

TO: Mr. Benjamin Rice, Project Manager
Geotechnical Branch
Division of Waste Management
Office of Nuclear Material Safety & Safeguards
U.S. NUCLEAR REGULATORY COMMISSION
Washington DC 20555

WM DOCKET CONTROL
CENTER

'84 DEC -6 P3:13

FROM: John P. Imse
WESTON GEOPHYSICAL CORPORATION
PO Box 550, Lyons Rd.
Westboro MA 01581

WM-RES
WM Record File
D1003
WESTON

WM Project 10, 11, 16
Docket No. _____
PDR _____
LPDR B, N, S

DATE: December 3, 1984
SUBJECT: WGC - R531
Task 005 - Expanded Trip Report

Distribution:
BRICE

(Return to WM, 623-S3)

At your request we have expanded our discussion of data review for NNWSI conducted under Task 005 during the month of September, 1984. The organization of this report mimics that of our original report.

1.0 NEVADA TEST SITE

September 17, 1984

Our review the first morning on site focused on selected intervals of core from G-1, G-2, and G-3. The core was laid out and available for our examination. Representative sections of core included unwelded tuff, welded tuff and vitrophyre. Geophysical logs, photos and inspector logs were also available. We compared 3D velocity logs with the actual core and noted the correspondence between low velocity zones and the non-welded tuff. Geologic logs for the core were examined to gain a greater understanding of what U.S.G.S. rock descriptions meant.

That afternoon we had a guided tour of G-tunnel, the in situ test tunnel at the site. Much of the tour concentrated on the in situ block heater tests being conducted. We were also shown various units, welded and non-welded, which are presumed to be corollaries to the repository host rock at Yucca Mountain. The guide did point out a fault of unknown origin which had been interpreted by one group as resulting from collapse of denser, welded materials over the less dense, weaker, non-welded volcanics.

September 18 & 19, 1984

Robert Scott, the U.S.G.S. geologist mapping Yucca Mountain, conducted a two-day field trip for us to see the stratigraphy and structure he has been mapping in his detailed studies. Our first day concentrated on the southeastern and eastern portions of Yucca Mountain, in particular the "imbricate normal fault zone." Mr. Scott also provided an explanation of his rationale for extending faults beneath the alluvium/colluvium filled washes to the east of the mountain. His primary basis is aeromagnetic data.

8501040161 841203
PDR WMRES EECWGC
D-1003 PDR

Weston Geophysical

1696

Our second day with Scott was spent examining the apparent "roll-over" structure on Busted Butte and the evidence for strike-slip faulting at the northern and northeastern end of Yucca Mountain. We also looked at an interpreted "slump" feature in Sever, Wash. We finished the day at C. Barton's pavements, discussing the jointing phenomenon he has been studying.

September 20 & 21, 1984

Our final two days at the Nevada Test Site were spent reviewing some of the trench studies, in particular, Rock Valley 1 and 2; Yucca Mountain trenches 8, 10a & b, 11, 13, 14; and Crater Flat trench CF-1, CF-2, and CF-3.

The Rock Valley trenches were excavated across a prominent scarp in the alluvium and document faulting of the alluvial materials. Fabric analysis and age dating have contributed to the identification of the fault and dating of the fault. Additional dating studies were still in progress, but initial data indicated possible offset of materials less than 20,000 years old.

Yucca Mountain trenches 11 and 13 were excavated and reconnaissance logged in 1982. The trenches were located to evaluate the overburden over traces of projected bedrock faults. No evidence for faulting was noted by the U.S.G.S. workers. Yucca Mountain trench 14 was located normal to an alluvial scarp. Faulting of the bedrock and overburden has been mapped by the U.S.G.S. Also noted by the U.S.G.S. was interbedded stringers of travertine and opaline silica.

Trenches 8, 10a, and 10b were located to intersect the projected Solitario Canyon Fault and across a scarp in the alluvium. Both 8 and 10b exposed faulting of bedrock and overburden. Travertine and opaline silica were present in the fault zone exposed in trench 8.

The three Crater Flat trenches were located to evaluate scarps in the alluvium. All three exposed faulted alluvium.

2.0 MENLO PARK, CA - U.S.G.S. OFFICES

September 24 & 25, 1984

Topics reviewed at the Menlo Park offices consisted of in situ stress data for G-1, Rock Valley neotectonics, gravity data, geodetic leveling and intermediate range refraction. M. Zoback, formerly of the U.S.G.S., gave us an overview of the in situ stress program, both the intent of the program and difficulties encountered. Zoback did mention that they have assumed that horizontal stresses not as important because of dominant normal fault mechanisms for the region. We briefly examined a portion of

the G-1 data and noted that the hole deviated 600 feet to the southwest and that 75% of the deviation was from 3000-6000' in depth, with no apparent spiraling.

Jim Yount reviewed the Rock Valley fabric analysis investigation and presented a brief discussion on the dating studies conducted at the site. Howard Oliver reviewed the gravity data program at Yucca Mountain, discussed the modeling studies for Crater Flat, and showed us a copy of the QA procedure for the gravity studies. The relatively new geodetic leveling program for Yucca Mountain was explained by Will Prescott. At this time the net is set for use, but Prescott does not feel sufficient data are available for assessment.

Seismic refraction studies in the Amargosa Valley and Yucca Mountain area were described by Walt Mooney. He presented results of work in the Crater Flat area which is presented in OFR-84-661 as well as describing future plans for acquisition around Yucca Mountain.

September 26, 27 & 28, 1984

While at the Denver office of the U.S.G.S., magnetic survey, rock property, seismic reflection and refraction, and seismology data sets were reviewed. The principal investigator for geophysical logging was not there, but we were allowed to review a suite of logs for borehole G-1. Don Healy did explain the borehole gravity program conducted for NNWSI, and he allowed us to examine some of his data.

Hans Ackerman spent a great deal of his time describing the many test programs for shallow seismic refraction and seismic reflection studies at Yucca Mountain. We were shown most of the reflection data in various processed and unprocessed formats. Len Anderson described his petrophysics studies of core from the Yucca Mountain area. Anderson walked us through his analysis from the waxing of the core on the drill rig to this sampling and testing in Denver. The magnetic parameter testing program was presented by Joe Rosenbaum. He described the general testing procedure as well as the oriented sampling and testing program being used to assist in core reconstruction.

Finally, Joe Wilmon, Gordon Bath, and Dick Blank described the history of magnetic surveys, both land and airborne, at the test site. Gordon Bath presented some of the data contained in his recent OFR dealing with interpretation of aeromagnetic data at Yucca Mountain.

J. Imse

JI/rf-0843R