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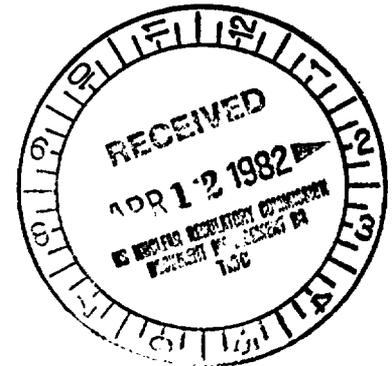
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MEMORANDUM FOR: Michael J. Bell, Chief  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

Hubert J. Miller, Chief  
High-Level Waste Technical  
Management Branch  
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FROM: Robert J. Wright, Senior  
Technical Advisor  
High-Level Waste Technical  
Management Branch  
Division of Waste Management

SUBJECT: BWIP SITE SUITABILITY ISSUES



Attached is a list of proposed BWIP site suitability issues. Proposed review assignments are noted. Also attached is a chart which portrays the key elements of review topics which guided the allocation of review issues to the five review topics.

The following notes are relevant to the issues list.

1. A site issue is a broad question that is critical to site suitability and should be answered during site characterization.
2. The issues have been derived from a number of sources, including (a) documents of BWIP; (b) reviews by the National Academy of Science, the BWIP hydrology and geology overview committees, the Office of National Waste Terminal Storage Integration; and (c) site visits by NRC staff and consultants.
3. The statement of an issue reflects a "bare bones" treatment. In particular, no mention is made of procedures or methods, which may be important components of some issues. These will be discussed in issue development.
4. Although the intent is to list first, within each topic, the

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more important issues, no great significance can be attached to the ordering of issues.

- 5. Some issues, eg. vertical permeability, are part of other, larger issues but are listed separately because of importance.

The next steps are for each issue reviewer to develop the issue and a review schedule therefore in accordance with steps 1.2, 1.3 and 1.4 of the SCR Review Plan.

*6.*

Robert J. Wright, Senior  
Technical Advisor  
High-Level Technical  
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# Matrix for Grouping Site Suitability Issues

Where?	What?	
Out from repository wall	<p><u>Transport</u></p> <ul style="list-style-type: none"><li>• Estimates of releases over 10,000 yrs., including effects of changes due to waste, humans, nature</li></ul>	<p><u>Stability</u></p> <ul style="list-style-type: none"><li>• Probability + nature of changes that affect transport due to waste, humans, nature</li></ul>
In from repository wall	<p><u>Barriers</u></p> <ul style="list-style-type: none"><li>• Barriers placed in underground facility - waste, waste form, backfill, seals - to satisfy repository functions</li></ul>	<p><u>Design</u></p> <ul style="list-style-type: none"><li>• Underground facilities to satisfy repository functions</li></ul>
Everywhere	<p><u>Institutional + Environmental</u></p> <ul style="list-style-type: none"><li>• Site selection procedures</li></ul>	



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

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BWIP SITE SUITABILITY ISSUES

A Transport

- A-1 What is the accessible environment? Quinn
- A-2 What hydrostratigraphic units are used for modeling and testing?  
What is the basis for identification? Johnson
- A-3 What is the areal distribution of values for the hydrogeologic  
parameters needed to calculate groundwater flow paths and travel  
times? Verma
- A-4 What are the effects on groundwater flow of structural,  
stratigraphic and lithologic heterogeneities in the basalt section,  
with emphasis on the Umtanum? Johnson
- A-5 What are the groundwater recharge and discharge locations,  
mechanisms and amounts for the Pasco Basin flow systems?  
Quinn
- A-6 What is the solubility of radionuclide-bearing compounds and phase  
stabilities in the groundwater system? Brooks
- A-7 What are the retardation properties of the mineral phases which  
line fractures? Brooks
- A-8 What is the age and chemistry of groundwater in the host rock?  
Corrado
- A-9 What are the groundwater flow paths, travel times and radionuclide  
releases under existing conditions? Quinn
- A-10 What are the expected effects on groundwater flow paths,  
groundwater travel time and radionuclide transport of future,  
natural changes?  
Quinn
- A-11 What are the expected effects on groundwater flow paths,

groundwater travel times and radionuclide releases of repository-induced changes?

Quinn

A-12 What are the expected effects on groundwater flow paths, groundwater times and radionuclides releases of human-induced changes?

Quinn

B Stability

- B-1 What are the probabilities and nature of natural changes that would adversely effect repository performance? Pendleton
- B-2 What are the probabilities and nature of human-induced changes that would adversely affect repository performance? Verma
- B-3 What are the probabilities and nature of repository-induced changes that would adversely affect repository performance? Rhoderick
- B-4 What is the seismic hazard to surface and subsurface facilities? Prestholt
- B-5 How does the value of mineral resources at the RRL compare with the values in other areas of similar size within the geologic setting? Wright
- B-6 What effects on repository performance can be expected from the Pleistocene faults on Gable Mountain? Pendelton
- B-7 What are the effects of future groundwater use on radionuclide isolation? Verma

C Rock mechanics, repository design

- C-1 Are the repository design criteria and the functional description complete and accurate with respect to the performance objective of isolating waste? Pittiglio
- C-2 Is the conceptual design consistent with the design criteria and the functional description and appropriate to satisfaction of the performance objective? Chase
- C-3 How does the conceptual design accommodate thermal and mechanical effects due to waste emplacement? Seamans
- C-4 How does the conceptual design accommodate stresses in the repository host rock? Hartung
- C-5 How is long term performance, in isolation of radionuclides, affected by construction of the Exploratory Shaft? Rhoderick

D Engineered barriers, waste form

D-1 How is the performance of each barrier component expected to be affected by the following parameters:

- (a) Hydrostatic head differentials and hydraulic conductivities between locations in the near field.
- (b) Rate of deformation of repository surfaces and resultant loading of engineered system components.
- (c) Electro-chemical potentials in the repository host rock.
- (d) Electrical conductivities of the ground water and the saturated repository host rock.
- (e) Thermo-dynamic parameters, including heat conductivity, heat capacity and heat transfer coefficients.
- (f) Gas transfer. Cook

D-2 What is the effect on radionuclide transport of changes in chemistry of the engineered barriers? Brooks

E Institutional and environmental

- E-1 What was the decision making process for selection of the candidate area and site? Uleck
- E-2 What technical factors were considered in selection of the candidate area and site? Coplan
- E-3 What institutional factors were considered in selection of the candidate area and site? Uleck
- E-4 What environmental factors were considered in selection of the candidate area and site? Pflum
- E-5 What other sites are under consideration for characterization? Coplan