

Appendix B

Poster Presentations

1. DEVIL'S HOLE WORKSHOP: MAY 28 – MAY 31, 2002

Anderson, Thomas H., and Deemer, Danielle L., 2002, Tectonic evolution of the Yucca Mountain Region: Role of the Las Vegas Valley shear zone, [abs.]: Devil's Hole Workshop, Pahrump, Nevada, unpublished.

Kinematic analysis of regional fault systems supported by field studies, (mainly west of Mercury, NV) provides insight into the tectonic history of Yucca Mountain. Our results support the previously offered interpretation of the Yucca Mountain region as a pull-apart basin filled with volcanic units erupted through thinned crust. The boundaries of the southern part of the pull-apart basin coincide with major faults (Kawich Greenwater rift or Gravity fault, Rt. 95/Carrara and Bare Mountain) that may have accommodated multiple episodes of crustal extension during Tertiary time. These major fault structures have the potential to influence and possibly control the transmission of water from the proposed repository into Amargosa Valley. Tens of km of right-lateral displacement along the Las Vegas Valley Shear Zone (LVVSZ) was accommodated by formation of a pull-apart basin at a northward releasing step along Forty Mile Wash. East of Forty Mile Wash, the trace of the LVVSZ trends westerly (roughly between Lathrop Wells and Mercury) probably along a pre-existing structure. Upright folds record Transpression along this left-step constraining bend with local vertical limbs in layers of the rocks of Pavits Spring (17+ to 14 Ma) that crop out south of Little Skull Mountain. Tuff of the Crater Flat Group (~14 Ma) that directly overlies folded beds of Pavits Spring records eruption during deformation. Gentle folds and irregular bed geometries that have been mapped in units as young as the Timber Mountain Group are evidence that contraction continued contemporaneously with volcanism until 11 Ma. Contraction recorded by folds is not evident in units younger than 11 Ma suggesting cessation of transpression related to strike-slip movement along the LVVSZ. Subsequent development of north-striking normal faults commonly linked by northwest-striking right-lateral strike-slip faults (e.g., Yucca Wash; Sever Wash) and complementary Northeast-striking left-lateral strike-slip faults (e.g., Mine Mountain; Rock Valley) records the transition to pure shear accompanied by local north-south contraction. Normal faults at releasing steps along the Rock Valley Fault that break across west-trending transpressional folds in the Specter Range reveal the relative ages of simple and pure shear deformation.

2. GEOLOGICAL SOCIETY OF AMERICA ANNUAL MEETING: OCTOBER 27 – OCTOBER 30, 2002

Deemer, Danielle L. and Anderson, Thomas H., 2002, *Transpressional structures in Northern Specter Range and Striped Hills, Nevada: Strong contraction within an extensional orogen*, [abs.]: Abstracts with Programs, Geological Society of America Annual Meeting, 34, 6,

Analyses of geologic maps and field observations in the Specter Range and the region to the north within the Nevada Test Site west of Mercury, Nevada reveal four episodes of deformation. 1) The earliest event occurred during pre-tertiary time, when north-trending folds were formed during east-directed thrusting that may have carried the rocks exposed in the Striped Hills onto a footwall presently exposed in the Specter Range and northern Spring Mountains. Hanging wall rocks in the Striped Hills are distinguished by the absence of Eureka Quartzite. 2) Early Miocene extension resulted in the formation of a basin, probably fault controlled, the full extent of which is unknown. 3) Middle Miocene deformation, occurring between approximately 16 and 10 Ma, is attributed to transpression between Mercury and Forty Mile Wash contemporaneous with displacement along the right-lateral Las Vegas Valley shear zone (LVVSZ). Contraction along the west-trending step may have accommodated tens of kilometers of displacement recorded along the LVVSZ. During shortening, Paleozoic and overlying Tertiary strata were uplifted. The contact between Early Miocene strata and Cambrian beds is strongly tilted, and west-trending folds are present in the Horse Spring and Pavits Spring formations. Underlying Paleozoic units in the northern Specter Range record brecciation, thrusts that may verge either north or south, and detachments, especially among carbonate strata of the Bonanza King Formation. Left-lateral strike-slip faults that cut the low-angle surfaces in the eastern Specter Range are the youngest transpressional structures. During contraction, Paleozoic strata in the Striped Hills and overlying Miocene strata were upturned and fractured along north-striking normal faults, perhaps above a pre-existing thrust, which served as a decollement. 4) Post-10 Ma structures include the left-lateral Rock Valley fault and north-striking normal faults that cut older Tertiary features.