

Sandia National Laboratories

Albuquerque, New Mexico 87185

December 15, 1987

Mr. Paul Bembia
Geotechnical Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
7915 Eastern Avenue
Silver Spring, MD 20910

Dear Mr. Bembia:

Enclosed is the November 1987 monthly report for FIN A1756. If you have any questions or comments please feel free to contact me at (FTS) 844-8368, Malcolm Siegel at (FTS) 846-5874, or Christi Leigh at (FTS) 846-1977.

Sincerely,

Robert M. Cranwell

Robert M. Cranwell, Supervisor
Waste Management Systems
Division 6416

RMC:6416

Enclosure

Copy to:

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Division of Low-Level Waste Management
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PDR WMRES EXISANL
A-1756 PDR

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NH Projects NH-10, 11, 16
PDR w/encl
(Return to NH, 623-55)

NH Record File: A-1756
LPDR w/encl

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PROGRAM: Geochemical Sensitivity Analysis FIN#: A1756

CONTRACTOR: Sandia National Laboratories BUDGET PERIOD: 10/87 - 9/88

NMSS PROGRAM MANAGER: P. Bembia BUDGET AMOUNT: 175K

CONTRACT PROGRAM MANAGER: R. M. Cranwell FTS PHONE: 844-8368

PRINCIPAL INVESTIGATORS: M. D. Siegel FTS PHONE: 846-5448
C. D. Leigh FTS PHONE: 846-1977

PROJECT OBJECTIVE

The objective of this project is to provide technical assistance to the NRC in determining the sensitivity of performance assessment calculations to uncertainties in geochemical data and in the representation of geochemical processes in transport models. In Task I, the error in model calculations of integrated radionuclide discharge due to speciation, sorption and kinetic effects will be evaluated. In Task II, the potential importance of organic molecules and colloids will be examined. SNLA will assist the NRC in determining how geochemical processes should be represented in transport models in Task III. Short-term technical assistance will be carried out under Task IV and the codes and data bases developed under this project will be transferred to the NRC under Task V.

ACTIVITIES DURING NOVEMBER 1987:

Task I. Uncertainty in Integrated Radionuclide Discharge

Subtask 1A. Conceptual Models for Repository Sites. During November, we continued to use NEFTRAN to calculate radionuclide discharges from a hypothetical basalt site. Hydrologic data from the BWIP and Nuclear Waste Consultants were used. Numerical criteria developed previously under Subtask 1D were used to determine if the Equivalent Porous Medium assumption was valid. Kd values were obtained from the Sandia Sorption Data Management System (SSDMS) or varied parametrically.

Subtask 1B. Solubility/Speciation Effects. A revised draft of a paper entitled "Thermodynamic Data Management System for Waste Isolation Performance Assessment" was completed. The final draft will be published in the proceedings of the American Institute of Chemical Engineers Airley House Symposium on Thermodynamic Data for Industrial Applications. A copy of the paper will be sent to the NRC under a separate cover by the end of December.

Subtask 1C. Sorption Effects. A letter report describing calculations of Kd values from thermochemical data was received from Stanford University. The report describes use of the MINEQL (+SGMA) code to evaluate the changes of calculated Kd values of Neptunium and Uranium due to changes in ground water composition. The report will be sent to the NRC under a separate cover.

Subtask 1E. Coupled/Dynamic Effects. No activity during November.

Task 2. Uncertainty in Radionuclide Discharge due to Transport by Organics and Colloids. Review of literature describing organo-actinide complexation continued during November.

Task 5. Technology Transfer. A revised version of the user's manual, software, and basalt site data for the SSDMS was produced during November. This version will be transferred to the NRC during December.

Other Activities. A Schedule 189 for this project for FY88 was prepared and is currently under management review.

Allocation of Resources

Task 1..... 35%
Task 2.....20%
Task 5.....45^%

A1756
 1646.010
 November 1987

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	<u>Current Month</u>	<u>Year -to- Date</u>
I. Direct Manpower (man-months of charged effort)	1.1 —	1.8 —
II. Direct Loaded Labor Costs	9	16
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	1	3
Travel	0	1
G & A	1	2
Other (computer roundoff)	1	1
	—	—
TOTAL COSTS	12	22

III. Funding Status

<u>Prior FY Carryover</u>	<u>FY 88 Projected Funding Level</u>	<u>FY 88 Funds Received to Date</u>	<u>FY 88 Funding Balance Needed</u>
22K	197K	50K	125K