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MEMORANDUM FOR: Joseph Holonich, Director
Repository Licensing and Quality Assurance
Project Directorate
Division of High-Level Waste Management

FROM: Margaret Federline, Branch Chief
Hydrology and Systems Performance Branch
Division of High-Level Waste Management

SUBJECT: PHASE I REVIEW OF STUDY PLAN 8.3.1.2.1.4, REV. 0: REGIONAL HYDROLOGIC SYSTEM SYNTHESIS AND MODELING [PPSAS 411421, TACS L60241]

As requested, we have completed the Phase I review of the subject study plan (see enclosure). This review was conducted using the Review Plan for NRC Staff Review of DOE Study Plans Revision 1 (December 6, 1990). As discussed below, we have identified no objection-level concerns. However, the study is a candidate for detailed technical review.

The stated objectives of this study are (1) to synthesize all existing hydrogeologic data as well as that collected during site characterization into conceptual models of the regional and subregional groundwater flow systems, and (2) to construct and calibrate numerical models of the groundwater flow systems based on the conceptual models. These models will be important tools in developing site-scale models to evaluate pre-waste-emplacement groundwater travel time, and predicted repository performance with respect to the EPA environmental standards under 40 CFR 191. The study includes the following four activities:

8.3.1.2.1.4.1	Conceptualization of regional hydrologic flow models
8.3.1.2.1.4.2	Subregional 2-D areal hydrologic modeling
8.3.1.2.1.4.3	Subregional 2-D cross-sectional hydrologic modeling
8.3.1.2.1.4.4	Regional 3-D hydrologic modeling

Work under this study plan does not include any field tests and thus will have no physical impacts on the Yucca Mountain site or other site characterization activities. No objections have been identified because the work does not include activities that could cause significant and irreparable adverse effects on the site, site characterization program, or the eventual usability of the data for licensing (programmatic fatal flaws). However, this study plan is a candidate for a detailed technical review because it meets several of the criteria described in step 6 of part 4.2 of the Review Plan. It is related to several key site issues (including groundwater travel time) and NRC open items (see enclosure, pages 4-6). Also, the study plan describes general approaches to model calibration, sensitivity studies, and validation.

The following concern about technical procedures should be brought to the attention of DOE. The study plan states that technical procedures do not apply to any of the work activities. One reason given is that "...modeling is an analysis and interpretation activity, the appropriate application of which is

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assured by technical review..." However, all work under this study clearly meets the scope of the procedure for a scientific notebook system (see attachment). The scientific notebook system may be used in lieu of a technical procedure to document research work that requires extensive professional judgement and trial-and-error methods. Because the study plan cites neither technical procedures nor the scientific notebook system, it appears that the work described will not be documented in an acceptable manner.

The review was conducted by Neil Coleman of the Hydrologic Transport Section, who can be reached at 504-2530.

Margaret Federline

Margaret Federline, Branch Chief
Hydrology and Systems Performance
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Enclosure:
As stated

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