

Challenges and Lessons Learned in Low-Level Radioactive Waste Management and Disposal in the Texas Compact - 9280

S.M. Jablonski, P.E.¹

Director, Radioactive Materials Division
Texas Commission on Environmental Quality
P.O. Box 13087, MC-233, Austin, Texas 78711

ABSTRACT

This paper discusses challenges and lessons learned in approaching the management and disposal of commercial low-level radioactive waste in the Texas Compact. The State of Texas has actively worked decades to address radioactive waste management and disposal issues. The current strides made in Texas on the radioactive waste management front have benefited from unique attributes that help support a public policy foundation.

The public policy of radioactive waste management, specifically low-level radioactive waste disposal, has been evolving in Texas for more than twenty years. The policy today is a product of past events and lessons learned. In many ways, public policy on radioactive waste disposal has come full circle. A purely scientific approach to radioactive waste management has not been the solution. Radioactive waste management public policy does not solely rely on technical expertise or state of the best technology. Sound science is simply not enough. Innovation in this case is largely people-based, focused on new ways to communicate and new opportunities to deliver a message of safe and effective radioactive waste management.

INTRODUCTION

The State of Texas has worked to independently address management and disposal of radioactive waste generated within its borders. Texas recently approved a plan for the issuance of a license for low-level radioactive waste and mixed waste disposal under a hybrid license for a site with two facilities, one commercial and one federal government facility. The state regulatory program also recently issued a license for by-product radioactive material disposal. Texas has exclusive authority to regulate and manage radioactive materials and radioactive waste, other than nuclear reactors and certain types of high-level radioactive materials which remain under federal jurisdiction.

Regulation of radioactive material, including radioactive waste disposal in the United States, was restricted to the federal government, under provisions of the Atomic Energy Act of 1954, which created the Atomic Energy Commission (AEC). Section 274 of the Atomic Energy Act (codified as amended at 42 U.S.C. §2021(b)) was enacted by the United States Congress in 1959 to allow states to enter into formal agreements with the AEC to assume state regulatory authority over some radioactive materials. The State of Texas became an "Agreement State" in 1963. The Texas radiation control program is overseen by the United States Nuclear Regulatory Commission (NRC), a successor agency to the AEC. The NRC reviews the Texas regulatory program for its adequacy and compatibility with federal requirements and retains the power to reassert federal authority if it finds that the state is unable to protect public health and safety or is not in compliance with Section 274 of the Atomic Energy Act.

The United States Congress passed the Low-Level Radioactive Waste Policy Act (codified as amended at 42 U.S.C. §§2021b-2021j) in 1980, which required states to be responsible for low-level radioactive

¹ The opinions expressed in this paper are the sole responsibility of the author and do not reflect the views or opinions of the State of Texas or the Texas Commission on Environmental Quality.

waste generated within their borders. The Act allowed states to work in cooperation with other states by means of federally-ratified compacts. Texas originally planned to “go it alone,” seeking a disposal location within its borders for waste generated in Texas. As Texas moved closer to possibly siting a new disposal facility, there was interest in having the ability to control the importation of low-level radioactive waste. In 1993, the Texas legislature passed into law the Texas Low-Level Radioactive Waste Disposal Compact (Texas Compact) as Texas Health and Safety Code, Chapter 403. The legislatures in Maine and Vermont followed and passed legislation to enter into the Texas Compact agreement wherein Texas is to provide a low-level radioactive waste disposal facility. The Texas Compact was ratified by the United States Congress and signed by President Clinton in September 1998. Due to the early closure and decommissioning of the Maine Yankee nuclear reactor, the Maine legislature passed emergency legislation to withdraw from the Texas Compact in April 2002, and formally withdrew from the Texas Compact in April 2004.

In Texas, radioactive waste is classified by the origin or the generating activity/process that resulted in the production of waste. Low-level radioactive waste is defined in statute at Texas Health and Safety Code §401.004 and in rule at Title 30 Texas Administrative Code §336.2(76). These definitions of low-level radioactive waste are exclusionary, as is the federal definition found in Title 10 of the Code of Federal Regulations, Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste.” Low-level radioactive waste does not include high-level radioactive waste such as spent nuclear fuel, transuranic waste produced by the defense nuclear weapons program, tailings and other by-products from the production of source material recovery and uranium mining, oil and gas naturally-occurring radioactive material (NORM), and non-oil and gas NORM waste. Low-level radioactive waste is a broad category of radioactive waste that is less radioactive than high-level radioactive waste in both concentration and intensity. Generally, low-level radioactive waste is material which has been declared as waste that has been contaminated by or contains short-lived radionuclides or longer-lived radionuclides in relatively low concentrations. Low-level radioactive waste is generated in Texas by a wide range of industries and facilities, including nuclear power reactors, research hospitals and laboratories, academic institutions, industrial sites, reclamation projects, as well as government and military facilities.

The approach to management and disposal of low-level radioactive waste is focused on the minimization of risk to people and protection of the environment. The classification system for low-level radioactive waste based on relative risk has been developed in Title 10, Code of Federal Regulations, Part 61. Because there is a greater risk related to handling and disposal of higher categories of low-level radioactive waste, waste in those categories have additional disposal restrictions. Texas statute has additional protection in the mandatory use of reinforced concrete containers and an additional reinforced concrete barrier for higher categories of low-level radioactive waste. Texas rule defines necessary modeling of a minimum period of 1,000 years after closure or the period where peak dose occurs, whichever is longer, to capture potential dose from the more mobile long-lived radionuclides and to help demonstrate site performance objectives are met. Additionally, Texas statute requires a corrective action fund as part of financial assurance to prevent and address any unplanned events into the future that may impact the closed disposal facility.

There are categories of low-level radioactive waste that are subject to near-surface land disposal requirements: Class A low-level radioactive waste, Class B low-level radioactive waste, and Class C low-level radioactive waste. Class A low-level radioactive waste is the least hazardous, containing mostly short-lived radionuclides at generally low concentrations that will be reduced in radioactivity through decay in a relatively short time. The majority of the low-level radioactive waste produced in the Texas Compact is classified as Class A. Under Texas requirements, a further sub-category of Class A low-level radioactive waste containing transuranics and longer-lived radionuclides requires placement in a concrete canister for added protection. Class B low-level radioactive waste is generally more hazardous than Class A waste. The majority of Class B and C low-level radioactive waste in the Texas Compact is

generated by nuclear power reactors. Class B and C waste must be in a stable form for disposal, and must be disposed in concrete canisters and also in an additional concrete barrier under Texas requirements. Class B low-level radioactive waste makes up only a small percent of the total volume of waste generated; but along with Class C waste, it contains the largest contribution of the total radioactivity. Class C low-level radioactive waste generally has the highest concentrations of radionuclides and must be handled accordingly. Waste generators in the Texas Compact produces only a very small amount of Class C low-level radioactive waste, less than five percent of the total volume generated. An additional category called Greater-than-Class-C low-level radioactive waste also exists, but the disposal of this waste is not the responsibility of the state and is generally not acceptable for near-surface land disposal.

Any of these classes of low-level radioactive waste, if they also contain materials classified as hazardous chemical waste, fall into a category called mixed waste. Low-level waste that is mixed with hazardous waste requires handling and disposal in accordance with low-level radioactive waste regulations as well as those applying to hazardous waste. Texas regulations allow for the dual licensing/permitting of a disposal facility to accept and dispose of mixed low-level radioactive waste.

The challenges and time frames for finding permanent disposal options for low-level radioactive waste has pressed Texas to actively pursue numerous options and solutions for waste management. In addition to the specific requirements for near-surface land disposal of low-level radioactive waste, Texas statute and rules also provide alternatives for waste management. These alternatives include possible exemptions for the disposal of certain radioactive material in non-radioactive waste landfills and release of radioactive material into sanitary sewer systems. Texas has a process in place to allow disposal exemptions through the rulemaking process. A successful exemption using this process allows for Texas licensees to dispose of short-lived low-level radioactive waste, less than 300-day half-life material, into municipal solid waste landfills. Landfills permitted under Resource Conservation and Recovery Act (RCRA) Subtitle C in Texas are also receiving other radioactive materials that have been exempted through the same process with regulatory concurrence.

In addition to exemptions and alternative waste management options, waste generators in Texas have focused efforts on waste minimization and waste volume reduction. These efforts were first limited to the nuclear power plant generators in Texas, but have expanded to the industrial, academic, and research hospital settings. Minimization efforts have included pre-staging work involving radioactive materials, sorting and segregation, and decontamination and recycling of equipment. Waste volume reduction efforts have included waste compaction and super-compaction, thermal destruction, shredding, and waste repackaging. These alternatives and efforts have provided additional tools for Texas generators in the safe management of radioactive waste.

Where We Have Been – Lessons Learned

The Texas Low-Level Radioactive Waste Disposal Authority (the Authority) was created by the Texas Legislature in 1981 in response to the federal Low-Level Radioactive Waste Policy Act making each state responsible for low-level radioactive waste generated in its borders. The Authority was commissioned to collect waste generator fees to site, construct, operate, and decommission a Texas low-level radioactive waste disposal facility. Texas' solution was to propose a state-owned, state-operated facility with full public participation and an open process.

In 1984, the Authority completed state-wide screening of possible disposal site locations and had identified regions that were considered more suitable than other areas within Texas. The state-wide screening focused on technical considerations, not on possible political or policy ramifications. Technically-favorable siting areas were identified in south Texas, far west Texas, and northwest Texas.

In 1985, a site was proposed for further study in McMullen County, about 70 miles south of San Antonio. Also in 1985, the Texas Legislature passed legislation to give preference to locating a low-level radioactive waste disposal facility on state-owned land. This legislation effectively terminated further study of a possible McMullen County site on private land and focused siting efforts on far west Texas, where most state-owned lands are located. In retrospect, clearly, technical criteria were not the only criteria that would be important to consider in site selection.

The Authority selected two sites in far west Texas for further analysis. Despite a temporary injunction from an El Paso district court, a site near Fort Hancock, Texas was designated as the preferred site in 1989. A field office was opened in near the preferred site to coordinate characterization studies on the preferred site and provide outreach to the local community. Although efforts were made for public outreach, the opposition to siting was active on day one and there was limited opportunity to gain common support in the community. In 1990, a second temporary injunction was filed by El Paso County to stop work on the preferred site. An El Paso district court held a trial and handed down a ruling in favor of El Paso County in 1991.

Although an appeal on the Fort Hancock site was filed, the Authority began searching for an alternate site location. Later in 1991, the Texas Legislature passed legislation that designated a 600-square mile area southeast of Fort Hancock, and farther away from El Paso County, for siting a low-level radioactive waste facility. In February 1992, a site was designated for further studies and facility siting near the town of Sierra Blanca.

In March 1992, a license application for the site near Sierra Blanca was submitted to the Texas Natural Resource Conservation Commission, predecessor of the Texas Commission on Environmental Quality, and soon the technical review of the application began [1]. In response to regulatory interrogatories and further site characterization work, the final version of the license application was submitted by the Authority in late 1993. Technical review of the application was completed and a draft license and an environmental analysis were open for public comment [2]. Several parties, including a Mexican state, requested a contested case hearing on the proposed licensing action. Following the hearing, which traveled to four cities in Texas over the course of several months, the draft license was ultimately denied in 1998.

The public policy need for a Texas disposal facility that spurred the creation of the Authority in 1981 had faded. Any further study or pursuit of the Sierra Blanca site was abandoned and the public policy of a government-owned, government-operated low-level radioactive waste management for Texas was open for debate. Almost two decades had passed, and there were no perceived ramifications of not having a Texas disposal site. The need for low-level radioactive waste disposal options held to be re-invented, to be put in a new context of pressing environmental issues.

The Texas Legislature charged the state's environmental agency with studying waste management and disposal options, including the concept of above ground isolation before the 2001 legislative session. The alternatives study [3] and an accompanying legal analysis [4] detailed the history of low-level radioactive waste management in Texas and the United States, estimated waste generation rates, developed a technical definition for assured isolation, and provided other alternatives for public policy consideration. This study was also an opportunity to highlight radioactive waste management successes and failures throughout the United States to help chart a new course.

Several bills were introduced and debated during the 2001 Texas Legislative session that would have impacted radioactive waste public policy, but none successfully passed. The session did provide a venue for open dialogue and an opportunity to build trust that Texas public policy could have a foundation in

sound science and also allow for innovations and new ideas. It included a healthy debate of lesson learned in radioactive waste management and an opportunity to openly discussion possible policy-based solutions.

Discussions on the developing radioactive waste public policy began well before the 2003 Texas Legislative session started in January 2003. The legislature was ready to take on change in radioactive waste policy under the leadership of key members who worked with stakeholders to reach compromise. House Bill 1567 changed statutory policies and concepts, especially with low-level radioactive waste disposal. Key changes included privatization of a Texas disposal facility, the acceptance criteria for federal radioactive wastes at a separate and adjacent facility, and waste disposal fees for the State of Texas general revenue. The ability to condemn private mineral rights for disposal facility siting was also part of this legislation. A disposal facility could also accept mixed low-level radioactive waste if approved by the state's environmental agency, under this new legislation. The designation for siting was restricted to the central and northern counties of West Texas. A proposed site had to have low rainfall, less than 20 inches per year, not be in a county along selected river segments, and had to be located in a county more than 62 miles (100 kilometers) north of the Texas-Mexican border.

The Texas Commission on Environmental Quality was charged in House Bill 1567 with the implementation of requirements for license application submission, review, selection, and completion of technical review. The implementation process required examination of possible rule language, stakeholder input, and revision to Title 30, Texas Administrative Code, in the following: Chapter 336 (Radioactive Substance Rules), Chapter 305 (Consolidated Permits), Chapter 39 (Public Notice), and Chapter 37 (Financial Assurance). The agency held stakeholders meetings on the rulemaking proposal, held a public hearing, and received written comments. Additionally, the agency requested input from the NRC on the proposed implementation of the new process in Texas. After an intense rulemaking effort, the agency established a process to receive any and all license applications, much like an open-bid process, over a 30-day period in July and August of 2004.

Where We Are Going – Current Licensing Action

On August 4, 2004, Waste Control Specialists, LLC submitted a license application to authorize the development, operation, and closure of two facilities for the disposal of low-level radioactive waste at a site in Andrews County, Texas. The site is located approximately 30 miles west of the City of Andrews, Texas, and five miles east of the City of Eunice, New Mexico. The facilities would be located approximately one-half mile east of the Texas-New Mexico boundary and one mile north of Texas State Highway 176. Figure 1 provides a map of the site location. No other license applications were received by the Texas Commission on Environmental Quality during the open 30-day period.

The proposed licensing action would authorize two facilities for low-level radioactive waste disposal under one Texas radioactive material license: a Texas Compact Waste Facility and a Federal Facility Waste Disposal Facility. The proposed acreage of the facilities are as follows:

- 29.66-acre Texas Compact Waste Facility;
- 89.90-acre Federal Facility Waste Disposal Facility; and
- 3.29-acre Administrative Area that is common to both facilities.

Waste Disposal Facility of 300,000 cubic yards or 8.1 million cubic feet that can be increased by license amendment after five years of operations.

The license application was assigned the radioactive material license number R04100, and review for administrative completeness was initiated in accordance with Texas Health and Safety Code § 401.230. The administrative review was used to determine if the application contained adequate information in all required areas to initiate a review of the application's technical merits. The original submission of the license application was determined to be administratively incomplete and a series of administrative notices of deficiency were issued to allow the applicant an opportunity to address the noted deficiencies [5, 6, and 7]. After sufficient resolution of administrative issues, the application was declared administratively complete on February 18, 2005 [8]. An initial public meeting on the proposed site was held in Andrews, Texas on March 31, 2005. The first public meeting was held in accordance with Texas Health and Safety Code §401.232 and allowed for public comment on the administratively complete license application in the proposed Host County.

After completion of the merit review and response to public comments and in accordance with Texas Health and Safety Code §401.237, the Texas Commission on Environmental Quality began the technical review of the license application in May 2005. The agency assembled a technical team, augmented by outside consultants with specific expertise in various aspects of the review. The commitment and follow-through of this technical approach to the application review were essential to support the public policy shift to privatization. The stakeholders that had been involved in the policy discussions at the legislature and during the rulemaking process needed to have confidence that the new approach could be based on sound science and allow for opportunities for streamlining and innovation.

In July 2005, a preview letter was issued to the applicant that detailed numerous issues of fundamental importance that would need to be addressed in the pending technical review [9]. Notices of technical deficiencies were issued to provide an opportunity to correct noted deficiencies [10 and 11]. Although responses to notices had been received, the applicant was informed that many deficiencies identified in previous notices had not been adequately addressed [12]. An additional list of concerns was sent to the applicant on June 30, 2006 [13]. On August 8, 2006, the applicant requested an extension of time to address outstanding technical issues [14]. A conditional extension to the technical review phase was granted to allow the opportunity to address remaining deficiencies. Additional submissions to the license application were made by the applicant in March and May 2007.

During the technical review, several guidance documents were reviewed, discussed, and used in conducting the agency's review and analysis of the license application. Some United States Nuclear Regulatory Commission documents considered in the review include: Regulatory Guide 4.18 [15], NUREG-1199 [16], NUREG-1300 [17], and NUREG-1200 [18]. Agency staff also developed specific guidance for conducting performance assessments of low-level radioactive waste disposal facilities.

To support the concept of an open and transparent licensing process, a web site has been maintained, with regular notice of updates and new postings to all stakeholders. The Texas Commission on Environmental Quality maintains a web site for information and access to documents related to low-level radioactive waste disposal licensing matter at:

http://www.tceq.state.tx.us/permitting/radmat/licensing/wcs_license_app.html. The license application, consisting of 14 sections in 34 consecutively numbered volumes and appendices, is also available for public review via the web site and in hard copy. Numerous revisions to the license application have been made to increase the supporting information for consideration of license issuance. Due to the significant degree of public interest in the license application after the technical review was completed, a second public meeting on the license application was conducted in Andrews, Texas on September 8, 2008.

The Executive Director of the Texas Commission on Environmental Quality reviewed the license application, including site characterization data, information on proposed operations, radiological and non-radiological impact assessments, and site closure discussions and proposed financial assurance. On August 11, 2009, a preliminary recommendation for license issuance filed by the Executive Director, along with a draft license and accompanying licensing order, and an environmental analysis documenting the license application review were all opened for public comment. The environmental analysis is a technical assessment of the license application that documents the review performed and discussion made throughout the technical review period.

The environmental analysis makes the following findings on the license application [19]:

- (1) As authorized in the draft license, the applicant is qualified by reason of training and experience to carry out the disposal operations in a manner that protects health and minimizes danger to life or the environment;
- (2) As authorized in the draft license, the disposal site, disposal design, land disposal facility operations (including equipment, facilities, and procedures), disposal site closure, and post-closure institutional control are adequate to protect the public health and safety in that they provide reasonable assurance that the general population will be protected from releases of radioactivity as specified in the performance objective in Title 30, Texas Administrative Code §336.724 (relating to Protection of the General Population from Releases of Radioactivity);
- (3) As authorized in the draft license, the disposal site, disposal site design, land disposal facility operations (including equipment, facilities, and procedures), disposal site closure, and post-closure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that individual inadvertent intruders are protected in accordance with the performance objective in 30 TAC §336.725 (relating to Protection of Individuals from Inadvertent Intrusion);
- (4) As authorized in the draft license, the land disposal facility operations (including equipment, facilities, and procedures) are adequate to protect the public health and safety in that they will provide reasonable assurance that the standards for radiation protection set out in Subchapter D of Title 30, Texas Administrative Code, Chapter 336 of the commission's rules (relating to Standards for Protection Against Radiation) will be met;
- (5) As authorized in the draft license, the disposal site, disposal site design, land disposal facility operations, disposal site closure, and post-closure institutional control are adequate to protect the public health and safety and the environment in that they will provide reasonable assurance that long-term stability of the disposed waste and the disposal site will be achieved and will eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure;
- (6) As authorized in the draft license, there is reasonable assurance that the applicable technical requirements of Subchapter H of Title 30, Texas Administrative Code Chapter 336 will be met;
- (7) As authorized in the draft license, the institutional control provides reasonable assurance that institutional control will be provided for the length of time found necessary to ensure the findings in paragraphs (2)-(5) above and that the institutional control meets the requirements of Title 30, Texas Administrative Code §336.734 (relating to Institutional Requirements);
- (8) As authorized in the draft license, the financial assurances met the requirements of Subchapter H of Title 30, Texas Administrative Code, Chapter 336; and

(9) As authorized in the draft license, any additional requirements under the rules of the commission are met.

As stated in the Environmental Analysis, the Texas Commission on Environmental Quality may incorporate in any license additional requirements and conditions with respect to the licensee's receipt, possession, and disposal of waste as appropriate or necessary in order to protect the health and safety of the public and the environment, to require reporting or recordkeeping, or provide for inspection of activities that may be necessary or appropriate to effectuate the purpose of any applicable statute including Texas Health and Safety Code, Chapter 401, or under the rules of the commission. Based on that authority and responsibility, the Environmental Analysis also identifies the following areas of the license application that warrant specific attention:

(1) The application provides characterization and modeling of the proposed disposal site to meet the requirements of Title 30, Texas Administrative Code §336.728(a). The Executive Director recommends that additional site information be provided to verify the characterization provided in the application to address data gaps and areas of uncertainty. Draft license conditions requiring additional site characterization work have been proposed as preconstruction requirements. Since additional field work and evaluation of that work is required in the draft license, the results of this work have not yet been reviewed.

(2) The application provides information to address sufficiency of depth to the water table so that groundwater, perennial or otherwise, shall not intrude into the waste to meet the requirements of Title 30, Texas Administrative Code §336.728(f). New final dimensions of facility buffer zones that differ from those presented in the application have been proposed in draft license conditions to provide assurance that water will not contact waste. The Executive Director recommends license conditions to require predictive modeling to assess future locations of the water tables.

(3) The application provides information related to fee simple ownership of the mineral estate beneath the proposed disposal site to address the requirements of Title 30, Texas Administrative Code §336.808(c) and Texas Health and Safety Code §401.204(c). The application states that a condemnation proceeding will be necessary to meet statutory requirements for ownership of the mineral rights beneath the proposed facilities. Under Texas Health and Safety Code §401.204(a), an application for a compact waste disposal facility license may not be considered unless the applicant has acquired the title to and any interest in land and buildings as required by commission rule. WCS does not own all of the mineral interests underlying the proposed land disposal facilities. In a petition, WCS asked the agency to request that the Texas Attorney General institute condemnation proceedings to acquire fee simple interest in the outstanding mineral rights (TCEQ Docket No. 2005-1994-RAW). A licensing order has been prepared stating that the application will be granted upon a demonstration that the applicant has acquired free and clear title to and all interests in land and buildings, including the surface and mineral estates, of the proposed disposal site, by either having acquired an undivided ownership of the buildings, surface estate, and mineral estate in fee simple through purchase or completed condemnation. The licensing order provides that the license may not be issued, signed, or granted until the ownership demonstration required above.

(4) The application provides information related to the United States Department of Energy assuming all right, title, and interest in the land and buildings for the disposal of federal facility waste to address the requirements of Title 30, Texas Administrative Code §336.909(2).

(5) The application provides information on equipment, facilities, and procedures to protect and minimize danger to the public health and safety and the environment as required by Title 30, Texas

Administrative Code §336.207. The Executive Director recommends development of a clear plan to establish a site-wide safety and high-performance culture that is integrated into the daily operations of the proposed disposal facility.

(6) The application proposes financial assurance for operation and closure of the proposed disposal facilities to address the requirements of Title 30, Texas Administrative Code §336.736.

Consideration of Unique Waste Streams

When unique technical issues arise, there must be flexibility in the licensing process to address the issue. The NRC has recognized the unique characteristics of depleted uranium (DU) and the potential issues of its disposal at near-surface land disposal facilities. Written issue papers, known as SECY papers, are prepared by NRC staff and submitted to their Commissioners to inform them about policy, rulemaking, and adjudicatory matters. The NRC recently released SECY-08-0147 [20] in response to a Commission directive to study DU and determine whether the classification and requirements found in Title 10, Code of Federal Regulations, Part 61 should be revised with respect to DU.

The SECY-08-0147 states that the types and degree of constraints are different for disposal of large quantities of DU in the near-surface compared to typical low-level radioactive waste. SECY-08-0147 also identifies that the characteristics of DU differ from commercial low-level radioactive waste, as “the radiologic hazard of DU is more persistent than typical commercial low-level radioactive waste . . . and has a much lower initial specific activity compared to its eventual specific activity, which is a problem because confidence is higher shortly after disposal that institutional controls will be maintained, engineered barriers will perform their function, and stability of the disposal site can be ensured.” SECY-08-0147 states that DU requires a greater consideration of long-term stability and isolation from the accessible environment over longer time frames than other low-level radioactive waste. SECY-08-0147 recommends initiating rulemaking to revise Part 61 to specify the need to conduct a site-specific analysis addressing the unique characteristics of DU and other additional considerations prior to authorizing disposal. This NRC recommendation is consistent with the condition in the draft license related to DU. SECY-08-0147 states that the technical requirements associated with disposal of DU would be developed through the rulemaking process. Therefore, because of the possible changes in federal regulations related to DU and the final technical requirements for acceptance of DU, the draft license contains a license condition prohibiting the receipt and disposal of large quantities of DU.

Addressing the Public Policy Issues

The public policy of radioactive waste management, specifically low-level radioactive waste disposal, has been evolving in Texas for decades. The radioactive waste management policy today is a product of past events, trial and some error, lessons learned, and much discussion. In many ways, the public policy on the radioactive waste management and disposal has come full circle. There has been site selection based only on technical criteria, potential sites rejected for non-technical reasons, and floating boxes drawn on maps. A purely technical approach to radioactive waste management and disposal has not been the solution. The current public policy does not solely rely on technical expertise or state of the best technology. Sound science is simply not enough to address all policy issues, technology users’ needs, and public concern. Innovation in this case is largely people-based, focused on new ways to communicate and new opportunities to deliver a message of safe and effective radioactive waste management. The openness and transparency of the process is essential to maintain stakeholder acceptance over the time frames necessary to complete the entire process of siting, licensing, constructing, and operating a facility.

Building trust and confidence with policy-makers takes a deliberate effort and patience. Communication, aimed at the audience’s background and experience, is not always a simple task. Policy-makers are

largely overwhelmed by the depth and detail that they are bombarded with related to any radioactive material issue. The learning curve is intimidating for their staff and ultimately themselves. Timing and opportunity are critical, highlighting which alternatives are ripe for likely acceptance and when they should be pursued. Effecting public policy can begin at home, first by taking the message of safe and effective radioactive waste management to your peer group, to any local organization that will listen, and to teachers and to schools. Encouraging and empowering the people that work for you and with you in the delivery of that message allows for momentum.

A remaining communication hurdle that has not yet been addressed is that low-level radioactive waste is defined in law and rule by what it is not. The classification of radioactive waste in the United States by its generating origin, rather than equivalent radioactive hazard, is a source of ongoing confusion. Radioactive waste must be managed and disposed to minimize risk to people and the environment. Getting over the hurdle of “classification confusion,” which can be fueled by those with a counter-message, is a necessary step to continue to move radioactive waste management issues forward.

REFERENCES

1. TEXAS LOW-LEVEL RADIOACTIVE WASTE DISPOSAL AUTHORITY, “Application for a License to Construct and Operate a Low-Level Radioactive Waste Disposal Facility,” 1993
2. TEXAS NATURAL RESOURCE CONSERVATION COMMISSION, “An Environmental and Safety Analysis of a Proposed Low-Level Radioactive Waste Disposal Facility near Sierra Blanca, Hudspeth County, Texas,” AS-102, Industrial and Hazardous Waste Division, March 1996
3. ROGERS & ASSOCIATES ENGINEERING BRANCH, URS CORPORATION, “Texas Compact Low-Level Radioactive Waste Generation Trends and Management Alternative Study: Technical Report,” Texas Natural Resource Conservation Commission, August 2000
4. TEXAS NATURAL RESOURCE CONSERVATION COMMISSION, “Legal Considerations Related to Low-Level Radioactive Waste Management Techniques in Texas,” P.A. Hershey and A. Medina, Environmental Law Division, Office of Legal Services, August 2000
5. HOWELL, D., Letter of September 17, 2004, from David Howell, Manager, Permits Administration Review Section, Registration, Review and Reporting Division, Texas Commission on Environmental Quality, to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
6. HOWELL, D., Letter of November 17, 2004, from David Howell, Manager, Permits Administration Review Section, Registration, Review and Reporting Division, Texas Commission on Environmental Quality, to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
7. HOWELL, D., Letter of January 14, 2005, from David Howell, Manager, Permits Administration Review Section, Registration, Review and Reporting Division, Texas Commission on Environmental Quality, to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
8. NELSON, D., Letter of February 18, 2005, from Donald Nelson, Team Leader, Permits Administration Review Section, Registration, Review and Reporting Division, Texas

- Commission on Environmental Quality, to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
9. WHEATLEY, W., Letter of July 20, 2005, from Wade Wheatley, Director, Waste Permits Division, Texas Commission on Environmental Quality to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
 10. WHEATLEY, W., Letter of September 16, 2005, from Wade Wheatley, Director, Waste Permits Division, Texas Commission on Environmental Quality to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
 11. HARDEE, J., Letter of January 30, 2006, from Jacqueline Hardee, Director, Waste Permits Division, Texas Commission on Environmental Quality to Dean Kunihiro, Senior Vice President, Waste Control Specialists, LLC.
 12. EDEN, D., Letter of June 5, 2006, from Dan Eden, Deputy Director, Office of Permitting, Remediation and Registration, Texas Commission on Environmental Quality to Rodney Baltzer, President, Waste Control Specialists, LLC.
 13. HARDEE, J., Letter of June 30, 2006, from Jacqueline Hardee, Director, Waste Permits Division, Texas Commission on Environmental Quality to Rodney Baltzer, President, Waste Control Specialists, LLC.
 14. BALTZER, R., Letter of August 8, 2006 from Rodney Baltzer, President, Waste Control Specialists, LLC to Glenn Shankle, Executive Director, Texas Commission on Environmental Quality.
 15. U.S. NUCLEAR REGULATORY COMMISSION, "Regulatory Guide 4.18: Standard Format and Content of Environmental Reports for Near-Surface Disposal of Radioactive Waste," Office of Nuclear Regulatory Research, Washington, D.C, June 1983
 16. U.S. NUCLEAR REGULATORY COMMISSION, "NUREG-1300, Environmental Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility: Environmental Report," Office of Nuclear Material Safety and Safeguards, Washington, D.C., April 1987
 17. U.S. NUCLEAR REGULATORY COMMISSION, "NUREG-1199. Revision 2, Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility," Office of Nuclear Material Safety and Safeguards, Washington, D.C., January 1991
 18. U.S. NUCLEAR REGULATORY COMMISSION, "NUREG-1200. Revision 3, Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility," Office of Nuclear Material Safety and Safeguards, Washington, D.C., April 1994
 19. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, "Draft Environmental and Safety Analysis of a Proposed Low-Level Radioactive Waste Disposal Facility in Andrews County, Texas," Radioactive Materials Division, August 2008
 20. U.S. NUCLEAR REGULATORY COMMISSION, "SECY-08-0147: Response to Commission Order CLI-05-20 Regarding Depleted Uranium," October 7, 2008