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WMHT: 3102X

MEMORANDUM FOR: Hubert J. Miller, Chief
High-Level Waste Technical
Development Branch
Division of Waste Management

FROM: R. John Starmer
High-Level Waste Technical
Development Branch
Division of Waste Management

SUBJECT: PRE-WORKSHOP, NTS GEOCHEMISTRY MEETING WITH
CONTRACTORS, JANUARY 7, 1983

Attached is a copy of the agenda for the pre-workshop NTS
geochemistry meeting with contractors. The meeting will be held January
7, 1983 in Silver Spring, MD. The purpose of this meeting is to discuss
pre-workshop information provided by DOE and to discuss workshop
questions. A copy of these questions is also attached for your
information.

ORIGINAL SIGNED BY

R. John Starmer
High-Level Waste Technical
Development Branch
Division of Waste Management

Enclosure:
As stated

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AGENDA

PRE-WORKSHOP NTS GEOCHEMISTRY MEETING WITH CONTRACTORS
NRC/NMSS/WMHT

DATE: January 7, 1983

TIME: 9:00 AM - 5:00 PM

PLACE: 4th Floor Conference Room
U. S. Nuclear Regulatory Commission
Willste Building
7915 Easter Avenue
Silver Spring, MD 20910

PURPOSE: NTS GEOCHEMISTRY WORKSHOP PREPARATION

PARTICIPANTS: Nuclear Regulatory Commission:

- P. Justus
- S. Coplan
- J. Starmer
- D. Brooks
- J. Corrado
- G. Birchard

Oak Ridge National Laboratory:

- A. Croff
- D. Kelmers
- C. Claiborne

AGENDA ITEMS:

- a. Introduction.
- b. Discussion of DOE information distributed week of 12/20/82.
- c. Discussion of prioritized workshop topics.
- d. Development of more detailed questions where necessary.

NTS Geochemistry Workshop
Discussion Questions 12/29/82

1. What are the important geochemical conditions and radionuclide retardation processes affecting the performance of a repository at the Yucca Mountain site?
 - A. What is known about the various radionuclide retardation mechanisms along the groundwater pathway at Yucca Mountain such as:
 1. solubility/speciation
 2. sorption
 3. diffusion
 4. colloid and particulate transport
 5. radiolysis
 - B. What geochemical retardation mechanisms are important for quantifying radionuclide transport in the vadose zone?
 - C. What is being done to bound the problem of radionuclide retardation?
 - D. What methods are being used to elucidate geochemical retardation processes? What are the uncertainties in the results of these investigations?
2. What are the chemical and physical characteristics of the flow paths along which radionuclides might be transported between a repository at Yucca Mountain and the accessible environment?
 - A. What are the effects of groundwater chemistry on radionuclide migration?
 - a. What is the chemistry of the groundwater along the expected flow paths?
 - b. What are the important radionuclide species to be expected in the groundwater?
 - c. What is the capacity of the groundwater system to buffer Eh and pH?
 - d. What methods are being used to determine groundwater characteristics? What are the uncertainties in the results of these investigations?
 - B. What are the effects of the host rocks/mineral and glass phases on radionuclide migration in the thermally disturbed zone and in the far field?

- a. What are the principal mineral phases that are or will be in contact with the groundwater?
 - b. What is the effect of mineral phases on radionuclide migration?
 - c. What is the capacity of the host rock to buffer Eh and pH?
 - d. What experimental techniques are being used to evaluate characteristics of the host rocks/mineral and glass phases? What are the uncertainties in the results of these investigations?
3. What are the important geochemical characteristics of the repository horizon that bear on performance of the waste package?
- A. What is the effect on radionuclide transport of changes in chemistry of the engineered barriers as a result of waste emplacement?
 - B. What is the effect on radionuclide transport of changes in chemistry of the natural barriers as a result of waste emplacement?
 - C. What are the implications of dehydration (hydration) reactions in the near field due to thermal load for radionuclide release/transport?
 - D. In what ways is retardation affected by the conditions that prevail and can be expected to prevail in the unsaturated zone?
 - E. What laboratory procedures are being used to determine the geochemical characteristics of the repository horizon that bear on performance of the repository in the near field? What are the uncertainties in the results of these investigations?
4. What geochemical data should be used by LANL in long term performance assessment at the Yucca Mountain site? How should geochemical models be validated?