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CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: Attendance at the 2001 Devil's Hole Workshop, hosted by the National Park Service
(20.01402.861)

DATE/PLACE: April 25-27, 2001
Death Valley, California

AUTHORS: James Winterle and Chandrika Manepally

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PERSONS PRESENT:

Two CNWRA staff members attended the workshop: James Winterle and Chandrika Manepally.

BACKGROUND AND PURPOSE OF TRIP:

The Devil's Hole Workshop is hosted annually by the National Park Service to provide a forum for discussion and dissemination of information regarding hydrologic, geologic, land use, and social issues that may affect water levels in Devil's Hole, located in the Amargosa desert, Nevada. Devil's Hole is important because it is the only place in the world where the endangered Devil's Hole pupfish is known to exist. Because Devil's Hole is located within the same regional groundwater flow system as Yucca Mountain (YM), the hydrologic and geologic information presented at this meeting is relevant to the understanding of the groundwater hydrology of YM.

SUMMARY OF PERTINENT POINTS:

The workshop consisted of oral presentations on April 25 and 26, and a field trip to the Grapevine Springs area on April 27. Several topics pertaining to the YM Project were presented.

Three presentations by U.S. Geological Society staff focused on the Death Valley Regional Groundwater Flow Model (DVRGFM), which is used by DOE to estimate boundary conditions for the YM site-scale flow model:

- Frank D'Agnese provided an overview of the history and future plans for the DVRGFM. Long-term plans for the Death Valley Model include incorporating new data and evaluating potential climate impacts. Mr. D'Agnese said that DOE is committed to funding development of the DVRGFM through FY 2004.
- Chris Menges presented a new surficial geologic map of the DVRGFM area. This map was described as an original effort (i.e., not an update of an existing map). The map made use of satellite imagery, new field survey data, and existing maps of areas within the coverage.

- Joe Hevesi presented technical details about the most current version of the DVRGFM. The current model abstracts the top 3000 m of regional stratigraphy into 15 horizontal layers, compared to the previous version which had only 3 layers. Mr. Hevesi also discussed an ongoing study to estimate return flows (recharge) from agricultural irrigation by monitoring several 50-ft auger-drilled boreholes in agricultural areas; this study has 1 yr of funding and may be continued depending on results.
- Grady O'Brien presented the status of the predevelopment steady-state flow model of the DVRGFM. The code used was MODFLOW 2000. The results of this modeling effort will be published later this year. This presentation and discussions with the authors provided insights to various techniques used in representing the flow domain features. Results of the steady-state regional model are expected to be used in independent saturated zone flow and transport modeling being conducted at CNWRA.

Mike King presented a summary of a proposal by Inyo County, California, for the DOE grant program to fund drilling deep lower carbonate aquifer wells. Inyo County officials propose to drill five new wells to study the relationship between water from the carbonate aquifer that feeds springs in Death Valley and the water that flows in the deep carbonate aquifer beneath YM. The likelihood of this proposal being funded is not yet clear.

John Jansen, a consultant to Inyo County, California, presented results of geophysical studies using seismic and electro-magnetic soundings used to evaluate geologic controls on springs in Death Valley. This approach appears to have been very successful in identifying fault structures that are associated with the occurrence of spring discharges.

Several Nye County, Nevada, representatives provided updates on information gleaned from the Nye County Early Warning Detection Program (EWDP):

- Tom Buqo presented a conceptual model for the depositional environment for sediments composing the alluvial basin along potential groundwater flow paths south of YM. Mr. Buqo suggested that the juxtaposition of differing sediment types can result in preferential groundwater flow paths within the alluvial basin.
- Don Shettel gave an update of hydrogeochemistry of the EWDP wells.
- Dave Cox presented results of recent pumping tests in EWDP wells EWDP-19D, EWDP-7SC, and EWDP-3S. For well EWDP-19D, total transmissivity of the tested intervals was estimated to be 372 m²/d; hydraulic heads were higher in the tuffs below the alluvial sediments, indicating potential for upward flow from tuffs to alluvium. Well EWDP-7SC revealed good reservoir permeability. Well EWDP-3S "...exhibited anomalously low permeability" compared to the nearby EWDP-3D which had been tested in February, 1999.

Hans Arlt of NRC presented a summary of the significance of recent findings of the EWDP wells from a regulatory perspective.

Al Eddebarh of Los Alamos National Laboratory provided an update of YM site-scale groundwater flow modeling. Dr. Eddebarh presented results of flow modeling considering several alternative conceptual models for structural controls on flow that had not previously been presented.

The workshop concluded with a half-day field trip to the Grapevine Springs area at the northeastern end of Death Valley National Park. This field trip afforded participants an opportunity to observe the surface expression of the fault structure associated with spring discharges of groundwater in the Death Valley area.

CONCLUSIONS:

As in past years, the Devil's Hole workshop provided an excellent opportunity to become familiar with the most recent research, data, and progress on hydrologic investigations that are relevant to the groundwater flow system beneath YM.

SIGNATURES:



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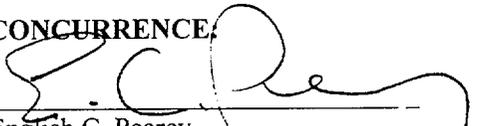
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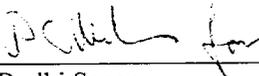
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