

Enclosure 2

OAK RIDGE NATIONAL LABORATORY  
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

WM DOCKET CONTROL  
CENTER

POST OFFICE BOX K  
OAK RIDGE, TENNESSEE 37831

'84 MAY 25 12:00

May 22, 1984

Dr. R. J. Starmer  
Geotechnical Branch  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
623-SS  
Washington, D.C. 20555

WM Record File

B0290

WM Project

2.1.12

Docket No.

PDR

LPDR

Distribution:

J. Starmer

John-T. (J.T.)

(Return to WM, 623-SS)

Dear John:

Attached is letter report L-290-6, "Request for Tuff and Groundwater Materials from Yucca Mountain," written by A. D. Kelmers. As previously discussed, we need these materials prior to initiation of our evaluation of the radionuclide sorption and solubility information being developed by LANL for the NNWSI candidate salt site at Yucca Mountain. We would appreciate your assistance in obtaining these site representative samples.

Sincerely,

Susan K. Whatley, Program Manager  
Engineering Analysis and Planning  
Chemical Technology Division

SKW:kk

Attachment

cc: W. D. Arnold  
A. D. Kelmers  
J. H. Kessler  
S. Y. Lee  
R. E. Meyer  
SKW File

cc: w/o encl. A. P. Malinauskas  
W. W. Pitt  
R. G. Wymer

B407160292 B40628  
PDR WASTE  
WM-11 PDR

We would like to request the following quantities of materials from Yucca Mountain:

Topopah Spring tuff - 5 kg  
Calico Hills tuff - 3 kg  
J-13 well water - 10 L.

It would be highly desirable to have as much documentation as possible transmitted with the materials. Mineralogic characterization of the tuff samples seems essential; if this is not transmitted with the samples, we will have to develop it ourselves. Values for physical properties such as surface area, porosity, etc., also would be desirable. Chemical analysis of the J-13 well water is essential; possibly this well water is consistent enough in composition that previous analytical data would be adequate.

We would like to urge that acquisition of these materials be expedited, since experimental work on our project relative to the Yucca Mountain site cannot begin until the samples are in hand. If it seems appropriate, we would like to be present when the samples are obtained, either by field work or from existing stored material, since exact selection of geologic materials frequently involves an element of professional judgment. Interaction with NNWSI/LANL staff in selection of the most representative samples for our needs could be beneficial.

L-290-6  
05/22/84

## LETTER REPORT

**TITLE:** Request for Tuff and Groundwater Materials from Yucca Mountain**AUTHOR:** A. D. Kelmers**PROJECT TITLE:** Laboratory Evaluation of DOE Radionuclide Solubility Data and Selected Retardation Parameters, Experimental Strategies, Laboratory Techniques, and Procedures**PROJECT MANAGER:** S. K. Whatley**ACTIVITY NUMBERS:** ORNL #41 37 54 92 6 (FIN No. B0290)  
NRC #50 19 03 1

In order to expand the work on this project to include evaluation of the radionuclide sorption and solubility information being developed by LANL for the NNWSI candidate site in tuff at Yucca Mountain, we will need representative samples of both tuff and groundwater materials. Experiments to evaluate radionuclide sorption or apparent concentration limit values must be conducted in the presence of representative rock material and groundwater. Because the mineralogy of the tuff beds at Yucca Mountain is so complex, it seems unlikely that site-relevant data could be obtained by utilizing generic samples of minerals similar to those reported to be present at Yucca Mountain, or by using poorly characterized tuff from the general Nye County area of Nevada. Therefore, we feel it is essential to obtain characterized tuff samples from the Yucca Mountain site. All the sorption experiments reported by LANL have employed well water from well J-13. It is always better to run experiments in actual groundwater rather than to prepare synthetic solutions; therefore, we also will need a sample of this water.

We plan to conduct sorption isotherm/apparent concentration limit experiments which may be relevant to both the engineered barrier facility and the site host rocks. It is our understanding that the Topopah Spring member (in the unsaturated zone) is now the leading candidate repository horizon. We would need an appreciable quantity of Topopah Spring tuff for the engineered barrier facility tests, since we plan to generate groundwater which may be representative of the intruding water in the unsaturated zone by refluxing distilled water with Topopah Spring tuff as well as run sorption isotherms with Topopah Spring tuff. Tests representative of radionuclide behavior in the far field (presumably the saturated zone) would require use of a representative altered tuff and well water J-13. LANL has done considerable work with Calico Hills tuff, so that might be a good tuff flow for us to use. For this far-field work, then, we would need Calico Hills tuff and J-13 well water.