

Mr. Robert R. Loux, Director  
Agency for Nuclear Projects  
Nuclear Waste Project Office  
State of Nevada  
Carson City, Nevada 89710

Dear Mr. Loux:

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW PLAN FOR REPORT OF EARLY  
SITE SUITABILITY EVALUATION OF THE POTENTIAL REPOSITORY SITE AT YUCCA  
MOUNTAIN, NEVADA

At a recent (February 6, 1992) technical exchange between the U.S. Department of Energy (DOE) and NRC, NRC staff committed to provide the State of Nevada, Nuclear Waste Project Office, DOE and affected units of local government with a copy of NRC's review plan for review of the DOE's Early Site Suitability Evaluation (ESSE) as soon as that plan was available. At the time of that meeting we specifically indicated to your representative that we would provide the review plan prior to the start of our review of the ESSE, but, because of the nature of the ESSE, it was necessary for the NRC staff to conduct a scoping review of the document before a review plan could be written.

The enclosed document is the final review plan for the NRC's review of the ESSE. The review plan states the objectives of our review and the schedule for submittal of the staff's comments to the DOE. If the State of Nevada wishes to make any comments, we would be pleased to consider those comments in our ongoing review.

If you have any questions or comments concerning the ESSE review or review plan, please contact Charlotte Abrams of my staff at (301) 504-3403.

Sincerely,

*/s/*  
Joseph J. Holonich, Director  
Repository Licensing and Quality  
Assurance Project Directorate  
Division of High-Level Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated *enclosed*

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REVIEW PLAN FOR U.S. DEPARTMENT OF ENERGY  
REPORT OF EARLY SITE SUITABILITY EVALUATION  
OF THE POTENTIAL REPOSITORY SITE AT YUCCA MOUNTAIN, NEVADA

INTRODUCTION

The "Report of Early Site Suitability Evaluation of the Potential Repository Site" (ESSE) presents an evaluation conducted by the U.S. Department of Energy (DOE) contractors of the technical suitability of the Yucca Mountain, Nevada site against criteria from 10 CFR Part 960 (DOE General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories). DOE considers this to be a baseline evaluation of the site and plans for an evaluation of this type to be conducted every 18 to 24 months to focus and prioritize future data acquisition activities and to aid in resolution of technical issues related to site evaluation. The DOE proposes to follow the ESSE with a test-by-test prioritization of site characterization activities and an integration of studies. DOE has scheduled the completion of this prioritization in fall 1992.

Volume I of the ESSE contains the suitability evaluation and an update to technical information and analyses that were presented in DOE's Final Environmental Assessment for Yucca Mountain, Nevada (FEA, issued in 1986). Evaluations and technical discussions are set up based on the structure of the siting guidelines presented in 10 CFR Part 960, Subparts C and D. The report identifies technical issues that are related to each guideline, followed by a review of FEA findings for each guideline and a review of technical information acquired since the FEA.

The ESSE is accompanied by a compilation of comments (Volume 2, "Report of the Peer Review Panel on the Early Site Suitability Evaluation of the Potential Repository Site at Yucca Mountain, Nevada") by members of an independent peer review panel. The site suitability evaluation incorporates recommendations of the peer reviewers.

PURPOSE AND SCOPE OF THE REVIEW

DOE has released the ESSE for a 90-day public comment period, ending June 15, 1992. However, given the review schedule provided later in this plan, the staff's comments will not be provided to DOE until July 15, 1992, to allow sufficient time for the staff to prepare draft comments and then brief the ACNW prior to forwarding final comments to DOE. This need for additional time will be identified to DOE by letter. Although DOE does not necessarily endorse the findings in the contractor report, it proposes to make this evaluation effort an iterative event, coupled with performance assessments, to be released at approximately 18 to 24 month intervals. DOE also plans to use the baseline site evaluation contained in the ESSE to focus and prioritize future data acquisition activities and to aid in the resolution of site technical issues. Because DOE plans periodic evaluations of this type, it is appropriate to identify and raise issues of concern early in the evaluation process.

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ENCLOSURE

This review is being conducted to support NRC's ongoing efforts to identify major concerns important to NRC's prelicensing consultation with DOE. The ESSE provides a baseline for DOE's site characterization priorities; therefore, NRC should review the ESSE to identify major technical concerns which could potentially affect DOE's program for gathering site characterization information.

In preparation for the review, the staff should become familiar with several documents containing information relative to the Commission's comments and recommendations on the DOE's siting guidelines. These documents include SECY-84-233, SECY-84-482, and 49 FR 9650 (Attachments).

#### Purpose of the Review

The purpose of the ESSE review will be to:

- 1) determine if DOE's application and interpretations of the siting guidelines are consistent with those concurred upon by the Commission;
- 2) determine if technical evaluations are free of any major concerns, there is inconsistency in the use of data, all data have been considered, or there are concerns related to interpretations; and
- 3) determine if the peer review process for the ESSE is consistent with the NRC's guidance on peer review for high-level waste repositories (NUREG-1297).

The review should be consistent with previous reviews conducted on DOE's draft and final Environmental Assessments. The review is not being conducted to determine the adequacy of the site with respect to the guidelines; however, if the NRC staff, at any time, determines that the site does not appear to be appropriate for further characterization, that issue must be raised. Because many of the guidelines are similar to (or the same as) the licensing criteria set forth in 10 CFR Part 60, the staff will review the data, interpretations, and assumptions that DOE may use to substantiate its evaluation of the site against the guidelines.

#### Review of Use of Expert Judgment

The formal use of expert judgement is directed toward drawing inferences where hard data and facts are few, whereas peer review is an independent critique of the way data and information are analyzed or of conclusions drawn from those analyses. Therefore, a separate review of the application and use of expert judgment will be conducted in conjunction with the review of the ESSE. The NRC staff has stated on numerous occasions its concern about possible misuse of "expert judgment" when demonstrating repository safety. For example, the enclosure to SECY-91-242 stated:

The staff recognizes that expert judgment will be widely used in a repository performance assessment, but would not consider it acceptable to substitute expert judgment for analyses, field or experimental data, or other more technically rigorous information that is reasonably available or obtainable. Expert judgment should be substituted for "hard data" only when it is impractical to obtain such information or when "hard data" would be of little value in resolving an uncertainty. When expert judgment is used, it must be supported by a clear underpinning of facts and logic, and it must be presented by the expert in a manner that allows rigorous cross-examination.

DOE and DOE contractor documents are not written to specifically support the license application. Nevertheless, use of expert judgment in those documents is of interest to the NRC staff for two reasons: 1) expert judgment may be used to determine which types of "hard data" to collect or the priorities to be placed on various experiments, and 2) the way in which DOE currently uses expert judgment may provide clues about DOE's future use in support of a license application.

The NRC staff's review of DOE's current use of expert judgment will focus on the potential for judgment to be substituted for "hard data." The staff will attempt to identify any areas where DOE appears to be neglecting or placing a low priority on generating reasonably available or obtainable analyses or experimental information of potential importance for evaluating repository safety.

The NRC staff's review will not concentrate on the methods employed by DOE to procure expert judgments as these judgements are not being employed to support any licensing decisions. However, the staff will give DOE's methods a review to identify any obvious potential for problems if those same methods were used to support a license application.

#### Documents for Review

- 1) The ESSE (Volume 1). This document contains the evaluation of the site's suitability against the 10 CFR Part 960 guidelines and the narrative of the technical information relevant to the site. Volume 1 also contains the background information on how the site suitability evaluation was conducted.
- 2) The Peer Review of the ESSE (Volume 2). This document contains the comments of the technical reviewers, an explanation of how the peer reviewers were selected, and a brief statement of how the peer review was conducted. It also contains a brief discussion of the results of the peer review, and a consensus position statement from the reviewers. It does not contain the documentation of the peer process.
- 3) New references identified in the review of the ESSE that may contain information necessary to the staff's conclusions. (In the early stages of the review, staff should review the list of references cited in the ESSE and identify those that are new and not readily available so that those references can be requested from the DOE.)

### PRODUCT DESCRIPTION

The final product will consist of one comment package with an introduction. Comments will follow the format established for Site Characterization reviews with a statement of the concern, bases for the concern, recommendations, and references. Comments should be technically defensible, consistent with the purposes defined in this review plan, and should accurately represent the information provided in the ESSE. In order to assure internal integration, comments should be coordinated between disciplines, where needed, and consistent with other NRC HLW policies and guidance.

### RESPONSIBILITIES OF THE REVIEW TEAM

The review team for the ESSE will be composed of staff from all disciplines, including quality assurance (QA) and performance assessment (PA) staff. The ESSE (Volume 1) review will require input from all on the application and interpretation of the siting guidelines and technical information. QA staff will have the responsibility of reviewing the peer review. Staff should be knowledgeable of peer reviewers' comments for technical areas for which they have responsibility.

Assignments are as follows:

<u>ESSE, Volume 1</u>	<u>Lead</u>	<u>Input</u>
Section	Introduction	All
2.3.1	Hydro	Geol
2.3.2	Hydro	Geol, WP
2.3.3	Geol	Eng, Hydro, WP
2.3.4	Hydro	Geol
2.3.5	Geol	Hydro
2.3.6	Geol	Hydro
2.3.7	Geol	Hydro, Eng
2.3.8	Geol	Hydro
2.3.9	PA	
2.4	PA	Geol, Hydro, Eng
3.0	PA	all

3.3.1.3	Hydro	
3.3.3.1	Hydro	Geol
3.3.3.2	Geol	Hydro, Eng, WP
3.3.3.3	Hydro	Geol
3.3.3.4	Geol	Eng

Disciplines providing input should coordinate with the lead discipline early in the review process.

In addition to the assignments listed above, performance assessment staff will also conduct a limited review of DOE's use of expert judgment in making the site suitability evaluation.

#### Volume 2

QA staff should review available information related to the peer review process. Other technical staff should read comments of the peer reviewers in their area of responsibility.

#### IQA REQUIREMENTS

The Senior Project Manager will be responsible for distributing the review plan and ensuring that members of the review team are familiar with the plan. A record of staff attending discussions of the review plan will be kept as part of the IQA documentation.

The Senior Project Manager will also be responsible for the documentation of the review process. Materials that will constitute the IQA record of this review are documentation of milestones 4, 6, 8, 10, 11, and 12.

#### SCHEDULE FOR THE REVIEW

Yucca Mountain Team members were provided copies of the ESSE at the Team meeting of March 18. The scope and tentative schedule of the review were discussed at the team meeting of April 1. Milestones in the review schedule are as follows:

1. April 1           Begin review of both volumes of ESSE
2. April 15        Coordination among disciplines should begin. Project Manager should be notified of any potential problems.
3. April 22        Staff should have concerns established well enough to discuss at the team meeting.
4. May 4           Draft concerns to Project Manager (HLPD) and Section Leaders (By dated note from technical leads)
5. May 12          Final concerns to Branch Chiefs
6. May 15          Final concerns to Project Manager, HLPD (By dated note from Branch Chief)
7. May 25 -29      Management (including NRC and CNWRA Management) review
8. June 1          Comment package to ACNW
9. June 17         Meet with ACNW Working Group to discuss results of staff review
10. July 1         Receive ACNW comments
11. July 10        Review package to Office Director
12. July 15        Review package to DOE

## REFERENCES

- Altman, W.D., Donnelly, J.P., and Kennedy, J.E., 1988, Peer review for high-level nuclear waste repositories, Generic technical position: U.S. Nuclear Regulatory Commission, NUREG-1297.
- DOE, 1986, Environmental assessment, Yucca Mountain site, Nevada research and development area, Nevada: DOE/RW-0073.
- NRC, 1984, SECY-84-233, Final decision on the U.S. Department of Energy's general guidelines for the recommendation of sites for nuclear waste repositories, June 11, 1984.
- NRC, 1984, SECY-84-482, Issuance of the final siting guidelines by the U.S. Department of Energy for the recommendation of sites for nuclear waste repositories, December 24, 1984.
- NRC, 1991, SECY-91-242, Staff's approach for dealing with uncertainties in implementing the EPA HLW standards, August 6, 1991.



schedular requirements of 10 CFR 50.48(c)(4) until prior to startup from the fifth refueling outage commencing more than 180 days after December 1981 (the date of approval for the modifications), or spring 1987 refueling outage.

The NRC staff has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

For further details with respect to this action see (1) the licensee's request dated September 7, 1983, and (2) the related Safety Evaluation dated February 29, 1984 which are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C. and at the Kewaunee Public Library, 822 Juneau Street, Kewaunee, Wisconsin 54216.

Dated at Bethesda, Maryland this 29th day of February 1984.

For the Nuclear Regulatory Commission  
Harold R. Denton,  
*Director, Office of Nuclear Reactor Regulation.*

(FR Doc. 84-6856 Filed 3-13-84; 8:45 am)  
BILLING CODE 7590-01-M

#### **Preliminary Decision Related to U.S. Department of Energy's General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Preliminary decision on concurrence in U.S. Department of Energy's Guidelines.

**SUMMARY:** This preliminary draft decision sets forth the findings of the Nuclear Regulatory Commission ("NRC" or "Commission") on whether to concur in the General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories (guidelines) proposed by the U.S. Department of Energy (DOE). These guidelines were developed pursuant to section 112(a) of the Nuclear Waste Policy Act (NWPA) and were submitted to the Commission on November 22, 1983. The Commission has concluded that it will grant its concurrence in the guidelines subject to the satisfactory resolution of several conditions.

The Commission will concur in these sitting guidelines provided that DOE:

(1) Amends the sitting guidelines to recognize NRC's jurisdiction for resolution of differences between the guidelines and 10 CFR Part 60;

(2) Commits to obtain NRC's concurrence on revisions to the sitting guidelines that relate to NRC jurisdiction;

(3) Revised the sitting guidelines so that:

(a) DOE modifies its use of high effective porosity to limit its use to those situations that could be considered as a favorable siting condition;

(b) DOE commits to revise its sitting guidelines on the unsaturated zone so that they are consistent with the final NRC amendments on the unsaturated zone;

(c) DOE should relocate the favorable condition relating to total dissolved solid concentrations in the groundwater, presently contained in section 960.4-2-1 (b)(7) of the guidelines, to section 960.4-2-8-1 where effects on natural resources are considered. As an alternative, DOE could delete this provision;

(d) DOE should not frame its guidelines such that a 1,000 year groundwater travel time (10 CFR 60.113) would be adjusted, particularly in the early stages of site selection;

(e) DOE should delete the word "permanently" from its definition of "disturbed zone;"

(f) DOE should clarify its meaning of "short-term" extreme erosion and revise the guidelines as appropriate;

(g) DOE should delete the word "significant" from section 960.4-2-8-1(c)(2) of the sitting guidelines where reference is made to "Evidence of significant subsurface mining" (emphasis added).

(h) DOE should modify the guidelines so that they are consistent with the Commission's definition of "anticipated processes and events" and "unanticipated process and events."

(i) DOE should modify the guidelines so that potentially adverse conditions (e.g., dissolution) be considered if they affect isolation within the controlled area even though the condition may occur outside the controlled area.

(4) Modifies the sitting guidelines to make clear that engineered barriers cannot constitute a compensating measure for deficiencies in the geologic media during site screening;

(5) Specifies in greater detail how the guidelines will be applied at each sitting stage including site nomination and characterization (for example, DOE should specify in the implementation guidelines which guidelines would be applied at each stage of site screening);

(6) Supplements the guidelines to indicate the kinds of information necessary for DOE to make decisions on the nomination of at least five repository sites and subsequently recommending

three sites to the President for characterization (examples of the kinds of information which the Commission has in mind can be found in NRC Regulatory Guide 4.17); and

(7) Adds additional disqualifying conditions to the guidelines with sufficient specificity to ensure that unacceptable sites are eliminated as early as practicable. Disqualifying conditions should be provided for those factors specified in section 112(a) of NWPA including seismic activity, atomic energy defense activities, proximity to water supplies, the effect upon the rights of users of water, the location of valuable natural resources, hydrology, geophysics, proximity to populations, and proximity to components of the National Park System, the National Wildlife Refuge System, the National Wild and Scenic Rivers System, the National Wilderness Preservation System, and National Forest Lands.

**DATE:** Comment period expires April 4, 1984. Comments received after this date will be considered if it is practical to do so but consideration of late comments cannot be assured. Written comments should not exceed ten pages in length.

**ADDRESSES:** Mail written comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Attention: Docketing and Services Branch. Deliver comments to: Room 1121, 1717 H Street NW., Washington, D.C., between 8:15 a.m. and 5:00 p.m. on weekdays.

**FOR FURTHER INFORMATION CONTACT:** Regis R. Boyle, Section Leader, Regulatory and Environmental Section, Repository Projects Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 427-4127.

#### **SUPPLEMENTARY INFORMATION:**

##### **I. Introduction**

This preliminary decision by the Commission relates to its proceeding on whether to concur in the General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories ("sitting guidelines" or "guidelines") proposed by the U.S. Department of Energy ("DOE").

In its Order of December 12, 1983, the Commission posed five questions relevant to the Commission's concurrence in DOE's sitting guidelines (48 FR 55789). The questions were discussed at the Commission's January 11, 1984 public meeting and are listed below.

**Question 1:** Do the guidelines omit any relevant technical criteria established in 10 CFR Part 60?

**Question 2:** Could any guidelines not related to 10 CFR Part 60 result in selecting a site that would not be a reasonable candidate for license application?

**Question 3:** The guidelines and 10 CFR Part 60 sometimes employ different wording to define terms and to describe certain technical criteria. Could these differences result in selecting a site that would not be a reasonable candidate for a license application?

**Question 4:** Would the selection of sites in accordance with the guidelines be a reasonable means to identify alternative sites for the purposes of the National Environmental Policy Act (NEPA)?

**Question 5:** Are the guidelines sufficient to assure the selection of sites that would be reasonable candidates for a license application?

In formulating this decision, the Commission applied the following criteria to the siting guidelines: (1) The siting guidelines must not be in conflict with 10 CFR Part 60;<sup>1</sup> (2) The siting guidelines must not contain provisions that might lead DOE to select sites that would not be reasonable alternatives for an Environmental Impact Statement (EIS); and (3) The siting guidelines should not contain provisions that are in conflict with NRC responsibilities as embodied in the NWA.

On the basis of these criteria, the Commission will concur in these siting guidelines provided that DOE:

(1) Amends the siting guidelines to recognize NRC's jurisdiction for resolution of differences between the guidelines and 10 CFR Part 60;

(2) Commits to obtain NRC's concurrence on revisions to the siting guidelines that relate to NRC jurisdiction;

(3) Revises the siting guidelines as indicated in Section IV of this decision;

(4) Modifies the siting guidelines to make clear that engineered barriers cannot constitute a compensating measure for deficiencies in the geologic media during site screening;

(5) Specifies in greater detail how the guidelines will be applied at each siting stage including site nomination and characterization (for example, DOE should specify in the implementation guidelines which guidelines would be applied at each stage of site screening);

<sup>1</sup> A conflict with 10 CFR Part 60 means any difference between it and the siting guidelines which, taking into account their different purposes, would lead DOE to propose for licensing a site which probably would not satisfy 10 CFR Part 60.

(6) Supplements the guidelines to indicate the kinds of information necessary for DOE to make decisions on the nomination of at least five repository sites and subsequently recommending three sites to the President for characterization (examples of the kinds of information the Commission has in mind can be found in NRC Regulatory Guide 4.17); and

(7) Adds additional disqualifying conditions to the guidelines with sufficient specificity to ensure that unacceptable sites are eliminated as early as practicable. Disqualifying conditions should be provided for those factors specified in section 112(a) of NWA including seismic activity, atomic energy defense activities, proximity to water supplies, the effect upon the rights of users of water, the location of valuable natural resources, hydrology, geophysics, proximity to populations, and proximity to components of the National Park System, the National Wildlife Refuge System, the National Wild and Scenic Rivers System, the National Wilderness Preservation System, and National Forest Lands.

By satisfying the above stated conditions, the DOE can obtain the concurrence of the Commission in the siting guidelines. However, the Commission encourages DOE to carry on a continuing and cooperative dialogue with the states and affected Indian Tribes in order to minimize misunderstandings and to keep them fully apprised of activities related to the siting of a high-level radioactive waste repository.

The Commission expects that DOE will revise the guidelines in response to this preliminary decision. Public comment is particularly desired on the issues raised in this preliminary decision. In commenting on this decision, the public should assume that DOE adequately addresses the Commission's conditions.<sup>2</sup> After considering public comments on this preliminary concurrence decision, the Commission will publish its final concurrence decision in the Federal Register. If the final concurrence decision sets forth conditions that DOE must meet in order to obtain the Commission's concurrence, then the Commission expects DOE to submit revised guidelines that will satisfy the Commission's stated conditions. If the

<sup>2</sup> In reaching its final decision on concurrence, the Commission will rely primarily on comments received during the 21 day comment period and those received during the public comment period which closed on February 1, 1984. Comment letters on this preliminary decision should not exceed ten pages.

Commission determines that the conditions have been met, it will inform DOE that the Commission's concurrence in the guidelines is then effective.

## II. Procedural Background

Section 112(a) of the Nuclear Waste Policy Act of 1982 ("NWA" or "Waste Act"), 42 U.S.C. 10312(a), directs DOE to issue general guidelines for the recommendation of sites for repositories and to obtain the concurrence of the NRC. The NWA does not specify any procedure for the Commission's concurrence. In ruling on a petition by the Yakima Indian Nation, the Commission found that NRC's concurrence responsibility is not rulemaking and does not require notice and opportunity for public comment (48 FR 39536). Nevertheless, in response to requests that the Commission structure its concurrence process as Notice and Comment rulemaking, the Commission decided that in order to crystallize the issues, it would accept-written comments on DOE's proposed siting guidelines and then conduct a public meeting on those siting guidelines.

On November 22, 1983, DOE submitted proposed siting guidelines for Commission concurrence. Written comments were received from the U.S. Environmental Protection Agency (EPA), six states, one Indian Tribe, four public interest groups, and one industry group. Subsequently, on January 11, 1984, the Commission conducted a day-long public meeting on the siting guidelines. The participants were DOE, EPA, eight states, one Indian Tribe, four public interest groups, one industry group, and one individual. During that meeting, the Commission announced that the record of the proceeding would be left open until February 1, 1984. Additional written submittals were received from DOE, EPA, the U.S. Geological Survey (USGS), nine states, two public interest groups, two industry groups, and two Indian tribes.

## III. Criteria for Concurrence

The NWA does not specify the scope or establish any criteria for Commission concurrence. The Yakima Indian Nation contended, without any supporting documentation, that Congress intended the Commission to review all aspects of the siting guidelines and the process leading to their proposed final form. The State of Nevada stated that plenary review of the siting guidelines is properly a task for the United States Court of Appeals and that the Commission's review is limited by its organic jurisdiction to assuring the public's health and safety. Accordingly,

Nevada recommended, "The standard which the NRC must apply in deciding whether to concur or not to concur in DOE site recommendation guidelines is whether, as a matter of law, the guidelines are (1) consistent with the requirements of the Act; (2) consistent with the Commission's own general statutory mission and responsibility, to protect the radiological health and safety of the public; and (3) consistent with other applicable administrative decisions or regulations adopted pursuant to either." *Serious Texans Against Nuclear Dumps (STAND)* suggested a similar standard but would limit Nevada's third standard for concurrence (identified above), to consistency with the requirements of 10 CFR Part 60.

The Commission's jurisdiction is established by the Atomic Energy Act of 1954, as amended ("Atomic Energy Act"); the National Environmental Policy Act of 1969, as amended ("NEPA"); the Energy Reorganization Act of 1974, as amended ("ERA"); and NWSA. These Acts provide the Commission broad jurisdiction over matters regarding protection of the public health and safety from exposures to radiation and over environmental impacts arising from NRC licensed facilities. This Commission's review of another agency's action is necessarily limited by the extent of this Commission's jurisdiction. Accordingly, the Commission's review of DOE's siting guidelines is limited in accordance with its jurisdiction.

The technical criteria that the Commission will use in licensing a repository are contained in 10 CFR Part 60. This rule implements the Commission's jurisdiction. Because a purpose of the guidelines is to ensure that DOE chooses sites that are suitable for development as a repository, a prime NRC concern in determining whether to concur in DOE's siting guidelines is to ensure that the guidelines are not in conflict with 10 CFR Part 60.

The Commission's regulations in 10 CFR Part 60 primarily address matters of public health and safety but are also concerned with DOE's site selection process as it affects the Commission's ability to comply with NEPA. Under section 114(f) of NWSA, the Commission is to adopt DOE's Environmental Impact Statement ("EIS") to the extent practicable. Thus, the Commission also reviewed DOE's siting guidelines to determine whether, if implemented in a reasonable manner, there is anything in those guidelines which might lead DOE to select sites that would not be

reasonable alternatives for an Environmental Impact Statement.

Finally, the Commission has considered whether the siting guidelines are in conflict with its responsibilities as embodied in the NWSA. The Commission has not examined how the guidelines deal with matters beyond its jurisdiction.

Accordingly, the Commission applied the following criteria to make its concurrence decision: (1) The siting guidelines must not be in conflict with 10 CFR Part 60; (2) The siting guidelines must not contain provisions that might lead DOE to select sites that would not be reasonable alternatives for an Environmental Impact Statement; and (3) The siting guidelines should not contain provisions that are in conflict with the NWSA.

#### IV. Application of the Concurrence Criteria

In this section, the Commission states its principal concerns with the guidelines and considers the oral testimony presented at the January 11, 1984, public meeting (hereafter called participants or commenters) and the written comments submitted to the Commission through the extended comment period which ended on February 1, 1984. The Commission has considered the comments which relate to the concurrence criteria discussed in Section III. Any other issues raised by the participants, but immaterial to the Commission's concurrence criteria, have not been addressed here.

In its Order of December 12, 1983, the Commission posed five questions relevant to the Commission's concurrence in DOE's siting guidelines. The questions were discussed at the Commission's January 11, 1984 public meeting and in written comments. These questions, along with the Commission's findings, are presented below.

##### Question 1

Do the guidelines omit any relevant technical criteria established in 10 CFR Part 60?

##### Discussion

The Commission finds that DOE's guidelines omit only one provision in 10 CFR Part 60 which requires discussion. 10 CFR 60.122(a)(2) requires DOE to demonstrate that a potentially adverse condition will not compromise the performance of the geologic repository. The DOE siting guidelines make no reference to this demonstration. Section 960.3-2-2-2 of the guidelines states "This evaluation shall consider on balance those favorable conditions and potentially adverse conditions identified

as such at a preferred site in relation to the qualifying condition and the disqualifying condition, if appropriate, of each guideline." (emphasis added)

The NRC approach for evaluating potentially adverse conditions in 10 CFR Part 60 is different from that used by DOE in the guidelines. The NRC approach is only possible after site characterization because by then, NRC will have the benefit of extensive data acquired during site characterization. DOE, however, must consider potentially adverse conditions before all of this data is available. Consequently, DOE must treat adverse conditions differently because DOE will apply the guidelines when data are limited. Therefore, even though the siting guidelines do not contain the provision identified in 10 CFR 60.122(a)(2), the Commission finds that the DOE approach is not in conflict with 10 CFR Part 60.

##### Conclusion

The Commission finds that DOE, in developing its repository siting guidelines, has included all of the relevant technical criteria established in 10 CFR Part 60.

##### Question 2

Could any guidelines not related to 10 CFR Part 60 result in selecting a site that would not be a reasonable candidate for license application?

##### Discussion

The Commission has identified six provisions in the siting guidelines for which there is no comparable requirement in 10 CFR Part 60 and which might result in selecting a site that would not be a reasonable candidate for a license application.

(a) *Resolution of inconsistencies between 10 CFR Part 60 and guidelines.* Section 9601.1 of the siting guidelines states that "The guidelines set forth in this Part are intended to complement the requirements set forth in the Act, 10 CFR Part 60, and 40 CFR Part 191. In applying these guidelines, the DOE will resolve any inconsistencies between the guidelines and the above documents in a manner determined by the DOE to most closely agree with the intent of the Act." (emphasis added)

The Commission's interpretation of its regulations is binding on DOE. Therefore, to the extent that DOE believes that the guidelines are inconsistent with 10 CFR Part 60, DOE must conform the guidelines to 10 CFR Part 60 as the means of conforming to the NWSA. If DOE believes that such an approach results in failing to meet

certain requirements of the NWPA. It should seek an exemption from NRC before acting in a manner contrary to the provisions of 10 CFR Part 60.

(b) *NRC concurrence in future revisions to guidelines.* In the *Draft of the Department of Energy's Analysis and Consideration of Comments Received on the General Guidelines for Recommendation of Sites for Nuclear Waste Repositories*, DOE stated, "If future revisions of 10 CFR Part 60 contain provisions with which the guidelines are incompatible, the DOE will revise the guidelines, as permitted by the Act."

The Commission believes that for NRC concurrence under section 112(a) of the NWPA to be meaningful, this section must be interpreted to require DOE to obtain NRC concurrence in subsequent revisions to the siting guidelines which involve matters under NRC jurisdiction. Therefore, the Commission finds that the guidelines should explicitly state that revisions of the guidelines which involve matters under NRC jurisdiction will be subject to the concurrence of the NRC.

(c) *High effective porosity as a favorable condition.* The guidelines identify as a favorable siting condition a geologic medium with a high effective porosity. Section 960.4-2-1(b)(4) of the guidelines states that a favorable condition for reducing the release of radionuclides would be "a high effective porosity along paths of likely radionuclide travel between the host rock and the accessible environment."

The Commission finds that a high effective porosity is not always a favorable siting condition. Groundwater flow velocity is the product of hydraulic gradient and hydraulic conductivity divided by effective porosity. A high effective porosity is a favorable condition if the product of the hydraulic gradient and hydraulic conductivity remains constant. However, under some circumstances, porosity and hydraulic conductivity have been shown to be positively correlated. In those situations, flow velocities may be greater at a site with a high porosity depending on site specific conditions. Therefore, under some circumstances, the condition on effective porosity may be adverse rather than favorable.

Furthermore, DOE defines "effective porosity" as "the amount of interconnected pore space and fracture openings . . ." (emphasis added). To conclude that a high effective porosity is a favorable condition would imply that an abundance of "fracture openings" would be a favorable site condition. While this may be valid in some instances, a large number of fracture

openings would not always be a favorable siting condition. The Commission finds that DOE should modify its use of effective porosity to limit its use to those situations that it could be considered as a favorable siting condition.

(d) *Unsaturated zone.* Section 960.4-2-1 of the siting guidelines includes conditions applicable to siting a repository in the unsaturated zone. The final technical criteria (10 CFR Part 60) approved by the Commission on June 13, 1983, contain no specific provisions related to the unsaturated zone. In January 1984, the Commission approved for publication draft provisions related to the unsaturated zone for incorporation into 10 CFR Part 60. While the Commission considers that the DOE siting guidelines are not in conflict with the Commission's criteria to be published for public comment, the final amendments to the Commission's siting criteria may be revised as the result of consideration of public comments on the proposed amendments. DOE should commit to revise its siting guidelines so that they are consistent with the final NRC amendments.

(e) *Total dissolved solid concentration of groundwater.* Section 960.4-2-1(b)(7) identifies groundwater with total dissolved solids of 10,000 parts per million (ppm) or more along the path of likely radionuclide travel to be a favorable condition. It is not clear to the Commission how a total dissolved solid concentration of 10,000 ppm or more in the groundwater would contribute to the compliance of section 960.4-1 for radionuclide releases to the accessible environment. Furthermore, groundwater containing a high concentration of dissolved solids may have an adverse effect on the performance of the engineered barrier system. Thus, we are not convinced that this condition is favorable.

DOE explains that this favorable condition was developed so that site locations with poor-quality ground water would be given preference over those with aquifers containing potable water or water capable of being used for irrigation. If the provision is retained in the final guidelines, then the Commission finds that it should be placed in section 960.4-2-8-1 of the siting guidelines where effects on natural resources are considered.

(f) *Minimum depth.* Section 960.4-2-3 of the siting guidelines states that a site would be disqualified "if site conditions do not allow all portions of the underground facility to be situated at least 200 meters below the directly overlying ground surface". 10 CFR Part 60 does not contain a provision related

to locating a repository 200 meters below the surface. However, 10 CFR 60.122(b)(5) has as a favorable conditions: "Conditions that permit the emplacement of waste at a minimum depth of 300 meters from the ground surface". In the siting guidelines, DOE has a similar favorable condition which states: "Site conditions that permit the emplacement of waste at a depth of at least 300 meters below the directly overlying ground surface".

The Commission finds that DOE may disqualify sites if a repository could not be constructed 200 meters below the surface and that such a disqualifying condition is not in conflict with 10 CFR Part 60.

#### Conclusion

The Commission finds, subject to the satisfactory resolution of the above comments, that the provisions in the guidelines not related to 10 CFR Part 60 would not result in selecting a site that is not a reasonable candidate for a license application.

#### Question 3

The guidelines and 10 CFR Part 60 sometimes employ different wording to define terms and to describe certain technical criteria. Could these differences result in selecting a site that would not be a reasonable candidate for a license application?

#### Discussion:

Listed below are instances where different wording is employed in the siting guidelines when compared to that in 10 CFR Part 60.

(a) *Groundwater travel time.* Section 960.4-2-1(d) of the siting guidelines states that "A site shall be disqualified if the expected pre-waste-emplacement groundwater travel time along any path of likely radionuclide travel from the disturbed zone to the accessible environment is less than 1,000 years, unless the characteristics and conditions of the geologic setting, such as the capacity for radionuclide retardation and the groundwater flux, would limit potential radionuclide releases to the accessible environment to the extent that the requirements specified in section 960.4-1 could be met."

DOE modifies this disqualifying condition by stating that sites having a groundwater travel of less than 1,000 years would still be considered if mitigating conditions are present. The NRC criterion at 10 CFR 60.113 allows adjustments to a 1,000 year groundwater travel time, but only on a case-by-case basis where approved or specified by the Commission. Under the guidelines,

DOE would be making determinations with respect to groundwater travel time that may prove unacceptable to the Commission.

The Commission believes that DOE should not frame its guideline such that a 1,000 year groundwater travel time (10 CFR 60.113) would be adjusted, particularly in the early stages of site selection. Therefore, the Commission finds that DOE should modify the guidelines so as not to rely on the possibility of an NRC adjustment.

(b) *Definition of "disturbed zone"*. Section 960.2 of the siting guidelines defines "disturbed zone" as "that portion of the controlled area, excluding shafts, whose physical and chemical properties are projected to change permanently as a result of underground facility construction or heat generated by the emplaced radioactive wastes such that the resultant change of properties could have a significant effect on the performance of the geologic repository" (emphasis added).

The Commission finds that if the disturbed zone encompasses only the area that is permanently changed, then DOE may neglect areas where transient changes occur that could have a significant effect on repository performance. Transient changes to the repository's physical, chemical, and hydrological environment significantly affecting waste isolation may extend beyond the zone that is permanently disturbed.

The NRC and DOE measure the path of groundwater travel from the outer boundary of the disturbed zone to the accessible environment. If DOE and NRC establish different boundaries for the disturbed zone, according to their respective definitions, each may find different lengths for the path of groundwater travel. Consequently, groundwater travel time, a key criterion for both NRC and DOE, would also be different. The Commission finds that DOE should delete the word "permanently" from its definition of "disturbed zone."

(c) *Definition of "restricted area"*. Section 960.2 of the siting guidelines defines "restricted area" as a term that applies "before repository closure". The definition of "restricted area" in 10 CFR Part 60 does not contain the phrase "before repository closure". DOE explained that the different wording is needed to clarify that administrative controls cannot be presumed to exist throughout the postclosure phase. As this is consistent with the usage in 10 CFR 60.111, the Commission views the differences in definitions to be insignificant.

(d) *Definition of "beyond reasonably available technology"*. Section 960.4-2-3(c) of the siting guidelines uses the phrase "engineered measures beyond reasonably available technology" in describing a potentially adverse condition for rock characteristics. 10 CFR 60.122(c)(20) uses a similar phrase, "complex engineering measures", in describing a potentially adverse conditions for rock or groundwater. DOE states that the term "beyond reasonably available technology" defines the term "complex".

While the Commission would not necessarily define "complex" in the same manner as DOE has, the Commission finds that the NRC and DOE phrases are not contradictory in the context of their use.

(e) *Erosion*. Section 960.4-2-5(c)(1) of the siting guidelines states that a potentially adverse condition would be "A geologic setting that shows evidence of sustained extreme erosion during the Quaternary Period" (emphasis added).

A similar adverse condition at 10 CFR 60.122(c)(16) does not qualify erosion as "sustained". The Commission finds that the DOE condition is less conservative than the NRC condition because the DOE condition would not take into account short-term extreme erosion as would the NRC condition.

DOE explained that periods of short-term extreme erosion would not be considered potentially adverse. This may be true if short-term refers to brief, episodic events, such as flash floods, that could cause extreme erosion. However, a short-term period taken from the perspective of geologic time (i.e., the Quaternary Period) could last tens of thousands of years. The Commission finds that the DOE should clarify the meaning of short-term and revise the guidelines as appropriate.

(f) *Subsurfacing mining*. Section 960.4-2-8-1(c)(2) of the siting guidelines states that a potentially adverse condition regarding a site's natural resources would be "Evidence of significant subsurface mining or extraction for resources within the site if it could affect waste containment or isolation" (emphasis added). DOE's qualification of subsurface mining as "significant" differs from a similar provision at 10 CFR 60.122(c)(18) which states that the potentially adverse condition would be "evidence of subsurface mining". DOE explained that it used the term "significant" to exclude activities such as surface or near-surface mining that might not affect repository performance.

In 10 CFR Part 60, the Commission never intended to imply that subsurface mining would include surface or near-surface mining. However, all evidence of

subsurface mining would be considered to be adverse until it had been thoroughly evaluated. Therefore, the Commission finds no need for the term "significant" and recommends that it be deleted from section 960.4-2-8-1(c)(2) of the guidelines.

(g) *Anticipated and unanticipated processes and events*. The guidelines define and use the phrases: "characteristics and processes affecting expected repository performance" and "potentially disruptive processes and events." 10 CFR Part 60 defines and uses related phrases: "anticipated processes and events" and "unanticipated processes and events." DOE explained that the sets of phrases have parallel meanings but DOE chose its wording for reasons of clarity.

The Commission finds that the different categorization of events and processes by DOE may lead to overlooking in the site selection process some site characteristics that are important to repository performance and considers that the guidelines should be revised. The Commission's definition of anticipated processes and events includes consideration of all geologic processes and events that have occurred during the Quaternary period, and may include some events that DOE would categorize as "disruptive." This different approach to categorizing processes and events could also lead to an inadequate site characterization program. performance assessments that are not adequate to provide reasonable assurance that the performance objectives of 10 CFR Part 60 are met, and an incomplete license application. Unless these definitions, and the related assessments and investigations, are made consistent, DOE could select sites using the guidelines that would not be a reasonable candidate for a license application. Therefore, the Commission finds that DOE should modify the guidelines to be consistent with 10 CFR Part 60.

(h) *Dissolution*. Section 960.4-2-4(c) of the siting guidelines states that a potentially adverse condition would be "significant dissolution without the site." (emphasis added.) A similar adverse condition at 10 CFR 60.122(c)(10) would consider dissolution without reference to its significance or where it occurs.

The inclusion of the word "significant" in the DOE provision is inconsistent with 10 CFR Part 60, which considers evidence of dissolution to be a potentially adverse condition that must be fully characterized and evaluated and shown not to be significant in the license application. DOE's approach

could lead to incomplete information on, and evaluation of, dissolution in the license application.

On the matter of the extent of the needed investigations, 10 CFR Part 60 requires that potentially adverse conditions be considered even if they are outside the controlled area if they affect isolation within the controlled area (as used in 10 CFR Part 60, site means the location of the controlled area). DOE should modify these aspects of the guidelines to be consistent with 10 CFR Part 60.

(i) *Site Ownership.* Section 960.4-2-8-2(a) of the siting guidelines states that the "site shall be located on land for which the DOE can obtain, in accordance with the requirements of 10 CFR Part 60, ownership, surface and subsurface rights, and control of access . . ."

10 CFR Part 60.121(a) specifies that "Both the geologic repository operations area and the controlled area shall be located in and on lands that are either acquired lands under the jurisdiction and control of DOE, or lands permanently withdrawn and reserved for its use."

The Commission finds that the 10 CFR Part 60 provision and the siting guideline provision are not in conflict as DOE would undertake to obtain the necessary controls under the language proposed in the guidelines.

#### Conclusion

The DOE siting guidelines provide definitions and provisions applicable to geologic waste disposal. 10 CFR Part 60 establishes technical criteria for the licensing of a high-level radioactive waste repository. The siting guidelines of DOE need not be identical to NRC criteria because the purpose of the siting guidelines is different from 10 CFR Part 60. The siting guidelines are to be used to select sites for repository development while 10 CFR Part 60 will be used to evaluate a site after it has been selected for licensing following an extensive site characterization program. Although the definitions and provisions in the DOE siting guidelines are not always identical with those in 10 CFR Part 60, the Commission finds, subject to the satisfactory resolution of the above comments, the definitions and provisions are not in conflict with those in 10 CFR Part 60.

#### Question 4

Would the selection of sites in accordance with the guidelines be a reasonable means to identify alternative sites for the purpose of the National Environmental Policy Act (NEPA)?

#### Discussion

The NWPA has increased the Commission's interest in DOE's compliance with NEPA. In the usual case, the NRC relies on license applicants to prepare Environmental Reports which, among other things, detail the investigation of alternative sites. These reports are a primary source of information for the NRC's implementation of its NEPA responsibilities. In this case, the applicant is another federal agency with independent NEPA responsibilities. This situation is not unique; the Commission has licensed several nuclear power plants built by the Tennessee Valley Authority ("TVA"). In some cases, the Commission used TVA's Environmental Impact Statement as an Environmental Report for the preparation of NRC's Draft and Final Environmental Impact Statements. Section 114(f) of NWPA modifies the relationship between the NRC and DOE by directing the Commission to adopt as much of DOE's Environmental Impact Statement as is practicable. Thus, the NRC has a particular interest in those activities of DOE that may ultimately have a bearing on the NRC's ability to adopt the EIS.

Some commenters contended that the guidelines would not lead DOE to select sites that would be reasonable alternatives for the purposes of NEPA. The Yakima Indian Nation supported this contention by noting that the guidelines are too subjective and non-selective. Wisconsin stated that compliance with the guidelines will not ensure that any recommended sites will be adequate alternatives for NEPA purposes because the guidelines do not require DOE to consider all the impacts which must be addressed in an Environmental Assessment or Environmental Impact Statement. Similarly, Texas recommended that the guidelines be altered to require DOE to evaluate environmental impacts prior to site characterization.

Serious Texans Against Nuclear Dumps (STAND) and the Yakima Indian Nation noted that the guidelines will not ensure that DOE will have three adequate sites after characterization has been completed. As noted by the Yakimas, DOE has taken the position that if one or more of the characterized sites prove to be unsuitable, the remaining one or two sites will suffice. STAND elaborated further by stating that the NWPA requires that three adequate sites be characterized so that (1) there are acceptable alternatives for the President, and (2) there are second and third sites available in case a site submitted to Congress is vetoed by the

host state or affected Indian Tribe. STAND concluded that "since the guidelines do not necessarily require that an adequate site be selected and characterized, the three adequate sites necessary for submission to Congress and to be discussed in the EIS may not exist."

DOE, in its supplemental testimony, stated that the siting guidelines will generate the technical information, as well as the environmental information, necessary for the nomination of suitable candidate sites in accordance with NWPA. As a result, DOE maintained that when the final EIS is prepared, sufficient information will exist for informed decisionmaking consistent with both NEPA and the NWPA.<sup>8</sup>

#### NRC Response and Finding

The Commission finds that the DOE siting guidelines contain a mix of geotechnical, institutional,

<sup>8</sup> The State of Washington contended that section 960.3-2-2-4(7) of the guidelines is inconsistent with section 112(b) of NWPA. Washington believes that section 112(b)(1)(E)(iv) requires DOE to compare all potential repository sites and locations in its evaluation of alternative sites, while section 960.3-2-2-4(7) of the guidelines would require DOE to compare only the five sites nominated for characterization.

Washington's interpretation of section 112(b)(1)(E)(iv) of NWPA is inconsistent with the clear statutory scheme established in section 112. Section 112(b)(1)(E)(iv) provides that the Secretary's nomination of a site as a candidate for characterization under section 112(v) shall be accomplished by an environmental assessment which shall include, among other things: a reasonable comparative evaluation by the Secretary of each site with other sites and locations that have been considered.

Washington would interpret the word considered to include all sites and locations currently under consideration including alternatives to deep geologic repositories. This interpretation of the word considered is not supported by the rest of section 112(b), or the overall statutory scheme. An examination of the entire site selection process shows that for the purposes of section 112(b)(1)(E)(iv) the word considered means those sites nominated for consideration for characterization. Only those sites will have the comparable levels of site information available necessary to make the "reasonable comparative evaluation" specified in section 112(b)(1)(E)(iv). Moreover, because the only purpose of that comparative evaluation is the choice of three sites for characterization, sections 112(b)(1)(B) and (C), there would be no statutory purpose served by including in the comparison sites not proposed for characterization.

Finally, the overbreadth of Washington's interpretation is clear from its inclusion of alternatives to deep geologic disposal. Section 114(f) explicitly excludes such alternatives from consideration in the final environmental impact statement to be prepared in support of a proposed repository site. Certainly, the preliminary documents designed to lead up to this choice of a final proposed site need not include extraneous information irrelevant to that final choice. Accordingly, the Commission finds that DOE's interpretation of section 112(b)(1)(E)(iv) warrants NRC deference.



socioeconomic, and environmental factors that must be considered in the site selection process. The judgments that must be made in applying the guidelines range from "technical judgments" (e.g., thermo-mechanical response of the host rock) to "value judgments" (e.g., trade-offs between potential effects on national parks as opposed to prime agricultural land use). The guidelines appear to cover the spectrum of factors that must be considered in order to select reasonable alternative sites for NEPA purposes. However, the Commission recognizes that the siting guidelines alone do not assure that appropriate sites will be selected. Of equal importance is the implementation of the guidelines. The site selection process established by the NWPAA (i.e., developing general siting guidelines, publishing Environmental Assessments, preparing site characterization plans, and publishing a site specific Environmental Impact Statement) provides an adequate framework for selecting alternative sites that comply with NEPA. Indeed, the Commission has not found that the guidelines contain provisions that would lead DOE to select alternative sites that could not be suitable sites for NEPA compliance. Therefore, if the guidelines are properly applied, DOE should select sites that would be reasonable alternatives for NEPA.

Because the NRC is required to adopt the DOE's EIS to the extent practicable, the NRC is particularly interested in how the guidelines will be applied at key stages in the site selection process. Unless the guidelines are applied with data appropriate to the decision to be made, NRC may not be able to adopt the DOE alternative sites as meeting the "rule of reason." Therefore, the Commission finds that DOE should specify in greater detail how the guidelines will be applied at each siting stage including site nomination and characterization. This might be done by specifying, in the implementation guidelines, which guidelines would be applied at each stage of site screening. DOE should also indicate the kinds of information, such as that identified in Regulatory Guide 4.17, that would be used by DOE to make decisions on the nomination of sites and subsequent recommendation of three sites for characterization. The information needs for each individual category of the technical guidelines (e.g., geohydrology, geochemistry, rock characteristics, climatic changes, etc.) should be specified.

### Conclusion

The Commission believes that, subject to the satisfactory resolution of the conditions set forth in this decision, using the DOE guidelines in the overall context of the site selection process established by the NWPAA would be a reasonable means for identification of alternative sites for NEPA purposes.

### Question 5

Are the guidelines sufficient to assure the selection of sites that would be reasonable candidates for a license application?

### Discussion

Many commenters viewed this question as being the central issue on whether the Commission should grant or withhold its concurrence. The principal issues raised by many of the commenters were: (a) The guidelines overemphasize the use of engineered barriers; (b) The guidelines are subjective, vague, and non-specific; (c) The postclosure guidelines should not take precedence over preclosure guidelines; (d) The guidelines do not specify the level of data needed to make decisions; and (e) The guidelines lack an adequate implementation methodology. A summary of these issues and the Commission's response and findings follows.

a. *The guidelines over-emphasize the use of engineered barriers.* Many commenters contended that DOE emphasizes engineered barriers at the expense of the natural ability of the site to isolate the high-level waste. These commenters believe that the guidelines would allow DOE to select a site for characterization in anticipation that engineered barriers would remedy any geologic deficiencies. The commenters recommended that DOE eliminate engineered barriers as a siting consideration. To support their argument, these commenters cited or interpreted various provisions of the NWPAA and 10 CFR Part 60.

STAND contended that the siting guidelines are inconsistent with NWPAA because they include undue consideration of engineered barriers. STAND's argument is based on its interpretation of section 112(a) and section 114(f) of NWPAA. Section 112(a) provides in pertinent part: "geologic considerations . . . shall be primary criteria for the selection of sites in various geologic media". Section 114(f) provides in pertinent part: "For the purposes of complying with the National Environmental Policy Act of 1969 . . . and this section, the Secretary shall consider as alternate sites to be

developed under this subtitle 3 candidate sites with respect to which (1) site characterization has been completed under section 113; and (2) the Secretary has made a preliminary determination, that such sites are suitable for development as repositories consistent with the guidelines promulgated under section 112(a)".

STAND believes that section 112(a) precluded DOE from giving engineered barriers primary importance in the siting guidelines. STAND further believes that section 114(f) requires DOE's site characterization process to result in at least 3 potentially licensable sites after characterization. To ensure that DOE finds three such sites, STAND believes that DOE should not rely at all on engineered barriers at the site selection stage, but should reserve engineered barriers as a safety margin for assuring that a site will remain viable after characterization.

The States of Texas and Nevada also believe that section 112(a) precludes DOE from including engineered barriers in its siting guidelines. They note that section 113(b)(1)(B) requires DOE to provide to the NRC and states, information on waste form or packaging and their interactions with site geology no sooner than when DOE proceeds to prepare to sink a shaft for the purposes of site characterization. They further note that section 121(b)(1)(B) requires NRC to provide for multiple barriers in its licensing criteria, 10 CFR Part 60. Therefore, they believe that these provisions of NWPAA imply that DOE was not authorized under NWPAA to include engineered barriers in its siting guidelines.

Texas and Nevada argued that the siting guidelines' emphasis on engineered barriers is inconsistent with 10 CFR Part 60. Nevada cited part of the preamble to 10 CFR 60 which states ". . . engineered and natural barriers must each make a definite contribution in order for the Commission to be able to conclude that the EPA standard will be met." (48 FR 28196) (emphasis added). Nevada feels that DOE has elevated the contribution of engineered barriers to a more significant level than that contemplated by the Commission. Texas also noted provisions at 10 CFR 60.112 and 10 CFR 60.113(a)(1)(i) which separate the siting process from consideration of the engineered barrier system. Consequently, Texas recommended that DOE should likewise separate consideration of engineered barriers from the siting process.

EPA expressed a slightly different view by recommending that DOE should not take full credit for the performance of

waste packages and waste forms (i.e., engineered barriers) required by 10 CFR Part 60 when making comparative performance assessments of potential sites. Instead, EPA believes that DOE should assume that waste packages and waste forms perform at least an order of magnitude less effectively than that required by 10 CFR Part 60 in order to compare the differences in isolation capabilities among the sites.

In their supplemental testimony, the Yakima Indian Nation stated that the EPA proposal is a step in the right direction but does not go far enough. The Yakimas recommended that the credit given to engineered barriers should be reduced by a factor of 100 from the minimum requirements of 10 CFR 60.113.

In addition to de-emphasizing the contribution of the engineered barriers, EPA recommended how DOE might give more emphasis to a site's natural characteristics. Since the natural characteristics of a site become more important for isolation as time progresses, EPA recommended that comparative performance assessments consider time periods of 50,000 to 100,000 years rather than just the 10,000 years considered in the containment requirement of proposed 40 CFR Part 191. EPA recommended that the performance assessments, used for comparative evaluations of sites, should be the same as those that will be used in judging compliance with 40 CFR Part 191 except for less emphasis on engineered barriers and more attention to times greater than 10,000 years.

The Edison Electric Institute (EEI) took an opposite view on engineered barriers. EEI believes that the guidelines over emphasize natural barriers, thereby departing from a "systems approach." Under a systems approach one would judge a repository's performance according to the combined contributions of all its components (i.e., the engineered and natural barriers). EEI maintains that a systems approach, in both siting and construction, would ensure a proper combination of man-made and natural components.

DOE, in its supplemental testimony, stated that DOE will "not rely on engineered barriers to compensate for deficiencies in the natural barriers of the repository system." DOE stated that "it is not the Department's intent" to suppress information regarding the innate capabilities of candidate sites by considering engineered barriers. However, DOE stated that it will evaluate alternative statements in the siting guidelines to clarify its intent with regard to engineered barriers.

#### *NRC Response and Finding*

The Commission finds that engineered barriers must be considered in the site selection process but cannot be used to compensate for geologic deficiencies during site screening. In developing 10 CFR Part 60, the Commission received comments which argued that the Commission's approach placed too great an emphasis on engineered barriers and provided insufficient incentives to select a site with optimal geologic and hydrologic characteristics. In response, the Commission stated that both engineered and natural barriers are important, and structured the NRC technical criteria in a manner that demands not only the use of advanced engineering methods, but also the selection of a site with excellent natural isolation capabilities.

The Commission notes that engineered barriers are explicitly mentioned at 10 CFR 60.122(a)(1) (in connection with geologic conditions), 10 CFR 60.122(c)(7) (in connection with groundwater), and 10 CFR 60.122(c)(8) (in connection with geochemical processes). Since engineered barriers are included in the NRC siting criteria, the Commission does not object to their inclusion in the DOE siting guidelines.

The Commission believes that NWPA does not legally preclude DOE from including engineered barriers in its siting guidelines. Section 112(a) establishes detailed geologic considerations as the *primary* criteria for site selection, but not the only criteria for site selection. Thus, the guidelines are not required to rely solely on geologic criteria.

Furthermore, the Commission considers that in selecting sites, DOE should consider the effect that the geohydrologic setting would have on the performance of engineered barriers in order to avoid any hostile geohydrologic setting that, through geochemical processes, could accelerate the degradation of the engineered barrier system.

Nonetheless, the Commission believes that the DOE siting guidelines must not rely on engineered barriers to compensate for geologic weaknesses of the site during the site screening stages. For example, it would not be prudent to select a site where there is evidence of active faulting by relying on engineered barriers.

With regard to the EPA recommendation, to deemphasize engineered barriers in the comparative performance assessments by DOE, as part of the site selection process, such assessments would not be in conflict with 10 CFR Part 60 and may be

employed as appropriate by DOE for this purpose. However, at the time of license application, DOE would be required to meet the criteria in 10 CFR Part 60. DOE has testified that its use of engineered barriers in comparative performance assessments would provide for an equal contribution at each site. Thus, no matter how large or small that contribution may be, it would in effect cancel out in a comparative evaluation leaving the sites' hydrogeologic properties as the distinguishing factors.

The EPA also suggested that it may be appropriate for DOE to examine times up to 100,000 years in their performance assessments. There is nothing in 10 CFR Part 60 that would prohibit DOE from extending the time period to 100,000 years if they so desire.

b. *The guidelines are subjective, vague, and non-specific.* Many commenters believe that the guidelines are so vague and non-specific that it would be impossible to use them to compare sites in any meaningful way. Many commenters stated that the guidelines should establish specific, numerical criteria against which a site could be measured by an objective observer. The commenters also believe that the guidelines could be made more specific by increasing the number of disqualifying conditions.

On the other hand, the U.S. Geological Survey (USGS) stated in its supplemental testimony that it is not possible to have totally objective criteria for the highly variable and complex geohydrologic systems. The USGS indicated that a high degree of subjective judgment is required in this process, particularly at the early stages of site screening when data are very limited and unequally distributed among potential sites. USGS noted that even after three sites are characterized, a totally numerical objective ranking system is neither appropriate nor feasible.

The guideline's lack of specificity was a major contention among the States. Utah stated that the guidelines are so non-specific that they allow the location of a repository virtually anywhere outside a national park or city limit. North Carolina, in its supplemental testimony, stated that the guidelines lacked specificity because of a noticeable absence of measurable thresholds. Nevada contended that the guideline's lack of specificity is not consistent with the requirements in the NWPA. Section 112(a) requires DOE to specify detailed geologic considerations in the guidelines. Nevada believes that geologic considerations in the guidelines are not detailed. Section 112(a) also



requires that the guidelines "shall specify factors that qualify or disqualify any site from development as a repository". In Nevada's view such factors must be quantitative, but most factors in the guidelines are qualitative. In its supplemental testimony, Nevada stated that while quantification is desirable, it recognizes that "in many instances, the data is not available to support numerical thresholds at this time."

Several commenters believe that the guidelines could be made more specific if they were developed for a particular geologic medium rather than all media. Wisconsin, in its supplemental testimony, stated that geotechnical criteria cannot be quantified on a national scale but must be medium-specific. Wisconsin believes that these medium-specific criteria are necessary to develop candidates for characterization, particularly if there is more than one site in each medium. Similarly, Washington and Mississippi pointed out in their supplemental testimony, that rock/media specific guidelines would allow a much higher level of quantification to be incorporated into the final guidelines. Likewise, Minnesota recommended that DOE develop "rock type subsets of the guidelines that would provide the quantification and parameters that would make each rock type a favorable or unfavorable media for waste isolation."

With regard to medium specific guidelines, USGS, in its supplemental testimony, noted that medium specific guidelines could be developed but such guidelines would not ensure an equal amount of data at all sites.

Many commenters also stated that the guidelines are overly vague because they do not specify a sufficient number of disqualifying conditions. The State of Nevada pointed out that of the 21 technical guidelines, only seven contain disqualifying conditions. According to STAND, of the seven disqualifying conditions, none would clearly disqualify unacceptable sites. STAND and others believe that the guidelines are constructed in a manner that would prevent drawing a conclusion on a disqualifying condition unless the entire system's performance were jeopardized. In this way, STAND contends that DOE may discover and then disregard a disqualifying condition on the premise that its presence would not affect the system's performance.

Wisconsin noted that there were no disqualifying conditions for geochemistry, rock characteristics, tectonics, water supplies, and national forest lands. In addition, Wisconsin and

others noted that the guidelines' lack disqualifying conditions for some of the NRC technical criteria. These include (1) a minimum depth of 300 meters (10 CFR 60.122(b)(5)), and (2) site ownership (10 CFR Part 60.121).

DOE responded to its supplemental testimony to arguments that the guidelines do not contain a sufficient number of disqualifying factors. DOE believes that it has expanded the list of factors, required by section 112(a) of the NWA, that would qualify or disqualify a site. DOE noted that the guidelines contain 22 qualification conditions and 11 disqualification conditions. In addition, DOE notes that the inverse of a qualification condition is a disqualification condition; i.e., "a site shall be disqualified if . . . (2) the qualifying condition of any system or technical guideline cannot be met" section 960.3-1-4). Thus, according to DOE, the guidelines contain 33 explicit and implicit disqualifying conditions, any one of which can disqualify a site from further consideration for development as a repository.

#### *NRC Response and Finding*

The Commission notes that several methods have been suggested for making the guidelines more specific. These methods include: (1) Adding more disqualifying conditions; (2) preparing medium-specific guidelines; and (3) establishing numerical guidelines.

A number of commenters recommended that DOE add more disqualifying conditions to their guidelines. "In their written testimony, several commenters noted that the guidelines do not specify disqualifying conditions for prospective sites which would prohibit these sites from being

\*Mississippi believes that DOE misinterpreted section 112(a) by not providing separate qualifying and disqualifying factors for "proximity to populations," "highly populated areas," and "populations within an area 1 mile by 1 mile adjacent to the site."

In relevant part, section 112(a) provides: Such guidelines shall specify factors that qualify or disqualify any site from development as a repository, including factors pertaining to—proximity to populations—. Such guidelines shall specify population factors that will disqualify any site from development as a repository if any surface facility of such repository would be located (1) in a highly populated area; or (2) adjacent to an area 1 mile by 1 mile having a population of not less than 1,000 individuals.

The Commission views the second sentence quoted above dealing with population factors as explaining Congressional intent regarding the general consideration of proximity to population mentioned in the first sentence. Thus, the Commission believes that DOE's interpretation of section 112(a) was reasonable in not considering the first reference to proximity to populations as establishing a requirement for population related siting criteria different from those required by the second sentence.

developed as a repository including factors pertaining to the location of valuable natural resources, hydrology, geophysics, seismic activity, and atomic energy defense activities, proximity to water supplies, proximity to populations, the effect upon the rights of users of water, and proximity to components of the National Park System, the National Wildlife Refuge Systems, the National Wild and Scenic Rivers System, the National Wilderness Preservation System, or National Forest Lands. Section 112(a) states, "Such guidelines shall specify factors that qualify or disqualify any site from development as a repository . . ." The Commission recognizes that quantitative disqualifying conditions may not be feasible. However, the Commission finds that more qualitative disqualifying conditions can be developed and should be included for each of the above factors listed in section 112(a) of the NWA to help ensure that unacceptable sites will be eliminated as early in the site selection process as practicable.

With regard to the development of medium-specific guidelines, the Commission notes that the NWA states that the guidelines shall specify considerations for the selection of sites in various geologic media (emphasis added). Thus, the Commission finds that the approach taken by DOE, of developing general rather than medium-specific guidelines, is not in conflict with NWA.

From a technical standpoint, the Commission believes that it would be very difficult, if not impossible, for DOE to write numerical guidelines that would work for all geologic media and situations at the early site screening stages. The Commission's staff has reviewed all the comment letters sent to DOE and NRC concerning numerical guidelines. The State of Nevada, in its supplemental testimony, stated "that in many instances, the data is just not available to support numerical thresholds at this time." The USGS noted in its supplemental testimony that inexact nature of earth science does not allow a fully quantitative characterization of the natural barriers in space and time. A few commenters, however, offered examples of numerical guidelines, but the Commission finds that these are not generally applicable.

With only limited data and a requirement to use the numerical criteria in the guidelines, DOE would have to evaluate sites with overly simplistic models and assumptions that would not be reliable. The Yakima Indian Nation noted in its supplemental testimony, that attempts at system performance

assessment (i.e., modeling) before the site has been characterized "will be an exercise in unverifiable speculation." Therefore, the Commission finds that application of numerical guidelines prior to site characterization is not practical.

In summary, the Commission finds that some areas of the guidelines would not adequately provide a foundation for site-screening decisions. As a result, the Commission finds that DOE should set forth additional disqualifying conditions in the guidelines for prospective sites that would ensure that unacceptable sites are eliminated as early as practicable.

*c. Postclosure guidelines should not take precedence over preclosure guidelines.* In response to public comments on the February 7 draft of 10 CFR Part 960, DOE ranked the guidelines according to their relative importance: the most important appearing first, and the least important last. The guideline hierarchy consists of two major divisions: postclosure guidelines, which would receive primary consideration, and preclosure guidelines, which would receive secondary consideration. DOE, in its supplemental testimony, stated that postclosure radiological safety is considered to be a more critical concern than preclosure radiological safety because of the relatively greater uncertainties associated with the quantification of geologic characteristics, processes, and events into the future and their impacts on expected repository performance, as compared to those associated with active controls that can be maintained through permanent closure.

Many commenters believe that postclosure guidelines should not take precedence over preclosure guidelines. These commenters reasoned that blanket assignment of lower significance to the preclosure guidelines is arbitrary and inconsistent with the NWPAA and 10 CFR Part 60. Wisconsin referred to section 112(a) of the NWPAA which requires that detailed geologic considerations should be the primary criteria for site selection. Although DOE has made detailed geologic considerations its primary criteria, Wisconsin believes that sufficient data would not be available to evaluate these criteria prior to site characterization. Hence, DOE could not use its primary criteria in deciding which sites should be selected for characterization. The State of Utah noted that the NWPAA's reference to detailed geologic considerations as primary criteria

cannot justify DOE placing less importance on the preclosure guidelines.

Although some commenters generally agreed that postclosure guidelines should not take precedence over preclosure guidelines, they did not agree on how the guidelines should be ranked. For example, Minnesota recommended that DOE use a risk analysis to substantiate its ranking of guidelines. Minnesota believes that a risk analysis would prove that guidelines for transportation, population density and distribution, and environmental quality would be more important than those guidelines identified by DOE. Texas recommended that guidelines for erosion, tectonics, and dissolution be considered among the primary factors for the selection of sites. Similarly, STAND found that guidelines for tectonics, dissolution, and human interference are not ranked as high as they should be. Wisconsin, however, took a different position and recommended that DOE not establish priorities among the guidelines.

In its supplemental testimony, USGS stated that it is appropriate for the guidelines to give priority to post-closure considerations. USGS noted that post-closure performance depends heavily on large-scale natural geologic and hydrologic characteristics which cannot be engineered or significantly modified. USGS concluded that it is important that potential repository sites be selected with geohydrologic properties generally favorable to long-term isolation.

#### *NRC Response and Finding*

While DOE itself has ranked its proposed siting guidelines according to its assessment of relative importance, the Commission sees no explicit requirement for this or any other ranking in the NWPAA. Accordingly, NWPAA provides DOE with the discretion to establish this or any other ranking, so long as DOE meets all of the requirements in 10 CFR Part 60 in order to obtain a license.

The technical requirements of 10 CFR Part 60 are not arranged in a manner that would indicate their relative importance. Nevertheless, when DOE applies for a license from the NRC, the NRC will assure itself that all of the applicable requirements in 10 CFR Part 60 are satisfied and will not consider any requirements to be of secondary importance. The Commission notes that some licensing requirements, such as those for waste retrieval, compliance with 10 CFR Part 20, and 10 CFR Part 71, have been relegated to receiving secondary emphasis in the guidelines. Despite this arrangement, DOE has indicated that in the final analysis all

the qualifying conditions, including those adapted from 10 CFR Part 60, must be satisfied. Consequently, since DOE must comply with all applicable NRC regulations, the issue of ranking or ordering the guidelines will not materially affect NRC in carrying out its statutory responsibilities.

*d. The Guidelines do not specify the level of data needed to make decisions.* Many commenters take exception to DOE's reference to "available data" and use of "conservative assumptions" to evaluate sites when the data is not available. The State of South Carolina stated that the "vague and open-ended references to 'available evidence/data/information' should be deleted from the Guidelines." Utah believes that the guidelines should require sufficient data collection at each step in the site selection process to assure that the selection process is sound. Utah further believes that it is not acceptable to base environmental assessments and site nominations on existing data. Similarly, Mississippi feels that DOE will nominate and recommend sites with an inadequate, if not faulty, data base. With regard to "conservative assumptions," the Yakima Indian Nation noted that it will always be easier to make assumptions than to get the data. If the data are not available to make decisions, the Yakimas suggested that DOE obtain the data rather than making conservative assumptions. On the other hand, USGS believes that there is enough information to make conservative and informed estimates that are defensible with technical qualifications.

Some commenters recommended that DOE delete its reference to "available data" and specify a minimum and equal level of data that would be needed to make decisions, particularly the decisions to nominate and select sites for characterization. Other commenters added that before DOE nominates sites, the level of data on those sites should be equal. However, in its supplemental testimony, Wisconsin stated that DOE "must abandon its efforts to treat all states equally during screening because the data are not equally available." In a similar manner, USGS stated that conservative and informed estimates of geohydrologic conditions can be made even though the level of data is unequal among sites.

#### *NRC Responses and Finding*

The NWPAA instructs DOE to use available data when selecting sites for characterization. Section 112(b)(1)(3) states:

In evaluating the sites nominated under

this section prior to any decision to recommend a site as a candidate site; the Secretary shall use *available* geographical, geologic, geochemical and hydrologic, and other information and shall not conduct any preliminary borings or excavations at a site unless (i) such preliminary boring or excavation activities were in progress upon the date of enactment of this Act or (ii) the Secretary certifies that such available information from other sources, in the absence of preliminary borings or excavations, will not be adequate to satisfy applicable requirements of this Act or any other law: Provided, That preliminary borings or excavations under this section shall not exceed a diameter of 6 inches (emphasis added).

The Commission finds that DOE's reference to available data is not in conflict with the NWPAA.

Because of the limitations on the current state of knowledge in the earth sciences area, the Commission finds that specifying a common level of data is not realistic and might be too inflexible in practical applications for particular sites and different media. On the other hand, the Commission considers that the guidelines must be applied with adequate data to support the siting decisions that must be made by DOE to prepare its EIS for the license application. Unless DOE has applied the guidelines in a reasonable way in making its siting decisions, the Commission may be unable to adopt DOE's EIS. Accordingly, in order for the Commission to be able to more readily adopt DOE's EIS, the Commission finds that DOE should specify the kinds of information DOE will use to make decisions on the nomination of sites and recommending sites for characterization. For each category of technical criteria in the guidelines, DOE should describe the type and level of information needed to conclude whether the site meets that aspect of the guidelines. Examples of these information needs can be found in Regulatory Guide 4.17.

*e. The guidelines lack an adequate implementation methodology.* Many commenters suggested that some of the guidelines' deficiencies could be corrected with a proper implementation methodology. These deficiencies include: (1) Allowing decisions to be based on available data no matter how limited; (2) considering engineered barriers in the siting process; and (3) using qualitative rather than numerical criteria. A methodology was first proposed by representatives of 20 states at an August 18, 1983 meeting with DOE in Dallas, Texas. Later, 13 states and the Yakima Indian Nation wrote letters requesting DOE to adopt the methodology. The States of Wisconsin,

Nevada, South Carolina, Mississippi and the Yakima Indian Nation referenced or alluded to these letters in their testimony before the Commission.

Briefly, the implementation methodology, as described in the letters to DOE, would require DOE to write new guidelines for each siting decision. Thus, DOE would have separate guidelines for site screening, site nomination, and site recommendation for characterization. DOE would repeat the consultation and concurrence process, specified in the NWPAA, for each set of guidelines.

Wisconsin endorsed the implementation methodology because it calls for a sequential development of implementation guidelines and methodologies. South Carolina noted that the current implementation guidelines suggest an overly vague and uncertain process of decision. Instead, South Carolina recommended that the guidelines should state that decision methodologies, which cannot be spelled out in the guidelines at this time, would be developed in consultation with the states and Indian tribes pursuant to the NWPAA. The comment from Nevada is typical of the sentiments of all the states: "The states collectively and individually have pointed out to DOE since the beginning that in order to understand the guidelines and know their potential effect in important site screening decisions that we must know how they will be applied."

The USGS stated that perhaps there is some merit to an implementation methodology which provides different guidelines for different stages of screening but USGS concluded that such a methodology does not appear necessary. The USGS believes that the procedures in the guidelines and the NWPAA already account for the sequential staging of decisions.

A specific implementation matter was raised by the Environmental Policy Institute (EPI) and the Umatilla Indians. EPI contended that DOE has improperly interpreted section 116(a) of NWPAA to ratify all site screening decisions made prior to enactment of NWPAA. EPI believes that there is nothing in NWPAA which justifies DOE's determination that siting guidelines do not apply to the identification of potentially acceptable sites for the first repository. The Umatilla Indians hold a similar view on this matter.

DOE believes that its interpretation is supported by the schedules established by NWPAA. Section 116(a) gave DOE 60 days to notify states that they contained potential repository sites, while section

112(a) gave DOE 180 days to promulgate siting guidelines. Under these conditions, DOE believes that Congress could not have intended DOE to apply the siting guidelines to identifying the first set of potential repository sites.

EPI replied that DOE's argument is inconsistent with the provision of a 90 day period for DOE to inform the states. EPI believes that no delay would have been required if Congress intended DOE to satisfy its previous decisions because those decisions were made before the enactment of NWPAA. Thus, EPI believe that Congress gave DOE 90 days to use the guidelines to reconsider its previous determinations of potentially available sites.

The Edison Electric Institute (EEI) recognized the states' desire to participate in the repository program. EEI pointed out, however, that the public's participation does not end with the siting guidelines. In its supplemental testimony, EEI states that the site selection process involves more than adoption of the guidelines and their application. EEI maintains that siting involving a number of additional actions, including the preparation of environmental assessments, site characterization plans, and environmental impact statements. At each of these points, affected states, Indian Tribes, and the public will have an opportunity to both scrutinize and participate in the process. EEI contends that development and adoption of the guidelines does not constitute the only, or even the most important opportunity for input by interested persons into the process.

#### *NRC Response and Finding*

The NWPAA requires that DOE issue general guidelines for the recommendation of sites for repositories. Other provisions in the NWPAA refer to the general guidelines when describing various decisions in the site-selection process. The implementation methodology proposed by the states would have DOE write separate guidelines for site screening, site nomination, and site recommendation for characterization. NWPAA does not require separate guidelines for each point in the decision making process. Accordingly, the Commission finds that the states' proposal for separate guidelines at each stage of the site selection process is not legally required and is not necessary for the Commission to fulfill its responsibilities. Rather, the NWPAA establishes a process (of which the guidelines is one part) which when

implemented should lead to selection of an acceptable site.

Following the issuance of the siting guidelines, DOE must nominate at least five sites for characterization. According to section 112(b)(1)(E), each nomination must be accompanied by an environmental assessment which includes an evaluation of each site against the guidelines. The Commission finds that the guidelines, in combination with high-quality environmental assessments, will provide an adequate basis for nominating sites. After nominating at least five sites, DOE will recommend to the President three of these sites for characterization. According to section 112(b), the decision to select three sites for characterization is to be made by the Secretary of Energy. As noted earlier, the Commission has a particular interest in the Secretary's selection of these three sites because these sites are the alternatives to be considered in the EIS prepared by DOE and which NRC is required to adopt to the extent practicable.

The Commission finds with respect to the comments of EPI and the Umatilla Indians that DOE's interpretation of section 116(a) is reasonable. Certainly, it would be anomalous to expect DOE to use the guidelines to reconsider its previous identification of sites within the statutory 90 days when those guidelines were not required to be promulgated for another 90 days. Under these circumstances, the Commission believes that DOE's interpretation of section 116(a) is not clearly in conflict with NWPA.

The Commission recognizes that the public's participation in the repository program does not end with the guidelines but will continue in the development of environmental assessments, site characterization plans, and environmental impact statements. These documents give the public access to decisions that will, in the end, designate a site for repository development.

The Commission also recognizes that the site selection process does not end with issuing the siting guidelines. The procedures for selecting a repository site, as envisioned by NWPA, are lengthy and involved. The success of the site selection process will depend on the proper implementation of all of these procedures in concert rather than any single procedure.

The Commission believes that the site selection framework contained in the NWPA is adequate to select sites for development as repositories, and finds that staged or tiered guidelines are not required by the NWPA and are not

necessary for the Commission to fulfill its responsibilities. Nonetheless, the Commission considers the implementation portions of the present guidelines to be vague and uncertain and could impede NRC's adoption of DOE's EIS. In order to better be able to adopt DOE's EIS, which will include consideration of alternative sites that are determined to be suitable for development as repositories using the guidelines, the Commission finds that DOE must specify in greater detail how the guidelines will be applied at each siting stage including site nomination and characterization. For example, the Commission finds that DOE should, in clarifying its implementation approach, identify which guidelines would be used for each siting decision. This example is illustrative but not inclusive of the revisions needed to meet this condition for NRC concurrence.

#### Conclusion

Subject to the satisfactory resolution of the above conditions for NRC concurrence, the Commission finds that the guidelines should be sufficient to assure the selection of sites that would be reasonable candidates for a license application.

#### V. Commission Findings

Subject to the satisfactory resolution of the conditions set forth in this decision, the Commission finds that (1) the siting guidelines are not in conflict with 10 CFR Part 60; (2) the siting guidelines do not contain provisions that might lead DOE to select sites that would not be reasonable alternatives for an EIS; and (3) the siting guidelines do not contain provisions that are in conflict with its responsibilities as embodied in the NWPA. The separate views of Commissioner Roberts follow.

#### Commissioner Roberts' Views on DOE Siting Guidelines.

I believe that the concurrence provision 5 and 6 go beyond what the Commission is required to do by section 112 of the Nuclear Waste Policy Act. My reading of section 112 is that it would only require that the Commission review the proposed DOT Siting Guidelines for substantial inconsistencies with our Part 60 regulations. Thus, I do not support the position that section 112 requires the NRC to make a sweeping review of the DOE waste program or intrude unnecessarily in their decisionmaking process at this very early stage. To do so would be counterproductive.

If required by the Commission, provisions 5 and 6 would force a level of specificity from DOE which is not warranted and, indeed, would be premature at this stage of the process. Having said this, I am fully cognizant of the substantial concerns raised by a number of States in our oral

presentation of January 11. While I am sympathetic toward their concern, I believe that the Commission must restrict its review to the health and safety factors as embodied in our Part 60 regulations. Thus I support only the inclusion of provisions 1 through 4 and 7 as conditions for concurrence.

Dated at Washington, D.C., this 9th day of March 1984.

For the Nuclear Regulatory Commission,  
John C. Hoyle,

Assistant Secretary of the Commission.

(FR Doc. 84-0836 Filed 3-13-84; 8:45 am)

BILLING CODE 7590-01-8

(Docket Nos. 50-280 and 50-281)

#### Virginia Electric and Power Co.; Granting of Relief From ASME Section XI Inservice Inspection Requirements

The U.S. Nuclear Regulatory Commission (the Commission) has granted relief from certain requirements of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components" to Virginia Electric and Power Company. The relief relates to the inservice inspection program for the Surry Power Station Unit Nos. 1 and 2 (the facilities) located in Surry County, Virginia. The ASME Code requirements are incorporated by reference into the Commission's rules and regulations in 10 CFR Part 50. The relief is effective as of February 28, 1984.

The relief permits the licensee to perform certain inservice inspections in a manner different from that prescribed in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda, as required by 10 CFR Part 50, because of inaccessibility, configuration of components, radiation level, or other valid reasons.

The request for relief complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter 1, which are set forth in the letter granting relief.

The Commission has determined that the granting of this relief will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this relief.

For further details with respect to this action, see (1) the application for relief and letters dated May 17 and September 28, 1978, December 15, 1980, March 25,



December 24, 1984

**POLICY ISSUE**  
**(Notation Vote)**

*Olmsstead*  
*1. J. Wolf*  
*2. C. Cannon*  
*3. P. G. Galt*  
*4. C. file*  
**SECY-84-482**

**For:** The Commissioners

**From:** Williams J. Dircks  
Executive Director for Operations

**Subject:** ISSUANCE OF THE FINAL SITING GUIDELINES BY THE U.S. DEPARTMENT OF ENERGY FOR THE RECOMMENDATION OF SITES FOR NUCLEAR WASTE REPOSITORIES

**Purpose:** To inform the Commission that the U.S. Department of Energy has issued the final siting guidelines (49 Fed. Reg. 47714, December 6, 1984) and has incorporated the changes agreed to at the June 22, 1984 Commission meeting; and to advise the Commission on whether or not it must formally concur in the supplementary information (preamble) to the final guidelines.

**Background:** On November 22, 1983 the U.S. Department of Energy (DOE) submitted to the U.S. Nuclear Regulatory Commission (NRC or Commission) a document entitled General Guidelines for Recommendation of Sites for Nuclear Waste Repositories (November 18, 1983). These guidelines were developed by DOE pursuant to Section 112(a) of the Nuclear Waste Policy Act of 1982 (NWSA). At that time, DOE requested that the Commission concur in the siting guidelines.

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At the request of several states, the Commission established a process, that was similar to notice-and-comment rulemaking, to concur in the guidelines. The Commission held a public meeting on the guidelines on January 11, 1984 and issued a preliminary concurrence decision (49 Fed. Reg. 9650) on March 14, 1984. The Commission considered public comments on the preliminary decision and instructed the NRC staff to meet with DOE to resolve the Commission's concerns that were set forth in the preliminary decision. After six open meetings with the NRC staff, DOE resubmitted guidelines dated May 14, 1984. The Commission considered the May 14 guidelines and heard additional public comments at a meeting held on June 22, 1984. At that meeting the Commission concurred in the guidelines with the understanding that DOE would:

- (1) Revise §960.1 of the guidelines so that DOE would submit to NRC for its concurrence all future revisions of the guidelines rather than only those that are "related to NRC jurisdiction;"
- (2) Delete from §960.3-2-3 the sentence that stated "Such recommendation decision shall include a preliminary determination by the Secretary, referred to in Section 114(f) of the Act, that such sites are suitable for the development of repositories under the guidelines of Subparts C and D;" and
- (3) Revise §960.3-1-5 to state that "engineered barriers shall be considered only to the extent necessary to obtain realistic source terms for comparative site evaluations based on the sensitivity of the natural barriers to such realistic engineered barriers."

The Commission instructed the staff to include the above items in a final concurrence decision along with other statements made at the June 22 meeting.<sup>1</sup> The Commission published its final concurrence decision in the Federal Register on July 10, 1984 (49 Fed. Reg. 28130).

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<sup>1</sup>Memorandum for William J. Dircks from Samuel J. Chilk dated June 28, 1984.

Discussion:

DOE published its final guidelines and supplementary information (sometimes referred to as the preamble) in the Federal Register on December 6, 1984 (Enclosure 1). The guidelines have been revised according to the Commission's final concurrence decision and DOE has incorporated the changes that the Commission requested at its June 22, 1984 meeting. The staff has marked the final guidelines to show where DOE has made these additional changes (Enclosure 2).<sup>2</sup>

The Commission's final concurrence decision contains the statement: "Moreover, the Commission expects that, to the extent that the Secretary promulgates revisions to or interpretations of the guidelines, they will be submitted to NRC for its review and concurrence" (49 Fed. Reg. 28140). The staff has therefore reviewed the preamble to determine whether it contains any such interpretation of the guidelines. The staff considered, among other things, whether the preamble: (1) modified the Commission's understanding of the guidelines;<sup>3</sup> (2) is an addition to the guidelines;<sup>4</sup> or (3) threatened the integrity of the guidelines.<sup>5</sup>

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<sup>2</sup>DOE also made several editorial changes, and one change that was intended to enhance the consistency of the guidelines with 10 CFR Part 60 (see Enclosure 3). These changes along with those requested by the Commission are marked on pages 3, 15, 20, 21, 22, 24, 29, 31, 36, 47, 48 and 50 of Enclosure 2.

<sup>3</sup>Transcript of the U.S. Nuclear Regulatory Commission in the matter of: "Discussion on Possible Vote of Commission Concurrence on DOE Siting Guidelines," June 22, 1984, p. 71, lines 23-25 and p. 72, line 1.

<sup>4</sup>Ibid., p. 101, lines 17-20.

<sup>5</sup>Ibid., p. 103, lines 9-12.

The staff believes that the Commission was concerned about "major significant" interpretations<sup>6</sup> that departed from the Commission's understanding of the guidelines or that introduced new guidelines and conducted its review in that light.<sup>7</sup>

Since DOE decided to issue its guidelines as a regulation (10 CFR Part 960), DOE must follow the procedures of the Administrative Procedure Act. One requirement of that Act is that DOE incorporate in its published rules "a concise general statement of their basis and purpose." Such a statement appears in the Federal Register notice as a preamble to the regulation itself.

The staff regards DOE's discussion of the guidelines in the preamble to be merely explanatory. The staff believes that it represents no departure from the Commission's understanding of the guidelines. Therefore, using the guidance provided by the Commission's deliberations, the staff concludes that DOE has not revised or interpreted its guidelines.

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<sup>6</sup>Transcript of the U.S. Nuclear Regulatory Commission in the matter of: "Discussion on Possible Vote of Commission Concurrence on DOE Siting Guidelines," June 22, 1984, p. 159, line 11.

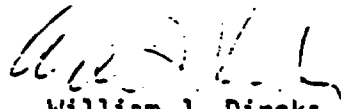
<sup>7</sup>The staff notes that Commissioner Asselstine had an early draft of the preamble at the June 22, 1984 meeting. At that meeting, Commissioner Asselstine stated, "Some of it [the preamble] is rationale for how you [DOE] responded to comments in a certain way, but some of it [the preamble] appears to get more into interpretive" (Transcript p. 72, lines 14-19). The staff adds, however, that the early draft of preamble differs from the final preamble.



Conclusion: The staff concludes that the final guidelines have adequately responded to the Commission's final concurrence decision. The staff also concludes that the preamble to the guidelines does not contain any interpretation of the guidelines and, therefore, does not require Commission concurrence.

Coordination: In accordance with the Commission's instructions on this matter, this Commission Paper represents a coordinated effort between the EDO staff, OPE, and OGC.

Recommendation: Based on this review, the staff recommends that no further action is necessary.



William J. Dircks  
Executive Director for Operations

Enclosures:

1. Federal Register Notice  
(49 FR 47714, 12/6/84)
2. Mark-up of final guidelines
3. Changes to text of siting guidelines

Commissioners' comments should be provided directly to the office of the Secretary by c.o.b. January 11, 1985.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT January 4, 1985, with an information copy to SECY. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

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June 11, 1984

**POLICY ISSUE**  
(Affirmation)

SECY-84-233

For: The Commissioners

From: William J. Dircks  
Executive Director for Operations

Subject: FINAL DECISION ON THE U.S. DEPARTMENT OF ENERGY'S  
GENERAL GUIDELINES FOR THE RECOMMENDATION OF SITES  
FOR NUCLEAR WASTE REPOSITORIES

Purpose: To request that (1) the Commission approve a proposed final  
decision for publication in the Federal Register and (2) the  
Chairman transmit the enclosed letter to the Secretary of Energy  
indicating that the Commission concurs in the siting guidelines.

Discussion: On November 22, 1983, the U.S. Department of Energy (DOE)  
submitted to the U.S. Nuclear Regulatory Commission (NRC or  
Commission) a document entitled General Guidelines for  
Recommendation of Sites for Nuclear Waste Repositories --  
November 18, 1983. These siting guidelines were developed by  
DOE pursuant to Section 112(a) of the Nuclear Waste Policy Act  
of 1982 (NWPA). At that time, DOE requested that the Commission  
concur in the siting guidelines.

The Commission held a public meeting on the siting guidelines on  
January 11, 1984 and issued a preliminary decision in the  
Federal Register on March 14, 1984 (49 FR 9650). A public  
comment period on the preliminary decision was held until April  
4, 1984. Thirty-five (35) comment letters on the preliminary  
decision were received by the Commission through May 14, 1984.  
Comment letters were received from ten (10) states, one (1)  
Indian tribe, two (2) federal agencies, one (1) industrial group,  
seven (7) public interest groups, and (5) private individuals.  
Some parties commented more than once. All comment letters  
received through May 14, 1984 were considered in developing the  
proposed final decision.

Contact:  
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8406200499 840611  
PDR SECY  
84-233 PDR

During the period between March 14, 1984 and May 3, 1984, the NRC staff and the DOE staff held six (6) meetings to resolve the concerns that the Commission had with the November 18, 1983 version of the siting guidelines. These Commission concerns were set forth in the Commission's preliminary decision of March 14, 1984. Subsequent to the NRC and DOE meetings, the DOE submitted revised guidelines to the Commission on May 14, 1984.

The proposed final decision (Enclosure 1) is based on the revised guidelines. The proposed final decision also considers public comment on the Commission's preliminary decision. Comments that were not specifically addressed in the proposed final decision were considered in Enclosure 2 (Responses to Public Comments).

The conclusion reached in the proposed final decision is that the revised guidelines satisfactorily resolve the seven conditions that the Commission set forth in its preliminary decision. It is further concluded that there is no basis for modifying the seven conditions that were set forth in the Commission's preliminary decision or adding to them. Therefore, it is proposed that the Commission concur in the revised guidelines.

A proposed letter to the Secretary of Energy from the Chairman (Enclosure 3) would inform DOE that the Commission has concurred in the revised siting guidelines.

Coordination: In accordance with the Commission's instructions on this matter, this Commission paper represents a coordinated effort between the EDO staff, OPE and OGC.

Schedule: The Commission has tentatively scheduled a meeting on this subject on June 22, 1984 at 10:00 a.m.

William J. Dircks  
Executive Director  
for Operations

Enclosures:

1. Proposed final decision
2. Responses to Public Comments
3. Proposed letter to Secretary of Energy from Chairman Palladino

This paper is tentatively scheduled for discussion and possible vote at an Open Meeting on Friday, June 22, 1984. If a vote is not taken at the meeting, Commissioners are requested to respond ASAP thereafter.

In order to allow adequate time for Commission consideration, Commission Staff Office comments, if any, should be submitted to the Commissioners NLT Wednesday, June 20, 1984, with an information copy to the Office of the Secretary.

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## NUCLEAR REGULATORY COMMISSION

Final Decision Related To  
U.S. Department of Energy's General Guidelines  
for the Recommendation of Sites for Nuclear Waste Repositories

AGENCY: Nuclear Regulatory Commission.

ACTION: Concurrence in U.S. Department of Energy's General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories.

SUMMARY: The Nuclear Waste Policy Act of 1982 directs the U.S. Department of Energy (DOE) to issue general guidelines for the recommendation of sites for repositories. In carrying out this responsibility, DOE is required to obtain the concurrence of the U.S. Nuclear Regulatory Commission (NRC or Commission). On November 22, 1983, DOE submitted proposed general guidelines to the NRC and requested that the Commission concur in them. On March 14, 1984, the Commission published a preliminary decision (49 FR 9650) which set forth seven conditions for granting its concurrence. On May 14, 1984, DOE submitted revised proposed general guidelines that considered the Commission's concurrence conditions.

This final decision by the Commission addresses the extent to which DOE has complied with the seven conditions. It also considers public comments that were received by the Commission on its preliminary decision.

The Commission has concluded in this final decision that (1) DOE has satisfactorily resolved the seven conditions set forth in the Commission's preliminary decision, (2) on the basis of a review of the public comments, the conditions set forth in the preliminary decision need not be modified nor is there a need to add new conditions, and (3) the Commission should grant its concurrence in the revised guidelines submitted to it by the DOE on May 14, 1984.

#### SUPPLEMENTARY INFORMATION:

##### I. INTRODUCTION

This final decision is the U.S. Nuclear Regulatory Commission's (Commission or NRC) concurrence in the General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories (siting guidelines or guidelines) proposed by the U.S. Department of Energy (DOE).

Section 112(a) of the Nuclear Waste Policy Act of 1982 (NWPA or Waste Act), 42 U.S.C. 10312(a), directed DOE to issue general guidelines for the recommendation of sites for repositories. In carrying out this



responsibility, DOE is required by the NWPA to consult with the Council on Environmental Quality, the Administrator of the Environmental Protection Agency, the Director of the Geological Survey, and interested Governors and to obtain the concurrence of the Commission.

On November 22, 1983, DOE submitted proposed general guidelines to the Commission and requested that the Commission concur in them. On December 15, 1983, the Commission described its decisionmaking process and set forth the procedural format for a public meeting on the proposed siting guidelines (48 FR 55789). The Commission scheduled the public meeting for January 11, 1984 to hear oral presentations on the siting guidelines and requested that any written comments on the siting guidelines be submitted to the Commission by January 9, 1984. At the public meeting on January 11, the period for receiving written comments on the guidelines was extended to February 1, 1984.

In its notice for the January 11 meeting (48 FR 55789), the Commission posed five questions which it believed to be relevant to the Commission's concurrence in DOE's siting guidelines.

- Question 1: Do the guidelines omit any relevant technical criteria established in 10 CFR Part 60?
- Question 2: Could any guidelines not related to 10 CFR Part 60 result in selecting a site that would not be a reasonable candidate for license application?
- Question 3: The guidelines and 10 CFR Part 60 sometimes employ different wording to define terms and to describe certain technical criteria. Could these differences result in selecting a site that would not be a reasonable candidate for a license application?
- Question 4: Would the selection of sites in accordance with the guidelines be a reasonable means to identify alternative sites for the purposes of the National Environmental Policy Act (NEPA)?
- Question 5: Are the guidelines sufficient to assure the selection of sites that would be reasonable candidates for a license application?

On March 14, 1984, after considering both the oral and written comments from the public, the Commission published a preliminary decision (49 FR 9650). The Commission established a twenty-one (21) day public comment on the preliminary decision which closed on April 4, 1984. Thirty-five (35) comment letters on the preliminary decision were received by the Commission through May 14, 1984. Comment letters were received from ten (10) states, one (1) Indian Tribe, two (2) federal agencies, one (1) industrial group, seven (7) public interest groups, and (5) private individuals. Some parties commented more than once. All of the comment letters received through May 14, 1984 were considered in developing this final decision.

In the preliminary decision, the Commission applied the following criteria for concurrence: (1) the siting guidelines must not be in conflict with 10 CFR Part 60; (2) the siting guidelines must not contain provisions that might lead DOE to select sites that would not be reasonable alternatives for an Environmental Impact Statement (EIS); and (3) the siting guidelines should not contain provisions that are in conflict with NRC responsibilities as embodied in the NWPA.

On the basis of these criteria, the Commission indicated that it would concur in the proposed siting guidelines provided that DOE satisfied seven conditions.<sup>1</sup> These conditions called upon DOE to:

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<sup>1</sup>In the Commission's preliminary decision, Commissioner Roberts presented separate views on the Commission's concurrence conditions in which he stated that he believes that Conditions 5 and 6 go beyond what the Commission is required to do by Section 112(a) of the Waste Act.

- (1) Amend the siting guidelines to recognize NRC's jurisdiction for resolution of differences between the guidelines and 10 CFR Part 60;
- (2) Commit to obtain NRC's concurrence on revisions to the siting guidelines that relate to NRC jurisdiction;
- (3) Revise the siting guidelines so that:
  - (a) DOE modifies its use of high effective porosity to limit its use to those situations that could be considered as a favorable siting condition;
  - (b) DOE commits to revise its siting guidelines on the unsaturated zone so that they are consistent with the final NRC amendments on the unsaturated zone;
  - (c) DOE should relocate the favorable condition relating to total dissolved solid concentrations in the groundwater, presently contained in Section 960.4-2-1(b)(7) of the guidelines, to Section 960.4-2-8-1 where effects on natural resources are considered. As an alternative, DOE could delete this provision;
  - (d) DOE should not frame its guidelines such that a 1,000 year groundwater travel time (10 CFR 60.113) would be adjusted, particularly in the early stages of site selection;

- (e) DOE should delete the word "permanently" from its definition of "disturbed zone;"
  - (f) DOE should clarify its meaning of "short-term" extreme erosion and revise the guidelines as appropriate;
  - (g) DOE should delete the word "significant" from Section 960.4-2-8-1(c)(2) of the siting guidelines where reference is made to "Evidence of significant subsurface mining" (emphasis added).
  - (h) DOE should modify the guidelines so that they are consistent with the Commission's definition of "anticipated processes and events" and "unanticipated process and events."
  - (i) DOE should modify the guidelines so that potentially adverse conditions (e.g., dissolution) be considered if they affect isolation within the controlled area even though the condition may occur outside the controlled area.
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- (4) Modify the siting guidelines to make clear that engineered barriers cannot constitute a compensating measure for deficiencies in the geologic media during site screening;
  - (5) Specify in greater detail how the guidelines will be applied at each siting stage including site nomination and characterization (for

example, DOE should specify in the implementation guidelines which guidelines would be applied at each stage of site screening);

- (6) Supplement the guidelines to indicate the kinds of information necessary for DOE to make decisions on the nomination of at least five repository sites and subsequently recommending three sites to the President for characterization (examples of the kinds of information which the Commission has in mind can be found in NRC Regulatory Guide 4.17); and
- (7) Add additional disqualifying conditions to the guidelines with sufficient specificity to ensure that unacceptable sites are eliminated as early as practicable. Disqualifying conditions should be provided for those factors specified in §112(a) of NWPA including seismic activity, atomic energy defense activities, proximity to water supplies, the effect upon the rights of users of water, the location of valuable natural resources, hydrology, geophysics, proximity to populations, and proximity to components of the National Park System, the National Wildlife Refuge System, the National Wild and Scenic Rivers System, the National Wilderness Preservation System, and National Forest Lands.

Subsequent to the preliminary decision, the Commission's staff met with DOE in six public meetings, beginning on March 14, 1984 and ending on

May 3, 1984, in order to assist DOE in resolving the Commission's conditions for concurrence. Members of the public were provided the opportunity to observe these meetings and to offer their comments and observations at the conclusion of each of these meetings.

On May 14, 1984, the DOE submitted revised proposed siting guidelines for the Commission's consideration.<sup>2</sup> DOE believes that the revised guidelines fully satisfy the concerns of the Commission as expressed in its preliminary concurrence decision.

## II. RESOLUTION OF NRC CONDITIONS FOR CONCURRENCE

In this section, the Commission (1) restates its conditions for concurrence that were set forth in the Commission's preliminary decision (49 FR 9650); (2) summarizes DOE's response to each condition; and (3) discusses the adequacy of DOE's response, considers public comments on each condition and concludes whether the conditions have been satisfied. Public comments that do not directly address the Commission's conditions for concurrence are considered in the section, "Other Commission Considerations Resulting From Public Comment."

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<sup>2</sup>On May 29, 1984, DOE submitted a letter to the Commission which identified editorial oversights in the May 14 submittal that were discovered after DOE had submitted the revised guidelines to the Commission. When the revised siting guidelines dated May 14, 1984 are referred to in this decision, the editorial corrections, as presented in the May 29, 1984 letter, are also considered.

In general, the States, public interest groups, and other commenters supported the seven conditions set forth in the Commission's preliminary decision. For the most part, the commenters believe that if DOE satisfactorily responds to the seven conditions, then objective and acceptable guidelines will be established. However, a few commenters believed that the conditions did not go far enough while others believed that some of the conditions were unreasonable and beyond the scope of NRC's jurisdiction. These latter comments, along with other comments that address specific conditions, are considered in the analysis that follows.

NRC CONDITION 1:

DOE should amend the siting guidelines to recognize NRC's jurisdiction for resolution of differences between the guidelines and 10 CFR Part 60.

DOE Response: DOE has revised §960.1 of the guidelines to state that "The DOE recognizes NRC jurisdiction for the resolution of differences between the guidelines and 10 CFR Part 60."

Discussion and Conclusions: The November 18, 1983 draft of the guidelines stated that DOE, in applying its guidelines, "...will resolve any inconsistencies between the guidelines and the above documents [NAPA, 40



CFR 191 and 10 CFR 60] in a manner determined by the DOE to most closely agree with the intent of the Act." In its preliminary decision, the Commission pointed out that the Commission's interpretation of 10 CFR Part 60 is binding on DOE. In its revised guidelines, DOE has deleted the language quoted above and replaced it with the words from Condition 1.

The commenters generally supported this condition. Minnesota suggested that DOE delete the language in §960.1 that authorizes DOE to resolve inconsistencies between the guidelines and 10 CFR Part 60. Likewise, the Natural Resources Defense Council (NRDC) found that "In order to ensure selection of a licensable site, DOE should submit apparent inconsistencies to the Commission for resolution according to the Commission's interpretation of 10 CFR Part 60, rather than according to DOE's interpretation...."

The current guidelines recognize NRC jurisdiction and no longer state that DOE would resolve differences between the guidelines and 10 CFR Part 60. The Commission concludes that the revisions to §960.1 of the guidelines satisfy Condition 1.

#### NRC CONDITION 2:

DOE should commit to obtain NRC's concurrence on revisions to the siting guidelines that relate to NRC jurisdiction.

DOE Response: DOE has revised §960.1 of the guidelines to state that "The DOE will submit any such revisions relating to NRC jurisdiction to the NRC and obtain their concurrence prior to issuance."

Discussion and Conclusions: Several commenters stated that NRC should concur in all revisions to the guidelines regardless of whether the revision falls within NRC jurisdiction. Nevada stated that "under the NWPA, there are simply no guidelines, original or amendatory, which do not require the Commission's concurrence because the Congress has said so." Likewise, Utah stated that "The NWPA does not provide that NRC concurrence to [sic] be limited only to those guidelines that relate to the Commission's licensing authority."

In its preliminary decision, the Commission explained that it would have jurisdiction to review the guidelines insofar as they might bear upon the exercise of NRC responsibilities under the Atomic Energy Act, the Energy Reorganization Act, the National Environmental Policy Act, and the Nuclear Waste Policy Act. Because of the broad scope of these responsibilities, the Commission fully anticipated that DOE would routinely seek NRC concurrence on revisions to the guidelines. However, the Commission does not consider it useful, or legally necessary, to review guidelines

unrelated to its jurisdiction; and for the Commission to engage in a decisionmaking process (i.e., to concur or to withhold concurrence) on a matter in which it has no authority or discretion would be anomalous.

If DOE were to revise its guidelines, it would have to observe the requirements of the Administrative Procedure Act (APA), which would include affording an opportunity for public comment. There would be an occasion for the Commission, as well as other commenters, to take exception to a proposed revision on the grounds of failure to obtain Commission concurrence in a matter within the Commission's jurisdiction. Moreover, the Commission would not expect DOE to risk judicial invalidation of its guideline revision by not requesting that the Commission concur. Therefore, the Commission concludes that Condition 2 as stated in its preliminary decision and the modifications that DOE made to §960.1 of the guidelines as a result of that condition are both appropriate and satisfactory.

NRC CONDITION 3(a):

DOE should modify its use of high effective porosity to limit its use to those situations that could be considered as a favorable siting condition.

DOE Response: DOE has revised §960.4-2-1(b)(4)(iv) of the guidelines to state that "High effective porosity together with low hydraulic conductivity in rock units along paths of likely radionuclide travel between the host rock and accessible environment" (emphasis added) is a favorable siting condition for waste disposal in the saturated zone.

Discussion and Conclusions: The November 18, 1983 draft of the guidelines stated that a favorable condition for reducing the release of radionuclides in groundwater would be "a high effective porosity along paths of likely radionuclide travel between the host rock and the accessible environment." According to Darcy's law, effective porosity is inversely related to the velocity of the groundwater flow (groundwater flow velocity equals the product of hydraulic gradient and hydraulic conductivity divided by effective porosity). Thus, for certain conditions, a high effective porosity could indicate a low groundwater velocity and, therefore, a long groundwater travel time of radionuclides to the accessible environment.

However, before a high effective porosity could be considered favorable, it must be assumed that the product of the hydraulic gradient and conductivity remains constant. The Commission noted that in some

circumstances this product is not constant because porosity and hydraulic conductivity can be positively correlated. If this positive correlation occurred at a particular site, then a high effective porosity would be an adverse, rather than favorable, condition.

The States of Utah and Minnesota recognized that, without considering the other components in Darcy's law, a high effective porosity could be favorable or adverse. Utah stated, "This guideline should either be changed to reflect the dynamic nature of the relationships defined by the travel time formula [Darcy's law] or should be converted to a 'potentially adverse condition' which accurately considers those dynamic factors."

The revised guidelines now state that DOE will consider a high effective porosity together with low hydraulic conductivity. This new wording reflects the inverse relationship between porosity and conductivity which satisfies the Commission's concern and should also satisfy Utah's concern that the guidelines "reflect the dynamic nature of the relationships defined by the travel time formula."

Minnesota criticized DOE's new wording and stated "DOE's proposed wording is inappropriate because the condition of high effective porosity, even coupled with low hydraulic conductivity, may under some circumstances be adverse--especially when considering crystalline rock." The Commission is not aware of any such circumstance. For Darcian flow at any given scale,

the Commission considers that the combination of high effective porosity and low hydraulic conductivity is a favorable condition with respect to groundwater travel time and advective transport of radionuclides.

The Commission concludes that DOE's revision to the favorable condition at §960.4-2-1(b)(4)(iv) satisfies Condition 3(a).

NRC CONDITION 3(b):

DOE should commit to revise its siting guidelines on the unsaturated zone so that they are consistent with the final NRC amendments on the unsaturated zone.

DOE Response: DOE has added a note to §960.4-2-1(b)(5) that reads, "The DOE commits, in accordance with the general principles set forth in Section 960.1 of these regulations, to revise the guidelines, as necessary to ensure consistency with the final NRC regulations on the unsaturated zone, which were published as a proposed rule on February 16, 1984 in 49 Federal Register 5934."

Discussion and Conclusions: The Commission requested a commitment from DOE to revise their guidelines if they are inconsistent with the final NRC amendments to 10 CFR Part 60 related to the unsaturated zone. The guidelines contain five provisions [§§960.4-2-1(b)(6)(i) through (v)] that

deal with the unsaturated zone. The proposed amendments to 10 CFR Part 60 contain similar, though not identical, provisions. In its preliminary decision, the Commission concluded that the guidelines are not in conflict with the proposed amendments to 10 CFR Part 60. Although the final NRC amendments may change after the Commission considers public comment, DOE's commitment to revise their guidelines will ensure that they remain consistent with 10 CFR Part 60.

A few commenters thought that in exchange for DOE's commitment to revise their guidelines, the Commission would not engage in a formal concurrence process on the guideline revisions. Minnesota stated that DOE should seek NRC concurrence in guidelines so that the guidelines will be consistent with the amendments to 10 CFR Part 60 on the unsaturated zone.

As indicated in the discussion of Condition 2, the Commission would concur in any guideline revision that falls within its jurisdiction, and revisions to guidelines dealing with the unsaturated zone would be within the Commission's jurisdiction. If the guidelines submitted on May 14, 1984 should prove to be inconsistent with the final NRC amendments on the unsaturated zone, then DOE on its own initiative, or in response to an NRC request, would revise the guidelines and submit the needed changes for concurrence. DOE's commitment to assure consistency satisfies the Commission that this will be accomplished.

The Commission concludes that DOE's commitment to revise the guidelines in §960.4-2-1(b)(5) satisfies Condition 3(b).

NRC CONDITION 3(c):

DOE should relocate the favorable condition relating to total dissolved solids concentrations in the groundwater, presently contained in Section 960.4-2-1(b)(7) of the guidelines, to Section 960.4-2-8-1 where effects on natural resources are considered. As an alternative, DOE could delete this provision.

- DOE Response: DOE relocated its provision from the section on Geohydrology (§960.4-2-1(b)(7)) to the section on Natural Resources (§960.4-2-8-1(b)(2)). DOE also changed the wording of the provision to read, "...along any path of likely radionuclide travel from the host rock to the accessible environment" (emphasis added).

Discussion and Conclusions: The Commission gave DOE two options as a means of resolving Condition 3(c). DOE could either transfer the provision to §960.4-2-8-1 where effects on natural resources are considered, or DOE could delete the provision. The first option would clarify DOE's intent to avoid sites that contain domestic or agricultural sources of groundwater. Since groundwater protection is more directly



related to natural resources (§960.4-2-8-1) than radionuclide releases (§960.4-2-1), the Commission reasoned that DOE could better clarify its intent by transferring the provision to §960.4-2-8-1.

The second option of deleting the provision would satisfy the Commission's concern that "...groundwater containing a high concentration of dissolved solids may have an adverse effect on the performance of the engineered barrier system" (49 FR 9653). The Commission felt that a high concentration of dissolved solids in groundwater could complicate the design of the waste canister and could perhaps hamper DOE's efforts to satisfy the containment and release rate requirements in 10 CFR Part 60.

The commenters held mixed views on whether DOE should delete or retain the provision that would favor sites where the groundwater contains a high concentration of total dissolved solids (TDS). Rhode Island would prefer that DOE delete the provision. Rhode Island believes that "If good quality water may be obtained by filtering, chlorinating, or treating the groundwater with flocculants, we would argue that such groundwater should not be exposed to radionuclides, regardless of its dissolved solids content."<sup>3</sup> Minnesota also favored deleting the provision but for a

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<sup>3</sup>The Commission notes that the processes identified would not remove dissolved solids from the water. However, processes such as evaporation, reverse osmosis, or ion-exchange could reduce or eliminate dissolved solids from the water as well as any radioactive contamination.

different reason. Minnesota stated, "It would not be prudent to locate a repository in an area where the danger of canister corrosion would be high [due to a high concentration of TDS]."

Utah criticized the high TDS provision but made no recommendation on how it should read or whether the provision should be deleted. Utah stated that "...the possibility of human intrusion for the use of such water [containing a high TDS] is likely to be heavily dependent upon other unrelated but predictable developments, and not appropriately assessed by this guideline."

Washington supported the provision for a high TDS in groundwater and stated that "We are not too concerned about which subsection of the guidelines contains this philosophy [of favoring sites where the groundwater contains a high TDS concentration], but we don't want it deleted."

DOE has retained and modified the provision for high TDS concentration in groundwater and will favor sites where the TDS concentration in groundwater exceeds 10,000 parts per million (ppm). Rhode Island's objection to this provision stems from its concern that DOE may use the 10,000 ppm of TDS as a threshold for poor quality groundwater, and with advances in water treatment technology, this "poor quality groundwater" could become an acceptable water source to future generations. The Commission agrees

that advanced water treatment could make poor-quality groundwater acceptable to future generations, but this scenario assumes that better quality water would not be available. If future generations must rely upon groundwater with a high dissolved solids content as a source of water, then the potentially adverse condition: "Potential for foreseeable human activities--such as groundwater withdrawal, extensive irrigation..." [§960.4-2-8-1(c)(5)] would discourage DOE from selecting a site where even poor quality groundwater could be a viable source.

The Commission shares Minnesota's concern that a high TDS concentration in groundwater could accelerate the corrosion of the waste canister. However, the favorable condition applies only to groundwater that flows from the host rock to the accessible environment and not to the water that may be in contact with the waste canister. The Commission concludes that DOE has satisfied Condition 3(c) by making appropriate changes to §960.4-2-1(b)(7) and §960.4-2-8-1(b)(2) of the guidelines.

NRC CONDITION 3(d):

DOE should not frame its guidelines such that a 1000 year groundwater travel time (10 CFR 60.113) would be adjusted, particularly in the early stages of site selection.

DOE Response: DOE has deleted from §960.4-2-1(d) the provision that would allow DOE to select sites where the groundwater travel time is less than 1000 years. DOE has also changed the wording of §960.4-2-1(d) to state: "A site shall be disqualified if the pre-waste-emplacement groundwater travel time from the disturbed zone to the accessible environment is expected to be less than 1000 years along any pathway of likely and significant radionuclide travel" (emphasis added).

Discussion and Conclusions: The November 18, 1983 draft of the guidelines allowed DOE to select sites for characterization where groundwater travel time is less than 1,000 years. Although 10 CFR Part 60.113 allows adjustments to a 1,000 year groundwater travel time, these adjustments must be approved or specified by the Commission. Consequently, Condition 3(d) originated from the Commission's objection that DOE may assume an adjustment to groundwater travel time that the Commission would not approve.

No commenters disagreed with the Commission that the criterion for a 1000 year groundwater travel time should not be adjusted when selecting sites for characterization.

The revised guidelines are written so that DOE can no longer adjust groundwater travel times, but the Commission notes that DOE has made other changes. DOE will now consider groundwater pathways of likely and

significant radionuclide travel, which differs from the NRC performance objective at 10 CFR 60.113. According to 10 CFR 60.113, the Commission will consider "...groundwater travel time along the fastest path of likely radionuclide travel...."

DOE has argued that the words "and significant" must be included because DOE will not know, until after site characterization, the pathways, rates, and amounts of groundwater travel in sufficient detail to know precisely whether the site meets the NRC's performance objective of a 1,000-year groundwater travel time. Therefore, DOE stated that in order to avoid disqualifying an adequate site because early predictions (before site characterization and before the extent of the disturbed zone or the location of the accessible environment is accurately known) indicated that small amounts of water incapable of carrying significant amounts of radionuclides might reach the accessible environment in less than 1,000 years, DOE has retained the words "and significant" in this disqualifier.

In the absence of a substantive concern, the Commission would not object to DOE phrasing its guideline provision for groundwater travel time in a manner different from its counterpart in 10 CFR Part 60. The issue prompting this condition for concurrence was not the discrepancy in wording, but rather that DOE had assumed the Commission's prerogative to adjust groundwater travel time.

The Commission stated in its Preliminary Decision that the guidelines and 10 CFR Part 60 need not be identical because they serve different purposes. "The siting guidelines are to be used to select sites for repository development while 10 CFR Part 60 will be used to evaluate a site after it has been selected for licensing following an extensive site characterization program" (49 FR 9655). The data acquired during site screening cannot support as rigorous a finding as the data acquired during site characterization. In the absence of information from site characterization at depth, the Commission expects that there will be large uncertainties in estimates of groundwater travel times. The Commission does not believe sites should be prematurely disqualified on the basis of speculation about pathways whose existence can only be verified by a site characterization program. Therefore, the criterion for groundwater travel time in the guidelines may be phrased differently than the criterion in 10 CFR Part 60.

If the language added by DOE would have conflicted with 10 CFR Part 60, then the Commission would not concur. In this case, the Commission views the phrase "and significant" to be redundant and not in conflict with these regulations. For the Commission expects, notwithstanding DOE's submission, that the fastest path of likely radionuclide travel will be significant, unless DOE can make the clearest and most compelling showing to the contrary in a particular case to the Commission pursuant to 10 CFR 60.113(b). The Commission would expect DOE to interpret the guidelines in this way. The Commission continues to believe that DOE should not anticipate relying on an adjustment to 10 CFR 60.113 in the early stages of site selection.

The Commission concludes that DOE's revision to the disqualifying condition at §960.4-2-1(d) satisfies Condition 3(d) and is not in conflict with the NRC performance objective at 10 CFR 60.113.

NRC CONDITION 3(e):

DOE should delete the word "permanently" from its definition of "disturbed zone".

DOE Response: DOE deleted the word "permanently" from its definition of disturbed zone at §960.2. The provision now reads, "Disturbed zone means that portion of the controlled area, excluding shafts, whose physical or chemical properties are projected to change as a result of underground facility construction or heat generated by the emplaced radioactive waste such that the resultant change of properties could have a significant effect on the performance of the geologic repository."

Discussion and Conclusions: In the November 18, 1983 draft of the guidelines, "disturbed zone" was defined as an area that is "projected to change permanently" as a result of repository construction or operation. The definition of "disturbed zone" in 10 CFR 60.2 is not limited to areas that have changed "permanently". Consequently, the Commission was concerned that DOE might neglect transient changes that could have a significant effect on repository performance, or that DOE might make siting decisions on the basis of a disturbed zone that is different from the one specified in 10 CFR Part 60.

Most commenters did not comment on this condition. Those who did, supported it. Therefore, the Commission concludes that the deletion of the word "permanently" at §960.2 of the guidelines satisfies Condition 3(e).

NRC CONDITION 3(f):

DOE should clarify its meaning of "short term" extreme erosion and revise the guidelines as appropriate.

DOE Response: DOE deleted the word "sustained" from §960.4-2-5(c)(1). The provision now reads, "A geologic setting that shows evidence of extreme erosion during the Quaternary Period."

Discussion and Conclusions: The term "short term" extreme erosion was used by DOE in one of its support documents on the guidelines in explaining why the guidelines used the term "sustained" extreme erosion. DOE explained that short term erosion would not affect waste isolation. Therefore, DOE used the term "sustained" extreme erosion in the guidelines so that it would not have to consider short term erosion.

In its preliminary decision, the Commission questioned the duration of "short term" and in response, DOE deleted the word "sustained" from §960.4-2-5(c)(1). All who commented on this issue agreed that DOE should make this deletion.



The Commission finds that DOE's deletion of the word "sustained" at §960.4-2-5(c)(1) satisfies Condition 3(f).

NRC CONDITION 3(g):

DOE should delete the word "significant" from Section 960.4-2-8-1(c)(2) of the siting guidelines where reference is made to "Evidence of significant subsurface mining" (emphasis added).

DOE Response: DOE deleted the word "significant" from §960.4-2-8-1(c)(2). The provision now reads, "Evidence of subsurface mining or extraction for resources within the site if it could affect waste containment or isolation."

Discussion and Conclusions: In the November 18, 1983 draft of the guidelines, DOE qualified subsurface mining as "significant", which differs from a similar provision at 10 CFR 60.122(c)(18). The Commission requested that DOE delete the word "significant" because all evidence of subsurface mining (as opposed to surface mining) should be considered adverse until the evidence has been thoroughly evaluated. Those who commented on this condition supported it.

The Commission concludes that DOE's deletion of the word "significant" satisfies Condition 3(g).

NRC CONDITION 3(h):

DOE should modify the guidelines so that they are consistent with the Commission's definition of "anticipated processes and events" and "unanticipated processes and events."

DOE Response: DOE deleted the terms "characteristics and processes affecting expected repository performance" and "potentially disruptive processes and events" from the guidelines.

Discussion and Conclusions: The November 18, 1983 draft of the guidelines were divided into postclosure guidelines and preclosure guidelines. The postclosure guidelines, in turn, were divided into two groups: "characteristics and processes affecting expected repository performance" and "potentially disruptive processes and events." These divisions of the guidelines established a ranking system whereby the postclosure guidelines would take precedence over preclosure guidelines. Within the postclosure guidelines, "characteristics and processes affecting expected repository performance" would take precedence over "potentially disruptive processes and events."

In its preliminary decision, the Commission found that the DOE terms: "characteristics and processes affecting expected repository performance" and "potentially disruptive processes and events" were inconsistent with related NRC terms: "anticipated processes and events" and "unanticipated processes and events." As a result, the Commission stated in the preliminary decision that DOE may overlook "in the site selection process some site characteristics that are important to repository performance and considers that the guidelines should be revised." DOE responded by deleting its terms, but as a consequence of the deletion, the postclosure guidelines are no longer ranked.

Several commenters were aware that DOE planned to satisfy this condition by deleting its terms from the guidelines. Minnesota stated, "By eliminating the distinction in terms, the NRC will undo what has been considered by the states as a significant step by DOE at setting some hierarchy of variable importance." Likewise, the Yakima Indian Nation noted that DOE's revision is a set-back for the Yakima Indian Nation and states who argued for a qualitative ranking of the guidelines. Without this ranking, the Yakimas believe that their review of the environmental assessments, prepared for each nominated site, will be weakened.

The Commission's position on whether or not the guidelines should be ranked is stated in its preliminary decision. The Commission stated,

"...the Commission sees no explicit requirement for this or any other ranking in the NWPA" and "...since DOE must comply with all applicable NRC regulations, the issue of ranking or ordering the guidelines will not materially affect NRC in carrying out its statutory responsibilities" (49 FR 9659). Furthermore, in evaluating repository performance, the potentially disruptive events are often found to be limiting in determinations of whether the proposed repository site and design adequately protect public health and safety. Therefore, the Commission considers all of the postclosure guidelines to be important to public health and safety and it would not be logical to rank one group of postclosure guidelines above another.

Some commenters would prefer that DOE resolve Condition 3(h) without eliminating the ranking of postclosure guidelines. Some commenters suggested that DOE revise its postclosure guidelines and then group them according to the NRC definitions of anticipated and unanticipated processes and events. As stated above, the Commission questions whether this is necessary, or even desirable. In addition, there is not a clear consensus among the commenters on how the guidelines should be ranked. Opinions range from giving preclosure, rather than postclosure, guidelines a higher ranking (Minnesota, Utah) to not ranking the guidelines at all (Wisconsin, Rhode Island). After reviewing comment letters sent to both DOE and NRC, the Commission considers that the arguments for guideline ranking were primarily motivated by a need for some assurance that DOE's site-selection process will proceed in a logical and verifiable fashion. The Commission

believes that DOE's response to Condition 5 (DOE should specify how the guidelines will be applied) should give these commenters that assurance.

The Commission concludes that DOE has adequately resolved Condition 3(h) by deleting from the guidelines the terms "characteristics and processes affecting expected repository performance" and "potentially disruptive processes and events."

CONDITION 3(f):

DOE should modify the guidelines so that potentially adverse conditions (e.g., dissolution) be considered if they affect isolation within the controlled area even though the condition may occur outside the controlled area.

DOE Response: DOE has added the following sentence to §960.4-2:

"Potentially adverse conditions will be considered if they affect waste isolation within the controlled area even though such conditions may occur outside the controlled area."

DOE has also revised the potentially adverse condition at §960.4-2-6(c) to read, "Evidence of dissolution within the geologic setting such as breccia pipes, dissolution cavities, significant volumetric reduction of the host rock or surrounding strata, or any structural collapse--such that a hydraulic interconnection leading to a loss of waste isolation could occur."

Discussion and Conclusions: The Commission objected to the November 18, 1983 draft of this provision because it was not consistent with a similar provision at 10 CFR 60.122(c)(10). The November draft referred to "significant dissolution within the site" while 10 CFR 60.122(c)(10) would consider dissolution without reference to its significance or where it occurs. In its revised guidelines, DOE has deleted the word "significant" from this provision and now refers to dissolution "within the geologic setting" instead of "within the site."

The Commission was also generally concerned that DOE may investigate only adverse conditions that occurred within the controlled area.<sup>4</sup> But, any adverse condition, even one outside of the controlled area, should be considered if it affects waste isolation. [See 10 CFR 60.122(c).] Minnesota and the Yakima Indian Nation agreed and noted that the adverse conditions for natural resources (§960.4-2-8-1(c)(1),(2) and (3)) should be revised in the same manner as the adverse condition for dissolution. The Commission believes that the general provision at §960.4-2, that states that potentially adverse conditions will be considered if they affect waste isolation even though such conditions may occur outside of the controlled area, addresses this concern.

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<sup>4</sup>As used in 10 CFR Part 60, site means the location of the controlled area.

The Commission concludes that DOE has satisfied Condition 3(i) by its revisions to §960.4-2 and §960.4-2-6(c).

NRC CONDITION 4:

DOE should modify the siting guidelines to make clear that engineered barriers cannot constitute a compensating measure for deficiencies in the geologic media during site screening.

DOE Response: DOE added the following paragraphs to §960.3-1-5 of the guidelines:

"Comparative site evaluations shall place primary importance on the natural barriers of the site. In such evaluations for the postclosure guidelines of Subpart C, engineered barriers shall be considered only to the extent necessary to obtain realistic source terms for site evaluations."

and

"...engineered barriers shall not be used to (1) compensate for an inadequate site; (2) mask the innate deficiencies of a site; (3) disguise the strengths and weaknesses of a site and the overall

system; and (4) mask differences between sites when they are compared."

Discussion and Conclusions: Many commenters supported this condition but some felt that the Commission did not go far enough. Minnesota argued that engineered barriers should not be used to influence the site selection process. The Natural Resource Defense Council (NRDC) recommended that if engineered barriers are used, DOE should specify, in the guidelines, the exact contribution it would assume from engineered barriers when nominating and recommending sites for characterization. The Yakima Indian Nation contended that "...equal engineered barrier contributions could mask very significant differences in isolation potential among candidate sites if the engineered barriers contribution were large relative to the natural barrier contribution."

The Commission finds that the revisions made to §960.3-1-5 clearly show that DOE will not select sites where engineered barriers must be used to compensate for deficiencies in the geologic media. The Yakima Indian Nation's argument that engineered barriers "could mask very significant differences in isolation potential among candidate sites" is satisfied by the guideline provision "...engineered barriers shall not be relied upon to mask differences between sites when they are compared," together with the other provisions which describe the information that will be considered.



During the January 11, 1984 public meeting, the U.S. Environmental Protection Agency (EPA) testified that DOE should not take full credit for the performance of waste packages and waste forms (i.e., engineered barriers) required by 10 CFR Part 60 when making comparative performance assessments of potential sites for repository development. Instead, EPA suggested that DOE should assume that waste packages and waste forms perform at least an order of magnitude less effectively than that required by 10 CFR Part 60 in order to compare the differences in isolation capabilities among the sites.

Most states, public interest groups and the Yakima Indian Nation supported EPA's proposal. In the revised guidelines, DOE added the following to §960.3-1-5:

"For a better understanding of the potential effects of engineered barriers on the overall performance of the repository system, these comparative evaluations shall consider a range of levels in the performance of the engineered barriers. That range of performance levels 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. The comparisons shall assume equivalent engineered-barrier performance for all sites compared and shall be structured so that engineered barriers are not relied upon to compensate for deficiencies in the geologic media."

The Commission also believes that the above revision responds, in part, to the NRDC suggestion that DOE specify the exact contribution it would assume from engineered barriers.

Serious Texans Against Nuclear Dumps (STAND) questioned the Commission's statement in the Preliminary Decision that:

"Section 112(a) [of the NHPA] establishes detailed geologic considerations as the primary criteria for site selection, but not the only criteria for site selection. Thus, the guidelines are not required to rely solely on geologic criteria" (49 FR 9657).

According to STAND, §112(a) does not permit DOE to place any reliance on engineered barriers in its guidelines when assessing sites for nomination and characterization. STAND believes that §112(a) explicitly identifies the only non-geologic factors which may be considered in the guidelines and these factors do not include engineered barriers.

Section 112(a) of the NHPA does not explicitly mention engineered barriers with other non-geologic factors to be considered in the guidelines. However, to satisfy the intent of the guidelines, the Commission believes that it must include relevant non-geologic factors. For example, realistic radiological source terms can only be calculated by considering engineered barriers. Accordingly, the Commission does not agree that engineered barriers should not be considered at all. The limited consideration of engineered

barriers, which DOE now proposes, is a reasonable approach; it accommodates the Commission's concern about not compensating for deficiencies in the geologic media. Furthermore, the Commission believes that Congress intended §112(a) of the NHPA to set minimum, not exhaustive, factors for consideration in the guidelines. Hence, the guidelines may consider engineered barriers as well as other non-geologic factors that are not explicitly mentioned in §112(a) of the NHPA. Such consideration of non-geologic factors will also enhance DOE's ability to select reasonable alternatives for NEPA purposes.

The Commission concludes that DOE has satisfied Condition 4 with the revisions added to §960.3-1-5 of the guidelines.

NRC CONDITION 5:

DOE should specify in greater detail how the guidelines will be applied at each siting stage including site nomination and characterization (for example, DOE should specify in the implementation guidelines which guidelines would be applied at each stage of site screening).

DOE Response: In response to NRC Condition 5, the DOE added a new appendix (Appendix III) to the siting guidelines and revised the implementation guidelines (§960.3) to describe in more detail how the guidelines will be applied.

Appendix III specifies how the guidelines will be applied at the principal decision points (i.e., potentially acceptable, nomination and recommendation, and repository site selection stages) of the siting process. The Appendix also defines the type of finding that will be made for each guideline at each of these stages. It further identifies which disqualifying conditions will be applied at various stages of site selection and the type of finding that will be made when the disqualifying condition is applied.

Discussion and Conclusions: The Commission finds that the revised guidelines submitted by the DOE on May 14, 1984 specify in greater detail how the guidelines will be applied at each siting stage. However, in its comment letter of April 6, 1984, the DOE stated that it believes that Condition 5 (as well as Conditions 6 and 7) goes substantially beyond what is required by the Waste Act. The Edison Electric Institute (EEI) expressed similar views. On the other hand, several commenters (e.g., Nevada, Texas, and the Yakima Indian Nation) indicated their belief that satisfactory compliance with Condition 5 (along with Conditions 6 and 7) would help to ensure that objective siting guidelines will be established. Since DOE's revised guidelines address all of the conditions specified in the preliminary decision, including Conditions 5, 6 and 7, the Commission

finds it unnecessary to respond further to the objections raised by DOE and EEI with respect to the Commission's jurisdiction.

In commenting on the Commission's preliminary decision, the commenters generally supported Condition 5. Nevada stated that DOE's compliance with Condition 5 will provide guidelines which will ensure that the selection of sites at the various decision stages will be based on sound technical findings. The State of Rhode Island indicated that the issue raised by Condition 5 is what caused the states to propose that DOE outline specific methodologies in the guidelines for implementing each of the stages of the siting process. Rhode Island noted that even though the NRC rejected the states' proposal for a specific implementation methodology<sup>5</sup>, NRC Condition 5 (and 6) appears to be "the next best thing." The State of Minnesota indicated that it would like the siting guidelines to specify the exact guidelines that will be used during each phase of the site selection process.

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<sup>5</sup>For a description of the states' proposed implementation methodology and the Commission's response, see the Commission's preliminary decision (49 FR 9660, paragraph e.).

The Commission finds that the modifications and additions that DOE has made to the November 18, 1983 version of the siting guidelines, as reflected in its May 14, 1984 submittal, satisfy the requirements of Condition 5 and many of the public's concerns with regard to this issue. In particular, the revised guidelines describe an implementation process which provides confidence that alternative sites will be selected in a manner that meets the requirements of the National Environmental Policy Act (NEPA). Appendix III of the revised guidelines identifies when and how the siting guidelines will be applied at each of the principal decision points in the site selection process. Appendix III also specifies two levels of findings that DOE will make for qualifying and disqualifying conditions at the various site selection stages.

At the first stage of site selection (i.e., the "potentially acceptable site" stage), the siting guidelines indicate that ten (10) disqualifying conditions will be applied and that DOE will make a "level 1" finding<sup>6</sup> for each of these disqualifying conditions. At the second stage of site selection (i.e., the site nomination and recommendation stage), the siting guidelines indicate that all of the qualifying and disqualifying guidelines will be applied and that DOE will make "level 1" or "level 3"

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<sup>6</sup>See Appendix III of the siting guidelines for the definitions of the various levels of findings.

findings for all of the guidelines. Appendix III indicates that a higher level finding (i.e., "level 2") will be made at this stage of site selection on the disqualifying conditions if the evidence is sufficient to support such a finding. At the third and final stage of site selection (i.e., repository site selection), the revised siting guidelines indicate that all of the qualifying and disqualifying conditions will be applied and that DOE will make more rigorous findings (i.e., level 2 or level 4) on all of the conditions.

Based on the revised siting guidelines, the Commission concludes that DOE has specified in greater detail how the guidelines will be applied at each siting stage, and which guidelines will be applied at each stage of the site selection process. Therefore, DOE has satisfied the requirements set forth in Condition 5.

NRC CONDITION 6:

DOE should supplement the guidelines to indicate the kinds of information necessary for DOE to make decisions on the nomination of at least five repository sites and subsequently recommending three sites to the President for characterization (examples of the kinds of information which the Commission has in mind can be found in NRC Regulatory Guide 4.17).

DOE Response: In response to NRC Condition 6, the DOE added a new appendix (Appendix IV) and a new section (§960.3-1-4--Evidence for Siting Decisions) to Subpart B of the siting guidelines. Appendix IV identifies the types of information that will be included in the evidence used for evaluations and applications of the guidelines at the nomination stage of the siting process. The appendix contains a description of the type of information that will be used to evaluate each condition under each principal category of guidelines (i.e., geohydrology, geochemistry, rock characteristics, etc.)

The new section entitled, "Evidence for Siting Decisions" includes a description of the kinds of information and data (and their sources) for each of the principal steps in the site selection process.

Discussion and Conclusions: Several of the commenters (e.g., Nevada, Rhode Island, South Carolina, and Minnesota) on the Commission's preliminary decision supported Condition 6 and indicated that DOE should specify the types of information which will be required at each stage of the site selection process. DOE has now made changes to the siting guidelines as a result of Condition 6 that specify in greater detail the kinds of information that will be used to make such siting decisions. Thus, DOE has complied with Condition 6.

However, the State of Utah (with the endorsement of NRDC, STAND, and the State of Washington) argued that all reliance on "available information"



be deleted from the siting guidelines. The Environmental Policy Institute (EPI) expressed similar views.

In its March 9, 1984 letter to the Commission, the State of Utah offered a proposal to rectify the matter relating to DOE's use of "available information" in the November 18, 1983 version of the siting guidelines. The State of Utah recommended "that all Guideline provisions which implement that standard [the use of "available data"] be deleted or expressly made applicable only to post-nomination decisions." The Commission has examined the proposal suggested by Utah and compared it to the revised guidelines that were submitted to the Commission by the DOE on May 14, 1984. The revised siting guidelines no longer refer to "available information" and do not use information that is "available" as a threshold for making siting decision. Rather, DOE has now specified in Appendix IV the types of information that will be used for evaluations and applications of the guidelines at the nomination stage of the site selection process. Additionally, §960.3-1-4 of the revised guidelines specifies the kinds of information (and their sources) that will be required to support decisions at the various stages of site selection. At the site nomination stage, the revised guidelines indicate that the sources of information shall include (1) the literature, (2) exploratory boreholes, (3) surface investigations, (4) in-situ or laboratory testing, (5) natural and man-made analogs, and (6) extrapolations of regional data. The Commission finds that these modifications to the siting guidelines are, for the most part, responsive to the concerns of the State of Utah.

The level of information provided in Appendix IV and §960.3-1-4 of the revised guidelines is all that can be reasonably expected for a generic rule. The Commission expects that DOE's environmental assessments will provide more detailed information such as the number, kinds, and types of tests, along with a full description of the data that supports the findings being made.

The Commission finds that the information contained in Appendix IV of the revised siting guidelines, along with the addition of §960.3-1-4 ("Evidence for Siting Decisions"), provides an adequate explanation of the kinds of information that DOE will use to make decisions at the various stages of the site selection process. Furthermore, the information contained in Appendix IV is comparable to that contained in NRC Regulatory Guide 4.17 which the Commission used as an example of the kinds of information it expected to see in the siting guidelines. Therefore, the Commission concludes that DOE has adequately responded to Condition 6 and made the appropriate modifications to the siting guidelines to comply with Condition 6.

NRC CONDITION 7:

DOE should add additional disqualifying conditions to the guidelines with sufficient specificity to ensure that unacceptable sites are eliminated as early as practicable. Disqualifying conditions should be provided for those factors specified in section 112(a) of the NWPA including seismic

activity, atomic energy defense activities, proximity to water supplies, the effect upon the rights of users of water, the location of valuable natural resources, hydrology, geophysics, proximity to populations, and proximity to components of the National Park System, the National Wildlife Refuge System, the National Wild and Scenic Rivers System, the National Wilderness Preservation System, and National Forest Lands.

DOE Response: In response to NRC Condition 7, DOE revised the siting guidelines by adding six (6) new disqualifying conditions and revised three (3) disqualifying conditions. The revised siting guidelines contain a total of 17 disqualifying conditions, including a disqualifying condition for each of the factors specified in §112(a) of NWPA.

Discussion and Conclusion: The intent of NRC Condition 7 was two-fold. First, the Commission believed that, at a minimum, the NWPA required a disqualifying condition for each of the factors specified in §112(a) of NWPA. Secondly, in view of its NEPA responsibilities, the Commission wanted some of these disqualifying conditions to be applied early in the site selection process to ensure that unacceptable sites will be eliminated as early as practicable. Many public commenters on the Commission's preliminary decision agreed with NRC Condition 7 (e.g., Washington, Utah, STAND, Rhode Island, Nevada, and South Carolina). However, other commenters on the Commission's preliminary decision, while agreeing with NRC Condition 7, felt that additional disqualifying

conditions should not be limited to those factors specified in §112(a) of the NHPA (e.g., Mississippi, Washington, Wisconsin, and the Department of Interior). In some instances, these commenters recommended specific additional disqualifying conditions. The Commission has no objection to DOE adding more disqualifying conditions to the siting guidelines (subject, of course, to applicable concurrence requirements) but since the revised guidelines contain disqualifying conditions that cover all of the factors specified in §112(a) of NHPA, the Commission cannot insist, as a condition for concurrence, that DOE add more disqualifying conditions.

The Commission finds that Appendix III provides assurance of an early application of certain disqualifying conditions. In particular, DOE has identified ten (10) disqualifying conditions in Appendix III that will be applied at the first stage of the site selection process (i.e., the potentially acceptable site stage). Accordingly, the Commission concludes that DOE has made appropriate modifications to the siting guidelines specified in NRC Condition 7 and has therefore satisfied that condition.

### **III. OTHER COMMISSION CONSIDERATIONS RESULTING FROM PUBLIC COMMENT**

In this section, the Commission considers other issues that were raised by commenters on the preliminary decision. These issues are relevant to the Commission's concurrence decision but were not addressed in Section II of this decision.

NRC Concurrence Criteria: In its preliminary decision, the Commission applied the following concurrence criteria: (1) the siting guidelines must not be in conflict with 10 CFR Part 60; (2) the siting guidelines must not contain provisions that might lead DOE to select sites that would not be reasonable alternatives for an Environmental Impact Statement (EIS); and (3) the siting guidelines should not contain provisions that are in conflict with NRC responsibilities as embodied in the NWPA (49 FR 9651).

Only one commenter, the State of Utah, disagreed with the Commission's concurrence criteria. Utah views the NRC concurrence criteria as being too limiting and confining and stated that "These self-imposed limitations on the Commission's role are both statutorily unwarranted and unreasonable in light of the broad authority granted by the NWPA." On the other hand, the Yakima Indian Nation stated that it "interprets these criteria to be coextensive with the Commission's jurisdiction, and agrees that they are the proper criteria for the Commission's decision." The State of Nevada indicated that it was satisfied with the breadth of the Commission's preliminary decision on the siting guidelines. Based on the comments received on its concurrence criteria (and also the lack of comment on this particular matter), the Commission has no reason to modify its concurrence criteria.

NRC Concurrence Process: Many commenters (e.g., the Yakima Indian Nation, U.S. Department of Interior, Nevada, STAND, EPI, Yale Environmental Litigation Program, Abbey Johnson, Utah, Wisconsin, Maine, Minnesota, Nevada, and Donald Finn) urged that there be additional opportunities for public comment on the final guidelines, either before the Commission concurs in them or before they become effective.

Whether DOE needs to obtain further public comment on its guidelines is a matter for DOE to decide. The Commission has consistently stated that concurrence is not rulemaking under the APA. Therefore, the Commission sees no legal requirement for additional public comment on this matter. Furthermore, the Commission afforded the public several opportunities to comment on the guidelines and its concurrence process. The Commission requested written comments on the November 18, 1983 guidelines. This comment period was initially scheduled to end on January 9, 1984 but the Commission, at the request of members of the public including several states, extended the comment period to February 1, 1984. The Commission also held a public meeting on January 11, 1984 to solicit the views of the public on the siting guidelines. On March 14, 1984, the Commission published in the Federal Register a preliminary decision for public comment. The comment period on this decision ended on April 4, 1984 but the Commission

continued to consider written comments received up to May 14, 1984. The Commission considers that the opportunities that it has provided for public comment have been adequate to assure the Commission that it is acquainted with the issues that bear on its concurrence decision.

Preliminary Determination: Section 114(f) of the NWA states, in part:

"For purposes of complying with the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 1321 [sic] et seq.) and this section, the Secretary shall consider as alternate sites for the first repository to be developed under this subtitle 3 candidate sites with respect to which (1) site characterization has been completed under section 113; and (2) the Secretary has made a preliminary determination, that such sites are suitable for development as repositories consistent with the guidelines promulgated under section 112(a)." (emphasis added)

Some commenters (e.g., STAND and EPI) requested that NRC clarify its interpretation of §114(f) of the NWA in its concurrence decision. STAND stated that the Commission must insist that the final siting guidelines specify that three suitable sites must be characterized, and that the sites must also be determined to be suitable after characterization. EPI's comments were directed more at the timing of DOE's preliminary determination.

The revised guidelines state that when DOE recommends sites for characterization, the recommendation will include "...a preliminary determination by the Secretary, referred to in Section 114(f) of the Act, that such sites are suitable for the development of repositories under the guidelines of Subpart C and D" (§960.3-2-3). EPI argued that the preliminary determination should be made after site characterization, not before characterization as DOE proposes.

The Commission believes that the revised siting guidelines provide a basis for DOE to select three sites that will be reasonable alternatives for the purposes of NEPA. The Commission has already stated, well before DOE issued its guidelines, what it considers to be needed for the Commission to meet its NEPA responsibilities. The Commission stated, "The Commission considers the characterization of three sites representing two geologic media at least one of which is not salt to be the minimum necessary to satisfy the requirements of NEPA" (46 FR 13972). The Commission did not require that all three sites be found to be suitable at the completion of site characterization. The Commission stated that the characterization of several sites "...will assure that DOE's preferred site will be chosen from a slate of candidate sites that are among the best that can reasonably be found." NRC's rules did not specify the criteria for selecting alternative sites for characterization but required that information on plans for considering alternative sites be included in DOE's Site Characterization Report, after sites were selected for characterization. Any doubts about



the suitability of the selection process could have been raised at this point. By requiring that NRC concur in the guidelines before sites are selected for characterization, and providing for environmental assessments and public participation at the time of site nomination, the site selection process specified in the HMPA provides even greater assurance that DOE will select three reasonable alternatives for an EIS. The Commission considers that neither 1's rules nor NEPA require that these sites be suitable for development as repositories at the end of site characterization.

There is clearly a sharp difference of interpretation of the HMPA between DOE's position--that the preliminary determination is to be made in advance of site characterization--and that of the commenters who believe that site characterization must be completed before the determination may be made. The Commission is presented with an issue that is fundamentally a question of statutory interpretation. But the Commission does not sit as a judicial forum to review or correct what may be erroneous interpretations by DOE of its own statutory responsibilities. Accordingly, whatever doubts there may be as to the correctness of DOE's position, it would be stretching the exercise of our discretion if we were to withhold concurrence on these grounds. The Commission concludes that this is a matter better, and more properly, left for judicial resolution.

Performance Assessments Before Site Characterization: Minnesota and the Yakima Indian Nation objected to the guidelines' reliance on performance assessments before site characterization. Minnesota argued that since the data needed for performance assessments are highly site specific and generally would not be available until after detailed site characterization, any performance assessment completed before site characterization would not be valid. Likewise, the Yakima Indian Nation believes that DOE should not be allowed to use system performance assessments before it has the data to support these assessments.

The Commission agrees that a premature reliance on system performance assessments could lead to erroneous conclusions. Performance assessments are reliable only when the uncertainties in the data and modeling method have been defined within reasonable bounds. The Commission notes that DOE has acknowledged, in the guidelines, the uncertainties surrounding its use of performance assessments. For example, the definition of "performance assessment" in §960.2 now includes the sentence: "Performance assessments will include estimates of the effects of uncertainties in data and modeling." Also, in Appendix IV of the guidelines DOE states, "The information specified below will be supplemented with conceptual models, as appropriate, and analyses of uncertainties in the data."

The Commission can find no reason to object to DOE's employing performance assessments since DOE will acknowledge the uncertainties that are

associated with those performance assessments. This is not to say, however, that the NRC will not criticize these assessments as they are developed for different sites.

Medium Specific Guidelines: The States of Minnesota, Wisconsin, Rhode Island, and the NRDC presented arguments for medium-specific guidelines. The concern expressed is that general guidelines are not able to focus on different parameters which are important in each separate rock type. However, the Commission finds no legal requirement in NWPA for medium-specific guidelines. Furthermore, medium-specific guidelines are not needed for NRC to meet any of its legal responsibilities because, as previously noted, the Commission anticipates that selection of sites in accordance with the revised guidelines will satisfy the provisions of NEPA.

Site Screening for First Repository: Some commenters repeated prior objections to DOE's not using its guidelines to select potentially acceptable sites for the first repository. No new reasons were advanced in support of their requests for the Commission to reconsider its position that DOE is not required to repeat or re-evaluate the site screening efforts that were completed prior to the enactment of the NWPA. Accordingly, the Commission adheres to the view on this point stated in its preliminary decision.

**IV. COMMISSION FINDINGS:**

In its preliminary decision, the Commission indicated its intention to grant its concurrence in the guidelines if DOE satisfactorily resolved seven conditions. The Commission requested public comment on its preliminary decision. Based on a review of the public comments on the preliminary decision received by the Commission as of May 14, 1984, the Commission finds no basis for modifying any of the seven conditions or adding to them. On May 14, 1984, DOE submitted revised guidelines to the Commission for its consideration. DOE believes that the revised guidelines fully satisfy the concerns of the Commission as expressed in its preliminary concurrence decision. For the reasons expressed in this final decision, the Commission finds that DOE has satisfactorily resolved the seven conditions and that the Commission should concur in the revised siting guidelines.

**V. COMMISSION DECISION**

The Commission concurs in the siting guidelines submitted to it by the DOE on May 14, 1984 as modified by its May 29, 1984 submittal. This concurrence

is limited to the revised guidelines and does not extend to any supplementary information which DOE may publish at a later date.

Dated at Washington, D.C., this \_\_\_\_\_ day of \_\_\_\_\_, 1984.

For the Nuclear Regulatory Commisison

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Samuel J. Chilk,  
Secretary of the Commission

**Enclosure 2**

Responses to Public Comments on the Commission's  
Preliminary Decision Related to  
U.S. Department of Energy's General Guidelines  
for the Recommendation of Sites for Nuclear  
Waste Repositories

Enclosure 2

Peer Group Review: One individual, Donald Finn, criticized the guidelines for not containing provisions "for a peer review program of technical, as well as socioeconomic, funding, and policy issues." While the Commission would have no objection to the establishment of a peer review program, the Commission finds this issue to be a matter that is beyond the requirements of §112(a) of the NWPA. On the other hand, the NWPA does give interested persons access to key decisions in the site-selection process.

NEPA Issues: Two states (Wisconsin and Utah) feel that the sites selected according to the guidelines would not be reasonable alternatives for an EIS. Wisconsin noted, "...a number of factors required to be considered under NEPA, such as sites of archeological or historical significances, are not even required to be considered under the guidelines." Likewise, Utah identified issues that should "...be addressed in the guidelines and EA's in order to assure that the nominated sites represent viable alternatives for ultimate EIS analysis." These issues include: the guidelines should examine the cultural and aesthetic impacts on parks in greater detail; and "The need [for the guidelines] to provide for analysis of considerations now treated only by pre-closure guidelines."

The guidelines contain conditions applicable to both historical (§960.5-2-5(c)(4)) and cultural (§960.5-2-5(c)(5)) impacts. Although the word



"archeological" does not appear in the guidelines, the Commission believes that archeological impacts are implicitly included at §960.5-2-5(c)(4) and §960.5-2-5(c)(5) (i.e., DOE will consider a repository's proximity to "a historical area" (§960.5-2-5(c)(4)) and "sites of unique cultural interest" (§960.5-2-5(c)(5)). In addition, Federal regulations (36 CFR Part 800) protect cultural and historical resources and DOE would avoid a "...major conflict with applicable Federal, State, or local environmental requirements" (§960.5-2-5(c)(11)). With regard to aesthetic impacts, the Commission believes that DOE could better assess aesthetic impacts as they may occur at particular sites rather than in a generic regulation.

The State of Utah raised the following issue:

"The need [for the guidelines] to provide for analysis of considerations now treated only by the pre-closure guidelines. Certain of these factors will continue to impose significant impacts long into the post-closure period. Examples include: (i) economic and social infrastructure associated with the repository that will significantly and permanently change the quality of the area, including the prospect of a potential economic 'bust' period following repository closure; (ii) the creation and

major shifts in the nature of use of repository-related transportation networks."

Utah interprets the guidelines to overlook consideration of impacts that begin before repository closure but could persist "long into the postclosure period." According to the guidelines, impacts arising during the preclosure period and impacts to a repository's performance during the postclosure period would be projected on two entirely different time scales. Preclosure impacts would be projected on the order of decades and postclosure impacts would be projected into geologic time (i.e., 10,000 years). The Commission assumes that Utah did not intend for DOE to project a repository's impact on "social infrastructure" 10,000 years into the future. We find nothing in the guidelines that indicates that preclosure impacts that persist beyond repository closure would not be fully considered.

Colocation of Reprocessing Facilities With a Repository: Minnesota stated, "If reprocessing becomes a viable activity and DOE decides to colocate reprocessing facilities with a repository, then the siting guidelines used to site the repository are inadequate."

The Commission is unaware of any plans to colocate reprocessing operations with a repository. Certainly, the NWPA contains no suggestion that such

reprocessing operations would be established at a repository site. Under these conditions, the Commission can see no obligation on the part of DOE to incorporate such a hypothetical situation into the guidelines.

Site Ownership and Land Use: The U.S. Department of Interior (DOI) questioned how DOE would acquire a repository site, particularly if the repository conflicted with the area's previous land-use. DOI suggested that the guidelines acknowledge that Federal land not "acquired" by DOE would have to be legislatively withdrawn. In addition, the DOI believes that the guidelines should contain an additional disqualifying condition for "Proximity to national parks, Indian trust lands and sites of cultural and religious significance to the Indian tribes...."

Both the guidelines and 10 CFR Part 60 address land acquisition. The guidelines specify that the site shall be located on land for which DOE can obtain the interests in land specified in 10 CFR Part 60. Legislative withdrawal is a reasonable way to obtain such interests in public domain lands--probably the only way where the land has not previously been withdrawn for other purposes. DOE is not obliged to be more specific in this regard.

With regard to the disqualifying condition suggested by DOI, the Commission notes that the guidelines contain two disqualifying conditions for impacts to

National Parks (§960.5-2-5(d)(2 and 3)) and an adverse condition for impacts on "...a significant Native American resource, such as a major Indian religious site or other sites of unique cultural interest" (§960.5-2-5(c)). Section 112(a) of the NHPA requires a disqualifying condition for impacts to National Parks but not for impacts to Native American resources. The Commission considers that this aspect of the guidelines is consistent with the NHPA and has no basis to require DOE to change it.

Additional data: The DOI stated, "We believe that if DOE finds that available data is not adequate and that additional data must be collected according to subsection 112(b)(3) of the Nuclear Waste Policy Act, then additional public review and comment should be allowed on DOE's description of information needed."

The NHPA is explicit with respect to requirements for public review and comment. In the absence of any provision for public participation between site nomination and recommendation, there is no basis for the Commission to insist on it. The Commission notes, however, that Appendix IV of the guidelines describes the kind of information DOE "...expects will be included in the evidence used for evaluations and applications of the guidelines of Subparts C and D at the time of nomination of a site as suitable for characterization".

(Appendix IV, 10 CFR 960). The public can comment on the adequacy of this information when it reviews DOE's draft EA's.

The guidelines should enhance statutory and regulatory requirements: The State of Wisconsin stated, "The NRC should require that the guidelines go beyond a mere reiteration of the statute and rules; they should enhance the statutory and regulatory requirements to ensure that they need not be compromised down the road" (emphasis added). Wisconsin explained that its objective in this regard was to ensure that DOE would be bound by objective, measurable, and predictable guidelines. The Commission views the modifications which DOE has made in response to the preliminary concurrence decision as being appropriate steps to achieve this desired objectivity.

Impacts to National Parks: The State of Utah stated that the guidelines underplay the aesthetic and cultural values of State and National Parks. Otherwise, the Gibson Dome site, near Canyonlands National Park, would have never been considered for a repository site. Utah stated, "The guidelines must require identification and consideration of cultural values and personal feelings and sensibilities which reflect feeling about the pristine beauty, solitude, unspoiled vistas, and spiritual grounding in or sense of identity with the earth, as reflected in personal viewpoints and in the arts."

On the other hand, one individual (Mr. John Parkyn) opposed the Commission's requirement (Condition 7) for DOE to specify a disqualifying condition for the natural areas listed in §112(a) of the NHPA. Mr. Parkyn suggested that the Commission consider the percentage of the United States which is already in those areas and concluded, "The storage of high level nuclear waste is more significant in a positive way to the future of the United States than any of these other uses of our land...."

The Commission is well aware of Utah's concern over possible impacts to Canyonlands National Park. The Commission is also aware of concerns from other states such as groundwater depletion or contamination and potential radiological exposures to their citizens. These are all legitimate concerns that must be considered before a final commitment is made to a particular site for a HLW repository. The Commission concludes that the statutory framework of NHPA, the regulatory framework of 10 CFR 960 and the Commission's regulations will ensure that all these concerns are appropriately considered.

In response to Mr. Parkyn's comment, the Commission finds that DOE has properly emphasized impacts to natural areas, as Congress intended in the NHPA. This emphasis does not overwhelm other siting factors important to repository performance such as geologic stability, dissolution or groundwater travel time. Instead the guidelines contain an appropriate combination of siting

factors that should ensure that the repository site will safely isolate radioactive waste without causing unacceptable impacts to the environment.

Atomic Energy Defense Activities: Section 112(a) of the HWPA requires DOE to specify factors that would qualify or disqualify a site that could be affected by atomic energy defense activities. The November 18, 1983 draft of the guidelines contained a favorable condition for the absence of nuclear installations (§960.5-2-4(b)) and an adverse condition for the presence of nuclear installations (§960.5-2-4(c)(2)).

Citizens Alert (CA) urged the Commission "...to insist on stronger language regarding 'atomic energy defense activities.'" CA reasoned that while the geology of a particular site may be acceptable at the present time, the geology could be significantly disturbed by future detonations of nuclear bombs. Similarly, Minnesota recommended that DOE consider health and safety, rather than just repository operations, when evaluating the affects of atomic energy defense activities. Minnesota concluded that it "...would like to see this concern [for public health and safety] reflected in the disqualifier [for a site's proximity to atomic energy defense activities]."

In response to Condition 7 of the Commission's preliminary decision, DOE has added a disqualifying condition: "A site shall be disqualified if atomic energy defense activities in proximity to the site are expected to conflict irreconcilably with repository siting, construction, operation, closure, or decommissioning" (§960.5-2-4(d)).

The Commission interprets this provision to take into account nuclear testing that is expected to occur at any time in the future. In addition, the postclosure guidelines would consider the "Potential for foreseeable human activities...such as...military activities" (§960.4-2-8-1(c)(5)).

The Commission disagrees with Minnesota that the disqualifying condition for atomic energy defense activities does not consider public health and safety. Public health and safety is implicitly included in this condition's reference to irreconcilable conflicts. One type of irreconcilable conflict with repository siting, construction, operation, closure or decommissioning would be DOE's inability to protect public health and safety or to meet the regulatory requirements for such protection.

NRDC proposed a disqualifying condition for atomic energy defense activities to replace the one proposed by DOE. NRDC's condition states, "A site shall be disqualified if any atomic energy defense activities are expected to



substantially interfere with repository construction, operation, or closure; or if repository construction, operation or closure is expected to substantially interfere with any atomic energy defense activity." (emphasis added). NRDC prefers the words, "substantially interfere" over the DOE words "conflict irreconcilably" because NRDC's wording would "...avoid even the potential for human disruption".

The Commission cannot make this matter a condition for our concurrence. Condition 7 requires DOE to write disqualifying conditions for factors set forth in §112(a) of the NWA. The exact wording of these disqualifying conditions is left to DOE's discretion provided DOE satisfies NRC's conditions for concurrence. In the preliminary decision, the Commission requested word changes to the guidelines only when it found inconsistencies between the guidelines and 10 CFR Part 60. Since 10 CFR Part 60 has no explicit provision for atomic energy defense activities, and since the waste isolation objectives of 10 CFR Part 60 are adequately addressed, we do not feel that we have grounds to require DOE to make the word changes recommended by NRDC.

Enclosure 3

The Honorable Donald P. Hodel  
Secretary of Energy  
U.S. Department of Energy  
Washington, D.C. 20545

Dear Mr. Secretary:

Enclosed is a copy of the U.S. Nuclear Regulatory Commission's final decision relating to concurrence in the U.S. Department of Energy's General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories that were developed pursuant to Section 112(a) of the Nuclear Waste Policy Act of 1982.

This final decision is based on the revised guidelines that were submitted to the Commission by the Department on May 14, 1984. The Commission finds that the revised guidelines satisfactorily resolve the concerns the Commission had with the guidelines that were initially submitted to the Commission on November 22, 1983. Furthermore, based on a review of the public comments received on the Commission's preliminary decision, the Commission finds no basis for modifying any of the seven conditions or adding to them. Accordingly, the Commission grants its concurrence in the revised siting guidelines dated May 14, 1984.

Sincerely,

Nunzio J. Palladino  
Chairman

Enclosure: NRC Final Decision

Enclosure 3