

U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Crystalline Repository Project Office

Briefing on the Draft Area Recommendation Report

January–February, 1986

**CRYSTALLINE
REPOSITORY PROJECT**

Briefing

Summary

- **Need for geologic disposal of nuclear waste**
- **Nuclear Waste Policy Act of 1982 establishes process and schedule**
- **Crystalline Repository Project site selection process**
- **Draft Area Recommendation Report (Draft ARR) now available for State, Indian Tribe, and public review and comment**

Need for Geologic Disposal of Nuclear Waste

- **Nuclear power plants supply 13% of nation's electricity**
 - **Generate spent nuclear fuel**
 - **Safe disposal required to protect man and environment**
 - **Over 10,000 metric tons of spent fuel now in temporary storage (40,000 metric tons by year 2000)**
- **Defense waste currently in existence; when solidified would be over 10,000 metric tons**
- **Safe permanent disposal of waste technically and economically feasible**
 - **Shown in 30 years of studies**
- **Knowing this, Congress passed Nuclear Waste Policy Act of 1982**
 - **Act directs DOE to select, license, construct, operate one geologic repository and to site a second; but not to construct without Congressional authorization**

Nuclear Waste Policy Act of 1982

- **Approved by Congress 12/21/82**
- **Signed by President 1/7/83**

Purposes

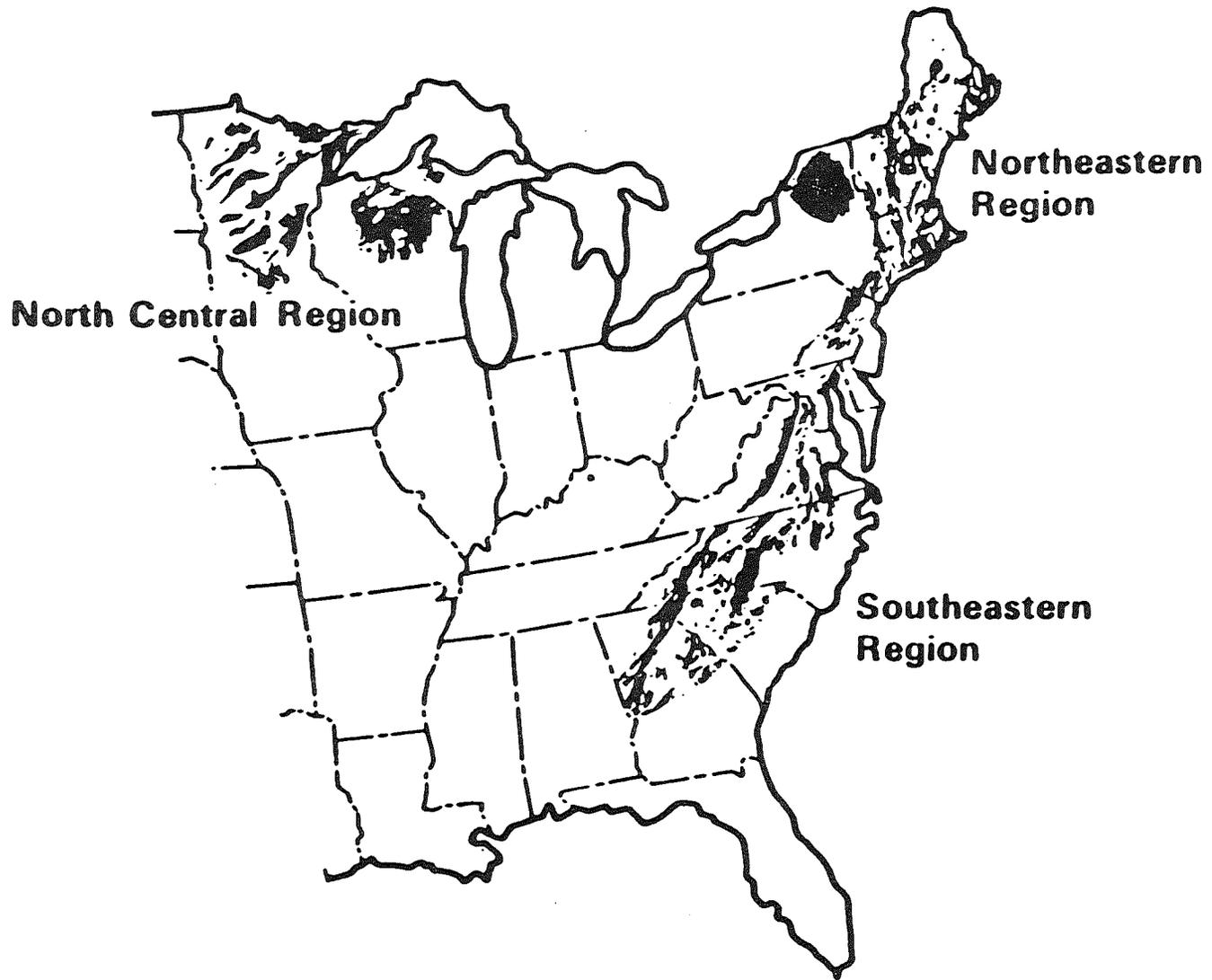
- **Establish schedule for siting, construction, operation of repositories**
- **Establish federal responsibility and policy for nuclear waste management**
- **Define relationships between federal government, state governments, and Indian Tribes**
- **Establish fund to cover disposal costs**

Crystalline Site Selection Process

- **National Academy of Sciences and the Inter-Agency Review Group recommended crystalline rock as having potential for repository siting**
- **Site Screening**
 - **National Survey—In 1983, DOE issued a national survey report on crystalline rocks which identified three regions for further study for possible repository sites.**
 - **Regional Survey—Compiled regional geologic and environmental characterization reports (data base) for regions identified in the national survey. Developed methodology for screening from regions to specific areas for further study.**
 - **Area Survey (field work)—Field investigations to determine if there are sites suitable for nomination/recommendation and site characterization.**

Crystalline Site Selection Process (Continued)

- **Nomination and recommendation**
- **Site characterization**
- **Request Congressional authority to construct**
- **Site recommendation and selection**
- **Licensing**
- **With Congressional authorization, construction**



**Crystalline Rock Regions Being
Considered for Second Repository**

Preliminary Recommendations

- **Based on application of a Region-to-Area Screening Process to the data contained within the Regional Geologic and Environmental Characterization Reports and other publicly-available data**
 - **20 candidate areas of which 12 are proposed Potentially Acceptable Sites (PAS)**
- **Results are preliminary**
 - **Subject to State, Indian Tribal, and public comments**

Proposed Potentially Acceptable Sites

<u>Region</u>	<u>State</u>	<u>Area Designation</u>	<u>Rock Body</u>	<u>Counties</u>
North Central	Wisconsin	NC-3	Wolf River Batholith	Langlade, Marathon, Menominee, Oconto, Portage, Shawano, and Waupaca
	Minnesota	NC-6	Undifferentiated granites	Marshall, Pennington Polk, and Red Lake
	Minnesota	NC-7	Undifferentiated granites	Norman and Polk
	Minnesota	NC-10	Archean gneisses/ Central Minnesota granites	Benton, Mille Lacs, Morrison, and Sherburne

Proposed Potentially Acceptable Sites (Continued)

<u>Region</u>	<u>State</u>	<u>Area Designation</u>	<u>Rock Body</u>	<u>Counties</u>
Northeastern	Maine	NE-2	Bottle Lake Complex	Hancock, Penobscot, and Washington
	Maine	NE-4	Sebago Lake Batholith	Androscoggin, Cumberland, and Oxford
	New Hampshire	NE-5	Cardigan Pluton	Cheshire, Hillsborough, Merrimack, and Sullivan

Proposed Potentially Acceptable Sites (Continued)

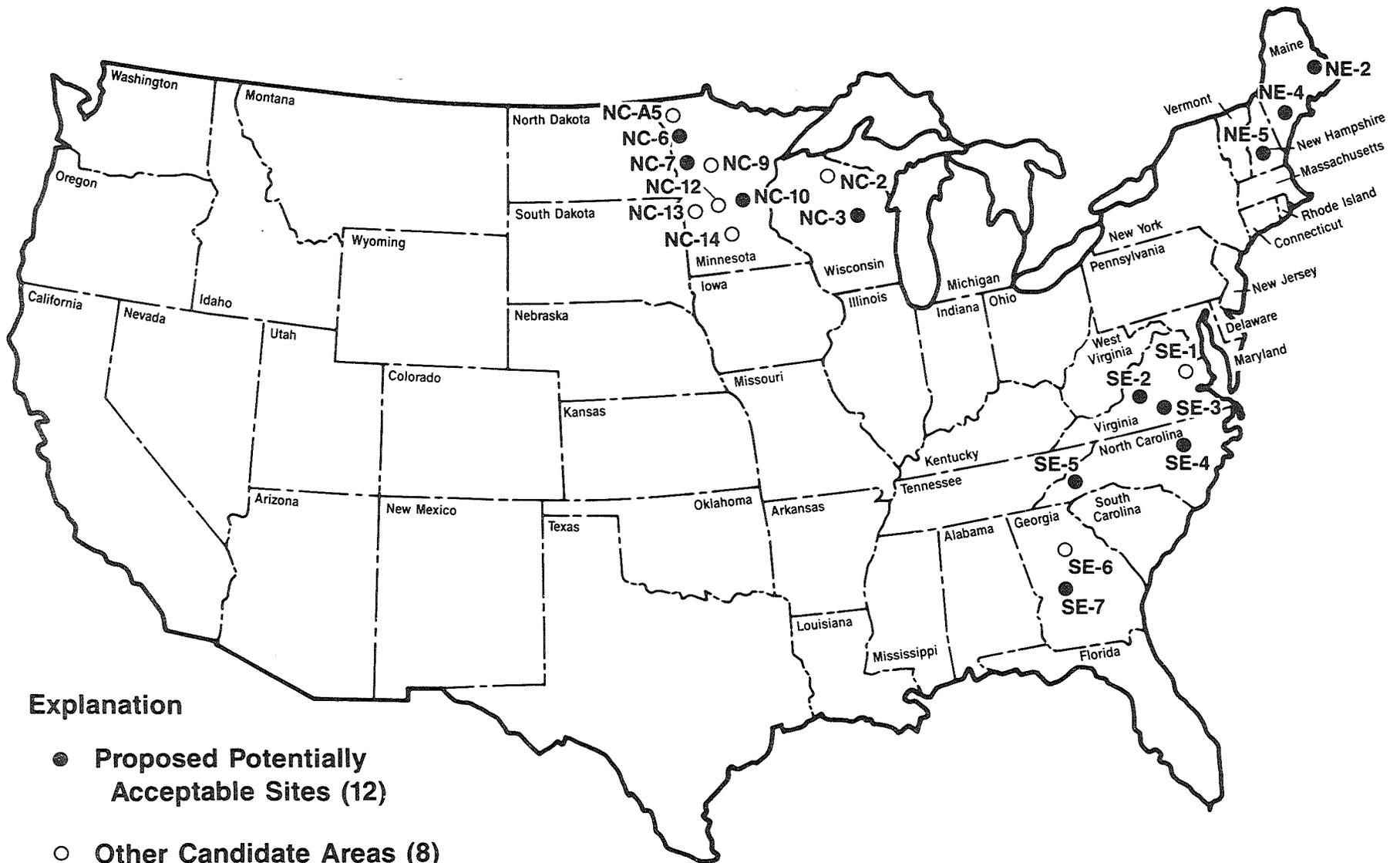
Region	State	Area Designation	Rock Body	Counties
Southeastern	Virginia	SE-2	Lovington Massif	Bedford
	Virginia	SE-3	Virgilina Gneiss	Halifax and Pittsylvania
	N. Carolina	SE-4	Rolesville Pluton	Franklin, Johnson, and Wake
	N. Carolina	SE-5	Elk River Complex	Buncombe, Haywood, and Madison
	Georgia	SE-7	Woodland Gneiss Complex	Lamar, Monroe, and Upson

Other Candidate Areas

<u>Region</u>	<u>State</u>	<u>Area Designation</u>	<u>Rock Body</u>	<u>Counties</u>
North Central	Wisconsin	NC-2	Puritan Batholith	Ashland, Bayfield, and Sawyer
	Minnesota	NC-9	Undifferentiated granites	Clearwater, Becker, and Mahnomen
	Minnesota	NC-12	Archean gneisses	Pope, Stearns, and Todd
	Minnesota	NC-13	Archean gneisses	Big Stone, Stevens, and Swift
	Minnesota	NC-14	Archean gneisses	McLeod, Nicollet, Renville, and Sibley
	Minnesota	NC-A5	Undifferentiated granites	Marshall

Other Candidate Areas (Continued)

<u>Region</u>	<u>State</u>	<u>Area Designation</u>	<u>Rock Body</u>	<u>Counties</u>
Southeastern	Virginia	SE-1	Fredericksburg Complex/ State Farm Gneiss	Goochland, Hanover, and Louisa
	Georgia	SE-6	Lithonia Gneiss	Gwinnett and Walton
Northeastern	N/A	N/A	N/A	N/A



Proposed Potentially Acceptable Sites and Candidate Areas for the Second Repository

Key Points to Region-to-Area Screening

- **Step 1 — Applies disqualifying conditions as specified in the DOE Siting Guidelines**
- **Step 2 — Applies regional geologic and environmental screening variables**
- **Step 3 — Sensitivity analysis conducted to consider additional geologic variables. Modification of Step 3 variables, various weight sets, and another method to determine favorability**
- **Validation of results**

Region-to-Area Screening Process

235 Crystalline Rock Bodies



20 Preliminary Candidate Areas



12 Proposed Potentially Acceptable Sites

Schedule for Final Decisions

- **Public comment period closes—4/16/86**
- **Consult with States/Indian Tribes—Spring**
- **Issue Final Area Recommendation Report and response to comments—
July 1986**
- **Formal notification of Potentially Acceptable Sites—July 1986**

Public Briefings and Hearings on Draft Area Recommendation Report

- **90-day comment period beginning 1/16/86**
- **January–February briefing for States, Indian Tribes, and public—question and answer sessions**
- **Late February–March public hearings for comments—formal sessions for comment record**

Area Phase Activities

- Detailed geologic, environmental, and socioeconomic data are gathered to determine the suitability of an area for further study
- Area phase geologic work would involve the following types of activities:
 - exploratory drilling
 - sampling
 - geophysical surveys
 - hydrologic testing
 - seismic monitoring
 - geologic mapping
- Area phase environmental/socioeconomic work would involve analyses of the following:
 - meteorology/air quality analysis
 - aquatic and terrestrial ecology
 - in and off-site hazards
 - archaeology and historical features
 - projected populations
 - seasonal population fluctuation
 - labor availability
 - regional economics
 - land use compatibility

Background

Nuclear Waste Fund

- **The nuclear Waste Policy Act of 1982 establishes a fund to be used for waste disposal expenditures.**
- **Commercial nuclear power utilities shall pay a fee equal to 1 mil per kilowatt-hour of electricity generated by each nuclear power reactor after April 6, 1983.**
- **A one-time fee is imposed on spent fuel or waste derived from spent fuel used to generate electricity prior to April 7, 1983.**
- **The Secretary of Energy had to establish procedures for collection and payment of fees by July 6, 1983.**
- **Adequacy of the fees shall be reviewed annually to insure full cost recovery.**

Schedule for Second Repository Siting, Construction, and Authorization

- **Issue Final Area Recommendation Report and identify Potentially Acceptable Sites** **July 1986**
- **Issue Final Area Characterization Plan** **December 1986**
- **Begin area field investigations** **December 1986**
- **Complete area field investigations** **1990**
- **Issue Final Environmental Assessments** **1991**
- **Nominate and recommend sites for characterization** **1991**
- **President approves recommended sites** **1991**
- **Issue initial site characterization plan** **1993**
- **Request Congressional approval for construction** **1993**

Schedule for Second Repository Siting, Construction, and Authorization (Continued)

- **President recommends site for repository to Congress** 1998
- **Submit license application to the Nuclear
Regulatory Commission** 1998
- **Receive construction authorization from the
Nuclear Regulatory Commission and begin construction** 2000
- **Begin waste emplacement** 2006

What Sites are Eligible for Second Repository?

- Sites characterized but not selected for first repository
- Sites not nominated for first repository
- Crystalline rock sites

Crystalline Rock Regions

Region	States	
North Central	Michigan Minnesota Wisconsin	
Northeastern	Connecticut Maine Massachusetts New Hampshire New Jersey	New York Pennsylvania Rhode Island Vermont
Southeastern	Georgia Maryland North Carolina	South Carolina Virginia



The Nuclear Waste Policy Act of 1982 charges the U.S. Department of Energy with developing technology and facilities for the management of high-level nuclear waste. Studies are under way in four types of geologic formations—basalt, crystalline rock, salt, and tuff.

The Crystalline Repository Project is carried out through DOE's Crystalline Repository Project Office. Additional information may be obtained by contacting:

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