

March 4, 2002

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 1402.861.220 -
"CONCEPTS OF SATURATED ZONE MODELING FOR DEVELOPMENT OF A
SITE-SCALE GROUNDWATER FLOW MODEL FOR YUCCA MOUNTAIN"

Dear Dr. Percy:

The U.S. Nuclear Regulatory Commission staff has completed its review of the subject report, which was sent to us on February 8, 2002, one week early. I find the product to be acceptable both technically and programmatically. This report describes the development of a three-dimensional site-scale model of groundwater flow for the saturated zone beneath Yucca Mountain. In calibrating this model, Center staff found that it was necessary to incorporate structural features, especially to represent a zone of low permeability in the northern part of the model. The report makes excellent use of visual graphics that aid the reader in gaining insight and understanding of the model development and results. Other staff comments are provided in the enclosure. These should be considered in any future updates of this report or other saturated zone modeling reports.

One of the author's recommendations is to evaluate effects of water table recharge along Fortymile Wash and in higher elevation areas. Please note that recharge estimates along Fortymile Wash are available in a report by C. Savard (*Estimated Ground-Water Recharge from Streamflow in Fortymile Wash Near Yucca Mountain, Nevada, Water-Resources Investigation Report 97-4273* US Geological Survey, Denver, CO, 30 pp, 1998).

The Center report relates to two of our integrated subissues, which also form sections of the Yucca Mountain Review Plan. These are: 4.2.1.3.5 (Climate and Infiltration) and 4.2.1.3.8 (Flow Paths in the Saturated Zone). If you have 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

Enclosure: As stated

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

Enclosure

Review of the CNWRA's "Concepts of Saturated Zone Modeling for Development of a Site-Scale Groundwater Flow Model for Yucca Mountain"

- p. 1-1: More detail is needed as to why "the CNWRA flow model is based on a substantially different hydrogeologic framework model compared with the DOE model".
- p. 2-3: Why were uniform 300-m sq. grid cells used for the horizontal discretization in the entire model? Larger grid elements along the boundary of the model would save computational time.
- p. 2-10: Comparison: CNWRA's high hydraulic conductivity unit vs. DOE's high hydraulic conductivity unit. DOE's highest hydraulic conductivity is found in the Bullfrog unit, making the Bullfrog unit one of the most sensitive parameters in the DOE's model, which is not the case for the CNWRA model.
- p. 2-23: Southern boundary condition should be discussed in more detail.
- p. 4-1: More detail is needed on what is meant by "... in the CNWRA model, the observed high water levels in this area are conceptualized as perched water...".

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