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MEMORANDUM FOR: Kenneth C. Jackson, Section Leader
Geochemistry Section
Geotechnical Branch

FROM: Linda A. Kovach
Geochemistry Section
Geotechnical Branch

John W. Bradbury
Geochemistry Section
Geotechnical Branch

SUBJECT: TRIP REPORT FOR VISIT TO LOS ALAMOS NATIONAL LABORATORY
AND SANDIA NATIONAL LABORATORY, SEPTEMBER 24-26, 1985.

The purpose of this trip was three-fold: to discuss with Dr. W.L. Polzer, Los Alamos National Laboratory (LANL), one project to be completed during the next fiscal year under the contract FIN A7150; an appendix seven visit with Dr. G.C. Porter and Dr. K. Thomas of the NNWSI; and to discuss with Drs. M. Siegel and I. Gerlach the possibility of initiating a technical assistance contract at Sandia National Laboratory (SNL).

SEPTEMBER 24, 1985

On September 24, 1985 we met with Ed Essington and Will Polzer to discuss task four of the contract FIN A7150, "Field Studies and Modeling Chemical Processes in the Unsaturated Zone." Under this task, the chemistry of the pore waters and soils in the caissons were to be evaluated. It appeared from previous conversations with Dr. Polzer that this portion of the contract would not be fulfilled. It is our contention that it is important to understand where and by what mechanism the tracers are being retained by the soil. Recent analyses of the outflow from caisson B indicated that there was an overall lack of conservation of mass in the caisson systems with respect to iodide transport. Since iodide is supposed to be a conservative tracer (travel with the water) this should not be occurring. We discussed with the LANL investigators the possibility and problems of sampling and analyzing the soil. Their response to implementation of the task was favorable. Dr. Polzer will submit a letter with the cost breakdown after having examined more thoroughly the possibility of sample collection and analysis. Before proceeding with implementation of the task the LANL investigators agreed also to check mass balance calculations on bromide to see if they observed similar problems with this tracer.

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September 25, 1985
Appendix Seven Visit to the NNWSI, Los Alamos

The purpose of the interaction with the NNWSI staff at LANL was for the NRC geochemistry staff and our contractors to inform the NNWSI staff of our concerns over the Yucca Mountain sorption information. A partial list of attendees is included under attachment 1. The morning was devoted to an information exchange between the NRC, our contractors, the DOE and its contractors. The interaction focused on a letter report (LR-287-7) entitled "Concerns Relative to the Applicability of the Yucca Mountain Radionuclide Sorption Information for Site Performance Assessment Purposes," (attachment 2) submitted to the NRC by A. D. Kelmers of Oak Ridge National Laboratory (ORNL). This letter report was done under contract FIN 80290, which is currently undertaking a program of review and evaluation of the NNWSI sorption information and methodology.

The information presented by Dr. Kelmers was generally well received by the NNWSI staff. Viewgraphs of the presentations by Kelmers are found in attachment 3. Our general impressions of the visit were quite favorable. The interchange proved to be beneficial to both the NRC and the DOE since it appeared that the NNWSI staff had concerns similar to ours regarding the sorption data. We gained useful insight into the methodology used in performing the sorption experiments by the NNWSI. Since we do not merely want to duplicate their data in the laboratory portion of the ORNL contract, this visit was especially useful to us for the initiation of our experiments.

With regard to Kelmers first concern regarding lack of sorption information compilation and synthesis, we were pleased to learn that the LANL staff is preparing a topical report on sorption; however, no expected completion date was given. We were also informed of a sorption data base that is nearing completion. These two items should be of interest to us.

Of concern to both the NRC and DOE staff, was the problem with timeliness of reporting, as outlined by Kelmers in the letter report. There does not seem to be an immediate solution to this problem. Exchanges of this type will help to keep us informed of the DOE progress in particular areas. However, future appendix seven interactions should be more narrowly focused, and involve less staff to be the most productive.

On the topic of performance assessment strategy for sorption modeling, we agreed that the uncertainty in actinide chemistry presents a problem for both the DOE in developing a testing strategy and for the NRC in evaluating these

data. This is an area where we may wish to develop a technical position to ensure that sorption information on the actinides is acceptable for licensing.

We were also pleased to see that LANL is beginning to test for the effects of such parameters as pH, groundwater composition, ionic strength and mineralogy on sorption. We endorse this type of testing as it should increase our understanding of the important parameters that affect sorption.

A more detailed description of the interaction and outcome of the discussion is provided by our contractor G. K. Jacobs in attachment 4 (MR-287-5). This report incorrectly identifies the appendix seven visit as a data review and/or meeting. We would like to clarify this point. This report is useful in that it gives a brief summary of the NRC concerns identified by A. D. Kelmers, and the response given by LANL. It also identifies some areas where our contractors feel there is still a need for investigation.

We would like to emphasize that the basis for this visit was to express our concerns; and to identify areas of concern that our contractors should pursue, not to pass judgment on the NNWSI program or come to any consensus or resolution on the potential issues.

During the afternoon we toured the NNWSI sorption labs. We saw batch sorption tests under controlled atmosphere conditions, crushed tuff column tests and fracture flow studies. All of these tests were performed under saturated conditions using J-13 ground water. The equipment and quality of the experiments as designed were outstanding. During the last hour of the afternoon, we toured Dr. Polzer's lab, since he is performing sorption and leaching experiments on crushed tuff under unsaturated conditions. This tour was for the benefit of our contractors, who were interested in unsaturated flow experiments.

September 26, 1985

We met with Malcolm Siegel, and William Casey of SNL during the morning to discuss a proposed contract for fiscal year 1987. This contract would be a joint project with the Waste Management Systems Division 6431, and the Geochemistry Division 1543 at SNL. During the afternoon we discussed the proposed contract further with Terry Gerlach.

PARTIAL LIST OF ATTENDEES AT APPENDIX SEVEN VISIT
LOS ALAMOS NATIONAL LABORATORY

Linda A. Kovach, NRC
John W. Bradbury, NRC
Gary K. Jacobs, ORNL
James G. Blencoe, ORNL
A. Don Kelmers, ORNL
Robert Meyer, ORNL
Malcolm D. Siegel, SNL
Gerald DePoorter, LANL
Kim Thomas, LANL
Donald Oakley, LANL
Uel Clanton, DOE/WMPO
Carl Johnson, State of Nevada
Maurice Morgenstein, State of Nevada
David Vaniman, LANL
Jerry Kerrisk, LANL
Karl Wolfsberg, LANL
Brian Travis, LANL
Dave Bish, LANL
Bruce Crowe, LANL
Schon Levi, LANL
Scott Sinnock, SNL
Aaron Meyer, LANL
Bob Rundberg, LANL
Francis Lawrence, LANL