RES SCP MEMO

2-1-89

MEMORANDUM FOR: Melvin Silberberg, Chief
Waste Management Branch
Division of Engineering
Office of Nuclear Regulatory Research

THRU: Ronald L. Ballard, Chief
Geosciences and Systems Performance Branch
Division of High-Level Waste Management
Office of Nuclear Material Safety and Safeguards

FROM: Donald L. Chery, Jr., Section Leader
Hydrologic Transport Section
Geosciences and Systems Performance Branch
Division of High-Level Waste Management
Office of Nuclear Material Safety and Safeguards

SUBJECT: REQUEST FOR COMMENTS ON THE YUCCA MOUNTAIN PROJECT SITE CHARACTERIZATION PLAN

Staff of the Hydrologic Transport Section are responsible for reviewing the geochemical, hydrological, climatological and meteorological portions of the Yucca Mountain Project (YMP) Site Characterization Plan (SCP) as identified on Tables 2, 3, and 4 of the NRC SCP Review Plan. As we discussed during a meeting with you on January 17, 1989, we request your staff's participation in developing comments in specific technical areas of the SCP. These areas include:

DOE PERFORMANCE ASSESSMENT PROGRAM

Preclosure Performance Assessment

There are four chapters in the SCP related to preclosure performance assessment wherein discussion of meteorological, climatological and hydrologic information needs is presented. We request technical comments on the adequacy of DOE's identification of information needs and strategy to assess preclosure performance with respect to meteorology, climatology and preclosure hydrology. Relevant chapters are: 1) Chapter 8.3.5.1 (Strategy for Preclosure Performance Assessment); 2) Chapter 8.3.5.3 (Public Safety from Normal Operations IRS); 3) Chapter 8.3.5.4 (Worker Radiological Safety IRS); and 4) Chapter 8.3.5.5 (Public Safety from Credible Accidents IRS).

General review guidance for these SCP chapters is provided in Section 3.2.4.10 (Review Guide for Preclosure Analysis) of the NRC SCP Review Plan. Dr. Tin Mo (X20541) of the Hydrologic Transport Section is the individual responsible to work with your staff in direct preparation of any comments related to preclosure performance assessment.

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DOE SITE PROGRAM

1. Meteorology, Climatology and Preclosure Hydrology

There are three chapters in the "Site Program" portion of the SCP that deal with meteorology, climatology and preclosure hydrology. In general, these chapters define the site characterization program to obtain site information, related to meteorology, climatology and preclosure hydrology, needed to evaluate preclosure performance as previously delineated in the chapters on preclosure performance assessment. We request technical comments on the adequacy of DOE's site characterization program in obtaining the information needed to evaluate preclosure performance assessment with respect to meteorology, climatology and preclosure hydrology. Relevant chapters are: 1) Chapter 8.3.1.5 (Climate); 2) Chapter 8.3.1.12 (Meteorology); and 3) Chapter 8.3.1.16 (Preclosure Hydrology).

General review guidance for these SCP chapters is provided in Section 3.2.3 (Review Guide for Site Investigations and Design Activities) of the NRC SCP Review Plan. Again, Dr. Tin Mo is the individual responsible to work with your staff with respect to review of DOE's meteorology, climatology and preclosure hydrology site programs as related to preclosure performance assessment.

2. Geochemistry

There is one chapter in the "Site Program" portion of the SCP that deals with geochemistry (Chapter 8.3.1.3; Geochemistry). The primary objective of this chapter is to define the geochemistry site characterization program used to obtain information needed to evaluate postclosure repository performance. Included in this chapter is a table (Table 8.3.1.3-2) outlining the current representation and alternative hypotheses for geochemical model(s) for the site geochemistry program. We request technical comments on the completeness of this table with respect to: 1) identification of the assumptions in DOE's current representation of geochemical models of the Yucca Mountain site; 2) identification of the uncertainty in those assumptions; and 3) identification of contradictory information or alternative hypotheses (interpretations) consistent with existing site data and evidence from field or laboratory tests. In addition, we request any comments your staff may have on the adequacy of the studies/activities outlined in this chapter that are to be used to gain information to defend identified assumptions and/or distinguish between alternatives. Existing site data on geochemistry is presented in Chapter 4 (Geochemistry) of the SCP.

General review guidance for Chapter 8.3.1.3 (in terms of the information provided in Table 8.3.1.3-2) is provided in Sections 3.2.4.4 (Review Guide for Modeling), 3.2.4.5 (Review Guide for Model Uncertainty) and 3.2.3 (Review Guide for Site Investigations and Design Activities) of the NRC SCP Review Plan. The general review criterion is that DOE should provide justification for neglecting any contradicting information or alternative interpretations or

else multiple conceptual models should be considered in assessing model uncertainty (for any models, not only geochemistry). In the NRC review of the CDSCP it was noted that the plan was inadequate in identifying basic assumptions as well as alternative assumptions, hypotheses or models. Table 8.3.1.3-2 was included in the SCP (as well as other tables for other technical areas such as geohydrology) to respond to that inadequacy. Thus, review of this table is important in assessing the adequacy of DOE's response to our CDSCP comment (NRC CDSCP Objection No. 1). Dr. John Bradbury (X20535) of the Hydrologic Transport Section is the individual responsible to work with your staff in direct preparation of any comments related to this aspect of geochemistry.

3. Geohydrology

There is one chapter in the "Site Program" portion of the SCP that deals with geohydrology (Chapter 8.3.1.2; Geohydrology). The primary objective of this chapter is to define the geohydrology site characterization program used to obtain information needed to evaluate postclosure repository performance. Included in this chapter are two tables (Table 8.3.1.2-2a and Table 8.3.1.2-2b) outlining the current representation and alternative hypotheses for unsaturated and saturated zone hydrologic system conceptual models for the geohydrology program. We request technical comments on the completeness of these tables with respect to: 1) identification of the assumptions in DOE's current representation of geohydrologic models of the Yucca Mountain site; 2) identification of the uncertainty in those assumptions; and 3) identification of contradictory information or alternative hypotheses (interpretations) consistent with existing site data and evidence from field or laboratory tests. In addition, we request any comments your staff may have on the adequacy of the studies/activities outlined in this chapter that are to be used to gain information to defend identified assumptions and/or distinguish between alternatives. Existing site data on geohydrology are presented in Chapter 3 (Geohydrology) of the SCP.

General review guidance for Chapter 8.3.1.2 (in terms of the information provided in Tables 8.3.1.2-2a and 8.3.1.2-2b) is provided in Sections 3.2.4.4 (Review Guide for Modeling), 3.2.4.5 (Review Guide for Model Uncertainty) and 3.2.3 (Review Guide for Site Investigations and Design Activities) of the NRC SCP Review Plan. The general review criterion is that DOE should provide justification for neglecting any contradicting information or alternative interpretations or else multiple conceptual models should be considered in assessing model uncertainty. The rationale for this review is identical to that described for the geochemistry site program in item number 2 above. The individuals responsible to work with your staff in direct preparation of any comments related to geohydrology are Mr. William Ford (unsaturated zone) and Mr. Neil Coleman (saturated zone). Their phone numbers are X20506 and X20530, respectively.

DOE WASTE PACKAGE PROGRAM

Waste Package Characteristics (Postclosure)

Chapter 8.3.4.2 (Waste Package Characteristics; Postclosure) of the SCP outlines DOE's strategy to show compliance with postclosure design criteria of 10 CFR 60.135 and provide information needed to assess overall repository performance. Characterizing the emplacement hole geochemical system and potential changes to that system from repository construction is an important aspect of establishing compliance. As part of this issue resolution strategy a design envelope for the waste package has been developed. Goals for characterization, design, or performance of each part of the design envelope are presented. Parts of the design envelope relate to geochemistry. These include: 1) The emplacement hole geochemical system that includes characterization goals for water chemistry (this is the degree to which the mean value of characterization parameters must be known; this is not a design constraint); and 2) alteration to the environment caused by non-waste package components that contains specific limits to alteration of water chemistry (with respect to water chemistry design goals for water which might come into contact with the waste package as identified in SCP Chapter 8.3.5.9; p. 13). We request technical comments on the reasonableness or achievability of 1) characterization goals for water chemistry; and 2) limits on alteration of water chemistry by repository construction materials.

General review guidance for Chapter 8.3.4.2 is provided in Section 3.3.25 (Review Guide for Waste Package Design) of the NRC SCP Review Plan. Dr. John Bradbury (X20535) of the Hydrologic Transport Section is the individual responsible to work with your staff in direct preparation of any comments related to this aspect of geochemistry.

GENERAL SECTION REVIEW PROCEDURES

We request that all comments (whether as objections, comments or questions as defined in the NRC SCP Review Plan) be provided in "point paper" format. The overall schedule for the Hydrologic Transport Section's review of the SCP calls for completing final drafts of point papers by March 31, 1989. To meet that schedule we request that initial drafts of point papers developed by your staff be provided to the responsible individuals identified in this memorandum by March 8, 1989. This will allow the review team to complete final drafts by the end of March. These responsible individuals will coordinate all review activities with Mr. Jeffrey Pohle (X20545), the lead reviewer responsible for integrating the overall Hydrologic Transport Section review of the SCP.

The Hydrologic Transport Section has a weekly meeting (10:00 AM on Thursdays; usually in conference room 5-B-13) to discuss overall progress on the SCP review and specific point papers being developed. These meetings should be attended by research staff participating in this request.

Please review the work described herein and let us know if your office can provide all or a portion of the requested support.

/s/

Donald L. Chery, Jr., Section Leader
Hydrologic Transport Section
Geosciences and Systems Performance Branch
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

cc: N. Stablein, RLPD

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OFC	HLGP*	HLGP*	HLGP*	HLGP*	HLGP	HLGP	HLGP*
NAME	JPohle/cj	TMo	JBradbury	WFord	DChery	RLBallard	NColeman
DATE	1/30/89	1/30/89	1/30/89	1/30/89	1/31/89	1/31/89	1/30/89

We appreciate your assistance in this review.

Donald L. Chery, Jr., Section Leader
Hydrologic Transport Section
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Division of High-Level Waste Management
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cc: N. Stablein, RLPD

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DATE	1/30/89	1/30/89	1/30/89	1/30/89	1/30/89	1/30/89	1/30/89

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