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Statement of
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and
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on behalf of the the
Natural Resources Defense Council, Inc.
before the
U.S. Department of Energy
regarding
DOE's Proposed General Guidelines
for Recommendation of Sites for
Nuclear Waste Repositories
(48 Federal Register 5670-82, February 7, 1983)

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We are Dr. Thomas B. Cochran, Senior Staff Scientist, and Barbara A. Finamore, Staff Attorney, with the Natural Resources Defense Council, Inc. (NRDC). We are pleased to have this opportunity to present testimony, on behalf of NRDC, to the Department of Energy regarding DOE's proposed guidelines for the identification, nomination, and recommendation of sites for nuclear waste repositories.

NRDC is a nonprofit environmental protection organization with over 32,000 members. NRDC's staff undertakes advocacy, policy analysis, and public education on a wide range of environmental issues, including clean air, clean water, forestry, public lands, toxic chemicals, and the international environment. For over a decade NRDC has been actively concerned about the hazards posed by the nuclear activities of the Federal Government, particularly those related to radioactive waste management and radiation exposure. NRDC has been involved in numerous legal and administrative proceedings and has testified frequently before Congress to assure that Federal Government nuclear activities do not endanger health and the environment, do not evade public scrutiny, and otherwise do not fail to comply with the law. We are appearing today to register our strong objections to DOE's proposed repository siting guidelines, which we believe violate the intent and purpose of the Nuclear Waste Policy Act of 1982 (P.L. 979-425) (hereafter "the Act").

I. Background

In order to appreciate the fundamental deficiencies in DOE's proposed guidelines (48 Fed. Reg. 5670-82, Feb. 7, 1983), it is useful to step back and examine the interests and activities of DOE that underlie the promulgation of these proposed guidelines.

It is apparent that DOE's primary interest regarding radioactive waste disposal now and in the recent past has not been to protect public health and safety and the quality of the environment. Rather, its interest lies in a bureaucratic mandate to salvage the nuclear power option by "solving" the nuclear waste problem, which is now defined as placing some waste in a repository as soon as possible. To that end, DOE has focused on developing repositories at existing DOE reservations, namely the Hanford Reservation and the Nevada Test Site, which do not have the most favorable geologic and hydrologic characteristics, but which are thought to present fewer political obstacles than alternative sites. The proposed guidelines appear to be designed to ensure that these Federal sites, and indeed virtually any site, will not be rejected at this stage of the selection process.

Thus, the proposed guidelines, which are generally so vague as to be meaningless, specifically sanction the examination of "lands already dedicated to handling nuclear materials" as a valid starting point for site selection; relax the hydrological conditions for repository sites; and fail to provide explicit qualifying and disqualifying physical factors throughout their technical guidelines. Furthermore, the proposed guidelines do

not attempt through the site selection process to reduce radiological releases from a repository to a level that is as low as reasonably achievable, but, as interpreted by DOE, require that lands adjacent to a Federal reservation need be considered only if they are "obviously superior" to the Federal lands. These guidelines fail to ensure the high degree of protection of public health and safety by specifying detailed geologic consideration as the primary site selection criteria as mandated by the Nuclear Waste Policy Act and, as such, are simply unacceptable.

II. Specific Comments

A. Lack of Meaningful Disqualifying Physical Factors

The first glaring omission in DOE's proposed guidelines is the lack of explicit disqualifying factors for each of the major parameters of a repository site. Of the nearly thirty geotechnical, environmental, and socioeconomic parameters that must be considered in repository siting, we count only nine disqualifying factors, most of which have nothing to do with ensuring future geologic repository stability. One eliminates nationally protected areas, such as parks (Section 960.5-9). Two more factors, one related to operational safety (Section 960.5-4-2), and the other related to routine release of radioactivity during the operational phase of the repository, i.e., the emplacement period (Section 960.5-8) have no bearing on site selection and offer no protection to future generations beyond protection of the current gene pool. A fourth factor, which

eliminates densely populated areas in excess of 1000 persons/square mile (Section 960.5-8-1), effectively screens politically unacceptable sites but is hardly applicable to potential exposure due to releases 1000 years in the future. A fifth factor, which limits the depth of the underground facility to 200 meters (Section 960.5-1-1), can be met for any surface point in the United States. A sixth factor eliminates sites where "characteristics that influence radionuclide transport are too complex to allow reasonable confidence of compliance with 40 CFR 191.13 when considered in conjunction with state-of-the-art engineering systems" (Section 960.3-2); and a seventh factor disqualifies sites that result in "adverse environmental impacts ... [that] cannot be mitigated" (Section 960.5-9). These sixth and seventh factors are so vague that they are unlikely to trigger disqualification of any site. Thus, in practical terms, there remain only two significant criteria that can be said to screen sites from a geologic standpoint. These are:

- (a) 1000-year groundwater travel time to the "accessible environment" (Section 960.5-2-1);
- (b) active dissolution fronts which would cause significant interconnection of the underground facility to the site's hydrogeologic system during the first 10,000 years (Section 960.5-2-4).

And even the first of these disqualifying factors has been severely weakened by a redefinition of the "accessible environment," as a result of behind-the-scenes negotiation among DOE, the Nuclear Regulatory Commission ("NRC"), and the

Environmental Protection Agency ("EPA"), and the second has narrow applicability to salt media.

Given the absence of explicit qualifying factors, it would be an interesting exercise to determine just how small a fraction of the United States would be disqualified by these two geologic criteria.

B. Section 960.5-2-1: Present and Future Hydrologic Conditions.

As noted above, the guidelines require that "[t]he site shall be disqualified if the average prewaste-emplacment groundwater travel time along the path of likely radionuclide travel from the disturbed zone to the "accessible environment" is less than 1000 years."

We strongly object to DOE's redefinition of the "accessible environment," which excludes aquifers within 10 kilometers of the repository (Section 960.2-0). While this definition is consistent with the currently proposed EPA HLW Disposal Standard (40 CFR 191.12), we are fully aware that relaxation of EPA's previously proposed one mile lithosphere boundary was the result of pressure from DOE and NRC.

EPA's original rule (carried at least through draft 19, March 19, 1981) placed the subsurface boundary of the accessible environment at one mile, the proximate outer bound of the underground facility, i.e., the subsurface area where waste handling activities are conducted.¹ This quantitative definition

¹ A nominal size repository, i.e., 2000 acres (3.125 square miles), if circular, would have a radius of one mile.

was consistent with the NRC's original, and the common-sense, definition of accessible environment as "those portions of the environment directly in contact with or readily available for use by human beings" (10 CFR 60.2, 46 Fed. Reg. 35285, July 8, 1981). Any freshwater aquifer, a source of water for drinking or irrigation, would clearly fit that definition and thus be protected.

Relaxing the definition of the accessible environment to exclude the lithosphere out to 10 kilometers (6.2 miles) fails to protect potentially large underground water supplies.² It also effectively reduces the original NRC requirement for groundwater travel time from 1 mile in 1000 years to 10 kilometers in 1000 years (10 CFR 60.122(f)(4)). We see no technical or other justification for increasing the public health risk in this manner.

C. Section 960.5-1-2: Thickness and Lateral Extent of the Host Rock

We believe that there is sufficient information currently available regarding the physical characteristics of various candidate host rocks to quantify disqualifying factors regarding the thickness and lateral extent of the host rock as a function of host rock type. The disqualifying factors should be conservatively chosen to insure that the requirements of Section 960.3-2 are likely to be met taking into account uncertainties

² Left unprotected is the groundwater below a surface area 38.6 times larger ($6.2^2 = 38.6$) than before, with a volume (to the minimum depth of the repository - 300 meters) of 76.4 million acre-feet (94.2 cubic kilometers or 22.6 cubic miles).

regarding the thickness and lateral extent of the host rock based on information that can reasonably be obtained through borehole data.

D. Section 960.5-9: Environmental Protection

This section requires the site to be located so as to reduce the likelihood and consequences of potential environmental impacts, and requires these impacts to be mitigated to the extent "reasonably achievable." DOE apparently narrowly interprets this mitigation requirement to apply only to the design of a repository, not to its selection.³ This interpretation is inconsistent with the explicit EPA requirement that "[d]isposal systems shall be selected and designed to keep releases to the accessible environment as small as reasonably achievable, taking into account technical, social, and economic considerations" (47 Fed. Reg. 58205, Dec. 29, 1982) (emphasis added). The DOE guidelines for the site screening process should be rewritten to ensure that, for the host rock type under consideration, all reasonably achievable steps have been taken to locate the site with the smallest potential radiological releases.

E. Conclusion

We submit that if DOE's foremost consideration were protection of the health and safety of future generations a quite different set of guidelines would have emerged. These guidelines would:

³ See U.S. Department of Energy, Draft Environmental Assessment for Characterization of the Hanford Site Pursuant to the Nuclear Waste Policy Act of 1982 (Public Law 97-425), DOE/EA-0210, February 1983, Section 3.1.3.5.7.2, p. 3-61.

(1) ensure that detailed geologic criteria are the primary criteria for site selection. Initial site screening would not be based on political boundaries (e.g., federally owned land tracts in Washington and Nevada), but would be based on identification of suitable host rock types followed by scrutiny of successively smaller subdivisions of broad provinces or regions containing the host rock types to identify the most suitable candidate sites.

(2) ensure that the guidelines for identification and selection of repository sites are more conservative than the EPA and NRC HLW disposal environmental standards and technical criteria (40 CFR 191 and 10 CFR 60), in order to account for uncertainties at this stage of the review process. For example, the NRC proposed rule defines as a favorable geologic condition "groundwater travel times between the disturbed zone and the accessible environment that substantially exceed 1000 years" (10 CFR 60.122(b)(2)(iv)). As one of its hydrologic criteria for screening sites, DOE should therefore ensure that, based on information and review to date, there is reasonable assurance that the groundwater travel time is an order of magnitude greater than 1000 years. Other guidelines should be similarly revised.

In sum, DOE's proposed guidelines require substantial revision before they can serve as an effective screening and decisionmaking device. These proposed guidelines are totally inadequate as a basis for any Environmental Assessments. Any further site characterization work at Hanford or any other site must await the promulgation of an adequate and final set of guidelines in conformance with the comments presented today.