

OAK RIDGE NATIONAL LABORATORY
 MANAGED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
 FOR THE U.S. DEPARTMENT OF ENERGY

POST OFFICE BOX 2008
 OAK RIDGE, TENNESSEE 37831-0275

May 4, 1992

Dr. Ronald O. Hultgren, Deputy Assistant Manager
 Energy Research and Development
 DOE Oak Ridge Field Office
 Post Office Box 2008
 Oak Ridge, Tennessee 37831-6269

REPOSITORY Oak Ridge/Energy Systems/
ORNL (x-10)
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Dear Dr. Hultgren:

Notification of Repeated Radiotracer Study - Oak Ridge National Laboratory Building 1504

- Refs.: 1. Notification of Planned Radiotracer Study-Oak Ridge National Laboratory Building 1505, February 12, 1992
2. Addendum to National Pollutant Discharge Elimination System Permit No. 002941 Renewal Application: Oak Ridge National Laboratory: Building 1504 Experimental Ponds, August 13, 1991

This letter serves as notification that Oak Ridge National Laboratory (ORNL) research personnel duplicated an experiment which released small quantities of radiotracers into laboratory streams in Building 1504. The purpose of these National Science Foundation-sponsored studies is to measure the rates of uptake and release of phosphate in a network of experimental streams dominated by different algal communities. To benefit from more favorable experimental conditions, the radiotracer experiment was repeated on March 30, 1992, following the same procedures previously described (Reference 1). The scientific results of the previous experiment were affected by a minor water quality problem, probably due to rainfall. The water quality problem neither affected the quantity of phosphorus-33 (P-33) released from the building in the first experiment nor caused the procedure to be altered for the second experiment. The effluent from the laboratory streams in Building 1504 is discharged to a group of six ponds behind the building which then overflow through piping into the Northwest Tributary just upstream of its confluence with First Creek. The National Pollutant Discharge Elimination System (NPDES) Permit Applications for the pond discharges were submitted to the Tennessee Department of Environment and Conservation (TDEC) in August 1991 (Reference 2). It is necessary that TDEC be notified that the experiment was duplicated because this was a controlled radiotracer release in an NPDES-permitted discharge.

The total radiotracer release was approximately 0.8 milliCuries (mCi) of P-33. A 0.1 mCi dose of the radiotracer was released over a 60-minute period in each of eight laboratory streams with exactly two of the eight streams receiving the dose at one time. Concentrations in the receiving ponds and in the Northwest Tributary were each orders of magnitude below the DOE Derived Concentration Guideline (DCG) for P-33. It should be noted that the half-life of P-33 is approximately 25 days.

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Human Subjects Project

The pertinent concentrations are indicated below.

Release solution concentration	3.33×10^{-2} uCi/mL
Building 1504 stream effluent concentration	1.4×10^{-5} uCi/mL
Concentration in ponds behind Bldg. 1504	1.33×10^{-7} uCi/mL
Concentration in Northwest Tributary	$<0.02 \times 10^{-6}$ uCi/mL
DCG concentration	2×10^{-4} uCi/mL

All personnel involved in the study were trained in the safe use of radionuclides, and activities were monitored by a health physicist during the experiment.

Please forward this information to TDEC at the following address.

Ms. Natalie Harris
Tennessee Department of Environment
and Conservation
2700 Middlebrook Pike, Suite 220
Knoxville, Tennessee 37921

If there are any questions or if additional information is required, please contact C. K. Valentine at 574-8775 or C. E. Nix at 574-7363.

Sincerely,



Thomas H. Row, Director
Environmental, Safety,
and Health Compliance

THR:WDG:dmh

- c. W. A. Alexander
- D. Buhaly, DOE-OR
- W. D. Goddard
- F. C. Kornegay
- E. C. Leming, TDEC
- C. L. Matthews, DOE-OR
- R. K. McConathy
- M. E. Mitchell
- P. J. Mulholland
- J. B. Murphy
- C. E. Nix

- F. R. O'Donnell
- J. E. Powell
- D. E. Reichle
- M. W. Rosenthal
- J. D. Story
- A. W. Trivelpiece - RC
- C. K. Valentine
- R. I. Van Hook
- S. H. Welch
- L. F. Willis
- E. D. Wright

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POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831-6198

May 29, 1992

Dr. Ronald O. Hultgren, Deputy Assistant Manager
Energy Research and Development
DOE Oak Ridge Field Office
Post Office Box 2008
Oak Ridge, Tennessee 37831-6269

707621

Dear Dr. Hultgren:

Notification of Planned Radiotracer Study - Oak Ridge National Laboratory Walker Branch

This letter notifies the Department of Energy (DOE) that research personnel at the Oak Ridge National Laboratory (ORNL) plan to release small amounts of radiotracers into Walker Branch. The purpose of the planned release is to determine the effect of hydrologic backwater zones on biological uptake and cycling of phosphorus in the stream. While this release is not a wastewater discharge and the amount of radiotracers involved is small, notification of the release to the Tennessee Department of Environment and Conservation (TDEC) is prudent.

The radiotracers used will include approximately 5 millicuries (mCi) of tritium as water (H₂O) and approximately 1.5 mCi of phosphorus-33 (P-33) as phosphate. The radiotracers will be released over a period of 1.5 hours. The approximate radiotracer concentrations, based on a stream flow of 6 liters/second (L/s) in Walker Branch, are described below. Radiotracer concentrations in Walker Branch, as the plume leaves the Oak Ridge Reservation under Bethel Valley Road, will be only slightly above background concentrations.

In-Stream, at the Point of Release

P-33: 47 x 10⁻⁶ mCi/L
Tritium as H₂O: 153 x 10⁻⁶ mCi/L

In-Stream, before Walker Branch goes under Bethel Valley Road

P-33: <10 x 10⁻⁶ mCi/L
Tritium as H₂O: <20 x 10⁻⁶ mCi/L

DOE Derived Concentration Guidelines (DOE Order 5400.5)

P-33: 200 x 10⁻⁶ mCi/L
Tritium as H₂O: 2000 x 10⁻⁶ mCi/L

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Human Subjects Project

Dr. R. O. Hultgren

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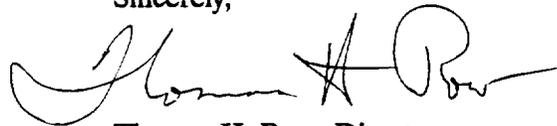
All personnel involved in the studies will be trained in the safe use of radionuclides, will wear appropriate protective clothing, and will be monitored by a health physicist during the experiment. This study will be conducted in late June unless notified otherwise. Monday, June 22, 1992, is the target date for the study, but the exact date will depend on weather and stream flow conditions.

Please forward this information to TDEC at the following address.

Ms. Natalie Harris
Tennessee Department of Environment
and Conservation
2700 Middlebrook Pike, Suite 220
Knoxville, Tennessee 37921

If there are any questions or if additional information is required, please contact C. K. Valentine at 574-8775 or C. E. Nix at 574-7363.

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Thomas H. Row, Director
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