



# Disposal of Low-Level Radioactive Waste

## Background Information

### Revised February 2009

## INTRODUCTION

In 1980 and 1985, Congress enacted the Low-Level Radioactive Waste Policy Act (P.L. 96-573) and the Low-Level Radioactive Waste Policy Amendments Act of 1985 (P.L. 99-240). The Act encouraged states to form regional compacts for the disposal of low-level radioactive waste (LLRW). The Act contained both positive and negative incentives. The positive incentive was a provision that allowed compacts to restrict access to their regional LLRW disposal facility to member states beginning in 1993, thus limiting the amount of waste disposed of in any state hosting a regional disposal facility. The negative incentive required states that failed to provide access to LLRW disposal facilities to take title and possession of wastes generated within their borders — the so-called “Take Title” provision. In 1992, in a lawsuit brought by New York State, the U.S. Supreme Court struck down the “Take Title” provision thus removing a major incentive for states to develop new disposal facilities.

Since 1980, Congress has granted consent to ten interstate compacts, but no new disposal facilities meeting the requirements of the Act — i.e., ability to dispose of Class A, B, and C LLRW — have been developed.<sup>1</sup> Texas is now the only state actively developing a new LLRW disposal facility in accordance with the compact provision of the Act. In 1993, the Northwest Compact and Washington State restricted access to the Richland (Hanford) LLRW disposal facility to the eleven states of the Northwest and Rocky Mountain Compacts. For many years, the Atlantic Compact and South Carolina accepted wastes at the Barnwell disposal facility from the thirty-six states not members of the Northwest, Rocky Mountain, or Atlantic Compact. This was the only disposal outlet for Class B and C waste generated in these thirty-six states. But as of July 1, 2008, access to Barnwell has been restricted to the three states of the Atlantic Compact.

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<sup>1</sup> Waste classes A, B, and C are defined in NRC regulations at Title 10 Part 61.55 of the Code of Federal Regulations, Waste Classification, and 10CFR61.56, Waste Characteristics. The classes of waste are defined as follows (quoted in part):

(i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in § 61.56(a). If Class A waste also meets the stability requirements set forth in § 61.56(b), it is not necessary to segregate the wastes for disposal.

(ii) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in § 61.56.

(iii) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in § 61.56.



The Position Paper proposes both near-term and long-term solutions for disposal of Class B and Class C low-level radioactive waste generated by non-DOE organizations in the thirty-six states that lost access to the Barnwell, SC disposal facility on July 1, 2008. The solutions proposed here call for the federal government, specifically the US Department of Energy (DOE), to play a key role and are outside the existing interstate compact framework established by the Low-Level Radioactive Waste Policy Act and subsequent state ratification and Congressional consent statutes.

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## BACKGROUND

South Carolina law and Atlantic Compact policies provide that access to the Compact's regional disposal facility at Barnwell be restricted to the three Compact states (South Carolina, Connecticut, and New Jersey) as of July 1, 2008. This date was fixed several years prior to the July 1, 2008 deadline.

How serious is the situation? Since July 1, 2008, public and private institutions and corporations and all federal and state government agencies, except the U.S. Department of Energy, that use radioactive materials in thirty-six states, the District of Columbia, and Puerto Rico have had no place to dispose of their Class B and Class C LLRW. These are the states not in the Northwest, Rocky Mountain, and Atlantic Compacts. The regional disposal facilities in Richland, Washington (Northwest and Rocky Mountain Compacts) and Barnwell, South Carolina (Atlantic Compact) are the only facilities licensed to dispose of Class B and Class C LLRW. As noted, access to the Richland disposal facility has been restricted to the Northwest and Rocky Mountain Compacts since 1993. Utah statute (2005) limits the EnergySolutions disposal facility at Clive to Class A waste. This facility is not a regional disposal facility and is open to all states except those in the Northwest and Rocky Mountain Compacts. As of July 1, 2008, it is the only facility to which organizations in states and territories not belonging to the Atlantic, Northwest and Rocky Mountain Compacts can send their Class A waste — not including biological wastes and sealed sources which are excluded. According to data from the DOE's Manifest Information Management System (MIMS), in 2006, the activity (curies) in low-level waste Classes B and C disposed of at Barnwell by the non-DOE users in these thirty-six states accounted for 95% of the activity disposed of at all three disposal facilities (Barnwell, SC; Richland, WA; and Clive, UT) by all non-DOE generators. The phrase "non-DOE" more accurately describes those users of radioactive materials of concern here than the often-used description "commercial." The concern is with institutional users such as universities, medical, and research centers, agencies of state and federal governments, except for the DOE, as well as commercial users such as utilities with nuclear power plants and industries including pharmaceutical and biotech companies



A more definitive long-term solution for Class B and Class C LLRW and biological LLRW, and sealed sources other than indefinite, on-site or other storage is needed. On-site storage is not an option for facilities completing decommissioning.

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## **ACTION IS NEEDED FOR WASTE DISPOSAL**

As noted, since passage of the Low-Level Waste Policy Act in 1980 (amended in 1985), Congress has approved ten interstate disposal compacts, but no new disposal facilities meeting the Act's requirements for disposal of LLRW waste Class A, Class B, and Class C have been developed under state oversight as called for in the Policy Act. Only one proposed facility received a conditional license: the proposed Ward Valley disposal facility in California's arid Mojave Desert designed to serve the four states of the Southwestern Compact (Arizona, California, North Dakota, and South Dakota). The Ward Valley facility never opened because of political opposition, first by the Clinton Administration and later by the California Legislature and Governor (former Governor Davis). Texas has an active program to develop a new disposal facility (Texas and Vermont Compact) and is currently in licensing proceedings.

In a 2002 speech, NRC Chairman Richard Meserve noted the need for Congressional action to modify the approach of the LLWPA. It was hoped that Envirocare of Utah (now EnergySolutions) would obtain approval from the State of Utah for disposal of Class B and Class C wastes. However, a state law enacted in 2005 prohibits the acceptance of Class B and Class C wastes for storage or disposal.<sup>2</sup> In his 2002 speech, Chairman Meserve went on to say:

“Sufficient disposal capacity currently exists to handle today’s disposal needs, particularly in light of the trend towards license renewal of civilian nuclear power plants. (License renewal delays decommissioning and hence postpones the need to dispose of the waste associated with decommissioning.) In addition, waste minimization, volume reduction, and decay-in-place strategies reduce the overall volume of material. Nonetheless, the disposal situation is increasingly uncertain. With the eventual closure of the Barnwell disposal facility to states outside the Atlantic Compact, the absence of progress in other Compacts to site low-level waste disposal facilities, and few other disposal options, access to facilities for the disposal of low-level waste is increasingly constrained. Although Envirocare of Utah may eventually obtain state approval for disposal of Class B and C wastes, the limited options for disposal are likely to keep disposal costs high. There is thus the potential that the decommissioning process for many sites and the medical use of radionuclides will be affected adversely.”

Other members of the NRC — Commissioners Jaczko, Lyons, and Merrifield — have also commented on the post-July 1, 2008 Class B and Class C LLRW disposal problem.<sup>3</sup> In

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<sup>2</sup> [http://www.le.state.ut.us/~code/TITLE19/19\\_03.htm](http://www.le.state.ut.us/~code/TITLE19/19_03.htm)

<sup>3</sup> January 11, 2006. Transcript of Meeting of the Commission with Members of the Advisory Committee on Nuclear Waste Commissioners Jaczko pp. 44-45, Lyons pp. 48-49, and Merrifield (failure of the LLRW Policy Act) pp. 59-60.



comments on a 2004 report of the General Accounting Office, the NRC noted:

“At the same time, the nearly 20 years of experience under the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPA) has demonstrated the difficulties in siting and licensing a LLRW disposal facility. Not one new facility has been developed in this time under the LLRWPA. Therefore, we believe it is in the national interest to begin exploring alternatives identified in Appendix II that would potentially provide a better legal and policy framework for new disposal options for commercial generators of LLRW.” (Quoted in part.)<sup>4</sup>

More recently, at the 2008 Waste Management Conference, current NRC Chairman Dale Klein noted that “LLW Compacts never worked as they were supposed to” and that it is important to act now to avoid a crisis in the future.<sup>5</sup>

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## **PROPOSED SOLUTIONS FOR DISPOSAL OF NON-DOE CLASS B AND C LOW-LEVEL RADIOACTIVE WASTES**

1. The Department of Energy has issued a Notice of Intent to Prepare an Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste. This action by the DOE was pursuant to the Energy Policy Act of 2005<sup>6</sup>. The Health Physics Society (HPS)<sup>7</sup> first advanced the proposal that the GTCC disposal facility also be used for the disposal of non-DOE Class B and Class C low-level waste. Existing statute requires further Congressional action in any event because the DOE must obtain Congressional approval of the GTCC EIS before issuing a Record of Decision (ROD) in selecting a site for a proposed GTCC facility. The facility should be used for Class B and Class C wastes also, since if it can safely dispose of GTCC wastes, it can certainly dispose of Class B and Class C wastes safely.

2. In order to avoid a time delay in providing disposal access to non-DOE users of radioactive materials for Class A biological and sealed sources, Class B and Class C wastes, it will likely be necessary to rely on facilities that exist today. Existing Department of Energy disposal facilities dispose of DOE waste materials that are similar to non-DOE wastes classified as Class B and Class C under 10 CFR Part 61. According to a DOE Inspector General’s report issued in 2001,

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<sup>4</sup> May 25, 2004 letter from Luis Reyes, NRC to Robin M. Nazzaro, GAO, review of GAO-04-604 draft “Low-Level Radioactive Waste Disposal Availability Adequate in the Short Term, but Oversight Needed to Identify Any Future Shortfalls” (NRC Adams [ML041260340](#))

<sup>5</sup> Radwaste Solutions, May/June 2008, Nancy J. Zacha, “Editor’s Note,” page 4 and “A Report from Waste Management 2008,” pages 47, 49.

<sup>6</sup> The basis of the DOE actions also include the Low Level Radioactive Waste Policy Amendments Act. See <http://www.gtceis.anl.gov/eis/why/index.cfm>.

<sup>7</sup> September 17, 2007, Letter from Health Physics Society to Department of Energy Office of Regulatory Compliance: “Comments on Notice of Intent to Prepare an Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste.”



there is excess capacity at disposal facilities operated by the Department for its own LLRW<sup>8</sup> at which Class B and Class C wastes could be disposed. Some existing DOE facilities suitable for Class B and Class C waste disposal should be made available to non-DOE users for, Class A biological and sealed sources, Class B and Class C waste LLRW only.

3. Reclassification of some Class B and Class C wastes and changes in the classification scheme of 10 CFR Part 61 has been suggested from time to time, and should be investigated. However reclassification of Class B and Class C wastes is unlikely to gain access for these wastes to the EnergySolutions disposal facility in Clive, Utah because of the acceptance criteria established by Utah state law and regulations.

The DOE is already contributing to a management solution for some non-DOE wastes. Through a program run by the Los Alamos National Laboratory, the Department's Off-Site Recovery Project (OSRP) collects and stores sealed radioactive sources from a wide variety of commercial and institutional users. This project exemplifies a federal resolution of a national waste problem — the kind of federal role that is needed today to resolve the Class B and Class C LLRW disposal problem in a timely, safe, and economical way.

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<sup>8</sup> "Utilization of the Department's Low-Level Waste Disposal Facilities," DOE/IG-05-5, May 25, 2001.