United States Department of the Interior

BUREAU OF MINES

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November 21, 1984

Mr. David H. Tiktinsky
Engineering Branch
Division of Waste Management, NMSS
U.S. Nuclear Regulatory Division
Washington, DC 20555

Dear Mr. Tiktinsky:

Mr. Gerald L. Finfinger of our Ground and Methane Control Group has reviewed the Final Report "Repository Drilled Hole Methods Study" SAND83-7085. Attached to this report is a list of his comments. I hope they will be of use to you in your evaluation of this report.

This review was done under the Nuclear Regulatory Commission - Bureau of Mines Interagency Agreement NRC-02-08-075.

Sincerely,

Edward D. Thimons

Edward D. Thimons
Supervisory Physical Scientist
Dust Control and Ventilation

Enclosure

WM-RES

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COMMENTS ON FINAL REPORT

"REPOSITORY DRILLED HOLE METHODS STUDY" - SAND83-7085

The temperature ranges of the underground environments for the vertical and horizontal hole concepts are different. Is this a typographical error or is there truly a difference?

The report implies that tunnel boring technology has been sufficiently developed and tested to the point that very few problems could be expected to occur if the horizontal hole concept is chosen. However published information is not available on the performance of remotely guided small diameter tunnel boring machines. Since the trajectory of the boring machine must be accurately controlled (6 inches in 100 feet; 12 inches overall) the potential for success of this concept is difficult to evaluate. Assuming the technology does exist how much of an "art" will be involved for the trajectory control? That is, will the operator know precisely how much force to apply to the sides of the holes to compensate for deviation or will the correction parameters be a direct function of on-the-job experience? If operator experience is an important consideration the following points should be addressed:

- How much training will be involved?
- Where will the training be performed?
- How many boreholes within a repository could be expected to deviate beyond the acceptable specifications?
- How many trained operators will be required within a repository to ensure absenteeism does not affect the boring operation?

Have engineering design calculations been performed on the various tunnel boring assemblies to ensure the equipment is capable of withstanding the expected forces? If not, how accurate are the equipment cost estimates? Based on previous experience how much will the surveying system add to the cost of the horizontal hole concept?

Why is maintenance twice as expensive for the vertical hole concept as the horizontal hole concept?

Concerning the economic comparison between the vertical and horizontal hole concepts the following should be noted:

- The vertical concept requires 30 feet of drilling per canister while the horizontal concept requires only 17 feet per canister.
- Trajectory control using the horizontal hole concept could considerably add to the overall cost.
- If borehole caving or squeezing exists within the horizontal boreholes the cost estimates would increase dramatically.