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MAY 6 8 1986

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Dr. Gary K. Jacobs  
Environmental Sciences Division  
Building 1505/Room 312  
P.O. Box X  
Oak Ridge National Laboratory  
Oak Ridge, TN

Dear Dr. Jacobs:

SUBJECT: CONTRACT NO. NRC-50-19-03-01, FIN B-0287, ORNL NO. 41-37-54-92-4,  
"TECHNICAL ASSISTANCE IN GEOCHEMISTRY," MARCH (1985) MONTHLY PROGRESS  
REPORT

I have received the March monthly progress report dated April 28, 1986. Based on my review, I have the following comments:

Task 1 BWIP Geochemical Technical Assistance

- Progress to date is satisfactory.
- The Appendix 7 meeting on waste package testing mentioned in last months contract response letter has been postponed. A new date has not been set.

Task 2 Yucca Mountain Geochemical Technical Assistance

- Progress to date is satisfactory.
- Enclosure 1 is short-term T.A. request number 34 (two documents related to uranium-series dating). If you have any questions please contact Linda Kovach (427-4693).

Task 3 Salt Site Geochemical Technical Assistance

- Progress to date is satisfactory.
- An Appendix 7 meeting concerning the salt geochemistry program is scheduled for May 19 - 22. Walt Kelly will call you with the details of the meeting, and to discuss any ORNL involvement.
- The following salt documents are being sent under seperate cover:
  - "Expected Near-Field Radionuclide Transport..."

DFC : WMGT	:	:	:	:
NAME : DJBrooks;mt	:	:	:	:
DATE : 86/05/	:	:	:	:
		8605290699	860506	
		PDR WMRES	EXIORNL	
		B-0287	PDR	
				3035

- 2. "The Clay Minerology of the Lower San Andres..."
- 3. "Petrographic Report on Salt..."
- 4. "Progress Report on Clay, Mineral Assemblages...", and
- 5. "Petrographic Report on Samples..."

Task 4 Short-term Technical Assistance

- ° Progress to date is satisfactory.

Task 5 Project Management

- ° Progress to date is satisfactory.

The action taken by this letter is considered to be within the scope of the current contract NRC-50-19-03-01/FIN B-0287. No changes to cost or delivery of contracted products is authorized. Please notify me immediately if you believe that this letter would result in changes to cost or delivery of contracted products.

Sincerely,

*151*

David J. Brooks  
Geochemistry Section  
Geotechnical Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosures:  
As Stated

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OFFICE : WMGT	:	:	:	:	:	:
NAME : DJBrooks	:	:	:	:	:	:
DATE : 86/05/06	:	:	:	:	:	:

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SHORT-TERM TECHNICAL ASSISTANCE TASK ORDER NO. 34

FIN NO/CONTRACTOR: B-0287/ORNL

REQUEST DATE: May 5, 1986

CONTRACT TITLE: Geochemistry T.A.

TASK TITLE: Document Review (OFR 85-47 and OFR 85-224)

ESTIMATED LEVEL OF EFFORT 3 staff days

REQUESTED COMPLETION DATE: June 2, 1986

PRODUCT DESCRIPTION: Letter Report

TASK DESCRIPTION:

° Review documents. This type of analysis is also being used at trench-14 to date on determine the origin of the carbonate (i.e., whether it is pedogenic or a hydrothermal spring deposit).

- Discuss any problems with the data or methods of analyses?
- Do the results agree with temperature results?
- Is there any other or better ways to determine the source of carbonate?

**PROBLEM AREAS:**

None.

**COST/BUDGET REPORT:**

Expenditures were \$47.1K for March 1986 and \$261.4K for FY 86 to date. A detailed cost/budget report will be sent under separate cover.

USGS-OFR-85-47

USGS-OFR-85-47

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

URANIUM-SERIES DATING OF SECONDARY CARBONATE AND SILICA PRECIPITATES  
RELATING TO FAULT MOVEMENTS IN THE NEVADA TEST SITE REGION AND  
OF CALICHE AND TRAVERTINE SAMPLES FROM THE AMARGOSA DESERT

Open-File Report 85-47

Prepared in cooperation with the  
Nevada Operations Office  
U.S. Department of Energy  
(Interagency Agreement DE-AI08-78ET44802)

This report is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards and stratigraphic nomenclature. Company names for descriptive purposes only and do not constitute endorsement by the USGS.

Denver, Colorado  
1985

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

URANIUM, THORIUM ISOTOPIC ANALYSES AND URANIUM-SERIES AGES OF CALCITE AND  
OPAL, AND STABLE ISOTOPIC COMPOSITIONS OF CALCITE FROM DRILL CORES  
UE25a#1, USW G-2 AND USW G-3/GU-3, YUCCA MOUNTAIN, NEVADA

Open-File Report 85-224

Prepared in cooperation with the  
Nevada Operation Office  
U.S. Department of Energy  
(Interagency Agreement DE-AI08-78ET44802)

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

Denver, Colorado  
1985

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

POST OFFICE BOX X  
OAK RIDGE, TENNESSEE 37831

April 8, 1986

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

Dear Dave:

Please find enclosed the progress report for the month of March 1986 for B0287, "Technical Assistance in Geochemistry."

Sincerely,

*Gary K. Jacobs*  
Gary K. Jacobs  
Manager, NRC Waste Program

GKJ/

Enclosure:

Monthly Progress Report For March 1986

cc: Office of the Director, NMSS (Attn: Program Support Branch)  
Division Director, NMSS Division of Waste Management (2)  
Branch Chief, Waste Management Branch, RES  
P. S. Justus, Chief, Geotechnical Branch  
K. C. Jackson, Geotechnical Branch  
J. W. Bradbury, Geotechnical Branch  
G. F. Birchard, Waste Management Branch, RES  
M. Siegel, Sandia National Laboratory  
A. D. Kelmers                      A. P. Malinauskas  
R. E. Meyer                        GKJ File

4/07/86

MONTHLY PROGRESS REPORT FOR MARCH 1986

PROJECT TITLE: Technical Assistance in Geochemistry  
PROJECT MANAGER: G. K. Jacobs  
PROJECT STAFF: J. G. Blencoe, R. M. Gove, A. D. Kelmers,  
R. E. Meyer, G. D. O'Kelley, and K. L. Von Damm  
ACTIVITY NUMBER: ORNL #41 88 54 92 4 (FIN No. B0287)  
NRC #50 19 03 01

TECHNICAL HIGHLIGHTS:

Task 1 - Hanford Site Geochemical Technical Assistance

J. G. Blencoe is continuing to revise the topical report on the solubility information for the Hanford Site.

Task 2 - Yucca Mountain Geochemical Technical Assistance

K. L. Von Damm reviewed two reports that described experiments on the reaction of both radioactive and nonradioactive glass in either deionized water or J-13 groundwater + tuff + stainless steel. The two major conclusions from the studies are that deionized water is a stronger leaching agent than J-13 and that radiolysis does not appear to have a significant effect on glass dissolution under saturated conditions in the presence of tuff. Letter reports (LR-287-37 and LR-287-38) on these documents will be forwarded under separate cover.

Task 3 - Salt Site Geochemical Technical Assistance

J. G. Blencoe reviewed the report: FY-1984 Annual Report: Spent Fuel and UO<sub>2</sub> Source Term Evaluation Results, PNL-5650, 1986, by W. J. Gray and G. L. McVay. The report presents a wealth of information on the leach characteristics of real spent fuel and simulated spent fuel (UO<sub>2</sub>) in spent fuel + brine or distilled water + iron + zircaloy experiments performed at 30-90°C for 28-180 days. A detailed review and evaluation will be forwarded under separate cover as letter report LR-287-36.

Task 4 - Short-Term Technical Assistance

In response to a short-term task order, G. D. O'Kelley reviewed the report: Solubility Experiments for the Nevada Nuclear Waste Storage Investigations Project, LA-10560-MS, 1985, by J. F. Kerrisk. The report outlines a program of measurements intended to provide solubilities of important waste elements under conditions pertinent to the Yucca Mountain Site. Although the program



appears to address most of the requirements of the technical position on solubility, there are a few concerns regarding the experimental methods to be employed, and there is little discussion of the important issue of uncertainties. A detailed evaluation will be forwarded under separate cover as letter report LR-287-32.

The letter report (LR-287-29) on the chemistry of plutonium, as requested under short-term task order, was completed during March and forwarded to the NRC Project Manager.

All participants for the sorption workshop to be held in Silver Spring, Maryland, during May 13-15 have been contacted by phone. All of the invited participants plan to attend. Letters confirming their participation and providing further details on the issues to be discussed will be mailed early in April. The NRC Project Manager will be kept abreast of the progress and plans for the workshop.

**PROJECT MANAGEMENT:**

Nothing to report.

**MEETINGS AND TRIPS:**

None.

**REPORTS AND PUBLICATIONS:**

LR-287-29, by J. C. Mailen and J. T. Bell, "Plutonium Chemistry and Migration Behavior in High-Level Waste Repository Environments."

LR-287-32, by G. D. O'Kelley, "Review of: Solubility Experiments for the Nevada Nuclear Waste Storage Investigations Project, LA-10560-MS, 1985, by J. F. Kerrisk."

LR-287-36, by J. G. Blencoe, "Review of: FY-1984 Annual Report: Spent Fuel and UO<sub>2</sub> Source Term Evaluation Results, PNL-5650, 1986, by W. J. Gray and G. L. McVay."

LR-287-37, by K. L. Von Damm, "Review of: 'Leaching Savannah River Plant Nuclear Waste Glass in a Saturated Tuff Environment,' in Scientific Basis for Nuclear Waste Management VIII, Mat. Res. Soc. Symp. 44, 247-256, 1985, by N. E. Bibler, G. G. Wicks, and V. M. Oversby."

LR-287-38, by K. L. Von Damm, "Review of: 'Parametric Testing of a DWPF Borosilicate Glass,' in Scientific Basis for Nuclear Waste Management VIII, Mat. Res. Soc. Symp. 44, 303-310, 1985, by F. Bazan and J. Rego."

FROM <b>ORNL</b>		DATE OF DOCUMENT <b>4/8/86</b>	DATE RECEIVED <b>4/23</b>	NO <b>MI-86371</b>
TO <b>DJBrooks</b>		LTR <b>XX</b>	MEMO	REPORT
		ORIG.	CC <b>XX</b>	OTHER
CLASSIF		ACTION NECESSARY <input checked="" type="checkbox"/>	CONCURRENCE <input type="checkbox"/>	DATE ANSWERED
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REG. NO.		FILE CODE: <b>426.1</b>		
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		<b>DBrooks</b>		<b>4/23</b>
ENCLOSURES				
<b>Packet was closed by a letter to Garry Jacobs on May 6, 1986. MT</b>				
REMARKS				