AUG 23 1988

LETTER FOR LINEHAN

MEMORANDUM FOR: John J. Linehan, Acting Chief
Operations Branch, HLWM

FROM: Ronald L. Ballard, Chief
Technical Review Branch, HLWM

SUBJECT: HLTR ASSISTANCE ON TECHNICAL POSITION: ANNOTATED OUTLINES

Of the annotated outlines to the 29 HLTR technical position submitted to you on August 16 and 17, 1988, regarding the above subject, we have made the following changes. As we discussed, 6 of the outlines are to be deleted, and 3 have been rewritten. Two new technical positions have been proposed by HLOB and are also enclosed. The following tabulation indicates the revisions made in Attachment A of my August 16, 1988 memo to you.

	Task Title	Changes and Additions
3	Design, Construction and Monitoring of ESF	Deleted
8	Substantially Complete Containment	Deleted
11	Pre-emplacement GWTT	Deleted
12	Information Needs for Developing an Adequate Description of the Groundwater Flow System	Deleted
13	Environment of EBS Package Reliability	Deleted
14	Radionuclide Transport	Rewritten
15	Chemical Interactions in Fractured Unsaturated Rock	Rewritten
16	Guidance for Determination of Anticipated Processes and Events and Unanticipated Processes and Events	Deleted
20	The Use of Tectonic Models Under 10CFR60	Rewritten
30	Application of Existing Reg Guides to Surface Design	New Addition
31	Application of Existing Reg Guides to Subsurface Design	New Addition

The last two technical positions (Nos. 30 and 31) have not been evaluated by HLTR, but are included for completeness.

/s/

Ronald L. Ballard, Chief
Technical Review Branch, HLWM

Enclosures:
As stated

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OFC	HLTR	HLTR	HLTR	HLTR			
NAME	TCardone/ll:	DBrooks	PJustus	RBallard			
DATE	8/23/88	8/23/88	8/23/88	8/23/88			

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PDR WASTE PDC
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TP TITLE: RADIONUCLIDE TRANSPORT

LEAD TECHNICAL CONTACT: John W. Bradbury

ADDITIONAL TECHNICAL CONTACTS:

1.0 Regulatory Evaluation

This TP will address aspects of 10 CFR Part 60 siting criteria 60.122(b) and 60.122(c), and performance objectives 60.112 and 60.113.

2.0 Summary of Guidance

This TP will provide guidance and criteria concerning the NRC regulartory requirements for consideration of alternative mechanisms on radionuclide transport from the repository to the accessible environment. This TP will discuss the significance of specific conceptual models on the calculation of ground water ages and the determinatin of pre-emplacement ground-water travel time.

3.0 Justification for Staff Effort

This TP is needed to direct the DOE to adequately consider alternative mechanisms to radionuclide transport in the geologic environment. The geochemistry staff considers that DOE has not addressed all possible conceptual models that pertain to radionuclide transport. This guidance would identify some plausible mechanisms of transport as of yet unaddressed by DOE.

TP Schedule (1)

Milestone	Elapsed Time(wk)	Accumulated Time(wk)	Date
Initiate need for TP	0	0	Completed (8/16/88)
Obtain PPSAS Number	1	1	(1)
Preliminary Outline Complete	2	3	(1)
Internal Draft	16	19	4/22/91
Internal NRC Comments	4	23	7/1/91
Public-Comment Draft	8	31	9/1/91
Federal Register Notice/ Transmittal to ACNW	3	34	9/21/91
Public Comment Period Closed	8	42	11/16/91
Public Meeting on disposition of comments	8	50	1/11/92
ACNW Meeting	2	52	1/25/92
Final TP	8	60	3/22/92

(1) Actual starting date for initiating TP work pending resolution on CDSCP comments, and the development of elements of proof/uncertainties/ information needs by CNWRA in program architecture.

TP Title: Chemical Interactions in Fractured Unsaturated Rock

Lead Technical Contact: John W. Bradbury

Additional Technical Contacts:

1.0 Regulatory Evaluation

This TP will address aspects of 10 CFR Part 60 siting criteria 60.122(b)(3-4) and 60.122(c)(7-9) and performance objectives 60.112 and 60.113.

2.0 Summary of Guidance

This TP will provide guidance on appropriate consideration of geochemistry in fractures in the unsaturated zone. Current plans for site characterization (CDSCP) do not include consideration of adsorptive retardation in fractures. If matrix flow is as slow as is presently envisioned by the USGS hydrologists, retardation in the matrix will probably not necessary to meet regulatory criteria. However, if fracture flow contributes significantly to the flux through the repository, retardation in fractures will probably be needed to isolate the radionuclides. Given the uncertainty about racture flow in the unsaturated zone, this document will discuss adequate characterization and evaluation fracture system mechanisms.

3.0 Justification for Staff Effort

This TP is needed to direct DOE in determination of chemical interactions in fractures in the unsaturated zone at Yucca Mountain.

TP Schedule (1)

Milestone	Elapsed Time(wk)	Accumulated Time(wk)	Date
Initiate need for TP	0	0	Completed (8/16/88)
Obtain PPSAS Number	1	1	(1)
Preliminary Outline Complete	2	3	(1)
Internal Draft	16	19	5/1/90
Internal NRC Comments	4	23	7/1/90
Public-Comment Draft	8	31	9/1/90
Federal Register Notice/ Transmittal to ACNW	3	34	9/23/90
Public Comment Period Closed	8	42	11/16/90
Public Meeting on disposition of comments	8	50	1/13/91
ACNW Meeting	2	52	1/27/91
Final TP	8	60	3/24/91

(1) Actual starting date for initiating TP work pending resolution on CDSCP comments, and the development of elements of proof/uncertainties/ information needs by CNWRA in program architecture.

TP Title: The Use of Tectonic Models Under 10 CFR 60
Lead Technical Contact: Keith McConnell
Additional Technical Contacts: Philip Justus

1.0 Regulatory Evaluation

10CFR60.2 requires that the program of exploration and research undertaken during site characterization should establish the geologic conditions and the ranges of those parameters at a particular site. More specifically, 10 CFR 60.122(a)(1) states that the DOE must demonstrate that:

> " The potentially adverse...natural condition[s] has been adequately investigated, including the extent to which the condition may be present and still be undetected taking into account the degree of resolution achieved by the investigations" and that "The effect of the potentially adverse ... natural condition on the site has been evaluated using analyses which are sensitive to the potentially adverse ...natural condition and assumptions which are not likely to underestimate its effect."

To achieve the regulatory requirements specified in 10 CFR 60 and outlined above, the use of conceptual models is required. Recognition of the obligation to use models for determining the long term performance of a repository is recognized in 60.101 which states that:

> Demonstration of compliance with long-term performance objectives and criteria will "involve the use of data from accelerated tests and predictive models that are supported by such measures as field and laboratory tests, monitoring data and natural analog studies" (60.101 (a)(2).

In addition, because conceptual tectonic models will be used to aid in defining which processes and events are anticipated and unanticipated processes and events, tectonic models will play a large role in the development of scenarios used to assess the long term performance of the repository under 60.112 & 60.113. For example, the EPA containment requirements of 40CFR191.13 requires that the sum of the cumulative releases be assessed from all significant process and events (draft TP, Scenarios). In order to develop a complete list of mutually exclusive scenarios for tectonics at the Yucca Mountain site, a comprehensive tectonic model must be available on which to base the selection. The NRC staff emphasized this requirement for the use of conceptual models in the development of scenarios in the DOE-NRC Conceptual Models meeting (April, 1988). In that meeting, the NRC staff stated that conceptual models:

"if confirmed, be used to calculate releases for all scenarios needed to show compliance with the EPA standard" (NRC comments, DOE-NRC Conceptual Models Meeting, April, 1988).

2.0 Summary of Guidance

The analysis of the use of tectonic models under 10 CFR 60 presented in this report is undertaken to highlight the NRC staff's position on what is required in the construction and use of alternative conceptual tectonic models in performance allocation and performance assessment. The objective of this analysis is to provide guidance to the DOE in the selection and use of a preferred tectonic model. Adherence to this analysis will ensure the completeness of the information provided and will aid in shortening the time needed for review.

3.0 Justification for Staff Effort

In its review of the CDSCP the NRC staff noted that the performance allocation process in the CDSCP did not address the investigations that would be needed to characterize the site with respect to the full range of alternative conceptual models and associated boundary conditions. The NRC staff also indicated that the program of investigation outlined in the CDSCP might favor providing data that would confirm the "preferred" model rather than collecting data to determine what the "preferred" model and boundary conditions should be. The NRC staff recommended that the full range of alternative conceptual models supported by available evidence from the Yucca Mountain area should be identified and form the basis for preliminary performance allocation. In addition, the NRC staff indicated that Conceptual models should:

1) form the basis for the predictive performance assessments of repository systems and subsystems, and

2) if confirmed, be used to calculate releases for all scenarios needed to show compliance with the EPA standard (NRC comments, DOE-NRC Conceptual Models Meeting, April, 1988).

In the April, 1988, meeting on Alternative Conceptual Models, the DOE agreed that they would provide in the statutory SCP a table listing the full range of conceptual models for all major disciplines. This was confirmed in a DOE presentation before the ACNW (June 28, 1988) in which the DOE presented their intentions to provide tabular listings of conceptual models for hydrology, tectonics and other major disciplines.

The guidance presented in this TP on tectonic models will provide the DOE with a regulatory perspective and rationale to assure that during site characterization the DOE:

1) presents all alternative conceptual tectonic models supported by existing geologic data,

2) provides an assessment of the possible effects on repository design and ability to meet the performance objectives under each conceptual model

3) provides a list of investigations and information needs to address each conceptual model, and

4) provides the sources of and estimates of the magnitudes of uncertainty associated with each conceptual tectonic model.

The Technical Position on Conceptual Tectonic Models can then provide a basis for development of a Standard Review Plan for evaluating tectonic models, for refining information needs outlined in Regulatory Guide 4.17 (Standard Format and Content Guide), and for developing a LAM - Licensing Assessment Methodology.

TECTONIC MODELS
TP SCHEDULE

Milestone	Elapsed Time(wk)	Accumulated Time(wk)	Date
Initiate need for TP	0	0	08/29/88
Obtain PPSAS Number	1	1	09/05/88
Preliminary Outline Complete	2	3	09/19/88
Internal Draft	16	19	01/09/89
Internal NRC Comments	4	23	02/13/89
Public Comment Draft	8	31	04/10/89
Federal Register Notice/ Transmittal to ACNW	3	34	05/01/89
Public Comment Period Closed	8	42	06/26/89
Public Meeting on disposition of comments	8	50	08/21/89
ACNW Meeting	2	52	09/04/89
Final TP	8	60	10/30/89

TP TITLE: Application of Existing Reg Guides to Surface Design

LEAD TECHNICAL CONTACT: J. Holonich

ADDITIONAL TECHNICAL CONTACTS: Various

1.0 Regulatory Evaluation

This TP will contain a collection of positions from those Regulatory Guides that have been issued by the NRC and are applicable to the surface design of the repository. The TP will list the technical areas that are the subject of 10 CFR 60, the applicable Reg Guide, the appropriate Regulatory Position from the Reg Guides, and those portions of 10 CFR 60 to which the Regulatory Position apply.

2.0 Summary of Guidance

the guidance provided by this TP will identify existing NRC Reg Guide positions that are applicable to the high-level waste repository.

3.0 Justification for Staff Effort

This TP will identify what existing NRC positions are applicable to the high-level waste repository. It is needed to help DOE and the NRC identify and consider existing staff positions that are applicable to the repository. In addition, the TP will provide a basis for establishing HLW staff positions without the need for developing individual TPs.

TP Schedule

Milestone	Elapsed Time(wk)	Accumulated Time(wk)	Date
Initiate need for TP	0	0	Complete
Obtain PPSAS Number	1	1	Complete
Preliminary Outline Complete	2	3	9/15/88
Internal Draft	16	19	1/6/89
Internal NRC Comments	4	23	2/3/89
Public-Comment Draft	8	31	3/31/89
Federal Register Notice/ Transmittal to ACNW	3	34	4/21/89
Public Comment Period Ends	8	42	6/15/89
Public Meeting on disposition of comments	8	50	None
ACNW Meeting	2	52	8/24/89
Final TP	8	60	10/21/89

(1) To be completed by individual author for each TP. This should be the date that work on the TP will actually begin.

TP TITLE: Application of Existing Reg Guides to Subsurface Design

LEAD TECHNICAL CONTACT: J. Holonich

ADDITIONAL TECHNICAL CONTACTS: Various

1.0 Regulatory Evaluation

This TP will contain a collection of positions from those Regulatory Guides that have been issued by the NRC and are applicable to the subsurface design of the repository. The TP will list the technical areas that are the subject of 10 CFR 60, Guides, the applicable Reg Guide, the appropriate Regulatory Position from the Reg Guides, and those portions of 10 CFR 60 to which the Regulatory Position apply.

2.0 Summary of Guidance

the guidance provided by this TP will identify existing NRC Reg Guide positions that are applicable to the high-level waste repository.

3.0 Justification for Staff Effort

This TP will identify what existing NRC positions are applicable to the high-level waste repository. It is needed to help DOE and the NRC identify and consider existing staff positions that are applicable to the repository are considered. In addition, the TP will provide a basis for establishing HLW staff positions without the need for developing individual TPs.

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TP SCHEDULE

Milestone	Elapsed Time(wk)	Accumulated Time(wk)	Date
Initiate need for TP	0	0	Complete
Obtain PPSAS Number	1	1	Complete
Preliminary Outline Complete	2	3	3/31/89
Internal Draft	16	19	7/21/89
Internal NRC Comments	4	23	8/24/89
Public-Comment Draft	8	31	9/21/89
Federal Register Notice/ Transmittal to ACNW	3	34	10/12/89
Public Comment Period Ends	8	42	2/7/89
Public Meeting on disposition of comments	8	50	None
ACNW Meeting	2	52	2/15/90
Final TP	8	60	4/14/89

(1) To be completed by individual author for each TP. This should be the date that work on the TP will actually begin.