



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 29 1985

MEMORANDUM FOR: Vandy L. Miller, Chief
Material Licensing Branch
Division of Fuel Cycle and
Material Safety

FROM: Leo B. Higginbotham, Chief
Low-Level Waste and Uranium Recovery
Projects Branch
Division of Waste Management

SUBJECT: UNIVERSITY OF WYOMING'S REQUEST FOR CONTINUED WASTE
DISPOSAL BY BURIAL IN SOIL PURSUANT TO 10 CFR 20.302

The University of Wyoming is requesting continued authorization to dispose of radionuclides by burial in soil. Specifically, the licensee is seeking an amendment which would approve onsite burial of:

- (1) any radionuclide in the list of radionuclides found in Appendix C, 10 CFR Part 20,
- (2) any of the radionuclides in Appendix C in quantities "calculated at a date three years post-burial,"
- (3) up to 24 waste disposals per year.

For the longer-lived radionuclides, the quantities proposed for burial would be equivalent to those radionuclides previously authorized under 10 CFR 20.304 and Appendix C. For the shorter-lived radionuclides, the proposed method of calculating quantities for disposal would, if authorized, permit the licensee to bury, for example, up to 262 Ci of I-125 or 556 Ci of S-35 at any one time. Carrying this calculation to the extreme, the licensee would be authorized to bury up to 10^{21} Ci of P-32.

We recommend therefore that the requested approval for the proposed burial of radionuclides in the quantities specified not be granted since these quantities would constitute a hazard to public health and safety. More to the point, the proposed number of radionuclides (over 180) and their curie quantities are inappropriate for onsite burial consideration under 10 CFR 20.302.

As part of the specific information supplied by the licensee, we have noted that the licensee has received the following quantities of radionuclides in 1983: 4.6 Ci P-32, 225 mCi I-125, 225 mCi H-3, 11 mCi S-35, 8 mCi Cr-51, and 3 mCi C-14. All of the P-32 wastes are intended for burial in soil (telephone confirmation). According to maps supplied by the licensee, the disposal site

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is within 10 feet of private property on its northwest boundary. In addition, there is cattle grazing activity on the licensee's own property immediately adjacent to the south and east boundaries of the burial site which provides animal products that enter the human food chain (telephone confirmation).

We have estimated potential doses to an intruder who might ingest crops and animal products grown directly on the disposal site. The source term used for the calculations is the inventory of radionuclides received by the licensee in 1983. Assuming that this inventory is disposed in 10 burials over a one-year period and assuming further that the agricultural yield provides only 5 percent (conservative) of the intruder's annual diet, projected doses to the intruder are:

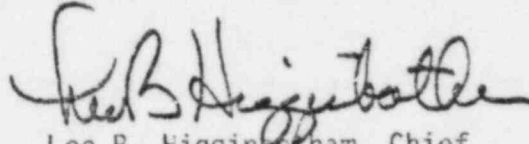
<u>Organ</u>	<u>Annual Dose</u>	<u>Principle Radionuclide</u>
Bone	1.1 rem	P-32
Lower Intestine	147 mrem	P-32
Total Body	43 mrem	P-32
Thyroid	3.5 mrem	I-125

Since these dose levels exceed the dose levels acceptable for onsite disposal, we recommend that the licensee no longer be permitted to dispose of waste by burial in soil. License Condition 20, which has previously authorized disposals by burial in soil, shall be rescinded.

Should the licensee wish to submit a new proposal pursuant to 10 CFR 20.302, we would recommend to the licensee that the request be limited in scope to those isotopes of immediate concern and that isotopic quantities, in general, should not exceed a few millicuries to a few tens of millicuries per burial, depending on the radionuclide. In the interim, the licensee should rely on other approved disposal alternatives. In this situation, for example, storage for decay of shortlived radionuclides would account for the major portion of the licensee's inventory.

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In order that we may expedite the review of a future submittal, please include a copy of the revised "Information Needs" pamphlet (April, 1985) in your response to the licensee.

A handwritten signature in dark ink, appearing to read "Leo B. Higginbotham". The signature is fluid and cursive, with the first name "Leo" being particularly prominent.

Leo B. Higginbotham, Chief
Low-Level Waste and Uranium
Recovery Projects Branch
Division of Waste Management

cc: Ken Jackson, WMLU