Arthur D. Little, Inc.

ACORN PARK
CAMBRIDGE, MASSACHUSETTS 02140
AREA CODE 617 864-5770

March 27, 1967

Mr. Robert E. Brinkman
Isotopes Branch
Division of Materials Licensing
United States Atomic Energy Commission
Washington, D.C. 20545

Re: Renewal of License No. 20-1489-4 (E67)

Dear Mr. Brinkman:

Enclosed in triplicate is our application for renewal of Byproduct Material License No. 20-1489-4 (E67), Form AEC-313.

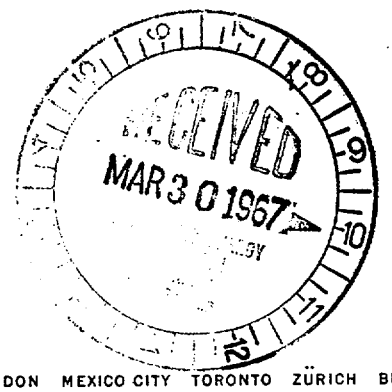
The information contained in this application includes or supercedes statements made in previous applications dated April 21, 1965, March 26, 1963, and March 16, 1961, and my letter dated May 1, 1961.

Very truly yours,

Charles J. Kensler, Ph.D.
Senior Vice President

CJK:tjb

Enc. 3



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8. Training and Experience of Paul E. Baronowsky

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	Harvard University	5 years	Yes	No
	Arthur D. Little, Inc.	3 years	Yes	No
b. Radioactivity measurement standardization and monitoring techniques and instruments	Harvard University	5 years	Yes	No
	Arthur D. Little, Inc.	3 years	Yes	No
c. Mathematics and calculations basic to the use and measurement of radioactivity	Harvard University	5 years	Yes	No
	Arthur D.Little,Inc.	3 years	Yes	No
d. Biological effects of radiation	Harvard University	5 years	Yes	No
	Arthur D. Little, Inc.	3 years	Yes	No

9. Experience with Radiation - Paul E. Baronowsky

Isotope	Max.Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	1 mC	Harvard University	5 years	Chemical synthesis and metabolic studies
	0.5 mC	Arthur D. Little, Inc.	3 years	Metabolic studies
H^3	1 C	Harvard University	5 years	Metabolic studies
P^{32}	1 mC	Harvard University	5 years	Chemical syntheses and enzymatic reactions
	1 mC	Arthur D. Little, Inc.	3 years	Metabolic studies
S^{35}	0.1 mC	Arthur D. Little, Inc.	0.5 year	Metabolic studies

10. Radiation Detection Instruments

Type	Number	Radiation	Sensitivity Range	Thickness	Use
A. Anton Survey Meter CD V-700, Model 6	1	β,γ	0-500 mr/hr		Survey
B. Juno Survey Meter, Model SRJ-7	2	α,β,γ	0-5000 mr/hr		Survey
C. Nuclear-Chicago Liquid Scintillation Spectrometer Model 6860	1	β			Measuring
D. Nuclear-Chicago Gas-Flow Detector, Model D47	1	β,γ			Measuring
E. Cary Model 32 Electrometer and Flow Detector	1	β			Measuring

Note: D is used with a Model 186A scaler or Model 1620 rate meter and other ancillary equipment as needed.

11. Method, Frequency, and Standards Used in Calibrating Instruments

A. The Anton survey meter is calibrated at each use with a built-in radium D + E check source.

B. The Juno survey meters are calibrated with an americium-241 source* that has been shielded with aluminum to stop alpha particles.
*See our license No. 20-1489-1, condition 19 (Amendment No. 32).

C. The Nuclear-Chicago Model 6860 Liquid Scintillation Spectrometer is calibrated with commercially available certified solutions of the respective isotopes.

D. The Nuclear-Chicago Model D47 Gas-Flow Detector is calibrated with $BaC^{14}O_3$.

13. Facilities and Equipment

In the area reserved for higher levels of activity (up to one millicurie) and for decontamination and cleaning of equipment (primarily glassware), the bench top is of stainless steel; a stainless steel sink drains into the sewerage system near the low-point for the building; the fume hood is a five-foot standard by-pass hood vented through an absolute filter (Cambridge Filter Corp.) and is equipped with external controls and a stainless steel working surface. Other benches in areas where lower levels of activity may be used have tops of Colorlith which are covered with disposable plastic-backed

13. Facilities and Equipment (continued)

absorbent paper sheets. The laboratory floor is covered with linoleum tile.

The primary storage facility is a freezer reserved for radioisotopically labeled materials.

14. Radiation Protection Program

Monthly film badge assays for all persons in area. Monthly wipe tests of benches and surfaces where labeled materials are used.

15. Waste Disposal

A. Aqueous solutions are poured into the stainless steel sink described in paragraph No. 13. Approximately 30,000 cubic feet of water pass through the sewerage system of this facility per year.

B. Dry combustible waste (paper) is collected in small plastic bags and is burned at night in an incinerator. The gases escape through a chimney approximately 50 feet high. It is estimated that not more than one microcurie of radioactive material will be burned per day.

C. Other radioactive waste is collected in steel drums and is disposed of through Tracerlab, Inc., Waltham, Mass.