

## Appendix F

# Other U.S. Nuclear Waste Technical Review Board Correspondence

- Letter from Senators Harry Reid and John Ensign to Chairman Jared L. Cohon; November 26, 2001.  
Subject: Questions related to the Department of Energy determination of site suitability
- Letter from Chairman Jared L. Cohon to Senator Harry Reid; December 17, 2001.  
Subject: Acknowledgement of letter and notice of impending review.
- Letter from Chairman Jared L. Cohon to Senator John Ensign; December 17, 2001.  
Subject: Acknowledgement of letter and notice of impending review.
- Letter from Chairman Jared L. Cohon to Senator Harry Reid; January 24, 2002.  
Subject: Responses to questions posed in letter of November 26, 2001.
- Letter from Chairman Jared L. Cohon to Senator John Ensign; January 24, 2002.  
Subject: Responses to questions posed in letter of November 26, 2001.
- Letter from Congressman John Shimkus to Chairman Jared L. Cohon, December 5, 2001.  
Subject: Questions related to the Department of Energy determination of site suitability.
- Letter from Chairman Jared L. Cohon to Congressman John Shimkus; January 24, 2002.  
Subject: Responses to questions posed in letter of December 5, 2001.
- Letter from Congressman Joe Barton to Chairman Jared L. Cohon, December 11, 2001.  
Subject: Potential health and safety issues at Yucca Mountain.
- Letter from Chairman Jared L. Cohon to Congressman Joe Barton; January 24, 2002.  
Subject: Responses to questions posed in letter of November 26, 2001.

## United States Senate

WASHINGTON, DC 20510-7012

NOV 29 2001

November 26, 2001

Dr. Jared L. Cohon  
Chairman  
United States Nuclear Waste Technical Review Board  
2300 Clarendon Boulevard, Suite 1300  
Arlington, VA 22201

Dear Dr. Cohon:

We are writing in regard to the Department of Energy's (DOE) possible site recommendation for Yucca Mountain, Nevada. The DOE is expected to make a determination by early next year on the suitability of the proposed repository. There are, however, unresolved questions regarding the integrity of DOE's scientific conclusions and procedures for investigating Yucca Mountain. Moving forward with a site recommendation prematurely would threaten Nevadans and would create a hazard for the residents of the 43 states through which the waste will be transported.

As you know, several independent review boards have raised questions about the DOE's investigation of the proposed repository. For example, in your letter of October 16, 2001 to Mr. Lake Barrett, Acting Director of DOE's Office of Civilian Radioactive Waste Management you stated:

"[The Board] believes there are significant problems associated with the technical basis for DOE's base-case repository design, which is a high-temperature design...[T]he Board recommended that the DOE undertake a comparison of the higher- and lower-temperature designs. This comparison does not appear to have been completed."

In addition, the Nuclear Regulatory Commission's Advisory Committee on Nuclear Waste (ACNW) raised concerns about the computer simulation used by the DOE to determine the suitability of the repository. In a September 21, 2001 letter to NRC Chairman Meserve, the ACNW stated:

"The [DOE computer simulation (TSPA-SR)] does not lead to a realistic risk-informed result, and it does not inspire confidence in the TSPA-SR process. In particular, the TSPA-SR reflects the input and results of models and assumptions that are not founded on a realistic assessment of the evidence."

To better understand these and other problems facing the site recommendation process, we would appreciate your responding to the following questions:

1. How strong is the current technical basis for DOE's repository design and for the analysis that support the site recommendation?
2. How confident are you that the current DOE program would lead to a safe repository that protects human health and the environment at Yucca Mountain?
3. Is it premature for the DOE to make a recommendation that the site is suitable for a geologic repository?

Your response to these questions will help us better identify the problems facing the Yucca Mountain program. Without clear resolution to these problems, the public will lack confidence that a sound scientific process has been followed and that their health and safety have been adequately considered. If you have any questions about our concerns, please contact us.

We appreciate your consideration of our request and look forward to hearing from you.

Sincerely,



HARRY REID  
U.S. Senator



JOHN ENSIGN  
U.S. Senator

Cc: William D. Barnard

HR:jh



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

December 17, 2001

The Honorable Harry Reid  
528 SHOB  
Washington, DC 20510-2803

Dear Senator Reid:

Thank you very much for the letter sent by you and Senator John Ensign dated November 26, 2001. Your letter raises several important questions related to the Department of Energy's (DOE) Yucca Mountain site investigation.

As part of its ongoing review of the DOE's site-characterization activities, the Board is evaluating the technical and scientific validity of work that will form the technical basis for a decision by the Secretary of Energy on whether to recommend the Yucca Mountain site for repository development. I have enclosed a copy of a letter sent to Secretary Spencer Abraham indicating that the Board anticipates conveying to him and to Congress the results of the Board's review in the next few weeks. To ensure that all pertinent information is considered in our response, we would like to respond to your letter at the same time.

The Board very much appreciates your continued interest in its ongoing independent technical and scientific review of the Yucca Mountain program. If you have questions, please contact me or have your staff contact William Barnard, the Board's Executive Director.

Sincerely,

{Signed by}

Jared L. Cohon  
Chairman

Enclosure



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

December 17, 2001

The Honorable John Ensign  
364 SROB  
Washington, DC 20510-2805

Dear Senator Ensign:

Thank you very much for the letter sent by you and Senator Harry Reid dated November 26, 2001. Your letter raises several important questions related to the Department of Energy's (DOE) Yucca Mountain site investigation.

As part of its ongoing review of the DOE's site-characterization activities, the Board is evaluating the technical and scientific validity of work that will form the technical basis for a decision by the Secretary of Energy on whether to recommend the Yucca Mountain site for repository development. I have enclosed a copy of a letter sent to Secretary Spencer Abraham indicating that the Board anticipates conveying to him and to Congress the results of the Board's review in the next few weeks. To ensure that all pertinent information is considered in our response, we would like to respond to your letter at the same time.

The Board very much appreciates your continued interest in its ongoing independent technical and scientific review of the Yucca Mountain program. If you have questions, please contact me or have your staff contact William Barnard, the Board's Executive Director.

Sincerely,

{Signed by}

Jared L. Cohon  
Chairman

Enclosure



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

January 24, 2002

Honorable Harry Reid  
United States Senate  
528 SHOB  
Washington, DC 20510-2893

Dear Senator Reid:

Enclosed are responses to the questions posed in letter of November 26, 2001 from you and Senator John Ensign. As you know, the Board provides independent advice on the technical issues associated with the management of the country's commercial spent nuclear fuel and defense high-level radioactive waste. The Board offers its technical views to help inform the larger consideration of issues that face the Department of Energy and Congress in their evaluation of the suitability of the Yucca Mountain candidate repository site.

The Board is keenly aware that many of the issues that must be considered in making decisions in this policy area are technical ones, but that other issues are not. We believe that Congress and the Secretary will find it useful to have our views on the technical and scientific information related to a possible site recommendation. As noted in our responses, policy-makers will decide how much technical certainty is acceptable for a site recommendation.

Please let me or the Board's staff know if we can provide you or your staff with additional information on the enclosed responses.

Sincerely,

{Signed by}

Jared L. Cohon  
Chairman

Enclosure

NUCLEAR WASTE TECHNICAL REVIEW BOARD  
RESPONSE TO QUESTIONS FROM  
SENATORS HARRY REID AND JOHN ENSIGN  
JANUARY 24, 2002

*1. How strong is the current technical basis for DOE's repository design and for the analysis that supports the site recommendation?*

In evaluating the DOE's technical and scientific work related to individual natural and engineered components of the proposed repository system, the Board finds varying degrees of strength and weakness. Such variability is not surprising, given that the Yucca Mountain project is in many respects a first-of-a-kind, complex undertaking. When the DOE's technical and scientific work is taken as a whole, the Board's view is that the technical basis for the DOE's repository performance estimates is weak to moderate at this time. As discussed in the Board's January 24, 2002 letter to Congress and the Secretary of Energy, the Board believes that it is possible to increase confidence in the DOE's projections of repository system performance.

The DOE's estimates of repository performance currently rely heavily on engineered components of the repository system, making corrosion of the waste package very important. High temperatures in the DOE's base-case repository design increase uncertainties and decrease confidence in the performance of waste package materials. Confidence in waste package and repository performance potentially could increase if the DOE adopts a low-temperature repository design. However, a full and objective comparison of high- and low-temperature repository designs should be completed before the DOE selects a final repository design concept.

The Board makes no judgment on the question of whether the Yucca Mountain site should be recommended or approved for repository development. Those judgments, which involve a number of public policy considerations as well as an assessment of how much technical certainty is necessary at various decision points, go beyond the Board's congressionally established mandate.

*2. How confident are you that the current DOE program would lead to a safe repository that protects human health and the environment at Yucca Mountain?*

At this point, no individual technical or scientific factor has been identified that would automatically eliminate Yucca Mountain from consideration as the site of a permanent repository. The Board believes, however, that specific activities can and should be pursued to increase confidence in the projections of performance of the proposed repository at Yucca Mountain. Those activities include identifying, quantifying, and communicating clearly the extent of the uncertainty associated with the DOE's performance estimates; comparing and evaluating a low-temperature repository design with the DOE's current base-case high-temperature design; increasing the fundamental understanding of the potential behavior of the proposed repository system; developing multiple lines of evidence; and strengthening arguments about defense-in-depth (or redundancy). The Board also believes that uncertainties related to the performance of waste package materials under high-temperature conditions should be addressed.

The Board's January 24, 2002 letter to Congress and the Secretary of Energy also contains suggestions about new initiatives that the DOE might undertake to increase confidence. Many factors, such as the DOE's ability to improve the integration of scientific and engineering activities, are likely to influence whether those activities can be successfully completed.

*3. Is it premature for the DOE to make a recommendation that the site is suitable for a geologic repository?*

The timing of a decision on whether the Yucca Mountain site should be recommended or approved for repository development is a judgment involving a number of public policy considerations as well as an assessment of how much technical certainty policy-makers believe is necessary at the time decisions are made. As stated in the answer to question 1, these judgments go beyond the Board's congressionally established mandate.





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

January 24, 2002

Honorable John Ensign  
United States Senate  
364 SROB  
Washington, DC 20510-2805

Dear Senator Ensign:

Enclosed are responses to the questions posed in letter of November 26, 2001 from you and Senator Harry Reid. As you know, the Board provides independent advice on the technical issues associated with the management of the country's commercial spent nuclear fuel and defense high-level radioactive waste. The Board offers its technical views to help inform the larger consideration of issues that face the Department of Energy and Congress in their evaluation of the suitability of the Yucca Mountain candidate repository site.

The Board is keenly aware that many of the issues that must be considered in making decisions in this policy area are technical ones but that other issues are not. We believe that Congress and the Secretary will find it useful to have our views on the technical and scientific information related to a possible site recommendation. As noted in our responses, policy-makers will decide how much technical certainty is acceptable for a site recommendation.

Please let me or the Board's staff know if we can provide you or your staff with additional information on the enclosed responses.

Sincerely,

{signed by}

Jared L. Cohon  
Chairman

Enclosure

NUCLEAR WASTE TECHNICAL REVIEW BOARD  
RESPONSE TO QUESTIONS FROM  
SENATORS HARRY REID AND JOHN ENSIGN  
JANUARY 24, 2002

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*3. Is it premature for the DOE to make a recommendation that the site is suitable for a geologic repository?*

The timing of a decision on whether the Yucca Mountain site should be recommended or approved for repository development is a judgment involving a number of public policy considerations as well as an assessment of how much technical certainty policy-makers believe is necessary at the time decisions are made. As stated in the answer to question 1, these judgments go beyond the Board's congressionally established mandate.

JOHN M. SHIMKUS  
20TH DISTRICT, ILLINOIS

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ENERGY AND AIR QUALITY  
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PROTECTION

BALTIC CAUCUS  
Co-Chairman

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**Congress of the United States**  
**House of Representatives**  
Washington, DC 20515-1320

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COLLINGSVILLE, IL 62234  
(618) 344-3066

221 EAST BROADWAY, SUITE  
CENTRALIA, IL 62801  
(618) 552-8676

December 5, 2001

The Honorable Jared L. Cohon  
Chair, U.S. Nuclear Waste Technical Review Board  
2300 Clarendon Boulevard, Suite 1300  
Arlington, VA 22201

Dear Dr. Cohon:

First, I would like to thank you for the work you have been doing in Nevada to discuss the status of Yucca Mountain site characterization over the last few months. I have had the pleasure of visiting Yucca Mountain in the past and have seen the research and the science that has gone into studying whether this site would be an appropriate nuclear waste repository or not. As you may be aware, I am from the State of Illinois, which is home to the most nuclear power plants in the nation. So this issue is a concern to many in my state.

Second, I have a question that I was hoping you, or your staff, could answer for me. Are you aware of any technical issues or concerns applicable to the site recommendation phase of the Yucca Mountain Project, that directly and negatively impact human health and safety, that could not be mitigated prior to the closure of the repository, which under the current design would occur 100-300 years after its opening?

I look forward to hearing the answer to this question. If should have any questions, please feel free to contact me, or my staff, at your convenience.

Sincerely,

  
John Shimkus  
Member of Congress



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

January 24, 2002

Honorable John Shimkus  
Committee on Energy and Commerce  
U.S. House of Representatives  
Rayburn House Office Building  
Washington, DC 20515-1320

Dear Mr. Shimkus:

Enclosed are responses to the questions posed in your letter of December 5, 2001. As you know, the Board provides independent advice on the technical issues associated with the management of the country's commercial spent nuclear fuel and defense high-level radioactive waste. The Board offers its technical views to help inform the larger consideration of issues that face the Department of Energy and Congress in their evaluation of the suitability of the Yucca Mountain candidate repository site.

The Board is keenly aware that many of the issues that must be considered in making decisions in this policy area are technical ones but that other issues are not. We believe that Congress and the Secretary will find it useful to have our views on the technical and scientific information related to a possible site recommendation. As noted in our responses, policy-makers will decide how much technical certainty is acceptable for a site recommendation.

Please let me or the Board's staff know if we can provide you or your staff with additional information on the enclosed responses.

Sincerely,

{signed by}

Jared L. Cohon  
Chairman

Enclosure

NUCLEAR WASTE TECHNICAL REVIEW BOARD  
RESPONSE TO QUESTIONS FROM  
REPRESENTATIVE JOHN SHIMKUS  
JANUARY 24, 2002

*Are you aware of any technical issues or concerns applicable to the site recommendation phase of the Yucca Mountain Project, that directly and negatively impact human health and safety, that could not be mitigated prior to the closure of the repository, which under current design, would occur 100-300 years after its opening?*

At this point, no individual technical or scientific factor has been identified that would automatically eliminate Yucca Mountain from consideration as the site of a permanent repository. However, the DOE uses a complex integrated performance assessment model to project repository system performance. Performance assessment is a useful tool because it assesses how well the repository system as a whole, not just the site or the engineered components, might perform. However, gaps in data and basic understanding cause important uncertainties in the concepts and assumptions on which the DOE's performance estimates are now based. Because of these uncertainties, the Board has limited confidence in current performance estimates generated by the DOE's performance assessment model. This is not an assessment of the Board's level of confidence in the Yucca Mountain site.

The Board believes that confidence in performance estimates can be increased. Future scientific investigations may show that components of the repository system perform better than or not as well as the DOE's performance assessment model now projects. It is impossible to know with absolute certainty whether issues or concerns that cannot be mitigated might arise in the future. This would be the case at any potential repository site.

**JOE BARTON**  
6TH DISTRICT, TEXAS

2284 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-4306  
(202) 226-2002

REPUBLICAN STEERING COMMITTEE  
REGIONAL REPRESENTATIVE



COMMITTEE ON  
ENERGY AND COMMERCE  
SUBCOMMITTEES:  
CHAIRMAN, ENERGY AND AIR QUALITY  
TELECOMMUNICATIONS AND THE INTERNET  
HEALTH

COMMITTEE ON SCIENCE  
SUBCOMMITTEE:  
SPACE AND AERONAUTICS

**Congress of the United States**  
**House of Representatives**  
Washington, DC 20515-4306

December 11, 2001

DEC 18 2001

The Honorable Jared L. Cohon, Ph.D.  
Chairman  
United States Nuclear Waste Technical Review Board  
2300 Clarendon Boulevard  
Suite 1300  
Arlington, Virginia 22201

Dear Dr. Cohon:

As you know, the safe and permanent disposal of high-level nuclear waste is a matter of significant importance for all the citizens of this nation. We noted with great interest the letter you recently received from two of our colleagues in the Senate, Harry Reid and John Ensign of Nevada, asking for the Board's views on certain aspects of the expected Yucca Mountain repository site recommendation decision. The House Energy and Air Quality Subcommittee is also significantly interested in the scientific basis for this decision. We are writing to join Senator's Reid and Ensign in enquiring about the Board's scientific views.

Most of us in Congress have been greatly encouraged by the scientific progress made by the Department of Energy in recent years. We understand that DOE's scientific results have been subject to a significant amount of review by both the public and scientific organizations such as the Board. The preponderance of the scientific information appears to indicate that the proposed repository site is or can be suitable for the protection of public health and safety. A peer review panel of the International Atomic Energy Agency, requested by DOE in consultation with the Board, recently concluded that DOE's approach is "soundly based and has been implemented in a competent manner" and that this approach "provides an adequate basis for supporting a statement on likely compliance within the regulatory period of 10,000 years and, accordingly, for the site recommendation decision."

However, since the Board has raised a number of concerns about DOE's repository development efforts at Yucca Mountain, we would like to join our colleagues from Nevada and, to gain a greater sense of perspective regarding the Board's concerns, ask for the Board's views on two additional questions:

ARLINGTON OFFICE:  
806 WASHINGTON DRIVE, SUITE F  
ARLINGTON, TX 76011

ENNIS OFFICE:  
303 WEST KNOX, SUITE 201  
ENNIS, TX 75119-3942  
817-543-1000 (main number for all offices)  
Homepage: <http://www.house.gov/barton/welcome.html>

FORT WORTH OFFICE:  
4521 SOUTH HULEN STREET,  
SUITE 210  
FORT WORTH, TX 76109

1. Does the Board have any reason to believe that the site currently being studied at Yucca Mountain could not be made suitable for the development of a repository? If so, please explain any such reason(s).
2. What improvements can DOE make in its research and design that would improve the effectiveness of a repository at that location? In keeping with the "step-wise repository development" approach recommended by the National Academy of Sciences, how can such improvements best be phased into the evolving repository design?

In asking these questions we would like to emphasize the importance that the Board's rigorous scientific review plays in this process. DOE's scientific program has been greatly strengthened by the Board's inquiry. If a decision is made to move to the next step in the repository development process at Yucca Mountain, consideration of a NRC license to construct and operate a repository, we expect that the Board will continue to provide an active, highly informed, and politically unbiased review.

We appreciate your consideration of this request and look forward to hearing from you.

Sincerely,



Joe Barton  
Member of Congress

JB:sw

c: The Honorable Spencer Abraham  
The Honorable Richard Meserve





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

January 24, 2002

Honorable Joe Barton  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Room 2125, Rayburn House Office Building  
Washington, DC 20515-6115

Dear Mr. Barton:

Enclosed are responses to the questions posed in your letter of December 11, 2001. As you know, the Board provides independent advice on the technical issues associated with the management of the country's commercial spent nuclear fuel and defense high-level radioactive waste. The Board offers its technical views to help inform the larger consideration of issues that face the Department of Energy and Congress in their evaluation of the suitability of the Yucca Mountain candidate repository site.

The Board is keenly aware that many of the issues that must be considered in making decisions in this policy area are technical ones but other issues are not. We believe that Congress and the Secretary will find it useful to have our views on the technical and scientific information related to a possible site recommendation. As noted in our responses, policy-makers will decide how much technical certainty is acceptable for a site recommendation.

Please let me or the Board's staff know if we can provide you or your staff with additional information on the enclosed responses.

Sincerely,

{Signed by}

Jared L. Cohon  
Chairman

Enclosure

NUCLEAR WASTE TECHNICAL REVIEW BOARD  
RESPONSE TO QUESTIONS FROM  
REPRESENTATIVE JOE BARTON  
JANUARY 24, 2002

*1. Does the Board have any reason to believe that the site currently being studied at Yucca Mountain could not be made suitable for the development of a repository? If so, please explain any such reason(s)?*

At this point, no individual technical or scientific factor has been identified that would automatically eliminate Yucca Mountain from consideration as the site of a permanent repository. However, the DOE uses a complex integrated performance assessment model to project repository system performance. Performance assessment is a useful tool because it assesses how well the repository system as a whole, not just the site or the engineered components, might perform. However, gaps in data and basic understanding cause important uncertainties in the concepts and assumptions on which the DOE's performance estimates are now based. Because of these uncertainties, the Board has limited confidence in current performance estimates generated by the DOE's performance assessment model. This is not an assessment of the Board's level of confidence in the Yucca Mountain site.

The Board believes that confidence in performance estimates can be increased. Future scientific investigations may show that components of the repository system perform better than or not as well as the DOE's performance assessment model now projects. It is impossible to know with absolute certainty whether issues or concerns that cannot be mitigated might arise in the future. This would be the case at any potential repository site.

*2. What improvements can DOE make in its research and design that would improve the effectiveness of a repository at that location? In keeping with the "step-wise repository development" approach recommended by the National Academy of Sciences, how can such improvements best be phased into the evolving repository design?*

If policy-makers decide to approve the Yucca Mountain site, the Board strongly recommends that in addition to demonstrating regulatory compliance, the DOE continue a vigorous well-integrated scientific investigation to increase its fundamental understanding of the potential behavior of the repository system. The Board believes, in addition, that specific activities can and should be pursued to increase confidence in the projections of performance of the proposed repository at Yucca Mountain. Those activities include systematically integrating new data and analyses produced by ongoing scientific and engineering investigations; identifying, quantifying, and communicating clearly the extent of the uncertainty associated with its performance estimates; comparing and evaluating a low-temperature repository design with the DOE's current base-case high-temperature design; increasing the fundamental understanding of the potential behavior of the proposed repository system; developing multiple lines of evidence; and strengthening arguments about defense-in-depth (or redundancy). The Board also believes that uncertainties related to the performance of waste package materials under high-temperature conditions should be addressed.

The Board has not evaluated the implications of a “step wise” approach to repository development. However, in its January 24, 2002 letter to Congress and the Secretary of Energy, the Board suggests several new actions that should be considered if policy-makers approve the Yucca Mountain site, regardless of the development approach used. The actions include monitoring repository performance before, during, and after waste emplacement; developing a strategy for modifying or stopping repository development if potentially significant unforeseen circumstances are encountered; and continuing external review of the DOE’s technical and scientific activities. The Board notes that the National Academy of Sciences (NAS) is scheduled soon to release a preliminary report describing the advantages and disadvantages of applying a step wise approach specifically to the development of a repository at Yucca Mountain. As part of its ongoing evaluation, the Board will review the technical and scientific validity of any plans that the DOE adopts in response to the NAS report.