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Andrews University
ATTN: Dr. G. William Mutch
Associate Professor of Chemistry
Berrien Springs, MI 49104

Gentlemen:

We have reviewed your letter dated March 9, 1988, requesting renewal of NRC License Number 21-11654-03 and find that we will need additional information as follows:

1. Materials

Describe the intended use of radionuclides utilized in your program in more detail than that currently listed in your license. This description should include the possession limit, intended use (e.g., tracer studies, synthesis, animal studies, etc.) and maximum amount of activity used per experiment for each type of "unsealed" radionuclide used; as well as the possession limit, intended use, and activity per source for each type of "sealed" radionuclide used.

2. Leak Test Procedures

Submit your procedures for leak testing sealed sources. Your procedures should include the following:

- a. The title and qualifications of the individual who will analyze leak test samples.
- b. The type, manufacturer's name, model number, and radiation detection and measurement characteristics of the instrument to be used for assay of test samples.
- c. Your procedures for calibrating the instrumentation used for analysis of leak test samples.
- d. The method, including a sample calculation, used to convert instrument readings to units of activity, e.g., microcuries.

3. Survey Meter

- a. Please confirm that your Eberline E-140 Survey Meter is still calibrated by the manufacturer on at least an annual basis.

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- b. If you propose to calibrate your own radiation survey and monitoring instruments, you should submit a detailed description of your planned calibration procedures. The description of calibration procedures should include, as a minimum:

- (1) The manufacturer and model number of the source(s) to be used.
- (2) The nuclide and quantity of radioactive material contained in the source.
- (3) The accuracy of the source(s). Traceability of the source to a primary standard should be provided.
- (4) The step-by-step procedures, including associated radiation safety procedures. These procedures should include a two-point calibration of each scale of each instrument with the points located at approximately 1/3 and 2/3 of each scale.
- (5) The name(s) and pertinent experience of the person(s) who will perform the calibrations.

4. Radiation Safety Officer (RSO)

- a. Please confirm that Bruce E. Lee is still acting as the RSO. If he no longer retains this responsibility, please specify the name of the individual that will serve in this capacity.
- b. Submit a description of the duties and responsibilities of the RSO. The typical duties of an RSO include the following:
- (1) To ensure that the use of radioactive material is by or under the direct supervision of individuals specifically listed on your license.
 - (2) To ensure that all users (where appropriate) wear personnel monitoring equipment when using radioactive materials.
 - (3) To ensure that radioactive materials are properly secured against unauthorized removal at all times when not in use.
 - (4) To perform routine confirmatory inspections of all laboratories using or storing radioactive materials.
 - (5) To ensure that the terms and conditions of your license are met and that all required records are maintained.

5. Survey Records of Waste

- a. Describe in detail your system for keeping records of surveys of radioactive waste that is generated in each lab.
- b. Inform us as to who will have the responsibility of performing the surveys and maintaining the records.

6. Personnel Monitoring Equipment

- a. Section 20.202 of 10 CFR Part 20 specifies that personnel monitoring equipment be used by individuals entering restricted areas who receive or are likely to receive a dose in excess of 25% of the dose specified in 20.101(a) of 10 CFR Part 20. Describe the criteria used to determine when whole body and/or extremity monitoring devices will be provided to users. If personnel monitoring will not be provided, describe the calculations and/or documentation which will be maintained to support the decision not to provide personnel monitoring. Specify the minimum criteria used to determine when extremity monitoring is required by personnel handling radioactive materials.
- b. If applicable, please supply us with the name of the company furnishing film badge or thermoluminescent dosimeter (TLD) service and the frequency for changing badges, dosimeters, etc. If pocket chambers or pocket dosimeters will be used, the useful range of the device in milliroentgens, the frequency of reading, and the procedures for maintaining and calibration of the devices should be specified.

7. Facilities

- a. Please confirm that your use of radioactive materials remains confined to those rooms and buildings as described in your application dated March 24, 1982. If you have added any new locations you must supply us facility diagrams along with a description of the types of studies that will be performed.
- b. Inform us as to which room and building will be dedicated for the purpose of housing for, and experimentation on, research animals.

8. Liquid Waste Disposal

Please provide a sample calculation of how you will determine the total amount of liquid waste that is released into the sanitary sewerage system from waste generate due to daily experiments and that which is a result of washing and rinsing animal cages. Also, describe how you will maintain records of liquid waste disposed to show that you remain in compliance with 10 CFR 20.303.

9. Procedures for Ordering, Receiving and Opening Packages Containing Radioactive Material

- a. Please describe your procedures for ordering radioactive material, and for receipt of material during working hours and during off-duty hours. The procedures should be adequate to ensure that possession limits are not exceeded, that radiation levels in unrestricted areas do not exceed those specified in 10 CFR 20.105, and that radioactive materials are secured against unauthorized removal at all times. It is preferable that all radioactive materials be ordered by one person and received in one location so that they may be reliably accounted for and surveyed expeditiously. Please inform us to who will have responsibility.
- b. Please also describe the procedure for safely opening packages containing radioactive materials. The procedures should include instructions to wear gloves, check packages for damage or leakage, wipe test the final source container, and monitor the packing material for contamination prior to disposal. You should also include your procedures for handling packages that are leaking or contaminated.

10. Surveys

Please confirm that monthly surveys will be performed immediately after the completion of each experiment involving the use of radioactive materials. Regarding the frequent monitoring during the use of radioisotopes, please verify that this will be performed by either the RSO or the RU, and not by a designee.

We will continue our review of your application upon receipt of this information. Please reply in duplicate, within 30 days, and refer to Control Number 85024.

If you have any questions or require clarification on any of the information stated above, you may contact us at (312) 790-5625.

Sincerely,

Kevin G. Null
Material Licensing Section

RIII

Null/crr

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