



**Department of Energy**  
Office of Civilian Radioactive Waste Management  
Yucca Mountain Site Characterization Office  
P.O. Box 98608  
Las Vegas, NV 89193-8608

**APR 24 1995**

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U.S. Nuclear Regulatory Commission  
Washington, DC 20555

REFERENCES SUPPORTING THE U.S. DEPARTMENT OF ENERGY (DOE)  
RESPONSE TO U.S. NUCLEAR REGULATORY COMMISSION (NRC) STAFF  
COMMENTS ON THE TOPICAL REPORT, "EVALUATION OF THE POTENTIALLY  
ADVERSE CONDITION 'EVIDENCE OF EXTREME EROSION DURING THE  
QUATERNARY PERIOD' AT YUCCA MOUNTAIN, NEVADA" (YMP/92-41-TPR)  
(SCPb: N/A)

References: (1) Ltr, Bell to Brocoum, dtd 1/30/95  
(2) Ltr, Milner to Holonich, dtd 3/13/95

In Reference 1, the NRC staff requested references needed to review DOE's responses to NRC staff comments on the Extreme Erosion Topical Report. DOE has compared the list provided by the NRC (Reference 1) to the reference list in the comment responses. Based on that comparison, DOE has provided the references listed in Enclosure 1. Enclosure 2 is a Variance List with annotations explaining either: (1) why a reference was not included, or (2) differences between items requested and items provided in Enclosure 1. Enclosure 3 is a description of the commitments contained in, or fulfilled by, this letter.

If you have any questions, please contact Thomas W. Bjerstedt of my staff at (702) 794-7590.

*Stephan J. Brocoum*  
For Stephan J. Brocoum  
Assistant Manager for  
Suitability and Licensing

AMSL:TWB-2940

Enclosures: *M. J. Bell*

1. List and Copy of References (References NOT RECORD MATERIAL)
2. Variance List
3. Commitments Established or Fulfilled in this Letter

9505150312 950424  
PDR WASTE  
WM-11 PDR

YMP-5

102.8  
WM-11  
NH03

List of References Provided with this Letter

✓Coe, J., P. Glancy, and J.W. Whitney, 1995. "Volumetric analysis and hydrologic characterization of a modern debris flow near Yucca Mountain, Nevada," U.S. Geological Survey Administrative Report, 50 p. (MOL.19950307.0140)

copyright ✓Rethier, D.P. and W.D. McCoy, 1993. "Aminostratigraphic Relations and Age of Quaternary Deposits, Northern Española Basin, New Mexico," Quaternary Research, v. 39, p. 222-230. (MOL.19950202.0024)

✓DOE, 1995. "Preliminary map of the surficial deposits of the southern half of the Topopah Spring NW quadrangle and the northern half of the Busted Butte quadrangle, Nye County, Nevada," U.S. Geological Survey letter report, letter, Hayes to Brocoum, dated 2/27/95. (MOL.19950301.0213)

✓Geslin, J.K., and T.C. Moyer, 1994. "Summary of Lithologic Logging of New and Existing Boreholes at Yucca Mountain, Nevada, March 1994 to June 1994," U.S. Geological Survey Open-File Report 94-451. (MOL.19941214.0057)

copyright ✓Harrington, C.D., and J.W. Whitney, 1995. Comment on "Evidence suggesting that methods of rock-varnish cation ratio dating are neither comparable nor consistently reliable," by P.R. Bierman and A.R. Gillespie, Quaternary Research, v. 43.

✓Hubert, J.F., and A.J. Filipov, 1989. "Debris-Flow Deposits in Alluvial Fans on the West Flank of the White Mountains, Owens Valley, California, USA," Sedimentary Geology, v. 61, pp 177-205. (NNA.921125.0010)

✓Ku, T-L., 1988. "Radiometric dating with U- and Th-series isotopes in the Nevada Test Site region - a review." (NNA.910412.0011)

✓Machette, M.N., 1985. "Calcic soils of the southwestern United States" in D.L. Weide and M.L. Faber (eds.), Soils and Quaternary Geology of the southwestern United States: Geological Society of America Special Paper 203, p. 1-21. (NNA.900712.0001)

✓Rosholt, J.N., C.A. Bush, W.J. Carr, D.L. Hoover, W.C. Swadley, and J.R. Dooley, Jr., 1985. "Uranium-trend dating of Quaternary deposits in the Nevada Test Site area, Nevada and California," U.S. Geological Survey open-file report OFR-85-540. (HQS.880517.2848)

Variance List

1. Beaty, 1990 was removed from the response package based on DOE internal review and concurrence.
2. Carr, W. J., 1992. Structural Model for Western Midway Valley Based on the RF Drillhold Data and Bedrock Outcrops: in Gibson, J.D. and others, 1992, Summary and Evaluation of Existing Geological and Geophysical Data Near Prospective Surface Facilities in Midway Valley, Yucca Mountain Project, Nye County, Nevada: Sandia National Laboratories Report SAND90-2491, Appendix A. (NNA.910709.0001) The NRC was on original distribution for at least four copies of the Sandia report, and the CNWRA received at least one copy. If additional copies are required, please contact Thomas W. Bjerstedt.
3. Crowe, B., F. Perry, J. Geissman, L. McFadden, S. Wells, M. Murrell, J. Poths, G.A. Valentine, L. Bowker, and K. Finnegan, 1995. "Status of volcanism studies for the Yucca Mountain Site Characterization Project," Los Alamos National Laboratory LAMS Report LA-12908-MS. (MOL.19950123.001)  
(Has been provided under separate cover, letter dated April 17, 1995, from Brocoun to Holonich.)
4. Frizzell and Shulters, 1990. This is a published USGS Miscellaneous Investigations Series map, I-2046, which is readily available through USGS map sales offices.
5. Harrington and Whitney, in press, has been accepted by Quaternary Research and is scheduled for publication in the March, 1995 issue. A draft copy of this paper has been included with the references, but submittal of the actual reference is contingent on publication.
6. Lundstrom and others (in press) is now DOE (1995) (Reference 1). This reference includes a letter report from the U.S. Geological Survey that explains a digitized Surficial Deposits Map prepared by DOE. A special map and letter report describing the surficial deposits along the eastern flank of Yucca Mountain and in Midway Valley was needed as part of the response package.
7. Lundstrom and Warren, 1994. The references to the poster described in EOS, v. 75, no. 44 (sup.), p. 275 were removed to reflect that the same information is available in the article in Proceedings of the Fifth Annual International Conference on High Level Radioactive Waste Management, v. 4, p. 2121-2130.

8. Machette, M.N., 1985. This citation was added during the concurrence review and has been provided to facilitate the review.
9. Maldonado, F., 1985. "Geologic map of the Jackass Flats area, Nye County, Nevada," U.S. Geological Survey miscellaneous investigations series map I-1519, 1:48,000. (This is a published USGS map, which is readily available through USGS map offices.)

Sawyer, D.A., R.J. Fleck, M.A. Lanphere, R.G. Warren, D.E. Broxton, and M.R. Hudson, 1994. "Episodic caldera volcanism in the Miocene Southwestern Nevada Volcanic Field: revised stratigraphic framework  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology, and implications for magmatism and extension," Geological Society of America Bulletin, v. 106, no. 10, p. 1304-1318. (MOL.19950206.0001)

Enclosure 3

**DOE commitment fulfilled in this letter:**

**DOE has fulfilled Commitment 2 from a letter dated March 13, 1995, from Milner to Holonich, Enclosure 3, by providing the references supporting DOE's responses to NRC's comments on the Extreme Erosion Topical Report (YMP/TR-92-41).**