



NUCLEAR WASTE PROJECT OFFICE

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Mr. Allen Benson  
Siting Division  
Office of Geologic Repositories  
Department of Energy  
Washington, D.C. 20585

Dear Mr. Benson:

We received and reviewed the draft minutes of the Nevada EA Comment Clarification meeting transmitted on July 31, 1985. While the draft minutes are substantially complete, we have revised the draft minutes to more accurately reflect the meeting discussion.

We have taken the liberty of retyping your draft minutes, with our revisions underlined. The revised minutes are enclosed for your consideration. A copy of your transmitted draft minutes are enclosed for comparison purposes.

Should you have any questions concerning our revisions, please do not hesitate to call.

Sincerely,

*Robert R. Loyd*  
Robert R. Loyd  
Director

Enclosure  
cc: Donald Vieth DOE/NV

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SUMMARY OF THE DEPARTMENT OF ENERGY (DOE)  
MEETING WITH THE STATE OF NEVADA  
TO CLARIFY COMMENTS ON THE  
DRAFT ENVIRONMENTAL ASSESSMENT (EA)  
FOR THE YUCCA MOUNTAIN SITE

AUGUST 19, 1985

CARSON CITY, NEVADA

Barry Gale (DOE/HQ) opened the session with introductory remarks. The purpose of the meeting was to clarify the State's comments on the draft EA, not to enter into technical debate on the issues raised by the comments. He pointed out that meeting minutes were being taken to become part of the official comment record. He also informed the State of DOE's commitment to participate in any future meetings or activities that Governor Richard Bryan or the Nevada Nuclear Waste Project Office feels necessary. Nevada indicated, for the record, that no further comments on the draft EA will be submitted and they felt the clarification of issues could be satisfied in this meeting. A list of attendees is attached.

Max Blanchard (DOE NV/WMPO) gave a brief explanation of the comment-response process and the strategy for presenting responses. He explained how the clarifying questions had been developed for the session and commended Nevada for a well organized, comprehensive EA comment submittal. He briefly

indicated that the following items would be considered in preparing the Comment Response Appendix (CRA) and revised EA: impacts on Caliente; defense high-level waste; an MRS scenario; two-phase repository design; socioeconomic impacts of outlying areas; and transportation assessments in Appendix A.

Clarifying questions were submitted to the State from DOE primarily for the acquisition of additional information. DOE requested copies of references quoted by the State in their comment package. Nevada provided DOE with one reference during the meeting and agreed to provide copies of others at a later date. Specific technical questions on comments would be handled with the appropriate State agencies.

The meeting minutes represent questions on State comments requiring clarification. Each question contains a parenthetical reference indicating its location in the State comment package. Some questions refer to a comment raised in several locations. State indicated record should show that since State received clarifying questions just prior to meeting, all verbal responses should be considered preliminary. State will provide written responses to all clarifying questions at a later date.

Nevada State Comments Clarification Meeting

1. Question: What is the basis for claiming that J-13 water does not appear chemically similar to other ground water at Yucca Mountain? (II-115)

Answer: Desert Research Institute (DRI) suggested to the State that DOE compare the Heiken, 1982 Summary Report on Geochemistry of Yucca Mountain and Environs, reference to the Thordarson, 1983 Geohydrologic Data and Test Results from Well J-13, Nevada Test Site, Nye County, Nevada. These reports show important differences in cation concentrations for ground water in the Yucca Mountain area. The significance of these differences, according to the State, is that these differences may impact conclusions in the draft EA with regard to sorptive capabilities of the clays and zeolites beneath the repository zone.

2. Question: Can the State offer published references other than those DOE cited in the draft EA, on recurrence rates from microseismicity data in the Basin and Range? (II-124, first page).

Answer: The State will send DOE, NV/WMPO the list of references. All data has been published and is available.

3. Question: Can the State offer published references other than those DOE cited in the draft EA, in regard to Yucca Mountain being located within an east-west seismic belt in Southern Nevada? (II-122, second paragraph).

Answer: The State suggested DOE review A. Rogers, 1981, in addition to the Smith reference cited on page 3-20 of the draft EA. Rogers has a table on historical earthquakes. Additionally, the State contended there was no justification for the east-west seismic belt boundary shown in the draft EA and the DOE should consider the entire zone of seismicity to be within the east-west seismic belt. This would be a conservative approach.

4. Question: What does the State expect to be defined in a memorandum of understanding or a memorandum of agreement with the State Historic Preservation Officer? (Park II-Department of Conservation and Natural Resources (DCNR) page 12).

Answer: The State Historic Preservation Officer (SHPO) is concerned the DOE will take a salvage approach to historic preservation versus conducting a program which encourages preservation. The DOE agreed to meet with and discuss the SHPO's proposal for an investigation/mitigation plan. The

plan would reveal goals and associated research questions which need to be addressed in the proposed program. The DOE indicated that all preconstruction surveys currently comply with SHPO requirements and are documented by archaeologists. The DOE stated it would encourage preservation of resources, as required by law. The meeting between SHPO and DOE should be coordinated with the State Nuclear Waste Project Office.

5. Question: In reference to the discussion of the upward movement of water vapor, the DOE asked (1) where are the described studies at the University of Arizona; and (2) what is Ross (1984), it is not mentioned in the reference list (I-31).

Answer: (1) University of Arizona has a research contract with the NRC to study the effects of drilling in crystalline rocks, to look at the unsaturated zone models in fractured crystalline rocks, and to observe natural analogs. The University has developed a list of technical reports under their NRC contract. The State forwarded to DOE the name of the NRC officer who has contract responsibility for the University's efforts in this research. The NRC officer is the best source for a complete list of references. (2) The B. Ross, 1984 reference was given to DOE by the State.

6. Question: The State contends that "by using only average

values in addressing potential transportation impacts, DOE effectively underestimates potential risks associated with waste shipments." The DOE believes that conservation was applied to the average values such that the resulting costs and risks were overestimated. Can the State provide specific evidence for transportation risks being underestimated (I-17)?

Answer: The issue of using either peak or average shipment risks was deferred for DOE to resolve in the CRA and final EA. The state suggested the following approaches be employed: (1) use of realistic versus idealistic data; (2) inclusion of a range of values and parameters using route-specific risks; (3) identification of a worst-case scenario reflecting high, low, and medium range risk values; and (4) use of a more conservative approach to bounding risks. The State's position was that a route-specific risk analysis should be included in the final EA and that each parameter contributing to a "worse-case" scenario should be analyzed individually and in combination with other parameters to bound the potential risk.

7. Question: The State contends that data used in the transportation analysis is not adequate to assess the regional and local effects of the transport of high-level radioactive waste (HLW) to a repository at Yucca Mountain.

The DOE needs State-designated routes for transport of HLW in order to do a realistic regional analysis. Can the State supply these routes? (II-17)

Answer: The State indicated that State-designated routes were unnecessary for analysis purposes since so few reasonable routes were available in Nevada. The State contended that a route-specific analysis was "absolutely required" by Section 112 of the NWPA. The State indicated that DOE should perform risk assessments for each possible route into and through Nevada.

8. Question: The State notes that the DOE makes no attempt to project long-range land/water needs (i.e., 100, 500, or 1,000 years or more). Is the State aware of any studies that project land/water needs 100 or more years into the future?

Answer: The Las Vegas Valley Water District and City of Las Vegas have studies which include water use projections for Las Vegas possibly beyond 100 years. The State agreed that studies projecting water use for Armagosa Farms would be difficult to obtain. The State emphasized the overriding concern was for long-range water requirements of the Las Vegas Valley. Water transport from other areas and deep carbonate aquifer development were cited as examples of the

type of studies conducted in the past or planned in the future which may provide information on long-range water requirements. DRI and the State Engineer were suggested as additional sources of such studies and information.

9. Question: Comments on rural social organization and structure stated that Native Americans tend not to be evenly distributed throughout the area. Rather, they reside in somewhat segregated subcommunities. What data are available to substantiate this observation (II-43)?

Answer: The State acknowledged the difficulty of accessing Native American statistics. Pockets of affected Indian tribes exist even though existing census data may not reveal their existence. The State wants DOE to identify Nevada's socioeconomic composition at this pocket level to provide a basis for discussions in Chapter 6 of the EA's. The State contended that enough data is available from county sources to enable DOE to include a more complete and adequate discussion of county- and locale-specific rural social organization and structure.

The DOE understands the criticality of assuring accurate

information and explained that an extensive study of potential impacts of immigrants on local Native American reservations will occur during the time that site characterization activities are conducted.

10. Question: State comments suggest that Native Americans living on reservations should be discussed. Does the State have evidence to suggest that Native Americans living on the Moapa or Duckwater reservations may be affected by a repository at Yucca Mountain (II-43)?

Answer: The State indicated that observance of a Nevada transportation map indicates that major railroad and highway routes run through reservations, specifically the Moapa and Duckwater reservations. The State requested a discussion of expected impacts on the Moapa and Duckwater reservations.

11. Question: The State indicates plans for the establishment of Bighorn Sheep in the Spotted Range. Please provide references indicating such plans (II-63).

Answer: The State suggested DOE contact the State Wildlife Office or the Fish and Wildlife Service (FWS). DOE contended contact was established with the FWS but no plans were found; therefore, none were forwarded to DOE. The DOE stated that because there will be no fence, there are no

impacts expected on the Bighorn Sheep. The State further contended that according to State Department of Wildlife comments on the draft EA, the State and FWS are developing plans for establishing Bighorn Sheep in the Spotted Range.

DOE assumes the plans to either be conceptual or draft and therefore the issue remains open. The DOE stated that if the FWS can forward any plans, DOE will meet to discuss the contents.

12. Question: The State indicates that efforts at NTS to prohibit unauthorized excavation or collection of archeological sites have not been successful. Can evidence of this be provided? (II-51 and DCNR section, pages 10 and 11).

Answer: The State provided no evidence of unauthorized excavations or collection of artifacts at archeological sites but indicated they would consult with SHPO to provide such evidence. DOE requested this information so that it may be addressed not only at Yucca Mountain but also at the NTS.

13. Question: The State cited the following references. Can DOE get complete citations for the following:  
Jacobson, 1982, cited on page I-29;

Ross, 1984, cited on page I31;

Slemmons, 1984, cited on page II-130?

Answer: The State handed to DOE the Ross, 1984, reference during the meeting. The State agreed to forward the Slemmons, 1984, and Jacobson, 1982, references to DOE at a later date.

14. Question: How would a large earthquake beneath Yucca Mountain influence flux in the unsaturated zone as suggested in this paragraph? (II-122, second potentially adverse condition, Historical Earthquakes).

Answer: The State will send specific failure regimes to DOE. The State suggested DOE also look at the DRI and NBMG comment packages for clarification. The processes or failure regimes will be needed by DOE for compliance with the 10 CFR Part 60, unanticipated events.

15. Question: Can the State offer published references on the Mammoth Lakes earthquake swarms that might be useful to interpretations at Yucca Mountain (II-122)?

Answer: The State claimed similarities in tectonic characteristics of Mammoth Lake and Yucca Mountain to the extent that these areas may have similar or analogous

earthquake potential. The USGS and University of Nevada, Reno (UNR) were suggested as sources of possible references which should be considered. The State agreed to provide a list of references to DOE.

16. Question: On what basis does the State suggest that an acceleration of 1.0 g at the surface facility site could result from an earthquake on the Solitario Canyon fault? (II-130, Tectonic favorable condition).

Answer: It was suggested DOE refer to John Bell's comments to locate the reference. Bell contends that ground acceleration in the Great Basin could be larger than that estimated by the standard fault length vs. magnitude method based upon data outside the Great Basin. Great Basin fault length vs. magnitude relationships show greater accelerations than would typically be experienced elsewhere.

17. Question: Given the NRC implicit approach to appropriate recurrence intervals for seismic design criteria for reactors (1,000 to 10,000 years), what recurrence interval would the State reviewers consider acceptable for repositories (II-140)?

Answer: The NRC defines capable faults using 10 CFR Part 100, Appendix A. The DOE said that 1,000 to 10,000 years is

valid only if 10 CFR 100, Appendix A is transferred by NRC to a repository. Both the State and DOE agreed the issue remains unresolved with the NRC. The DOE recognized active faults and appropriate seismic design criteria will be a debated subject.

18. Question: What evidence does the State have that "there seem to be wide fluctuations in chemical composition with time from single wells" at Yucca Mountain (II-132)?

Answer: The State contended that evaluation of well data by DRI indicated there were both random and systematic variations in cation and anion species present in J-13 water, analyzed as a function of time. The State suggested DOE review DRI's package of the comments for their analysis.

19. Question: What is the basis for concern about felsitic eruptions in the area when there has been no silicic activity in southern basin and range for the past 5-6 my? (IV-Schilling's letter to Loux, point (2).)

Answer: The State suggested the Bureau of Mines may have some studies available. The State felt young volcanic eruptions important, especially in the geologically-active Great Basin. The State will contact John Schilling specifically for any references, then forward those to DOE.

20. Question: What "deep circulating springs" close to Yucca Mountain does the State think should be examined, and how would the State suggest examination be done? (Schilling's letter, item 4).

Answer: The State clarified the comment indicating DOE should examine springs to the north and west of Yucca Mountain, concentrating on the Crater Flat area and the Calico Hills. Purpose is to determine the origin of the waters, mainly as a tool to help define potential volcanic activity in the area. Examination of the springs should include review of the spring's characteristics (e.g., water temperature, chemical and isotope composition). The State indicated Crater Flat may be part of a larger volcanic field which may include Yucca Mountain, therefore, the potential of a volcanic hazard is a concern.

The DOE referred the State to a map on page 3-25 of the EA which showed only one spring, and that was not near Yucca Mountain. This spring was a low temperature spring. The State suggested DOE combine their (DOE) referenced investigations with Schilling's information (to be provided by the State) on hot springs (see page 11 of letter to Loux).

21. Question: What is the State's rationale for thinking that Appendix A be applied to a nuclear waste repository,

especially considering that the unofficial NRC position is that new criteria will be developed for repositories?

(Bell's comment, Appendix A, 10 CFR Part 100).

Answer: The concept of capable faulting and seismic design criteria has not been ironed out for repositories. Since Appendix A, 10 CFR Part 100 addressed capable faults for nuclear reactors, the State contended that DOE include in the revised EA an evaluation of repository surface facilities to Appendix A. The State said it is a perception of Bell's that Appendix A is applicable (especially in the absence of other criteria) although the DOE noted Appendix A is not mentioned in 10 CFR Part 60. The State suggested DOE attempt to prove compliance with Appendix A as a conservative approach.

22. Question: How did the State arrive at the recommended scenario of "an earthquake with 3-m displacement could occur at the repository in the next 10,000 years"? (Bell, page 19, item 1).

Answer: The State described this as a conceptual scenario based on a conservative approach to regional tectonics. The State suggested DOE focus on the larger events in the Great Basins, such as Cedar Mountain, where earthquakes have approached a magnitude seven. If such large events were

extrapolated to Yucca Mountain, an earthquake could result in a 3-meter displacement. The State will check with Bell to further clarify the comment.

23. Question: Given that the Implementation Guidelines explain how the Technical Guidelines are to be used, on what basis does the State justify the position that the isolation period for tectonic processes be extended to 100,000 years, particularly considering that the EPA criteria for releases to the accessible environmental apply through 10,000 years (Bell's comment, page 19, item 5).

Answer: The State indicated that 10 CFR Part 960 Section 4-2-1 considers hydrologic processes which might affect the repository during the next 100,000 years. Bell contends that tectonic processes should also be considered for the 100,000 year period. The State recalled that either the first or second issuance drafts of EPA's 40 CFR Part 191 also considered 100,000 years for release limited to the assessable environment. The State will meet with Bell to clarify the comment and will forward clarification to DOE.