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LETTER REPORT

TITLE: Suggested Issues for a Workshop on Performance Assessment with DOE/Hanford (generally applicable to other sites)

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PERFORMANCE ASSESSMENT ISSUES

1. Overall Strategy

Before addressing concerns specific to the various components of the multiple barrier system, a general understanding of the overall strategy for performance assessment is required. We need to understand how credit for the various barriers will be allocated and how emphasis on the performance of the more important barriers will be justified. Questions that come to mind include: Will key radionuclides be modeled differently than less important ones? Will some barriers be modeled accurately, while others treated with "bounding" calculations? Will the waste package be modeled carefully, while far-field sorption treated only as a potentially favorable characteristic? The use of accurate models versus bounding calculations is a particularly important consideration for all models, because the approach to modeling will determine the type of data that needs to be obtained.

2. Relationship of Data to Models

It is often mentioned that performance assessment drives the gathering of data. Unfortunately, this direct relationship is difficult to detect in the actual workings of the site projects. Information on how performance assessment actually helps to set priorities, acceptable uncertainty limits, required detection limits, and the nature of the data obtained would be most beneficial. The allocation of performance (see 1.) should allow DOE to set targets for the "goodness" of the data that will go into the performance assessment models. Also, where ranges

of values are needed, how is the experimental program helping to establish the limits and type of distribution of the ranges. Finding out about the nature of this relationship is important because it allows one to evaluate the detailed models that DOE has selected and the type of data required. The consistency of the choices should then be comparable to generic technical positions and a judgement made about the acceptability of the DOE approach.

3. Geochemical Conditions

We need to understand the model for geochemical conditions that DOE intends to use as a basis for determining (experimentally or via models) parameters dependent on the geochemical conditions. Questions to consider include: What are the anticipated conditions? Will a range of values be used? If so, then will the ranges be estimated based on field measurements or will a computer code be used to calculate ranges? If calculated, will the ranges be based on mechanistic models or will the models just be equations fit to empirical data? How will the degree of conservatism be established?

4. Sorption

Our concern over the validity of the DOE approach to modeling far-field sorption remains. Suffice to say that a discussion should be included on the agenda that addresses the nature of radionuclide transport models being used by the DOE (especially the nature of sorption models). We will develop a detailed list of questions/concerns as needed.

5. Solubility

The mass transfer approach to modeling releases from the waste package seems quite viable. Our major concern is the nature of the data being obtained and how it will be used in these models. For example, it is not clear how the DOE will incorporate the role of colloids and/or particulates into these mass transfer models. Also, the experimental programs do not seem to be placing much emphasis on elucidating the importance of colloids and/or particulates. A significant quantity of data on the steady-state concentrations of various radionuclides is being obtained by the DOE. It is important to determine how this data will be used in the waste package model. For example, will bounding

values be estimated based on the entire data set? How will the high temperature data be extrapolated to lower temperatures for use in modeling times beyond the thermal period? Will the data be used to develop a suite of empirical equations for calculating radionuclide solubility/concentration values, or will the data be used to try to validate sophisticated computer models that can be used to simulate the experimental results and to extrapolate to conditions not studied experimentally.