

Department of Energy
Office of Civilian Radioactive Waste Management
Office of Repository Development
1551 Hillshire Drive
Las Vegas, NV 89134-6321

QA: N/A
Project No. WM-00011

DEC 08 2004

OVERNIGHT MAIL

ATTN: Document Control Desk
Director, Division of High-Level Waste
Repository Safety
U.S. Nuclear Regulatory Commission
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Rockville, MD 20852-2738

**REQUEST FOR STAFF FROM U.S. NUCLEAR REGULATORY COMMISSION'S
(NRC) CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES (CNWRA)
TO PRESENT THEIR PUBLICATIONS AT PROBABILISTIC VOLCANIC HAZARD
ANALYSIS UPDATE (PVHA-U) WORKSHOPS**

As you know, the PVHA-U project is currently being conducted to assess the probability of a volcanic event disrupting the proposed repository at Yucca Mountain, Nevada. A panel of ten experts are responsible for making the assessments and a formal expert elicitation process, consistent with NUREG-1563 *Branch Technical Position on the Use of Expert Elicitation in the High-Level Radioactive Waste Program*, is being followed. The principal reason for conducting the PVHA-U is to evaluate new information, both data and models, developed since the original PVHA in 1996 that is relevant to estimating volcanic probability. Some of this new information has been published by the staff of CNWRA.

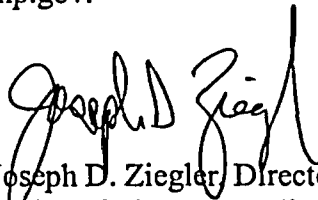
In order to ensure that all members of the expert panel have a common understanding of relevant data sets and models, a series of public workshops with an invited audience of observers is planned. Scientists who have conducted research that is relevant to the assessment of volcanic hazard at Yucca Mountain are being invited to present their work. It is preferred to have the original investigators as presenters, since these individuals can explain their work most completely and accurately, as well as answer questions from members of the expert panel. The presenters are important contributors to the PVHA-U, but they are not "participants" in the assessments of volcanic hazard. Those assessments will be made by the ten experts.

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Two individuals associated with the NRC's CNWRA, Brittain E. Hill and John A. Stamatakos, have published information relevant to this topic. On behalf of a request from the expert panel, the U.S. Department of Energy, in turn, requests that they present their work at the PVHA-U Workshop 2, planned to be the week of February 14, 2005, in Las Vegas, Nevada. The presentations should be based upon relevant published materials, including those in Enclosure 1. Also, a preliminary draft agenda is included as Enclosure 2. At subsequent workshops, the expert panel may identify other individuals associated with NRC as potential presenters; in all cases, these individuals would be asked to base their presentations on their own publications.

There are no new regulatory commitments in this letter. We appreciate your consideration of this request. For any questions, please contact Eric T. Smistad at (702) 794-5073 or e-mail eric_smistad@ymp.gov, or Timothy C. Gunter at (702) 794-1343 or e-mail timothy_gunter@ymp.gov.



Joseph D. Ziegler, Director
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OLA&S:TCG-0342

Enclosures:

1. List of References
2. Preliminary Draft Agenda

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Enclosure 1

Relevant references by Brittain E. Hill and John A. Stamatakos:

Connor, C. B., Stamatakos, J. A., Ferrill, D., Hill, B. E., Ofoegbu, G., and Conway, F.M., 2000, Volcanic hazards at the proposed Yucca Mountain, Nevada, high-level radioactive waste repository, *Journal of Geophysical Research*, 105: 417-432.

Connor, C. B., Lane-Magsino, S., Stamatakos, J. A., Martin, R. H., La Femina, P. C., Hill, B. E., and Lieber, S., 1997, Magnetic surveys help reassess volcanic hazards at Yucca Mountain, Nevada: *Eos (Transactions of the American Geophysical Union)*, v. 78, p. 73-78.

Connor, C. B., Stamatakos, J. A., Ferrill, D. A., and Hill, B. E., 1999, Comment on detecting strain in the Yucca Mountain Area, Nevada: *Science*, v. 282, p. 1007b.

Connor, C. B., Stamatakos, J. A., Ferrill, D. A., Hill, B. E., Ofoegbu, G. I., Conway, F. M., Sagar, B., and Trapp, J., 2000, Geologic factors controlling patterns of small-volume basaltic volcanism: Application to a volcanic hazards assessment at Yucca Mountain, Nevada: *Journal of Geophysical Research*, v. 105, p. 417-432.

Conway, M. F., Ferrill, D. A., Hall, C. M., Morris, A. P., Stamatakos, J. A., Connor, C. B., Halliday, A. N., Condit, C., 1997, Timing of basaltic volcanism along the Mesa Butte fault in the San Francisco volcanic field, Arizona, from $^{40}\text{Ar}/^{39}\text{Ar}$ dates: Implications for longevity of cinder cone alignments: *Journal of Geophysical Research*, v. 102, p. 815-824.

Ferrill, D. A., Stamatakos, J. A., and McKague, H. L., 1997, Quaternary slip history of the Bare Mountain Fault (Nevada) from the morphology and distribution of alluvial fan deposits: *Reply: Geology*, v. 25, p. 190.

Ferrill, D. A., Morris, A. P., Jones, S. M., and Stamatakos, J. A., 1998, Extensional layer-parallel shear and normal faulting: *Journal of Structural Geology*, v. 20, p. 355-362.

Ferrill, D. A., Stamatakos, J. A., and Sims, D., 1999a, Normal fault corrugation: Implications for growth and seismicity of active normal faults: *Journal of Structural Geology*, v. 21, p. 1027-1038.

Stamatakos, J. A., and Ferrill, D. A., 1998, Strike-slip fault system in Amargosa Valley and Yucca Mountain, Nevada, by Schweickert, R. A., and Lahren, M. M., *Comment: Tectonophysics*, v. 294, p. 151-160.

Relevant references by B. Hill and J. Stamatakos: (continued)

Stamatakos, J. A., Connor, C. B., and Martin, R. H., 1997, Quaternary basin evolution and basaltic magmatism of Crater Flat, Nevada, from detailed ground magnetic surveys of the Little Cones: *Journal of Geology*, v. 105, p. 319-330.

Stamatakos, J. A., Ferrill, D. A., and Spivey, K. H., 1998, Paleomagnetic constraints on the tectonic evolution of Bare Mountain, Nevada: *Geological Society of America Bulletin*, v. 110, p. 1530-1546.

Enclosure 2

PRELIMINARY DRAFT AGENDA

WORKSHOP 2

ALTERNATIVE MODELS

PROBABILISTIC VOLCANIC HAZARD ANALYSIS UPDATE (PVHA-U) YUCCA MOUNTAIN PROJECT

I. Overview of PVHA-U and Goals and Approach for Workshop 2

Welcome and short overview (Smistad; King/Cline)

- Why PVHA-U is being conducted; schedule

Workshop 2 Goals and Approach (Coppersmith)

- Review of goals and approach
- Overview of presentations
- Plan for elicitation interviews (indiv. influence diagrams, etc.)

Status of Modeling of Aeromagnetic Data and Drilling Program (Cogbill/Perry/Blakely)

II. Tectonics of the Yucca Mountain Region

G. Biasi (UNR) (velocity structure beneath YM from tomography)

C. Fridrich (USGS) (Crater Flat extension and rotation)

D. O'Leary (USGS) (recent ideas about tectonic models)

J. Savage (USGS) (geodesy and regional perspective on tectonics)

J. Stamatakis (CNWRA) (Quaternary evolution of Crater Flat basin)

G. Thompson (Stanford) (volcanism and faulting in regions of extensional tectonics)

B. Wernicke (Caltech) (alternative interpretations of geodetic strain info)

III. Characteristics of Possible Future Volcanic Events in the Yucca Mountain Area

[Event Definition]

F. Spera (UCSB) (characteristics of volcanic events)

M. Bursik (U of Buffalo) or J. Guttman (Wesleyan) or J. Luhr (Smithsonian) (definition of "extrusive event")

P. Delaney (USGS) (dike emplacement in areas of extensional tectonism)

M. Sheridan (Univ of Buffalo) (dike swarms near Boulder Dam)

B. Hill (CNWRA) (event definitions used by CNWRA)

S. Sparks (Univ of Bristol) (event definition for Japan)

IV. Models for Characterizing the Recurrence Rate of Future Volcanism

C. Connor (Univ of So Florida) (general methods in estimating temporal recurrence rate)

C-H. Ho (UNLV) (temporal recurrence rate models)

B. Hill and J. Stamatakis (CNWRA) (temporal cluster model)

W. Duffield (No Arizona Univ) or R. Carlson (Carnegie Inst) (volume-predictable models)

Preliminary Draft Agenda (continued)

V. Models for Characterizing the Spatial Distribution of Future Volcanism

- C. Connor (Bayesian approach to forecasts of volcano spatial density)
- E. Smith (UNLV) ("hot spot" theory)
- M. Tynan (DOE) (mega-ring model)
- M. Sheridan (Univ at Buffalo) (bivariate Gaussian model for scoria cone location)
- C. Jaupert (l'Institut de physique du globe de Paris) (physical controls volcanic eruptions)

VI. General Approaches to Hazard Analysis

- N. Coleman (NRC) (model approach)
- B. Hill, (CNWRA) (hazard models by CNWRA)
- O. Jaquet (COLENCO, Switzerland) (volcanic hazard forecasts in Germany)
- N. Chapman (NAGRA, Switzerland) or S. Sparks (Univ of Bristol) (volcanic hazards for HLW in Japan)