disposal via the sewer. Longer lived radioisotopes will be held for disposal by burial in soil. Facilities include a burial ground.

UNIVERSITY of IDAHO

MOSCOW, IDAHO



College of Agriculture
Department of Agricultural Chemistry
Jan. 15, 1962

Mr. John E. Bowyer
Senior Licensing Reviewer
Isotope Branch
Division of Licensing & Regulation
U. S. Atomic Energy Commission
Washington 25, D.C.

Dear Mr. Bowyer:

This letter is written in response to your letter of November 17, 1961, and the notification of January 4, 1962, in regard to our application to amend By-product Material License No. 11-197-3.

In your original letter dated November 17, 1961, you raised a question in regard to weekly urine-bioassays for persons handling between 100 millicuries and 8 curies of tritium. In our original request to amend our license we requested the use of 250 millicuries. We have reviewed our possible uses for tritium and have concluded that for the time being we would probably not need to use 250 millicuries. We would therefore change our request to a request for a maximum of 90 millicuries of tritium. It is our understanding that with this lower level we would not be required to conduct weekly urine-bioassays. If our program develops to where we will desire to use more tritium we will make this request at a later date.

In your letter of November 17, 1961, you also requested more information concerning our request to remove the condition from our license which pertained to methods used by Dr. J.V. Jordan in the use of specific isotopes. Dr. Jordan is no longer at this institution. I have therefore asked Dr. Harvey Hermanson, who will be in direct charge of the handling of the isotopes in this department, to outline the procedures which will be used in place of those submitted by Dr. Jordan.

Dr. Hermanson has submitted the following statement. The provisions of Dr. Jordan's letter of January 13, 1958, should continue to form the basis for handling of S-35 and P-32 under our license. Substitution of the following items in Items 11, 12, 14, and 15 of Form AEC-313 will provide a more practical working arrangement consistent with safety.

Item 11. Flow counters, carbon counters and GM tubes will be calibrated once a day, when in use, against standards in New England Nuclear Model 1225 Beta Reference Source Sets or against other comparable secondary standards. Scintillation detectors will be calibrated, once a day when in use, against standards in a New England Nuclear Model 1230 Gamma Reference Source Set. The survey meters will be calibrated against suitable secondary standards once a day when in use and will be calibrated against the 1 mc. Co⁶⁰ sealed source at least once a semester.

Mr. Bowyer
1-15-62

2

Item 12. A film badge service from Radiation Detection Co., Palo Alto, Cal., will be contracted for Hermanson's personal monitoring. Several self-reading 0-200 mr dosimeters will be on hand for personal monitoring of temporary assistants and general dose determination. Records and reports required by the Atomic Energy Commission's regulation 10 CFR Part 20 will be made.

Item 14. An Eltronics SM3 survey meter, Tracerlab, Su-14, survey meter, or Nuclear-Chicago, Model 1615, ratemeter with cathode follower in conjunction with thin end window GM tubes, are used to survey the working area and equipment after use of radioisotopes. Whenever particulate radioactive matter is suspected, dust masks will be worn and a rotameter, vacuum source and vacuum filter system will be used to verify low radioactive dust contamination in the inhalation zone. The recommendations of the Atomic Energy Commission's regulation 10 CFR Part 20 will be followed.

Item 15. Disposal of waste will be carried out according to the Atomic Energy Commission's regulation 10 CFR Part 20. Short lived radioisotopes will be held until the activity is low enough for disposal via the sewer. Longer lived radioisotopes will be held for disposal by burial in soil. Facilities include a burial ground.

Very truly yours

Duane Le Tourneau

Duane Le Tourneau, Acting Head
Department of Agr. Chemistry

D LeT/g

IDAHO'S LAND-GRANT UNIVERSITY
Land-Grant College...USDA
Centennial
1862-1962
UNIVERSITY OF IDAHO
College of Agriculture
*Dedicated to Idaho's Growth Through
Agricultural Progress*



DLR:IB:JEM (38087)

NOV 17 1961

University of Idaho
Agricultural Chemistry Department
Moscow, Idaho

Attention: Duane J. Le Tourneau

Gentlemen:

This is to acknowledge your application to amend byproduct material License No. 11-197-3 received October 20, 1961.

In licensing the use of Tritium, we require weekly urine-bioassays for persons routinely handling between 100 millicuries and 8 curies of Hydrogen 3. We will appreciate being advised what arrangements will be made for performance of such bioassays.

Reference is made to your request to remove the condition from your license which pertains to methods used by Dr. J. V. Jordan in the use of specific isotopes. Since the provisions of Dr. Jordan's letter of January 13, 1958 form the basis on which many of the isotopes were included in the license, we shall need to know what procedures you will use in place of those submitted by Dr. Jordan before we can amend the license.

Upon receipt of the above information, we will continue our review of your request.

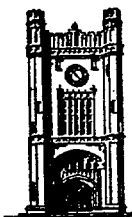
Very truly yours,

John E. Bowyer
Senior Licensing Reviewer
Isotopes Branch
Division of Licensing and
Regulation

OFFICE ▶	DLR:IB	DLR:IB				
SURNAME ▶	JEM:JEM/dw	Bowyer				
DATE ▶	11/17/61	11/17/61				

UNIVERSITY of IDAHO

MOSCOW, IDAHO



College of Agriculture
Department of Agricultural Chemistry

October 11, 1961

Mr. James R. Mason
Chief, Isotopes Branch
Division of Licensing and Regulation
U.S. Atomic Energy Commission
Washington 25, D.C.

Dear Mr. Mason:

Recently this department has hired a new faculty member, Dr. H.P. Hermanson, trained and interested in using radioisotopes in agricultural research. As a result we have decided to expand our present program. We are therefore requesting certain changes in our Byproducts Material License 11-197-3(F63) relative to the isotopes that we may use, the purposes for which these isotopes may be used, and the addition of Dr. Hermanson's name to the license as an individual user.

The requested changes are indicated on the attached copies of Form AEC-313. You will note that the amounts of activity for Materials C and E under 6b have been changed and that Materials H through N under 6a and 6b are new requests. Item 7 has also been rewritten to allow usage in a wider variety of experiments.

Dr. Hermanson's training and experience with radioisotopes is listed in Items 8 and 9. Dr. Hermanson received a B.S. degree from the University of Minnesota, an M.S. degree from Cornell University, and his Ph.D. at the University of Minnesota. His field of interest is soil chemistry. He is an assistant professor and assistant agricultural chemist in this department.

Items 10, 11, 12, 13, 14, and 15 remain the same as outlined in our application for renewal dated June 9, 1961.

On July 28, 1961, Mr. Wellington Pierce of the Idaho Operations Office inspected our activities authorized under the license. In reviewing our license with us, Mr. Pierce pointed out that certain letters from Dr. J.V. Jordan outlining methods he would use with specific isotopes had become conditions of our license. This was done before the University of Idaho had drawn up the regulations governing the safe handling of radioactive isotopes at the University of Idaho. Since Dr. Jordan is no longer here and his name has been withdrawn from the license, Mr. Pierce pointed out that we may not wish to conduct our operations according to the statements made in these letters. We respectfully request that methods dealing with the handling of specific isotopes outlined in letters from Dr. J.V. Jordan be withdrawn as conditions of License 11-197-3(F63).

We have exhausted our supply of Form AEC-313. I would greatly appreciate receiving more copies for our departmental use and for my use as radiological safety officer of the University.

Very truly yours

Duane Le Tourneau

Duane Le Tourneau 38087 Acting Head
Department of Agr. Chemistry

D LeT/g

ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.

11-197-3
#6

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)		11-197-3 #6	
Agricultural Chemistry Department University of Idaho Moscow, Idaho		At 1a and Radioisotopes Laboratory University of Idaho Moscow, Idaho	
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.)	
Agricultural Chemistry Department		11-197-3 (F63) with amendments 1,2,3,4, and 5	
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.)	
Duane Le Tourneau Harvey P. Hermanson		Duane J. Le Tourneau	
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.)	
A Calcium-45	A Any	A 20 millicuries	✓
B Sodium-24	B "	B 5 "	✓
C Sulfur-35	C "	C 1 curie	+
D Chlorine-36	D "	D 2 millicuries	✓
E Phosphorus-32	E "	E 1 curie	✓
F Strontium-90	F "	F 2 millicuries	✓
G Cesium-137	G "	G 2 "	✓
H Carbon-14	H "	H 2 "	
I Strontium-85	I "	I 1 "	
J Strontium-89	J "	J 100 "	
K Rubidium-86	K "	K 1 "	
L Potassium-42	L "	L 15 "	
M Bromine-82	M "	M 250 "	
N Tritium	N "	N 250 "	see letter

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.)

All of the above isotopes will be used in the laboratory either to calibrate instruments and evaluate methodology or as tracers in studies of soil chemistry, nutrient uptake from the soil, and metabolic pathways in biological material such as bacteria, fungi, higher plants, and animals. In addition, A, C, E, H, J, K, and L listed under 6a above will be used in greenhouse studies with soils and plants. Materials C, E, and J will also be used in replicated field experiments at branch experiment stations of the University of Idaho and outlying experimental plots under the jurisdiction of the University of Idaho.

DUPLICATED

FOR DIV. OF COMPLIANCE
(continued on reverse side)

38087

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING (Harvey P. Hermanson)	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	University of Minnesota	3 months	Yes <u>No</u>	Yes <u>No</u>
b. Radioactivity measurement standardization and monitoring techniques and instruments	University of Minnesota	3 months	Yes <u>No</u>	Yes <u>No</u>
c. Mathematics and calculations basic to the use and measurement of radioactivity	University of Minnesota	3 months	Yes <u>No</u>	Yes <u>No</u>
d. Biological effects of radiation			Yes <u>No</u>	Yes <u>No</u>

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Sr-90	About .5 uc	University of Minnesota	1½ y.	Standardize Sr-90 analysis method for soils. Plant uptake from soil.
S-35	2½ mc	University of Minnesota	6 weeks	
Sr-85	1 mc			
P-32	1 mc			

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/cm²)	USE (Monitoring, surveying, measuring)

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

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

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.

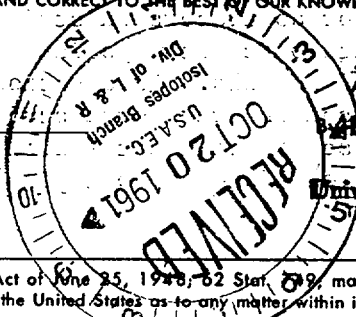
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

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

OCT 16 1961



Agricultural Chemistry Dept.
Applicant named in item 1 Dr. J. Hermanson

The Regents
of the

University of Idaho
Title of certifying official

Kenneth A. Dick

Financial Vice President
University of Idaho

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948, 62 Stat. 795, 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.

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027.3.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.) Agricultural Chemistry Department University of Idaho Moscow, Idaho		(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).) Radioisotopes Laboratory University of Idaho Moscow, Idaho	
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Agricultural Chemistry Department		3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.) Renewal #11-197-3 (with Amendments 1,2,3 and 4)	
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.) Duane J. Le Tourneau		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.) Duane J. Le Tourneau	
6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.) (A) Calcium-45 (B) Sodium-24 (C) Sulfur-35 (D) Chlorine-36 (E) Phosphorus-32 (F) Strontium-90 (G) Cesium-137		(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.) (A) any (A) 20 millicuries (B) any (B) 5 millicuries (C) any (C) 100 " (D) any (D) 2 " (E) any (E) 3 curies (F) any (F) 2 millicuries (G) any (G) 2 "	
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.) (A) AND (B): To study calcium and sodium ion movement in slick-spot soils. (C), (D) AND (E): To be used as tracers in soil and plant nutrient studies in replicated field experiments, in the laboratory and in greenhouses. (E): Also for agricultural field studies. (F) AND (G): To be used for instrument standardization.			

35308

DUPLICATE

(Continued on reverse side)

Form AEC-313 (5-58)

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			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

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 ²)	USE (Monitoring, surveying, measuring)
See; supplemental sheets.					

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

See: supplemental sheets.

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

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 See: supplemental sheets.
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. See: attachment.
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 JUN 12 1961

By: Kenneth A. Dick
 Kenneth A. Dick, Comptroller
 University of Idaho

Title of certifying official _____

U.S.A.E.C.
 Isotopes Branch
 Div. of L & R

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.

10.

Radiation Detection Instruments

Type of Instruments	Number	Radiation Detected	Sensitivity mr/hr	Window Thickness	Use
Survey meters-El. Tronics, sm-3	1	alpha, beta, gamma	0-0.2 0-2.0 0-20	less than 2 mg/cm ²	monitoring surveying
Tracerlab, Su-14	2	"	0-0.25 0-2.5 0-25	less than 2 mg/cm ²	"
Atomic Accessories, Model SM-131	2	"	0-5 0-50 0-500	less than 2 mg/cm ²	"
Baird-Atomic Model 414, Logarithmic	1	beta, gamma	3-3000	0.9 mg/cm ²	"
Auto Scaler, Tracerlab SC-1B	1				measurement
RCL Scaler, Radiation Counter Laboratories, Mark 13, Model 1	1				"
Baird-Atomic Model 123 G-M Scaler	5				"
Baird-Atomic Model 2010 Scaler	1				"
Windowless Flow Counter, Radiation Counter Labs	1	alpha, beta, gamma			"
Scintillation Detector, Nuclear, Chicago	1	beta, gamma			"
Baird-Atomic Model, 810A wall type scintillation Detector.	1	"			"
Pulse Height Analyzer, Tracerlab, RL1-6SR					"

35308

11-197-3
5

Radiation Detection Instruments

Type of Instruments	Number	Radiation Detected	Sensitivity mr/hr	Window Thickness	Use
Baird-Atomic Model, A-2-17B Single Channel Scintillation Spectrometer	1				measurement
Rate Meter, Tracerlab, Sc34Bd	1				"
Carbon Counter, Tracerlab, Sc55	1	alpha, beta, gamma			"
Windowless Flow Counter, Tracerlab Sc166	1	alpha, beta, gamma			"
Baird-Atomic Model 822B Stand and End Window GM Tubes	5	"		less than 2 mg/cm ²	"
Baird-Atomic Model 821B Micro-Thin End Window Flow Counter	1	"			"
Baird-Atomic Model 410 Count Rate Meter	1				"
Atomic Accessories Model RSC-5A Chromatogram Scanner with Recorder	1				"
Atomic Accessories Model ND-191-BF ³ Neutron Counter	2	neutrons			"

Approved
11/19/53

Append 5
11-191-3

11.

Flow counters, carbon counter and GM tubes will be calibrated once a day, when in use, against standards in New England Nuclear Model 1225 Beta Reference Source Sets. Scintillation detectors will be calibrated, once a day when in use, against standards in a New England Nuclear Model 1230 Gamma Reference Source Set. Calibration of Atomic Accessories Model SM-131 survey meter will be calibrated, once a day when in use, against standard source supplied with the instrument. The Baird-Atomic Model 414 Logarithmic Survey Meter is factory calibrated and will be calibrated, once a day when in use, by following secondary calibration procedure recommended in the manufacturer's instruction manual.

In addition, the survey meters will be calibrated once a semester against the 1 mc. Co⁶⁰ sealed source.

13. Facilities and Equipment - Radioisotopes Laboratory Building

1. Radiochemical Laboratory

Two hoods, benches, distilled water, waste disposal cans for "hot" and normal waste, chemical glassware, chemicals and general laboratory supplies, gas, H and C water, balances, remote pipettor, two Atomic Accessories Model RHT-60-3 remote handling tools, 25 Atomic Accessories Model LB-24 lead bricks and:

3	Atomic Accessories Model	AB-23	absorber sets
1	"	"	" L-75 Isotope Analysis Kit (electroscope)
10	"	"	" IF-1 indium foils
2	"	"	" PC-14 planchet storage cabinets
1000	"	"	" NP-11 nickel plated cupped planchets
1000	"	"	" LT-16 lusteroid well counter tubes
5	"	"	" PF-44 plancet forceps
5	"	"	" RD-43 Ring and disc sets
1	"	"	" SPP-69 sample spinner
20	"	"	" TMP-74 micropipette transfer (2 ea. 1 , 2 , 5 , 10 , 25 , 50 , 100 , 250 , 500 , and 1 ml.)
1	"	"	" RP-65 remote pipettor
1	Western Radiation Lab		S-200 lead container for 1 mc Co ⁶⁰ - to be supplied with Co ⁶⁰
1	Atomic Accessories Model	LS-62	lead shield and collimator
10	"	"	" BSS-35 shielded syringe (0.10 cc)
1	"	"	" SL-71 education source kit
2	"	"	" RRT-60-3 remote handling tools
1	Curtiss-Wright Neutron	Howitzer	

2. Preparation Laboratory

Carver Press, balance, Wiley Mills, large waste cans

3. Counting Room

1	Baird-Atomic Model	255	non-overloading proportional amplifiers
5	"	"	960 dual purpose precision timers
5	"	"	800D low background iron shields
1	Atomic Accessories Model	RRMA-X-X51	single channel recorder
1	Baird-Atomic Model	812	scintillation probe
1	Atomic Accessories Model	L-24K-58	Landsverk charger
2	"	"	" AGR-28 pressure regulators

4. Storage Rooms - 2

Steel safe for isotopes storage, air conditioner

5. Dark Room

Enlarger, mechanical developer, printer, safe lights, refrigerator, developing pans, racks

6. Office

Desk, chairs, filing cabinet, shelving, table

7. Lavatory and wash-up facilities

8. Waste storage pit - concrete lined 5'x5'x5', underground, at rear of building

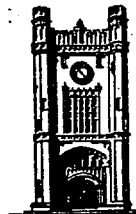
Item 15.

Disposal of waste will be carried out according to the attached, "Regulations Governing the Safe Handling of Radioactive Isotopes at the University of Idaho." Facilities include a waste storage pit (see Item 13) and a burial ground. Disposal in the burial ground will be made according to the requirements of the Federal Register, Jan. 29, 1957, Title 10, Part 20, Section 20.304.

Amend 3
11-197-3

UNIVERSITY of IDAHO

MOSCOW, IDAHO



College of Agriculture
Department of Agricultural Chemistry

June 9, 1961

Mr. James R. Mason
Chief, Isotopes Branch
Division of Licensing & Regulation
U. S. Atomic Energy Commission
Washington 25, D.C.

Dear Mr. Mason:

Attached to this letter are 3 copies of AEC form AEC-313 for renewal of Byproduct Material License 11-197-3.

I realize that the renewal request is somewhat late; however, at the present time we do not have any isotopes in our possession under this license.

While there are no changes listed in the renewal application, several items of equipment have been added and the facilities of the Radioisotopes Laboratory have been improved. I have therefore filed with the renewal application a more complete listing of the facilities and equipment available under items 10, 11, and 13 of Form AEC-313.

In addition to Byproduct License Number 11-197-3, the Department of Physical Sciences, University of Idaho, holds Byproduct License Number 11-197-2 (D64). Individual users under this license are Dr. Peter Freeman and Dr. Elmer Raunio.

Please notify me if further information is needed.

Very truly yours

Duane Le Tourneau

Duane Le Tourneau
Associate Agr. Chemist

D LeT/g

35308

UNIVERSITY OF IDAHO
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION
MOSCOW, IDAHO

DEPARTMENT OF AGRICULTURAL CHEMISTRY

February 21, 1961

1057

11-197-3 Am # 4

Isotopes Branch
Division of Licensing & Regulation
U. S. Atomic Energy Commission
Washington, D. C.

Gentlemen:

For the past several years Dr. J. V. Jordan, Agricultural Chemistry Department, University of Idaho, Moscow, Idaho, has been primarily responsible for the handling of license number 11-197-3 and the procurement of isotopes under this license. Dr. Jordan has now left the University of Idaho and I have assumed primary responsibility. My name was added to the license as amendment No. 3 after I had completed a course of training at the Oak Ridge Institute of Nuclear Studies.

In checking through the file left by Dr. Jordan, I have noted that the expiration date of the original license is listed as Mar. 31, 1960. In checking through the correspondence I found a letter dated Feb. 2, 1960, from Dr. Jordan which indicates that the license in its entirety was amended so that the expiration date is now June 30, 1961. I cannot find this amendment in the files nor can I find amendments No. 1 and No. 2 to the original license. If copies of these amendments are available, I will greatly appreciate receiving copies. I expect it is also necessary to amend the license to delete Dr. Jordan's name.

In another item of correspondence dated Jan. 29, 1960, and signed by James R. Mason, Chief Isotopes Branch, Division of Licensing and Regulation, it is stated that application for renewal of the license should be filed at least 30 days before the expiration date of the existing license. I would like copies of the necessary forms so that the application for renewal can be filed.

In addition, we are currently contemplating some experiments with rubidium-86. I would therefore appreciate receiving the necessary forms so that this change might be made in the future.

Since Dr. Jordan's departure I have also been designated the Radiological Safety Officer of the University of Idaho. I would like to receive copies of the latest version of Title 10, Part 20, Rules and Regulations, Standards for Protection against Radiation. I would also appreciate being placed on the mailing list to receive revision of these rules and regulations and any other bulletins, publications or changes in rulings as they become available.

Thank you for your assistance in these matters.

Very truly yours

Duane Le Tourneau

Duane Le Tourneau
Associate Agricultural Chemist

D LeT/G

DUPLICATED
FOR DIV. OF COMPLIANCE

22201

UNIVERSITY OF IDAHO
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION
MOSCOW, IDAHO

DEPARTMENT OF AGRICULTURAL CHEMISTRY

August 24, 1960

Chief, Isotopes Branch
Bureau of Licensing & Regulation
Washington 25, D.C.

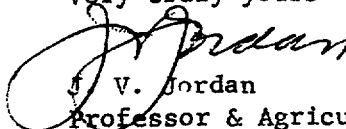
Dear Sir: Re: License 11-197-3 Amendment No. 2 (F-61)

This has reference to the above license issued to the Agricultural Chemistry Department, University of Idaho, Moscow, Idaho, and expiring June 30, 1961.

Please refer to Item 13 in which G.D. Wyer is listed. We would like to amend the license by replacing G.D. Wyer with Dr. D. J. Le Tourneau. Mr. Wyer has resigned his position here. Dr. Le Tourneau has been on the departmental staff for several years and in August, 1959, attended a course of instruction at the Oak Ridge Institute of Nuclear Science in the safe handling and techniques of using radioactive materials. Dr. Le Tourneau is well qualified to conduct experimental studies using tracer levels of radioisotopes.

Will you please give this your early consideration?

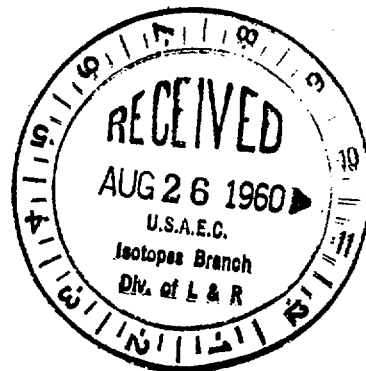
Very truly yours



J. V. Jordan
Professor & Agricultural Chemist

JVJ/g

cc/Radioisotopes
Committee



DUPLICATED
FOR DIV. OF INSP.

28803

Am # 2 11-197-3

UNIVERSITY OF IDAHO
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

8072

MOSCOW, IDAHO

September 30, 1959

DEPARTMENT OF AGRICULTURAL CHEMISTRY

WSC

19161

11-197-3

Mr. Robert E. Brinkman
Senior Licensing Reviewer
Isotope Branch
Division of Licensing Regulation
U. S. Atomic Energy Commission
Washington 25, D.C.

Dear Mr. Brinkman:

Your letter of September 15, 1959, addressed to Dr. J. V. Jordan, has been referred to me as he is currently away from the campus.

After talking to the chairman of the radioactive isotope committee for the University of Idaho and referring to Dr. Jordan's correspondence, I am enclosing the copies of the material that I believe is requested by your office. The enclosed material represents the material as written and approved by the members of the isotope committee last spring semester. These regulations were not approved by other University officials during the summer. They were given to the executive committee of the University after your letter of September 15. They were approved by this committee on September 28, 1959.

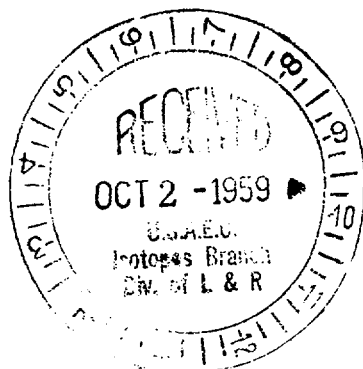
Please contact me if any further materials are necessary to complete Dr. Jordan's application.

Sincerely yours

D. J. Le Tourneau

D. J. Le Tourneau
Associate Agricultural Chemist

DJ LeT/g



UNIVERSITY OF IDAHO
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

MOSCOW, IDAHO

DEPARTMENT OF AGRICULTURAL CHEMISTRY

May 26, 1959

4970

U. S. Atomic Energy Commission
Division of Licensing & Regulation
Isotopes Branch
1717 "H" Street N. W.
Washington 25, D. C.

Gentlemen:

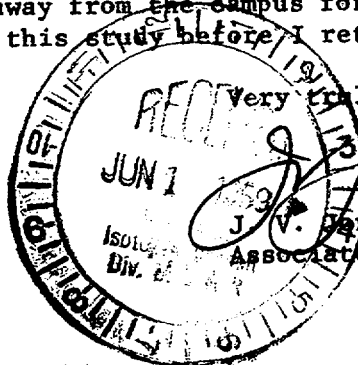
License: 11-197-3060

We wish to amend our License 11-197-3060 to include the byproduct materials Cs-137 and Sr-90.

Details are described on the attached AEC-313 form. Note that Mr. G. D. Wyer has been added as an individual user since this is a joint project in the same department at the University. I will be away from the campus for several months and Mr. Wyer will begin this study before I return.

cc: Prof. Jobe, Chr.
Radioisotopes Committee

Very truly yours
J. V. Jordan
J. V. Jordan
Associate Agric. Chemist



19161

2142 11-197-3

Form AEC-313 (5-58)		ATOMIC ENERGY COMMISSION		Form approved. Budget Bureau No. 38-R027.3.	
APPLICATION FOR BYPRODUCT MATERIAL LICENSE					
<p>INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.</p>					
1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)		(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)			
University of Idaho Moscow, Idaho					
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.)			
Agricultural Chemistry		application for amending license 11-197-3060. See letter of May 26 attached.			
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.)			
J.V. Jordan G.D. Wyer - see Items 8 & 9		J.V. Jordan			
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 Cesium137-Barium137m		any form, 2mc. max. any form, 2 mc. max.			
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.)					
for standardization of pulse height analyzer and detectors during assay for Sr90 and Cs137 in agricultural products and soils.					

DUPLICATED
FOR DIV. OF INSP

19161

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)
G.D. Wyer				
a. Principles and practices of radiation protection	Univ. of Idaho	2 yr.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
b. Radioactivity measurement standardization and monitoring techniques and instruments	"	2"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
c. Mathematics and calculations basic to the use and measurement of radioactivity	"	"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
d. Biological effects of radiation	"	"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
P32	2 mc.	Univ. of Idaho	2 year	{ tracers in soil and plant studies
S35	30 mc.	"	"	

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 ²)	USE (Monitoring, surveying, measuring)
SAME AS FOR J.V. JORDAN					

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

SAME AS FOR J.V. JORDAN

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

SAME AS FOR J.V. JORDAN

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

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 ☒ SAME AS FOR J.V. JORDAN

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. " " "

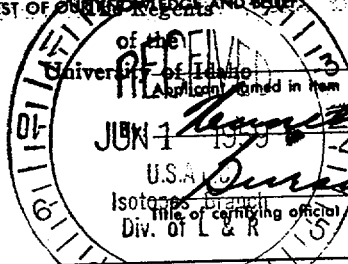
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. If otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

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 20 AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

MAY 26 1959

Date



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.

UNIVERSITY OF IDAHO
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

MOSCOW, IDAHO

March 26, 1958

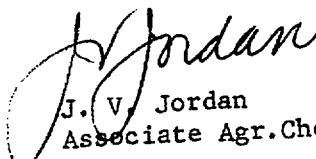
DEPARTMENT OF AGRICULTURAL CHEMISTRY

Isotopes Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
1717 H St., N.W.
Washington 25, D.C.

Gentlemen: Re: Renewal of License 11-197-1 and 3

Enclosed are 3 copies of AEC form 313 requesting a renewal of license 11-197-1, 3. Actually, I am not certain as to whether the affixes 1 and 3 are correct; however, on the form 313 I have listed the isotopes and possession limits we are currently permitted. License 11-197-2 regarding C-14 does not expire until May 31, 1959.

Very truly yours


J. V. Jordan
Associate Agr. Chemist

JVJ/g
cc/Dr. Gurevitch
Radioisotopes Committee

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tenn. Attention: Isotopes Extension, Division of Civilian Application. 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.) University of Idaho Moscow, Idaho	(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Agricultural Chemistry Department	3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.) Renewal for 11-197-1, and 3
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.) J. V. Jordan Associate Agricultural Chemist	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.) J. V. Jordan

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.) P-32 S-35 Cl-36 Na-24 Ca-45	(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.) any, 3 curies " 100 mc. " 2 uc. " 5 mc. " 20 mc.
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FOR DIV. OF INSP.

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.)

P-32 is used for uptake studies by "sick" and vigorous alfalfa in N. Idaho.

~~**Cl-36 for organic syntheses - advanced class use.**~~

S-35, Na-24, Ca-45 for tracing moisture movement in "sick spot" soils.

9537

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			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

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 ²)	USE (Monitoring, surveying, measuring)

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

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

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.

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 26 March 1958

Applicant named in item 1
 By: Kenneth A. Dick
Kenneth A. Dick
Director
 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.

11-197-X 8447
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UNIVERSITY OF IDAHO
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION
MOSCOW, IDAHO

DUPLICATE
FOR DIV. OF INSP.

January 13, 1958

DEPARTMENT OF AGRICULTURAL CHEMISTRY

Isotopes Extension
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Oak Ridge, Tennessee

Gentlemen:

Your reference: IEB:RWS(8362)

Thank you for your letter of January 9. I do not recall seeing these questions before, and if I did not reply to your letter of February 20, 1957, it was certainly an oversight for which I apologize.

Your question #1: Enclosed. There is an active Radioisotopes Committee on the campus which reviews tracer projects and levels of activity to be used.

#2: Such field experiments are in relatively isolated areas. If run on an experiment station, then the immediate area is properly posted. If the experiment is on a privately owned farm, the experimental area is fenced with 4 ft. high angle steel posts and 2 strands of barbed wire. The area is also posted with the regulation sign in weatherproof holder.

#3: These are small experiments and I have been applying the fertilizer personally. However, one other person is always present for operating the survey meter. Overalls are standard clothing; nose and mouth masks are worn to minimize hazard of breathing and ingesting dust; and rubber gloves are worn. Clothing and boots are monitored following operations. Overalls are removed in the field, rolled and put in a paper bag, and washed at the radioisotopes laboratory.

#4: Yes. However, phosphorus is not a very mobile element in soil and under the 25-inch rainfall in our areas, falling mainly in fall, winter and early spring, runoff has not been a factor. Field experiments are not run anywhere near wells, which are the main potable water sources in this area.

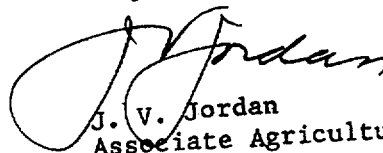
#5: The plots are 50 ft. long by 6 ft. wide, but the tracer is confined to 4 rows, each 50 ft. long and 6 in. apart, or to an area of about 100 sq.ft., or 0.18 lbs. P_{205} per plot. The concentration of P-32 per sq.ft. soil is $\frac{0.18}{100} = 0.0018$ lbs. P_{205} , or 0.8154 gms. P_{205} . When the fertilizer leaves Beltsville it reportedly has a specific activity of 0.15 mc/gm. P_{205} . Hence the P_{205} concentration per sq.ft. of soil theoretically would be 0.12 mc/sq.ft. However, the tracer is not applied for 10 days to 2 weeks following the pile-dated activity, so the conc. of P-32/sq.ft. is further reduced.

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FOR DIV. OF AG.
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Isotopes Extension
1/13/1957

#6: The fertilizer is never applied during windy weather. Dust hazard during application is minimized by first adding moist soil to the measured fertilizer increment before application. Nose and mouth respirators further minimize the dust hazard. Plant samples are rinsed off before analysis.

I hope this answers your questions satisfactorily and that you can review favorably our application for extension.

Very truly yours


J. V. Jordan

Associate Agricultural Chemist

JVJ/g