

April 18, 2000

Dr. English Percy, Manager
Geohydrology and Geochemistry Element
Center for Nuclear Waste Regulatory Analyses
6220 Culebra Road, Building 189
San Antonio, Texas 78238-5166

SUBJECT: COMPLETION OF INTERMEDIATE MILESTONE - IM 1402.861.020 - LETTER
REPORT "POROSITY DISTRIBUTIONS IN THE YUCCA MOUNTAIN REGION"

Dear Dr. Percy:

The U.S. Nuclear Regulatory Commission staff has completed its review of the subject report. It was sent on April 6, 2000, one day early. This product is programmatically and technically acceptable for publication, and I will enter it as a public document. The report does an excellent job of summarizing sources of data for porosity in the saturated and unsaturated zones at Yucca Mountain. Porosity is a key parameter in estimating groundwater flow velocities for natural barriers. These natural barriers consist of valley fill alluvium and fractured volcanic tuffs with varying degrees of welding and alteration. The higher the connected porosity, the greater is the surface area of reactive minerals that migrating groundwater contacts. Valley fill alluvium will have a higher connected porosity than the fractured tuffs, and therefore has greater potential to retard radionuclides that may escape from a repository in the future. The report points out that the valley fill aquifer south of Yucca Mountain has not been characterized. Nye County, Nevada, is drilling new wells that will help to fill the data gaps. Over the next year the U.S. Department of Energy plans to fund cross-hole tests at an alluvial tracer test complex. That work, along with borehole logs, should improve the understanding of porosity in the valley fill aquifer.

The Center report supports resolution of the deep percolation, saturated zone, and matrix diffusion subissues (key technical issue: Unsaturated and Saturated Flow Under Isothermal Conditions). The milestone relates to several sections of the Yucca Mountain Review Plan. These include 3.2.1.3.3 (Quantity and Chemistry of Water Contacting Waste Packages and Waste Forms); 3.2.1.3.5 (Spatial and Temporal Distribution of Flow); 3.2.1.3.6 (Flow Paths in the Unsaturated Zone); and 3.2.1.3.8 (Flow Paths in the Saturated Zone). If you have any questions, please call me at (301) 415-6615.

Sincerely,
/RA/

Neil Coleman, Program Element Manager
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

cc: J. Linehan
B. Meehan
B. Sagar, CNWRA

Dr. English Pearcy, Manager
 Geohydrology and Geochemistry Element
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