UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201

December 2000

The Honorable Dennis Hastert
Speaker of the House
United States House of Representatives
Washington, DC 20515

The Honorable Strom Thurmond
President Pro Tempore
United States Senate
Washington, DC 20510

The Honorable Bill Richardson
Secretary
U.S. Department of Energy
Washington, DC 20585

Dear Speaker Hastert, Senator Thurmond, and Secretary Richardson:

The Nuclear Waste Technical Review Board (Board) submits this *Letter Report to The U.S. Congress and The Secretary of Energy* in accordance with provisions of the Nuclear Waste Policy Amendments Act of 1987, Public Law 100-203. The Act requires the Board to report to Congress and the Secretary of Energy no fewer than two times each year.

Congress created the Board to evaluate the technical and scientific validity of activities undertaken by the Secretary of Energy in characterizing a site at Yucca Mountain, Nevada, as a possible location for a permanent repository for disposing of spent nuclear fuel and high-level radioactive waste. The Board also reviews the Department of Energy's (DOE) work related to the packaging and transport of such waste.

Consistent with its congressional mandate, the Board has focused its technical and scientific review and comments on issues central to a decision by the Secretary of Energy—currently scheduled for 2001—on whether to recommend the Yucca Mountain site for repository development. Many of the Board's comments are aimed at encouraging the DOE to develop a defensible technical basis for a potential site recommendation. That basis should include a clear description of how a Yucca Mountain repository would perform over thousands of years and how the DOE developed its estimates of repository system performance. In the Board's view, there should be general consistency and logic among the conceptual description of the site, projections of repository performance in performance assessments, modeling of fundamental physical processes, and relevant field and laboratory data.

This two-page letter report presents a brief update of the Board's views on the status of the DOE program.

The Board recently has noted substantial improvements in the DOE's performance assessment capabilities since the DOE issued its viability assessment of the Yucca Mountain site in 1998. However, estimating the performance of a proposed long-lived, first-of-a-kind repository at Yucca Mountain is an extremely difficult undertaking because of highly complex interactions among the components of the natural and engineered systems, only some of which are well understood at this time. The Board has commented in the past on the limitations of performance assessment models and has urged the DOE to supplement its performance assessments with other lines of evidence.

Technical challenges remain for the program. An example is the conceptual design for the proposed repository—an issue on which the Board has commented in several reports over the last 10 years. The repository design has a direct bearing on repository performance and thus on the suitability of the site. In the Board's view, the DOE has not yet demonstrated a firm technical basis for its present high-temperature "base case" repository design. The Board looks forward to the results of DOE work that is under way to evaluate the effects of alternative lower-temperature repository designs on repository and waste package performance.

In light of continuing technical challenges, the Board believes that the DOE's ongoing efforts in quantifying levels of uncertainty and conservatism that will be associated with predicting repository performance are especially important. The Board has observed often that scientific uncertainty always will be associated with predicting the performance of a geologic repository—at Yucca Mountain or at any other site. When the magnitude of uncertainties and the degree of conservatism are quantified, decision-makers will have a much better basis for assessing a potential site recommendation, including whether the levels of uncertainty associated with the recommendation are acceptable.

The decision on whether to recommend the Yucca Mountain site will be a major policy decision that is informed by scientific and technical insight. The Board looks forward to continuing its role in this process, which is to provide to Congress and the Secretary an unbiased and independent review of the DOE's technical and scientific work supporting a decision on site recommendation.

Sincerely,

{signed by}

Jared L. Cohon
Chairman