

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: Attendance at the American Geophysical Union Spring Meeting

DATE/PLACE: May 28–31, 2002
Washington, DC

AUTHOR: Melissa Hill

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PERSONS PRESENT:

M. Hill Center for Nuclear Waste Regulatory Analyses (CNWRA); N. Coleman, B. Leslie, W. Ford, W. Dam, L. Hamdan and T. Nicholson U.S. Nuclear Regulatory Commission (NRC)

BACKGROUND AND PURPOSE OF TRIP:

The purpose of the trip was to (1) give an oral presentation on conceptual models of the potentiometric surface at Yucca Mountain and (2) learn of recent studies and advances relevant to the high-level waste program.

SUMMARY OF PERTINENT POINTS AND ACTIVITIES:

- (1) Presentation on "Conceptual Models of the Potentiometric Surface at Yucca Mountain"
(Authored by M. Hill, J. Winterle, D. Sims, D. Farrell, and Paul Bertetti)

M. Hill delivered an oral presentation on conceptual models of the potentiometric surface at Yucca Mountain. The presentation focused on three conceptual models which consisted of two interpretations from CNWRA and a U.S. Department of Energy (DOE) interpretation. The conceptual models were developed using water level data and were compared to geophysical, structural, and geochemical data. The comparisons revealed that flow paths and potentiometric contours were not consistently orthogonal for any of the three conceptual models, suggesting that (i) potentiometric contours may be incorrectly interpreted due to assumptions of perched versus nonperched aquifer conditions; (ii) the resolution of the geochemical data, which was used to interpret flowpaths, is insufficient for constraining the conceptual models; and (iii) the system is anisotropic, which is supported by evaluation of the geologic stress field.

Questions and comments from the audience and responses:

- The interpreted flowpath near the VH1 and VH2 wells suggests that flow is upgradient. Reply: Water levels for the VH1 and VH2 wells are high, which affects the interpreted contours. The possibility that the wells reflect perched aquifer conditions has not been definitely resolved and differences among the conceptual models can depend on those assumptions. The resolution of the geochemical data used to interpret the flowpaths is also important to consider.

- Could the differences in the conceptual models reflect transient conditions of the potentiometric surface?
Reply: A 10-year study by Grieves, et al. (1997) found that water levels fluctuated, in some cases, by a meter or less, suggesting that the potentiometric surface for Yucca Mountain is relatively stable and has minimal seasonal fluctuations.
- (2) Studies and Advances Relevant to the High-Level Waste Program
- “Long-Term Monitoring Research Needs: A DOE Perspective, by B. Moore and C.B. Davis
This discussion focused on the DOE approach to long term monitoring which involves increasing the efficiency of current monitoring programs. Topics included development of low maintenance, *in situ* sensors, data procurement via remote networks, and the selection of data from the networks.
 - “Soil CO₂ Flux in the Amargosa Desert, Nevada, During El Nino and La Nina Years 1998–1999” by A.C. Riggs, D.I. Stannard, F.B. Maestas, M.R. Karlinger, and R.G. Striegl
This presentation focused on CO₂ flux in soils which was monitored during two climatic events. The results of the monitoring program indicated that the largest CO₂ flux occurred in soils that are simultaneously warm and moist.
 - “Concentration and Distribution of Well Drilling in the Amargosa Desert Area of Southern Nevada” by M.P. Lee, A.J. Gros, and N.M. Coleman
The authors covered the history of water availability in the Amargosa Desert. Natural water supplies (springs) agricultural and public supply wells were highlighted. Physical and economic factors rather than water availability are reported to have been the basis for the reduction in irrigation permits.
 - “255 Agreements, Not 293 Unresolved Issues, on the Proposed High-Level Waste Repository at Yucca Mountain, Nevada” by B.W. Leslie
This presenter described the role that the NRC plays in the Yucca Mountain Project. Recent events in the program and the status of the issue resolution process for key technical issues were presented. Over 200 agreements remain, which require that documentation be provided by the DOE, and then reviewed and accepted by the NRC.
 - “The CNWRA Three-Dimensional Groundwater Flow Model for Yucca Mountain as a Regulatory Tool to Risk Inform NRC Reviews” by H.D. Arlt and J.R. Winterle
H. Arlt focused on a three-dimensional groundwater flow model and its use for resolving key technical issues related to groundwater flowpaths and radionuclide transport. The model is used to review DOE saturated zone models and total system performance assessment analyses.
 - “Experiments to Support the Design of a Field Scale Colloid Test at the Yucca Mountain Alcove 8/Niche 3 Complex” by E.P. Rosen and M.A. McGraw
These authors described scoping experiments that are being used to design field tests intended to evaluate flow and transport of colloids at Yucca Mountain. The results of the scoping experiments suggest that a high flow rate and low ionic strength solution are

needed for the field test. Additional scoping experiments are planned to evaluate the fluorescent properties of microspheres and colloids to be used in the field tests.

CONCLUSIONS:

Presentation of CNWRA studies at technical forums, such as the American Geophysical Union Spring Meeting, provides an opportunity for CNWRA work to be evaluated by technical experts that are familiar with the Yucca Mountain Project. This broad technical feedback is important to improving ongoing CNWRA support for NRC programs.

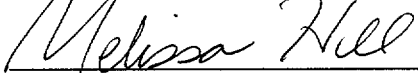
PROBLEMS ENCOUNTERED:

None

RECOMMENDATIONS:

NRC and CNWRA studies should continue to be presented at technical forums such as the American Geophysical Union Meetings.

SIGNATURES:

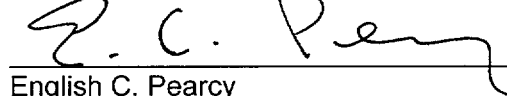


Melissa Hill
Scientist

6/17/02

Date

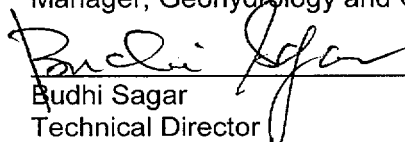
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