



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Northeast Fisheries Center
Sandy Hook Laboratory
Highlands, New Jersey 07732

June 18, 1985

F/NEC34:JEO

Ref. No.: License No. 29-16185-01

Mr. John D. Kinneman, Chief
Nuclear Materials Section A
Nuclear Materials Safety & Safeguards Br.
Div. of Radiation Safety & Safeguards
U.S. Nuclear Regulatory Commission
Region I, 631 Park Ave.
King of Prussia, PA 19406

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Dear Mr. Kinneman:

The following statements represent the additional information you requested concerning the renewal of our NRC License #29-16185-01.

In accordance with NRC regulation .20.302b no licensed material will be released into the sea. The following describes the details of our liquid radioactive waste disposal procedures.

A. Liquid Wastes

Three types of liquid wastes are generated during our measurements of marine photosynthesis aboard research vessels: ^{14}C -sea water waste, ^{14}C -KOH waste, and ^{14}C -xylene liquid scintillation waste.

A.1 ^{14}C Sea Water Waste

Sodium ^{14}C bicarbonate is added to sea water (pH 8.1) in plastic 260 ml polycarbonate bottles with screw caps. The final isotope concentration in these bottles is 0.10 $\mu\text{Ci/ml}$ sea water. Each day at sea (100 days/yr) forty bottles (260 ml) are prepared and incubated under sunlight to measure photosynthesis. Following incubation, 60 mls of isotope sea water are filtered to measure particulate and dissolved photosynthesized ^{14}C . The 200 ml of sea water remaining in each bottle is brought back to the Sandy Hook Laboratory in specially constructed radisotope-labeled boxes and disposed in the sanitary sewage system by dilution (tenfold) with tap water to achieve a concentration less than 0.02 $\mu\text{Ci/ml}$ waste water. The filtrate from each bottle (50 ml) is pooled in five gallon radioactive-labeled plastic carbuoys and returned to the laboratory for disposal as above.

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A.2 The remaining 10 ml of filtrate from each bottle is acidified (using a specially constructed sparging chamber) under an isotope hood (1000 CFM flow) and bubbled for 30 min. with air to displace ^{14}C as $^{14}\text{CO}_2$. To minimize atmospheric release of isotope, this $^{14}\text{CO}_2$ effluent is trapped using an in-line supersaturated KOH scrubber solution. Our estimated release of $^{14}\text{CO}_2$ to the atmosphere is $1 \times 10^{-8} \mu\text{Ci/ml}$ for one hour each day. After each survey the activity of this ^{14}C -KOH solution ($\sim 0.6 \mu\text{Ci/ml}$) and appropriate dilution factor are determined before disposal in the sanitary sewage system. This waste is readily soluble in water.

A.3 From each bottle three liquid scintillation vials are prepared (2 with filters plus 10 ml xylene Fluor and 1 with 10 ml of bubbled filtrate plus 10 ml xylene fluor). The activity of this liquid scintillation waste averages $0.00013 \mu\text{Ci/gram}$. These liquid scintillation wastes are being disposed through a private disposal firm (RADIAC) in accordance with NRC 20.306.

B. Solid Wastes

No solid ^{14}C wastes are generated at this facility.

Please call me if you require any additional information concerning our practices, procedures, or license renewal.

Sincerely yours,

John E. O'Reilly
John E. O'Reilly, Acting Chief
Chemical Processes Branch