

**RECENT WCS RADIOACTIVE WASTE DISPOSAL INITIATIVES IN TEXAS
OFFERING POTENTIAL SOLUTIONS TO LONG-STANDING NATIONAL NEEDS**

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ABSTRACT

Waste Control Specialist LLC (WCS) has safely operated a hazardous, toxic, and radioactive waste treatment, storage, and disposal (TSD) facility in Andrews County in the State of Texas (Texas) since 1997 (Figure 1). In 2004, WCS applied for the following two licenses to safely receive and dispose of:

1. 11e.(2) byproduct material.
2. Class A, B, and C low-level radioactive waste (LLW).

There are compelling reasons for WCS's decision to pursue the aforementioned expansion of current waste-management services. Among them are:

1. Operational experience and excellent safety record.
2. Suitable climatic and natural site conditions for long-term containment and isolation of hazardous, toxic, and radioactive constituents.
3. Strong community
4. National need for these new/additional disposal options/services.

The Texas Department of State Health Services (DSHS) is presently reviewing the WCS's 11e.(2) byproduct material disposal license application (the 11e.(2) LA). A favorable DSHS licensing decision is expected by December 2005. The Texas Commission on Environmental Quality (TCEQ) is presently reviewing the WCS LLW-disposal license application (LLW LA). A favorable TCEQ licensing decision is expected by December 2007. WCS plans to commence disposal operations no later than six months after license approval.

Current Capabilities, Services and Activities



- 1 Access road to fenced site with guarded entrance and security building
- 2 Administration buildings with analytical laboratory
- 3 Administration building with radiological laboratory
- 4 Rail spur to site and on-site rail-unloading facility
- 5 Container storage building
- 6 Bulk/Bin storage area (nine licensed storage pads; one is covered)
- 7 Waste treatment building
- 8 RCRA Part B landfill (is being expanded to the East [E])
- 9 General area for the pending 11e.(2)-byproduct-disposal cell
- 10 General area for the pending federal LLW-disposal cell
- 11 General area for the pending Texas-Compact LLW-disposal cell

Fig. 1. Aerial view of a portion of the WCS TSD site in Andrews County, Texas.

WCS has required authorizations, licenses, and permits required to (a) treat and store mixed LLW (MLLW), and to store sealed sources and Greater Than Class C (GTCC) LLW meeting applicable curie (Ci)-concentration and -possession limits in the WCS license (Table I). The WCS site currently serves as an inclement-weather “safe haven” and staging solution for transuranic radioactive waste (TRUW) shipments destined for the near-by Waste Isolation Pilot Plant (WIPP) site located in New Mexico.

Table I. Radioactive Material Possession Limits

	Activity Limits (the total amount of Ci allowed on site at any given time)	Examples
Category I	35,000	<i>Plutonium (Pu), Americium, Radium (Ra), Curium</i>
Category II	20,000	<i>Hafnium-175, Radon-222, Strontium-90</i>
Category III	200,000	<i>Cobalt-60, Cesium-137, Radium-224</i>
Category IV	2,000,000	<i>Radon-220, Cesium-135, Silver-105</i>
Sealed Sources	150,000	
	Concentration Limits (the sum of the fractions applies to mixtures of isotopes)	
Special Nuclear Material (SNM)	U-235 (<10% enriched) = 2.1E+03 pCi/g [9.9E-04 g SNM/waste g] U-235 (>10% enriched) 1.3E+03 pCi/g [6.2E-04 g SNM/waste g] Pu-239 1.7E+07 pCi/g [2.8E-04 g SNM/waste g] Pu-241 2.3E+10 pCi/g [2.2E-04 g SNM/waste g]	

The WCS site has a Class III radioactive waste storage and treatment license from the TDH that allows for possession of hundreds of thousands of Ci of various radionuclides for the term of the license. The WCS facility/site also has an exemption from the NRC to receive/store special nuclear material (SNM) without regard to a gram limit. WCS uses a concentration limit that allows receipt and storage of most of the TRU waste presently generated and/or stored by the United States Department of Energy (USDOE).

The WCS facility also has a RCRA permit that initially was issued by the Texas Natural Resource Conservation Commission (TNRCC), which has renamed TCEQ, and a TSCA authorization from the EPA. Furthermore, the WCS facility is the only RCRA disposal facility in the country to have been permitted after the “Land Disposal Restrictions” (LDR) regulations were adopted, providing additional liability protection.

The NRC has adopted a policy that allows licensed facilities to dispose of “unimportant quantities” of source material at the WCS facility without further approval from the NRC and the need to manifest the material as LLW. Hence, WCS can receive and dispose of the following LLW that are classified as exempt from licensing under Texas regulations (see also Table I):

Safety, quality assurance (QA), and quality control (QC) are fundamental components of the WCS operations. To ensure that the WCS operations meet all applicable authorizations, licenses, and permits, and the customer’s requirements, in addition to WCS’s regular QA/QC procedures

and audits, site and process audits have also been completed by the USDOE for the Broad Spectrum Contract, several major USDOE contractors, and numerous major private companies.

Additional, periodically updated, information on the WCS organization, current and planned activities as well as existing and pending authorizations, permits, licenses, and their amendments is available on the WCS web page (www.wcstexas.com).

License Applications

On June 21, 2004, using the existing regulatory framework, WCS submitted an application to the DSHS for land disposal of 11e.(2) byproduct material in a dedicated, specially-designed, near-surface landfill at the Andrews County site (Figure 2). In addition, on August 04, 2004, WCS submitted a license application to the TCEQ to dispose of Class A, B, and C LLW in two other dedicated, specially designed, near-surface landfills at the Andrews County site; one for federal LLW and the other for Texas-Compact LLW (Figure 4).

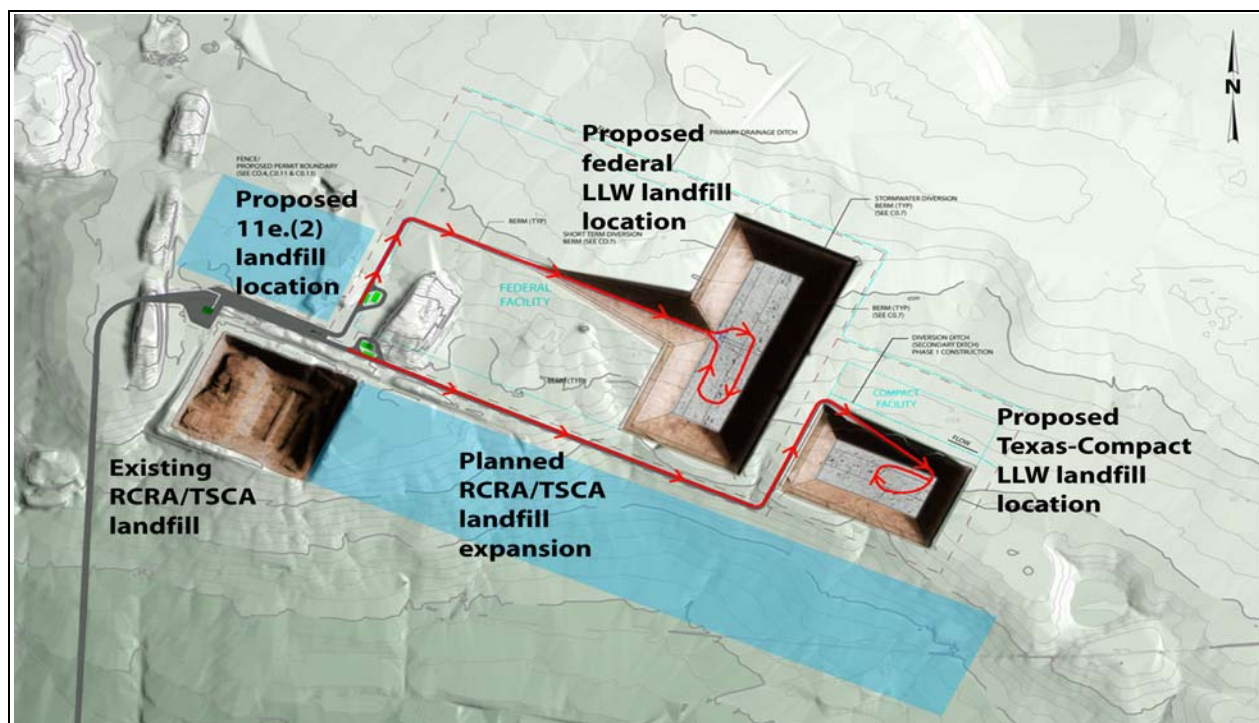


Fig. 2. Schematic illustration of existing and planned disposal facilities/landfills at the WCS Andrews County site.

Since Texas is an Agreement State with both the U.S. Nuclear Regulatory Commission (NRC) and the EPA, the regulatory authority for the hazardous, toxic, and radioactive waste management activities conducted by WCS at the Andrews County site essentially rests with Texas agencies. In 2003, WCS decided to pursue 11e.(2) byproduct material and Class A-C LLW disposal licenses. The framework and expected process for these LAs are described below followed by a concise summary of the main characteristics at the WCS Andrews County site that, in addition to the benefit of an organization with more than six years of experience in safe

waste hazardous, toxic, and radioactive waste management, support these LAs.

The LLW LA was submitted on August 4, 2004, in response House Bill 1567 (HB 1567), passed by the 78th Texas State Legislature on May 2003. The bill designated TCEQ as the lead agency to issue one license to a private company for the purpose of developing and operating near-surface LLW disposal facilities in Texas to accommodate disposal of LLW from the Texas-Vermont Compact and Federal Facilities. It also included special criteria for selecting only one applicant in the event multiple applications were submitted and, even though WCS was the only applicant, the TCEQ decided to perform an evaluation against these selection criteria.

HB 1567 also established a schedule for the processing of the applications. The following summarizes the major HB 1567 licensing milestones and their respective duration:

- Selection of Applicant - no later than 270 days after the August 6, 2004 due date for the LLW LA;
- Administrative Completeness Review - no more than 225 days;
- Technical Review – no more than 450 days;
- Administrative hearing – no more than 365 days; and
- Based on the above milestones, the TCEQ's ruling on the LA is due by December 2007.

In addition, HB 1567 also states that (a) the construction of infrastructures and facilities, and the training of personnel required to safely operate the LLW landfill shall be completed within a 2-year period; and (b) commencement of full-scale operations is expected by December 2009. However, since the WCS organization/staff is already familiar with the construction and safe/compliant operation of a landfill containing radioactive materials, the WCS expects to be able to commence the LLW-disposal operations within six months after receiving the LLW disposal license.

site Characteristics Supporting the Recent License Applications

The following factors are key characteristics supporting both LAs:

1. The local climate is arid with the annual average evapotranspiration rate greatly exceeding both the annual precipitation rate and the local infiltration rate. Indeed, the average annual precipitation is approximately half of the 50 centimeter-per-year (cm/y) (20 inches-per-year [in./y]) maximum precipitation criterion defined in HB 1567. Actually, the evaporation rate at the WCS site exceeds rainfall by a factor of four.
2. The prevailing geological setting provides very-high waste containment and isolation. Two particularly beneficial geological characteristics are:
 - a. the seismically quiescent region; and
 - b. the prevailing ground conditions (see item 3).
 - c. The safety embodied in the conservative designs of the 11.e.(2) and the federal and Texas-Compact landfill designs. All disposal units/cells are situated more than 30 feet below the ground surface in the uppermost portion of a laterally extensive, 245-305 meters [m] thick (800-1,000 feet [ft] thick), virtually impermeable formation, also referred to as the Red Bed, comprised of virtually impermeable red clay and discontinuous sandstone lenses. The disposal units are designed to take advantage of the

site geology by embedding the waste entirely within the virtually impermeable clay medium and to provide intrusion, erosion and water migration protection by covering the waste with a more than 30-foot-thick thick, layered cap/cover. Indeed, the performance assessment calculations conclusively demonstrate the suitability of the proposed site and design features to safely contain and isolate the wastes from the environment and from human exposure until they are rendered harmless.

3. The very high local public and political acceptance and support in Andrews County and in neighboring counties in both Texas and New Mexico. As evidenced across the USA during the past 20 years, characteristic 4 is particularly important to both ongoing and planned operations involving radioactive materials. Indeed, the search for economical solutions to the safe disposition of radioactive materials is a highly contested activity around the world. Two global major challenges facing the development of any new radioactive waste management facility/operation are:
 - a. Opposition to and rejection of any development or solution associated with nuclear materials; and
 - b. Political ambitions and agendas.

The result is that a broad range of different radioactive materials continue to be stored in surface- and near-surface structures highly susceptible to natural and human forces and threats pending the development of robust disposal solutions. No LLW Compact disposal facility has been licensed or opened in the USA since passage of the LLW Policy Act in 1980 despite serious efforts in many states, including waste-rich and resourceful states such as California, Texas, and New York.

Furthermore, the nation's two privately operated as well as the government-operated LLW-disposal sites are encumbered by political, operational, and regulatory restrictions and challenges that either limit or compromise their ability to meet current and future national needs. This latter condition becomes even more perilous due to the fact that each of the privately operated sites currently dispose of 99 percent (%) of the nation's commercially/privately-generated Class A LLW and Class B and C LLW, respectively.[1] Furthermore, the site currently receiving the Class B and C LLW is mandated by a state law to close its doors to all states located outside the Atlantic Compact in mid 2008, which lead the General Accounting Office (GAO) to report in June 2004 that "If disposal conditions do not change, however, most states will not have a place to dispose of their Class B and C wastes after 2008".[1]

CONCLUSION

In conclusion, there is a national need for safe disposal of both commercially/privately- and federally-generated LLW. WCS is confident that the prevailing characteristics of and conditions at the WCS site, i.e., its sparsely populated, remote location, geology, arid climate, and local community and residential support, augmented by the design features of the proposed disposal units, exceed the requirements defined in HB 1567 and the related TCEQ regulations. Indeed, the merits of the WCS' applications will be scrutinized by two different State agencies. Their findings should alleviate any public and political concerns related to the ability of the WCS site

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to safely contain and isolate the disposed wastes until they are rendered harmless to man and the environment.

REFERENCES

General Accounting Office, 2004, “LOW-LEVEL RADIOACTIVE WASTE – Disposal Availability Adequate in the Short Term, but Oversight Needed to Identify Any Future Shortfalls”, (GAO-04-604) (June 2004)