MAY 1 1 1988

Mr. Ralph Stein, Acting Associate Director Office of Systems Integration and Regulations Office of Civilian Radioactive Waste Management U.S. Department of Energy RW-24 Washington, D.C. 20545

Dear Mr. Stein:

The Nuclear Regulatory Commission (NRC) staff has completed its technical review of the Consultation Draft Site Characterization Plan (CDSCP) for the Yucca Mountain Nevada Site issued by the Department of Energy (DOE). My March 7, 1988 letter to DOE transmitted draft point papers containing our preliminary concerns, which were the focus of NRC-DOE workshops in March and April. The point papers have been finalized, with no significant changes, and are presented (Enclosure 1) for DOE's continued consideration in the development of the Site Characterization Plan (SCP). It is important to note that although we endeavored to identify our most significant concerns within the time available for this review, our continuing interactions with DOE and our review of the SCP may result in identification of additional concerns.

The NRC's most fundamental technical concern with the CDSCP remains the objection (Objection 1 in Enclosure 1) related to the failure to recognize the range of alternative conceptual models of the Yucca Mountain site that can be supported by the existing limited data base and that need to be considered in the development of testing programs. This concern was the subject of the April 11-14, 1988 workshop on alternative conceptual models during which the NRC, DOE, and State of Nevada participated in an open and useful exchange of technical information and views on considering a full range of alternative conceptual models of present and future states of the proposed repository site and anticipated and unanticipated processes and events in identifying needed investigations. The NRC staff recommended that the DOE provide in the SCP a systematic treatment of alternative conceptual models, integrated across technical disciplines, and suggested ways in which such information might be effectively presented in the SCP. The NRC staff review of the SCP will determine to what extent these concerns have been addressed.

Another fundamental concern (Objection 5) is that the quality assurance (QA) plans for site characterization activities are undergoing potentially significant revisions, have been the subject of NRC comments unaddressed by DOE to date, or have not undergone NRC staff review. During the March 21-24 Draft Point Papers workshop, the DOE made the following commitments: (1) DOE will not start new work in an area until the NRC has reviewed the QA plan for that program area and confirmed its implementation through audits; (2) the Nevada Project Office QA plan was to be submitted within two to three weeks of that workshop; and (3) DOE will meet with NRC in May to discuss all open items

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previously identified and to provide a schedule for formal submittal to NRC of DOE contractor QA plans. These commitments are the necessary first steps toward resolution of the fundamental NRC QA concern. Hence, it is important for DOE to provide the Nevada Project Office QA plan as soon as possible and set a firm date for the May meeting on QA open items.

In addition to this fundamental QA concern, there are a number of QA comments (Comments 104-108) in the enclosure which express the NRC staff's lack of confidence that various facets of the DOE QA program are adequate and in accordance with 10 CFR Part 60. These comments need to be resolved by DOE in a timely manner to avoid having the reliability and accuracy of data collected during site characterization subject to challenge during NRC's licensing review.

The three additional objections (Objections 2,3, and 4) identified by the NRC staff involve the exploratory shaft facility (ESF). First, the CDSCP does not include the conceptual design information on the proposed ESF needed to allow evaluation of the potential interference of proposed investigations with each other or the interference of construction operations in the two shafts and drifts with these investigations (Objection 3). The second ESF-related objection (Objection 4) is that the CDSCP does not adequately consider the potentially adverse impacts that could result from the proposed locations of the exploratory shafts (and other shafts and ramp portals) in areas that may be subject to erosion and flooding. Adverse impacts could include (a) potentially significant and unmitigable effects on the waste isolation capability of the site and (b) affecting the ability to adequately characterize the site. The third ESF-related objection (Objection 2) is that the proposed shaft (ES-1) penetration into the Calico Hills unit and the proposed horizontal drifting through it may have significant negative impacts on the waste isolation capability of the site. The Calico Hills unit is an important barrier between the repository horizon level and the groundwater table, and DOE has not evaluated whether the activities proposed may irreparably damage its ability to function as a barrier.

Among the NRC staff's other concerns are three comments which are especially significant in that they address DOE positions that are inconsistent with requirements in 10 CFR Part 60. These positions may result in DOE not having information needed at the time of license application submittal to adequately demonstrate compliance of the natural and engineered barriers with regulatory requirements. The first concern (Comment 3) is that the CDSCP's interpretation of the term "substantially complete containment" and the design objectives for performance of the waste package and for radionuclide release from the engineered barrier system are inconsistent with 10 CFR 60.113 and hence inappropriate to guide the waste package testing and design program. The second such concern (Comment 64) involves the statement in the CDSCP that in situ testing to evaluate seal components and placement methods would not start until after the submission of the license application. That position will result in a lack of sufficient data for evaluating the license application.

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The third concern (Comment 103) is that there is a lack of sufficient information in the CDSCP about the performance confirmation program. 10 CFR 60.140 requires that the performance confirmation program be started during site characterization.

In addition to these inconsistencies with NRC requirements, there are several comments (Comments 36, 90, 92, and others) on inconsistencies relative to the EPA standard. Although the standard was vacated by the U.S. Court of Appeals for the First Circuit in July 1987, and the NRC recognizes that it is not currently in effect, it is our understanding that DOE prepared the CDSCP based on the vacated standard. While NRC considers this approach to be reasonable, it has noted several instances involving departures from the standard that need to be reexamined by DOE.

Another concern that is reflected in a number of comments (Comments 22, 46, 67, 71, and others) relates to a lack of conservatism in assumptions upon which various investigations are based. The NRC staff has previously expressed its concern over a lack of conservatism in the draft and final Environmental Assessments. The staff's review of the CDSCP indicates that while there has been progress in this area, DOE still needs to take further steps toward adopting conservatism in its program. It has been noted earlier herein that the staff objected to the CDSCP because a conservative treatment of uncertainties in the existing limited data was not provided for by considering a full range of alternative interpretations (alternative conceptual models) in the development of the site characterization program. In addition, it has also been noted earlier that the design objectives for waste package containment established to guide the waste package design and testing program were not conservative, and thus may not allow sufficient margin for meeting performance objectives in 10 CFR 60.113. Furthermore, numerous specific examples from the earth sciences investigations--e.g., slip rate determinations on faults (Comment 37); zone of investigation for fault identification for facilities important to safety (Comment 50); use of the ten thousand year cumulative slip earthquake (Comment 52)--indicate that this is a serious concern to the NRC staff with regard to investigations designed to gain a basic understanding of the site. It is important that DOE consider areas where introduction of a greater degree of conservatism is needed in site characterization activities.

Yet another concern that is a theme throughout the staff comments (Comments 26, 30, 47, and others) is that the site characterization program needs to be better integrated into a unified and focused effort towards obtaining the information needed to understand the site and evaluate its suitability for a repository. This integration of investigations needs to be across technical disciplines and also includes factoring performance assessment into the site characterization program to help direct site characterization activities, to identify important processes and parameters, and to assist in development and refining of conceptual models. One particular example of where integration seems to be lacking across technical disciplines is the site characterization drilling program, where the consideration of multiple tests in boreholes might

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reduce the number of holes and the corresponding potential for compromising the waste isolation capability of the site (Objection 1; Comment 27).

As emphasized in my March 7, 1988 letter, you are encouraged to give full attention to all the point papers, with a view to resolving the individual concerns prior to the start of new site characterization activities. Steps toward timely resolution of the concerns that have already been taken are the April 11-14, 1988 workshop on alternative conceptual models and the March 21-24, 1988 draft point papers workshop at which DOE indicated that they understood the NRC concerns and made commitments regarding the QA concern. Also, at an April 13, 1988 management meeting NRC proposed a number of interactions with DOE on some of the staff's other major concerns, e.g., exploratory shaft location and design; interpretation of "substantially complete containment" in 10 CFR Part 60.113. DOE agreed with the desirability of those interactions and committed to an early response on how many of them could be scheduled in the time available prior to release of the SCP. Furthermore, the staff is tentatively scheduled to meet with the DOE in June or July 1988 to discuss how the DOE plans to respond to the staff's CDSCP concerns. The SCP is where resolution of these concerns needs to be documented. As part of the acceptance review of the SCP, the NRC staff will determine if DOE has substantively responded to the NRC staff CDSCP concerns.

The NRC staff will continue to be available to consult with the DOE regarding the concerns highlighted in this letter and the enclosed package. Mr. Youngblood of my staff will work with you to make the necessary arrangements for any interactions that may assist in resolution of these concerns.

Sincerely,

Robert E. Browning, Director Division of High-Level Waste Management Office of Nuclear Material Safety and Safeguards

Enclosure: NRC Staff Final Point Papers on the CDSCP Yucca Mountain Site

| cc: | C. | Gertz, DOE-NV/WM | | | MPO |
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| | R. | Loux, | State | of | Nevada |

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investigations related to one discipline do not seem to be related to or coordinated with holes related to another discipline.

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cc: C. Gertz, DOE-NV/WMPO R. Loux, State of Nevada

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