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Distribution:

Denver Research Center  
Ground Control Division

Tiktinsky

(Return to WM, 623-SS)

May 15, 1985

Mr. David Tiktinsky  
Engineering Branch  
Division of Waste Management  
Office of Nuclear Material Safety & Safeguards  
Nuclear Regulatory Commission  
1920 Norfolk Avenue  
Bethesda, MD 20814

Dear Dave:

Enclosed are review comments on the documents entitled "NNWSI Exploratory Shaft Title II Design Submittal," August 1983, Draft, Vol. 1 and Vol. 2, Los Alamos National Laboratory, and "Conceptual Design Report Exploratory Shaft-Phase I," NNWSI, LANL, LA-9179-MS, June 1982.

If we can provide further assistance for this document review, please phone me at FTS 776-0741 or Kanaan Hanna at FTS 776-0760.

Sincerely,

*R. L. Mandell*

R. L. Mandell  
Group Supervisor  
Mine Design

Enclosure

cc: David R. Forshey, Wash. Office  
Earl B. Amey, Wash. Office

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## NNWSI EXPLORATORY SHAFT DOCUMENT TECHNICAL REVIEW

- Document:
1. NNWSI Exploratory Exploratory Shaft Title II Design Submittal, August 1983, Draft, Vol. 1 and Vol. 2, Los Alamos National Laboratory
  2. Conceptual Design Report Exploratory Shaft-Phase I, NNWSI, LANL, LA-9179-MS, June 1982.

Reviewers: K. Hanna, and D. Conover

Date Review Completed: May 9, 1985

### Comments

- 1) One of the objectives in constructing the exploratory shaft is to assimilate data on the extent of fracturing and fracture characteristics. Because the amount of fracturing to be encountered by the shaft and test rooms is unknown, unfavorable ground conditions must be considered. The present design specifies the use of rock bolts and wire mesh for ground support in the test rooms, and a concrete lining in the shaft. The design should consider the cost, design and procurement of additional, heavier supports as well as the safety implications and scheduling delays which may arise from unstable ground conditions. In addition, some of the more fractured zones intersected by the shaft may require bolting before the liner emplacement to avoid an excessive build-up of pressure behind the lining. (Hustrulid, W., Preliminary Stability Analysis for the Exploratory Shaft, Sandia Report SAND83-7069, pp. 37.)
- 2) The contingency plans for the possible inflow of perched water are not adequately explained --in particular: the projected inflow rates, pump system, and sealing techniques. Depending on the probability of encountering perched water, drilling exploratory holes in advance of the shaft may be warranted.
- 3) In addition to the extensometer stations, and multiple point borehole extensometers (MPBX), it is suggested that pressure monitors be emplaced to measure the pressure on the shaft lining. Monitors should be installed at regular intervals and in highly fractured zones.
- 4) The procedure to obtain in situ stress data is not adequately described. For example: What type of instrument(s) will be used? How many tests will be performed? Will tests be conducted outside the stress concentration zone surrounding the shaft?
- 5) It is stated that permeability changes of the shaft wall due to closure will be calculated. By what method are these calculations to be performed, and will the permeability changes be monitored?

- 6) Many specifications are set forth regarding the construction and installation of epoxy-resin bolts; however, it is not clear whether the use of epoxy bolts will be allowed by the NRC. Have specifications been developed for cement-grout bolts in the event that they are substituted for epoxy bolts? In addition, equipment, time, and cost estimates for rock bolting may need to be modified if cement-grout bolts are used.

The technical issues to be discussed with the DOE should include the following:

- perched water inflow rates
- sealing techniques and techniques used to determine in situ stresses
- shaft monitoring
- artificial support performance
- post-repository shaft sealing: removal of the concrete shaft liner below repository level when sealing the shaft.