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JUL 26 1985

Sheldon Meyers, Acting Director  
Office of Radiation Programs (ANR-458)  
U. S. Environmental Protection Agency  
Washington, D. C. 20460

Dear Mr. Meyers:

This is in response to your letter of July 2, 1985, in which you expressed concern regarding the method used in the design of covers for the UMTRA disposal sites, as described in a paper presented at the Seventh Symposium on Management of Uranium Mill Tailings, Low-Level Waste and Hazardous Waste, February 6-8, 1985, at Fort Collins, Colorado.

Your concern with some of the statements contained in the paper "Sensitivity Analysis of Parameters Affecting Radon Barrier Cover Thickness," presented by Smith, et al., of the Jacobs-Weston Team is understandable. We have looked into this matter and obtained the following corrected and expanded statement of the actual design methods employed.

The statement the EPA quotes from the paper is an incorrect representation of the UMTRA Project's rationale for providing reasonable assurance in radon barrier design. The paper is incorrect in stating that average values are used for all parameters, although it is true that average values are used for many parameters.

In developing parameter values for radon barrier design, considerable attention is given to sampling each site sufficiently to characterize each parameter's average value very well. As indicated in the paper, the uncertainties on most parameters can be reduced to a considerable degree with suitable numbers of samples. Consequently, the uncertainty in the required radon barrier thickness due to uncertainty in these parameters is small. It is believed that for these parameters the small uncertainties constitute reasonable assurance that the radon release standard will not be violated due to error in the parameter values.

For parameters where sampling cannot reduce the uncertainty in the best value to use (specifically long-term moisture contents), a conservative value is in fact used. For long-term moisture content the value used is intended to be the driest condition a pile could maintain for extended periods of time, not the average moisture condition expected in the pile. In reviews by the NRC on this topic, the long-term moisture contents used in our designs have been evaluated and accepted as being conservative estimates of the long-term moisture content that actually will be experienced at the sites.

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In summary, UMTRA Project radon barrier design is intended to provide reasonable assurance that the EPA emission standard will be met through 1) limiting the uncertainties on parameter values through extensive site characterization, and 2) using conservative estimates of the values for parameters which contribute large uncertainties to the cover thickness estimate.

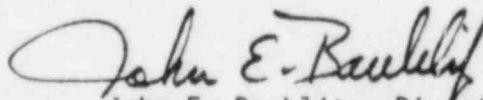
In addition, it should be stated that other implicit assumptions in the radon barrier calculation contribute to the conservatism of the design:

- 1) Reduction in radon emissions due to the 1 to 2 feet of rock, gravel, and soil used as an erosion barrier are not considered. The erosion barrier is sized to withstand the PMP or PMF and is a conservative feature for radon emission reduction.
- 2) The calculated radon barrier thickness is always rounded upward to the next nearest half foot, providing an additional measure of conservatism.
- 3) Reductions in radon emissions due to frozen or snow-covered ground are not considered. The annual release rate will be lower in proportion to the period of the year during which such conditions exist.

In view of these conservative elements of the UMTRA Project radon barrier design which were misrepresented by the paper by Smith et al., 1985, we trust that you will agree that reasonable assurance is provided that the stabilized piles will exhibit radon fluxes lower than the 20 pCi/m<sup>2</sup>.s standard.

Please let me know if you have any comments or questions.

Sincerely,



John E. Baublitz, Director  
Division of Remedial Action Projects  
Office of Terminal Waste Disposal  
and Remedial Action  
Office of Nuclear Energy

cc:

John Themelis, Manager, UMTRA/PO  
Roger Williams, Manager, Jacobs Engineering Group  
Robert Browning, NRC  
Danny Sheppard, PE-24 (with EPA letter of 7/2/85)