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Dec. 12, 1986

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

WM-RES
WM Record File
B0287
ORNL

WM Project 10, 11, 16
Docket No. _____
PDR ✓
LPDR B, N, S

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Dear Dave:

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

Sincerely,

Gary K. Jacobs
Gary K. Jacobs
Manager, NRC Waste Programs
Environmental Sciences Division
Building 1505, MS-038, FTS/626-0567

GKJ/

Enclosure: (1) Monthly Progress Report for November 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, NMSS
K. C. Jackson, Geotechnical Branch, NMSS
J. W. Bradbury, Geotechnical Branch, NMSS
A. D. Kelmers A. P. Malinauskas
R. E. Meyer GKJ File

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12/09/86

MONTHLY PROGRESS REPORT FOR NOVEMBER

PROJECT TITLE: Technical Assistance in Geochemistry

PROJECT STAFF: J. G. Blencoe, R. M. Gove, A. D. Kelmers, R. E. Meyer,
V. S. Tripathi, and K. L. Von Damm

PROJECT MANAGER: G. K. Jacobs, Earth Sciences Section
Environmental Sciences Division
Oak Ridge National Laboratory

ACTIVITY NUMBER: ORNL #41 88 54 92 4 (FIN No. B0287)/NRC #50 19 03 01

OBJECTIVE:

The objective of this project is to provide technical assistance to the NRC in the evaluation of geochemical information pertinent to candidate HLW repository sites. The project emphasizes the collection and review of key information in order to provide input to the NRC analysis of technical issues regarding the geochemical aspects of HLW isolation.

TECHNICAL HIGHLIGHTS

Basalt:

J. G. Blencoe reviewed the report, "Structure, Textures, and Cooling Histories of Columbia River Basalt Flows," Geol. Soc. Am. Bull. 97, 1144-1155, 1986, by P. E. Long and B. J. Wood. This article discusses the origin of colonnade and entablature zones in subaerial basalt flows. The evidence weighed in theorizing an origin for these structures includes: (1) the macroscopic characteristics of subaerial basalt flows - and particularly the nature of fracturing (columnar jointing) in these flows; (2) the petrographic characteristics of rock samples from intraflow structures in subaerial basalts; and (3) the results obtained from mathematical modeling of the cooling of a subaerial basalt flow. The authors conclude that colonnade zones in subaerial basalt flows form by slow conductive cooling, while entablature zones form by relatively fast, "convective" cooling induced by downward-ingressing meteoric water that enters the flow after its base and top have solidified. A detailed review and evaluation will be forwarded under separate cover (LR-287-65).

G. K. Jacobs prepared for the hydrogeology data review to be held at Hanford December 2-5. In particular, hydrochemistry data available prior to January 1985 were collected and reviewed so that recent (post-January 1985) data, anticipated to be available at the data review, could be assessed properly. A trip report will be forwarded during the next reporting period.

PROJECT MANAGEMENT:

Nothing to report.

MEETINGS AND TRIPS:

G. K. Jacobs and J. G. Blencoe attended the Annual Geological Society of America Meeting. The meeting was held during November 9-13, 1986 in San Antonio, Texas.

REPORTS AND PUBLICATIONS:

LR-287-65, by J. G. Blencoe, "Review and Evaluation of "Structure, Textures, and Cooling Histories of Columbia River Basalt Flows," Geol. Soc. Am. Bull. 97, 1144-1155, 1986, by P. E. Long and B. J. Wood."

PROBLEM AREAS:

None.

COST/BUDGET REPORT:

Expenditures for the year to date were \$54.4K.