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(Return to WM, 623-SS)

FEB 07 1986

MEMORANDUM FOR: Joseph O. Bunting, Chief
Policy and Program Control Branch

THRU: Philip M. Altomare, Section Leader
Program Planning Section
Policy and Program Control Branch

FROM: Ruth Chiang Carter, Project Manager
Program Planning Section

SUBJECT: CRITICAL REVIEW OF DOE DOCUMENT "A METHODOLOGY FOR
AIDING REPOSITORY SITING DECISIONS"

The Department of Energy has proposed a decision-aiding methodology to be used in repository siting decisions. The decision-aiding methodology is based on the utility-estimation method which was one of the three proposed methods in the draft environmental assessments published by the DOE in December 1984. The draft environmental assessments recommended three methodologies for repository siting decisions. Two of the methodologies (averaging and pairwise comparison) were criticized for lacking firm theoretical foundations, and the third methodology (utility-estimation method) was criticized for not following formal application procedures suggested by the professional literatures. In response to these criticisms, the DOE has developed a decision-aiding methodology which follows theoretical guidelines of the multiattribute utility analysis. The multiattribute utility analysis method is a formalized version of the utility-estimation method.

The decision-aiding methodology based on the multiattribute utility theory is an appropriate methodology for repository siting. The methodology divides a decision into multiple decision steps and these decision steps subdivide and identify decision areas. The identification of decision areas improves understanding of the decision process and it can be a guideline to a decision maker for site comparison as well as his (her) decision process. Because a decision is divided into parts, scientific and value judgements can be made exclusively from each other. This particular decision technique is necessary in order to consider all possible aspects of the facility as independently as possible.

In its document, the DOE list the primary application of the methodology as well as the limitations imposed on the methodology. The rationale of each decision step is also included but the rationale is provided in relation to the theory and not specific to siting. All other aspects of the methodology is given in relation to the theory and fails to be specific in respect to

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repository siting. In the absence of definite objectives and attributes that are specific to siting guidelines, it is not possible to agree or disagree with the DOE in adaptation of the methodology. However, based on wide acceptance of the methodology by industries and theoretical applicability implications, one can conclude that the methodology is likely to be a suitable methodology to use, provided that the objectives and attributes conform to the theory.

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Ruth Chaing Carter, Project Manager
Program Planning Section
Policy and Program Control Branch

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FROM	DATE OF DOCUMENT	DATE RECEIVED	NO
Ben Rusche, (Phil Alton)	5		WMPC-277
TO	MEMO REPORT OTHER CC OTHER		
Peter Myers National Ac	CONCURRENCE <input type="checkbox"/> DATE ANSWERED NECESSARY <input type="checkbox"/> COMMENT <input type="checkbox"/> BY 1/31/86		
CLASSIF	DEFERRED TO DATE RECEIVED BY DATE		
DESCRIPTION (Must Be Unclassified)	are 12/12		
Critical Review	12/12		
"A Methodology			
Repository Site			
Decisions"			
ENCLOSURES			
REMARKS	CLOSED 2/7/86 memo to JOB		

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Department of Energy
Washington, D.C. 20585

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WM Project 10, 11, 16
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Sent to REB
DOE

Dr. Peter B. Myers
Staff Director
Board on Radioactive Waste Management
National Academy of Sciences
2101 Constitution Avenue
Washington, D.C. 20418

Dear Dr. Myers:

As a follow up to my letter to Frank L. Parker of August 29, 1985, we are pleased to provide for review by the Board on Radioactive Waste Management a report describing the ranking methodology to be used in the final Environmental Assessments (EAs) to accompany the nomination of sites as suitable for site characterization for the first geologic repository.

The ranking methodology has been developed in response to comments received from the Board and others regarding the adequacy of the three methods presented in the draft EAs. The methodology is a much refined and more detailed version of the "utility-estimation method" presented in the draft EAs. This method was regarded by most commenters on the draft EAs as being potentially the most appropriate if it were implemented in a fashion more strictly consistent with the professional decision-analysis literature.

The decision-aiding methodology is not intended to reduce the professional judgment required in selecting sites for characterization. It should, however, permit the scientific and value judgments to be made explicit to the reviewer. Furthermore, the methodology should permit sensitivity analyses that can be used to explore the sensitivity of the decision to alternative judgments. The methodology is not intended to be used, by itself, to determine which sites should be recommended; its purpose is to provide a technical basis, in conjunction with the provisions of the siting guidelines specifying diversity of rock types and other information, for such a decision. The decision as to which sites will be recommended will be made by the Secretary of Energy, based on the EAs.

The description of the methodology contained herein is generic. The various steps in the methodology are discussed and illustrated specifically enough, however, so that the application to the repository siting decision should be clear. All assumptions and value judgments presented in the report are for illustrative purposes only. We believe that this methodology description is as you and my staff have discussed.

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We appreciate your undertaking this review on the schedule discussed in the August 29 letter. We believe that the importance of the site-recommendation decision and the increased public confidence following such a review of the methodology warrant such steps. We look forward to the meeting with the Board on October 1-3, and if we can be of further assistance until then, please do not hesitate to call.

Sincerely,

A handwritten signature in cursive script, reading "Ben C. Rusche".

Ben C. Rusche, Director
Office of Civilian Radioactive
Waste Management

Enclosure