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Dr. Colin Heath
U.S. Department of Energy
Washington, D.C. 20545

Dear Dr. Heath:

Enclosed is a copy of the trip report prepared by the U.S. Nuclear Regulatory Commission (NRC) staff following its February 16-24, 1981 visit to review siting studies at the Nevada Test Site (NTS).

I would like to bring to your attention the following points that are developed in the report.

1. It is believed that the site screening process would benefit from development of formal siting criteria for tuff. This would help in documentation of the site selection process, as requested in 10CFR60.11(a); it would help assure that the selected site is among the best that can reasonably be found; and it would also tend to direct project activities more toward programmatic and less toward scientific objectives.

2. Draft 10CFR60.123(b) requires examination of each fault within the disturbed zone for evidence of movement during the Quaternary. Such work is not yet under way at the Yucca Mountain study area. Techniques for dating fault movement have been well developed for nuclear power plant siting and could be applied at NTS.

3. An important question is whether the Bullfrog tuff has sufficient strength for a repository at a depth of 2500 feet. Unconfined compressive strength measurements on saturated drill core taken from the Bullfrog tuff resulted in values of 2900 to 8000 pounds per square inch. Under conventional design criteria these strengths may be marginal to unacceptable.

4. Two boreholes, G-1 and H-1, have been drilled very near the center of the study area, where a repository at that site would be located. Draft 10 CFR 60 indicates that boreholes should be located so as to coincide with future pillars or shafts of the underground structure. At present,

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repository conceptual design studies are in an embryonic stage of development. Also, methods for effective sealing of boreholes in tuff have not been developed. Considerable advancement of both subjects is needed if decisions on the placement of future boreholes are to be affected.

5. The exploration effort would benefit if geological and seismic exploration methods were used to compliment each other. Results from seismic reflection will not be available during FY-81, and the future program appears slow paced. Therefore, the drilling program will probably not have the benefit of the structural data that could be obtained from a seismic reflection survey.

6. It is unclear whether a U.S.G.S. code developed for NTS or an ONWI code will be chosen for modeling groundwater and radionuclide migration. Either code must be verified and validated for use in site characterization. Since a comprehensive modeling scheme can require several years for development, validation, and documentation, the planning should be well in hand now.

7. Ground water from the study area may flow through a carbonate aquifer system at depth of 10,000 to 12,000 feet to a discharge point at Ash Meadows, about 35 miles to the south. It is important to determine, early in site screening, the proximity of the carbonate aquifer system to the proposed repository and the time required for water to flow from the repository to the discharge point.

8. One of the key site suitability questions is whether high-level waste can be safely stored on a reservation dedicated to nuclear weapons testing, because of the possibility of seismic damage to the repository. A large body of information is available on seismic effects in many parts of N.T.S., but few measurements have been made in the study area. A substantial record at depth and on the surface in the study area will be needed.

9. While a formal quality assurance program exists for NTS, it does not appear to be fully implemented.

The visit provided the NRC technical staff with an excellent opportunity to appreciate the scope of the siting investigations at the Nevada Test Site. Considerable amounts of technical information were obtained that will be useful if NTS is advanced by DOE for licensing attention. Hopefully, the observations made in the trip report will prove useful to

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the DOE staff and its contractor. It should be noted that the review is not complete and the observations reflect, in part, the technical specialities represented by the NRC group.

I wish to thank your staff and the DOE-Nevada Operations staff for their time and cooperation in connection with the trip.

We would be pleased to meet with you to discuss any comments you may have or to enlarge on details of the trip report. We look forward to subsequent trips to NTS to continue our cognizance of siting activities.

Sincerely,

ORIGINAL SIGNED BY
John Greeves (for)
Hubert J. Miller, Chief
High-Level Waste Technical
Development Branch
Division of Waste Management

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