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United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

OCT 10 1984

Mr. Hubert J. Miller
Chief, Repository Projects Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Miller

The Department of the Interior has reviewed the document containing the Draft Technical Position for the Hydrologic Testing Strategy for the Basalt Waste Isolation Project. Our detailed comments are attached. We appreciate the opportunity to comment on this information.

WM Record File

101.6

WM Project

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Docket No.

PDR

LPDR

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Kennedy

of

Sincerely,


Bruce Blanchard, Director
Environmental Project Review

Enclosure

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Specific Comments on Hydrologic Testing Strategy for the Basalt Waste Isolation
Project; NRC BWIP Technical Position Paper No. 1.1

The Nuclear Regulatory Commission (NRC) states on page 3 "A highly prescriptive approach by the NRC staff to guidance on groundwater testing strategy is not appropriate." Although some specific suggestions are appropriate, it is our impression that the document is more prescriptive than is warranted by the present state of knowledge of the hydrology of basaltic terrane in general and of the BWIP site in particular.

Page 3, Para. 2, Line 6. It is also necessary to consider the time period over which the tests must be run.

Page 4, Para. 4, Line 17. "..., and some along the most important potential pathways..." Such tests cannot be run until well along in the process of characterization because the pathways will be unknown for some time.

Page 4. The proposed site is in proximity to the Columbia River. We recommend a good data base be collected to know what the preoperating conditions are in the river. Water quality and radionuclides present in the river should be gathered by a single agency.

Page 4, Para. 4, Line 19. We do not believe that there is any compelling reason to start testing in the Grande Ronde Formation, even though the target repository horizons are in this formation. Perhaps tests in the Priest Rapids Member of the Wanapum or some other highly permeable zone would allow the stressing of a larger area and, consequently, yield more information in the early testing stages.

Page 6, Para. 1. It is the purpose of the USGS-PNL-Rockwell Interagency Hydrologic Working Group to resolve the regional ground-water system model issues. Solution to this complex problem should not be expected until well into the process of site characterization.

Page 6, Para. 5. It should be made clear that the model under discussion is for the reference repository area and not the basin model being used to set the boundary conditions.

It is unclear how large-scale, multiple-well pump tests will "...improve hydraulic head data..."

Page 7. The overall tone of the discussion of large scale, multi-well pumping tests on this page and the top of the following page is much more positive than is warranted by the many uncertainties attendant to running and analyzing such tests.

Page 7, Para. 1. It should be noted that drilling muds can always be a problem in hydraulic testing. The competence of the driller and the quantities of mud lost are better indicators than the size of the well in determining whether drilling mud would significantly affect the proposed tests.

Page 7, Para. 2, Line 4. Suggest rewording this line as follows "multiple wells may permit the analysis of the type of..."

Page 7, Para. 4, Lines 5 and 6. Suggest the deletion of "and to determine the degree of vertical isolation." This is a restatement of measuring vertical hydraulic conductivity.

Page 7, Para. 4, Line 6. Sentence starting "The effects of..." is not correct. Large-scale tests will integrate the effects of numerous heterogeneities rather than detect small-scale features. This is stated in the first sentence of the following paragraph.

Page 8, Section 2.1 indicates that a constraint to a testing strategy for the groundwater flow system at the BWIP Site is the reasonableness of the testing strategy in terms of limited resources and duration of the project. On page 10, the Technical Position indicates that the revised program should fall within the range of \$3 million to \$10 million (exclusive of administrative overhead) and take between one and two years to complete (not considering mobilization time). Does NRC consider these resources and time requirements "reasonable" (particularly given the licensing requirements of NRC)? Is the time schedule and cost a legitimate concern of NRC or should it be left entirely to DOE, who has the ultimate responsibility?

Page 9, Section 2.2, number 1. First bullet is unclear as to the intent. Third bullet, "continuous water-level monitoring recorders," implies strip chart recorders rather than digital or bottom hole transducer records. Is this the intent? Fourth bullet, "hydrochemistry survey," is rather a vague statement of intent. Fifth bullet, the term "piezometric baseline" needs careful definition because it can imply many different things both spatially and temporally.

The term "technical consensus" is used in a number of places in explaining the draft Technical Position. It would be helpful to explain how and by whom such technical consensus on various matters is to be achieved.

The draft Technical Position indicates that installation of the revised piezometric and hydrochemical monitoring network will include existing and new boreholes. Care should be taken in including existing holes drilled with mud as part of the revised monitoring network.

Page 10, Para. 1, Line 4. Suggest replacement of "host rock" with "unit(s) being tested" as being more descriptive. Achieving maximum drawdown and cone of depression would dictate testing some unit other than the Grande Ronde in the first test.

Page 11, Para. 2, Section 2.4.1. Suggest replacing the word "standard" in the first line with "most effective" as, to our knowledge, there is no "standard" method. Line 6, typo "paried" should be "paired."

Page 11, Para. 3, Line 5. The phrase "including calibration of the external boundary conditions" needs clarification.

Page 12, Section 2.4.3. In addition to the sampling proposed, much valuable additional information can be obtained by collecting periodic samples of water from the pumped well during the long-term pumping tests.

Page A-1, Para. 2. It should be recognized that all depth to water measurements will require correction to obtain true bottom hole pressures in order to evaluate the rather flat hydraulic gradients within single horizons and to determine the vertical gradients between zones.

Page A-2, Line 2A. We assume that you mean by the term "pre-analyze" the running of model simulations using ranges of values for the hydrologic parameters in order to obtain some guidance as to how long the test should be run. Perhaps some explanation of intent would be desirable.

Page A-3, Para. 1. We do not agree that a test near RRL-2 would be desirable early in the testing procedure. This well was hydraulically fractured in several zones in order to make in-situ stress measurements. This testing could have altered the vertical permeability in the vicinity of RRL-2.

Page A-3, Para. 2B. It might be more desirable to pick a unit which has displayed widespread hydrologic continuity, such as the Priest Rapids Member, for the first test because of the large areal stress which could be applied. It is instructions such as these which reinforce our concern over the highly prescriptive tone of this Technical Position paper.

The collection of periodic water samples from the pumping well may also furnish valuable additional information and should be included in the testing procedure.

Page A-4, Para. A3, Line 7. There are no wells which penetrate the "entire Grande Ronde Formation" at the RRL and there may be no need to test the entire rock mass.

Page A-4, Para. A3, Line 22. It is unclear what is meant by "a clear hydraulic connection" as requiring additional testing of the overlying units. Perhaps some expansion of intent could be desirable in this section.

Page A-5, Para. A5. If no response to pumping can be detected at distances as small as 50 meters, will any additional hydraulic testing of wells be necessary. Would this not require experimental work with shafts and tunnels?