DOE/EM Waste Management Update

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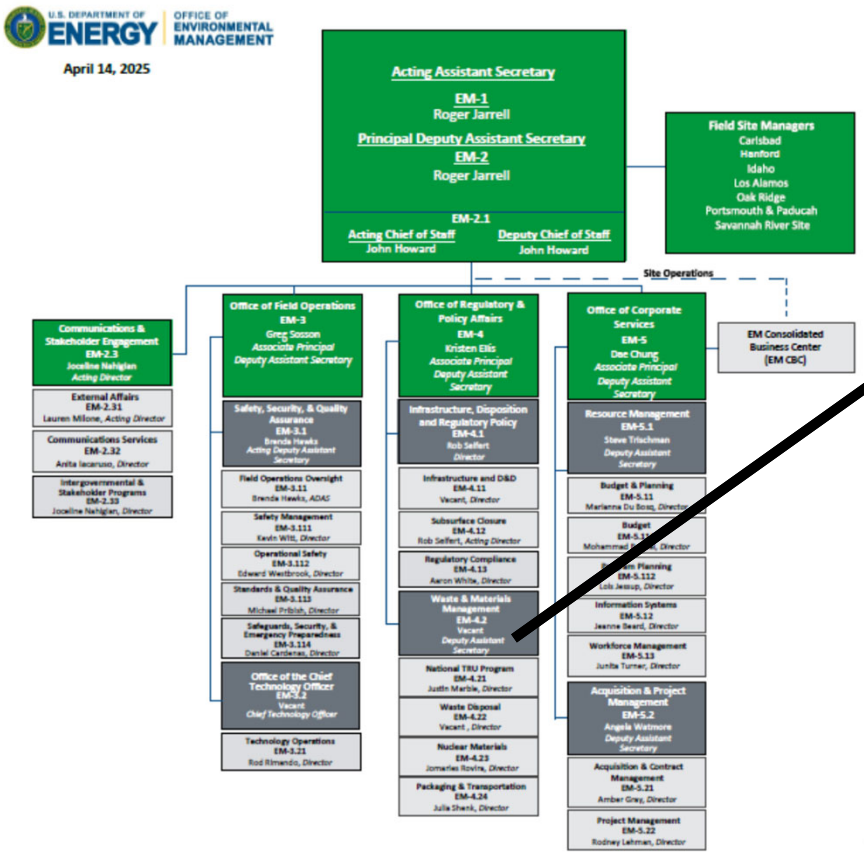
Office of Waste and Material Management

APRIL 2025

EM Organization Chart



Waste & Materials Management
EM-4.2
Vacant
Deputy Assistant Secretary

National TRU Program
EM-4.21
Justin Marble, *Director*

Waste Disposal
EM-4.22
Vacant, *Director*

Nuclear Materials
EM-4.23
Jomaries Rovira, *Director*

Packaging & Transportation
EM-4.24
Julia Shenk, *Director*

EM MISSION

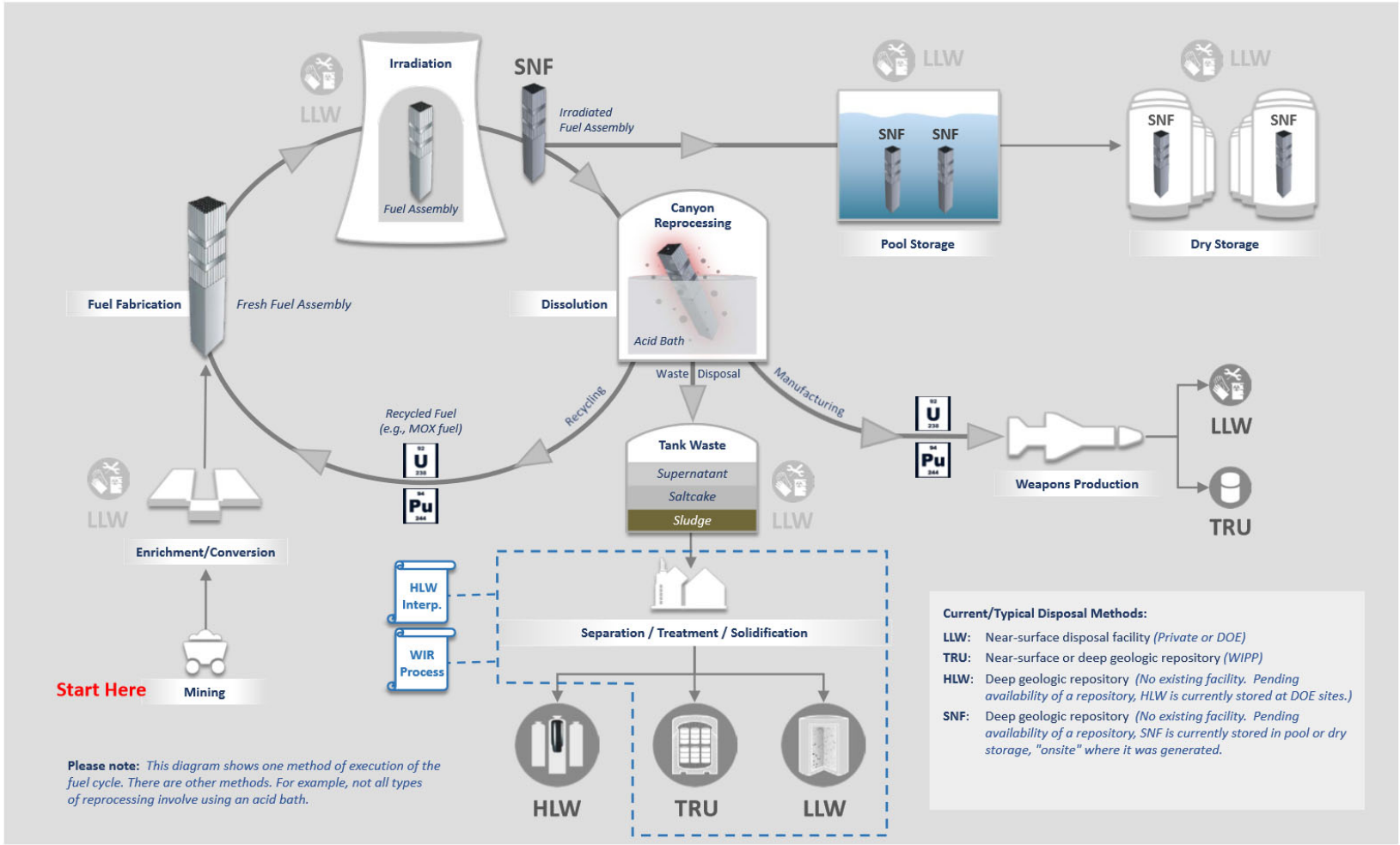
- To complete the safe cleanup of the environmental legacy brought about from decades of nuclear weapons development and government-sponsored nuclear energy research.

- EM's priority is to ensure the safety and health of the public and drive down environmental risks while supporting U.S. jobs, U.S. energy and U.S. security.

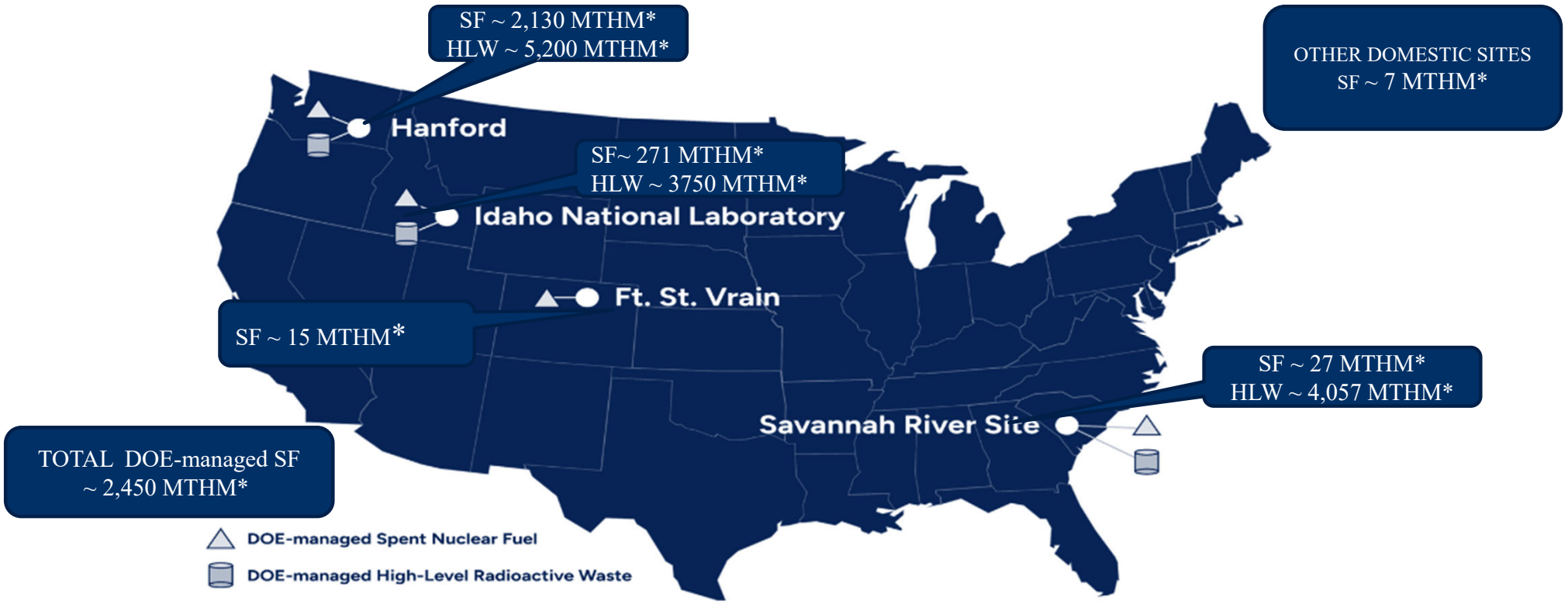
Radioactive Waste

Waste Classification and Definition	Regulatory Responsibilities	Disposition Path
High Level Waste (HLW): (A) highly radioactive waste material resulting from the reprocessing of spent nuclear fuel (SNF), including liquid waste produced directly in reprocessing and any solid materials derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the DOE determines requires permanent isolation.	• DOE for disposal • US Environmental Protection Agency (EPA) disposal standards • US Nuclear Regulatory Commission (NRC) licensing	Geologic repository
Transuranic (TRU) waste: Man made elements above 92, greater than 100 nanocuries (nCi/g) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years.	• DOE for disposal • EPA certification • New Mexico permit	Waste Isolation Pilot Plant (WIPP), DOE owned/operated
Low Level Waste (LLW): Radioactive waste that is ***NOT*****:** HLW, SNF, TRU waste, byproduct material or naturally occurring radioactive material (NORM). **Mixed LLW**: Radioactive waste with a hazardous component regulated under the Resource, Conservation and Recovery Act.	• DOE for disposal of DOE owned LLW • NRC Agreement State for commercial facilities • EPA/State permit if mixed	DOE or commercial near-surface disposal facilities
Greater-than-Class C (GTCC) LLW	• DOE for disposal • NRC regulates disposal	• Disposal path decision TBD • DOE National Environmental Policy Act (NEPA) analyses evaluated disposal at WIPP and land disposal facilities at generic commercial sites • NRC staff to issue a new proposed rule that consolidates and integrates criteria for licensing the disposal GTCC LLW and 10 CFR Part 61, LLW Disposal rulemaking activities

Waste Produced Throughout the Nuclear Fuel Cycle



EM-Managed Spent Fuel (SF) & High Level Waste (HLW) Inventory



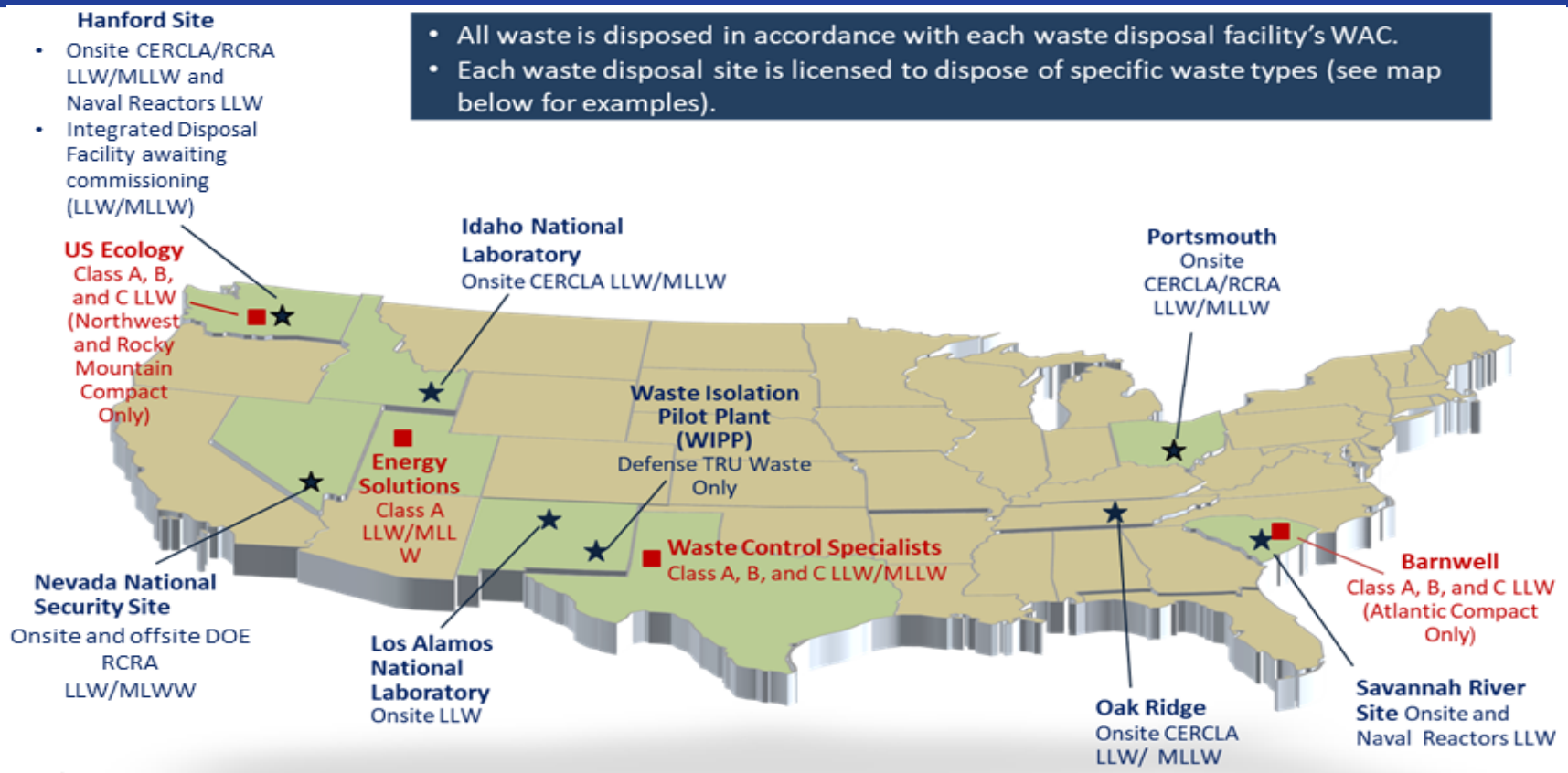
MTHM = metric tons of heavy metal

SF and HLW Challenges

- Currently, there's no disposal pathway for SF and HLW. However, all wastes for disposal must meet as-yet-to-be-issued repository acceptance criteria.
  - EM works closely with the Office of Nuclear Energy, National Laboratories, and other stakeholders to ensure the SF inventory will be accepted for disposal.
- EM continues to safely and securely store and manage the SF inventory in wet/dry storage facilities on-site until a geologic repository is available.
- EM must safely manage aging waste tanks, retrieve waste from tanks/binsets, and permanently close the tanks.
- EM sites have used internationally-recognized high-temperature vitrification technologies to treat HLW.

Operating DOE & Commercial Disposal Facilities

- All waste is disposed in accordance with each waste disposal facility's WAC.
- Each waste disposal site is licensed to dispose of specific waste types (see map below for examples).



CERCLA – Comprehensive Environmental Response, Compensation and Liability Act; RCRA – Resource Conservation and Recovery Act

Waste Disposal Considerations

- DOE's Radioactive Waste Management Manual found in 435.1-1 has a "tiered" policy on treatment, storage, and disposal:
  - *DOE waste shall be treated, stored, and in the case of low-level waste, disposed of at the site where the waste is generated, if practical, or at another DOE facility. If DOE capabilities are not practical or cost effective, exemptions may be approved to allow use of non-DOE facilities for the storage, treatment, or disposal of DOE radioactive waste …*
- Waste disposal is always fully protective of worker and public health and the environment and in compliance with applicable Federal, state, and local requirements, with necessary permit(s), license(s), and approval(s) for the specific waste.
- Sufficient LLW/MLLW disposal capacity exists at DOE and commercial facilities to support the EM cleanup mission.

Low-Level Waste Disposal Facility Federal Review Group (LFRG) as of 2025

- DOE panel that reviews LLW disposal facility performance at DOE Sites as per DOE Order 435.1. Radioactive Waste Management
- Comprised of Federal employees and led by EM.
- Ensures compliance and consistency of facility design, construction, operation, and closure.
- Qualified, experienced, and independent review teams consisting of Federal staff and Contracting support as needed.

LFRG Membership includes:

Program Secretarial Offices

- Office of Environmental Management (EM)
- Office of Environment, Health, Safety, and Security (EHSS)
- Office of Nuclear Energy (NE) Office of Science (SC)
- Office of Legacy Management (LM)
- National Nuclear Security Administration (NNSA)

DOE Sites with LLW Radioactive Waste Sites

- Hanford, Richland, WA
- Idaho National Laboratory, ID
- Los Alamos National Laboratory, New Mexico
- Nevada National Security Site, NV
- Oak Ridge National Laboratory, Oak Ridge, TN
- Paducah, Kentucky and Portsmouth, OH, PPPO Office
- Savannah River Site, SC

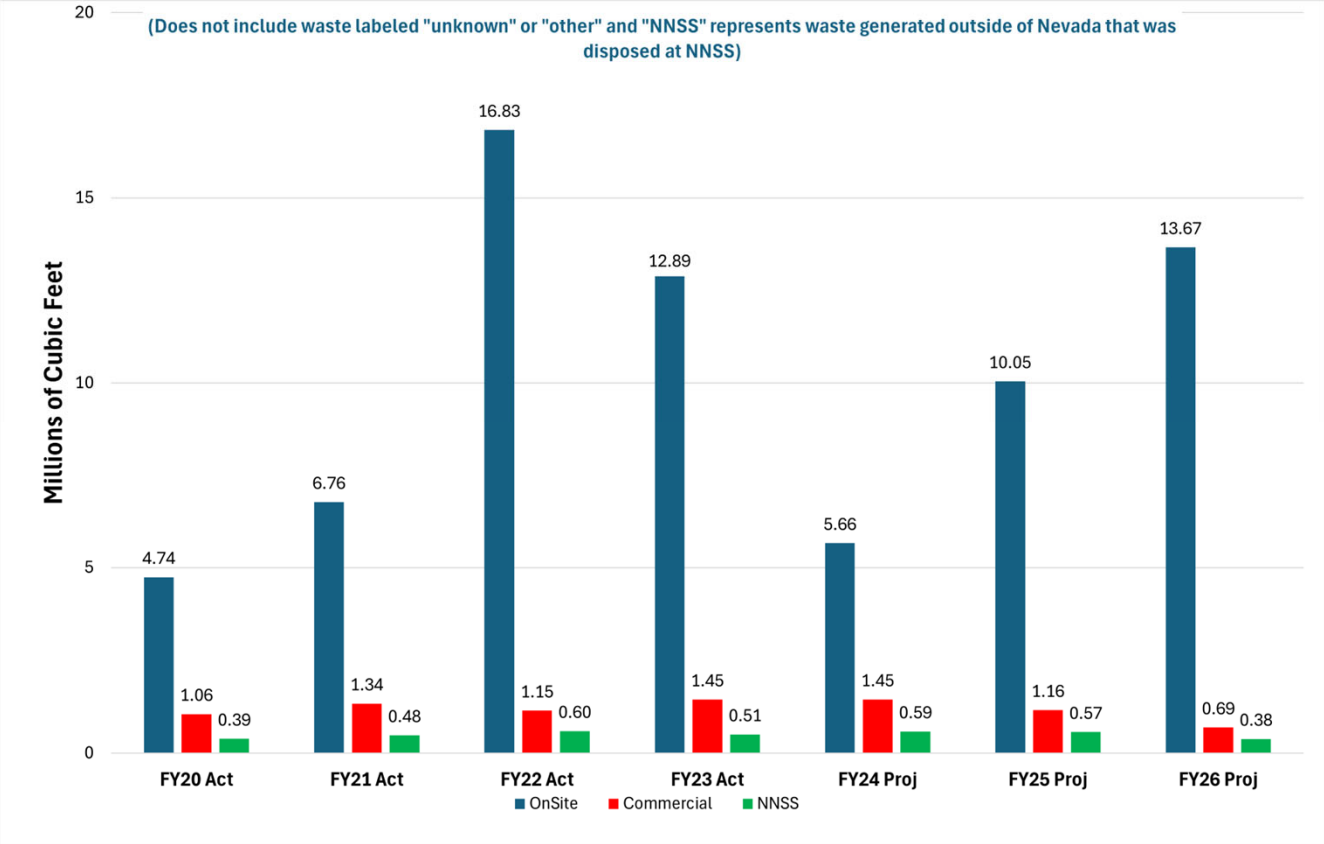
DOE LLW/MLLW Data

Waste Information Management System (WIMS)

- WIMS is developed to provide stakeholders with the tools necessary to easily visualize, and understand current and future waste volumes, categories, and problems of forecasted waste streams.
- WIMS meets this need by providing a user-friendly online system to organize, and present waste forecast data from DOE sites. This system provides a method for identification of waste forecast disposal volumes, waste classification, disposition pathways, and potential barriers to final disposition.
- Includes LLW/MLLW treatment/disposal forecast from all DOE sites, not just EM sites.
- Annually updated and website maintained by Florida International University

Visit WIMS at: Waste Information Management System (emwims.org)

DOE Complex-wide LLW/MLLW Disposal Volume by Disposal Location



Commercial LLW Disposal Manifest Data

Manifest Information Management System (MIMS)

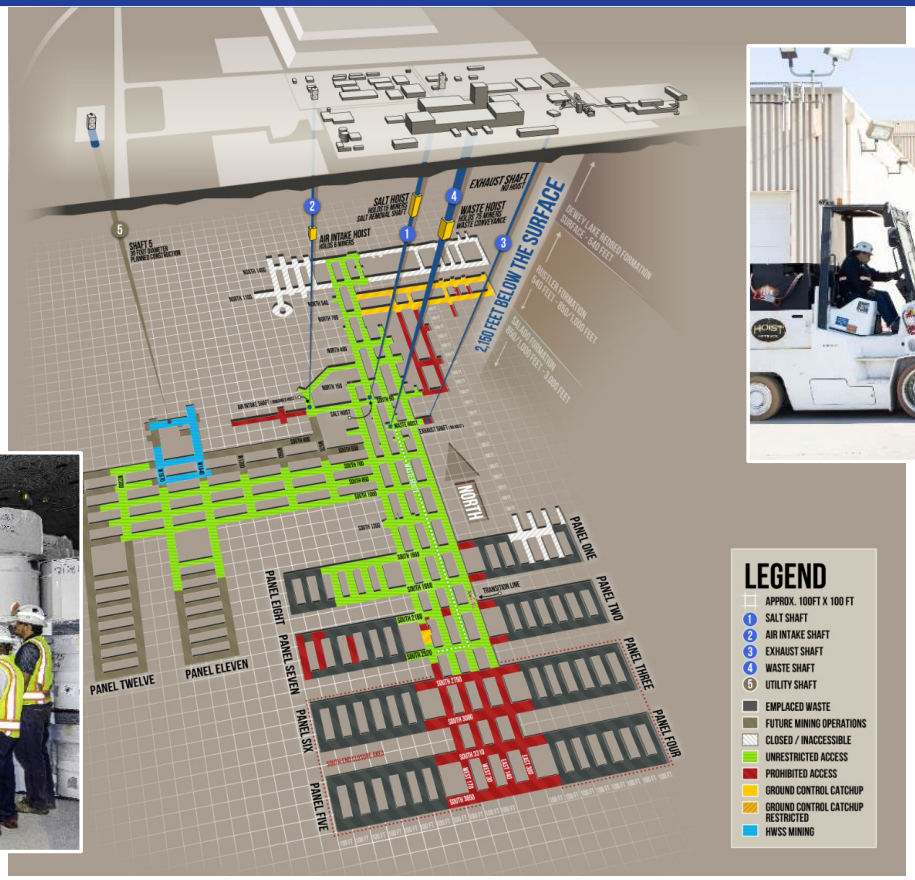
- MIMS is the public source for manifest data of non-DOE LLW shipped to commercial disposal facilities to meet the provisions in 42 U.S.C. 2021g(a)
- States/compacts are the primary stakeholders
- Data is available for currently operating commercial LLW disposal facilities
  - Barnwell, Energy*Solutions*, US Ecology, and Waste Control Specialists
- Currently updated with CY 2024 data. Next update will be January of 2026 (update with CY 2025 data)

Visit MIMS at: mims.doe.gov

Waste Isolation Pilot Plant

- WIPP is America's only deep geologic repository for the permanent disposal of defense-generated transuranic (TRU) radioactive waste left from research and production of nuclear weapons.

WIPP

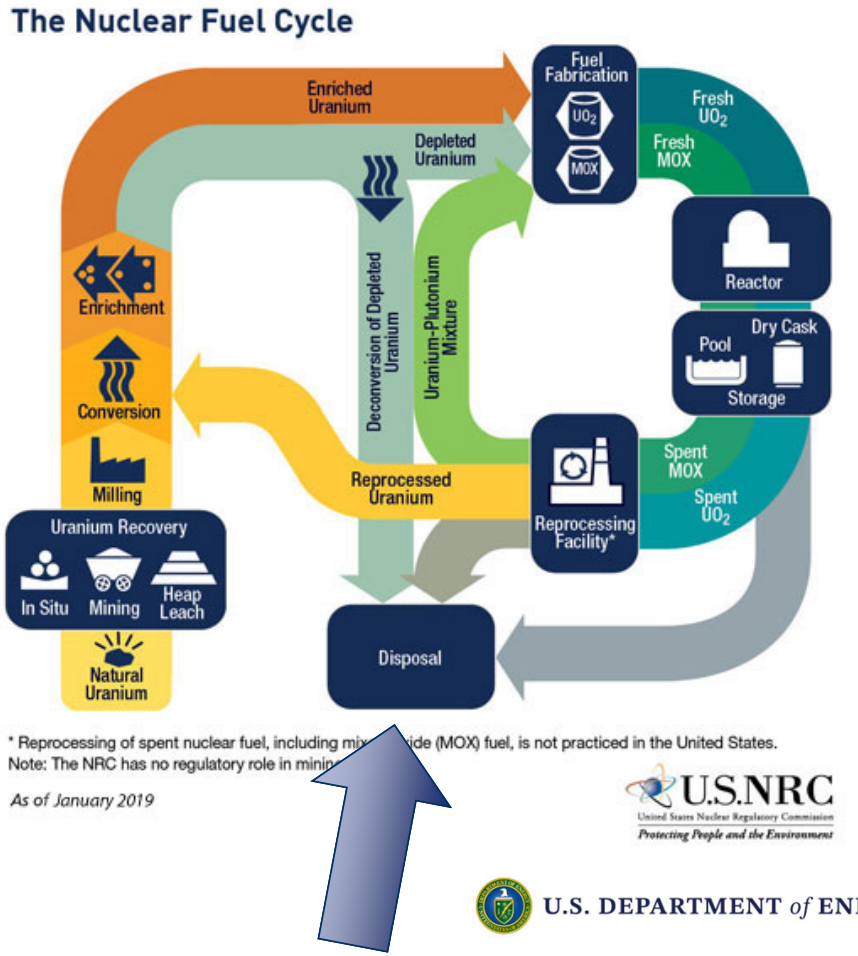

EXHAUST SHAFT
SALT HOIST
WASTE HOIST
AIR INTAKE HOIST
2,150 FEET BELOW THE SURFACE
NORTH
PANEL ONE
PANEL TWO
PANEL THREE
PANEL FOUR
PANEL FIVE
PANEL SIX
PANEL SEVEN
PANEL EIGHT
PANEL ELEVEN
PANEL TWELVE
LEGEND
APPROX. 100FT X 100 FT
1 SALT SHAFT
2 AIR INTAKE SHAFT
3 EXHAUST SHAFT
4 WASTE SHAFT
5 UTILITY SHAFT
EMPLACED WASTE
FUTURE MINING OPERATIONS
CLOSED / INACCESSIBLE
UNRESTRICTED ACCESS
PROHIBITED ACCESS
GROUND CONTROL CATCHUP
GROUND CONTROL CATCHUP RESTRICTED
HWSS MINING


135
201


3000

Conclusion

- DOE waste management oversight is rigorous.
- Statutory and regulatory requirements are well established.
- Decisions are made at the site level considering the safety, compliance, and the best interest of the government.
- There are opportunities for stakeholder input.
- Waste disposition is considered throughout the entire lifecycle



Thank you for your Attention

Questions?