

About LLW Forum

LLW Forum, established to facilitate state and compact implementation of the Low-Level Radioactive Waste Policy Amendments Act of 1985, promotes the objectives of the low-level radioactive waste regional compacts. LLWF provides opportunity for state and compact officials to share information with each other and to exchange views with officials of federal agencies and other interested parties.

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Acronyms Used in **LLW notes**

CFR	◆ Code of Federal Regulations
CRCPD	◆ Conference of Radiation Control Program Directors
DOE	◆ US Department of Energy
DOT	◆ US Department of Transportation
EPA	◆ US Environmental Protection Agency
IAEA	◆ International Atomic Energy Agency
ICRP	◆ International Commission on Radiation Protection
LLWF	◆ Low-Level Waste Forum
NARM	◆ Naturally occurring and accelerator produced radioactive material
NCRP	◆ National Council on Radiation Protection and Measurements
NORM	◆ Naturally occurring radioactive material
NRC	◆ US Nuclear Regulatory Commission
OAS	◆ Organization of Agreement States
TENORM	◆ Technologically enhanced naturally occurring radioactive material

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Officers

Joe Klinger, Chair
Kristen Schwab, Chair-Elect
Earl Fordham, Past-Chair
Alyse Peterson, Treasurer

Forum Corner


 LLW
FORUM

LLW Forum Meeting Dates

Board Meeting – May 11, 2022

LLW Forum Fall Meeting
October 12-13, 2022, Baltimore, MD

DSWG October 14, 2022 (AM)

Forum Focus

The April 7th meeting considered the Spring Meeting activities, noting that after surveys are received more will be discussed at future meetings. Some issues include becoming less dependent on hotel AV due to extreme costs, considering guidelines for presentations, and process for selection of topics of interest.

Leonard Slosky provided a “Safety Moment” recollection. He described an accident in Colorado in 1984, involving a Navy shipment of torpedos and the importance of not deviating from a Hazmat intended route.

Mission & Operations Committee

Membership Categories are being reviewed with the Executive Board and more information will be provided next month.

Focus on Financials

Financials are in good standing and a small discrepancy on DSWG billings/receipts is being resolved.

LLWF's Disused Sources Working Group (DSWG)

As presented at the Spring Meeting by
Michael Klebe

Contributing Factors to Problem of Disused Radioactive Sealed Sources

- Life-cycle costs for managing and disposing of sources not internalized
- Inconsistent view of which sources pose a security threat
- Regulatory system inadequacies for a post-9/11 threat environment
- No financial incentive for reuse, recycle, or disposal
- Opportunities for recycling and reusing sources underutilized
- Type B shipping container availability and cost

Improvements Regarding Casks

Optimus L - Certificate of Compliance issued December 2021 with two each to be constructed and delivered in June 2022 and in December 2022 and more thereafter in 2023 and 2024

Optimus H - Certificate of Compliance anticipated in December 2022

Obstacles for Sealed Source Disposal

Lack of an incentive for licensees to dispose of unused sources

- Not a priority for regulatory programs
- Possible options:
 - Possession limit (two-year)
 - Possession fee (annual source fee)
- Management awareness - Use of the inspection entrance and exit interview process

Discussion continued in DSWG meeting following the Spring Meeting.

LLW FORUM'S SPRING MEETING, MARCH 6 -7, 2022, SAN ANTONIO, TEXAS

NRC: Low-Level Waste and Decommissioning
 Stephen Koenick, Chief, NRC Low-Level Waste and Projects Branch

Low-Level Waste

Part 61 and GTCC/TRU Rulemakings

Commission Direction on SECY-20-0098 - Pathforward for GTCC rulemaking has been issued. See the following page for details.

VLLW Developments

VLLW Scoping Study (SECY-21-0057)

Issued on June 1, 2021

NRC plans to continue with the current regulatory framework and will continue to evaluate potential enhancements within the existing VLLW regulatory framework.

Alternative Disposal Requests (ADRs) Guidance

NRC completed ADRs for Columbia Generating Station (onsite disposal) on March 11, 2022; Columbia Fuel Fabrication Facility (disposal at US Ecology Idaho) on March 18 2022; and is reviewing South Texas Project (landfill disposal).

Radiation Source Protection and Security Task Force

Chaired by NRC, 14 Federal Agencies and one State organization evaluate and provide recommendations related to security of radioactive sources in the U.S. The Task Force is currently preparing the 2022 report to the President and Congress.

Decommissioning

Seeking Public Comment on a Proposed Rule for Decommissioning Nuclear Facilities

- Would implement specific regulatory requirements for different phases of the decommissioning process consistent with the reduced radiological risk. Topics include:
 - Emergency preparedness
 - Decommissioning funding assurance
 - Environmental considerations
 - Spent fuel management planning
 - Record retention requirements
 - Published March 3, 2022 (87 FR 12254)
 - Four draft regulatory guides available for comment in parallel with the proposed rule
- Comment period is open until May 17, 2022. Comments can be submitted at <https://www.regulations.gov/> by searching for Docket IDNRC-2015-0070.

Improving Decommissioning Process – Guidance

NUREG-1757, “Consolidated Decommissioning Guidance”

- Volume 1, Rev. 3, “Decommissioning Process for Materials Licensees” (to be issued as draft for public comment)
- Volume 2, Rev. 2, “Characterization, Survey, and Determination of Radiological Criteria” (to be finalized summer 2022)

NUREG-1575, Rev. 2, “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)” (to be finalized)

Highlights of the Forum presentations are presented in this issue. For complete information, the LLW Forum Spring on-line booklet is available using this [link](#). It includes the agenda and presentations.

NRC: Low-Level Waste and Decommissioning
continued

April 5, 2022 Announcement

**STAFF REQUIREMENTS – SECY-20-0098 – PATH FORWARD
AND RECOMMENDATIONS FOR CERTAIN LOW-LEVEL RADIOACTIVE
WASTE DISPOSAL RULEMAKINGS**

The Commission has approved the staff's recommended Option 1, to issue a new proposed rule that consolidates and integrates criteria for licensing the disposal of greater-than-Class C (GTCC) waste and Title 10 of the Code of Federal Regulations (10 C.F.R.) Part 61, "Low-Level Radioactive Waste Disposal," rulemaking activities, and provides for Agreement State licensing of those GTCC waste streams that meet the regulatory requirements for near-surface disposal and do not present a hazard such that the NRC should retain disposal authority.

Additionally, for GTCC waste streams containing strategic special nuclear material, the Commission has approved the staff's recommendation to explore regulatory approaches that would allow for a single regulator for an Agreement State licensee disposing of GTCC waste in a land disposal facility, including potential amendment to 10 C.F.R. §§ 150.14 and 150.15.

The staff should take another look at the technical basis for the performance objectives in Part 61 and ensure that the compliance period is based on scientific data. Rather than using the same compliance period for disposal sites containing significant amounts of depleted uranium, GTCC, or transuranic waste, the staff should consider a site-specific, graded approach based on when the peak dose is projected to occur or establish a longer compliance period for disposal sites containing significant quantities of mobile, long-lived radionuclides.

If during its development of the new proposed rule the staff determines that provisions in the final rule provided to the Commission in SECY-16-0106 are protective of public health and safety, including for long-lived radionuclides, the staff should propose those provisions to the Commission.

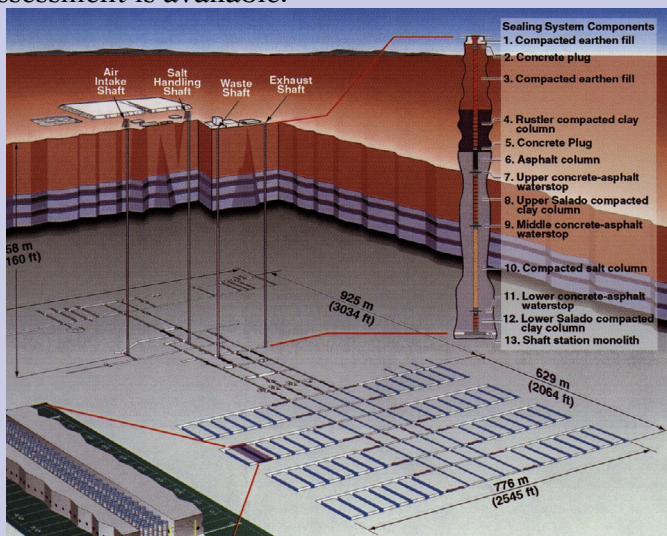
From: Brooke P. Clark, Secretary

EPA Updates

Dan Schultheisz, EPA Office of Radiation and Indoor Air

Waste Isolation Pilot Plant (WIPP) Recertification

WIPP, a geologic repository near Carlsbad New Mexico, located in bedded salt, disposes transuranic (TRU) radioactive waste from the manufacture of atomic weapons and from DOE defense clean-up. EPA performs oversight for the radioactive portion of waste. Recertification every five years includes a performance assessment (PA) probabilistic model that calculates potential repository releases. Recertification decision is expected in April 2022 (to be published in the *Federal Register*). A new technical publication providing a basic overview of various geochemical concepts incorporated in WIPP performance assessment is available.



Multi-Agency Radiation Site Survey and Investigation Manual (MARSSIM)

MARSSIM provides a federal consensus approach for conducting radiation surveys.

EPA Science Advisory Board revision review was initiated in late 2020, with the final report anticipated April 2022.

Federal Guidance

EPA advises the President with respect to radiation matters, directly or indirectly, affecting health, including guidance for all Federal agencies in the formulation of radiation standards. The most recent report was FGR 15, which updated and expanded *Report No. 12, External Exposure to Radionuclides in Air, Water and Soil* (2019). FGR 16 will provide updated cancer risk coefficients for ingestion, inhalation, and external exposure for more than 1000 radionuclides. EPA anticipates submitting the draft report for peer review this year.

Phosphogypsum (TENORM)

Phosphogypsum regulated under the Clean Air Act (40 CFR part 61, subpart R)

- Managed in stacks, limited agriculture and research uses approved by rule
 - Process for requesting approval of other uses (risk assessment required)
- Continuing interest in alternate uses of phosphogypsum and other TENORM materials
- Growing emphasis on “circular economy” to reuse, recycle, repurpose presents challenges
 - Research on extracting rare earths and other critical minerals from PG, red muds
 - White Mesa uranium mill has established a circuit to produce mixed rare earth concentrate
 - NORM X conference theme: “Residues Applied in a Circular Economy” (May 2022)

Continuing Work on Radioactivity Associated with the Oil and Gas Sector

- Management of large liquid and other waste streams
- Worker exposure hazards
- What are radon emissions from wellhead and flaring?

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DOE/EM Waste Management Update

Doug Tonkay, Acting Deputy Assistant Secretary for Waste and Materials Management

High Level Waste (HLW) Interpretation

Issued *Federal Register* Notice, December 21, 2021, affirming its HLW interpretation.

Greater than Class C Low-Level Radioactive Waste Disposal

DOE continues to monitor NRC developments on the path forward for 10 CFR Part 61 Licensing Requirements for Land Disposal of Radioactive Waste.

National TRU Program Priorities**Waste Isolation Pilot Plant (WIPP) Priorities**

Activities continue in worker safety, mine capacity and waste enhancements, and infrastructure upgrade.

Depleted Uranium Oxide

- Focus on disposal at commercial sites (WCS and EnergySolutions, when licensed)
- Pilot shipment to WCS in September 2020
- Dependent on FY22 budget - additional \$5M

Low-Level Radioactive Waste Federal Review Group

FY 2021/2022 reviews are ongoing/planned at LANL, Hanford and SRS.

2021 Packaging and Transportation Highlights

- More than 4000 hazardous materials shipments
- Trained 1031 first responders in 67 Transportation Emergency Preparedness Program courses
- Completed 57 Packaging Certification Program docket

MIMS Data for 2021

Currently available at <https://mims.doe.gov/>

Department of Defense (DOD)

Mike Kurth, HQ Joint Munitions Command, Rock Island Arsenal, Rock Island, IL

Safe, compliant, and cost-effective disposition of LLRW and mixed waste for DOD and other Federal agencies

DOD LLRW Lead Agent

Program services all military property or assets containing source, special nuclear, or byproduct material that is acceptable for disposal in a land disposal facility, in accordance with the USNRC Regulations.

The program also includes:

- Mixed waste (hazardous and radioactive)
- Naturally occurring radioactive material waste (NORM)
- Naturally occurring and accelerator-produced radioactive material waste (NARM)

Support to DOD – Army, Navy/Marine Corps, Air Force, Army Corps of Engineers, Defense Logistics Agency, Defense Health Agency

Unique, Worldwide Response Team for Combat/Noncombat Low-Level Radioactive Materials Incidents

- Approximately 500 U.S. military bases
- States with the most bases are California, Texas, Florida, and Virginia
- Numerous U.S. military overseas locations
- Military radioactive commodities - 1000's of military radioactive items
- Regulatory licenses: Army – 60 NRC licenses, Air Force and Navy – Master Material Licenses
- State of Washington – over 200 permits renewed annually

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*Disposal Site Updates***Waste Control Specialists**

David Carlson, President and COO

Safe Disposal of Radioactive Waste

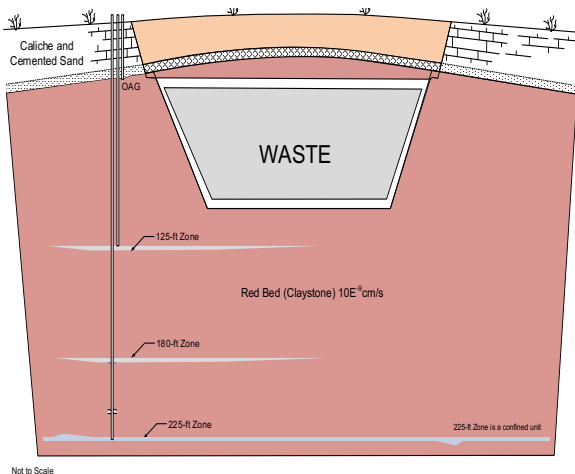
- Class A/B/C and Mixed Low-Level Radioactive Waste (LLRW)
- NORM and Byproduct material

Disposal for:

- Nuclear Power Plants
- Industrial Customers
- US Government (DOE, DOD, etc.)
- Hospitals and Research Laboratories

Key Attributes of WCS site:

- Sub-Grade Design
- Natural Claystone Barrier
- No viable pathway to groundwater
- WCS Performance Assessment examines site geology, surface water and groundwater, future weather changes, residential and intrusion scenarios, and future land uses
- Facility meets Texas regulatory requirement for protection for one million years

**TX Compact Waste Facility (CWF)
Opened in April 2012**

- 9,000,000 cubic feet of licensed volume
- 475,000 cubic feet currently constructed (1st phase)
- 236,873 cubic feet used to date (2.6% of licensed capacity)
- Texas owns the privately developed Texas Compact Landfill
- License Term – through September 2024 with provision for 10-year renewals thereafter

**Federal Waste Disposal Facility
Opened in June 2013**

- 26,000,000 cubic feet of licensed volume
- 2,640,000 cubic feet currently constructed (1st phase)
- 455,500 cubic feet used to date (1.8% of licensed capacity)
- Also permitted for “mixed waste” (radioactive and hazardous)
- DOE Agreement to take ownership after closure
- License Term – through September 2024 with provision for 10-year renewals thereafter

EnergySolutionsVern Rogers, Director
of Licensing and Permitting

Company ownership has changed to TriArtisan Capital Advisors with TriArtisan making a substantial additional investment in the company to become the majority owner.

EnergySolutions has a fundamental focus on industrial and radiological safety, having received numerous Utah and national awards for safety achievement. Between 2011 and 2021, over 6.8 million hours worked without a lost-time injury.

Disposal Site Updates - EnergySolutions - continued

Clive Enhancements

Correct Licensed Volume

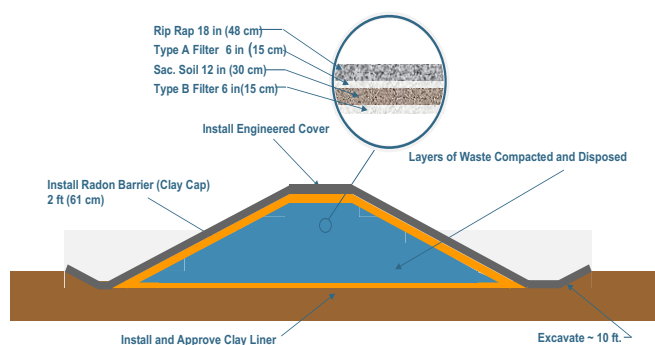
License Amendment No. 26

Class A West engineering design for 8,724,097 yd³ Class A LLRW waste volume.

Class A West modeled (performance assessment) of 8,724,097 yd³ Class A LLRW waste volume.

Different licensed volume limit unrelated to engineering design or performance assessment modeling results

Stable Embankment Construction



Exempted Waste Cell

Significant volumes of non-impacted/suspect waste generated by D&D projects.

Clive facility has a long history of managing this type of waste.

Waste shipped to Clive must be Class A LLRW - screened to determine if it can be exempted from some of the controls without increasing risk to human health.

Exemption is being evaluated by Utah Division of Waste Management and Radiation Control.

Tracking and reporting to compacts will continue.

Federal Cell (depleted uranium)

Site-specific Performance Assessment

Designation of a Federal Cell Facility

Perpetual Stewardship Agreement with DOE

Sealed Source Disposal

2013 Joint effort with CRCPD and State of Utah

License exemptions granted for disposal of Class A sealed sources on a per-source basis.

Received and managed 41,190 sealed sources between 2013 and 2015.

2020 permanent license amendment requested and is under consideration.

Capital Improvements

- East Side Rotary
- Railyard Maintenance and Storage Facility
- Mobile Equipment Fleet Upgrades
- Evaporative Storage Expansion
- Operational Safety Enhancements

Barnwell Operations

The Barnwell Disposal Facility is owned by the state of South Carolina and operated by EnergySolutions. The facility is the host disposal site for the Atlantic Compact which is comprised of South Carolina, New Jersey, and Connecticut.

The Facility began operations in 1971 and has provided continuous disposal operations for over 45 years. The site is licensed to dispose of Class A, B and C low-level wastes, including irradiated hardware and large components, steam generators, resins, and reactor pressure vessels.

> 90% of facility in closed condition, under institutional monitoring

Operational Updates

Large Component Disposal

Campaign 1 – 3 Oconee rotors and 42 diaphragms disposed

Campaign 2 – 3 Oconee rotors and 42 diaphragms disposed

Campaign 3 – 3 Oconee rotors and 42 diaphragms disposed

License 097 Renewal Application (2019)

Ongoing Operational Efficiencies

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Deep Isolation: Innovation in Radioactive Waste Disposal

Betsy Madru, VP Global Affairs and Policy

Deep Isolation offers a solution to disposal of waste by placing corrosion-resistant canisters containing spent fuel into borehole repositories deep underground (far deeper than feasible with a mined repository).

Process Features

- Uses directional drilling technology to drill into suitable host rocks that have remained isolated from the environment for millions of years
- Leverages mature technologies that are widely used in industry and that we have integrated and enhanced with our own patented innovations

Safety Features

Safety in depth: Protection from the long-term effects of climate change and other natural processes; reduced risk of human intrusion.

Reducing conditions: low oxygen environment at depth inhibits canister corrosion and slows release of radionuclides.

Radioactivity trapped safely in deep rock: the inherent properties of many rock formations, coupled with long travel paths to the surface, mean the great majority of radionuclides never get near the biosphere - and peak dose at the surface is orders of magnitude lower than regulatory safe limits.

Future safety guaranteed by past performance: we look for isotopic markers showing that host rocks have been isolated for millions to tens of millions years.

Urenco USA Update

Steve Magill, Site Projects Manager

Located in southeast New Mexico - 1st new nuclear facility in the U.S. in more than 30 years, commencing in 2010, and the only uranium enrichment plant in North America.



Urenco USA Facility

Current Capacity – 4.9 Million SWU
 Capital Investment – \$5 Billion
 Current Employees – 230
 Provides one third of the U.S. demand for enrichment services

Limited Sources of Supply - Advanced Fuels

Russia is currently the sole commercial source. Energy Act of 2020 directed DOE to establish a domestic High-Assay Low Enriched Uranium (HALEU) Availability Program.

Producing Advanced Fuels at UUSA would be the most efficient and lowest cost enrichment option in the U.S. by leveraging existing infrastructure, trained workforce, and Urenco's 50+ years of operating experience.

- U²³⁵ enriched to 5.5% - 10% - Anticipated product availability in 2024
- U²³⁵ enriched from 10% - 20% - Estimated product availability is 6-7 years

Urenco hosts Richie Enrichment Science Workshops each year for elementary schools in Andrews, Eunice, Hobbs, Lovington, and Seminole. This program reaches all 5th grade science students in the local area, more than 20 schools and 2100 students. Each year, more than 150 employee volunteers help host the workshops, which help educate the students about the nuclear process.

LLW FORUM'S SPRING MEETING, MARCH 6 -7, 2022, SAN ANTONIO, TEXAS

*Texas/Vermont Compact
Interactive Session on Management
Rule, Current Activities, and
Getting Waste to WCS*

Speakers:

Dan Shrum, Discussion Leader
Brandon Hurley, Compact Chair
Stephen Raines, Compact Executive Director
Linda Morris, Compact Commissioner
John Salsman, Compact Vice Chair
**Ashley Forbes, TCEQ Deputy Division
Director**

Speakers discussed:

- approval procedures for importing waste into Texas, including TCEQ's role, and approval procedures for exporting waste
- the activities and committees
- an update on rule revisions being undertaken

Introduction

The interactive panel will discuss the means through which the Texas/Vermont Compact accepts imports from other states along with an additional review and certification by TCEQ.

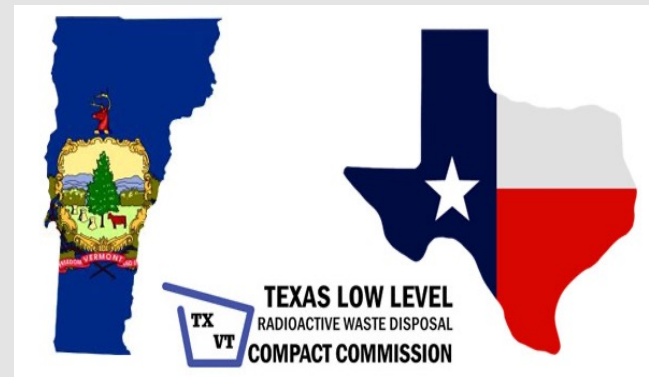
An update on draft rules for informal comments and other activities will be mentioned.

Brandon Hurley

Import Approval Procedures

Use the online import application, complete a public comment period of 35 days, complete a TCEQ process to certify in good standing status, pass a review by the Technical Committee for correctness, receive approval from the Compact Commission vote, and accept the agreement stipulations. Other processes may apply for large volumes.

Stephen Raines

**Technical Committee**

Import application review includes:

- general information
- broker application - yes/no
- disposal period
- volume, activity, and waste description, including form
- where and from whom the waste is coming
- needed export authorizations/generator authorizations from a compact
- any comments Commission received

Linda Morris and John Salsman

TCEQ's Role

TCEQ performs a technical review of import application and issues a letter of certification that disposal is authorized. Both WCS and the Compact are provided a copy of the certification. See the Waste Generator Disposal Guide on TCEQ's [webpage](#). Also note that rates and contract terms negotiated for nonparty compact waste disposal are subject to review and approval by TCEQ.

Ashley Forbes

Texas/Vermont Compact Interactive Session on Management Rule, Current Activities, and Getting Waste to WCS
continued

Linda Morris and John Salsman

Export Procedures

Technical Committee review includes:

- General information, including activity and volume
- Where material is being sent
- Export period and final disposal location
- Why export is requested
- Any comments Commission received

Committees Activities

Rules Committee

Contributes as new rules or rule revisions occur.

Technical Committee

- Reviews all petitions and makes recommendations to Commission
- Reviews reports and other documents provided to the Commission on a regular basis
- Conducts inquiries into possible violations of rules
- Suggests changes to petition application to provide clarification as needed

Capacity Committee

Finalizing metrics for evaluating current and future capacity at the Compact Waste Facility (CWF) that will provide an "in-house" tool for Commission use.

Management Rule Update

31 Texas Administrative Code §675.24
"Requirement to Report on the Importation of Certain Low-Level Radioactive Waste for the Management or Disposal that is not Required to be Disposed of in the Compact Facility." The current rule became effective on March 28, 2018.

In summary, the rule requires that persons bringing low-level radioactive waste into Texas must sign an agreement to report certain information on a regular basis to the TLLRWDC if that material is not to be disposed of at the CWF.

Current Texas companies with agreements: Two

The rule revision is in committee. Informal comments have been requested with only three received. Updated status will be presented at a future TLLRWDC meeting.

Other conforming rule changes such as definitions and emergency export rules will be sent through as a package; the rules are now in committee.

Technical Position Statement

"Establishing the Generator of Low-Level Radioactive Waste For the Purpose of Determining Party vs. Non-Party Status For the Texas Low-Level Radioactive Waste Disposal Compact"

This document provides guidance to the Commission if there is a question as to who is the generator of the LLRW. It is based on the concept used by the TCEQ in its shipping document TCEQ Form 20225 to determine "original generator" as being the last person to put the material to practical use.

The document is not a rule, and is only one consideration among many when making the generator determination.

LLW FORUM'S SPRING MEETING, MARCH 6 -7, 2022, SAN ANTONIO, TEXAS

Texas Regulatory and Advocacy Activities

Texas Commission on Environmental Quality (TCEQ)

Bobby Janecka, Commissioner

Radioactive Materials Division

TCEQ seeks insightful collaboration on issues in order to design effective regulation and licensing matters.

TCEQ regulates:

- Low-level radioactive waste (LLRW) and byproduct disposal
- Processing and storage of radioactive waste
- Radioactive waste storage and processing
- Uranium recovery operations
- Commercial processing and treatment of radioactive substances
- Non-oil and gas NORM disposal

TCEQ licensed the Texas Compact disposal site, through an evolving licensing and regulatory process. As needs continue to change, efforts will be made to accommodate those needs in responsive methods.

Advocates for Responsible Disposal in Texas (ARDT)

Brian Christian, Environmental Policy Specialist

ARDT was formed in 1994 by LLRW generators to support the Texas Low-Level Radioactive Waste Disposal Authority and the organization has changed trajectory as Texas Legislature made changes to the laws regarding LLW disposal.

ARDT Goals

Goals are to support the State of Texas as it provides for the permanent disposal of LLRW and provide information about LLRW disposal to the public; decision-makers, including state leadership and the Texas Legislature; and local governments.

ARDT Guiding Principles

South Texas Project (STP) and Comanche Peak (CP) and a network of partners collaborate on policy issues, analyze legislative positions and provide educational materials on LLW issues.

Advocacy

During legislative sessions, ARDT serves as a central clearinghouse for generators to:

- Collaborate on policy issues
- Analyze and develop positions on proposed legislation
- Provide support and direction to governmental affairs teams

Texas Legislative Session, January 2023

The Legislature will consider the Sunset Commission Review and Recommendations regarding the Texas/Vermont Compact (TLLRWDC) and the regulatory agency, TCEQ. ARDT will stress the importance of TCEQ and TLLRWDC to disposal of LLW.

Sunset Timeline

- Staff-level reviews are being conducted now through next May.
- Summer/Fall 2022 Sunset Commission Deliberation
- 88th Texas Legislature Convenes January 10, 2023 - "Sunset Bills" filed to address statutory changes
- Agency implementation 2023-2024

LLW FORUM'S SPRING MEETING, MARCH 6 -7, 2022, SAN ANTONIO, TEXAS

Southwest Research Institute
Miriam R. Juckett, Senior Program Manager

Nonprofit Institute

- More than 2,700 employees
- More than 1,500 acres /6.1 km² facility in San Antonio, Texas
- More than 2.3 million ft² / 214,000 m² of laboratories, workshops and offices
- More than 1400 patents
- 50 R&D 100 awards



Innovation

Solving problems and creating value with novel ideas and multidisciplinary collaborations.

Radiation Testing and Off-Site Source Recovery Program

SwRI has a High-Level Radiation-Effects Facility that provides clients with high-intensity gamma radiation for research and testing. This facility consists of two irradiation cells that can be used for studying radiation effects on equipment, animals, plants, and food. With a Specific Radioactive Materials License issued by the Texas Department of State Health Services, SwRI can possess, use, and store Category 1 and 2 cesium and cobalt sealed sources to support the Off-Site Source Recovery Program to remove excess, unwanted, or disused radioactive sealed sources that pose a potential risk to national security, health, and safety.

Radioactive Tracer Capabilities

Used for highly accurate real-time wear measurements for engine components

Recent Work on Low-Level Waste

Dose calculations to support NRC technical basis document on disposal of greater-than-Class C (GTCC) and transuranic (TRU) waste under 10 CFR Part 61

- Acute and chronic doses under intruder and accident scenarios; CNWRA-developed BDOSE™ (ADAMS ML19192A200)
- Offsite groundwater pathway dose; GoldSim® (ADAMS ML19191A019)

Insights into how the radiological properties of various GTCC waste streams and exposure scenario considerations may affect required compliance demonstrations for disposal of GTCC waste streams

Public Outreach and Stakeholder Engagement

Needed because of increased public scrutiny and awareness; strong influence of social media
Concerns often related to “perceived risk”
Need proactive, holistic approach

Public Outreach and Stakeholder Engagement

- Communication planning
- Identification of key stakeholders
- Effective public engagement (meetings, workshops) to collect and distribute meaningful information
- Plain-language materials explaining technical content
- Public comment response
- FAQs and recovery planning

LLW FORUM'S SPRING MEETING, MARCH 6 -7, 2022, SAN ANTONIO, TEXAS

NORM and TENORM

Discussion Panel

- David Allard, Moderator, Appalachian Compact Commission (ACC) Chair
- David Carlson, WCS President and COO
- Leonard Slosky, Rocky Mountain Compact Executive Director
- Vern Rogers, EnergySolutions, Director, Licensing and Permitting
- Dale Patrick, Southwest Compact, State of North Dakota (Ret.)

Panel Discussion Items

Please describe your state or Compacts' approach to regulating the disposal of TENORM waste.

Does your state or Compacts consider TENORM waste to be LLRW?

How does your state or Compact's disposal site categorize TENORM waste for MIMS LLRW reporting and tracking?

Given the ACC's recent reporting problems, should there be specific tracking of TENORM waste when disposed of at licensed LLRW disposal site?



Highlights of the Panel Discussion

Panel discussion focused on how the licensed LLRW sites [e.g., in UT and TX] track and report on this type of waste, also noting how they classify the waste in the DOE's MIMS database. In addition to disposal locations of TENORM and its tracking, other influential factors of TENORM were explored, such as:

- variety of ways TENORM is generated
- issues of landfill disposal including radiation monitoring alarms at landfills
- DOT regulations as they affect TENORM transportation for disposal
- conducting TENORM surveys appropriately
- enforcement actions
- influence of varying background levels of radiation in various locations and states
- the question of who regulates TENORM in a particular state

Pennsylvania

Years	TENORM		LLRW	
	Volume (ft ³)	Activity (Ci)	Volume (ft ³)	Activity (Ci)
2016	38400	0.9123	206649	2229
2017	112032	2.73	383856	1890
2018	66048	1.88	278136	42153
2019	108096	2.86	211271	907
2020	250344	3.50	145545	1213
Total	574,920	12.0	1,225,457	48,392

This table separates waste that is considered TENORM and compares the values to the rest of the waste generated within the Compact. It compares both volume and activity.



Pennsylvania does not directly regulate TENORM through radiation rules, but addresses TENORM through solid waste and oil and gas regulations. PA does not consider TENORM to be LLRW. PA uses the DOE's MIMS data [generators, volume and curies] for generating our annual LLRW Report for our DEP LLRW Advisory Committee and the ACC [PA, DE, MD and WV]. What we discovered last year was that both UT and TX had reported TENORM waste as "LLRW" back several years. That has implications for the ACC. If DE, MD or WV were to generate over a designated percent of our PA volume for a few years, they would be required to start building a LLRW disposal site. Currently TENORM volume from the ACC going to UT and TX exceeds our LLRW volume. Moving forward, we'll be watching the MIMS data very closely and working with the DOE and LLRW disposal sites to ensure this is all tracked and reported appropriately.

David Allard

LLW FORUM'S SPRING MEETING, MARCH 6 -7, 2022, SAN ANTONIO, TEXAS

*NORM and TENORM
Discussion Panel
continued*

Generation of TENORM

- Oil & Gas Well Development and Production 
- Mineral Sands Industry (e.g., zircons) 
- Uranium and Other Mining Operations 
- Water Treatment (residuals) 
- Metal Refining and Recycle Industries 
- Phosphate Production 
- Geothermal Energy 

North Dakota

North Dakota has long been involved with TENORM wastes generated in oil and gas production (filter socks and tank bottom sludges) and uranium mining in the 1950s and 1960s. Appropriate surveys, considering high background radiation levels, and conversions of limits from pCi/g to survey meter readings have required significant employee training. Incidents and enforcement issues have resulted in refining how TENORM is regulated.

North Dakota has adopted TENORM rules (CRCPD SSR Part N with some changes) and regulates General and Specific licensees for TENORM.

Waste disposal locations used are:

- Secure Energy 13 mile Landfill in North Dakota (approval expected in summer 2022)
- US Ecology in Idaho
- Oaks Landfill in Montana
- Clean Harbors in Colorado
- Arlington in Oregon – Oil Field Waste Logistics

Dale Patrick

WCS, Texas

TENORM is not considered LLRW and is regulated by the Railroad Commission of Texas (which regulates the oil and gas industry). Disposal facilities in Texas are:

- Trinity Engineering, Houston
- EcoServe, Winnie
- Lotus, LLC, Andrews
- US Ecology, Robstown
- WCS, Andrews

WCS takes international and U.S. oil and gas wastes. Waste is not recorded in the MIMS database because it is not defined as LLRW.

David Carlson

EnergySolutions, Utah

Thirty years experience with TENORM disposal has revealed two main complications:

- lack of awareness in the industry that there are radiation issues with wastes related to fertilizer, water treatment, oil and gas, and coal ash
 - detection levels considering background and appropriate measurement techniques
- TENORM is reported to the State of Utah, but not reported in the MIMS presently.

Vern Rogers

Rocky Mountain Compact

Rocky Mountain Compact considers TENORM as LLRW. The compact has its own definition of LLRW and issues import and export permits for TENORM. Clean Harbors facility in eastern Colorado disposes of TENORM. The State of Colorado adopted TENORM regulations in November 2021; compliance will start in July 2022.

Leonard Slosky

Appalachian CompactDelaware • Maryland •
Pennsylvania • West Virginia**Meeting**
October 28, 2022

At the annual meeting November 2021, David Allard, CHP, was elected as chair. The compact has reviewed and commented on NRC's proposed decommissioning rule. The compact is lacking several commissioners (agency heads or alternatives). The annual report is coming soon and will be posted on the website.

Atlantic CompactConnecticut •
New Jersey • South Carolina**Meeting**
March 22, 2022
September 2022, details available
in JulyContact: Max Batavia max@atlanticcompact.org**Central Compact**

Arkansas • Kansas • Louisiana • Oklahoma

Kelly Dixon, Chair, reported that there are long-standing vacancies for commissioners and alternates. The commission has discontinued approving exports; exports are allowed by rules as long as other relevant rules are being followed. Record retention policy work is on-going. Noteworthy is that the Oklahoma Legislature proposed a bill to ask the Department of Environmental Quality to study feasibility of nuclear power in Oklahoma. The bill did not pass; however, it is an indicator of options for future energy.

Central Midwest Compact

Illinois • Kentucky

Meeting
Fall 2022, date to be determined

Joe Klinger, Commissioner, noted the compact is a small one, but has large quantities of waste. The compact includes legacy sites, 11 reactors in IL, along with other sites. Lori Beagle serves as support staff. The compact has a website, tracking procedures for wastes, and publishes reports to the legislature that are available to the public as well.

Midwest Compact

Indiana • Iowa • Minnesota • Missouri • Ohio • Wisconsin

Meeting
June 2022, date to be determined

Jim Chiles, ED, reported that the Annual Report is available presently.

Northwest CompactAlaska • Hawaii • Idaho •
Montana • Oregon • Utah • Washington • Wyoming**Meeting**
September -October 2022 timeframe

Earl Fordham, Compact Chair, reported waste volume is stable. Washington sites include operating nuclear power plants and military DOE sites, which fund the compact through permit fees.

State of Utah

Utah Department of Environmental Quality Waste Management & Radiation Control Board will meet at 1:30 pm (MST) on April 14, 2022.

Doug Hansen, Utah's Division of Waste Management and Radiation Control Director, noted

that the program remains busy, will be involved in another legislative session, and is working on radiation grants and licensing actions.

State of Washington

Kristen Schwab, Chair Elect of LLWF, and Washington State Department of Health, reported the program is in final stages of renewing US Ecology radioactive material license and expects to issue the license in a month or two.

Rocky Mountain Compact

Colorado • Nevada • New Mexico

Leonard Slosky, Executive Director, reported that the compact has a new board member, Tracie White, and that operations of the compact are stable. He noted the compact is one of the original compacts, receiving Congressional consent in 1986. Everyday operations include import and export review and approvals.

Southeast Compact

Alabama • Florida • Georgia •
Mississippi • Tennessee • Virginia

Meeting

July 2022, date to be determined

Ted Buckner retired and Tom Hansen has been hired as the new Executive Director. Contact:

Tom Hansen, Jr., PhD, CHP, RRPT Executive Director tom@secompact.org PO Box 31525, Knoxville, TN 37930 Phone: 919/380-7780 secc@secompact.org

Southwestern Compact

Arizona • California • South Dakota • North Dakota

Donna Earley, Chair, announced the retirement of Kathy Davis with great appreciation for what she's

done for compact and for the LLW Forum writing in the announcement: "I want to thank Kathy for her service and guidance to the Commission, both as a Commissioner and Executive Director since the beginning of the SWLLRWCC. Kathy has worked endlessly to make strong connections with other compacts and to make our job as commissioners as easy as possible. We are all truly grateful for her dedication to the work of the Commission." The commission has selected Ron Gaynor to serve as its Executive Director. In announcing the selection, the Commission wrote: "Mr. Gaynor brings over 25 years of experience in the low-level radioactive and hazardous waste industries to the Commission. The Commission looks forward to his vision and leadership, as we move into the future."

Texas Compact

Texas • Vermont

Meetings

May 26, 2022

July 21, 2022

Sunset Review

May 26, the Sunset Staff report will be made public. In June, the Sunset Commission and Compact Commission will meet. A public comment period will run through summer - fall of 2022. Final decisions are expected around October 12, 2022.

Unaffiliated State

New York Unaffiliated State

Alyse Peterson (NY), LLWF Treasurer, reported that NY has four nuclear power plants, Indian Point decommissioning site, and 1400 radioactive material licenses. An annual report of waste volumes is published.

Low-Level Radioactive Waste Disposal Compact Membership

Northwest Compact

- Alaska
- Hawaii
- Idaho
- Montana
- Oregon
- Utah
- Washington
- Wyoming

Midwest Compact

- Indiana
- Iowa
- Minnesota
- Missouri
- Ohio
- Wisconsin

Appalachian Compact

- Delaware
- Maryland
- Pennsylvania
- West Virginia

Rocky Mountain Compact

- Colorado
- Nevada
- New Mexico

Northwest accepts Rocky Mountain waste as agreed between Compacts

Central Midwest Compact

- Illinois
- Kentucky

Atlantic Compact

- Connecticut
- New Jersey
- South Carolina

Southwestern Compact

- Arizona
- California
- South Dakota
- North Dakota

Texas Compact

- Texas
- Vermont

Central Compact

- Arkansas
- Kansas
- Louisiana
- Oklahoma

Southeast Compact

- Alabama
- Florida
- Georgia
- Mississippi
- Tennessee
- Virginia

Unaffiliated States

- District of Columbia
- Maine
- Massachusetts
- Michigan
- Nebraska
- New Hampshire
- New York
- North Carolina
- Puerto Rico
- Rhode Island

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Information Resources

- DOE Public Affairs/Press Office - 202/586-5806
- DOE Distribution Center - 202/586-9642
- EPA (for program information, publications, laws and regulations) www.epa.gov
- EPA Information Resources Center - 202/260-5922
- EPA Listserve Network Contact Lockheed Martin EPA Technical Support at (800) 334-2405 or email (leave subject blank and type help in body of message) listserv@unixmail.rtpnc.epa.gov
- Government Accounting Office (GAO) Document Room - 202/512-6000
- Government Printing Office (to order entire *Federal Register* notices) - 202/ 512-1800
- Legislative Resource Center (to order U.S. House of Representatives documents)- 202/226-5200
- NRC Public Document Room - 202/ 634-3273
- NRC Reference Library (NRC regulations, technical reports, information digests, and regulatory guides) www.nrc.gov
- U.S. Government Printing Office (GPO) (for the Congressional Record, Federal Register, congressional bills and other documents, and access to more than 70 government databases) <http://www.access.gpo.gov>
- U.S. Senate Document Room - 202/224-7860
- Variety of documents through numerous links at LLW Forum, Inc. at www.llwforum.org

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