



UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
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Office of Civilian Radioactive Waste Management  
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Dear Ms. Dixon:

The Nuclear Waste Technical Review Board appreciates the opportunity to comment on the Department of Energy's (DOE's) proposed environmental impact statement (EIS) for a geologic repository at Yucca Mountain, Nevada. The Board submits these comments as part of its responsibility under the Nuclear Waste Policy Act, as amended, to evaluate the scientific and technical validity of the activities carried out by the Secretary of Energy and the DOE Office of Civilian Radioactive Waste Management. The Board focuses its comments on the technical quality of the analyses that support the draft EIS. The Board believes that resolution of its comments will improve the estimates of environmental impacts in the final EIS and improve the technical basis for deciding whether to pursue the proposed action described in the document.

The Board's comments on the draft EIS are attached to this letter. Some key comments are:

- The final EIS should be based on an updated repository design and should include the updated performance assessment results that the DOE plans to produce to support a possible recommendation that the site be developed as a geologic repository.
- It is clear that the nature of environmental risks posed by both alternatives, and the uncertainty about those risks, change over time. Tables S-1 and 2-7, which categorize all impacts as either short-term or long-term, should be supplemented by a discussion that explains how the environmental risks of both alternatives progress over time, including the period beyond 10,000 years.
- The specific transportation routes assumed for the analyses of transportation impacts should be identified in the EIS.
- The analyses of the impacts of transportation accidents should include estimates of the environmental impacts associated with cleaning up after any accidents that release radioactive materials to the environment.

- Population data used in the EIS should be updated from the 1990 census figures and should be extrapolated to estimate continued population growth for a reasonable time in the future.
- The EIS should acknowledge the potential for stigma effects near a Yucca Mountain repository or associated transportation routes and should explain why it is not appropriate to include estimates of those possible effects.

The estimates of long-term repository performance for the proposed action of the draft EIS are essentially the same as those used by the DOE to prepare its 1998 Viability Assessment of a Yucca Mountain repository. After reviewing the Viability Assessment, the Board stated its belief that identifying important sources of uncertainty, estimating the magnitude of those uncertainties, reducing critical uncertainties, and evaluating the effects of residual uncertainties on expected repository performance are essential for supporting a technically defensible site-suitability determination. The Board concluded that a significant amount of additional scientific and engineering work will be needed to increase confidence in a site-suitability determination. The Board recommended that the DOE evaluate alternative repository designs that have the potential to reduce uncertainties in projected repository performance, thereby reducing the scope of additional necessary scientific study. Because the draft EIS relies on essentially the same performance assessment capabilities as those used to prepare the Viability Assessment, the Board believes that these conclusions and recommendations are equally applicable to the draft EIS.

The Board believes that neither of the no-action scenarios evaluated in the draft EIS is likely to occur, but the two scenarios do appear to represent the extremes of a spectrum of possible futures. Because the no-action alternative is hypothetical, there may be little merit in attempting analyses of this alternative more sophisticated than those presented in the draft EIS.

Again, the Board appreciates the opportunity to comment on the draft EIS for a Yucca Mountain repository.

Sincerely,

Jared L. Cohon  
Chairman

Attachment:  
Comments on draft EIS

# U.S. Nuclear Waste Technical Review Board

## Comments on the Draft Environmental Impact Statement for a Geologic Repository at Yucca Mountain, Nevada

1. The performance assessment models and data used to project the long-term performance of a Yucca Mountain repository are very similar to those used by the U.S. Department of Energy (DOE) to prepare its 1998 Viability Assessment of a Yucca Mountain repository. The Board has previously commented on the Viability Assessment<sup>1</sup> and those comments would also apply to the draft Yucca Mountain EIS. The DOE intends to refine its models and collect additional data before the final Yucca Mountain EIS is prepared. The Board recommends that the final EIS include the updated performance assessment results that the DOE plans to produce to support a possible recommendation that the site be developed as a geologic repository.
2. It is clear that the nature of environmental risks posed by both alternatives, and the uncertainty about those risks, change over time. Tables S-1 and 2-7, which categorize all impacts as either short-term or long-term, should be supplemented by a discussion that explains how the environmental risks of both alternatives progress over time, including the period beyond 10,000 years.
3. The repository design that was assumed when preparing the draft EIS already has evolved and may change further before the final EIS is prepared. The Board recommends that the final EIS be based on the most advanced design concepts available at the time the final EIS is prepared.
4. The description of the proposed action indicates that active institutional controls (e.g., monitored and enforced limitations on site access) would be applied to the Yucca Mountain site only until permanent closure of the repository has been completed. This seems contrary to the provision of the Energy Policy Act of 1992 that directs the Secretary of Energy to “continue to oversee the Yucca Mountain site to prevent any activity at the site that poses an unreasonable risk . . . .” The oversight mandated by the Energy Policy Act appears to require some degree of active institutional control of the site, which would cause environmental impacts not evaluated in the draft EIS. The Board recommends that the final EIS clarify the extent to which active institutional control of the Yucca Mountain site may be required by the Energy Policy Act, and estimate the environmental impacts that would be associated with a scenario that incorporates such control.
5. Appendix J of the draft EIS describes the use of the HIGHWAY and INTERLINE computer codes to project the specific transportation routes to be used for analysis of transportation impacts when moving radioactive wastes to a Yucca Mountain repository. However, the draft EIS does not report what those transportation routes are. The Board recommends that the final EIS identify the

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<sup>1</sup> U.S. Nuclear Waste Technical Review Board, *Moving Beyond the Yucca Mountain Viability Assessment*, Washington, D.C., April, 1999.

specific transportation routes that are used for analysis of transportation impacts. If the DOE has identified preferred transportation routes, those also should be identified in the final EIS. If preferred transportation routes have not been identified, the final EIS should discuss when and how such identification will occur.

6. The analyses of transportation accidents that result in releases of radioactive materials to the environment assume that the released materials are not cleaned up. While this assumption may provide a bounding estimate of the radiation doses that nearby residents could receive, it is unrealistic because it fails to estimate the environmental impacts of clean-up (e.g., worker radiation exposure; condemnation of roads, land, or water supplies; disposal of contaminated soil and building materials). A methodology for making such estimates was presented in *Transportation of Radionuclides in Urban Environs: Draft Environmental Assessment*, NUREG/CR-0743; SAND 79-0369, July 1980. While somewhat dated, the cost estimates and perhaps the methodology could be updated for today's use. The Board recommends that the final EIS include estimates of the environmental impacts of clean-up after transportation accidents.
7. The draft EIS uses 1990 census data for those analyses that require estimates of population sizes. Because of rapid growth in the Las Vegas Valley area, the 1990 census data are out of date. More recent population estimates and twenty-year projections of future growth are available from the Nevada State Demographer's Office at the University of Nevada, Reno. The Board recommends that the State Demographer's population projections be used when preparing impact estimates for the final EIS.
8. Comments at public meetings on the draft EIS have indicated a significant public concern about possible stigma effects (reduced land values, decreased tourism) in areas near a Yucca Mountain repository or associated transportation routes. The Board recognizes that assessing the impact of stigma effects would be difficult because such effects depend not on the actual physical effects of the proposed action, but on the negative perception of those effects by some members of the public. The extent to which stigma effects might occur is extremely speculative and therefore might be inappropriate for analysis in a Yucca Mountain EIS. The Board recommends that the final EIS acknowledge the possibility that stigma effects might occur and explain the basis for deciding whether to include an analysis of such effects in the final EIS.
9. The draft EIS uses the "Modal Study" (discussed on page 6/29 of the draft EIS) in its analyses of transportation accidents. It is our understanding that this study will be updated by the U.S. Nuclear Regulatory Commission, but not in time for inclusion in the final Yucca Mountain EIS. The Board recommends that the final EIS note any efforts to update the study and discuss the DOE's plans for reviewing the results of any update to determine whether a supplement to the final EIS may be needed.
10. The draft EIS identifies the Caliente/Chalk Mountain route (possible rail or heavy-haul route) as a *non-preferred alternative*. However, the draft EIS presents no *environmental* logic for this designation. Instead, the draft EIS states that the designation is based on opposition from the U.S.

Air Force, which is concerned about potential interference with Nellis Air Force Range testing and training activities. Since this route is about half the overall distance of the more circuitous Caliente route and therefore should be less harmful to the environment, and since this route avoids the population centers surrounding Las Vegas, it would seem to be a candidate for designation as a *preferred alternative* from an environmental perspective. The Board recommends that the final EIS provide a more thorough explanation of the basis for deciding whether to exclude the Caliente/Chalk Mountain route from consideration..