

MANAGING LOW-LEVEL RADIOACTIVE WASTES

A Proposed Approach

John W. Peel, U.S. Department of Energy
and
George B. Levin, EG&G Idaho, Inc.

In the 1970's, the United States had six commercial sites for disposal of the nation's low-level radioactive wastes (Figure 1). Today, there are only three sites, and these three have limited capacities (Figure 2). With projections indicating an increase from 99,000 cubic meters in 1980 to 332,000 cubic meters by 1990 (Figure 3), there appears to be a discontinuity between disposal sites available and the number of sites required. In summary, "national inaction regarding the creation of additional disposal capacity can have serious adverse effects on our national energy program and our national health care system."¹

Although low-level wastes are produced in virtually every state (Figure 4) from power generation, medical activities, or industrial uses (Figure 5), little attention or interest was paid to the nation's disposal capacity until 1979 when the governors of Washington, Nevada, and South Carolina took action. Governor Ray of Washington temporarily closed the Hanford commercial site due to poor packaging of incoming wastes. The Beatty site was temporarily closed by Governor List of Nevada due to questionable operating and shipping practices. Governor Riley of South Carolina placed annual limits on the volume of waste to be accepted at Barnwell, cutting it by half (34 thousand cubic meters by 1981).

In 1978, President Carter established the Interagency Review Group on Nuclear Waste Management (IRG) to review the nation's plans and progress in managing radioactive wastes. In its final report, issued in March 1979,

1. Final Report of the National Governors Association Task Force on Low-Level Radioactive Waste Disposal, August 1980.

DISCLAIMER

This book was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

the group recommended that the Department of Energy (DOE) assume responsibility for developing a national plan for the management of low-level wastes. In his February 12, 1980 message to Congress, President Carter endorsed the IRG recommendations, established the State Planning Council, and directed DOE to take the lead in developing a national management plan for low-level wastes. In addition, DOE was directed to offer elected officials and the public the opportunity to fully participate in waste management decisions. Toward this end, DOE directed that a strategy be developed to guide federal and state officials in resolving issues critical to the safe management of low-level wastes.

EG&G Idaho, Inc. was selected as the lead contractor for the Low-Level Waste Management Program and was given responsibility for developing the strategy. A 25 member task force was formed which included individuals from federal agencies, states, industry, universities, and public interest groups. The task force identified nineteen broad issues covering the generation, treatment, packaging, transportation, and disposal of low-level wastes. Alternatives for the resolution of each issue were proposed and recommendations were made which, taken together, form the draft strategy. These recommendations are summarized as follows:

SYSTEM-WIDE ISSUES

Waste Classification--A classification system should be based on all hazardous characteristics of low-level radioactive wastes.

Regulatory Authority: Federal vs. State--A modified agreement state program should be instituted, offering greater flexibility and federal funding.

Incentives--Incentives should be offered to facilitate the siting of low-level waste management facilities.

Liability--The Department of Energy should initiate a study to clarify liabilities in all waste management sectors.

GENERATION, TREATMENT, AND PACKAGING

Reducing Waste Volumes--Regulations and incentives should be combined to encourage wide use of the best available treatment techniques.

Waste Packaging--Packaging regulations for transportation should be retained, with additional regulations promulgated for disposal packaging.

TRANSPORTATION

Regulatory Structure--Existing regulatory agency structure should be retained.

Regulations--Current transportation regulations should be retained.

Enforcement of Regulations--An option should be offered to states to allow state enforcement of federal transportation regulations.

Routing Authority--Routing rules should be set by the federal government, with state participation.

Emergency Response--States should design their own emergency response programs with federal guidance and assistance.

DISPOSAL

Environmental Release--Acceptable levels should be established for the safe release of solids as well as liquids and gases into the environment.

Storage for Radioactive Decay--Onsite storage for radioactive decay of wastes should be allowed to continue as currently practiced.

Interim Storage--Storage of wastes should be allowed onsite for power plants, and on or offsite for other generators while disposal capacity is being developed.

Disposal Options--The disposal methods selected should match the hazard of the waste.

Disposal Responsibility--The federal and state governments should divide disposal responsibility according to isolation required for the wastes.

Site Operation--The owner of the disposal site should lease the facility to private industry to operate.

Site Ownership and Extended Care--States should have the option to transfer disposal sites to the federal government for extended care and monitoring after site closure.

Regulation of Federal Disposal Sites--The Department of Energy should continue to regulate its sites with monitoring by states allowed.

The national strategy is consistent with the recommendations of the National Governors Association, the National Conference of State Legislatures, and the State Planning Council. These organizations have recommended that states accept primary responsibility for the safe disposal of commercial low-level wastes and develop individual state management plans. They have endorsed a regional rather than individual state approach to resolving the problem with disposal capacity. In addition, they have called for Congressional authorization for states to enter into interstate agreements and compacts to establish regional disposal sites.

The roles of federal, state, and local governments, industry, and the public are being defined as the strategy evolves. The strategy suggests that the primary decision making, regulatory, and enforcement authority be assumed at the state level, the extent depending on agreement state status. The role of local governments should be in siting and routing decisions, which may involve economic incentives to offset the negative impacts of hosting a site.

The federal government should support these state and local efforts through the Low-Level Waste Management Program, providing funding,

resources, and technical assistance to interested states. Private industry should continue its role in providing capitalization costs and operational services for waste management facilities. Finally, interested groups and citizens should be involved in waste management decision making throughout the policy-setting process and in influencing siting and routing decisions.

The national strategy is important for it provides all segments of the interested public an opportunity to contribute to the formation of government policy. It is intended for use by federal agencies, state governments, local officials, and the public in making policy-level decisions on low-level wastes. As a starting point, it endorses the concept of geographically-distributed disposal sites to serve all regions of the country. The strategy, in addition, will be a focus for discussion for interested groups and individuals, as the document is designed for public review and understanding.

DOE's strategy review process has initially involved state associations, governors, and state legislators. Mailings to industry, public interest groups and individual citizens are continuing to broaden the document's distribution. Regional workshops are planned over the next six months to discuss strategy recommendations and alternatives with interested parties (Figure 6). Following the close of public comment in June, the strategy will be finalized to reflect the comments and concerns of the states and the public. Once the final strategy is completed in September 1981, detailed implementation plans will be developed to complete the national plan for low-level radioactive wastes.

Requests for copies of the draft strategy should be directed to:

Low-Level Waste Management Program
EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, Idaho 83415

Radioactive Waste Programs Branch
U.S. Department of Energy
or Idaho Operations Office
550 Second Street
Idaho Falls, Idaho 83401

Managing Low-Level Radioactive Wastes

A Proposed Approach

**John W. Peel, U.S. Department of Energy
and
George B. Levin, EG&G Idaho, Inc.**

INEL-S-29 669

In the Early 1970's the United States had 6 Commercial Burial Grounds In 1980, Only Three Remain Open

Site	Date Opened	Current Status
Beatty, Nevada	1962	Open
Morehead, Kentucky	1962	Closed 12/1/77
West Valley, New York	1963	Closed 1975
Richland, Washington	1965	Open
Sheffield, Illinois	1967	Closed
Barnwell, South Carolina	1971	Open

INEL-S-22 353
REVISION 1

Figure 1

Projected Capacities of Active Commercial Disposal Sites From Now Until 1995

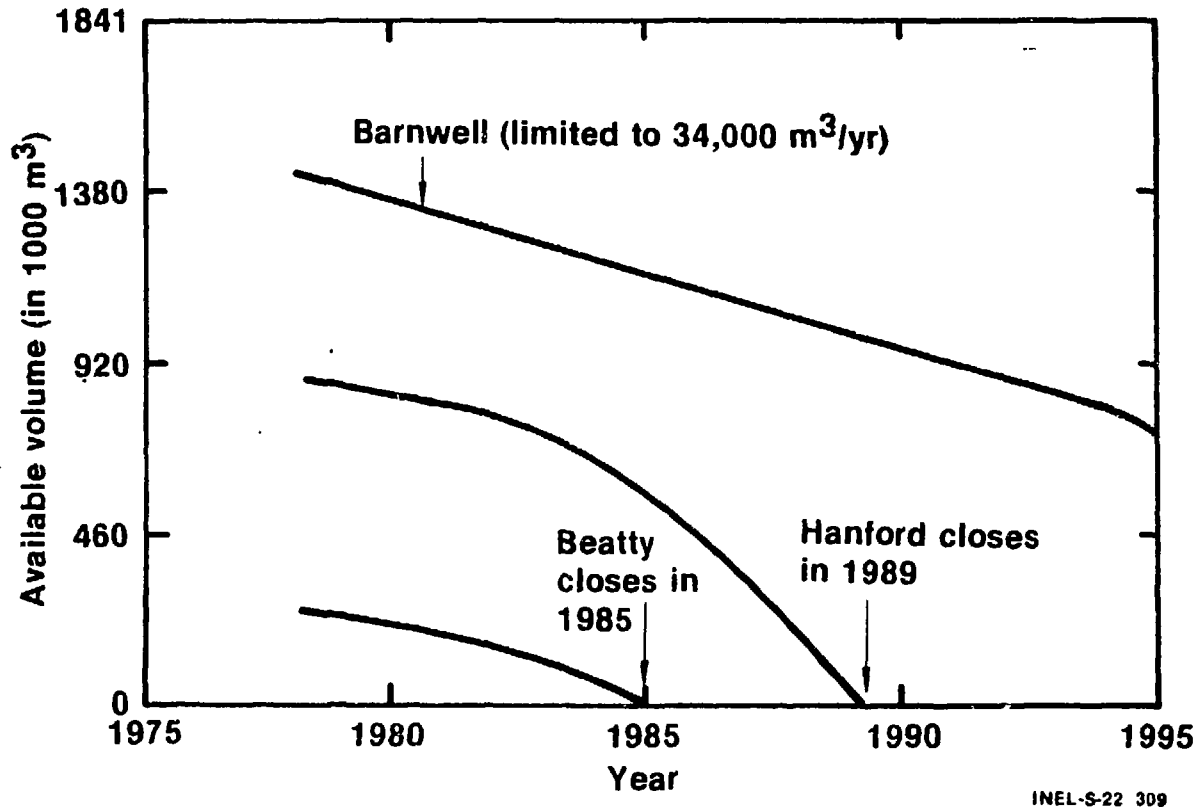
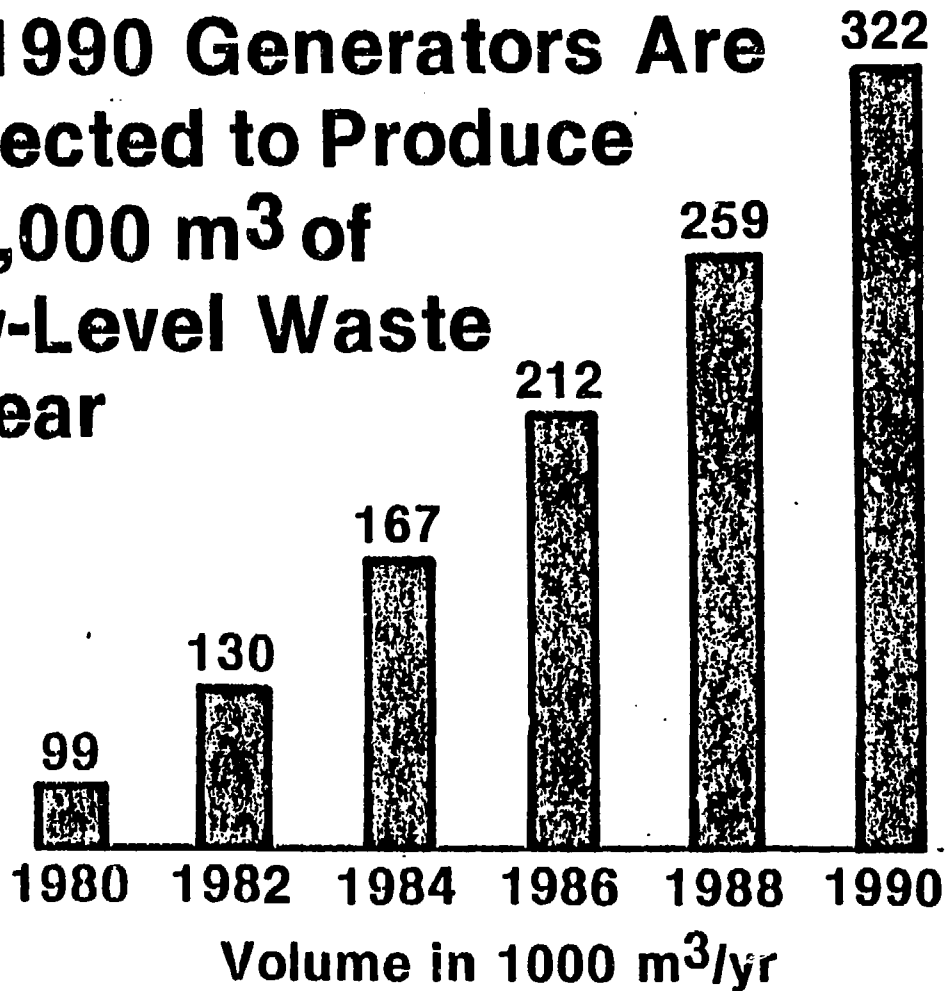


Figure 2

**By 1990 Generators Are
Expected to Produce
322,000 m³ of
Low-Level Waste
a Year**



INEL-S-24 209

Figure 4

Low-Level Radioactive Wastes Are Generated in Every State (1979 Volumes in Cubic Meters)

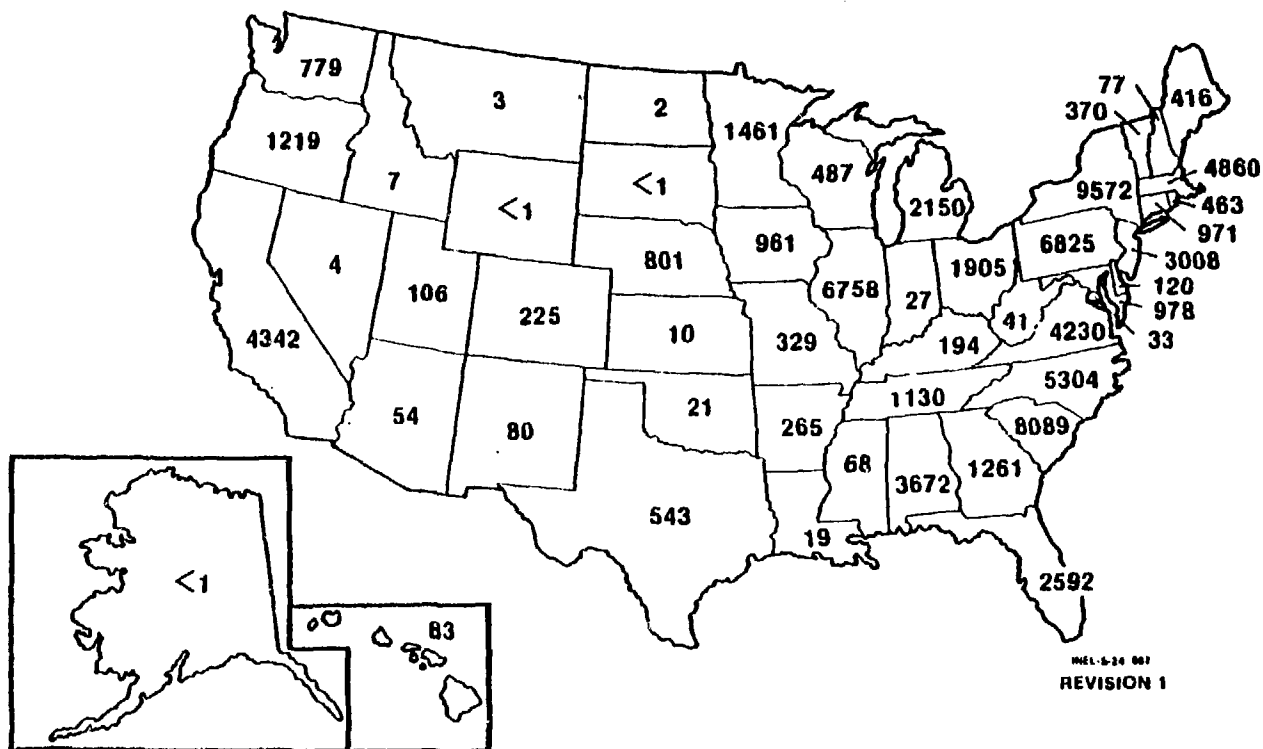
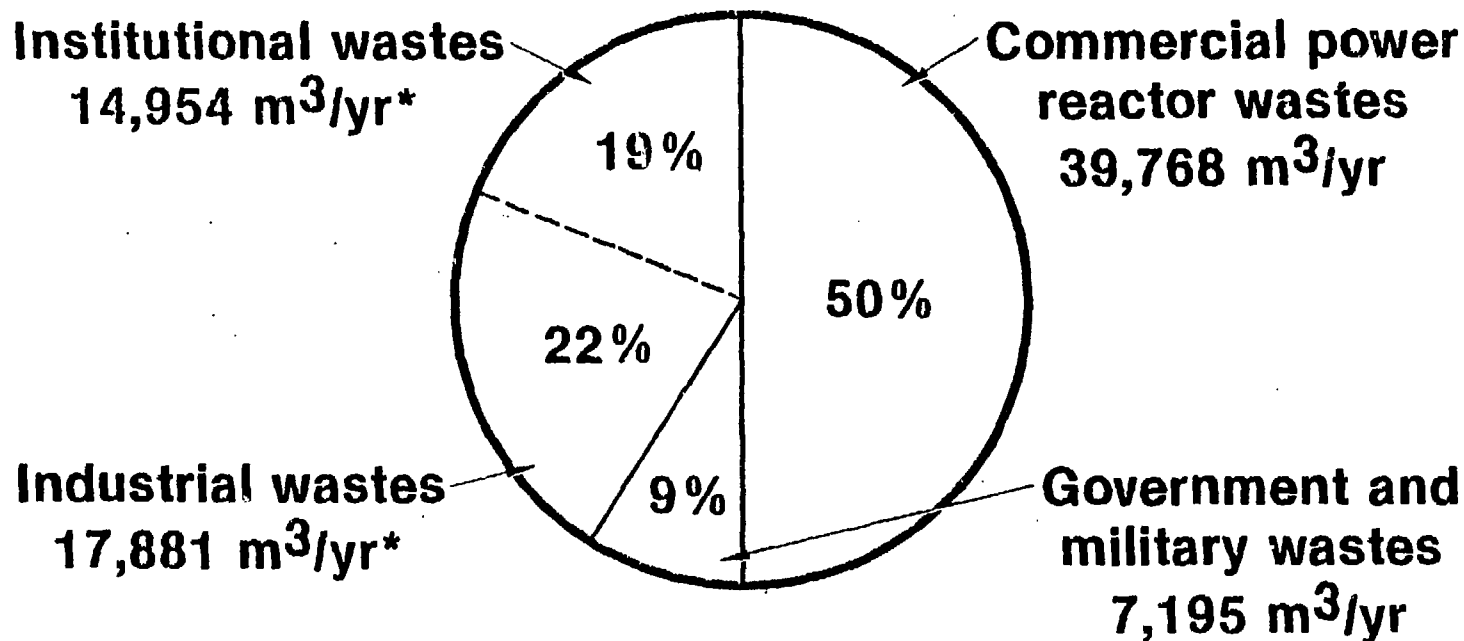


Figure 1

Low-Level Wastes Are Generated From Several Sources



*1979 estimate

INEL-S-23 776

Figure 2

The Disposal of Low-Level Radioactive Wastes Gained National Attention in Fall 1979

- **Governor Ray of Washington temporarily closed the Hanford commercial site due to poor packaging of incoming wastes**
- **Governor List of Nevada temporarily closed Beatty due to questionable operating and shipping practices**
- **Governor Riley of South Carolina placed limits on the volume of waste accepted at Barnwell**

INEL-S-29 643

President Carter Directed the U.S. Department of Energy to Develop a Comprehensive Management Plan for Low-Level Radioactive Wastes

Conditions	Results
<ul style="list-style-type: none">• State governments must be involved• The public must have the opportunity to participate	<ul style="list-style-type: none">• State Planning Council established• Strategy document written and released for review

INEL-S-29 642

The 25-Member Strategy Task Force Identified Nineteen Issues in Four Broad Areas

- **System-wide issues**
- **Generation, treatment, and packaging issues**
- **Transportation issues**
- **Disposal issues**

INEL-S-29 634

System-Wide Issues Affect All Components of the Waste Management System

- **Waste classification**
- **Regulatory authority: Federal vs. State**
- **Incentives**
- **Liability**

Two Basic Issues Relate to Waste Generation, Treatment, and Packaging

- **Reducing Waste Volumes**
- **Waste Packaging**

INEL-S-29 640

Transportation Issues Involve the Shipping of Waste to a Disposal Site

- **Regulatory structure**
- **Regulations**
- **Enforcement of regulations**
- **Routing authority**
- **Emergency response**

Several Issues Relate to the Disposal of Low-Level Wastes

- Environmental release
- Storage for radioactive decay
- Interim storage
- Disposal options
- Disposal responsibility
- Site operation
- Site ownership and extended care
- Regulation of Federal disposal sites

INEL-S-29 638

The Strategy Is Consistent with Recommendations of National Organizations

- **States should accept primary responsibility for the safe disposal of commercial low-level waste**
- **States should pursue a regional approach to the disposal problem**
- **Congress should authorize states to enter into interstate compacts to establish regional disposal sites**

The Roles of Federal, State, and Local Governments, Industry, and the Public Are Being Defined as the Strategy Evolves

- **State and local governments have the primary role in decision making**
- **The Federal government supports state efforts**
- **Industry continues its role in capital investment and operation**
- **Public interests review policy documents and participate in site selection and routing decisions**

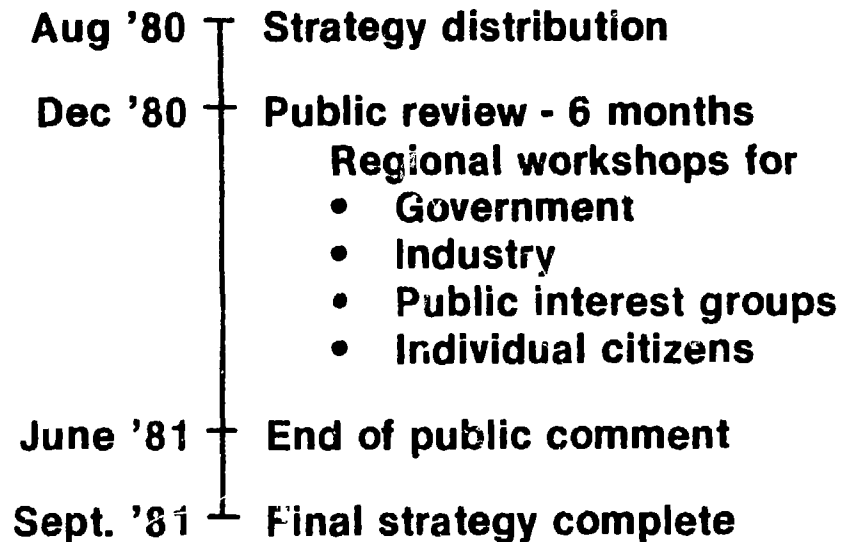
The National Strategy, Managing Low-Level Radioactive Wastes, Is an Important First Step in the DOE Planning Process

- **A proposed approach for policy-level decision making**
- **An endorsement of regional disposal sites**
- **A document designed for public review and understanding**

INEL-S-29 636

29656

The Strategy Review Process Is Underway



INEL-S-29 635

Figure 6

For Further Information Contact:

**Low-Level Waste Management Program
EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, Idaho 83415**

or

**Radioactive Waste Programs Branch
U.S. Department of Energy
Idaho Operations Office
550 Second Street
Idaho Falls, Idaho 83401**