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Mr. John G. Themelis, Project Manager
UMTRA Project Office
U.S. Department of Energy
Post Office Box 5400
Albuquerque, New Mexico 87115

WM Record File

WM Project 58

Docket No. ✓

PDR ✓

LPCH ✓

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Dear Mr. Themelis:

Enclosed for your information are staff conclusions pertinent to the status of the NRC's review of the Shiprock radon barrier, one of the issues conditional to our concurrence in the Remedial Action Plan.

The issue concerns the use (in the cover design) of a diffusion coefficient that is the average of only six test values. A July 26, 1985 letter from Mr. Baublitz (DOE) to Mr. Meyers (EPA) indicated that, for DOE's design of radon barriers, uncertainties involved in using average parameter values are reduced through extensive sampling.

Therefore, NRC staff concurrence in the Shiprock radon barrier design remains open until we can review and approve a revised design which applies either a more reliable diffusion coefficient based upon additional testing of the cover material, or a more conservative diffusion coefficient based upon the existing data.

Sincerely,

Leo B. Higginbotham, Chief
Low-Level Waste and Uranium Recovery
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure:
As stated

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REVIEW OF THE RADON BARRIER FOR THE SHIPROCK UMTRAP SITE

by
Engineering Branch
Division of Waste Management

Background

The NRC staff has conducted a review of DOE's radon barrier design calculations for the Shiprock UMTRAP site. These calculations, submitted to Banad Jagannath (WMEG) by the TAC during a meeting on May 10, 1985, were performed by IECO (RAC) and constitute the most current information pertinent to this open issue.

The current radon barrier design presented by the RAC has two variations based on the arrangement of the relocated contaminated material in the final embankment configuration. These variations differ from the design that is presented in the RAP. In a telephone conversation between Steve Smykowski of the NRC and Mr. John Smith (TAC), Mr. Smykowski was informed that the TAC planned on limiting the amount of testing and sampling of radon barrier material until an actual borrow site was formally accepted by the RAC. During another telephone conversation with Steve Smykowski, Mr. T.R. Wathen (RAC) indicated that the RAC will attempt to place the highly contaminated material deeper in the pile if construction activities permit. The resultant attenuation benefits from overlying material of lower levels of contamination may reduce the required cover thickness. Mr. Wathen also mentioned that the RAC has accepted the borrow site that the TAC has identified in the RAP, and plans to perform additional tests on the cover material.

Conclusions

Based on a review of the calculations, the staff finds that the values of all the input parameters for the RAECOM model are acceptable with the exception of the value selected for the diffusion coefficient (D) of the radon barrier material. Samples obtained from only six test pits at the borrow site were tested to estimate values for D. The arithmetic mean of these values was used in the calculations to estimate cover thickness. The staff finds that the results from these limited number of tests do not provide sufficiently conservative estimates of this significant parameter and therefore, additional testing is necessary to better characterize the radon barrier material.

Based on the present limited diffusion coefficient data, the staff concludes that the cover thickness calculated from this data (i.e., 7.9 feet) does not provide reasonable assurance that the EPA standard will be met. This will remain an open issue until a revised cover thickness design is provided using either a more reliable D value based upon more detailed testing of the borrow material, or a more conservative D value based upon the existing data.