

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: American Geophysical Union Spring 2000 Meeting
(20.01402.861)

DATE/PLACE: Washington, DC
May 30–June 2, 2000

AUTHORS: W. Illman and J. Winterle

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PERSONS PRESENT:

The 2000 Spring Meeting of the American Geophysical Union (AGU) was held in Washington, DC May 30–June 3, 2000. The conference was attended by W. Illman, J. Winterle, S. Painter, and P. Bertetti from the CNWRA and several NRC staff members.

BACKGROUND AND PURPOSE OF TRIP:

The semiannual AGU meetings provide an excellent opportunity for exchange of information and exposure to new technologies among earth and physical scientists, many of whom are conducting research pertinent to the geological disposal of high-level waste (HLW) and other CNWRA activities. This trip afforded CNWRA and NRC attendees opportunities to present ongoing research activities, receive constructive feedback regarding methods and assumptions, and discuss new methods and technologies with other researchers. Presentations in several of the meeting sessions were directly relevant to ongoing investigations of the suitability of Yucca Mountain (YM) as a geologic repository for HLW.

SUMMARY OF ACTIVITIES:

Scott Painter (CNWRA) helped organize an interdisciplinary session on anomalous transport in geologic media. The session brought together a diverse group of researchers working on transport problems that are not accurately modeled by the classical advection-dispersion equation. S. Painter gave a presentation on anomalous transport in fracture networks. This work, which was funded by the Swedish Nuclear Fuel and Waste Management Company and performed in collaboration with Vladimir Cvetkovic (Royal Institute of Technology, Stockholm), explored alternative mathematical descriptions of transport in sparsely fractured rock. Mark Meerschaert and David Benson (University of Nevada, Reno) presented a related approach applied to highly heterogeneous porous formations.

J. Winterle (CNWRA) organized a special session titled "Parameter Estimation in Strongly Heterogeneous and Fractured Aquifers." This session included both poster and oral presentations. There were several presentations of interest to CNWRA work for the NRC. For example, Arthur Geldon (USGS, Denver) presented an excellent overview of interpretations of aquifer tests conducted in the volcanic tuffs in the YM region. George Zyvoloski (LANL) followed with an overview of the development and verification of the Site-Scale Saturated Zone Flow Model for Yucca Mountain. These two presentations provided us with

valuable insights into development of YM conceptual and process models, and opportunities to ask questions and to hear opinions of other scientists not directly involved with YM activities. Also worth noting, is a modeling study presented by Alan Shapiro (USGS, Reston) of the effects of fluid density on interwell tracer test results. Alan Shapiro showed that small changes in fluid density (e.g., 1.0 versus 1.02 kg/L) caused by the added tracer solution can cause changes in the shape of tracer breakthrough curves that could lead to biased estimates of other model parameters, such as matrix diffusion coefficients, or effective porosity. Abstracts for the any of the presentations given in this session can be obtained from J. Winterle.

A special session titled "Recent Advances in Using Tracers for Interpreting Hydrogeologic Systems," organized by T. J. Nicholson (NRC) and W. Dam (NRC), held several presentations of interest. G. Bussod (LANL) presented results from field-scale unsaturated zone tracer experiments conducted at the Busted Butte, Nevada, site. He concluded that the data from the tracer experiments emphasize the importance of strong capillary forces in the matrix on the physical retardation of solute migration through vitric Calico Hills rocks. J. Nimmo (USGS) followed with an overview of results from a field experiment conducted in fractured basalts at the Idaho National Engineering and Environmental Laboratory. M. Conrad (LBL) presented results on natural isotope tracer by means of infiltration through the vadose zone at the Hanford site in Washington. J. Selroos (SKB) presented results from the analyses of Tracer Retention Understanding Experiments from the Aspö Hard Rock Laboratory in Sweden. T. Doe (Golder Associates) gave a talk on the analysis of tracer experiments in fractured rock using a discrete fracture network approaches. In connection to the saturated zone modeling at YM, P. Reimus (LANL) presented a talk on the use of multiple tracers to test conceptual models and obtain transport parameter estimates for radionuclide migration in saturated, fractured tuffs at YM. He concluded that the tracer test involving multiple tracers showed that the flow system behaved as a dual porosity medium with matrix diffusion being important for attenuation of radionuclide transport. Waddell (HSI GeoTrans) presented results and analyses from the BULLION forced gradient experiment conducted at the Nevada Test Site. P. Bertetti (CNWRA), W. Dam (NRC), J. Bradbury (NRC), T. Nicholson (NRC), and D. Brooks (NRC) presented a poster describing the regulatory perspective of the importance of field data in performance assessment of a high-level nuclear waste repository.

The Langbein Lecture, presented by I. Rodriguez-Iturbe (Princeton University) was titled, "Hydrologic Sciences Tomorrow: Complexity and Self-Organization in Ecohydrology." His well-attended talk dealt with the coupling of meteorology, hydrology, and biology, a major challenge in hydrologic sciences in the near future.

W. Illman (CNWRA) and J. Winterle (CNWRA) also visited NRC headquarters (HQ) in Rockville, MD, on May 31. The purpose of this visit was to introduce W. Illman to NRC staff and to attend a YM Team Meeting.

PROBLEMS ENCOUNTERED: None

PENDING ACTIONS: None

RECOMMENDATIONS:

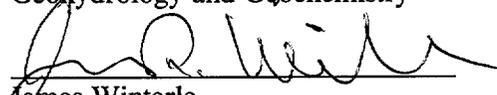
The AGU Fall and Spring meetings provide a valuable insight to hydrologic research and characterization methods and provide an invaluable forum to present results of CNWRA research for informal peer review. Discussions with meeting participants result in useful insights into modeling hydrologic processes and help staff to stay abreast of new technologies. Continued participation in AGU meetings by CNWRA hydrology staff is recommended.

SIGNATURES:



Walter Illman
Geohydrology and Geochemistry

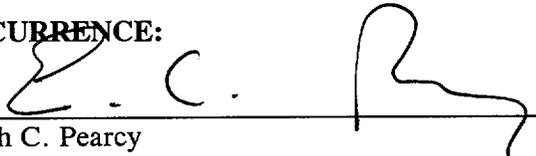
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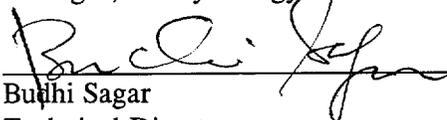
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