

INDIANA UNIVERSITY
BLOOMINGTON, INDIANA

OFFICE OF THE TREASURER

5593

October 10, 1960

U. S. Atomic Energy Commission
Oak Ridge,
Tennessee

Attention: John M. Maddox
By-Products Licensing Branch
Isotopes Extension
Division of Civilian Application

Reference: License No. 13-108-4

Gentlemen:

We wrote to you on September 14, 1960 advising that we will require revision of the Jordan Hall License to achieve the following ends:

1. Inclusion of Tritium (H^3) among the authorized materials.
2. Revision of the list of authorized users.
3. Approval of incinerator disposal of animal carcasses containing radio-active materials.

At the present time, we have received no word from you regarding our request. Enclosed for your convenience is a copy of the above referenced letter. We would appreciate hearing from you at your earliest opportunity.

Yours very truly,

INDIANA UNIVERSITY
Purchasing Department

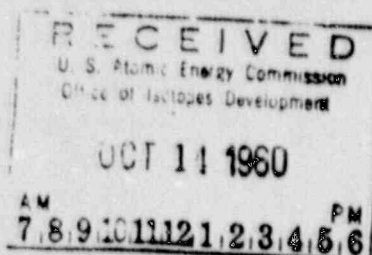
R. M. Priest
R. M. Priest
Associate Purchasing Agent



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September 14, 1960

U. S. Atomic Energy Commission
Oak Ridge,
Tennessee

Attention: John M. Madden
By-Products Licensing Branch
Isotopes Extension
Division of Civilian Applications

Reference: License No. 13-108-4

Gentlemen:

We will require revision of the Jordan Hall license to achieve the following ends:

1. Inclusion of Tritium (H^3) among the authorized materials.
2. Revision of the list of authorized users.
3. Approval of incinerator disposal of animal carcasses containing radioactive materials.

1. The present license permits use of elements of atomic number 3-8, thus excluding tritium, H^3 . The ease of preparation of tritium-labelled compounds makes it imperative that we be allowed to use this isotope. As high activities can be achieved, and suppliers are not interested in low activities, we request a limit of 500 millicuries.

2. Ray Rapaport left Indiana University in August 1959. Milton van Wagoner left in July 1960.

The following persons will begin studies involving isotopes and should be listed among authorized users:

Charles C. Miller - Associate Professor of Botany

Has previous experience with isotopes other than a section of a biochemistry laboratory at Wisconsin. Will undertake studies with tritium-labelled kinetin and other adenine derivatives.

David G. Frey - Professor of Zoology

Has worked with Carbon 14 during two summers. Will use carbon 14.

Thomas B. Brock - Assistant Professor of Bacteriology, Ph.D. Ohio State

Will use sugars and acids labelled with O^{14} and H^3 .

Howard V. Richmond - Associate Professor Bacteriology

Has worked at the Pasteur Institute, at London Medical Laboratory and at Yale University. Previous experience with tracer experiments involving H^3 and O^{14} .

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3. According to information from the manufacturer, the Jordan Hall incinerator has an exit rate from the incinerator outlet to the flue of 6 cubic feet per second at 1400° F. Allowing for a drop to an ambient temperature averaging 25° C, to have used 2 cubic feet sec. and converted to liters per hour as follows:

$$\begin{aligned} 1 \text{ cu. ft.} &= 28.3 \text{ l} \\ 1 \text{ hour} &= 3600 \text{ sec.} \\ \text{Flow rate in liters per hour} &= 1 \times 28.3 \times 3.6 \times 10^3 \\ &= 2.0 \times 10^5 \text{ l/hr.} \end{aligned}$$

- a. For Carbon 14 the permissible effluent concentration (Appendix B, Table II, Fed. Reg. 22.16, 1957) is 5×10^{-6} mCi/ml or mCi/l.

$$2.0 \times 10^5 \text{ l/hr.} \times 5 \times 10^{-6} \text{ mCi/l} = 10^{-3} \text{ mCi/hr.}$$

Hence, we may dispose of 1 mCi of carbon 14 every four days (i.e. 100 hrs.).

- b. For Iodine 131 the permissible effluent concentration is 3×10^{-10} mCi/ml or mCi/l

$$2 \times 10^5 \text{ l/hr.} \times 3 \times 10^{-10} \text{ mCi/l} = 6 \times 10^{-5} \text{ mCi/hr.,}$$

hence, disposal of 1 mCi I¹³¹ is permissible if not repeated more frequently than 1.5×10^4 hrs. As this is 683 days, it is impractical to dispose of I¹³¹ entirely in this manner. To bring iodine disposal within practical and safe levels, we shall require that not more than 0.01 mCi be incinerated within 10 days. This can be accomplished by storing frozen carcasses for the requisite number of half-lives (e.g. 10 days for a one mCi experiment).

- c. For tritium (H³), the permissible effluent activity is 2.5×10^{-5} mCi/l.

$$2 \times 10^5 \text{ l/hr.} \times 2.5 \times 10^{-5} \text{ mCi/l} = 5 \times 10^{-3} \text{ mCi/hr.}$$

At this rate, incinerator disposal of 10 mCi/day is permissible.

Where various isotopes are incinerated such that the disposal periods overlap, the sum of the ratios of the quantity of each isotope to its total permissible quantity shall not exceed unity. This will assure meeting the requirement of the note following Appendix C, Federal Register 22.16, 1957.

All levels are computed in relation to the flue gases leaving the incinerator after adjustment of volume to an average ambient temperature of ca. 25° C. As the total flow through, though the stack should exceed the flue rate, we have a sizeable margin of safety here.

All incinerations will be performed in iron trays. Residual ash will be stored in closed metal containers and ultimately eliminated by burial in the University burial area.

We ask for permission to incinerate radio-active waste material in this building.

Will you give consideration to this revision and advise us promptly? It might be that this should be considered as a request for renewal of our present license since it is

due to expire on January 31, 1961. If there is any additional information that you require, contact the writer.

Yours very truly,

INDIANA UNIVERSITY
Purchasing Department

R. M. Priest
Associate Purchasing Agent

EDP/mj