

EGG-M-94302  
Conf-940748-98

ABSTRACT--INMM ANNUAL MEETING 1994

OVERVIEW OF COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE DISPOSAL IN THE UNITED STATES

Paul Smith

National Low-Level Waste Management Program  
Idaho National Engineering Laboratory  
PO Box 1625  
Idaho Falls, ID 83415-2420  
208-526-6083

Disposal of commercial low-level radioactive waste (LLW) is a critical part of the national infrastructure needed to maintain the health of American businesses, universities, and hospitals. Currently only 19 States (located in the Northwest and Southeast) have access to operating disposal facilities; all other States are storing their LLW until they open new disposal facilities on their own or in concert with other States through regional compact agreements. In response to recommendations from the National Governors' Association, Congress assigned the burden for LLW disposal to all States, first in 1980 through Public Law 96-573, the "Low-level Radioactive Waste Policy Act," and again in 1986 through Public Law 99-240, the "Low-Level Radioactive Waste Policy Amendments Act of 1985." As directed by Congress, the Department of Energy provides technical assistance to States and compact regions with this task. After almost 14 years, nine compact regions have been ratified by Congress; California, Texas, North Carolina, and Nebraska have submitted license applications; California has issued an operating license; and the number of operating disposal facilities has decreased from three to two.

**MASTER**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

OVERVIEW OF  
COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE DISPOSAL IN  
THE UNITED STATES

Can you imagine storing your household waste at home for years at a time? What if your wife or husband had to go to another state for a routine diagnostic procedure just because it used radioactive materials? What if your child could not go to your alma mater because it had stopped research in the field your child had dreamed about? Far fetched? (\* States Without LLW Disposal) Currently thousands of generators in 31 states plus Washington, DC and Puerto Rico must store their low-level radioactive waste (LLW) onsite because they do not have access to disposal facilities. If not corrected, this situation will lead to situations even more serious than those just described.

My presentation is intended to provide a rudimentary understanding of the current commercial low-level radioactive waste (LLW) disposal system. I will discuss the two pieces of federal legislation that form the framework for managing commercial LLW, where we are nationally, and how DOE fits into the picture.

From a business perspective, it has been estimated that the annual use of radioactive materials is responsible for about \$257 billion in gross industry sales, 3.7 million jobs, \$11 billion in corporate profits, and \$45 billion in tax revenues to local, state, and federal governments. Never-the-less, the "person on the street" is probably unaware of the mounting LLW crisis.

MASTER

## **DISCLAIMER**

**This report 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, make 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.**

## **DISCLAIMER**

**Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.**

(\* Fraction of Annual Solid Waste that is Radioactive) Possibly, this is due to the fact that LLW only represents about 4/10,000 of 1 per cent of the volume of all solid waste produced nationally. That fraction is about the same as 2 cubic feet of the volume formed by a football field covered to the depth of 10 feet. Many believe it is just a matter of time until curtailments occur that will directly touch the lives of significant numbers of people. These curtailments will likely be in areas such as university research, medical diagnosis and treatment, electrical power, and the production of critical measuring devices.

(\* LLW Disposal Facilities in 1979) In the fall of 1979, after a series of incidents involving improperly packaged waste and damaged waste containers, the governors of Nevada and Washington temporarily closed the sites in their states. The governor of South Carolina, with the only operating disposal site east of the Mississippi, began a two-year phase-down of the volumes of waste it would to 1.2 million cubic feet per year. These actions had a two fold purpose: First, to protect the public health and safety of the public and environment of their states. And second, to demonstrate the need for more stringent enforcement of LLW regulations by demonstrating their states' dissatisfaction with their unique status as being the only hosts for the Nation's LLW.

In 1980, with the full support of the National Governors' Association, National Conference of State Legislatures, and other groups, Congress passed the Low-Level Radioactive Waste Policy Act. (\* LLRWPA, Public Law 96-573) This law made it federal policy that :

1. Each state is responsible for disposal of its own LLW
2. States may form regional compacts for LLW disposal
3. Regional disposal facilities can exclude out-of-region waste after January 1, 1986

As the 1986 deadline for opening new disposal facilities approached, little progress had been made. Realizing that the initial legislation was quite general and contained few incentives, Congress amended the first piece of legislation through the Low-Level Radioactive Waste Policy Amendments Act of 1985. (\* Milestone Dates, Requirements and Penalties, LLRWPA of 1985, Public Law 99-240) This act established a series of milestones and penalties designed to provide sufficient incentives to cause states to have new disposal facilities available by January 1, 1993. That would provide 7 additional years, for a total of 13 years after passage of the original law. The milestones outlined in the second legislation are dates for completing key activities in the process of developing new disposal sites. These activities include:

- |                 |   |
|-----------------|---|
| July 1, 1986    | States to join regional compacts or certify their intent to develop their own independent disposal facility |
| January 1, 1988 | Compact regions to designate a host state, and independent states develop a siting plan                     |
| January 1, 1992 | Each host state to submit a disposal facility license application   |
| January 1, 1993 | Each compact region and state to provide for disposal of all its waste.                                     |

For the generators, the penalties include payment of disposal surcharges that range from \$20 to \$160 per cubic foot and, in some cases, denial of access to disposal facilities. For the States and compact regions, the penalties include forfeiture of a portion of the generator surcharges that, in many cases, could provide millions of dollars to their siting budgets.

(\* LLW Disposal in 1994) So what progress has been made in the past 14 years? Some would say precious little, and point to the fact that we have one less disposal facility because Nevada closed the Beatty facility on 12/31/92. (\* New Host States) That story, however, would neglect the fact that we now have 10 compact regions (including the newly formed Texas compact region) and the potential for 11 new sites. If these new sites were combined with the existing Richland, WA facility, the new system would take waste from 47 states and accommodate about 99% of the waste. Such a system would leave only Michigan, New Hampshire, Rhode Island, Washington, DC, and Puerto Rico without LLW disposal.

Disposal of 99% of the nation's LLW is pretty good isn't it? Why then the "doom and gloom" at the beginning of this presentation? (\* Host States with License Applications) It's because it has taken 14 years for 4 states submit license applications. These states are:

- California (the host state for the Southwestern compact region) It has an approved facility license but can't use it until the Bureau of Land Management transfers the land it needs and the ongoing litigation is worked through, and ,
- Texas, North Carolina, and Nebraska, (the host states for the Texas,

Southeast, and Central compact regions, respectively) These states are reviewing license applications and beginning to experience the same legal and political delays that California is working through.

If these 4 facilities are built by the end 1998 as planned, there would be 5 disposal facilities located in all parts of the country except the northeast. Given the current alignment of compact states, this system of 4 disposal facilities would include only 31 states and provide for disposal of about 2/3 of the nation's waste.

The 7 other planned facilities are at various stages in this process. Ohio, for example, expects to enactment implementing legislation for their LLW program during the first few months of next year. At about the same time, Pennsylvania anticipates naming 3 potential sites. Currently, these 7 other facilities are projecting completion dates around the year 2000.

(\* DOE's Role) What does DOE have to do with all of this? DOE established the Low-Level Waste Management Program at DOE headquarters to meet its responsibilities under the 1980 legislation. To develop a strategy for managing the nation's LLW, DOE gathered representatives from universities, industry, national labs, and government. In addition, the consensus grew out of these "participant" or "stakeholder" meetings that DOE needed a full-time contractor. Therefore, DOE formed the National Low-Level Waste Management Program (the Program) at the Idaho National Engineering Laboratory (INEL). (\* Initial Program Activities) During the years between the 1980 and 1985 pieces of legislation, the Program helped "flesh-out" the strategy determined by these "stakeholders" through:

- development of a national liaison network
- technical "modules" or reports
- the Annual DOE LLW Management Conference
- Manifest Information Management System
- LLW Forum for policy representatives
- an organization for technical representatives that was the precursor to the Host State Technical Coordinating Committee

(\* Additional DOE Responsibilities) Upon enactment of the second piece of legislation, DOE picked up some new responsibilities and continued the assistance already noted. These new responsibilities included:

- administering the surcharge escrow account and the unusual volume allocation system
- preparing an annual rebate expenditure report and an annual progress report for Congress

The focus of the Program has always and continues to be on helping states meet their specific challenges. To that end we actively solicit suggestions from States and compact regions and factor them into the various products we provide.

These products fall mainly into three areas: reports, services, and meetings.

(\* Sampling of Program Reports) The Program has produced reports on most technical areas involved in developing new disposal facilities to include site selection, site characterization, performance assessment, environmental monitoring, disposal technologies, site closure, economics, and licensing.

The service area of the Program is probably the most diverse in terms of the variety of the assistance provided. One type of assistance we provide in this area is called "state-specific-requests." If a state has a specific problem that we can help with, it can submit a request for assistance to DOE wherein the problem and the assistance being sought is discussed. DOE evaluates the request against its guidelines and resources and either undertakes the task or provides a reason for declining the request.

Currently, this mechanism was used by the Program to support three consultants at the National Academy of Sciences review of the Ward Valley site. Also, we are producing a report on the effect fissures have on performance assessments.

We support both ongoing meetings of specific organizations and ad hoc workshops for providing state-specific assistance on a wide variety of topics. Ongoing meetings include the LLW Forum and the Host State Technical Coordinating committee for the policy and technical representatives, respectively, of the various states and compact regions. We also fund and organize the Annual DOE LLW Management Conference. This is the 16th year for the conference, which will be held December 13-15 at Phoenix, AZ.

(\* Sampling of Workshop Topics) The Program has found workshops to be a very effective means of helping states and compact regions address specific issues. Since the first of the year we have conducted 17 workshops on topics to include:

- Biomedical mixed LLW
- Project management

- Storage
- Transportation
- Site selection
- Volunteerism

Currently, we have a suite of 26 different workshops that can be adapted to meet the specific needs of a given state or compact region.

It has been a pleasure for me to provide a basic outline of why states and compact regions are even attempting to establish new disposal facilities, the progress they are making, and how DOE is involved. Obviously, there is no single answer for the thousands of generators in the 31 states, Washington, DC, and Puerto Rico that have to store their waste onsite. Each state and compact region has different needs and priorities that "the answer" must address. It has been, is, and will continue to be a difficult process, but together we are making progress and finding workable solutions. Thank you.

Work supported by the  
U.S. Department of Energy, Assistant Secretary for Environmental Restoration and  
Waste Management, under  
DOE Idaho Operations Office Contract DE-AC07D01570.

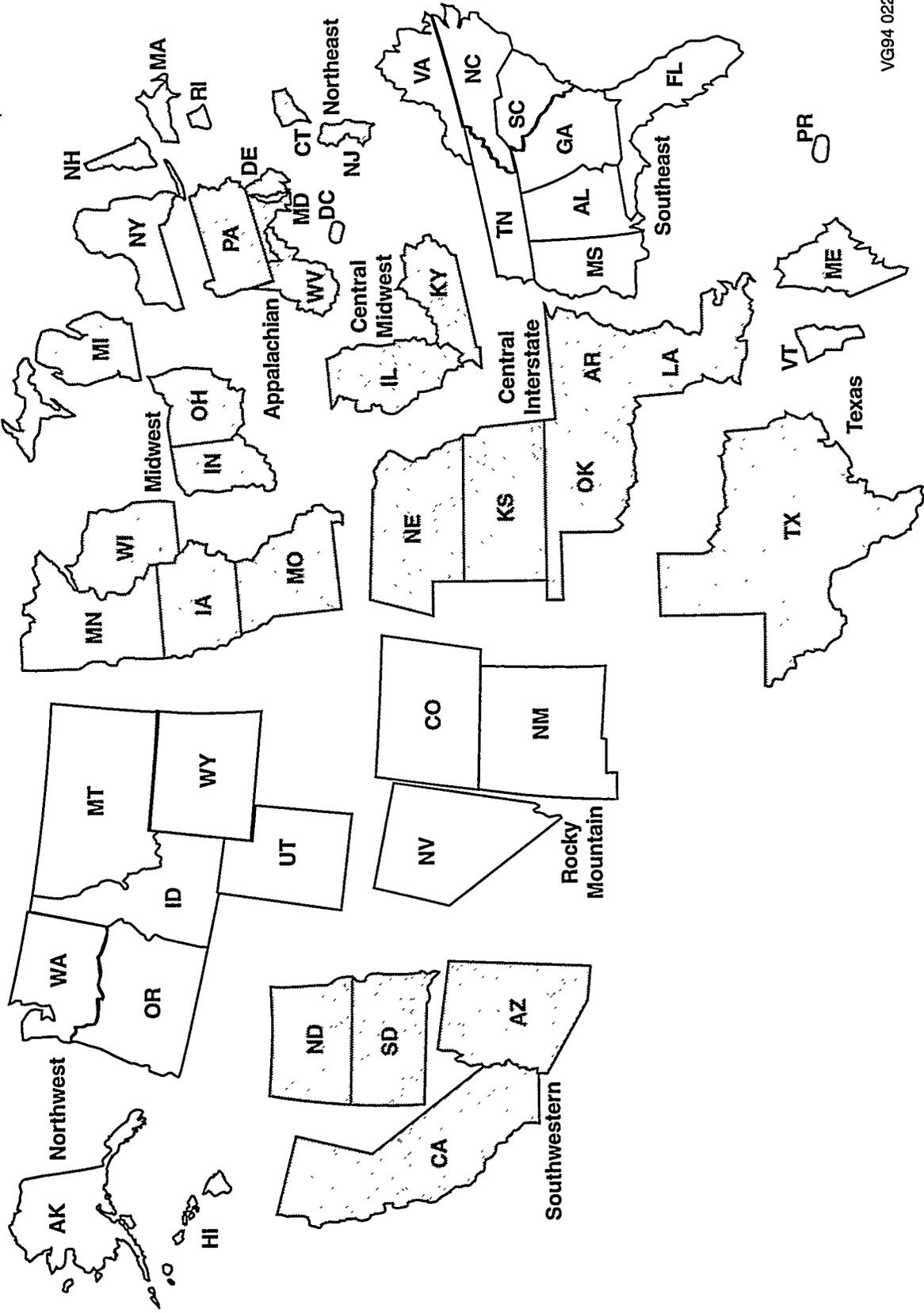
#### **DISCLAIMER**

This report 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.

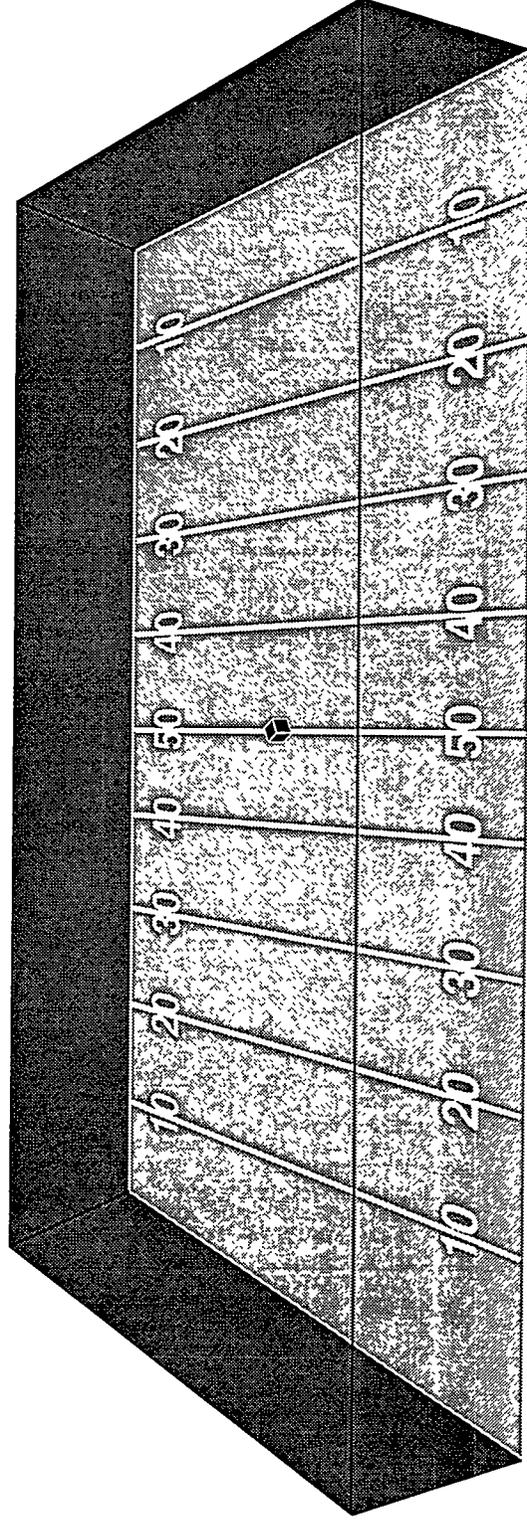
## List of Overheads/Slides

1. "States Without LLW Disposal" - Map of US highlighting all except the Northwest, Rocky Mountain, and Southeast compact regions
2. "Fraction of Annual Solid Waste that is Radioactive" - Football field with 10 ft of waste with 2 cubic feet radioactive
3. "LLW Disposal Facilities in 1979" - Map of US highlighting Washington, Nevada, and South Carolina
4. "Low-Level Radioactive Waste Policy Act, Public Law 96-573" - Listing of the main provisions of the 1980 legislation.
5. "Milestone Dates, Requirements, and Penalties, Low-Level Radioactive Waste Policy Amendments Act of 1985, Public Law 99-240" - Table of the milestone dates, requirements and penalties for the 1986 legislation
6. "LLW Disposal in 1994" - Map of US highlighting Washington and South Carolina
7. "New Host States" - Map of US highlighting all new host states (California, Texas, North Carolina, Nebraska, Illinois, Ohio, Pennsylvania, Connecticut, New Jersey, New York, and Massachusetts.
8. "Host States with License Applications" - Map of US highlighting the California, Texas, North Carolina, and Nebraska
9. "DOE's Role"
10. "Initial Program Activities"
11. "Additional DOE Responsibilities"
12. "Sampling of Program Reports"
13. "Sampling of Workshop Topics"

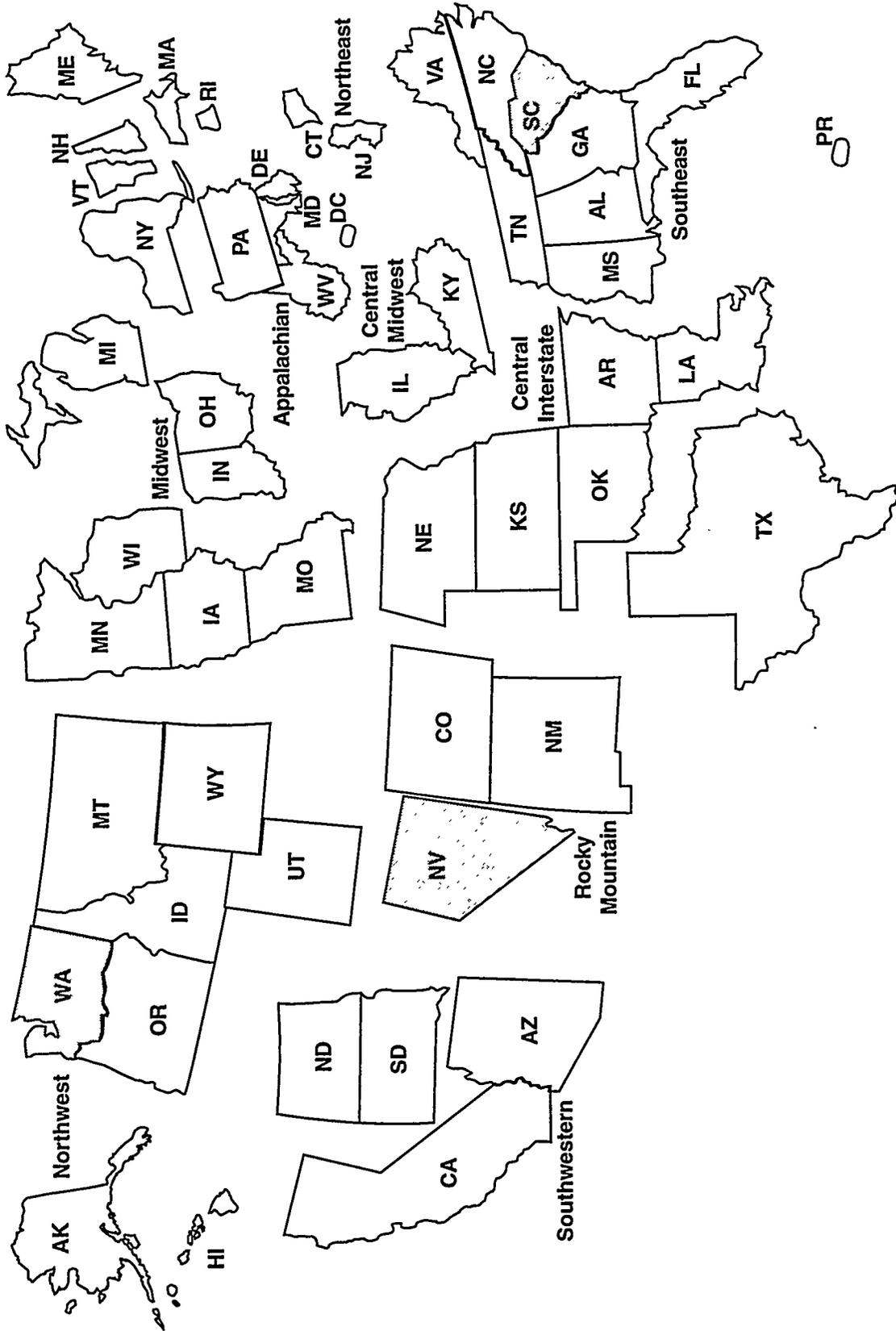
# States Without LLW Disposal



# Fraction Of Annual Solid Waste That Is Radioactive



# LLW Disposed Facilities In 1979



# **Low-Level Radioactive Waste Policy Act**

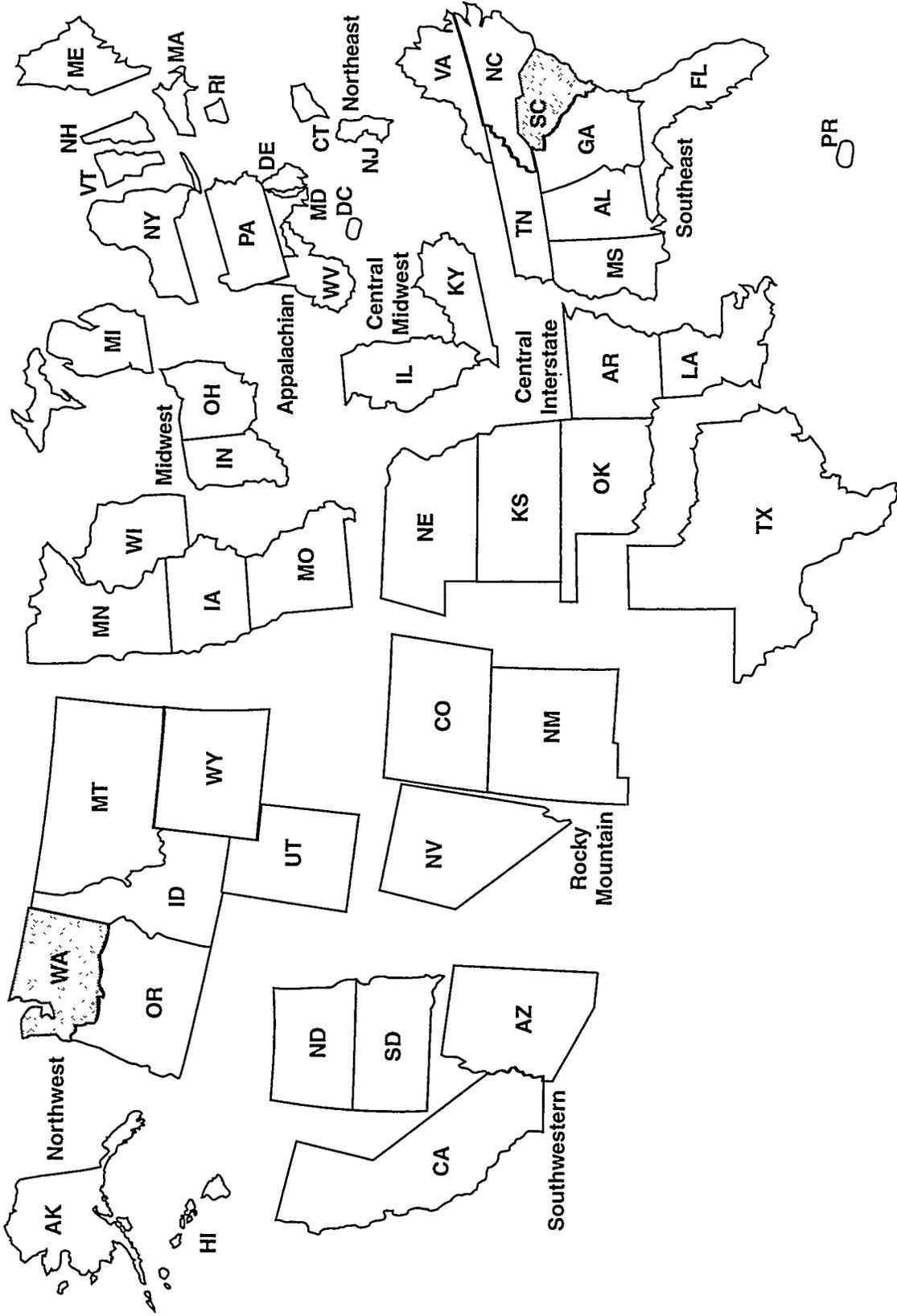
## **Public Law 96-573**

- 1. “Each State is responsible for providing for the availability of capacity either within or outside the State for the disposal of low-level radioactive waste generated within its borders”**
- 2. “To carry out the policy set forth ...the states may enter into such compacts as may be necessary to provide for the establishment and operation of regional disposal facilities,” and**
- 3. “After January 1, 1986, any such compact may restrict the use of the regional disposal facilities under the compact to the disposal of low-level radioactive waste generated within the region.”**

## Milestone Dates, Requirements, and Penalties Low-Level Radioactive Waste Policy Amendments Act of 1985 Public Law 99-240

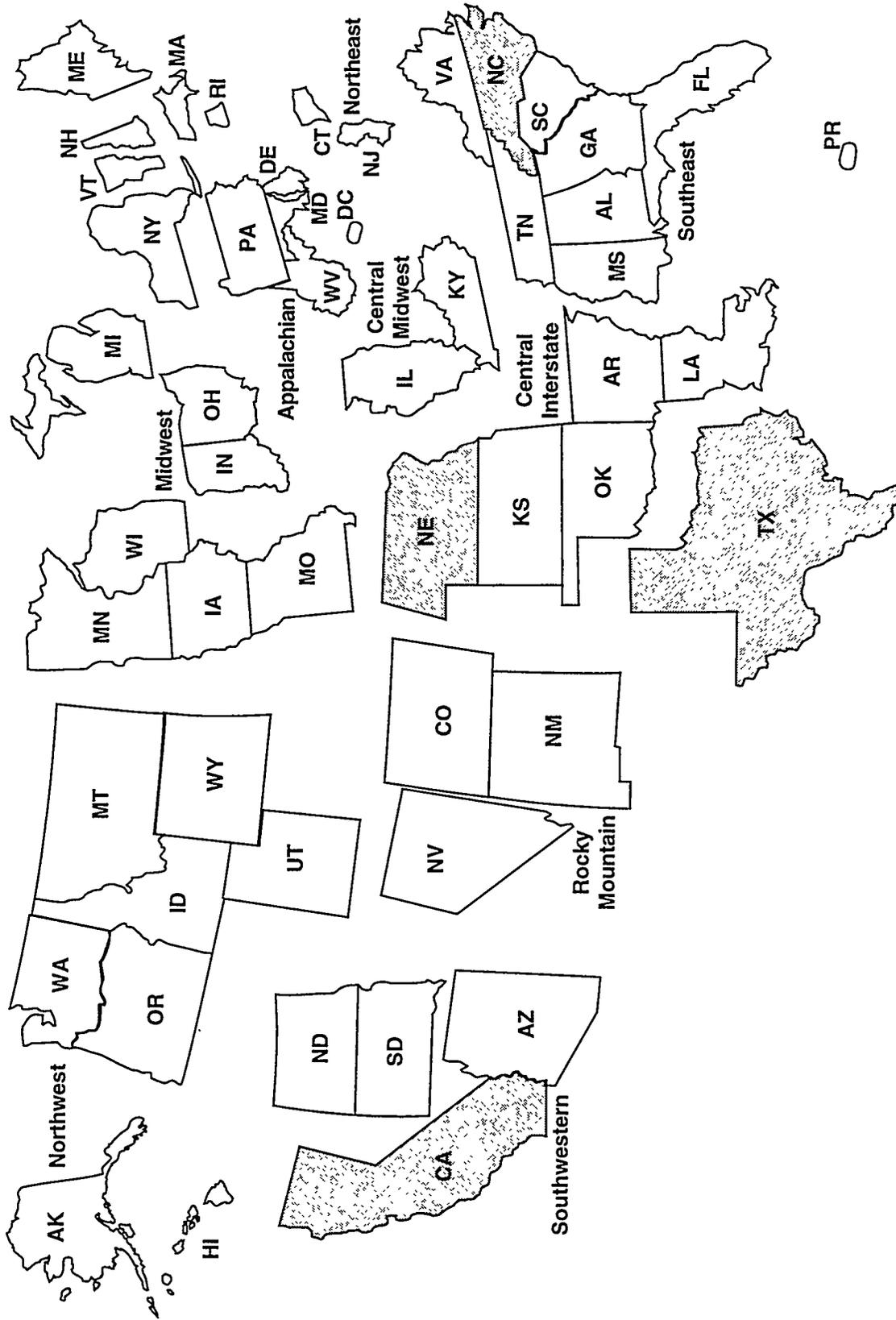
Milestone	Requirement	Penalty
7/1/86	Each state must join a regional compact or certify its intent to develop its own disposal site.	Forfeit \$2.50/ft <sup>3</sup> rebate \$20/ft <sup>3</sup> surcharge (7/1/86 - 12/31/86) Denial of access (1/1/87 - 12/31/87)
1/1/88	Compacts must designate a host state and develop a siting plan. Single states must develop a facility siting plan.	Forfeit \$2.50/ft <sup>3</sup> rebate \$40/ft <sup>3</sup> surcharge (1/1/88 - 6/30/88) \$80/ft <sup>3</sup> surcharge (7/1/88 - 12/31/88) Denial of access (1/1/89 - 12/31/89)
1/1/90	Compacts and "go-it-alone" states must file a disposal facility license application or certify their capability to manage their LLW beginning in 1993.	Forfeit \$5.00/ft <sup>3</sup> rebate Denial of access (1/1/90 - 12/31/91)
1/1/92	Each compact or state must file a disposal facility license application.	\$120/ft <sup>3</sup> surcharge (1/1/92 - filing)
1/1/93	Each compact or state must provide for disposal of all their LLW.	Forfeit \$10.00/ft <sup>3</sup> rebate, or take title and possession of waste, or be liable for generator damage
1/1/96	The Act's final target date. (Found unconstitutional and severable by the U.S. Supreme Court in July 1992)	

# LLW Disposal Facilities In 1994





# Host States With License Applications



# DOE'S ROLE

## **Initial Program Activities**

- **Developing a national liaison network that would be the “arms and legs” for DOE to identify and fulfill specific and generic needs**
- **Producing pertinent reports for educational and planning purposes**
- **Funding regular meetings of policy representatives from the various states and compact regions through the LLW Forum**
- **Organizing the Annual DOE LLW Management Conference where both DOE and commercial LLW workers can learn and network with others having similar interests and challenges**
- **Developing a Manifest Information Management System to make commercial LLW disposal information readily available from a computerized repository, and,**
- **Organizing a group composed of the host states and major stake holders including the NRC, EPA, and EPRI to coordinate the technical aspects of developing new disposal facilities that was the precursor to the current Host State Technical Coordinating Committee.**

## **Additional DOE Activities**

- **Development and maintenance of a Surcharge Escrow Account for holding 25% of the surcharge collected by host states on LLW disposal**
- **Preparation of an annual report to Congress on the use of surcharge rebates disbursed to the various states and compact regions**
- **Preparation of an annual report to Congress on the progress being made by the States in meeting the milestone dates prescribed by Congress**
- **Disposal of greater-than-Class C waste, and**
- **Management of a system for allocating space at the disposal facilities for waste generated from “unusual or unexpected” activities at the commercial power reactors.**

# SAMPLING OF PROGRAM REPORTS

1. Conceptual Design Report: Alternative Concepts for Low-Level Radioactive Waste Disposal, June 1987, DOE/LLW-60T
2. The Critical Path in Developing Low-Level Radioactive Waste Disposal Facilities - Site Selection, October 1987, DOE/LLW-64T
3. The Critical Path in Developing Low-Level Radioactive Waste Disposal Facilities - Site Characterization, June 1988, DOE/LLW-67T
4. Assistance Available Through the National Low-Level Waste Management Program, August 1993, DOE/LLW-68T, Revision 3
5. Prototype License Application: Safety Analysis Report Belowground Vault, October 1988, DOE/LLW 72T
6. Automated Pricing Schedule - Version 1.1, May 1993, DOE/LLW-97
7. A Process for Establishing a Financial Assurance Plan for LLW Disposal Facilities, April 1993, DOE/LLW-139
8. Economics of a Small-Volume Low-Level Radioactive Waste Disposal Facility, April 1993, DOE/LLW-170
9. Analysis of the Legal, Regulatory, and Technical Issues Associated with DOE Accepting Commercial Mixed Waste, June 1993, DOE/LLW-180
10. Comparative Approached to Siting Low-Level Radioactive Waste Management Facilities, June 1994, DOE/LLW-199
11. 1992 State-by-State Assessment of Low-Level Radioactive Wastes Received at Commercial Disposal Sites, September 1993, DOE/LLW 181
12. Report to Congress in Response to Public Law 99-240, 1992 Annual Report on Low-Level Radioactive Waste Management Progress, DOE/EM-0143P.

# **SAMPLING OF WORKSHOP TOPICS**

- 1. Biomedical Mixed Low-Level Radioactive Waste**
- 2. Communications Working Session**
- 3. Contracts Management**
- 4. Fundamentals of Radiation and Low-Level Radioactive Waste Management**
- 5. Temporary Storage**
- 6. Transportation**
- 7. Media Relations Training**
- 8. Performance Assessment**
- 9. Quality Assurance**
- 10. Risk**
- 11. Site Selection**
- 12. Volunteerism**