



UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
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*External Affairs*

## **Board Completes Review: Material Submitted to the Board Does Not Significantly Affect the Findings of 1992 NAS Panel**

The Nuclear Waste Technical Review Board has released its review of 11 reports submitted in January 1997 by Mr. Jerry Szymanski concerning ongoing, intermittent hydrothermal activity and large earthquake-induced changes in the water table at Yucca Mountain. Additional material provided later by the Office of the Attorney General of the State of Nevada also was reviewed. Overall, the Board concluded that the material submitted to them does not significantly affect the conclusions of a 17-member panel in a 1992 National Academy of Sciences (NAS) Report. The NAS panel concluded from observations in the field and geochemical data that there is no evidence to support Szymanski's theory that the water table at Yucca Mountain has risen periodically hundreds of meters from deep within the earth's crust.

The Board reached three specific conclusions.

1. The material reviewed by the Board does not make a credible case for the assertion that there has been ongoing, intermittent hydrothermal activity at Yucca Mountain or that large earthquake-induced changes in the water table are likely at Yucca Mountain. This material does not significantly affect the conclusions of the 1992 NAS report.

2. There are several areas where additional research could be used to further evaluate the hypotheses of ongoing, intermittent hydrothermal activity and large earthquake-induced changes in the water table at Yucca Mountain. However, because of the lack of any substantive evidence supporting either of these hypotheses, the Board views additional research on these issues, if not already carried out, as generally having a lower priority than more important issues in the evaluation of repository performance.

3. However, some fluid inclusions found in mineral deposits at Yucca Mountain do provide direct evidence of the past presence of fluids at elevated temperatures (at least 72°C) in the vicinity of the proposed repository. This could be an indicator of some degree of past hydrothermal activity. The critical question is, "At what time in the past were such fluids present?" If fluids at elevated temperatures were present less than 100,000 years ago, as some of

the reviewed reports claim, this could lend credence to the hypothesis of ongoing hydrothermal activity at Yucca Mountain. On the other hand, if these fluids were present around 10,000,000 years ago or earlier, they could be associated with volcanic events related to the original formation of Yucca Mountain and would have no bearing on the hypothesis of ongoing hydrothermal activity. The Board believes that the ages of fluid inclusions should be determined. A joint program between federal and State of Nevada scientists for collecting, dating, and analyzing fluid inclusions would be one way to help eliminate some of the past disagreements associated with sample collection and handling.

In undertaking its review, the Board focused on answering four questions. (1) Are there significant new data since the 1992 NAS report? (2) What is the quality of these data (and interpretations)? (3) How much credence do these data lend to the hypothesis of ongoing, intermittent hydrothermal activity (large earthquake-induced changes in the water table) at Yucca Mountain? (4) If these data (and interpretations) significantly affect the conclusions of the 1992 NAS report, how can the issue be resolved? The Board has finished addressing these questions and has sent its review to the U.S. Department of Energy. A copy has been furnished to the Nevada Attorney General's office.

This review and other Board reports and information are available from the Board's Arlington, Virginia, office and also may be downloaded from the Board's web site at **[www.nwtrb.gov](http://www.nwtrb.gov)**. Requests for copies of reports or other information may be made by telephone (703-235-4473), fax (703-235-4495), or e-mail ([info@nwtrb.gov](mailto:info@nwtrb.gov)).

The Board was created by Congress in the Nuclear Waste Policy Amendments Act of 1987 to evaluate the validity of technical and scientific activities undertaken by the Secretary of Energy related to the DOE's program to manage and dispose of the nation's spent nuclear fuel and defense high-level waste, including activities related to site characterization and the handling and transport of spent fuel and high-level waste.

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