WM-1
PDR

Return to
NSHill
623-SS

MAY 28 1982

3108.1/3001.3/KCC/82/05/27/0

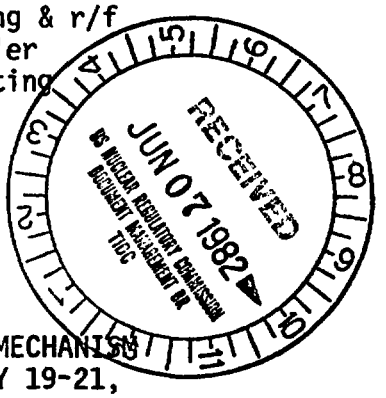
- 1 -

Distribution:
~~WMHL file~~
WMHL r/f
WM r/f
NMSS r/f
JBMartin
REBrowning
MJBell
KCChang & r/f
HJMiller
JOBunting
PDR

WMHL: ~~3108.1~~ 109.1

MEMORANDUM FOR: F. Robert Cook
High-Level Waste Licensing
Management Branch
Division of Waste Management

FROM: Kien C. Chang
High-Level Waste Licensing
Management Branch
Division of Waste Management



SUBJECT: SECOND SEMI-ANNUAL WORKSHOP ON THE LEACHING MECHANISM OF NUCLEAR WASTE FORMS, GAITHERSBURG, MD, MAY 19-21, 1982

Enclosed are highlights on the subject meeting and meeting agenda.

Kien C. Chang
High-Level Waste Licensing
Management Branch
Division of Waste Management

Enclosure:
As stated

OFC	WMHL					
NAME	KCChang:lmc					
DATE	5/ /82					

Second Semi-Annual Workshop on the Leaching Mechanisms
of Nuclear Waste Forms

May 19-21, 1982
Holiday Inn, Gaithersburg, MD

The main theme of the workshop was Leaching Mechanisms of Nuclear Waste Forms. Other subjects related to waste disposal (including hydrology and geology) were also discussed. Proceedings of this workshop will be published in report PNL 4228. Round Robin Results of MCC-1 Leach Test will be documented in PNL 4249.

1. Factors considered to have large influence on the rates of leaching included SA/volume (Pete Macedo and McVay); phase separation and glass metal interaction (McVay) and interdiffusion matrix dissolutions and surface layer formation/establization (D. Wallace).

2. All three repository programs basalt, tuff and salt included modeling to evaluate waste release performance using results obtained in studies of leaching mechanism.

   We detected areas of disconnection between projects in this area, e.g., the waste dissolution model being developed(by Don Jackson) could not handle SA/volume ratio and did not consider phases where near equilibrium was reached. Long term (thousands of years) projection of leaching mechanisms was not addressed.

3. MCC-1 test results only give comparative leaching rates. They cannot be used to quanitfy leaching in a repository. Round robin results of MCC-1 tests indicated larger difference in inter-laboratory data (factor of up to 2) than intra-laboratory data (factor of less than 1). The development of MCC-14 test was proposed (J. Mendel). This test together with MCC-15, 16 and 17 will be structured to qualify a waste form for disposal in a given repository with features to account for extrapolation, leach time of thousands of years, release of actinides and statistical treatment of data collected. Tentatively, MCC-14 will address controlled E_h leach test method, MCC-15 will address ph effects, MCC-16 will address nearfield static leaching and MCC-17 will address low flow rate leach test for nearfield analysis.

4. Multi-component interaction testing and analog experiments encountered various problems in trying to simulate actual flow conditions. The assumed slow flow conditions could not be achieved because backfill material such as bentonite and undissolved particles (one or 2 microns in sizes) in the leachants (groundwaters) tended to clog up and stop the flow. While ways had been found by the experimenters to defeat the clogging, questions arose as how realistic were the data collected compared to what actually would take place in the repository environment.

SECOND SEMIANNUAL WORKSHOP ON THE LEACHING MECHANISMS OF NUCLEAR WASTE FORMS

May 19-21, 1982

GAITHERSBURG HOLIDAY INN, GAITHERSBURG, MD

PNL 4228
PNL 42

MAY 19, 1982

8:00 - 8:15 am	Introductions and Welcome — John Mendel, Warren Eiler
	SESSION I. PROGRESS REPORT ON LEACHING MECHANISMS PROGRAM
8:15 - 9:00 am	University of Florida - LL (Larry) Hench, Principal Investigator
9:00 - 9:45	Catholic University of America - PB (Pete) Macedo, Principal Investigator. Dependance of material loss rate on contact time
Coffee Break	
10:00 - 10:45	Pennsylvania State University - WB (Will) White, Principal Investigator
10:45 - 11:30	✓ Rockwell Science Center - AB (Alan) Harker, Principal Investigator
11:30 - 12:15	✓ Pacific Northwest Laboratory - GL (Gary) McVay, Principal Investigator
LUNCH	
1:30 - 2:15 pm	Lawrence Livermore National Laboratory - DD (Don) Jackson, Principal Investigator
	SESSION II. SPECIAL TOPICS IN STATIC AND LOW-FLOW RATE LEACH TESTING
2:30 - 3:00 pm	Leach Testing of Waste Forms: Interrelationship of IAEA and MCC-Type Tests - VM (Virginia) Oversby, Lawrence Livermore National Laboratory
3:00 - 3:15	An Examination of the MCC-1 Leach Test Method, Part I: Round Robin Results - JL (Lee) Daniel, Materials Characterization Center — PNL-4249
Coffee Break	
3:30 - 3:50	An Examination of the MCC-1 Leach Test Method, Part II: Experimental Technique - HM (Skip) Kingston, National Bureau of Standards
3:50 - 4:10	An Examination of the MCC-1 Leach Test Method, Part III: Comparison of Glass Compositions - DJ (Dave) Cronin, National Bureau of Standards
4:10 - 4:40	Glass Dissolution Mechanisms: MCC-1 Static Leach Test Data - RM (Dick) Wallace
5:30 - 7:00 pm	SOCIAL HOUR (Cash Bar)

MAY 20, 1982

SESSION II. (Continued)

8:00 - 8:30 am	Effect of Solubility on Leaching - B (Bernd) Grambow, Hahn-Meitner Institute
8:30 - 9:30	Thermodynamics of Geochemical Systems - KM (Ken) ~~Krupka~~, Pacific Northwest Laboratory Sid Phillips
Coffee Break	

SESSION III. NEAR-FIELD HYDROLOGICAL, DIFFUSION AND CONVECTION PHENOMENA

9:45 - 11:45	Tutorial on Groundwater Hydrology - W ~~(Bill) Back~~, U.S. ~~Geological Survey~~ Geo Trans Inc. Reston Va, CR (Charlie) Faust & Allen Freeze & Cherry Groundwater 1979 Prentice Hall
11:45 - 12:15	Influence of Diffusion through a Concentration Boundary Layer on the Dissolution Rate of Waste Forms - PL Chambre, University of California
LUNCH	
	Status Report on Reference Flow Regimes for Geologic Repositories
1:15 - 1:30 pm	Basalt - MJ (Mick) Apted, Rockwell Hanford
1:30 - 1:45	Tuff - Speaker to be determined
1:45 - 2:00	Salt - Speaker to be determined

SESSION IV. STATUS OF MULTICOMPONENT INTERACTIONS TESTING

2:00 - 2:30	Interactions Testing at PNL - DG (Dave) Coles and JW (John) Shade, Pacific Northwest Laboratory
2:30 - 3:00 ✓	Interactions Testing at BWIP - MJ (Mick) Apted, Rockwell Hanford
Coffee Break	
3:15 - 3:45	Interactions Testing for a Nuclear Waste Repository in Granite - K (Keith) Harvey, Whiteshell Nuclear Research Establishment
3:45 - 4:15	Interactions Testing at SRL - GG (George) Wicks, Savannah River Laboratory
4:15 - 4:45	The Behavior of Leached Constituents in Backfill - EJ (Jim) Nowak, Sandia National Laboratories
DINNER	
8:00 - 10:00	Tour of Catholic University facilities

MAY 21, 1982

SESSION IV. (Continued)

8:00 - 8:30 am	Laboratory Analog Experiment - MG (Marty) Seitz, Argonne National Laboratory
8:30 - 9:00	Rock-Water Interactions in a Controlled Temperature Gradient Circulation System - R (Bob) Charles, Los Alamos National Laboratory

SESSION IV. (Continued)

9:00 - 9:30 am	Waste Glass-Seabed Sediment Interactions: Observations of the Soret Effect - LH (Larry) Brush, Sandia National Laboratories
Coffee Break	

SESSION V. WHAT IS MCC-14?

9:45 - 10:00	Some Thoughts on MCC-14: Recommended Practice for Experimentally-Evaluating Waste Form Leaching in a Geologic Repository - JE (John) Mendel, Materials Characterization Center
10:00 - 10:30	The Role of E_h in Simulated Geologic Repository Leach Testing - WB (Will) White, Pennsylvania State University
10:30 - 12:00	Open Discussion on Evaluating Waste Form Leaching in a Geologic Repository
12:00 - 12:30	Wrap up
12:30	Adjourn