Lawrence Livermore National Laboratory

NUCLEAR SYSTEMS SAFETY PROGRAM

October 3, 1984
EG-84-079

Michael E. Blackford
Project Officer, MS-623ss
Geotechnical Branch,
Division of Waste Management, NMSS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Trip Report on Field at the NNWSI Site, Nevada

REFERENCE: NRC FIN No. A0294

Dear Mr. Blackford:

One member (D. Burton Slemmons) of our LLNL team was able to participate in the recent field trip program (with DOE/NRC/USGS staff) at the NNWSI site, Nevada, on September 18 through 20, 1984. (H. Lawrence McKague was scheduled to take this field trip program, but he was not able to make it because of his illness after returning from his Washington trip of September 10 through 14, 1984).

Dr. Slemmons filed his field trip report as follows:

Tuesday, September 18, 1984: Travel from Reno, to Mercury, Nevada.

Wednesday, September 19, 1984:

1. The short, low-displacement faults and monoclinal flexure about 1 mile west of Busted Butte.
2. A right-slip fault of the NW-trending fault set at the northeastern end of Yucca Mountain, about 1 km northeast of G-4 drill site.
3. A landslide-like hill on the southern edge of Yucca Wash, southeast of Trench 13.
4. An exposed base below the soil in an area about 1 km north of drill hole G-4.

Thursday, September 20, 1984:

1. Examination of Trenches 10B, 8, and CF-1.

2. Travel from Mercury, to Las Vegas and Reno, Nevada.

The following comments summarize Dr. Slemmons' main observations from the field trip to the NNWSI site:

1. The field and laboratory studies show good progress during the past year. New programs have been initiated with well-trained and capable specialists. The new exploratory trench work, for example, uses current state-of-the-art methods. Previous high quality geologic studies are being continued. His comments are limited to the field examination. Accordingly, some of the comments which follow may be answered by work that is either underway or may be completed.

2. The field mapping and geologic relationships shown during the examination of the Busted Butte area suggest that the geologic mapping is detailed and uses state-of-the-art methods. The location and continuity of faults could be improved if greater use of ground geophysical methods were used for determining the relation of faults to younger volcanic units, alluvial cover, and exact location of exploratory trenches. The lack of fault exposures in some older trenches, may be related to location of trenches without adequate geophysical evaluations to site the trenches.

3. Use of soil stratigraphic methods for correlating geomorphic and structural features would provide better resolution of inactive or weakly active faults. The calcareous soil deposits along and near some of the NW-trending strike slip faults of the northern part of Yucca Mountain may provide a more quantitative and better documented dating of faults of this area.

4. Re-examination of Trench 14, and examination of Trenches RC-1 and 2, Trench 10B, and Trench 8 suggested, or demonstrated, that there are small fault offsets of the K-horizon. These relations strongly suggest that Quaternary faulting is much more extensive than is shown in previous geologic maps and reports. The small size of the apparent offsets and the subdued character is the topographic expression of the faults suggest that local earthquakes have moderate magnitudes and long recurrence intervals.

5. The late Quaternary fault activity shown by faults adjoining Yucca Mountain and in the Rock Valley fault zone suggest that the site is not outside an eastwest zone of long-term seismic activity.

6. Faults of the Yucca Mountain area, nearby parts of the Walker Lane trend and Rock Valley would be greatly enhanced by use of modern low-sun angle aerial photography for the structural evaluations.

7. Additional detailed mapping and evaluation of the Walker Lane trend at the north end of Yucca Mountain is needed for evaluation of seismic stability of the siting area.

This is a short-form report requested by Mr. Benjamin J. Rice, WMGT's NNWSI Site Coordinator.

If you have any questions, please let us know.

Sincerely yours,

Daĕ H. Chung
Project Leader

DHC:slc:102s

cc: B. J. Rice, WMGT
H. L. McKague, L-279
D. B. Slemmons, Reno