AEC-314a
(3-68)

UNITED STATES ATOMIC ENERGY COMMISSION

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CERTIFICATE - DISPOSITION OF RADIOISOTOPES

LICENSEE (Institution, Firm, Hospital, Person, etc.)

University of Idaho
Moscow, Idaho 83843

LICENSE NUMBER 11-197-9

EXPIRATION DATE
October 31, 1968

Attention: Dr. Howard Loewenstein
Associate Professor Forestry

Gentlemen:

ADDRESS (if same as above write same)	DEPARTMENT(S)
SAME	COLLEGE OF FORESTRY

INDIVIDUAL RADIOISOTOPE USER(S)

HOWARD LOEWENSTEIN

CERTIFICATION

The licensee and any individual executing this certification on behalf of the licensee certify that (check appropriate item(s) below):

☐ NO BYPRODUCT MATERIALS HAVE BEEN PROCURED AND/OR POSSESSED BY LICENSEE.

OR

ALL BYPRODUCT MATERIALS PROCURED AND/OR POSSESSED BY LICENSEE UNDER BYPRODUCT MATERIAL LICENSE NO. 11-03197-09 HAVE BEEN:

☐ (1) TRANSFERRED TO (state name or institution, firm, hospital, person, etc.)

WHICH HAS BYPRODUCT MATERIAL LICENSE NO. _____

☐ (2) DISPOSED OF BY DECAY.

☐ (3) DISPOSED OF IN COMPLIANCE WITH THE PROVISIONS OF 10 CFR 20.

☑ (4) LICENSED UNDER LICENSE NO. 12A-04-1 ISSUED BY IDAHO AN AGREEMENT STATE PURSUANT TO SECTION 274 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED.

REMARKS: (If additional space is needed use reverse side)

B14

SIGNATURE OF CERTIFYING OFFICIAL

/s/ Howard Loewenstein

DATE 12/6/68

UNIVERSITY OF IDAHO

MOSCOW, IDAHO 83843

College of Forestry,
Wildlife and Range Sciences

December 6, 1968

Mr. Richard E. Cunningham, Chief
Isotopes Branch
Div. of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Cunningham:

In connection with your letter of December 3 concerning the expiration of our Radioisotope License, I am enclosing a photocopy of a letter from John E. Bowyer which explains the situation. We have been granted a State of Idaho Radioactive Material's License (IDA-04-1) as of October 28, 1968.

Sincerely,

Howard Loewenstein, Prof.
Forestry

HL:clg
Enc.

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

October 8, 1968

University of Idaho
College of Forestry, Wildlife
and Range Sciences
Moscow, Idaho 83843

Attention: Prof. Howard Loewenstein

Gentlemen:

The Commission has entered into an agreement with the State of Idaho whereby the State assumed regulatory authority over byproduct material (radioisotopes) licensing October 1, 1968. Your application has been transmitted to Mr. Jerry L. Yoder, Chief, Radiological Health, Statehouse, Boise, Idaho 83707, for appropriate action. Future communications within the State of Idaho should be directed to that organization.

The enclosed Part 150, "Exemption and Continued Regulatory Authority in Agreement States Under Section 274," Title 10, Code of Federal Regulations, explains the areas of regulatory authority retained by the Commission and those areas turned over to the State.

Sincerely,

John E. Bowyer

John E. Bowyer
Isotopes Branch
Division of Materials
Licensing

Enclosure:
10 CFR 150

cc: Mr. Jerry L. Yoder, Chief
Radiological Health Section
Idaho Dept. of Health

H III
INITIAL

PART 1

Inspector: Hyder

Date of Inspection: 7-17-68

Licensee: Univ of Idaho
Forestry Wildlife etc

Address: Moscow Idaho

License No.: 11-197-9

II:

AEC-591 ✓

A. Clear case (Initial/Reinsp)_____

B. Clear case (F/U of 592)_____

C. Noncompliance case ✓

III:

AEC-417_____

A. Immediate threat to Public Health and Safety_____
B. More than nominal sum of money_____
C. Involve more than 90 days_____
D. Particular complexity_____
E. Licensing problems_____
F. Problems of policy or interpretation_____
G. "Notice of Alleged Violation" or other enforcement_____
H. Uncorrected previous noncompliance_____
I. Multiple license case (number that could have been handled on 591 or 592 but were included in a 417)_____
J. Discretion of Field Office_____
K. Involve safety items_____

~~IV~~

AEC-592_____

A. Involves nonsignificant risk_____

B. Involves significant risk_____

PART 2

Date Dispatched JUL 24 1968

Suspense Date_____

V and VI:

1. Adequate reply received from licensee:

_____; Copy to L&R for info_____
(Date)

2. Inadequate reply received from licensee:

Forwarded to L&R for action_____
(Date)

3. No reply received from licensee and forwarded to L&R for action

Note: If F/U is made on No. 1, 2, or 3 above, check a. or b. below:

a. F/U shows satisfactory corrective action: cy AEC-591 to L&R for info

b. F/U shows incomplete corrective action: TWX report to L&R_____

VII:

ELAPSED DAYS INFO:

No. of days from date of Inspection to issuance of AEC-592:

10 or less___; 11 to 15___; 16 to 20___;

21 to 25___; over 25_____

From issuance of AEC-592 to licensee reply:

20 or less___; 21 to 30___; 31 to 40___;

over 40_____

From Inspection date to date of F/U Inspection: 20 or less_____; 21 to 40_____; 41 to 60_____; 61 to 90_____; 91 to 120_____

VIII:

Additional follow-up by agreement with L&R

_____

SPECIAL LIMITED INSPECTION

1. Name and address of licensee
Univ of Idaho
College of Forestry, Wildlife and Range Sciences
Moscow, Idaho 83843

2. Date of inspection
7-17-68

3. Type of inspection
I

4. License number(s), docket number(s), number and date of last amendment for each license. Category and Priority of each license
11-00197-09
Amend #1 4-18-68

5. Date of previous inspection
None

6. Is "Company Confidential", or proprietary, or classified information contained in report?
Yes _____ No ✓
(Specify paragraphs)

Accompanied by: Newell Maughan Idaho State Dept of Health

7. Scope of inspection
Discussion of Program
Review of Records
Tour of Facilities

8. Hyder
Inspector

8-7-68
Date of Report

Reviewer

Date of Review

Licensee U of Idaho 11-197-9

Summary

N/C 591 issued

This is mainly a seminar program

Noncompliance and Safety Items

Records of surveys performed on potentially contaminated waste prior to disposal not maintained.

Unusual Occurrences

No reported

Status of Previously Reported Noncompliance or Safety Items

No previous Inspection

Management Interview

N/C 591 issued to & Signed by Dr H.W. Steffens Academic V.P.

Licensee U of Idaho 11-197-9

DETAILS

A. Participants

Dr H. Loewenstein User
Dr Pitkin Assistant to Dr Loewenstein
Dr W.W. Steffens Academic V.P.

B. Scope of License Program

P-32, Sc-46 & Ta-182 used in Summer for Field Studies

C. Organization

State University

D. Administrative Control

User reports to University Administration

E. Use of Material

P-32 plant uptake studies
Sc-46 used to tag seeds
Ta-182 will be tag gophers

Licensee U of Idaho 11-197-9

F. Facilities

Average chem Lab
Materials stored in lock room
at Univ. Nursery

G. Equipment

~~M~~
Nuclear Chicago Model 2650 Gm 5 m
N/C anti proportional counter
~~##~~ See attached Reprint

H. Radiological Safety Procedures

Materials used by graduate student
under Dr Lorenzini in strict
supervision
Field studies at remote locations

I. Personnel Monitoring and Exposure to External Radiation

Nuclear Chicago Film badges monthly
< 200 mrem Total 1967
No detectable Exposure 1968

J. Exposure of Employees to Concentrations of Radioactive Materials

P-32 in dilute solution
Sc-46 ~ 2 mc on wool
Ta-182 ~ 100 mc/wire
(handled with Tongs)

Licensee U of Idaho 11-197-9

K. Effluents to Unrestricted Areas

P-32 injected into soil

L. Disposals

most waste stored
Some paper & gloves, etc disposed after survey (no records of survey)

M. Miscellaneous Surveys, Evaluations, and Records

Frequent lab surveys recorded in experiment Note books

N. Special License Conditions

None

O. Posting and Labeling

All CRM RAD

Licensee U of Idaho 11-197-9

P. Independent Measurements

None made

Q. Operations Observed

None observed

R. Incidents, Overexposures, Theft or Loss, Equipment Malfunction

one gopher believed carried off by bob cat [gopher Tagged with ~100 nc Ta-182

S. Other Information or Continuation from Previous Paragraphs

H III
R(4)

PART 1

Inspector: Hyder

Date of Inspection: 7-17-68

Licensee: Univ of Idaho
Dept Agricul. Biochem

Address: Moscow Idaho

License No.: 11-197-3

II:

AEC-591 ✓

A. Clear case (Initial/Reinsp) ✓

B. Clear case (F/U of 592)_____

C. Noncompliance case_____

III:

AEC-417_____

A. Immediate threat to Public Health and Safety_____
B. More than nominal sum of money_____
C. Involve more than 90 days_____
D. Particular complexity_____
E. Licensing problems_____
F. Problems of policy or interpretation_____
G. "Notice of Alleged Violation" or other enforcement_____
H. Uncorrected previous noncompliance_____
I. Multiple license case (number that could have been handled on 591 or 592 but were included in a 417)_____
J. Discretion of Field Office_____
K. Involve safety items_____

IV:

AEC-592_____

A. Involves nonsignificant risk_____

B. Involves significant risk_____

PART 2

Date Dispatched JUL 24 1968

Suspense Date_____

V and VI:

1. Adequate reply received from licensee:

_____; Copy to L&R for info_____
(Date)

2. Inadequate reply received from licensee:

Forwarded to L&R for action_____
(Date)

3. No reply received from licensee and forwarded to L&R for action

Note: If F/U is made on No. 1, 2, or 3 above, check a. or b. below:

a. F/U shows satisfactory corrective action: cy AEC-591 to L&R for info

b. F/U shows incomplete corrective action: TWX report to L&R_____

VII:

ELAPSED DAYS INFO:

No. of days from date of Inspection to issuance of AEC-592:

10 or less___; 11 to 15___; 16 to 20___;

21 to 25___; over 25___

From issuance of AEC-592 to licensee reply:

20 or less___; 21 to 30___; 31 to 40___;

over 40___

From Inspection date to date of F/U Inspection: 20 or less___; 21 to 40___; 41 to 60___; 61 to 90___; 91 to 120___

VIII:

Additional follow-up by agreement with L&R

_____

SPECIAL LIMITED INSPECTION

1. Name and address of licensee

Univ of Idaho
Dept of Agricultural
Biochemistry & Soils
Moscow Idaho

2. Date of inspection

7-17-68

3. Type of inspection

RI

4. License number(s), docket number(s), number and date of last amendment for each license. Category and Priority of each license

11-00197-03

Amendment #10 7-19-67

5. Date of previous inspection 6/20/66

6. Is "Company Confidential", or proprietary, or classified information contained in report?

Yes _____ No ✓

(Specify paragraphs)

7. Scope of inspection

Accompanied by Newell Maughan
Idaho State Dept of Health

Review of Records
Discussion of Program
Tour of Facilities

8. Hyder
Inspector

8-7-68
Date of Report

JWM
Reviewer

8/8/68
Date of Review

Licensee U of Idaho 11-197-3

Summary

clear 591 issued

Inactive Program

Noncompliance and Safety Items

clear 591 issued

Unusual Occurrences

None reported

Status of Previously Reported Noncompliance or Safety Items

6/20/66 containers not properly labelled

7/17/68 only material on hand labeled CRM + X QD

Management Interview

clear 591 issued to

Dr H W Steffen - Academic V.P.

Licensee U of Idaho 11-197-3

DETAILS

A. Participants

Dr. Duane LeTourneau user

B. Scope of License Program

Inactive program for past 2 years

C. Organization

State University

D. Administrative Control

User reports to University Administration

E. Use of Material

only activity since last inspection Burial of Waste 7/27/66

Licensee U of Idaho 11-197-3

F. Facilities

Radiochem Labs

G. Equipment

Has just obtained
Beckman model LS 100
Liquid Scintillation

H. Radiological Safety Procedures

Hopes to start Isotope program
Fall 68

I. Personnel Monitoring and Exposure to External Radiation

None

J. Exposure of Employees to Concentrations of Radioactive Materials

None

Licensee U of Idaho 11-197-3

K. Effluents to Unrestricted Areas

None

L. Disposals

burial of uc amount of several isotopes on 7/27/66

M. Miscellaneous Surveys, Evaluations, and Records

No radiological work

N. Special License Conditions

O. Posting and Labeling

counting Standards

CRM KAD

Licensee U of Idaho 11-197-3

P. Independent Measurements

None made

Q. Operations Observed

None observed

R. Incidents, Overexposures, Theft or Loss, Equipment Malfunction

no identified

S. Other Information or Continuation from Previous Paragraphs

To File

Thru C. D. Brown

University of Idaho Moscow Idaho

Lic Nos. 11-00197-03, -09

Health & Safety

Announced inspection conducted July 17, 1968. 11-00197-03 has been inactive for last 2 years.

11-00197-09 used limited amounts of P-32, @ Sc-46, and Te 132 for field studies. All field work at remote locations

No Health & Safety problems likely

Reinspect third 1/4 July 1970.

J E Hyder

To: File

Date: July 13, 1966

From: Eugene D. McFall, Radiation Specialist
Region IV, Division of Compliance, Denver

Subject: UNIVERSITY OF IDAHO, MOSCOW, IDAHO - LICENSE NOS. 11-197-6 AND SNM-433 - HEALTH AND SAFETY EVALUATION

The subject licensee was visited on June 21, 1966. Mr. G. A. McKean, Radiation Protection Officer, was the principal interviewee during the inspection. It was observed that the licensee controls access to all areas where licensed materials are used. Access is controlled by the authorized users under the subject licenses. There has been no loss or theft of licensed material at the University of Idaho.

There appeared to be no health and safety problems associated with the storage and use of licensed material at the University of Idaho.

E. O. McFall

3-IV
R(1)

PART 1 Inspect _____

Date of Inspection: 6/20/66

Licensee: Un. of Idaho

Address: Moscow, Idaho

License No.: 11-197-6

II:

AEC-591_____

A. Clear case (Initial/Reinsp)_____

B. Clear case (F/U of 592)_____

C. Noncompliance case_____

III:

AEC-417_____

A. Immediate Public Health and Safety Threat_____

B. Expenditure of more than nominal sum for compliance_____

C. Excess of 90 days appears necessary to achieve enforcement_____

D. N/C items of particular complexity_____; Licensing problems_____; Requires Headquarters interpretation_____

E. Appropriate for "Notice of Alleged Violation"_____

F. Uncorrected previous noncompliance

_____

G. Other_____

IV:

AEC-592 ✓

A. Involves nonsignificant risk ✓

B. Involves significant risk_____

PART 2

Date Dispatched JUL 20 1966

Suspense Date_____

V and VI:

1. Adequate reply received from licensee:

_____; Copy to L&R for info_____
(Date)

2. Inadequate reply received from licensee:

Forwarded to L&R for action_____
(Date)

3. No reply received from licensee and forwarded to L&R for action

Note: If F/U is made on No. 1, 2, or 3 above, check a. or b. below:

a. F/U shows satisfactory corrective action:

cy AEC-591 to L&R for info_____

TWX report to L&R_____

b. F/U shows incomplete corrective action:

TWX report to L&R_____

VII:

ELAPSED DAYS INFO:

No. of days from date of Inspection to issuance of AEC-592:

10 or less___; 11 to 15___; 16 to 20___;

21 to 25_____; over 25_____

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over 40_____

From Inspection date to date of F/U Inspectic

20 or less_____; 21 to 40_____; 41 to 60___;

61 to 90 _____; 91 to 120_____

VIII:

Additional follow-up by agreement with L&R

_____

Reprinted from SOIL SCIENCE SOCIETY OF AMERICA PROCEEDINGS
Vol. 29, No. 3, May–June 1965, pages 328–329
677 South Segoe Road, Madison, Wisconsin 53711 USA

An Injection Probe for Rapid Placement of Radioisotopes in Soil[1]

H. LOEWENSTEIN

Abstract

Numerous time-consuming injections of radioisotopes in soil are required in certain studies utilizing tracer techniques. The injection probe described herein retains desirable features of earlier models, but allows placement of the tracer to proceed at a greatly accelerated rate.

APPARATUS USED to place radioisotopes in soil should meet the triple requirements of safety, accuracy, and rapidity. Murdock and Engelbert,[2] Nakayama and van Bavel,[3] and others have devised injection probes which satisfy the first two criteria. If a large number of injections are necessary, however, time spent in applying radioisotopes with these probes may become prohibitively long. In connection with a study of tree seedling root development, the author has developed a modified probe which makes possible a very rapid injection rate, while at the same time maintaining the essential attributes of safety and accuracy.

The injection probe is schematically presented in Fig. 1. The outer sheath is fashioned from 1/4-inch outside diam stainless steel tubing, 36 inches in length. Projecting 1½ inches from the bottom and running inside the full length of the outer sheath is a tube made of 1/8-inch outside diam stainless steel. Two ports (1/16 inch diam) for ejection of the radioisotope solution are drilled opposite one another in the portion of the inner tube extending beyond the outer sheath. As in the Murdock and Engelbert probe, the tip bears a small pointed cap (3/8-inch outside diam stainless steel). The exposed lower end of the inner tube is thus the narrowest portion of the device, and plugging of the ports with soil does not occur.

A "T" handle of stainless steel tubing, 9 inches in length and ½ inch in diameter, is welded to the outer sheath 2½ inches from the top to facilitate insertion and withdrawal of the probe.

Unique to this probe is the stainless steel platform used to support a reservoir bottle containing the supply of radioisotope solution. This platform is soldered to the sheath, 6 inches below the handle. The edges are bent upward to prevent the bottle from slipping off. Dimensions of the platform should be determined after the bottles to be used are selected. Polyethylene bottles of about 500-ml capacity and approximately 3 inches in diameter have proven satisfactory. A steel clip, fastened to the outer sheath of the probe may be snapped around the neck of the reservoir bottle to insure rigid support.

A female Luer–Lok connector[4] is soldered to the top of the inner tube of the probe and projects above the outer sheath. This joint is strengthened by a stainless steel sleeve enveloping the top of the outer sheath and extending part way up the connector.

A major feature of this injection probe is the incorporation of the Cornwall Continuous Pipetting System and associated accessories[4] to facilitate rapid injection of solution into the soil. The assembly, as furnished by the manufacturer, consists of an automatic double valve connected to the bottom of a syringe (adjustable to deliver from ½ to 5 cc), and a stainless steel syringe holder topped by a steel plunger. In operation, this steel plunger is pushed against the glass plunger of the syringe itself. The base of the entire assembly is supplied with a male Luer–Lok connector. A simple twist firmly locks this connector to the female one atop the probe proper. The bottom outlet of the double valve leads to the probe, while the side outlet is connected to tygon tubing of sufficient length to reach the support platform. The end of this tygon tubing is attached to a glass tube long enough to reach the bottom

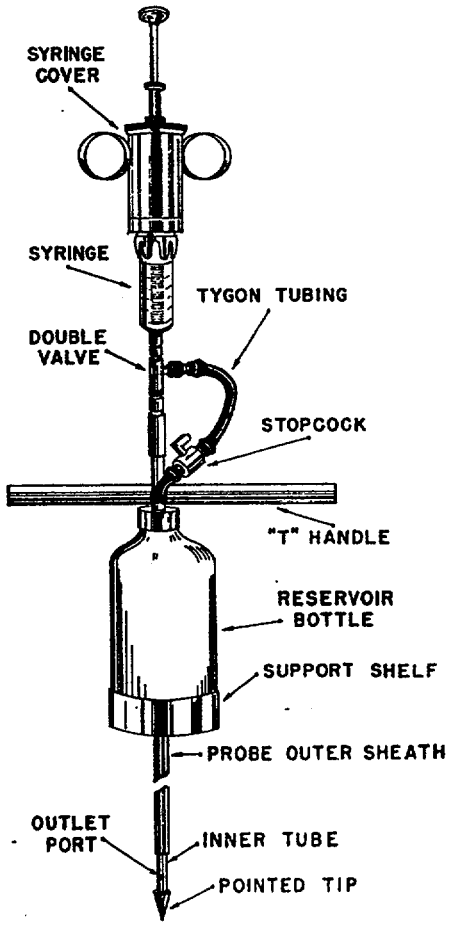


Fig. 1—Schematic drawing of radioisotope injection probe. Dimensions and materials used to fabricate the instrument are given in text.

[1] Contribution from the College of Forestry, Wildlife, and Range Sciences, University of Idaho, Moscow. Received Nov. 23, 1964. Approved Dec. 29, 1964.

[2] Murdock, J. T., and L. E. Engelbert. 1958. The importance of subsoil phosphorus to corn. Soil Sci. Soc. Amer. Proc. 22:53–57.

[3] Nakayama, F. S., and C. H. M. van Bavel. 1963. Root activity distribution patterns of sorghum and soil moisture conditions. Agron. J. 55:271–274.

[4] Manufactured by Becton, Dickinson and Company, Rutherford, New Jersey, and available from most scientific supply houses.

of the reservoir bottle. This glass tube passes through a rubber stopper about 1 inch from its upper end. An air hole should be bored in this stopper. When ready for use, the screw cap of the bottle containing the radioisotope solution is removed, the vessel is placed on the support platform and the glass tube is carefully inserted. The rubber stopper should fit securely in the neck of the bottle.

During early trials, leakage through the outlet ports was sometimes noted while the probe was being transferred from one injection site to another. This was traced to occasional faulty closure of the valve leading from the syringe to the reservoir. A one-way Luer–Lok type stopcock was then inserted in the line near the reservoir end of the tygon tubing. By keeping this stopcock closed during movement of the probe, leakage was completely eliminated.

In practice, the probe is inserted in the soil to the desired depth, as judged by markings etched into the steel outer sheath. The stopcock above the reservoir bottle is opened, and the plunger on the syringe slowly depressed, thus ejecting a predetermined amount of solution into the soil. As the plunger is released, the syringe is automatically refilled on the upstroke. The reservoir stopcock is then closed and the probe removed from the soil and reinserted at the next injection site. The entire operation takes but a few seconds. If 5 ml of solution is used per injection, one 500-ml reservoir bottle will be sufficient for approximately 100 injections. To expedite procedures, reservoir bottles in a quantity sufficient to furnish solution for the total number of injections planned should be filled beforehand in the laboratory. Decontamination of the probe and accessories is accomplished by repeated rinsings with water or an appropriate solvent.

In one study utilizing three of these probes, 1,600 five-ml injections were made at soil depths ranging from 3 to 24 inches. The entire operation was completed within 8 hours. No damage to probes was noted during this period of heavy use, no contamination problems were encountered, and the ease of operation precluded personnel fatigue.—H. LOEWENSTEIN, *Assoc. Professor of Forestry, University of Idaho, Moscow.*

1. University of Idaho
Moscow, Idaho 83843

2. June 20, 21, 1966

3. Reinspection

4. 20, 30, 40, 70

5. License No. 11-197-6, issued March 17, 1965, expiration March 31, 1967
License No. SNM-433, (Docket No. 70-481), issued May 31, 1963, expiration June 30, 1966

6. All pertinent records, as well as the facilities, equipment, instrumentation, etc., were reviewed and/or examined during the course of the inspection.

The items of noncompliance observed or otherwise noted during the course of the inspection are set out below:

License No. 11-197-6

Item No. 8, "Maximum amount of radioactivity which licensee may possess at any one time".
in that, 40 mc of C-14 were purchased on March 18, 1966, for a total possession of 47 mc of C-14, contrary to Item No. 8.A. of the license, which limits the quantity of C-14 that may be possessed at any one time to 40 mc. (See Paragraph 13)

License No. SNM-433

Condition No. 11.A., "Leak testing".
in that, during the period of May 9, 1963, to June 19, 1966, a 0.5-curie Pu-Be neutron source was not always tested for leakage and/or contamination at intervals of six months or less, contrary to Condition No. 11.A. of License No. SNM-433. (See Paragraph 23)

7. 5/9/63

8. No

Original Signed By
EUGENE D. McFALL

Initials — Inspector — JUL 20 1966 Date

Original Signed By
Roger T. Woodley

Initials — Reviewer — JUL 20 1966 Date

Inspection History

9. The licenses in effect at the University of Idaho were inspected on May 9 and 10, 1963. Minor items of noncompliance were observed and aForm AEC-591 was issued for each license.

Current Inspection

10. An announced, reinspection of License Nos. 11-197-2, -3, -4, -6, SNM-433, and SUD-632 was conducted on June 20 and 21, 1966. There were no items of noncompliance observed or otherwise noted for License Nos. 11-197-2, -4, and SUD-632 and a Form AEC-591 was issued for each license. There were two minor deficiencies observed while inspecting License No. 11-197-3 and a Form AEC-591 was issued. Items of noncompliance not covered by a Form AEC-591 were observed while inspecting License Nos. 11-197-6 and SNM-433. The principal interviewee during the course of the inspection was Mr. G. A. McKean, Radiation Safety Officer for the licensee. Authorized users under the various licenses were also interviewed during the inspection. The inspection findings were discussed with Dr. H. Walter Steffens, Academic Vice President; Mr. J. W. Watts, Business Manager; and Mr. McKean, at the conclusion of the inspection on June 21, 1966. The information contained in this report was observed or supplied by the aforementioned individuals and is reported in substance. It was observed while making the inspections that the previous items of noncompliance had been corrected.

Organization

11. The University is a land-grant school controlled by a Board of Reagents. The school's President is Dr. Ernest W. Hartung, Dr. H. Walter Steffens, Academic Vice President, has the overall responsibility for the use of isotopes on the campus. The University has established an Isotope Committee consisting of: Dr. Peter K. Freeman, Chemistry Department - Chairman; Dr. William Parish, Kirtley Laboratory; Dr. Donald Clifton, Department of Mines; Dr. Duane LeTourneau, Agricultural Chemistry Department; Dr. Clifford Forbes, Zoology Department; Dr. Elmer Raunio, Chemistry Department; Mr. George A. McKean, Engineering Testing Laboratory - Radiation Safety Officer.

12. According to Mr. McKean, the Committee has not met formally in over two years. However, informal discussions have been held concerning the use of licensed material. McKean did not know whether there were any notes available for the topics discussed at the last meeting.

Procurement and Inventory

13. Only C-14, in various liquid forms, has been procured by the licensee under License No. 11-197-6. Dr. R. M. Cook, the authorized user under Condition No. 12 of the license, stated that all licensed material has been procured from Volk Radiochemical Company and Nuclear - Chicago. Dr. Cook exhibited purchase receipts which revealed that the licensee received 40 mc of C-14 from ~~Abbott Laboratories~~ Nuclear - Chicago on March 18, 1966. An examination of the licensee's inventory records revealed that 7 mc's of C-14 were on hand in storage and contained animal waste at the time when the 40 mc of C-14 was received by the licensee on March 18, 1966. Dr. Cook was reminded that, according to Item No. 8 of License No. 11-197-6, the maximum amount of radioactivity which the licensee may possess at any one time is 40 mc of C-14. Dr. Cook stated that he was cognizant of the fact that he possessed more C-14 than authorized by the license. He stated that he planned on making several animal injections and the amount of material on hand after the injections would be less than 40 mc. He stated that he would subsequently write to DML and request Item No. 8 of the license be amended to authorize a possession limit of 100 mc of C-14. He stated that, in the future, he would pay more attention to the amount of material on hand prior to making a purchase.

14. An examination of inventory records of special nuclear material possessed under License No. SNM-433 revealed that no licensed material has been procured since the previous inspection conducted on May 9 and 10, 1963. The licensee continues to possess a 0.5-curie Pu-Be neutron source; a 1-curie Pu-Be neutron source; and, a 5-curie Pu-Be neutron source, for a total of 104 grams of plutonium encapsuled as Pu-Be neutron sources.

Program

15. Different C-14 labeled compounds are used in ruminant metabolism studies. The C-14 labeled compounds are synthesized with barium carbonate and subsequently injected into different animals at the dairy barn. Dilutions and injection preparations using C-14 are made in a ventilation hood inside Room 205 in the Dairy and Science Building. Blood samples are collected from injected animals several hours after an injection is made and are brought back to Room 205 where sample preparation and counting is conducted. Dr. Cook stated that there was no set frequency for injecting animals nor was there a set amount of C-14 used in the dose injected into the animals. He further stated that approximately 50% of C-14 injected into the animals was exhaled

as CO_2. Use records revealed that the blood samples taken from the animals contained 0.001 uc to 0.003 uc of C-14. It was observed that the licensee was using C-14 in accordance with Condition No. 14 of License No. 11-197-6 which incorporates statements, representations, and procedures contained in the licensee's application dated February 15, 1963.

16. There has been no change in licensee use of special nuclear materials authorized by License No. SNM-433 since the previous inspection. The licensee continues to use a 1-curie Pu-Be neutron source in a Visiflux neutron howitzer ten hours per semester to perform activation analyses on indium, gold, silver, aluminum, and copper foils. The howitzer is used in Room 13 in the engineering building. The 5-curie Pu-Be neutron source has remained in storage inside a Nuclear-Chicago sub-critical assembly since the previous inspection. Natural uranium, in the form of cylindrical slugs, canned in aluminum were also stored inside the light water moderated sub-critical assembly. The licensee had 1384 of the above type slugs inside the assembly. Use records exhibited by Professor W. P. Barnes revealed that the frequency of use for the sub-critical assembly was approximately 40 hours during the fall and spring semesters teaching flux studies and reactor design to graduate students. The 0.5-curie Pu-Be neutron source was in storage in a Curtiss-Wright howitzer in Room 334 in the new physical science building. Dr. P. K. Freeman stated that the above Pu-Be neutrons source had not been used since the previous inspection. He further stated that the licensee did not have any need for the source or howitzer any more and the equipment would probably be returned to the vendor.

Disposal

17. Dr. Cook stated that only a few disposals of C-14 have been made since the program was started prior to the last inspection. An examination of disposal records revealed that samples taken from animals containing 0.001 uc to 0.003 uc of C-14 have been disposed of via the sanitary sewer in Room 205 in the Dairy Science Building. A maximum of 0.5 mc of C-14 was disposed of via the sanitary sewer on June 10, 1966. The above disposal was the maximum amount disposed of. Dr. Cook stated that he planned on disposing of animal waste which has been collected and stored in an isolated area at the dairy barn. The burial would be on University of Idaho property. He further stated that the burials would be conducted in accordance with 10 CFR 20.304 regulations. He also stated that the amount of byproduct material disposed of would be documented pursuant to 10 CFR 20.401(b). It was noted from

reviewing the licensee's disposal records that disposals were made via the sanitary sewer pursuant to 10 CFR 20.303 and records were being maintained pursuant to 10 CFR 20.401(b).

Facilities and Instrumentation

18. The licensee's facilities for storing and using C-14 under Licenses No. 11-197-6 have remained unchanged since the previous inspection. Dr. Cook continues to use Room 205 in the Dairy Science Building for storage and use of byproduct material. Access to the lab room is controlled by Dr. Cook. Equipment found inside the room was the same as that submitted with the licensee's application dated February 15, 1963. It was observed that the instrumentation available for Dr. Cook's use was the same as that submitted with the licensee's application dated February 15, 1963. Metal and wooden stalls are used to house animal injected with C-14. These facilities are located at the Dairy Barn research area.

19. The facilities for storing and using the 1-curie and 5-curie Pu-Be neutron sources have remained unchanged since the previous inspection. The light moderated sub-critical assembly containing the 5-curie Pu-Be neutron source and the Visiflux howitzer containing a 1-curie Pu-Be neutron source are stored and used in Room No. 13 in the engineering building. Equipment found inside Room No. 13 has remained unchanged since the previous inspection. Mr. Barnes stated that he, along with other individuals involved in teaching nuclear engineering courses have keys to the room. He stated that the door of the room was kept locked at all times while not in use. The writer observed that the door of Room 13 was locked at the time of the inspection. Mr. Barnes stated that the licensee continues to possess the same instrumentations as submitted with the licensee's application dated May 31, 1961. It should be noted that the range for each instrument along with its use was also submitted with the licensee's application. Mr. Barnes stated that instrumentation is calibrated in accordance with licensee's procedures submitted with the above application. Instrumentation examined by the writer was in operable condition at the time of the inspection.

Posting and Labeling

20. It was observed that doors of rooms where byproduct and special nuclear materials were stored were posted pursuant to 10 CFR 20.203(e)(1). The stalls at the dairy barn used to keep the animals during and after injections of C-14 was posted pursuant to the above regulations. All bottles, vials, containers, etc., containing

C-14 labeled pursuant to 10 CFR 20.203(f)(1) and (f)(4). The sub-critical assembly and the two howitzers, each containing a Pu-Be neutron source, were labeled pursuant to 10 CFR 20.203(f)(1) and (f)(4).

Personnel Monitoring

21. Personnel monitoring devices are not worn by Dr. Cook while using C-14.

22. Students and faculty members involved in using the sub-critical assembly and the Visiflux howitzer are required to wear two dosimeters, one sensitive to gamma radiation and the other sensitive to neutron radiation. The licensee possessed eight Bendix, Model 862, 0 to 200 mr self-reading dosimeters for measuring gamma radiation and eight Bendix, Model 609, 0 to 200 millirem self-reading dosimeters for measuring thermal neutrons. Students and faculty members are required to zero each dosimeter; make an entry in a log book listing the date entering the restricted area; the individual's name; dosimeter number; dosimeter reading prior to entering restricted areas; dosimeter reading after leaving restricted area, and, etc. It should be noted that the same system was employed by the licensee at the time of the previous inspection. A review of the dosimeter log revealed that a maximum of 3 mr gamma and a 4 millirem neutrons was received by a student during a 3-hour lab period. Personnel doses for both gamma and neutron radiation averaged approximately 1 mr/day for a 3-hour lab period. The writer reviewed personnel doses from May 1, 1963 through June 16, 1966.

Leak Test Program

23. The licensee possesses three Pu-Be neutron sources. Condition No. 11.A. of License No. SNM-433 requires that the licensee conduct leak tests of the sealed sources at intervals not to exceed six months. A review of the licensee's leak test records revealed that the 1-curie and 5-curie Pu-Be neutron sources had been leak tested at intervals not to exceed six months or less as required by the above Condition of the license. However, the 0.5-curie Pu-Be neutron sealed source, in the possession of Dr. P. K. Freeman, was not always leak tested at intervals not to exceed six months as required. A review of leak test records for tests conducted on the 0.5-curie Pu-Be neutron source showed that the source had been tested on the following dates: 1/6/64, 5/21/64, 12/7/64, 12/12/64 and 6/19/66. Results were listed as < 0.005 uc. The above data shows that the licensee was remiss in not always leak testing the sealed source at intervals of six months or less as required. Dr. Freeman stated that he was aware of the fact that he had failed to always leak test the source at the proper frequency. He

further stated that since the source had remained in storage since the previous inspection, except for being leak tested, that it was easy to overlook leak testing the sealed source at the proper frequency. He stated that in the future he would see that the 0.5-curie Pu-Be neutron source was leak tested at intervals not to exceed six months as required. He informed the writer that in view of the licensee's infrequent use of the neutron source that the source would probably be returned to the vendor for disposal.

Surveys

24. Both the Radiation Safety Officer and Dr. Cook have conducted surveys in Room 205 in the Dairy Science Building and at the dairy barn where C-14 is used. A survey meter with a micro-window tube capable of picking up C-14 is used when making the surveys. Dr. Cook also stated that he surveys horizontal surfaces and ventilation hoods after making dilutions. All entries in the log book for surveys conducted by both the RSO and Dr. Cook revealed that there had been no spread of C-14 in areas outside the ventilation hood in Room 205 and at the dairy barn. Two hundred to 500 counts per minute was listed as detected on absorbant paper taken from the ventilation hood after making a C-14 dilution. It was observed that the licensee was maintaining records of surveys pursuant to 10 CFR 20.401(b).

25. Isodose surveys have been conducted to determine radiation levels at different distances from receptacles where three Pu-Be neutron sources are stored and used. According to Professor Barnes, the surveys are made with a Nuclear-Chicago, Model 2671, neutron survey meter and Nuclear-Chicago, Model 2588, 0 to 2.5 r/hr survey meter. Survey records exhibited by Barnes revealed that surveys had been conducted during the storage and use of the light water moderated sub-critical assembly and the two neutron howitzers to determine compliance with 10 CFR 20.105(b). A maximum of 1.7 mr/hr gamma and < 1 mrem/hr neutrons was detected at the top of the sub-critical assembly. A maximum of 2.5 mr/hr gamma and < 1 mrem/hr neutrons was detected at the top of the Visiflux howitzer containing a 1-curie Pu-Be neutron source. A maximum of 0.25 mr/hr gamma and <1 mrem/hr neutrons was detected at the side of the Curtiss-Wright howitzer containing a 0.5-curie Pu-Be neutron source. Professor Barnes stated that the supplier also provided the licensee with survey and leak test information for each of the Pu-Be sources. It was observed that the licensee was conducting surveys as required and maintaining the results pursuant to 10 CFR 20.401(b).

Independent Measurements

26. At the time of the inspection, radiation measurements were made at the side of the three receptacles containing the Pu-Be neutron sources. A maximum of 1.7 mr/hr gamma was detected at the top of the sub-critical assembly. A maximum of 2.5 mr/hr was detected at the top of the Visiflux howitzer. The writer detected 0.25 mr/hr gamma at the side of the Curtiss-Wright howitzer. The writer used a Frieseke-Hoepfner, Model FH-40T, 0 to 50 r/hr, survey meter to make the above radiation measurements. The instrument was calibrated in April, 1966.

Compliance withConditions of Licenses

27. It was observed that byproduct material, authorized by License No. 11-197-6, was being used by, or under the supervision of, and in the physical presence of, Dr. R. N. Cook, pursuant to Condition No. 12 of the license. It was observed that byproduct material was not being used in or on human beings or in field applications where such activity is released except as provided otherwise by a specific condition of this license, pursuant to Condition No. 13. Byproduct material was being used in accordance with statements, representations, and procedures contained in licensee application dated February 15, 1963. Laboratory animals or their products which have been administered C-14 have not been used for human consumption, pursuant to Condition No. 15 of the license. Dr. Cook stated that the animals used in the above experiments were still alive and in the possession of the University of Idaho Dairy Department. He stated that the animals would be subsequently disposed of by burial on licensee property, pursuant to 10 CFR 20.304 regulations.

28. The three Pu-Be neutron sources, authorized by License No. SNM-433, were being used at the University of Idaho at the location specified in Condition No. 10 of the license. Condition No. 11 of the license covers leak testing requirements which have already been covered in the report.

Management Review

29. At the conclusion of the inspection, the findings were reviewed with Dr. H. Walter Steffens, Academic Vice President; Mr. J. W. Watts, Business Manager; and, G. A. McKean, Radiation Safety Officer for the University of Idaho. Dr. Steffens stated that it was the desire of the University of Idaho to follow the regulations and conditions of the various licenses issued to the University. He stated that he would follow up and see that the deficiencies were corrected. Dr. Steffen also stated that the University planned on going to a broad license to cover the

use of byproduct material on campus. He stated that he felt that it would be a step in the right direction for all concerned at the University and planned on submitting a proposal to DML in the very near future for the broad license.

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: September 2, 1966

FROM : Eugene D. McFall, Radiation Specialist
Region IV, Division of Compliance, Denver

SUBJECT: UNIVERSITY OF IDAHO, MOSCOW, IDAHO - LICENSE NOS. 11-197-2, -3, -4, AND SUD-632 - HEALTH AND SAFETY EVALUATION

The subject licensee was visited on June 20 and 21, 1966. Mr. G. A. McKean, Radiation Protection Officer, was the principal interviewee during the inspection. It was observed that the licensee controls access to all areas where licensed materials are used. Access is controlled by the authorized users under the subject licenses. There has been no loss or theft of licensed material at the University of Idaho.

There appeared to be no health and safety problems associated with the storage and use of licensed material at the University of Idaho.

FIELD INSPECTION N ES

Licensee University of Idaho
Date June 20 & 21, 1966
Address Moscow, Ida.
Inspector E. D. McFall
Type of Inspection (I, R, F):
Announced ✓ Unannounced ___
Accompanied by None
10 CFR
20 ✓ : 30 ✓ : 31 ___ : 40 ___ : 70 ___
Affiliation State Notified
Notice Issued:
Clear ✓
Minor Item ___
Previous Items of Noncompliance:
Condition No 13.B (2) Leak tests
(Above deficiency was corrected by the licensee.)
License No. 11-197-2

GENERAL DATA

1. Personnel contacted:
Dr. P. K. Freeman, authorized user (one of 3 users)
Mr. D. A. McKean, R.S.O.

2. Organization:
a. Chain of Command and Responsibility:
b. Authorized users:
c. Unauthorized users:
d. Isotope Committee: yes ✓ no ___
Members:
Functions:
e. RSO

See writeup for License No's. 11-197-6 & SNM-433

Mr. D. A. McKean

Licensee Un. of Idaho

GENERAL DATA (Continued)

3. Program Scope:

a. Procurement and Use of Material: Material procured for use in chemistry course given in fall semester by Physical Science Department.

Date	Material	Form	Quantity	Possession Limit
Sept 1964	S-35	liquid	10-mc	25-mc
" 1965	"	"	"	50-mc
Prior to the last insp. on May 9 & 10 1963	C-14	solid	0.5-mc	25-mc
	S-22	liquid	1 μc	
	Fe-55		3 μc	exempt concentrations in a training kit. Atomic Accessories
	Co-60		0.5 μc	
	Zn-65		0.5 μc	
	Pm-147		3 μc	
	Tl-204		3 μc	
	Pb-210		0.05 μc	
	Nat. Uranium	solids	5 lbs	
	~~Barium-133~~			
	Co-60	sealed source	0.5 mc	10 mc

Evidence of overpossession at any time: yes ___ no ✓

Details:

Frequency of Use

Generally-licensed materials: See above

Unlicensed materials: ①chemistry course No. 116 consist of one 1 hour lecture and two 3 hour lab periods in fall semister. Atomic Accessories training kit used ②Surface Chemistry course given in fall semisters 1964 & 1965. (10 hrs each fall semester)

Non-licenseable sources of radiation: See above

b. Transfers of Material: None

③. Dr. P.K. Freeman uses 0.5 mc Co-60 sealed source to calibrate some survey meters. (10 hours/year)

4. Personnel Monitoring

a. ~~Film Badge Service~~ Dosimeters

12 - Bendix, 0 - 200 mr self-reading, model No. 862.

1 - Bendix Charger

Records

Dr. Freeman maintains personnel monitoring record in a laboratory notebook.

b. Frequency

Students (6-8) and instructor in lab courses are required to wear a dosemeter.

c. Maximum quarterly and yearly exposure

max quarterly 95 mrem for a student. (one day's exposure for A.E. Sunday on 1/20/66. all others were 0-10 mr for each 3 hr

5. Training Program lab course.

Training & experience of Authorized users has been submitted with applications. Students are given verbal and written instructions on how to use licensed material.

6. Compliance with Applicable Procedures

Licensed material was being used in acc. with statements, representations, and procedures contained in application dated 12/20/60, and in related documents listed in Condition Nos. 16 & 16.A. of the license.

GENERAL DATA (Continued)

7. Facilities:

a. Restricted area:

Byproduct is used in Room 334 in the new Physical Science Bldg. The access to the lab. is controlled by the authorized users. The lab is kept locked when not in use. Keys to room are maintained by the authorized users and 1-graduate student.

b. Unrestricted Areas: —

c. Unauthorized locations: The building Custodian also has a master key to all rooms of Bldg. —

d. Facility and laboratory equipment (instruments, alarm systems, etc.):

material is stored in a lead cave in Rm 334. The room has the normal compliment of laboratory equipment.

8. Posting and Labeling

Door of Rm 334 in Physical Science Bldg. where material stored, was posted in acc. 20.203(e)(1).

Cave posted in acc. 20.203(e)(1)

Licensed material labeled in acc. 20.203(f)(1) & (f)(4).

Form AEC-3 posted on a wall inside Rm. 334.

Licensee: Un. of Idaho 5/

6. Surveys and Records:
   a. Laboratory areas: Each student is required to make surveys when using byproduct material in Rm. 334. Surveys are conducted under Dr. Freeman's supervision. Results are kept in students notebooks. Dr. Freeman has conducted surveys infrequently.
   b. Storage areas: Records are kept in ~~Book~~ "Radioisotope Laboratory - Safety Records" - book. All ~~results~~ were listed as negative. (Freemans)
   c. Teletherapy areas: Storage area surveys conducted by Freeman showed varing
   d. X-Ray (radium) areas: results: 0.1 to 1 mr/hr, depending on amount inside cave. Freeman uses Electronic, 0-20 mr/hr
   e. Independent Measurements taken: survey meter to make surveys.
      Instrument FH-40T, 0-50 r/hr By E. D. McFall
      Calibration date April 2, 1966
      0.1 to 0.2 at side of lead cave containing a 5 mc Co-60 sealed source ½ training set.

7. Special License Conditions:
   a. Leak Tests:
      1/31/63 5/21/64 12/7/65
      8/30/63 12/7/64 6/14/66
      11/6/64 5/28/65
   } Source (0.5 mc Co-60) does not have to be tested for leakage while in storage acc. to Licensed Cond. 14. A. (3).
   b. Other: O/C on leak Test. All results were <0.005 μc. Tests on sealed source conducted by Dr. Freeman in acc. with cond. No. 14. D. of the license.

8. Thefts or Incidents: none (Freeman keeps the records)

9. Responses

none

Licensee: Un. of Idaho

9. Discussion with Management:

There were no items of non-compliance observed and a Form AEC-591 was issued. (See writeup for Licenses Nos. 11-197-6 & SNM-433 for management coverage.)

10. Items of noncompliance (brief):

10 CFR	Item	Date(s)

CONDITION

1 - RW 9/22

FIELD INSPECTION N ES

Licensee University of Idaho Date June 20 & 21, 1966

Address Moscow, Idaho Inspector E. D. McFall

Type of Inspection (I, R, F): Accompanied by None

Announced ✓ Unannounced ____

10 CFR Affiliation State Notified

20 ____ : 30 ____ : 31 ____ : 40 ____ : 70 ____ Notice Issued:

Clear ____

Previous Items of Noncompliance: Minor Item ✓

License No. 11-197-3

GENERAL DATA

1. Personnel contacted:

Dr. Duane Le Tourneau, authorized user
Dr. H. Lowenstein
Mr. G. A. McKean, RSO

2. Organization:

a. Chain of Command and Responsibility:

b. Authorized users:

c. Unauthorized users:

d. Isotope Committee: yes ____ no ____
Members:

Functions:

e. RSO

See 592 write-up for License Nos. 11-197-3 & SNM-433 for Organization.

Licensee Un. of Idaho 2

GENERAL DATA (Continued)

3. Program Scope:

a. Procurement and Use of Material: Scandium-46 & P-32 procured & used for tracer studies.

Date	Material	Form	Quantity	Possession Limit
	Material on Hand			
	P-32	liquid	20-mc	1 curie
	Scandium-46	"	8-mc	50-mc
	300 mc of P-32 ordered whenever an order is placed			
	Received 1st order of 20-mc Scandium-46 on 5/16/65 & 30-mc on 5/13/66. (only 2 shipments although use of Scandium-46 approved by Dr. Le Tourneau)			
	License amendment No. 8 dated 4/27/65			
*	All orders for Sc-46 & P-32 have been			

Evidence of overpossession at any time: yes ___ no ✓

Details:

Frequency of use

Generally-licensed materials:

—

Only materials used have been P-32 & Scandium-46. all material used under supervision of Dr. Le Tourneau. Various seed were coated with P-32 & Sc-46 & planted on plots on University of Idaho property for uptake & tracer studies. Seeds were planted in May 1965 & 1966. (See attached sheet) Plots are restricted areas controlled by the Licensee

Unlicensed materials:

—

Non-licenseable sources of radiation:

—

Disposals

b. Transfers of Material:

(See disposals)

5/7/63 — 0.002 μc's

5/7/63 — 0.00604 μc's

5/8/64 — 0.001 μc's

5/8/64 — 0.001 μc's

7/28/64 — 0.1 μc

Only P-32 has been disposed on above dates via sanitary sewer in

* Records of disposals are possessed by Dr. Le Tourneau

Frequency of U-e. (cont)

Two coatings of 300-mc of P-32/coating & two treatments of 20-mc & 30-mc of Sr 90 have been made by the licensee on different seeds in spring (May 1965, 1966) & subsequently planted on University property in posted plots. Area used is part of the experimental farm located west of the University barns. (Dairy, sheep & swine barns.) Dilution & preparations are made in Rm 220 in Forestry Bldg. Dilution have been made inside a ventilated hood ~~cap~~ which is rated 800 c/f/m, ventilation flow. Dilution & coating of seeds performed inside hood under supervision of Dr. Lee Tourneau. Dr. Lowenstein & J. Pitkin & L. McConnell have made dilutions & treated the seeds. L. Mc Connell is a graduate student. The plots are restricted areas controlled by the licensee. Plots are fenced, posted, etc. to prevent unauthorize people from bothering the plants [plant uptake work, Dr. Lowenstein submitted a complete outline to Dr. Le Tourneau on this] Records of use of licensed materials are kept by D. Le Tourneau who is the (investigator) along with being an authorized user. Some records such as survey, disposals, etc., are also possessed by the RSO.

4. Personnel Monitoring

a. Film Badge Service

3+1 control badge on a 2-weeks exchange basis from Radiation Detection Co. Started with Nuclear-Chicago on 12/25/64 same No. of film badges. Reviewed all 1963 film badge results to 4/25/66.

b. Frequency

c. Maximum quarterly and yearly exposure

Max. 148-mr for H. McConnel during 2nd cal. qu. 1965. 124-mr for T. Pethin during 2nd qu 1965. 6mr for H. McConnel during 1st quarter 1966. (max for 1966)

5. Training Program

McConnel is a graduate student working under the supervision of Dr. La Tourneau.

6. Compliance with Applicable Procedures

* (above personnel doses OK)

material used in accordance with procedures, statements, representations submitted with applications incorporated in Condition No. 15 Amendment No. 7 and with application submitted (dated) March 17, 1965. Dr. Lowenstein stated that he submitted a complete outline of his proposed uptake work using Sr-46 & P32. Dr. La Tourneau stated that he along with the RSO reviewed the study prior to Dr. Lowenstein using any licensed material.

X

GENERAL DATA (Continued)

7. Facilities:

a. Restricted area: materials (licensed) have been used in room 220 in the Forestry Bldg. & in room No. 127 in agriculture Science Bldg. since the last inspection. Access to the above two rooms along with a storage room in the basement of the Forestry Bldg. is controlled by the authorized user. The

b. Unrestricted Areas: doors of Rms 127 & 220 are kept locked when not in use. A total of 8-mc of Sc-46 was in storage inside a

c. Unauthorized locations: room in the basement of the Forestry Bldg. Access to the room is controlled by authorized users. Plots are controlled by the licensee. (Plots are areas where licensed materials have been used)

d. Facility and laboratory equipment (instruments, alarm systems, etc.):

Rm-127 — lab benches, vent hoods, sinks, etc. Material (when on hand) is stored inside locked wooden cabinets.

Rm-220 — lab benches, vent hoods, metal sinks, etc.

Instruments

1- Nuclear Model D-1A, 0-5 r/hr
1- Baird Atomic, Model 420, 0-100 mr/hr

8. Posting and Labeling

Rms 127 & 220 were posted in accordance with 20.203(e)(1).

The storage room in the basement room in the Forestry Bldg., was posted in acc. 20.203(f)(1)(e)(1).

Containers, bottles, vials, etc in Rms 127 & 220 were labeled in acc. 20.203(f)(1) & (f)(4).

The container in which the 8-mc of Sc-46 was stored on a shelf inside a locked posted room in the basement of the Forestry Bldg., was not labeled in acc. 20.203(f)(1) & (f)(4).

Licensee: Un. of Idaho

2. Storage facilities:

3. Posting and Labeling:
   a. Rooms, Areas:

   b. Containers:

already covered on page #4

4. Instruction to Personnel:
   a. General Instructions:

   b. Operating and Emergency Procedures:

already covered on page # 3

   c. Posting of Form AEC-3: yes ✓ no ____

5. Waste Disposal:
   a. Liquid wastes:
   Liquid waste has been disposed of via the sanitary sewers in acc. 20.303.
   b. Solid wastes:

Disposals

date	Kind	Amount
* 5/7/63	P-32	0.002 μc's
5/8/64	P-32	0.002 μc's
7/28/64	P-32	0.1 μc

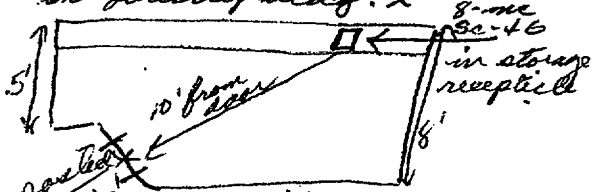
   c. Records:
   Records are maintained by the licensee.
   d. Surveys:
   see next page
   e. Burial Facility:

* before last inspection

Licensee: Un. of Idaho

6. Surveys and Records: Personnel surveys (direct) along with
   a. Laboratory areas:
both direct & smear surveys have been conducted in Rms 127 in Ag. Science Bldg. & in Rm 220 & the storage room in the Forestry Bldg. where Sc-46 is stored. Surveys are conducted during & after the use of licensed material. Records of surveys kept
   b. Storage areas: by Dr. Le Tourneau and Dr. Lowenstein.
Results: Rm 127
1 mr/hr @ side of wooden storage cabinet #1
   c. Teletherapy areas:
2.2 mr/hr @ side of a metal waste can.
1.0 mr/hr @ side of glass war recepticle
0.6 mr/hr @ side of wooden storage cabinet #2
   d. X-Ray (radium) areas:
0.15 mr/hr @ 1 meter from the above cabinets. See below for survey in Rm. 220.
   e. Independent Measurements taken:
   Instrument TH 407 By E. D. McFace
   Calibration date April 1966
   0-50,000 mr/hr range.

Basement storage room in forestry Bldg. × (earth next to room)



8-mc Sc-46 has been in storage in room ~1 week at time of inspection. Only individuals (users) have been in room since storage of material. Room locked.

× at the door

7. Special License Conditions:
   a. Leak Tests:
   no sources
   b. Other:
Plants have been gathered at different periods of growth & counted for material uptakes.

8. Thefts or Incidents:
none

Licensee Surveys (continued)
Rm 220. (max)
Shipment of P32 (inside out hood) (64.4 mc)
9 mr/hr @ side
6 mr/hr @ 1'
23 mr/hr @ 10" from bottle after removing from package
0.3 mr/hr at door of the storage room in the basement of Forestry B.

× - 8 mc of Sc-46 stored inside storage room.

Licensee Un. of Idaho #7

9. Discussion with Management:

Dr. Lee Journeaux stated that the container in which 8-mc of Sc 46 was stored would be labelled as required. Discussed deficiencies also with Dr. H. Walter Steffens, Act-Vice President & with Mr. George McKean, RSO. The previous items of noncompliance had been corrected.

10. Items of Non-compliance (brief):

10 CFR 20.	Item	Date(s)
203(f)(1)	The container in which	
(f)(4)	the Sc-46 (8-mc) was	
	stored, was not labeled	
	in accordance with the	
	above regulations.	

Condition

None

RW 9/22

FIELD INSPECTION NOTES

Licensee University of Idaho Date June 20 & 21, 1966

Address Moscow, Idaho Inspector E. D. McFall

Type of Inspection (I, R, F): Accompanied by —

Announced ✓ Unannounced ___

10 CFR Affiliation ___

20 ✓ 30 ✓ : 31 ___ : 40 ___ : 70 ___ Notice Issued:

Previous Items of Noncompliance: Clear ✓

20.203 (b) Minor Item ___

20.203 (f)(1) & (f)(4)

20.401 (b) (Records not maintained for surveys

License No. 11-00197-04

GENERAL DATA

1. Personnel contacted:

Mr. George A. McKean RSO & authorized user.

2. Organization:

a. Chain of Command and Responsibility:

b. Authorized users:

c. Unauthorized users:

d. Isotope Committee: yes ___ no ___
Members:

Functions:

e. RSO

See 592 write-up for Organizational structure.

Licensee Un. of Idaho

GENERAL DATA (Continued)

3. Program Scope:

a. Procurement and Use of Material: Only 1 new source procured since the last inspection. Sources used as radiation sources in water & snow gauges.

Date	Material	Form	Quantity	Possession Limit
	Material on Hand			
	1- Co-60	Sealed Source	200-mc	4 source of 500-mc each not to exceed 1 curie
+	1- Co-60	"	500-mc	" " "
	1- Co-60	"	40-mc	2 sources of 40 mc total not to exceed 80-mc
	1- Co-60	"	1-mc	"
	1- Cs-137	"	100-mc	4 source to 500-mc each, total not to exceed 1 curie
	1- Cs-137	"	1-mc	

Evidence of overpossession at any time: yes ___ no L

Details:

Procurement

Generally-licensed materials: X- Procured on 9/9/65 from US Nuclear Corp.

Unlicensed materials: —

all other sources procured prior to the last inspection on 5/9/63.

Non-licenseable sources of radiation: —

Program (no change since the previous insp.)

b. Transfers of Material:

a 200-mc & a 500-mc (both Co-60 sealed sources) are used in a snow gauge to measure the depth of snow on Moscow Mtn., located 7 air miles from Moscow, Idaho. Gauges containing sources are placed on mtn. during early fall & removed in late Spring or early summer after snow melts

none

Program (cont.)

Equipment is taken & removed from Mtn in a Dodge power wagon. a snow Cat is used to check conditions several times in the winter.

4. Personnel Monitoring

a. Film Badge Service

Nuclear-Chicago on a monthly basis. Started with the Co. on 6/1/62.

6+1 control badge

b. Frequency

monthly basis

c. Maximum quarterly and yearly exposure

max - 430 mrem for [redacted] during 4th qu 1965. Ex 6

max - 1360 mrem for [redacted] for year 1963.

5. Training Program

Authorized users training has been submitted with license application. Most of the training has been self study & on-the-job at the university.

6. Compliance with Applicable Procedures

Byproduct material used in accordance with statements, instructions, representations, etc., encorporated in condition No. 6, 7, and No. 7.

Personnel Monitoring

Form AEC-5 & supplies reports are maintained by the licensee. A max of 3000 mrem personnel dose Ex 6 was received by [redacted] during 3rd qu. of 1961. However, the personnel doses were not valid. (See licensee's write-up of incident.)

GENERAL DATA (Continued)

7. Facilities:

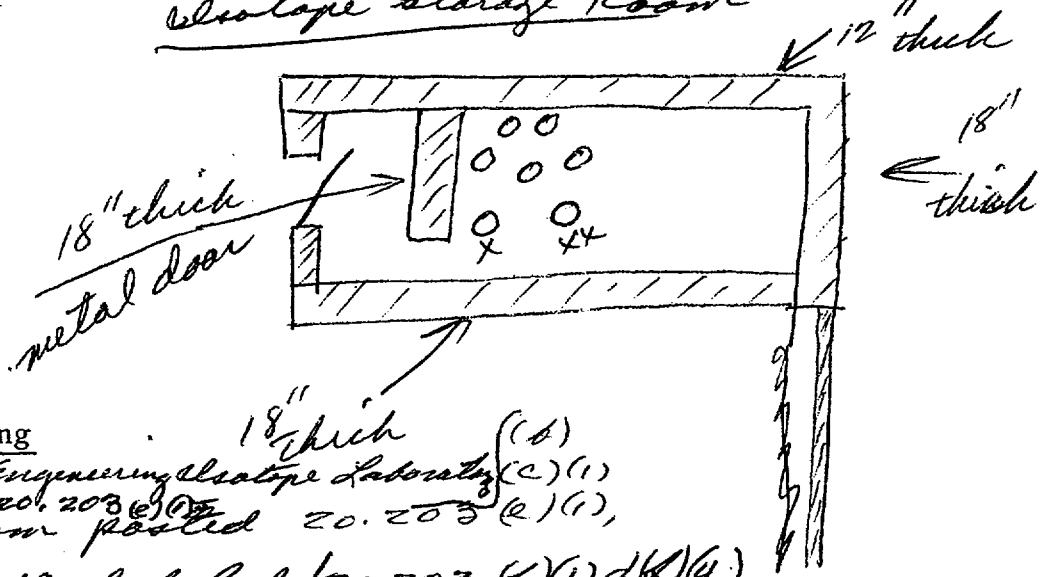
a. Restricted area: New facilities - The licensee has a new cement ~~block~~ Engineering Isotope laboratory located about ¼ mile from the campus proper on university property. The facilities

b. Unrestricted Areas: at Moscow Mtn are restricted to prevent unauthorized personnel from entering area where snow gauge is located. Material, when not in use, is stored in the basement in a locked room ~~a~~ called "Isotope storage room".

c. Unauthorized locations:

d. Facility and laboratory equipment (instruments, alarm systems, etc.):

Isotope Storage Room



8. Posting and Labeling

① Outside door of Engineering Isotope Laboratory posted in accordance with 20.203 (c)(1)
② Door of room posted 20.203 (e)(1),
③ containers all labeled /20.203 (f)(1) & (f)(4).
④ Sources are Tagged (when in storage) (during transportation) in accordance with Cond. No. 16 of license issued on 7/25/61.

X - containing 200 mc Co-60 source

XX - containing 500 mc Co-60 sealed source

Access to storage facilities & laboratory propers is controlled by authorized users. Only users have keys to the lab & storage room.

other sealed sources stored inside other containers inside room.

Licensee: Un. of Idaho

5

2. Storage facilities:

covered on page #4

3. Posting and Labeling:
   a. Rooms, Areas:

   b. Containers:

4. Instruction to Personnel:
   a. General Instructions: posted on a bulletin board inside lab. (license, Form AEC-3, etc & other info.)

   b. Operating and Emergency Procedures:

   c. Posting of Form AEC-3: yes ✓ no ____

5. Waste Disposal: 2-location in lab.
   a. Liquid wastes:

   b. Solid wastes: none

   c. Records:

   d. Surveys:

   e. Burial Facility:

~~Page 5~~

Licensee: Un. of Idaho

6. Surveys and Records:

a. Laboratory areas:
Surveys are conducted every time leak test are made. Last was made on 6/10/66. All sources were accounted for & results were: 0.1 mr/hr @ storage room door & on last wall
0.15 mr/hr @ side of North wall.

b. Storage areas:
once every or near 6 months frequency

c. Teletherapy areas: Surveys made at side of Dodge Power wagon when transporting sources to Mtn. < 1 mr/hr to driver in cab at side of truck during transporting & sources containers secured by seat belt to bed of Dodge powerwagon during transportation.

d. X-Ray (radium) areas: —

e. Independent Measurements taken:
Instrument 74407 By E. D. McFall
Calibration date April 1966

~~unable to~~ did not check radiation levels at side of containers because of the high bkg.

0.4 mr/hr @ the side of the door (outside)

0.2 mr/hr on inside wall of storage room.

7. Special License Conditions:
a. Leak Tests: Leak test

b. Other:

200 mc Co-60 source
2/23/63
7/30/63
10/24/63
6/26/64
} on mtn.

500 mc Co-60 source
8/31/65 – Leak test Cert.
9/15/65
6/10/66
} on mtn

8. Thefts or Incidents:

none

12/11/64
6/11/65
9/9/65
6/10/66
} on mtn.

exempt from leak testing at 6 months or less when in remote locations (on mtn.

Leak tests – see back

Page 6

Leak Test (cont

40-mc Co-60 source.

2/25/63
7/30/63
11/25/64
6/26/64
11/23/64
6/11/65
12/10/65
6/10/66

both sources { 1-mc Cs-137 source
1-mc Co-60 source

11/30/63
7/30/63
11/25/64
6/26/64
12/11/64
6/11/65
12/10/65
6/10/66

100-mc Cs-137 source

5/11/63
10/24/63
4/24/64
6/26/64
12/11/64
6/11/65
12/10/65
6/10/66

all op

Licensee Univ. of Idaho 7

9. Discussion with Management:

There were no items of noncompliance & a Form AEC-591 was issued. (See write-up for 592 for exit interview discussion. The previous items of noncompliance have been corrected.

10. Items of Non-compliance (brief):

10 CFR	Item	Date(s)

Condition

MAY 16 1963

TO: File

FROM: Philip S. Sandel, Radiation Specialist
Region IV, Division of Compliance

SUBJECT: UNINSPECTABLE LICENSE - UNIVERSITY OF IDAHO, DEPARTMENT OF PHYSICAL SCIENCES, MOSCOW, IDAHO - LICENSE NO. 11-197-5

CO:IV:RSS

During a routine inspection of byproduct material licenses held by the University of Idaho on 5/9/63, contact was made with Mr. W. T. Collins, authorized user under byproduct material License No. 11-197-5. Mr. Collins stated that at the present time he had no byproduct material in his possession and had obtained no byproduct material as of this date under License No. 11-197-5.

As a result of the conversation with Mr. Collins, byproduct material license No. 11-197-5 is considered uninspectable.

Visit 5-9-63

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: October 9, 1964

FROM : John J. Ward, Investigation Specialist
Region IV, Division of Compliance, Denver

SUBJECT: COMPLIANCE INQUIRY MEMORANDUM - UNIVERSITY OF IDAHO, ENGINEERING EXPERIMENTAL STATION, MOSCOW, IDAHO, LICENSE NO. 11-197-4, 10 CFR 20.405 - EXPOSURE, LEVELS OF RADIATION

Licensee reported to DSLR by letter dated 10/6/64, copy to CO:IV that two licensee employees' film badge records for August, 1964, show exposures of 3. rem each. Licensee explains erroneous readings caused by storing badges near Ra-Be source for two-week period. Actual exposure to personnel calculated <0.2 rem for August.

Region IV will examine exposure records next inspection.

cc: R.G. Page, w/cpy. ltr
L. Dubinski, w/cpy. ltr

University of Idaho
Moscow, Idaho

May 9 and 10, 1963

Initial and Reinspection

10 CFR 20, 30, 40 and 70

5. copy off license

Note 591 forms should not have been issued on 11-197-2 & SNM-433 due to deficiencies in leak test frequency. RVW

RW 7-15-63

6. Four byproduct material licenses Nos. 11-197-2, 3, 4, 6, and SNM-433, and SUD-632.

An announced initial inspection of byproduct material License No.s 11-197-3, 4, and 6, and SUD-632, and reinspection of byproduct material license No. 11-197-2 and SNM-433, were conducted on May 9 and 10, 1963. AEC Form 591 were issued to the aforementioned licensee. The following items of noncompliance were noted or otherwise observed during the course of the inspection:

License No. SNM-433, SUD-632, [redacted], 11-197-3, 11-197-4

✓ 10 CFR 20.203(f)(1) or (f)(2) — in that, containers were not properly labeled to indicate the presence of radioactive material. (Paragraph 17b, 17c, & 17e) ✓

License No. 11-197-[redacted] -3, and -4

✓ 10 CFR 20.203(f)(4) — in that, storage containers were not properly labeled to show the quantity, date of measurement, ~~of~~ And kind of material in the containers. (Paragraph 17b & 17c) ✓

SNM-433, 11-197-3, -6

✓ 10 CFR 20.206(c) — in that, Form AEC-3 was not properly posted. (Paragraph 17b, 17d, & 17e) ✓

11-197-6

✓ 10 CFR 20.203(e) — in that, area in which radioactive material was stored was not properly posted to indicate the presence of radioactive material. (Paragraph 17d) ✓

11-197-4

✓ 10 CFR 20.203(c)(1) — in that, area was not properly posted to indicate the presence of a high radiation area. (Paragraph 17c) ✓

✓ 10 CFR 20.401(b) — in that, records of surveys were not properly maintained. (Paragraph 18c) ✓

✓ 11-197-2 — in that, leak tests were not performed and results maintained as required by License Condition No. 13. (Paragraph 16a) ✓

✓ SNM-433 — in that, leak tests results of which is were not maintained as prescribed in application dated June 25, 1962, incorporated as part of the license. (Paragraph 16a) ✓

9. Initial Inspection

The initial inspection of the licensee was made on November 7, 1957. The operations licensed under byproduct material license 11-197-1, 11-197-2, source material license C-1168, was inspected at that time. License 11-197-1 expired on April 30, 1958, and was superceded by License No. 11-197-3 issued April 4, 1958. License C-1168 expired on February 1, 1958, and was terminated by letter from L. C. Cady, dated April 25, 1961, stating that the licensee did not wish to renew the license. During the course of the initial inspection, it was noted that the licensee was in noncompliance with several regulations in that radiation surveys were not made and a metal storage safe was not properly posted. In addition, the licensee had violated Conditions 11 and 12 of License 11-197-1, in that byproduct material was used at an unauthorized location.

10. Re-inspection

A reinspection of the operation under license No. 11-197-2, and initial inspections of license No. 11-197-3 and SNM-433, was made on July 27 and 28, 1961. A clear notice was issued for byproduct material license No. 11-197-3. The following items of noncompliance were noted in conjunction with license No. 11-197-2 and SNM-433:

10 CFR 20.203(e)(1) in that, rooms or areas in which licensed materials were stored, were not posted with the words "CAUTION - RADIOACTIVE MATERIALS". and

10 CRR 20.206-c in that, Form AEC-3 was not posted in the Radioisotopes Laboratory.

11. Current Inspection

On May 9 and 10, 1963, an announced initial inspection of Byproduct Material License No. 11-197-4, 11-197-6, and license No. SUB-632, and reinspection of license Nos. 11-197-2, 11-197-3, and SNM-433, were conducted by Eugene D. McFall, Radiation Specialist, Division of Compliance, Region IV, accompanied by Philip S. Sandel, Radiation Specialist, Division of Compliance Region IV. Principal interviewees were as follows:

License No. 11-197-2	Dr. Peter K. Freeman, Radiation Safety Officer
License No. 11-197-3	Dr. Harvey P. Hermanson, Authorized User
License No. 11-197-4	G. A. McKean, Authorized User
License No. 11-197-6	Dr. R. M. Cook, Assistant Professor of Dairy Science, Authorized User
SNM-433 and SUD-632	W. P. Barnes, Associate Professor, Mechanical Engineering

12. Organization

Radiation safety officers listed for the licenses held by the University of Idaho are Dr. Peter K. Freeman and Dr. D. J. LeTourneau. However, during the course of the inspection, Dr.

LeTourneau was contacted and he stated that he is no longer active in the University's isotope program and that Dr. Harvey P. Hermanson has replaced him as Radiation Safety Officer. The University of Idaho has an isotope Commistee which meets on an infrequent basis which reviews all proposed uses of radioactive material. The Isotope Committee is composed of the following members:

Dr. Peter K. Freeman, Radioisotope Laboratory

Dr. Edgar Grahn, Chemistry Department

Dr. Elmer Raunio, Chemistry Department

Dr. Clifford Forbes, Zoology Department

Mr. Godfrey Martin, Chemical Engineering Department

Dr. Harvey Hermanson, Agricultural Chemistry Department

Dr. Don Clifton, Department of Mines

Dr. William Parish, Kirtley Laboratory

Donald Duncan, Engineering Testing Laboratory

Isotope Committee Members (continued)

Dr. Willard Wilson - Engineering. The Isotope Committee meets on an infrequent basis. All applications for use of byproduct material are reviewed by Dr. Freeman or Dr. Hermanson. The Isotope Committee indicated to the inspector that a single radiation safety officer is being considered for the University program.

3. Personnel Monitoring

a. License No. 11-197-2 - Bendex Model H62 pocket dosimeters, range 0 to 200 mr are used by the students and instructor participating in the radioisotope laboratory. There are a total of ten pencils plus a charger (Universal Atomics Accessories Model No. 750) available for use. Results of the pocket dosimeters are recorded on a daily basis in the radioisotopes laboratory "Safety Records Book", which is maintained by Dr. Freeman in the radioisotopes laboratory. A review of these records indicated the maximum exposure of 5 mr in a single day.

b. License No. 11-197-3 - A bi-weekly film badge service supplied by Radiation Detection Company of Mountainview, California, is utilized under this license. The film badge program is on a bi-weekly exchange basis. Three badges are supplied; one control and two for use of Dr. Hermanson and graduate student K. Takayama. Maximum exposure for the year 1962 was 210 mr for [redacted] which was the only recorded exposure for the year. Five Nuclear-Chicago, 0 to 200 mr range, pocket dosimeters are used for personnel not assigned film badges. Results of these pencils are kept in the "Radiation Survey Record" book maintained by Dr. Hermanson. These records were reviewed and maximum pocket dosimeter reading recorded was 3 mr.

c. License No. 11-197-4 - Film badges supplied by Nuclear-Chicago film badge service on a monthly change basis are used by this license. A review of the vendor's reports revealed that the maximum quarterly exposure was 228 mr for the fourth quarter of 1962, however, during this period the control badge indicated 238 mr. Six film badges are supplied for this license, five being issued to individual users, the sixth being the control.

d. SNM-433 and SUD -632 - Pocket dosimeters are used for personnel monitoring under these two licenses. Three Bendex Model 862, 0 to 200 mr range, self-reading gamma pencils and nine Bendex Model 609, 0 to 120 mrem neutron pencils are available for use. Each person who enters the room where the subcritical assembly is located, is required to wear a gamma and a neutron dosimeter. Results are kept in the College of Engineering, Mechanical Engineering Department, Nuclear Laboratory, in a log book. The maximum gamma exposure for an entry was 5 mr for entry gamma

and 5 mrem neutron. Results reviewed were mainly 0 to 2 mr and mrem, respectively.

14. Procurement, Use, Transer and Disposal

a License No. 11-197-2 - All procurement records are maintained by Dr. Freeman in the "Radio-isotopes Laboratory Safety Records" log book. A review of the records revealed no cases of over possession of byproduct material. Inventory on hand at time of inspection included one Cobalt-60 sealed source of 1 millicurie, 0.55 millicuries Carbon-14, and 1 millicurie of Phosphorus-32. Dr. Freeman had records of a burial made on ~~xxxx~~ 3/27/63. The material buried included 25 microcuries Carbon-14, and waste from an Atomics Accessories kit which includes the following: 5 microcuries Carbon-14, 1 microcurie Sodium-22, 1 microcurie Manganese-64, 5 microcuries Iron-55, 1 microcurie Cobalt-57, 1 microcurie Cobalt-60, 1 microcurie Zinc-65, 1 microcurie Nickel-63, 1 microcurie Cesium-137, 1 microcurie Barium-133, 5 microcuries Promethium-147, 5 microcuries Thallium 207, 5 microcuries lead-210, and 2 grams of uranium nitrate. Record of the burial site was recorded by the physical plant of the University of Idaho by Mr. Edward Stoles. Dr. Freeman stated that the burial was made in accordance with 10 CFR 20.304. Requirements.

b License No. 11-197-3 - Dr. Hermanson maintains records of purchaseof byproduct material in a ledger book entitled "Radiation Survey Record". Dr. Hermanson stated that material is ordered from either Oak Ridge National Laboratory or Nuclear-Chicago Corporation . A review of Dr. Hermanson's purchase records indicated no cases of over possession by the licensee. The byproduct material is used under the direction of Dr. Hermanson who is in charge of the isotope program for the Agricultural Chemistry Department. Dr. Hermanson replaced Dr. Jordon, former authorized user. Graduate students use byproduct material under Dr. Hermanson's direction. Three graduate students are now working on research projects including use of Carbon-14 and Phosphorus-32 on a study of fungus, and use of Phosphorus-32 in tracing vegetation of ~~perennial~~ perennial weeds. Disposals made by Dr. Hermanson are also recorded in the "Radiation Survey Record" book. Disposals are made by dumping down the drain. A review of waste disposals made since the last inspection indicated the following:

Isotope	Date of Disposal	Quantity Disposed
Sulfur-35	10/28/61	0.00002 uc
Phosphorus-32	10/28/61	<0.00001 uc
Iodine-131	10/28/61	$<10^{-6}$ uc
Zinc-65	7/12/62	0.5 uc
Chlorine -36	1/9/63	5 uc

Phosphorus-32 5/7/63 0.0021 uc

License No.

C. 11-197-4 - Mr. McKeen stated that all sources were obtained from U. S. Nuclear Corporation. Sources on hand included three Cobalt-60 sources of 1 millicurie, 40 millicurie, and 200 millicurie strength, and two Cesium-137 sources of 1 millicurie and 100 millicurie strength respectively. Mr. McKeen stated that there have been no disposals made under this license. He further stated that if disposals are made, they will be made by shipping sources back to the manufacturer.

License No.

d. 11-197-6 - Dr. Cook presented a copy of the purchase receipt for 6 millicuries of Carbon-14 purchased from the Volk Radiochemical Company. Dr. Cook stated that the material had been received only a short time previously and no work has been conducted to this time.

License No.

e. SUD-632 - Dr. Barnes presented records of the receipt of 1384 slugs containing 5,488 pounds of uranium on February 7, 1963. The slugs were from the Savannah River plant of E. I. duPont de Nemours, Inc., ~~Akin~~ Aiken, South Carolina. The slugs are to be used in a subcritical assembly, Model No. 9000, from Nuclear-Chicago Corporation. The facility is used as laboratory support for related courses in ~~nuclear~~ engineering. As stated in the license application, there will be no transfer or disposal of material under this license.

f. License No. SNM-433 - ~~Two~~ Three $Pu^{239}Be$ neutron sources have been procured under this license. One ~~1~~ 1/2 curie source was procured on ~~April 16, 1962~~ July 29, 1961, from Mound Laboratory and is incorporated ~~in a Visuflux water moderated neutron source assembly.~~ ~~One 1 curie source pro~~

One 1 curie Pu-Be source which was procured on April 16, 1962 from Mound Laboratory is stored in the original shipping container in room No. 13 of the ~~The~~ Engineering Building. The third source ~~The second source, which is 5~~ curies, is ~~in the subcritical assembly, Model 9000. The subcritical assembly~~ is in the locked condition. The ~~½~~ curie source in the Visuflux assembly is located in the Radioisotopes Laboratory while the 1 curie and the 5 curie source and subcritical assembly is located in Room No. 13 of the Mechanical Engineering Department Building.

c. SNM-433 and SUD-632 - The Nuclear Chicago Model 9000 student training reactor is located in Room No. 13 of the Mechanical Engineering Department Building. Room 13 is located on the ground floor of the building. The room is approximately 18 x 25 with one entrance which is locked at all times. Professor Barnes and Professor J. A. Avery, Assistant Professor of Mechanical Engineering, have control over the use of the subcritical assembly and maintain keys to the facility. Instrumentation available at the Model 9000 training facility, in addition to those listed in Appendix A, are as follows:

1. One Nuclear Chicago Model 2670 Alpha Meter
2. One Nuclear Chicago Model 2650 GM survey meter, range 0 to 100 mr/hr
3. One Nuclear Chicago Model 2671 Nuetron counter with probe Model No. 2646 with a range of up to 2500 neutrons/cm^2/sec.
4. One Chatham Electronics Model No. 3, GM survey meter, range 0 to 50 mr/hr.
5. Three Bendex Model 862 Gamma self-reading pocket dosimeters, range 0 to 200 mr/
6. Nine Bendex Model 609 Thermal neutron pocket dosimeters, range 0 to 120 mr.

d. License No. 11-197-2

According to Dr. Freeman, all material licensed by the subject license is stored and used in the Radioisotopes Laboratory on the University of Idaho campus. The laboratory is a frame structure consisting of offices, storage rooms, accounting room, and chemistry laboratory facilities. Keys to the Radioisotopes Laboratory are in the possession of Dr. Freeman, Dr. Porter, and all graduate students under their direction. The graduate students; however, have been instructed not to handle any isotopes unless under the direction of Dr. Freeman.

e. License No. 11-197-3

Byproduct material licensed under the above license, is used in the laboratory Room No. 127 in the Agricultural Science Building. The laboratory is approximately 20 x 20' room, equipped with two fume hoods and laboratory benches, sink, and miscellaneous other laboratory equipment. Room 127 is kept locked at all times when not in use. Keys to the laboratory are in the possession of Dr. Hermanson. Instrumentation used by Dr. Hermanson in his program is as outlined in Appendix A.

f. License No. 11-197-4

Byproduct material licensed under the above license, is used in snow gauges which are located on West Butte Mountain which is ten miles northeast of Moscow. Byproduct material is stored in the Kirtley Engineering Building under the stairwell to the basement in a locked room. Weather

conditions made a visit to the West Butte Mountain location impossible, but Mr. McKean described the facilities on the mountain and precautionary measures that are taken.

9. License No. 11-197-6

Byproduct material used under this license will be used in a laboratory on the second floor of the Dairy Science Building by Dr. Cook. The laboratory is a small, approximately 15 x 15, laboratory equipped with normal laboratory furniture and supplies.

16. Leak Test

a. License No. 11-197-2

Record of
Leak tests performed on the 1 millicurie Cobalt-60 source are as follows:

Last Date of Test	Results
3/21/61	< 0.0001 uc
1/3/63	< 0.001 uc

Should have sent a 4/17 rep!
I W

Byproduct material license condition No. 13 specifies that leak tests should be performed at intervals of no more than six months. As can be seen from table above this condition has not been met. However, Freeman said the source was leak tested on or before a six month basis, but no records were maintained.

b License No. 11-197-4

Leak test records reviewed by the inspectors are as follows:

Isotope	Quantity	Date Received	Leak Test Certificate Date	Subsequent Leak test Date
* Co-60	40 mc	8/3/61	8/5/61	7/23/61 1/11/62 7/20/62 2/23/63
* Co-60	200 mc	6/22/62	6/14/62	2/23/63
Co-60	1 mc	2/5/63	1/30/63	
Cs-137	100 mc	7/17/62	4/30/62	
Cs-137	1 mc	2/5/63	1/30/63	

* IN SNOW GAUGES DURING WINTER

Those sources shown in the table that were located in the snow gauges and uneccessible for leak tests that prescribe six month intervals, have been leak tested as prescribed by license Condition No. 51.A which states that each sealed source located at the remote test sites named in Item 11 above, shall be tested for leak age and/or contamination each spring when the cap is placed over the columnator and each fall when the cap is removed from the columnating device or at intervals not to exceed twelve months if the source remains at the remote test site but is not used in the snow gauge during any twelve month period. All results above were listed as no leak detected, and wipes used for the wipe test were counted using Baird Atomics Spectrometer which is capable of detecting to 0.001 uc.

C. License No. SNM-433

1. Leak test records for the 1/2 curie Pu-Be source contained in the Visuflux radiation facility are as shown below:

Leak Test Date	Results
7/29/61	no detectable
11/29/61	no detectable
5/2/63	no detectable

According to the licensee's letter of application dated December 21, 1960, leak tests on the above mentioned source will be performed each month. As can be seen from the table, this has not been done. Dr. Freeman stated that the source is stored for long periods of time in the Visuflux and that the wipe test shown above were made when source was handled.

2. The 1 curie plutonium-beryllium source that is to be put into the Visuflux neutron irradiation facility is currently stored in the Mound Laboratory shipping container in the Nuclear Engineering Laboratory. Leak tests for this source are as shown below:

Isotope	Date of Procurement	Leak Test Date	Subsequent leak test
1 curie Pu-Be	April 16, 1962	4/16/62	none X Req's 4/7 rept

According to application dated May 26, 1961, which is incorporated as part of License Condition No. 8 of license SNM-433, Pu-Be source will be wipe tested each month. As can be seen from the table ~~below,~~ above, this has not been done.

3. The 5 curie Pu-Be source which is contained in the Model 9000 Nuclear-Chicago subcritical assembly, was wipe tested as shown below:

Source	Date of Receipt	Subsequent Wipe Tests
5 curie Pu-Be	3/13/63	3/25/63

According to the application dated June 29, 1962, which is incorporated as License Condition No. 8 of License No. SNM-433, provides that wipes tests be made each time sources are handled or at least each six months which has been done for this source.

17. Posting and Labeling

a. License No. 11-197-2 - It was observed that Form AEC-3 was posted in the Radioisotopes Laboratory. It was observed that the door to the Radioisotopes Laboratory was posted "CAUTION - RADIOACTIVE MATERIALS", and the storage area for byproduct material in the hood in the Radioisotopes Laboratory, which contained 1 millicurie Phosphorus-32 and

0.5 millicuries Carbon-14, was properly posted. The containers, which were used for storing the Phosphorus-32 and the Carbon-14, were labeled in accordance with 10 CFR 20.203(f)(1) and (f)(4). The small storage room in which the Cobalt-60 contained in a lead pig was stored, was marked "CAUTION - RADIATION AREA", and the lead pig was properly labeled according to 10 CFR 20.203(f)(1) and (f)(4).

b. License No. 11-197-3 - It was observed that the door to Room 127 was posted with a "CAUTION - RADIOACTIVE MATERIALS" sign. It was observed that a container containing 2.8 microcuries of Strontium-90 was not properly labeled in accordance with 10 CFR 20.203(f)(4), in that, the quantity of material and date of assay were not included on the tag. All other byproduct material was properly labeled in accordance with 10 CFR 20.203. It was further observed that Form AEC-3 was not posted by the licensee although the laboratory is maintained as a Restricted area.

c. License No. 11-197-4 - It was observed that the door to the storage area containing the sealed sources was posted "CAUTION - RADIOACTIVE MATERIAL" and "RADIATION AREA". It was observed that each shielded container has a padlock and the padlocks were in the locked condition. The containers containing the 1 millicurie Cobalt-60, the 100 millicurie Cesium-137, and the 200 millicurie Cobalt-60 sources were not properly labeled in accordance with 10 CFR 20.203(f)(1) and (f)(4), in that, the labels did not contain the quantity of material contained therein and the date of assay. The shielding containers containing the 1 millicurie Cesium-137 was labeled in accordance with 10 CFR 20.203 requirements. It was observed that Form AEC-3 was not posted in the restricted area by the licensee. It was further noted that the inside door to the storage area containing the lead pigs was not posted as a high radiation area in accordance with 10 CFR 20.203(c)(1). Independent measurements that had been taken in the storage area indicate radiation levels of 250 mr/hr at 1 meter from the 200 millicurie Cobalt-60 storage container. This container did not have a lead plug over the source storage hole as the other containers did.

d. License No. 11-197-6 - The 6 millicuries of Carbon-14 procured under this license was stored in the original shipping containers which were properly labeled in accordance with 10 CFR 20.203 requirements. The Carbon-14 was stored in an icebox which was not labeled in accordance with 10 CFR 20.203 requirements, inthat a "CAUTION _ RADIOACTIVE MATERIALS" sign was not placed thereon. In addition, it was observed that a Form AEC-3 was not posted in the laboratory although the laboratory was maintained as a restricted area.

e. License No.s SNM-433 and SUD-632 - The door to Room No. 13 in which the Nuclear-Chicago Model 9000 student training reactor is located, was posted in accordance with 10 CFR 20.203 requirements. The Nuclear-Chicago Model 9000 subcritical assembly, which contained the 5 curie Pu-Be source and the bulk of the 5488 pounds of uranium, was not posted in accordance with 20.203(f)(1) and (f)(2). In addition, uranium slugs are stored under a table in the lab in tubes with five slugs to a tube and these also were not labeled in accordance with 10 CFR 20.203(f)(2) in that five slugs equal approximately twenty pounds of uranium. In addition it was observed that Form AEC-3 was not posted.

18. Surveys

a. License No. 11-197-2 - Surveys are performed by the students of the lab once per week but these surveys have not been recorded on a routine basis in the "Radioisotopes Laboratory - Safety Records" book. Dr. Freeman also conducts surveys which are recorded, these surveys are done on an infrequent basis. A review of the surveys indicated that in April 1963, 500 microcuries of Carbon-14 in the form of carbon dyoxide was accidentally pumped into the Radioisotopes Laboratory Instrument Room through a Welch Duo-Seal Vacuum pump by a graduate student. Calculations were made by Dr. Freeman using the volume of the room with no allowance for air movement and these calculations indicated that the maximum concentration of Carbon-14 in the room was 0.7×10^{-5} uc/ml of air which is below Appendix B Table I of 10 CFR 20. All of the calculations done by Dr. Freeman are recorded in his log book.

b. License No. 11-197-3 - A physical survey is made of the laboratory in the Agricultural Science Building when working with byproduct material. Dr. Hermanson, or the graduate students performing the work, make the surveys and the results are recorded in the Radiation Survey Record Ledger Book maintained by Dr. Hermanson. Dr. Hermanson said that there has never been a spread of contamination in the Isotopes Laboratory. Dr. Hermanson's log book showed complete survey records of all arrivals, disposals, dilutions, routine surveys and calibration records of the survey instruments used.

c. License No. 11-197-4 - Mr. McKean stated that surveys are made when byproduct material is moved or used in any way, however, surveys are not recorded. Sources are moved to and from West Butte Mountain near Moscow, Idaho, but no record of surveys made of these movements or of inplacement of the sources in the snow gauges have been recorded.

d. License No. 11-197-6 - Dr. Cook stated that byproduct material had not been used as yet; therefore, no surveys had been made.

e. License No. SNM-433 and SUD-632 - Professor Barnes stated that surveys are made of the 5 curie

Pu-Be neutron source prior to opening the shipping container. Results of these surveys are recorded in a log book. Maximum radiation levels detected was 6.5 mr/hr at the surface of the container and 230 neutrons /cm^2/sec. at the same place. The shipping container was surveyed again after the lid was removed and before placing the source into the sub-critical assembly.

19. Instruction to Personnel

General

The administrative instructions entitled "Regulations Concerning the Safe Handling of Radioisotopes at the University of Idaho" dated September 1962, are used by all licensees of the University. A copy of this dosument is supplied to all persons using byproduct and special nuclear and source materials. Copies of the appropriate licenses were maintained by each licensee for use by persons working under the licenses.

Discussion with Management

On May 10, 1963, the inspectors attended a meeting of the Radioisotopes Committee, University of Idaho, for the purpose of discussing the deficiencies found by the previous day's inspection and to answer any questions the Isotope Committee might have. Members of the Isotope Committee attending this meeting were Dr. Freeman, Dr. Hermanson, Dr. Martin, Professor Barnes, and Mr. McKean. Deficiencies of the programs were discussed at this time and the ~~appropriate Form 591's were issued.~~ licensee's corrective action for each deficiency was reviewed. The appropriate Form 591's were issued at the conclusion of the meeting.

(1)

11-197-2

Organization – applies to all licenses U. of Idaho

Co^{60} – Sealed Source 4/25/61 received

Leak Tests 3/21/61 <.0001 uc. Lic. Cond 13 B(2) – every [illegible]

1/3/63 <0.001 uc

Receipts

Isotope	activity	form	date received	
C^{14}	0.05 mc	HOOC-COOH	~1954	(analyzed [illegible] May 1963 William Davis)
P^{32}	1 mc	H_3PO_4	3/25/61	
C^{14}	0.5 mc	$BaCO_3$	4/61	lost in April 63 to Room
✓ C^{14}	0.5 mc	Acetic Anhydride	4/61	
PuBe	0.5 curie	Pu-Be	6/8/61	
P^{32}	1 mc	H_3PO_4	3/1/63	

Disposals

Burial 3/27/63

0.025 mc C^{14}; Waste from atomic accessories kit, C^{14} 5uc Na^{22} 1uc, Mn^{54} 1uc, Fe^{55} 5uc, Co^{57} 1uc, 60 1uc, Zn^{65} 1uc, Ni^{63} 1uc, Cs^{137} 1uc, Ba^{133} 1uc, Pm^{147} 5uc, Tl^{207} 5uc, Pb^{210} 5uc, Uranium Nitrate 2 gm. Record of burial site recorded by Physical Plant by Ed Stoles

No ventilation system in room but two hoods evacuate room to cause air movement.

11-197-2

In April 500uc of C^{14} in the form of CO_2 was accidently pumped into the Radioisotopes laboratory Instrument Room through a vacuum pump. Welsh Duo-Seal Vacuum Pump. Calculations made by Dr. Freeman using the volume of the room with no allowance for air movement indicated a maximum concentration of C^{14} of $5/7 \times 10^{-5}$ uc/ml of air which is below Appendix B Table I of 10CFR20. 7×10^{9} ml was the volume of the room.

Personnel Monitoring - Pocket Dosimeters are used - Bendix Dosimeter mod 232 0-200mr. 10 pocket film Charger (Universal atomics accessories model no. 750 charger)

2 Tuxedo Charger-Dosimeter Model NC-401 Fast Neutron Dosimeters Recorded in book

Radioisotopes Laboratory - Safety Records
Surveys are maintained in this book

Additional Instruments - Cary Model 31 Vibrating Reed Electrometer

1-250, 1-500, 1-1000ml ionization chambers for use with Cary

2 glassware set-ups 1-C^{14} and 1-H^3.

Visuflux Neutron Howitzer - Pu Be source
20.203(f)(4) Assay + date not on tag "Caution - Radioactive Materials" sticker is on.

(3)

All graduate students plus Dr. Freeman & Dr Porter have keys, the students do not use isotopes, students instructed not to handle any isotopes.

Survey shows 4 mr/hr @ surface of Co^{60} container. o.k.

Leak Tests – ½ curie Pu Be source

7/29/61 – no detectable — Nuclear-Chicago Probe on
11/29/61 – no detectable — moistened tissue
5/2/63 – no detectable

Source stored long periods – wipe tests made every time source has been moved from one storage container to another.

Students survey lab/once/week but have not been recording data. Dr. Freeman's surveys are infrequent. Nuclear Chicago Mod. 2112 Neutron Survey Meter.

4 pw
5/9/63

Enterprises — License No 11-197-3

H. P. Hermanson Ph.D. Reports to A.C. Wiese Ph.D. Head, Ag. Chemistry Dept.

Dr. Hermanson is in charge of the isotope program for the Ag. Dept. Hermanson replaced Jordan.

uses

(1) K. Takayama is working on a study of fungus using C-14 & P-32.

(2) J. Wright is making studies of fungus by using Tracer amounts of C-14.

(3) H.P. Hermanson separation techniques using Sr-90.

(4) G. Ames tracing Vegetation of perental weeds during P-32

Instruments

(See page 10 Lic. appr.)

Purchase of material — Material On Hand

Records of purchases of by-product material are kept in Hermanson ledger book entitled "

Opr C-45 - 4/9/63
C-14

Purchases made ~~Material on hand~~ (continued) WM 8/19/63

20 μc	P-32	12/22/62	When order made
10 μc	P-32	7/23/62	
.653 μc	~~C-~~ 34	7/12/62	
10 μc	P-32	3/12/62	
50 μc	C-14	3/4/62	
1 μc	Z-65	1/22/62	
5 μc's	S-35	1/22/62	
5 μc's	L-210	1/22/62	
135 μc's	Cs-137	12/5/61	
.8 μc	Sr-90	12/5/61	

Most material is ordered from ORNL
Exempt quantities are ordered from Nu-Ch

Waste Disposal

		Dumped down drain
P-32	5/7/63	0.0020 μc
P-32	5/7/63	0.0001 μc
Cl-36	1/9/63	.5 μc
Z-65	7/12/62	.5 μc
I-131	10/28/61	< 10^{-6} × 20 μc
P-32	10/28/61	< .00001 μc
S-35	10/28/61	.00002 μc

Records are kept in ledger book "Radiation Survey Record" (No inceration of material made)
Disposals arrivals, dilution records, survey results calibration records, some dosemeter results are maintained in Radiation Survey Record book (Ledger book).

Shipping & purchase receipts are kept in a bound folder. Dr. Hermanson maintains folders.

now / No receipt for purchases of 135 μc Cs-137 & .8 μc's Sr-90 purchased from Nu-Ch. on 12/5/61.

5/9/63

Survey

A physical survey is made while working byproduct material in the Laboratory 127 in Ag. Sc. bldg. Hermonsen or the student makes the surveys & results are kept in Radiation Survey record ledger book. A Tracerlab Model SU1H 0-2500 mr/hr. Instruments are calibrated on infrequent basis. Hermonsen said there has never been a spread of contamination in the isotope lab. (Rm 127)

All uses of material is carried out in Rm 127.

Rom 127 is kept locked when not in use. Door posted ~~in accordance~~ Caution - Rad - Mat.

nor 20.203 (f)(4) Label on dilution made on material was not labeled in accordance with. Labeled in accordance with 20.203 f(1)(3). (2.8 μc of Sr-90 in container)

nor 20.6(c) AEC-3 not posted by license

4

5-9-63

11-197-3

Personnel Monitoring – Film badge service. Radiation Detection Company 385 Logue Avenue Mountain View, California on two week basis.

Two persons – [redacted] 1st qtr 1963 Ex 6

65 mr

No tear badges worn 1/20/63 – 2/19/63 Increase in background equivalent to 12000 mrem for [redacted] and 360 mrem for [redacted] As there are no filter patterns on films the readings are not accumulated for the above individuals. (Note from film badge service)

Year 1962 210 mr for [redacted] Only recorded exposure for year, also all 210 mr in 1st qtr. Ex 6

This film service started January 1962. No film service from October 1960 to January 1962.

Dosimeters are used for personnel not normally assigned film badges. Results are kept in the "Radiation Survey Record" book.

Dosimeters – Nuclear Chicago 0-200 mr Model no. _____ 6 of these.

EW

License No 11-197-4 5/9/63

Interviewee - G. A. McKean
one of authorized users under condition 19 of the license.

Material on hand

Source	Amount	~~Date~~ Received	Leak Test certificate
1-Co-60	40-mil	8-3-61	8-5-61
1-Co-60	200 "	6-22-62	6-14-62
1-Cs-137	100 "	7-17-62	4-30-62
1-Co-60	1-mil	2-5-63	1-30-63
1-Cs-137	1 mil	2-5-63	1-30-63

All sources obtained from [redacted] ~~Nuclear Chicago~~. U.S. Nuclear Corp.

So No	Date Leak tested	
40-mil Co-60	7/23/61	
	1/11/62	
	7/20/62 ×	at a field site could not be completed
	2/23/63 ×	
1 mil Cs-137	4/30/63	
1 " Co-60	1/30/63	
40 mil Co-60	2/23/63	Results listed as No Leak detected.
200 mil Co-60	2/23/63	

~~Proposed scintillation detector~~

Baird atomic spectrometer used to count wipe test. Both instruments capable to detect 0.001 μc.

Gauges are on West Butte 10 miles N.E. of Moscow.

E M 5/9/63

Leak tests are made by Duncan & McKean.

Dosimeters

10 Nuclear-Chicago L65 0-200 mr dosimeters
1 N-Ch L65 Charger

Instruments

1 - NUCOR C-1A Survey meters

Material Storage

under staircase - door to storage area posted - Caution Rad. Mat'l & Rad. area
Each container has a padlock & was in the locked condition.

Not Posted properly — Co^{60} - 1mc — 20mr/hr @ surface, 3mr/hr @ 6", 1mr/hr @ 18", 0.4mr/hr @ 1 meter. (These readings are with 200mc Cf^{60} source out)

Cs^{137} - 1mc
Cs^{137} - 100mc - Not Posted properly
Co^{60} - 200mc. — Not Posted properly

Independent Measurements

~~120mr/hr @ surface~~

200mc Co^{60} > 1000mR/hr @ surface
250mr/hr @ 1 meter

def.
Containers not labeled in acc with [illegible]

Off Dep (continued) EM

AEC 3 not posted 5/9/63
Room not posted as a high radiation area.
Survey meters

Model No D-1A
Nuclear corp of America / 0-[illegible]
Baird Atomic model 420 0-100 mr/hr

Surveys

Surveys are made but are not recorded.

non 20.401(b) records are not maintained of surveys.

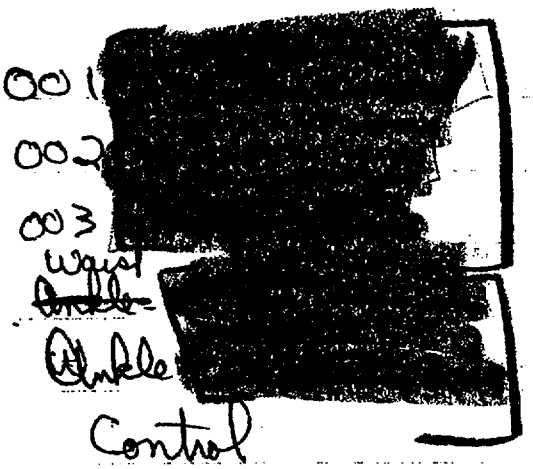
No disposals

(4)

U. of Idaho
Eng. Exp. Station

11-197-4

Personnel Monitoring - Nuclear Chicago Film Badge Service
Badges changed every month.



MAX qtrly (4th qtr 1962)

228
222
228

238

Control badges are higher than any exposures.
Personnel Records are O.K.

TU-2149J

Has no material as yet - needed nothing

11-197-5

Initial Inspection

University of Idaho
Dept. of Physical Sciences
520 East B Street
Moscow, Idaho

6.	7.	8
C^{14}	Any	1mc
H^3	Any	100mc
P^{32}	Any	10μc

9. Lab. studies on Antibiotics
Conditions
11. 10CFR20
12. By or under supervision of W.T. Collins (Plant Physiologist U.S. Forest Service)
13. No field applications or studies
14. App. 11/14/62. R.S.O. Dr. P.K. Freeman
includes U. of Idaho Procedure for Safe Handling of Isotopes.

University of Idaho
Department of Dairy Science
Moscow, Idaho

11-197-6

Initial Inspection

6. C^{14} 7. Any 8. 40 mc

9. Synthesize labeled compounds for use in ruminant metabolism studies.

Conditions

11. 10CFR 20

12. Used by or under supervision and in physical presence of R.N. Cook (asst. Prof Dairy Scien

13. Not on humans or in field applications

14. Appr. 2/15/63

15. Animals or their products administered radioactivity shall not be used for human consumption.

→ R.S.O. Dr. P.K. Freeman

"U. of Idaho Regulations"

Dr. R. M. Cook - Asst Prof. of Dairy Science

11-197-6

Procurement - Volk Radiochemical Company

2 mc. C^{14} Acetate
2 mc. C^{14} Butyrate
2 mc. C^{14} Proprionate

} 4/30/63

Total 6 mc.

Surveys - O.K.

Instrumentation - instruments to be used are located in Radioisotope Laboratory - Cary Model 31 Vibrating Reed Electrometer.

Send - "Caution - Radioactive Materials" - See about stickers

Materials not used as yet -
AEC-3 given and instructions for use

Call to Dr. P.K. Freeman 6/4/63

½ curie Pu-Be source in VISUFLUX in Radioisotopes Lab.

1 curie Pu-Be source in shipping contain in Nuclear Engineering Lab.

[illegible] 1.[illegible]
[illegible] mr/gm
Mr. [illegible] W.P. [illegible] SU[illegible]-63[illegible]

[illegible] [illegible] Mech. [illegible]
[illegible] to G. E. Peterson [illegible]
Mech. Eng Dept. He has
been given authority by the
[illegible] College of Engineering, A.S. Jenssen
to be in charge of [illegible]
[illegible] J. A. [illegible], Asst
professor of Mech. Engineering,
[illegible] control over the [illegible]
of the [illegible].

1384 slugs - 5,488 lbs
2/7/63

Savannah River [illegible]
E. I. du Pont Co ~~de Nemours~~
Aiken S.C.

[illegible]-438

1 curie Pu-Be (P.K. Freeman)
5-curie Pu-Be in the sub-
critical - sub[illegible]
[illegible] conditions

[illegible] curie [illegible] 3/13/63 [illegible]
[illegible] Chemical Dayton,
Ohio

1 curie [illegible] April 19 1962 -
[illegible] in a Visaflux
Source Assembly. [illegible]

SNM

Mound Lab in Dayton.

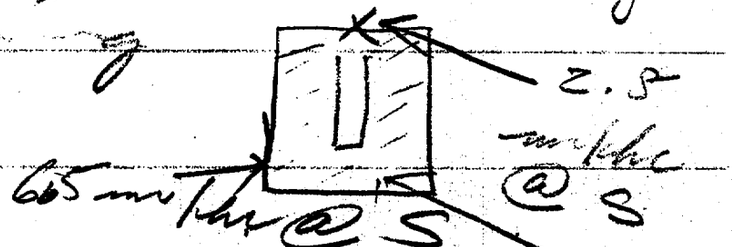
Wipe test

1 Curie - 4/16/62

5 curie on 3/25/63 - before put to use - before putting the source in the sub critical.

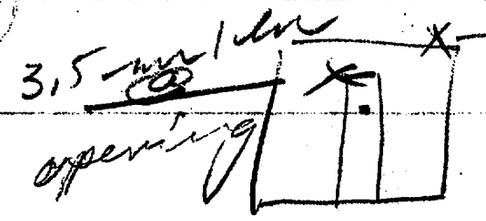
Surveys

Shipping container was surveyed prior to opening



230 Neutrons / cm² - sec

Survey with lid removed from container



250 Neutrons / cm² sec

Personnel Monitoring

Each person who enters the room where the sub-critical is located is required to wear a gamma & neutron dosimeter. Results are

1

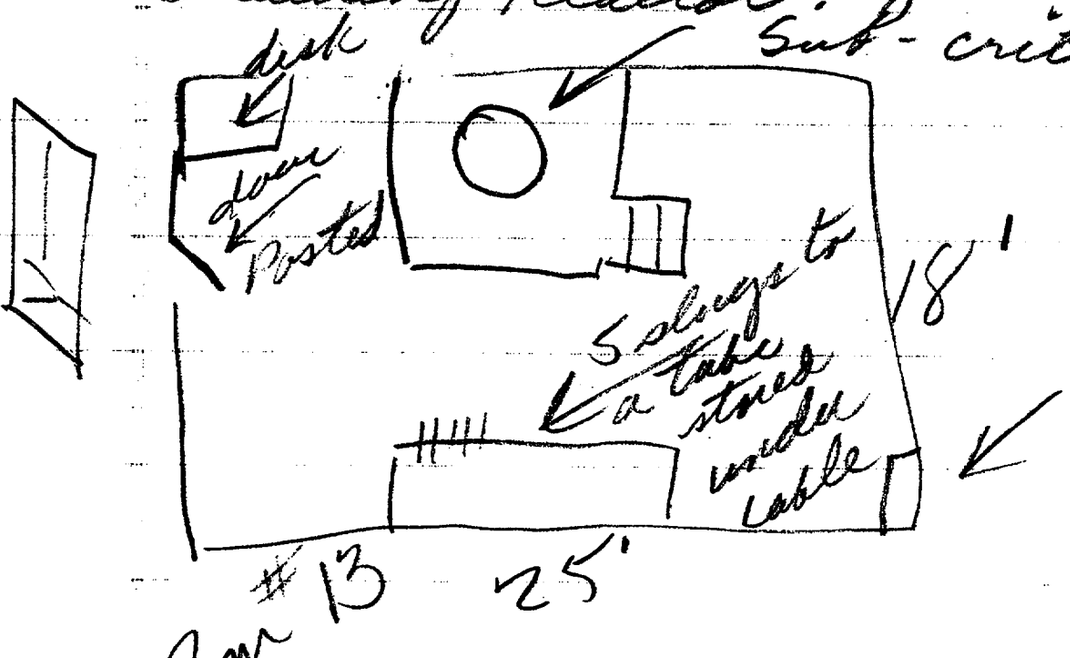
Personnel Monitoring

Dept in College of Engineering
Mechanical Engineering Dept.
Nuclear Laboratory - Engr. 13
First entry in check book was
No
for 1:30 PM on March 3, 1963
The max. Gamma 5 mr
& 5 neutrons & results
were mainly 0 - 2 mr &
neutrons.

Deficiencies

20.203(f)(1)
20.203(f)(2)
20.206(c)
Leak testing

Licensee has a Nuclear-Chicago Model 9000 Student Training Reactor.



Rm

Instruments

4 EM

5/9/63

Instruments

1- Nuclear-Chicago model 2670 Alpha meter

1- Nuclear-Chicago Model 2650 GM meter range 0-100 mr/hr

1- Nuclear-Chicago Model 2671 Neutron probe Model 2646 Neutron counter 2500 Neutrons/cm²/sec

1- Chatham Electronics Model No. 3 0-50 mr/hr range.

Dosimeters

3- gamma Bendix 862 0-200 mr self reading - 9 on order

9- Bendix 609 0-120 millirems thermal neutrons

Robert Lowenstein, Acting Director,
Division of Licensing and Regulation,
AEC Headquarters

SEP 5 1961

Donald I. Walker, Director, Idaho
Compliance Area, Division of Compliance

ORIGINAL SIGNED BY
DONALD I. WALKER

INSPECTION REPORT - UNIVERSITY OF IDAHO, MOSCOW, IDAHO - BYPRODUCT MATERIAL LICENSE 11-197-2, 11-197-3, AND SNM-433
CO-ID:WCF

Transmitted herewith is one (1) copy of the subject report.

The only items of noncompliance observed or otherwise noted during the course of the inspection are as follows:

License 11-197-2 and SNM-433

10 CFR 20.203 (e)(1) Caution signs, labels and signals
in that rooms or areas in which licensed materials in which one-millicurie amounts of each of the isotopes of Phosphorus-32, Cobalt-60 and Carbon-14 were stored and in which 0.5 curies of Plutonium-239 was stored were not posted with the words "Caution-Radioactive Materials".

10 CFR 20.206 Instruction of personnel; posting of notices to employees.
(c) in that Form AEC-3 was not posted in the Radioisotopes Laboratory.

License 11-197-2

Item 8 - in that the licensee possessed 1.25 millicuries of Carbon-14 from March 30, 1961, to July 28, 1961, an overpossession of 0.25 millicuries.

There has been very little activity associated with licensed programs at the University of Idaho. The use of materials licensed for possession by License No. 11-197-3 were temporarily discontinued in October, 1960, when Dr. J. V. Jordan left the Staff of the University of Idaho. Since Dr. Jordan was the only person in the Department of Agricultural Chemistry who was working with licensed materials, it was not possible to ascertain whether the radiation control program observed by Dr. Jordan was in strict compliance with statements, representations, and procedures

(continued)

contained in his applications and in University administrative instructions which are incorporated as conditions of License No. 11-197-3. However, it appeared from the records left by Dr. Jordan that compliance with provisions of 10 CFR 20 and 30 was being observed. The records which Dr. Jordan had kept were left with Dr. D. J. LeTourneau, RSO for the University of Idaho. Dr. LeTourneau stated that he was not entirely familiar with Dr. Jordan's use of licensed materials since he had not worked with Dr. Jordan.

The inspector was introduced to Dr. Harvey Hermanson, who has been added to the Staff at the University of Idaho to take over where Dr. Jordan left off. Dr. Hermanson stated that he had reviewed all of Dr. Jordan's records and the provisions of License No. 11-197-3. He indicated that the procedures which he intended to follow concerning the use of licensed materials were not necessarily the same as those which Dr. Jordan had outlined and that he would have to request that the applications sent in by Dr. Jordan and incorporated as conditions of the license be replaced with his application when he applies to be included as an authorized user of License No. 11-197-3.

In view of the facts presented above, a clear form notice has been issued to the licensee concerning the inspection of License No. 11-197-3. L&R's copy of this notice is enclosed herewith. The report enclosed includes information concerning the licensee's use of licensed materials authorized by License Nos. 11-197-2 and SNM-433. Materials licensed for possession by these licenses are being used by Dr. F. K. Freeman in the instructions of a course in radiochemistry. It will be noted that SNM-433 has more recently been reissued to include the use of another plutonium-beryllium neutron source by the College of Engineering. At the time of the inspection, the only source possessed by the University was a sealed source containing 2 grams of Plutonium-239, which will be used by Dr. Freeman.

The University of Idaho has an Isotope Committee which was supposedly established to review individual proposals for the use of licensed materials at the University of Idaho and to act in an advisory capacity to aid in the selection of proper safety measures. Because of the relative inactivity concerning the use of licensed materials, the committee business has been handled by the RSO, Dr. LeTourneau. Dr. LeTourneau stated that he had reviewed all applications for licensed materials and that the applications were supposed to be signed by him. However, a review of the licensee's recent applications (Form 313) reveals that the applications are signed by the Bursar and not by the RSO or the Chairman of the Isotope Committee.

(continued)

It appears that the Isotope Committee exists more in name than for the function they were established to perform. However, the members of the Isotope Committee did meet with the inspector to discuss the requirements for applying for a broad scope license for the University of Idaho and, according to Dr. LeTourneau, they were to meet in the very near future to further discuss the advisability of applying for an institutional broad scope license. Dr. LeTourneau felt that the membership of the Committee would be altered considerably to include persons who are presently more closely associated with the use of licensed materials at the University than some of the members who are presently on the Committee.

The licensee can be contacted through Dr. D. R. Theophilus, President, University of Idaho, Moscow, Idaho.

In view of the fact that the use of radioactive materials licensed by License No. 11-197-3 had been temporarily discontinued and the licensee plans to recommence operations in the near future, a reinspection of the program under License No. 11-197-3 will be rescheduled in approximately six months. Other licenses issued to the University of Idaho will be scheduled for inspection in accordance with Section III.03 of Draft AEC Manual Appendix 0705.

Enclosure:
Inspection Report
University of Idaho (1 cy)
Clear Case 11-197-3

CC: Leo Dubinski (w/orig rpt)

OFFICE ▶	CO-ID	CO-ID	CO-ID			
SURNAME ▶	WCPierce:mh	WBJohnston	DIWalker			
DATE ▶	8/29/61					

Form AEC-417
(4-58)

UNITED STATES ATOMIC ENERGY COMMISSION

COMPLIANCE INSPECTION REPORT

1. Name and address of licensee

University of Idaho
Department of Physical Sciences
Moscow, Idaho

2. Date of inspection

July 27 & 28, 1961

3. Type of inspection 1 Reinspection(1) 1 Initial

4. 10 CFR Part(s) applicable

20, 30 70

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

License 11-197-2, Amendment 2 (IF-4) (Reinspection(1)) Issued: 1/5/61 Expires: 4/30/64
Amended in its entirety

Amendment No. 3 - Dated 2/23/61

Scope and Conditions: See Par. 12. a

License SNM-433 (III 8,5) (Initial) Issued: 1/16/61 Expires: 1/31/63

Scope and Conditions: See Par. 13. a

6. Inspection findings (and items of noncompliance)

Byproduct materials and special nuclear materials are used in teaching a course in radiochemistry. Students keep records of personnel monitoring and physical radiation surveys, and records of receipts of licensed materials are maintained by the principal authorized user, Dr. P. K. Freeman.

The only items of noncompliance observed or otherwise noted during the course of the inspection are as follows:

License 11-197-2 and SNM-433

10 CFR 20.203 (e)(1) Caution signs, labels and signals
in that rooms or areas in which licensed materials in which one-millicurie amounts of each of the isotopes of Phosphorus-32, Cobalt-60 and Carbon-14 were stored and in which 0.5 curies of Plutonium-239 was stored were not posted with the words "Caution Radioactive Materials." (Pars. 12 e. and 13).

10 CFR 20.206 (c) Instruction of personnel; posting of notices to employees
in that Form AEC-3 was not posted in the Radioisotopes Laboratory (Pars. 12. f and 13).

(continued)

7. Date of last previous inspection

License 11-197-2 - 11/7/57
License SNM-433 - None

8. Is "Company Confidential" information contained in this report? Yes ☐ No ☒
(Specify page(s) and paragraph(s))

DISTRIBUTION:

CO (1)
L&R (1)
ID (1)

Original signed by WILLIS B. JOHNSTON
Wellington C. Pierce
(Inspector)

Approved by: Willis B. Johnston, Inspector
Idaho Compliance Area
Division of Compliance
(Operations office)

Original signed by WILLIS B. JOHNSTON

SEP 5 1961
(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

16—73314-2 U. S. GOVERNMENT PRINTING OFFICE

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

Form AEC-117
(4-58)

UNITED STATES ATOMIC ENERGY COMMISSION

COMPLIANCE INSPECTION REPORT

1. Name and address of licensee	2. Date of inspection
University of Idaho Department of Physical Sciences Moscow, Idaho	July 27 & 28, 1961
	3. Type of inspection: Routine (1) Announced (2) Special (3) Initial (4) Termination (5) Reinspection (6)
	4. 10 CFR Part(s) applicable 20, 30 70

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

License 11-197-2, Amendment 2 (IP-4) (Reinspection(1)) Issued: 1/5/61 Expires: 4/30/64
Amended in its entirety

Amendment No. 3 - Dated 2/23/61

Scope and Conditions: See Par. 12. a.

License SNM-433 (2 & 3) (Initial) Issued: 1/16/61 Expires: 1/31/65

Scope and Conditions: See Par. 15. a

6. Inspection findings (and items of noncompliance)

Byproduct materials and special nuclear materials are used in teaching a course in radiochemistry. Students keep records of personnel monitoring and physical radiation surveys, and records of receipts of licensed materials are maintained by the principal authorized user, Dr. P. K. Freeman.

The only items of noncompliance observed or otherwise noted during the course of the inspection are as follows:

License 11-197-2 and SNM-433

10 CFR 20.203 (c)(1) Caution signs, labels and signals
In that room or areas in which licensed materials in which one-millicurie amounts of each of the isotopes of Phosphorus-32, Cobalt-60 and Carbon-14 were stored and in which 0.5 curies of Plutonium-239 was stored were not posted with the words "Caution Radioactive Materials." (Paras. 12 e. and 15).

10 CFR 20.206 (c) Instruction of personnel; posting of notices to employees
In that Form AEC-3 was not posted in the Radioisotopes Laboratory (Paras. 12. f and 15).

(continued)

7. Date of last previous inspection
License 11-197-2 - 11/7/57
License SNM-433 - None

8. Is "Company Confidential" information contained in this report? Yes ☐ No ☒
(Specify page(s) and paragraph(s))

DISTRIBUTION:
CO (1)
IEM (1)
IO (1)

Originals signed by
WILLIS B. JOHNSTON
Willis B. Johnston
(Inspector)

Approved by: Willis B. Johnston, Inspection
Idaho Compliance Area
Division of Compliance
(Operations office)

SEP 5 1961
(Date report processed)

If additional space is required for [illegible] binding, identifying each item by number and noting "Continued" on the face of form under appropriate [illegible] (continued)
format, leaving sufficient [illegible] to local
[illegible] (Par. 12. b).
March 30, 1961, to July 28, 1961, on maintenance of 0.25 mCi/ml-

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

16—75814-2 U. S. GOVERNMENT PRINTING OFFICE

9. History

The initial inspection of the licensee was made on November 7, 1957. The operations licensed under Byproduct Material License 11-197-1 and 11-197-2 and Source Material License C-1168 were inspected at this time. License 11-197-1 expired on April 30, 1958, and was superseded by License 11-197-3, issued April 4, 1958. License C-1168 expired on February 1, 1958, and was terminated in accordance with Inspection Guide Memo 32, Section II (b)(2) on receipt by this office of a copy of a letter from L. C. Cady dated April 25, 1961, stating that the licensee did not wish to renew the license. During the course of the initial inspection, it was noted that the licensee was in noncompliance with Federal Regulations in that radiation surveys were not made and a metal storage safe was not properly posted. In addition, the licensee had violated Conditions 11 and 12 of License 11-197-1 in that byproduct material was used at an unauthorized location.

10. General

A reinspection of the operations under License 11-197-2 and initial inspections of License 11-197-3 and SNM-433 were made on July 27, and 28, 1961. This report contains information pertaining only to the inspections of operations licensed by Licenses 11-197-2 and SNM-433. With respect to License 11-197-3, a clear notice has been enclosed with this report. Initial contact with the licensee was made with Dr. R. K. Raumie, Director, Radioisotopes Laboratory and Dr. P. K. Freeman, Assistant Professor of Chemistry. Dr. Freeman instructs in a course in which byproduct materials are used.

11. Administration and Organization

The Radiological Safety Officer at the University of Idaho is Dr. D. J. LeTourneau. Dr. LeTourneau was contacted during the course of the inspection in connection with License 11-197-3. Dr. LeTourneau was listed as the only authorized user of licensed materials on License 11-197-3 at the time of the subject inspection. Dr. LeTourneau stated that an Isotope Committee exists at the University of Idaho and that its membership is made up of the following persons:

Dr. Waldo Curtis, Chairman,	Physics
Dr. D. J. LeTourneau, RSO,	Agricultural Science
Dr. E. H. Graham,	Chemistry
Dr. R. K. Raumie,	Chemistry
Dr. McIlvaine,	Botany

Dr. LeTourneau stated that the Committee does not meet regularly since the activity of the licensed programs at the University had been quite limited. He stated that some of the committee members had discussed recent applications for byproduct material licenses which were made by the College of Engineering; he added that the applications were required to be signed by the RSO prior to being sent to L&R. Dr. LeTourneau stated that he expected that the membership of the Committee would be changed in the near future to include Dr. Freeman as RSO and to include representatives from the College of Engineering; he added that Dr. Harvey Hermansen, recently added to the Staff of the College of Agriculture would also be considered for membership on the Committee, since he plans to request L&R to be listed as an authorized user on License 11-197-3. According to Dr. LeTourneau, the Committee is approved by Dr. D. R. Theophilus, President, University of Idaho.

12. License 11-197-2, Amendment 2 (I-F, 4) (Reinspection(1)) Issued: 1-5-61
License amended in its entirety Expires: 4-30-64

a. Scope:

"A. Carbon 14, Any, 1 millicurie. Use: Chemical Exchange and similar laboratory studies.

"B. Cobalt 60, Sealed Source (Western Radiation Laboratory CCT-1), 1 millicurie. Use: To be used for experiments in gamma ray absorption and scattering, radiation chemistry and in calibration of survey instruments.

"C. Phosphorus 32, Any, 1 millicurie. Use: To be used for experiments in X-ray absorption, radioactive decay and radiochemical separation methods."

Conditions:

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

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

"12. Byproduct materials shall be used by, or under the direct personal supervision of, E. K. Raumio or P. K. Freeman.

"13. Sealed sources shall be tested for leakage and/or contamination in accordance with the following:

A. Leak test shall be performed by persons specifically licensed by the Commission to perform such tests.

B. Each sealed source containing byproduct material with a half-life greater than thirty (30) days and in any form other than gas, shall be tested for leakage and/or contamination as follows:

(1) An appropriate test for leakage and/or contamination shall be performed on the sealed source surface, or on the accessible surfaces of the device in which such a sealed source is permanently or semipermanently mounted. The test shall be performed upon receipt of a source from another person, unless the licensee receives certification from the person making the transfer that the sealed source had been tested within thirty (30) days prior to transfer and found free of any removable radioactive material.

(2) Following completion of the test prescribed in B(1), each sealed source shall be tested for leakage and/or contamination at intervals not to exceed six (6) months.

C. The test performed pursuant to B shall be sufficiently sensitive to detect 0.05 microcurie of removable beta and/or gamma emitting radioactive material. Records of leak test results shall be maintained by the licensee.

D. If the test performed pursuant to B(1) and B(2) reveals removable radioactive material, the licensee shall take immediate action to prevent spread of contamination and, within thirty (30) days after completion of the test, shall notify the Isotopes Branch, Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D.C.

E. Repair of sources shall be performed by the manufacturers of the sources or by persons specifically licensed by the Commission to perform such repairs."

Amendment 3, 11-197-2 Issued: 2/23/61

Condition 15.A. is amended to read:

"15.A. Leak tests shall be performed by Dr. Peter K. Freeman."

b. Scope of Program

Dr. Freeman stated that, prior to his application for renewal and change of scope of the subject license, the use of byproduct materials was confined to small quantities (less than 0.5 mc) of Carbon-14 being used in a research project by Dr. Grahn. He said that generally licensed materials had been used for instruction in a course in radiochemistry prior to his receipt of a specific license. Dr. Freeman stated that he was unaware that Dr. Grahn still possessed some of the Carbon-14 which he (Dr. Grahn) had originally purchased and that he (Freeman) had ordered and received one (1) millicurie of Carbon-14-tagged compounds, which is the possession limit of the license. Dr. Freeman was informed that the possession of byproduct material in excess of one (1) millicurie of Carbon-14 was in violation of Item 8 of the subject license; the amount of Carbon-14 estimated by Dr. Grahn to be left over from his previous activities was about 250 microcuries. Dr. Freeman stated that he would request an increase in the possession limit of the license to take care of the overpossession. In addition to the Carbon-14 received by Dr. Freeman, records were exhibited which revealed that one millicurie of Phosphorous-32 and one millicurie of Cobalt-60 (as sealed source) had been received. Dr. Freeman stated that the materials would be used in connection with the radiochemistry course which he teaches every other semester and that they would only be used under his direct personal supervision.

c. Facilities and Instrumentation

According to Dr. Freeman, all materials licensed for possession by the subject license are stored and used in the Radioisotopes Laboratory on the University of Idaho campus. The Laboratory is a frame structure consisting of offices, storage rooms, a counting room and chemistry laboratory facilities. In addition to the counting equipment possessed by the licensee, the licensee possessed the following operable survey instruments:

Nuclear Chicago Model 2112 with BF_3 probe.
0-150, 0-1500 and 0-15,000 CPM (operable)
Universal Atomic Model 700 survey meter (operable)
0-0.5, 0-5 and 0-50 mr/hr
Baird Atomic Model 414 Logarithmic Survey Meter

The licensee also possesses an alpha survey probe which can be attached to one of their survey instruments.

d. Personnel Monitoring

According to Dr. Freeman, he and each student enrolled in his course are supplied with two pencil dosimeters during the times when they work with radioisotopes in the laboratory; he said the dosimeters were read by the students at the end of each week's use and the average reading of the two dosimeters is recorded by the student. Examination of the pencil dosimeter records exhibited by Dr. Freeman revealed that three students were enrolled in the course during 1960 and two were enrolled in 1961. The highest recorded reading was 11 mr/week; however, most of the exposures were 1 mr/week or less. There were no exposures recorded which exceeded 25 percent of the maximum permissible levels which became effective January 1, 1961.

University of Idaho

e. Storage Facilities - Posting and Labeling

All of the materials which were reported to have been received (Par. 12. b) were stored in the Radioisotopes Laboratory. Entrances to the storage rooms were posted with signs bearing the radiation caution symbol and the words "CAUTION RADIATION AREA" in magenta on a yellow background; however, the storage rooms and areas were not posted with the words "Caution Radioactive Materials". Dr. Freeman was informed that the wording on their signs was not in compliance with 10 CFR 20.203 (e)(1). Dr. Freeman agreed to exchange the signs for those which were in compliance with Federal Regulations. Dr. Freeman added that the Radioisotopes Laboratory was locked at all times when not occpied by himself or graduate students under his supervision. He stated that his graduate students had been cautioned not to handle radioactive materials except in his presence. All storage containers of licensed materials were marked with labels bearing the radiation caution symbol and the words "CAUTION RADIOACTIVE MATERIALS" and with information pertaining to the name of the isotope, the amount of activity and the date of measurement of the activity.

f. Instruction to Personnel

Dr. Freeman stated that a portion of the course work was devoted to instructing students in the use of pencil dosimeters and survey instruments and in the safe handling of radioisotopes; written instructions in the use of materials are passed out at the beginning of the course. Dr. Freeman exhibited copies of the subject license, of 10 CFR 20 and 30 and of the University regulations governing the use of radioactive materials at the University of Idaho. Form AEC-3 was not conspicuously posted in any place in the Radioisotopes Laboratory. Dr. Freeman was informed that the condition constituted noncompliance with 10 CFR 20.206(c). He stated that the condition would be corrected. As noted in Par. 12 e. above, students are informed of the exposures received by them during their coursework because they keep their own records of exposure.

g. Waste Disposal

Dr. Freeman stated that the University has set aside a small plot of ground for the disposal of solid wastes; however, they have made no disposals to the burial ground as a result of the activities licensed by the subject license; no liquid wastes have been disposed of. Dr. Raunio stated that a number (unknown) of badges containing radioactive material had been given to Dr. L. D. Cady, University Liaison Officer to AEC, by the U. S. Army. Dr. Raunio stated that the identity of the radioactive material was not known by Dr. Cady so the badges were buried in the University burial grounds.

h. Surveys and Records

Dr. Freeman stated that the students who take the course are required to make physical radiation surveys of their working areas and of the storage areas during each class period that licensed materials are used. The student survey records exhibited by Dr. Freeman showed that levels ranging between 2.5 and 6 mr/hr had been measured at a distance of one foot above the storage cave. In addition to student surveys, the records show that Dr. Freeman made a survey of the storage areas on July 21, 1961; no levels above 3 mr/hr were recorded. Measurements were made by the inspector using an RM 40T survey instrument calibrated July 13, 1961, at Idaho Operations Office. The highest level of radiation determined was 2 mr/hr, at the surface of the Cobalt-60 sealed source storage container.

University of Idaho

i. Leak Testing of Sealed Sources

According to the record of receipt exhibited by Dr. Freeman for the Cobalt-60 sealed source, the source was leak tested by Western Radiation Laboratories on March 21, 1961, prior to being sent to the University of Idaho; the report showed less than 0.00001 microcurie was present. It should be noted that Dr. Freeman is authorized to perform subsequent leak tests of the sealed source at six-month intervals.

13. License SNM-433 (III-B,5) (Initial) Issued: 1/16/61 Expires: 1/31/63

a. Scope:

"Plutonium, 8 grams of plutonium encapsulated as a Pu-Be neutron source. Use: For use in educational experiments in accordance with the procedures described in the licensee's application dated December 21, 1960."

b. General

A license has also been issued to the University of Idaho for the possession of eight grams of plutonium encapsulated as a Pu-Be source to be used in educational experiments involving neutrons. Dr. Freeman stated that the source would be used in conjunction with the byproduct materials discussed in Par. 12 of this report; thus, the radiation safety program involving the neutron source would be conducted concurrently with the program authorized by License 11-197-2. According to Dr. Freeman the source had not been used up to the time of the inspection but had been received on June 8, 1961, and had been transferred from the shipping container to the neutron howitzer on July 24, 1961, at which time the transfer operation was monitored with a survey instrument by Dr. Freeman and a leak test of the sealed source was made; the record of the survey and leak test which was exhibited showed that the leak test was negative. According to the licensee's application, the source is to be leak tested once a month. Dr. Freeman stated that he had not leak tested the source when he first received it because he had not opened up the shipping container; he said that he had leak tested it the same day he transferred the source to the neutron howitzer. The record of receipt of the sealed source containing Plutonium-239 which was exhibited by Dr. Freeman showed that the source contained 8 grams of plutonium (one-half curie) and was received on June 8, 1961. The neutron howitzer was marked with a tag bearing the radiation caution symbol and the words "CAUTION RADIOACTIVE MATERIALS" in magenta on a yellow background and information as to the name and activity of the isotope. A survey of the howitzer by the inspector revealed that there was no level of radiation in excess of 1 mr/hr at any point on the surface. The plutonium source was stored in the same laboratory building as the byproduct materials licensed for possession by License 11-197-2 (Par. 12. c) and, therefore, the items of noncompliance pertaining to Federal Regulations which were noted in conjunction with License 11-197-2 are also applicable to this license (See Pars. 12. e and 12. f).

14. Discussion with Administration

On July 28, 1961, Dr. LeTourneau called a meeting of the University Isotope Committee in which all members of the Committee and other persons were present. During this time, the provisions of applicable Federal Regulations were discussed with the committee, with particular emphasis being placed on the requirements which the University would have to fulfill to be approved for a broad scope license. Since several of the departments and colleges

University of Idaho

within the University of Idaho have recently applied for specific licenses or are interested in doing so, the Isotope Committee was interested in the possibility of making application for a broad scope license. At the conclusion of the meeting with the Isotope Committee, the results of the inspection were discussed briefly with President Theophilus in the presence of Dr. Lefoumeau.

FIELD INSPECTION NOTES

Licensee University of Idaho Licenses 11-172-2 & SNM-933 Date July 27 & 28, 1961

Address Moscow Idaho Inspector W.C. Pierce

Type of Inspection (I, R, F):
Announced X Unannounced ___
10 CFR
20 X : 30 X : 31 ___ : 40 ___ : 70 X

Accompanied by —

Affiliation —

Notice Issued:
Clear —
Minor Item ___

GENERAL DATA

1. Personnel contacted: Dr. P.K. Freeman - Assist Prof. Chemistry
Dr. E.K. Rawnio - Director Radioisotopes Lab.

2. Organization:
a. Chain of Command and Responsibility: President of U. of I. Dr. D.R. Theophilus

b. Authorized users: P.K. Freeman
E.K. Rawnio

c. Unauthorized users:
none

d. Isotope Committee: yes X no ___.
Members:
See License 11-172-3
Functions:

e. RSO D.J. LeTourneau

Licensee U of Idaho

GENERAL DATA (Continued)

3. Program Scope:

a. Procurement and Use of Material:

Date From	Date To	Material	Form	Quantity	Possession Limit
4/25/61	present	Co-60	Sealed source	1 mc	1 mc.
3/21/61	present	P-32	any	1 "	1 mc.
3/20/61	"	C-14	$BaCO_3$ Ac_2O	1 mc	1 mc
		~~14C-433~~			
6/8/61	present	Pu Be source	Sealed Source for	8 g/1/4 curie	8 g
From 1958		C-14	oxalate	~~1~~ 250 gm	1 mc

Evidence of overpossession at any time: yes X no ___

Details: Dr. Groh was originally the only user on license #2 for 1 mc. 0.5 mc of C-14. about half of materials still remain. In addition Freeman has purchased 1 mc of C-14 under newly issued license # 2.

Generally-licensed materials:

- Two kits of generally licensed materials are stored in small cabinet. Amounts are generally licensed and containers are properly labeled. Received 10/2/59.

Unlicensed materials:

Non-licenseable sources of radiation: None

b. Transfers of Material:

None as yet

Licensee U. of Idaho 3

GENERAL DATA (Continued)

4. Facilities:

a. Restricted area: Materials stored in storage ~~closets~~ rooms in Radioisotopes Lab.

b. Unrestricted areas: Not removed from lab

c. Unauthorized locations: None.

d. Facility and laboratory equipment (Instruments and alarm systems, etc.):

Radioisotopes Laboratory consists of two large rooms plus several offices and storage rooms.
P-32 + C-14 stored in one storage room.
Co-60 source stored in separate room
Pu-Be Cannister was sitting in middle of floor of laboratory.

Instruments

Chicago Nuclear Model 212 with BF_3 probe.
0-150, 0-1500, 0-15000 cpm

Universal Atomics Mod. 700 0-0.5, 0-5 & 0-50mr/hr

Baird Atomic Mod 414 Logarithmic Survey Meter

Also have alpha survey probe for use with one of survey instruments.

INSPECTION NOTES

10 CFR 20 - Standards for Protection Against Radiation

Licensee U. of Idaho 11-197-2 Date July 27 & 28, 1961

1. Personnel Monitoring (See 10 CFR 31, Page 5 for Radiographers):
   a. Dosimeters 2 dosimeters/person Film Badges —
      Range 0 - 200 mr/hr
   b. Film badge supplier:

      Furnished on: N/A ___ quarterly basis
      ___ monthly basis
      ___ weekly basis

   c. Badges supplied to: N/A

   d. Exposure records consist of: ~~Daily~~ Weekly Dosimeter Records X
      ~~Supplier's records~~ ___
      ~~Form AEC-5~~ ___
      Form AEC-4 ___

      Dosimeter records maintained: yes X no ___

   e. Average quarterly exposures, beta and/or gamma:
      ~~Film~~ [11 mr/wk] was highest
      most exposures are less than [1 mr/wk].

   f. Highest quarterly exposures:
      no exposures in excess of
      25% of permissible limits.

   g. Overexposures, with names, dates, sources:

      none

   h. Reports of overexposures:
      To USAEC:
      N/A

      To Employee:

2. Storage facilities: Licensed Materials are stored in rooms where they can be locked up day or night. Dr. Freeman says lab is never left unlocked when it is unattended. Graduate students are always present if Freeman is not.

3. Posting and Labeling:

a. Rooms, Areas:

Neither rooms nor areas were posted in ~~accordance~~ accordance with 10CFR 20.203(e)(1). Rather signs were "Caution Radiation Area" and radiation caution symbol.

b. Containers

All containers used for storage of materials were labeled in accordance with 10CFR 20.203(f)(1)&(f)(4).

Waste cans also properly marked.

4. Instruction to Personnel:

a. General instructions: Laboratory instructions in use of materials given to students prior to taking course. Students keep own personnel monitoring records and make lab. surveys. Also given copy of University Instructions

b. Operating and Emergency Procedures:

These procedures are included in University Regulations Copies of license and 10CFR20 were on file in Dr. Freemans office.

c. Posting of Form AEC-3: yes ___ no X

5. Waste Disposal: ~~Corrected in presence of inspector~~

a. Liquid wastes: Consist of washings from contaminated glassware only.

b. Solid Wastes: Only waste buried was bunch of badges originally given to Dr. Cady. Badges buried in University burial ~~ground~~ ground. Material was ~~Possibly~~ ~~to be~~ radium although not known.

c. Records:

University knows where material is buried but no date of burial was made.

d. Surveys:

None

e. Burial Facility: Small plot of University ground has been set aside for burials. DeTournay plans to mark the area better. Only stakes mark individual burial sites at present time.

6. Surveys and Records:
   a. Laboratory areas: Students make surveys of laboratory and storage areas during class. Freeman made survey of transfer of Pu-Be source to Howitzer on 7/24/61
   b. Storage areas: Freeman made survey of storage areas on 7/21/61. Student readings show range of 2.5-6 mr/hr 1 ft above storage
   c. Teletherapy areas: None
   d. X-ray (radium) areas: None
   e. Independent Measurements taken:
      Instrument FH 40 T By W.C. Reece
      Calibration date July 13, 1961

      Surface of 1 mc Co-60 source container 2mr/hr
      " " Pu-Be Howitzer < 1mr/hr

7. Special License Conditions:
   a. Leak Tests: Leak Test Performed by Western Radiation Labs. on 3/21/61 prior to sending to U of Idaho. Source will be tested by Freeman in future.
   b. ~~Other~~: Pu-Be source was left in storage until July 24, 1961 at which time it was transferred to Howitzer and leak tested. No activity was removed.
8. Thefts or Incidents:

   N/A

9. Discussion with Management:

Items of non-compliance with reference to this license were discussed with Dr. Rannio + Dr. Freeman and discussed ~~briefly~~ briefly with Dr. Theophilus, President, in presence of Dr. D. S. LeTourneau. P.S.O.

10. Items of Non-compliance (brief):

10 CFR	Item	Dates(s)
20.203(d)	Laboratory in which materials are stored is not properly posted	July 27, 1961
20.206(c)	Form AEC-3 not posted in conspicuous place	July 27, 1961
CONDITION 8	Licensee possesses ~ 1.35 mc of Carbon-14 as result of present use and remainder of material used in past.	March 30, 1961 to July 27, 1961.

Neutron Howitzer
Pu 139 8g
6/8/61

and in accord with
(f)(1)

Area in which
materials are
stored marked
as Caution Radiation
Area.

All containers
properly marked
including waste
cans.

AEC-3 was
not posted but
he has a copy
of it.

License No. 2
U of Idaho
Cabinet in which
generally licensed
materials are
stored was properly
marked and
individual containers
marked in accordance
with (f)(4) & (f)(1)

Cobalt-60 source
in accord with
(f)(1) and (f)(4)
April 3, 1961
1 mc Co-60

Area in which
materials were
stored was not
marked in accordance
with (e)(1).

Have disposed
of badges which
Dr. Lady had
but did not
know what
they were. Assumed
that they might
be Ra.

1. Tell them to
post sign and AEC-3

2. Is building locked
when not occupied

3. Do you have
lab instructions
to students.

BF3 neutron
probe on
a Chicago Nuclear
Model 2112

150, 1500, 15000 CPM

Universal Atomics
~~Counter~~ Mod 700
0.5, 5, 50 mr hr

Log Survey Meter
Baird Atomic
Mod 414

Also have alpha
survey probe

U. of Idaho Last Inspection 11/7/57

Items of noncomp. noted during last inspection

(1) form was unauthorized place of use

(2) surveys were not made by licensee

(3) safe containing material was not labeled in accordance with 10CFR20.203(f)(1)

11-197-2

1. Upto January 5, 1961, Dr. Graham was licensed for 0.5 mc of Carbon-14.

2. Direct personal supervision of E.K. Rawls & P.K. Freeman.

3. Sealed sources required to be leak tested only by persons licensed to perform such tests. Shall be performed on receipt in absence of certificates that source has been tested. Every 6 mo. thereafter. Effective Feb 23, 1961, E.K. Freeman is authorized to perform leak tests.

Source Material License C-1168
expired 2/1/58 When was
source material transfered or disposed
of by Dr. Jobe.
If material was possessed
as of Feb. 13, 1961 license
should have been applied for
by May 14, 1961.

SNM - 433

✓ 1. Has neutron source been
received yet?

✓ 2. 8 gram possession limit on Pu

✓ 3. Neutron source must be leak
tested each month. Are there records
of such

ok 4. Source should be locked in
storage position when not in use.

U of Idaho 11-197-2

E.K. Raunio

Director of Radioisotopes Lab

P.K. Freeman

Asst. ~~Assoc~~ Prof. Chem

In charge of teaching course

Materials are used under supervision of P.K. Freeman.

Co^{60} sealed source, 1 mc received April 25, 1961

Source had been leak tested March 21, 1961 by Walton Radiation Lab. Less than 0.0000[illegible] microcurie activity

SNM Pu-Be

one one-half curie Pu Be source 6-8-61

Leak tested by Freeman after placing in Holder [illegible] on 7/24/61 no detectable activity measured

Received 0.5 mc [illegible] - Co[illegible] March 30, 1961

P^{32} . 1 millicurie was received 3-21-61

Also received 1 generally licensed kit of isotopes. Educational Source Kit purchased by U of I on 10-2-59

No other material have been purchased according to Freeman

Dosimeters are kept on students taking course.

3 students + Freeman during 1960. Each student uses 2 dosimeters

Highest dose received by Freeman 11 mr/wk.

Prior to 1960, nothing was done with licensed materials

Surveys: Surveys made by student are in notebook. Show levels of radiation in storage cave. 1 ft above cave 25-6 mr/hr.

7/21/61 Freeman made survey of Co^{60} container + PuBe source

Also made survey on 7/24/61 of transfer of PuBe source to McIntyre

Grahn supposedly has some additional Carbon-14 – 250 μc.

FIELD INSPECTION NOTES

Licensee Univ. of Idaho 11-197-3 Date July 27 & 28, 1961

Address Moscow, Idaho Inspector W.C. Pierce

Type of Inspection (I, R, F):
Announced X Unannounced ___
10 CFR
20 X : 30 X : 31 ___ : 40 ___ : 70 ___

Accompanied by _____

Affiliation _____

Notice Issued:
Clear X
Minor Item _____

GENERAL DATA

1. Personnel contacted: Dr. D.J. LeTourneau RSO
Dr. Harvey Hermanson will soon be authorized user on subject license

2. Organization:
a. Chain of Command and Responsibility:
LeTourneau is RSO & is on Isotope Committee Dr. D.R. Theophilus is President.
b. Authorized users: D.J. LeTourneau

c. Unauthorized users:
not using materials at time of inspection

d. Isotope Committee: yes X no ___
Members: Dr. Waldo Curtis Chmn. Dept. of Physics
Dr. LeTourneau Ag. Chem.
Dr. E.H. Grahn Chemistry
Functions: Dr. R.K. Ramio Chemistry
Dr. McIlvaine Botany

e. RSO Committee reviews applications for use of byproduct materials at University. Has not been very active because of relative inactivity of program. RSO has been keeping informed of current problems and has signed recent AEC-313's which have been sent in by Engineering Dept.
D.J. LeTourneau

Licensee U of Idaho

GENERAL DATA (Continued)

3. Program Scope:

a. Procurement and Use of Material:

Date From	Date To	Material	Form	Quantity	Possession Limit
~~12/2/58~~	~~3/24/58~~	P^{32}	any	2 mcs	3 Curies
3/24/60		"	"	3 mcs	"
	1959	S^{35}	any	< 100 mcs	100
		Hard to tell when materials were received in log book. However, records of receipts found			by looking were later

Evidence of overpossession at any time: yes___ no X

Details:

Generally-licensed materials: Kit of generally licensed materials has been used for course teaching. Kit presently stored at Radio ~~the~~ Isotopes Lab.

Unlicensed materials:

none

Non-licenseable sources of radiation:

none

b. Transfers of Material:

none recorded.

Licensee U of Idaho 3

GENERAL DATA (Continued)

4. Facilities:
   a. Restricted area:
      Laboratory in Agricultural Science Building

   b. Unrestricted areas:
      Possibly used in unrestricted area in fertilizers
      However could not be ascertained because Dr. Jordan had left the U of Idaho
   c. Unauthorized locations:
      License authorizes stations at Sandpoint & Deary.

   d. Facility and laboratory equipment (Instruments and alarm systems, etc.):
      Lab Equipment consists of handling tools etc and following survey instruments. ✓

      Nuclear Corporation of America Lab Monitor
      Tracerlab Survey Meter
      El Tronic Survey Meter 0-0.2, 0-2, 0-20 mr/hr

      Condition will be checked by Hermanson prior to using any licensed materials.

INSPECTION NOTES

10 CFR 20 - Standards for Protection Against Radiation

Licensee Univ. of Idaho Date July 27 & 28, 1961

1. Personnel Monitoring (See 10 CFR 31, Page 5 for Radiographers):
   a. Dosimeters _____ Film Badges X 2 badges
      Range _____

   b. Film badge supplier: Radiation Detection Co.

      Furnished on: ____ quarterly basis
      ____ monthly basis
      X b. weekly basis

   c. Badges supplied to: Wyer & Jordan
      Starting Jan 7, 1957 to June 30, 1959.
      May 1, 1960 to October 30, 1960

   d. Exposure records consist of: Supplier's records X
      Form AEC-5 _____
      Form AEC-4 _____

      Dosimeter records maintained: yes ____ no ____

   e. ~~Average~~ ~~quarterly~~ Highest exposures, beta and/or gamma:
      Was 50 mrem beta/week to June 30, 1959
      " 20 mrem " /week To Oct 1, 1960.

   f. ~~Highest quarterly~~ exposures:
      N/A

   g. Overexposures, with names, dates, sources:
      None

   h. Reports of overexposures:
      To USAEC:
      None

      To Employee:
      None

2. Storage facilities:
Stored in hood in lab. which is locked and keys kept by Dr. Hermanson. Only low levels of materials were stored in hood at time R-32 & 5-35 which had decayed considerably to levels which were below instrument detection.

3. Posting and Labeling:
a. Rooms, Areas:
Room posted in accordance with 10CFR 20.203 e) (6)

b. Containers
Containers of relatively decayed materials were marked in accordance with 10CFR 20.203 (f)(1) & f)(4)

Dr. Hermanson said the materials could not be used by him and that he would probably dispose of them.

4. Instruction to Personnel:
a. General instructions:
Could not be determined.

b. Operating and Emergency Procedures:
included in University Administrative Instructions, License and regulations were

c. Posting of Form AEC-3: yes ___ no X
not applicable

5. Waste Disposal:
a. Liquid wastes:

b. Solid Wastes: July 2, 1959 < 1 microcurie at University burial ground.

c. Records:
Records were kept.

d. Surveys:

e. Burial Facility: Plot of ground set aside by University for burial of wastes.

Licensee U of Idaho 3

6. Surveys and Records:
   a. Laboratory areas: Last record made by graduate student who worked for Jordan. 9/7/60. Reportedly was the last day of use.
   b. Storage areas: Herrmanson has surveyed area with survey meter possessed by Department of Phy. Sciences on ?/25/61. No activity could be found in hood or in waste containers.
   c. Teletherapy areas:
   d. X-ray (radium) areas:
   e. Independent Measurements taken:
      Instrument FH 40 T By W.C. Pierce
      Calibration date July 13, 1961

      < 0.02 at any place measured including outside surface of P-32 & S-35 bottles.

7. Special License Conditions:
   a. Leak Tests: none

   b. Other: Incorporated conditions could not be checked for compliance because material has not been used since Jordan left and Jordan has resigned. Records of blood tests were on file by no X-ray records.

8. Thefts or Incidents:

   none noted.

9. Discussion with Management:

The History of the license and of the Conditions of the license were discussed with Dr. LaTourneau & Dr. Hermanson. Regulations in 10CFR20 & 30 were also discussed. The possibilities of the University getting a broad scope license were discussed with the Isotopes Committee and several other interested persons. Regulations were briefly discussed and the licensee's administrative instructions were completely covered. President Theophilus was notified of the inspection.

10. Items of Non-compliance (brief):

10 CFR	Item	Dates(s)
	None that could be determined.	

CONDITION

U of Idaho 11-197-3 supersedes 11-197-1

To April 30, 1958

Material authorized for use by J.V. Jordan as of April 15, 1958

G.D. Wyer & Jordan as of 10/8/59.

Letters and applications as Condition 15

1. March 27, 1956
2. December 13, 1957
3. Jan. 22, 1958
4. May 26, 1959
5. Letter January 13, 1958
6. Admin Instructions dept 30, 1959.

To Tonneau first authorized Aug 31, 1960

~~To Dept~~

1(a) Wastes to be buried in drums

Drums temporarily stored in concrete pit.

b. film badge service biweekly

1 badge per worker

2 dosimeters " "

Recalibrate instruments monthly

d. plant samples disposed of in burial ground.

e. University personnel undergoe eye check, physical and blood exam

no use indicated

no 2. (a) Nat experiments to be seen in lab. stock sample to be stored in safe

OK (b) operators use film badges and dosimeters

~~Instructions~~ Regulations Governing Safe Handling

(1) Do individuals go through committee before using materials. Form AEC-313 no must be signed by RSO.

yes (c) Records of receipt, transfer and disposal kept by individual investigator.

yes (d) principal investigator to make arrangements for personnel monitoring and record keeping.

yes (e) Does Rx blood count and chest x ray? required. If so, what is frequency.

Personnel Monitoring

Film badge service – Radiation Detection Company Palo Alto
Jan 7, 1957

2 badges Wyer & Jordan
min. limit – 10 mr [illegible]
X ray, beta – gamma [illegible]

Neutron & [illegible] & X ray on film
from 3/23/59

50 Beta # is highest
~~July 7, 1960~~ June 29, 1959 to July 10, 1959
~~June 26, 1959 was last~~
was last period recorded.
Le Tourneau could not find records
thereafter. Letter from Rad Det
indicates film badges were supplied
to October 30, 1960

Shows receipt of 2 mc [illegible] on
Dec 2, 1958

3 mc [illegible]

March 24, 1958
Shows record of disposal of
wastes at dump site on July
2, 1959, no mention [illegible]

Associate Professor of Assoc. Professor
Agricultural Chemistry

Dr. Waldo Carter, Chem. Physics
Dr. LeTourneau " " R&D
Dr. Grahn Chemistry
Dr. Raunio Chemistry
not member but will be Dr. Freeman "
Dr. McIlvaine Botany

One course Ag Chem 151 [illegible] a teaching course taught by Dr. Jordan

License, regulations and instruction kept in notebook

Survey - last record made by [illegible] graduate student under Jordan's supervision on Sept 7, 1960

Record made by [illegible] July 25, 1961 [illegible] of remaining [illegible] P^{32} & S^{35} [illegible] no attempt note by licensed or inspector

Also no activity in [illegible]

Memo on record indicates blood
was less than 1 pint.

Records show blood count
reports for Wyatt & Fowler
in 1959.

Lawrence D. Low, Director, Division of Compliance, AEC Headquarters

May 8, 1961

Donald I. Walker, Director, Licensee Compliance Division, Idaho Operations Office

ORIGINAL SIGNED BY
DONALD I. WALKER

TRAINING FOR PROSPECTIVE LICENSEE, UNIVERSITY OF IDAHO, ENGINEERING EXPERIMENT STATION, MOSCOW, IDAHO

LC:DIW

Transmitted herewith is a letter received at ID from C. C. Warnick, Associate Director, University of Idaho Engineering Experiment Station, Moscow, Idaho, who is requesting information as to where individuals may receive training to use radioactive materials.

At the present time, we know of only one institution that is giving short courses in the handling of radioisotopes, the Colorado School of Mines Research Institute, Golden, Colorado. I hesitate to give him only one name, when I am sure that other courses are available, perhaps in the Seattle-Portland area.

It is recommended that, if your staff or that in L&R know of additional institutions which offer such courses, Dr. Warnick be so informed. Please note that they would like to have their people receive training so that materials might be used this summer.

Enclosure:
Ltr dtd 5-3-61

BCC: W. C. Fillmore, ID Liaison,
AEC Hq w/o encl.

OFFICE ▶	LC					
SURNAME ▶	DIWalker:fh					
DATE ▶	5-8-61					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

FEB 7 1958

H. L. Price, Director
Division of Licensing and Regulation

Marvin M. Mann, Assistant Director, Compliance
Division of Inspection

Signed by M. M. Mann

UNIVERSITY OF IDAHO, LICENSE NOS. 11-197-1, 2, 10 CFR 30; C-1168, 10 CFR 40

Symbol: INS:CCP

Attached is a copy of the inspection report, prepared by the Idaho Operations Office Inspection Division, concerning activities of the subject licensee.

Information gathered during inspection shows that the licensee was in non-compliance with the following:

License 11-197-1, Condition 10 and 12. Authorized place of use.
Byproduct material has been used at a location not listed in this condition.
(Par. 15 of report.)

10 CFR 20.201(b) Surveys.
Licensee does not make surveys as specified in this section.
(Par. 22 of report.)

10 CFR 20.203 (f)(1) Caution signs, labels and signals.
Safe containing byproduct material is not labeled as specified in this section.
(Par. 20 of report.)

It is suggested that a letter be addressed to the licensee to inform him of the above non-compliance items and request that appropriate action be taken to correct or overcome these deficiencies. When corrective action has been completed on this matter, please furnish the office that conducted the inspection with copies of pertinent correspondence and these items will be checked during the next regularly scheduled inspection.

A summary of this case will be included in the February report to the Office of the General Manager.

A copy of this memorandum and the enclosure has been furnished the Office of the General Counsel.

CC: W. D. English, OGC, w/enc.
D. I. Walker, IOO, w/o enc.

Enclosure:
Cpy Rpt Dtd1/3-58

INS

CCPALMITER:AS

2-7-58

JAN 17 1958

Marvin M. Mann, Assistant Director, Compliance
Division of Inspection, Washington

ORIGINAL SIGNED BY
DONALD I. WALKER

Donald I. Walker, Director, Division of
Inspection, Idaho Operations Office

COMPLIANCE INSPECTION REPORT - UNIVERSITY OF IDAHO, MOSCOW, IDAHO

SYMBOL: INS:DIW

Transmitted herewith are two (2) copies of subject report.

This report covers only three of the University's four licenses, as stated in Paragraph 24.

I was somewhat concerned about the operations of Dr. Jordan of the Department of Agricultural Chemistry, in that he was disturbed that I had reported to Dr. Gurevitch, Isotope Committee Chairman, that he had bypassed the committee in amending his license for P^{32} from 50 millicuries to 3 Curies. He voiced his opinion that it really was his concern and not that of the committee. Undoubtedly, Dr. Gurevitch has informed Dr. Jordan of the committee's responsibilities by this time. Secondly, I was concerned about his storing of fairly large amounts (100 millicuries) of P^{32} in the laboratory for even temporary periods, since it was obvious that some students in the building who were not badged had access to this room. This is one of those cases where the operations in general appear badly, but no definite point of noncompliance can be found. I think that if, as Dr. Cady stated, a Radiological Safety Officer is appointed for the University, we may be able to work through him to make a more presentable program under Dr. Jordan. It is my opinion that Dr. Jordan is undoubtedly capable enough to operate a safe program, but is so wrapped up in the research end that he can hardly be bothered with such "trifling" things.

The operations of Drs. Jobe and Grahn are on a small enough scale that should present no problems. Dr. Grahn appeared to be operating with due controls over the use of his C^{14}.

Concerning the University of Idaho, I would like to make the following recommendations:

(1) The licensee (University) should apprise the Commission of the type of control to be exercised over users so that major changes in policies, initiated by the users, will come under the surveillance of the Isotope Committee.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

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(2) The University should either amend License No. 11-197-1 to include the area near Moscow for the use of licensed material or refrain from using material at that area. (Par. 15 of the report).

(3) The licensee should conduct a survey, within the meaning of Section 20.201(a), and maintain records thereof.

(4) The licensee should give assurance that all containers, having amounts of licensed material in excess of the limits prescribed in Section 20.203(f) (1), are properly marked.

(5) The licensee should inform the Commission of the individual named as the University Radiological Safety Officer, and the duties for which this individual is responsible.

(6) License No. 11-100-1 be amended or reissued as No. 11-197-3, to conform with the numbering sequence of the other Byproduct licenses issued to the University.

BCC: W. J. Legarde, IDO Liaison Officer, RDD, Wash. w/o encls.

OFFICE ▶	INSP					
SURNAME ▶	DIWalker:la					
DATE ▶	1/16/58					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

(8-51)

UNITED STATES ATOMIC ENERGY COMMISSION

COMPLIANCE INSPECTION REPORT

IG 2 years

1. Name and address of licensee or permit holder

University of Idaho
Moscow, Idaho

2. Date of inspection

November 7, 1957

3. Type of inspection

Initial (Routine)

4. 10 CFR part(s) applicable

20 - 30 - 40

5. License (or permit) number(s) and expiration date(s)

Number	Date	Exp. date	Number	Date	Exp. date
11-197-1 w/amend#1	4/3/56	4/30/48			
11-197-2	5/23/57	5/31/59			
C-1168	1/10/57	2/1/58			

6. Scope of license(s) and permit

License No. 11-197-1
Phosphorus 32 - Any - 50 millicuries, amended to 3 curies by Amendment No. 1
Sulfur 35 - Any - 500 millicuries
Chlorine 36 - Any - 50 millicuries
To be used as tracers in soil and plant nutrient studies in replicated field experiments, in the laboratory and in greenhouses.
(Continued)

7. Special conditions and limitations of license(s) or permit

License No. 11-197-1
(10) Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above (of license); and the material is to be used by, or under the supervision of, the individual named above. (Dr. J. V. Jordan)

(11) Except as hereinafter provided the licensee shall comply with provisions of the Atomic Energy Commission's proposed standards for protection against radiation (Continu

8. Inspection findings

All licensed material at the University of Idaho is used for research. The Isotopes Committee is active, though on one occasion, it was bypassed by one of the users who amended a license (See par. 16). Adequate records for procurement and control of material, personnel monitoring, and waste disposal are maintained. Part of the licensed material is used at an unauthorized location (See par. 15). Surveys, as required by Section 20.201(b), have not been performed (See par. 22). Areas and most containers having licensed materials are adequately posted and marked, though one safe used for storage of part of the licensed material, is unmarked (See par. 20).

9. Items of noncompliance

20.201(b)
20.203(f) (1)
30.24(d) (3)
License Conditions 10 and 12.

10. Give date of last previous inspection: None

11. Is "Company Confidential" information contained in this report? No.
(Specify page(s) and paragraph(s))

ORIGINAL SIGNED BY
DONALD I. WALKER

Donald I. Walker
(Inspector)

DISTRIBUTION:
Inspection Div., Hq. (2)
Inspection Div., IDO (1)

Approved by: Donald I. Walker, Director
Division of Inspection
Idaho Operations Office
(Operations office)

JAN 13 1958
(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

U. S. GOVERNMENT PRINTING OFFICE 16—73814-1

Item 6 (Continued

License No. 11-197-2

Carbon 14 - Any - 0.5 millicurie - Used for chemical exchange studies.

License No. C-1168

"To receive possession of and title to three hundred (300) pounds of uranium ore during the term of this license for use by your Chemical Engineering Department in ore leaching experiments."

Item 7 (Continued)

as published in the Federal Register, July 16, 1955 (10 CFR 20), until such time as said proposed regulations or revisions thereof become effective regulations of the Commission. Notwithstanding, Section 20.2A(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user.

(12) Licensed material to be used at University Home Experiment Station, Moscow, Idaho and Branch Station, Sandpoint, Idaho.

License No. 11-197-2

(11) Byproduct material to be used by, or under the supervision of, Edgar H. Grahn.

(12) Except as hereinafter provided the licensee shall comply with provisions of the Atomic Energy Commission's Standards for Protection Against Radiation (10 CFR 20) as published in the Federal Register, January 29, 1957; and the Amendment to said Standards as published in the Federal Register, May 14, 1957.

License No. C-1168

"This License is subject to all the provisions of the Atomic Energy Act of 1954, now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission. Except as herein provided, it is subject also to the provisions of the Commission's proposed regulations, published in the Federal Register July 16, 1955, Title 10, Code of Federal Regulations, Part 20, entitled 'Standards for Protection Against Radiation' until such time as said proposed regulations or revisions thereof shall become effective regulations of the Commission. Notwithstanding Section 20.2A(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user."

12. An initial, routine inspection of the University of Idaho, Moscow, Idaho was conducted on November 7, 1957. Personnel interviewed included Dr. L. C. Cady, University Liaison Officer to the Atomic Energy Commission; Dr. J. V. Jordan, Department of Agricultural Chemistry; Dr. Edgar H. Grahn, Department of Physical Sciences; Dr. Jobe, Department of Chemical Engineering; and Dr. Gurevitch, Department of Physics.

13. The use of all radioactive materials at the University of Idaho is under the direction of a Radioisotopes Committee consisting of the following members: Dr. Gurevitch, Department of Physics, Chairman of the Committee; Dr. McIlvaine, Department of Biological Sciences; Drs. Jordan and Lewis, Department of Agricultural Chemistry; Drs. Grahn and Raunio, Department of Chemistry; Dr. Johnson, Department of Forestry; Dr. Jobe, Department of Chemical Engineering; and Mr. Prater, Bureau of Mines. According to Dr. Gurevitch, the Isotopes Committee meets at irregular intervals, generally on the request of either one of the users of the licensed material or one of the members of the Committee, itself. The Committee ordinarily meets two or three times each semester to discuss general policies and the program of each user of the material. The minutes of each of these meetings of the Isotopes Committee are distributed to the members of the Committee and a central file is maintained by the Chairman, Dr. Gurevitch.

14. License material used under License C-1168 is used by Professor Jobe of the Department of Chemical Engineering. This work is directed towards research in the extraction of uranium from low grade uranium ores. At the time of inspection Dr. Jobe had in his possession approximately 120 pounds of uranium ore containing 0.3% U_3O_8. The bulk of the ore was still in the original shipping container with smaller amounts, having been passed through a fine crusher in small glass jars. All of the material was stored in a locked cabinet which bore the proper radiation symbol and wording.

15. Radioactive material possessed by the University under License No. 11-1971 is used by or under the supervision of Dr. J. V. Jordan of the Department of Agricultural Chemistry. This material is used as tracers in soil and plant nutrient studies in field experiments in the laboratory, greenhouses, and field stations of the University. To date, Dr. Jordan's work has involved the use of very small amounts of Sulfur 35 and fairly large quantities of Phosphorus 32. The Phosphorus 32 is received in the form of phosphates in commercial fertilizers containing approximately 100 millicuries of P^{32} in two kilograms of the commercial fertilizer. The majority of this material is used at the Experimental Farm of the University at Sandpoint, Idaho, which is approximately 110 miles north of Moscow. Dr. Jordan stated that recently some of the Phosphorus 32 has been used on a local farm approximately 5 miles south of Moscow. This experimental plot consisting of .1 acre is located on the farm of a private individual and not connected with the University but having a contractual agreement for the use of this land. According to Dr. Jordan, the area is fenced. Dr. Jordan stated that the .1 acre has been planted to alfalfa and the commercial fertilizer containing P^{32} has been distributed over the area at varying intervals. This location, for use of licensed material, is not permitted by the conditions of the license. (See Special Conditions 10 & 12, Item 7).

16. The application for this license, No. 11-197-1, was reviewed and passed by the Isotopes Committee. On February 5, 1957, Dr. Jordan requested and was granted an amendment to the license, Amendment No. 1, changing the possession limit for Phosphorus 32 from 50 millicuries to 3 curies. According to Dr. Gurevitch, the Isotopes Committee was not informed of the change in program until the time it was discussed with him by the writer on November 7, 1957. Such procedure by the user is not in compliance with Section 30.24(d)(3). The Isotopes Committee has not appointed a Radiological Safety Officer or a member of the business office of the committee, as suggested by the above section. According to Mr. Cady, a member of the University Business Office was being added to the committee and one of the committee members would be designated as the Radiological Safety Officer for all licenses possessed by the University. At the time of the inspection, each of the users were, more or less, acting as the Radiological Safety Officers for their own operations.

17. Dr. Jordan is supplied with film badge service from the Detection Laboratories, Palo Alta, California, on a bi-weekly basis. Records of the film badge reports are maintained by Dr. Jordan and indicated an average of less than 30mr for each two-week period. The highest reading recorded was 130 mr for a two-week period. At the time it is received by Dr. Jordan from the USDA, the material is temporarily stored within one of the laboratories in the Department of Agricultural Chemistry. The laboratory rooms are adequately marked with the proper radiation symbols with the wording, "CAUTION - RADIOACTIVE MATERIALS" and "CAUTION - RADIATION AREA". However, storage in these areas is on a short-time basis only, most of the material being distributed to the agricultural plots soon after shipment has been received. Dr. Jordan stated that some of the plant materials were brought back to the laboratory for analyses and that the plant wastes were buried at the University burial ground under his direction. The maximum amount of activity which had been buried at one time from Phosphorus 32 and Sulfur 35 was estimated to be a maximum of 100 microcuries. At some time in the past, approximately two years ago, 2 millicuries of Cobalt 60 in the form of cobalt dichloride had been buried at the same location since its radiation level in the laboratory area had been considered to be in excess. Dr. Jordan could not recall the conditions under which the Cobalt 60 had been acquired since the University has had no previous authorizations and Cobalt 60 is not one of the byproduct materials listed under any of the present licenses for the University of Idaho.

18. Under License No. 11-197-2, the University possesses Carbon 14, used by Dr. Edgar H. Grahn, Professor in the Department of Physical Sciences. Mr. Grahn stated that approximately 100 microcuries per year were used. This material is being used in tracer amounts (micro curie quantities) in the study of exchange reactions of the complex oxalates. All of Dr. Grahn's work with Carbon 14 is conducted at the Isotopes Laboratory. No personnel monitoring equipment is used by Dr. Grahn.

19. Each of the three users of licensed material, Drs. Jobe, Jordan and Grahn, maintain adequate records of the amounts of radioactive material received, used, and disposed.

20. The Isotopes Laboratory at the University of Idaho is a one-story frame building located on the campus. The building is divided into five separate rooms; one of the two rooms at the front of the building is utilized as an office, the second as a counting room, the interior of which is shown in Photograph 1, Appendix A, of this report. A room at the rear of the building is used as a storage area for radioactive material. The material is stored in a metal safe equipped with a combination lock. The metal safe containing approximately 100 micro curies of Carbon 14 and an unknown amount of Phosphorus 32, is not marked as required by Section 20.203(f) (2). The canisters properly marked and located on top of the safe in Photograph 2 in the Appendix of this report contains some of the commercial fertilizers from which the major part of radioactive P^{32} is decayed. Dr. Raunio who guided the inspection in this area, did not know the history of these P^{32} fertilizers. The middle rooms illustrated in Photograph 3 are used as laboratory space for handling the radioactive materials. Both doors to the Isotopes Laboratory were posted with signs bearing the notation, "CAUTION - RADIATION HAZARD". To replace these, the University was supplied with signs bearing the proper symbol and the notation, "CAUTION - RADIOACTIVE MATERIAL", to comply with the regulations.

21. At the rear of the Isotopes Laboratory located below ground level is a concrete storage pit covered by two lead-lined doors. The doors to this pit are shown in Photograph 4 just below the two windows of the Isotope Laboratory Building and immediately in front of the car in the left foreground. Radioactive wastes, Carbon 14, Phosphorus 32, and Sulfur 35, placed in this pit are allowed to decay for a matter of several half lives and are then taken to the University burial ground for burying.

22. Though Drs. Jordan, Grahn, and Jobe make periodic surveys for contamination of the facilities, no records of these are maintained by the users. Also, no general surveys for existing or potential hazards, resulting from the use of radioactive material, have been made by the licensees as required by Section 20.201(b).

23. The other locations where material is used, Sandpoint, Idaho and the one reported in paragraph 15 above, were not visited, since no work was currently being performed there.

24. The University also has License No. 11-100-1, for 50mc of Calcium 45 and 100mc of Phosphorus 35, used by Dr. F. D. Johnson, College of Forestry. Dr. Cady stated that Dr. Johnson was on leave, had used no licensed material since April, 1957, and anticipated no use of material until the fall of 1958. Dr. Johnson's facilities were not accessible and therefore the inspection of this license is not included in this report.

COMPLIANCE INSPECTION REPORT

University of Idaho

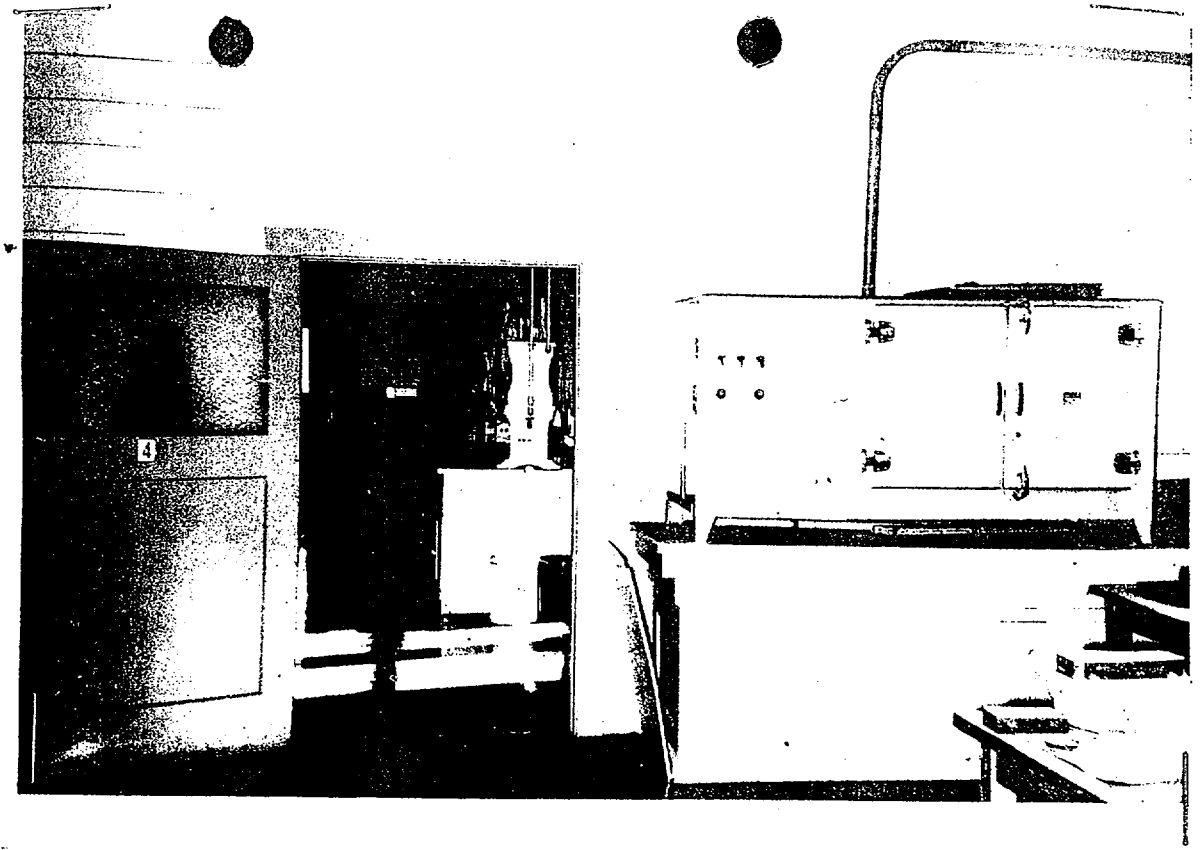
Moscow, Idaho

APPENDIX

November 7, 1957

1. University of Idaho Isotopes Laboratory. Counting Room

2. University of Idaho Isotopes Laboratory: Safe used for storage of Licensed Material. Note lack of proper markings.



3. University of Idaho Isotopes Laboratory:
Rooms used for handling radioactive materials.
Door to counting room in the background.

4. University of Idaho Isotopes Laboratory:
Underground waste disposal storage pit under windows
in center of photograph.
Radioactive Material sign is barely visible on pit door.