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MEMORANDUM FOR: Dan J. Fehring
Repository Projects Branch
Division of Waste Management
FROM: Chris G. Pflum
Repository Projects Branch
Division of Waste Management
SUBJECT: REVISED MODELING STRATEGY DOCUMENT FOR HLW PERFORMANCE ASSESSMENT

I have a few comments on your document that may prove helpful in preparing the final draft. In general, the document reads well and presents all the pertinent issues that may arise in DOE's performance assessments. The document also anticipates DOE's response to these issues. DOE may, however, respond differently than what the document suggests.

DOE explains in its siting guidelines how it will resolve various issues throughout the repository program. Some of the issues in the guidelines are similar to those in your document, but at times, the guidelines and your document offer different resolutions for the same issue. In the comments that follow, I will try to point-out where these discrepancies lie.

On several occasions you state that it is not clear how much credit DOE will assign to engineered barriers when projecting the overall performance of a repository. (pp 17, 24 and 38) While the siting guidelines do not assign a specific value to each engineered barrier, they do establish a range of values that would not vary from site to site. Section 960.3-1-5 of siting guidelines explains that when DOE compares sites it will consider "a range of performance levels [that] shall vary by at least a factor of 10 above and below the engineered barrier performance requirements set forth in 10 CFR 60.113, and the range considered shall be identical for all sites compared." Thus, for the purpose of modeling a repository's performance, one can assume that the release rate will be 10^{-4} to 10^{-6} per year and that the containment period will last 30 to 10,000 years. I suggest that you acknowledge this range of values in your document.

On page 58 you present the issue: "Have the NEPA/institutional/siting requirements for nuclear facilities been met?" Your analysis of this issue--"Results of numerical analyses are not anticipated for this issue"--may be incorrect. Section 114(f) of the NWPA requires DOE to issue an environmental impact statement (EIS) for its decision to select a site for development as a repository. The NWPA goes on to say that this EIS will satisfy DOE's NEPA obligations and that the NRC should adopt this EIS (to support its decision to license a repository) to the extent practicable.

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According to the guidelines, the EIS will examine a site's compliance with various guidelines in the context of the evidence related to those guidelines. This evidence, according to §960.3-1-5, "shall include analyses of expected repository performance to assess the likelihood of demonstrating compliance with 40 CFR Part 191 and 10 CFR Part 60." Consequently, numerical analyses will appear in DOE's EIS. If we plan to comment on these numerical analyses, they should be included in the document's technical analyses.

The issue pertaining to pre-waste emplacement groundwater travel time (p. 56) is phrased in terms of our performance objective at 10 CFR 60.113. However, the guideline criterion for groundwater travel time differs from that in 10 CFR 60. The guidelines refer to travel time "along any pathway of likely and significant radionuclide travel" while 10 CFR 60 refers to travel time "along the fastest path of likely radionuclide travel." The Commission found that the guidelines and 10 CFR 60 were not in conflict. Nevertheless, you should be aware of the different wording.

The definitions of "finding", "model" and "performance assessments", listed in the document's appendix, differ from definitions in the guidelines. Since these terms are not defined in 10 CFR 60, we have tacitly accepted DOE's definitions by concurring in the guidelines. I suggest that you use the guidelines' definitions of these terms.

Apart from the guidelines, I have one comment on your discussion of the disturbed zone. On page 51 you state that you expect DOE to "evaluate the transport of radionuclides through the disturbed zone." I suggest the underlined phrase be changed to read: "from the disturbed zone to the accessible environment." According to our rationale behind 10 CFR 60, transport through the disturbed zone would be too complex for analyses. Transport analyses should therefore begin once the radionuclides leave the disturbed zone. In addition, the document later states, "the NRC staff does not expect DOE to claim substantial credit for isolation of wastes within the disturbed zone" (p. 52). If the disturbed zone does not substantially contribute to waste isolation, it is not clear why DOE must evaluate the transport of radionuclides through the disturbed zone.

I believe these comments can be incorporated into your document with only a few revisions. Let me know if I can help.

"ORIGINAL SIGNED BY"

Chris G. Pflum
Repository Projects Branch
Division of Waste Management

DFC	:WMRP:mkg	:WMRP	:EPA	:	:	:	:
NAME	:CGPflum	:RRBoyle	:	:	:	:	:
DATE	:84/08/06	:8/6/84	:	:	:	:	: