



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

Status of Disposal Capabilities for Greater-Than-Class C (GTCC) Low-Level Radioactive Waste

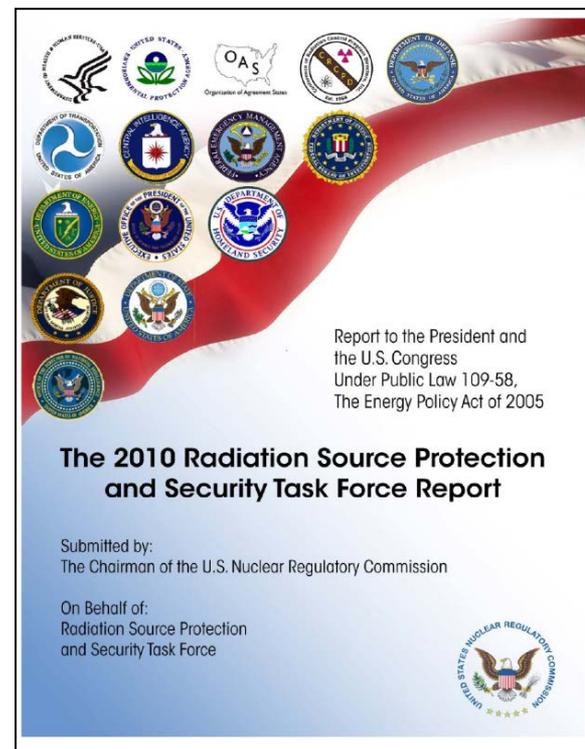
Frank Marcinowski

Deputy Assistant Secretary for Waste Management
Office of Environmental Management

August 13, 2015

- Currently there is no disposal pathway for GTCC LLRW or GTCC-like waste.
- Congressional Mandate
 - Low-Level Radioactive Waste Policy Amendments Act of 1985 (Public Law #99-240)
 - Deems the Federal Government responsible for the disposal of LLRW with concentrations of radionuclides that exceed the limits established by NRC for Class C radioactive waste (e.g. GTCC LLRW). DOE was the agency that was later assigned that responsibility.
 - Requires disposal of GTCC LLRW at a facility licensed by NRC.
 - Energy Policy Act of 2005 (Public Law #109-58)
 - Requires DOE to submit a Report to Congress on the GTCC EIS disposal alternatives and await action by Congress before issuing a Record of Decision selecting a GTCC disposal alternative.

- Responds to National Security Concerns
 - Potential for disused sealed sources to be used in a radiological dispersal devices (e.g., dirty bomb)
 - Disposal need highlighted as one of two key security challenges in Inter-Agency Task Force Reports to President Obama and Congress
- Supports Future U.S. Programs
 - Medical isotope production (molybdenum-99)
 - Green energy (e.g., Gen IV Nuclear Energy Systems)
 - Space exploration (e.g., DOE Space and Defense Power System Programs)
- Provides Environmental Stewardship
 - Statutory mission and DOE cleanup commitments for the West Valley Site in New York



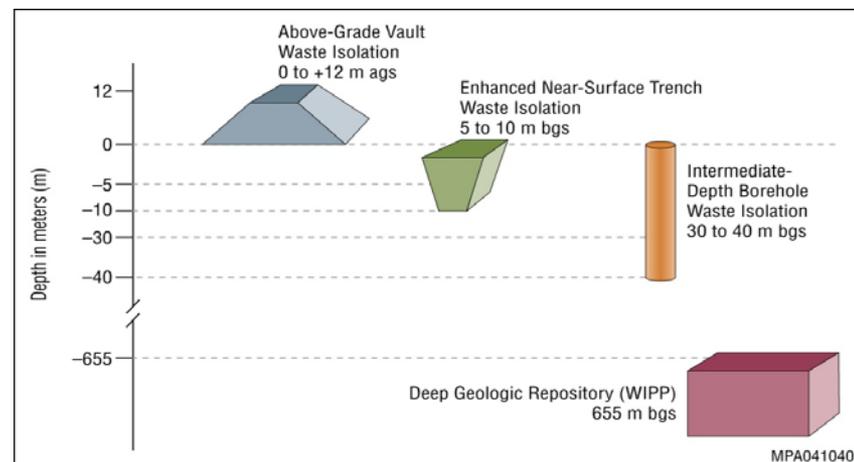
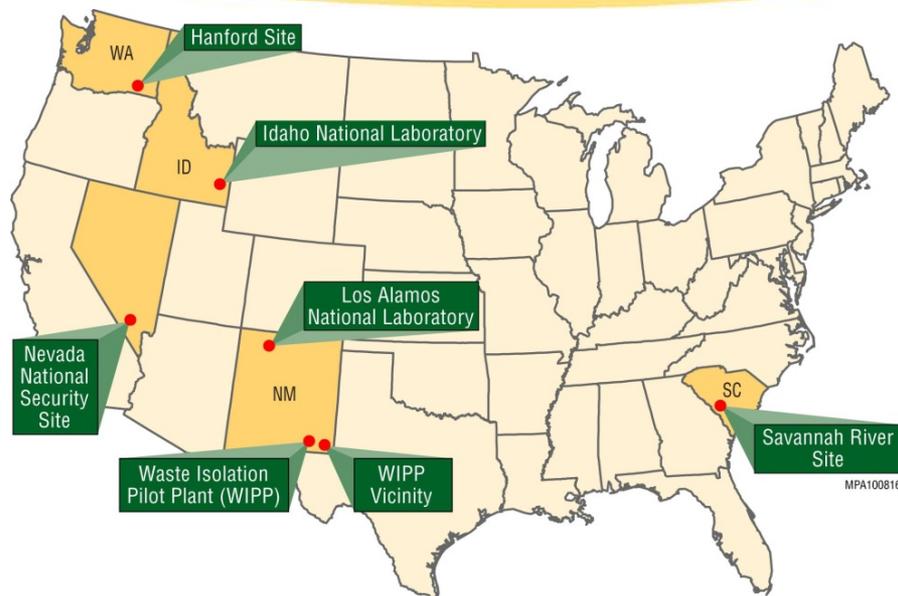
- GTCC LLRW:
 - ***A formal, defined waste classification in federal law and regulations***
 - Generated from Nuclear Regulatory Commission (NRC) or Agreement State licensed activities
 - The most hazardous class of LLRW as defined by the NRC in 10 CFR 61
 - ...“waste that is not generally acceptable for near-surface disposal... for which form and disposal methods must be different, and in general more stringent, than those specified for Class C waste”
 - Must be disposed of in a geologic repository, as defined by NRC, unless proposals for disposal in a site licensed pursuant to 10 CFR 61 are approved by the Commission

- GTCC-Like Waste:
 - ***Not a formal waste classification by rule or DOE order; rather, a descriptive category created for purposes of the EIS***
 - DOE owned or generated LLRW or transuranic (TRU) waste with characteristics similar to GTCC LLRW and with no identified disposal path
 - Primarily non-defense TRU waste from clean up activities at the West Valley Demonstration Project in New York

Overview: GTCC LLRW Waste & GTCC-Like Inventory

- Waste Inventory
 - The combined GTCC LLRW and GTCC-like waste inventory is about 12,000 m³ (420,000 ft³) and contains a total activity of about 160 million curies (MCi)
 - 8,800 m³ (310,000 ft³) or 75% is GTCC LLRW (commercial)
 - 2,800 m³ (99,000 ft³) or 25% is GTCC-like (DOE owned)
 - Waste Groups (GTCC LLRW and GTCC-like waste):
 - Group 1: Wastes from currently operating facilities. This includes wastes that are currently in storage or are expected to be generated from these operating facilities.
 - Group 2: Projected wastes from proposed facilities and/or actions. Some of this waste may never be generated.
- GTCC LLRW Waste Types
 - Activated metals: Primarily from commercial nuclear power plants
 - Most of this waste will not be generated for decades, but represents over 98 percent of the total curies.
 - Sealed sources: Used in hospitals, industries, and universities through out the U.S.
 - Other waste: From environmental cleanup and isotope production (Missouri University Research Reactor in MO, WVDP, BWTX in VA, WCS in TX)
- GTCC-like Waste Types (same waste types as for GTCC LLRW)
 - Waste from DOE clean up and other mission activities (WVDP, INL, BWTX in VA, ORR, LANL)

1. **No Action:** Continue current storage/management practices
2. **Geologic Repository:** At Waste Isolation Pilot Plant (WIPP)
3. **Boreholes:** At Hanford, Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), Nevada National Security Site (NNSS), WIPP Vicinity, and generic commercial location in Region IV (west)
4. **Trenches:** At Hanford, INL, LANL, NNSS, Savannah River Site (SRS), WIPP Vicinity and generic commercial location in Regions II and IV (southeast and west)
5. **Vaults:** At Hanford, INL, LANL, NNSS, SRS, WIPP Vicinity, and generic commercial location in Regions I-IV (northeast, southeast, midwest, and west)



Draft GTCC EIS did not contain a preferred alternative but DOE anticipates a preferred alternative to be included in Final GTCC EIS).

- Evaluates 11 environmental resource areas as well as potential cumulative impacts at seven sites.
- Evaluates geologic disposal and land disposal in enhanced near surface trenches, boreholes, or above-grade vaults.
- Also evaluates land disposal at generic commercial sites in Nuclear Regulatory Commission (NRC) Regions I-IV.
- Evaluates potential long-term human health impacts (calculated over 10,000 years).
- For each alternative the analysis assumes that the total waste inventory would be disposed of at a single disposal site. Depending on the selected option for disposal, decisions can be made to dispose of the waste at more than one location.
- Structured so that decisions on disposal method(s) or site(s) could be made by waste type.

Resource Areas Evaluated in Final EIS

1. Climate, Air Quality, and Noise
2. Geology and Soils
3. Water Resources
4. Human Health
5. Ecology
6. Socioeconomics
7. Environmental Justice
8. Land Use
9. Transportation
10. Cultural Resources
11. Waste Management
12. Cumulative Impacts

Public Feedback Captured in the Comment Response Document

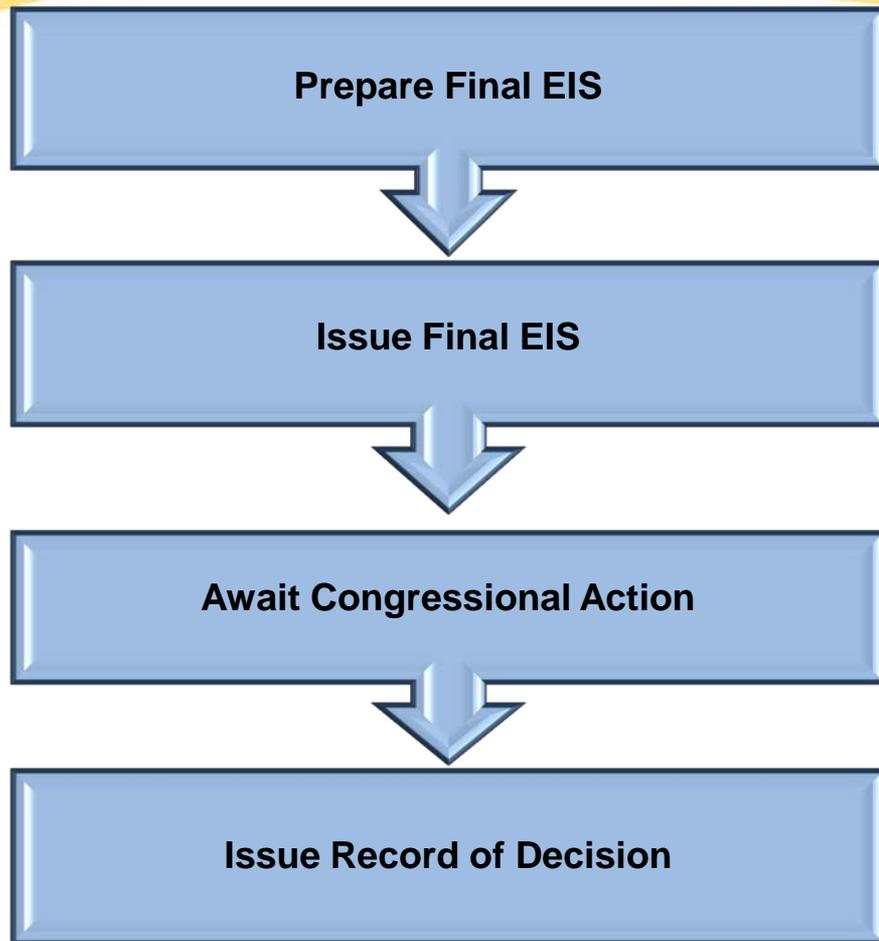
- **Over 4,000 public comments were submitted on the Draft GTCC EIS. DOE addresses those comments in the Comment Response Document section of the proposed Final GTCC EIS.**
- **Comments on Disposal Alternatives**
 - General public opposition to all alternatives, except State/local support for WIPP
 - WIPP supporters: NM State Government officials and City of Carlsbad officials
 - Numerous environmental groups and citizens oppose WIPP especially those within NM
 - General call for DOE to re-issue a revised Draft EIS that analyses hardened onsite storage and a new geologic repository [environmental groups]
 - Northwest community [EPA Region 10, Yakama Nation, Heart of America, and local citizens] challenged the viability of GTCC disposal at Hanford due to potential cumulative impacts
- **Comments on Technical Considerations**
 - Transportation analysis is insufficient/doesn't present specific routing [environmental groups]
 - Technical assumptions need to be better defined and supported [NRC et al.]
 - Challenged validity of model input parameters, approach, and results [NRC, Yakama Nation, Institute for Energy and Environmental Research, et al.]

Factors Considered During the Development of Preferred Alternative

- Public comments provided on the Draft GTCC EIS
- Disposal site: Potential human health impacts (including those from transportation and cumulative impacts); cultural resources and tribal concerns; laws, regulations, and other requirements
- Waste type: Radionuclide inventory/characteristics, waste form stability, physical characteristics, and availability for disposal
- Disposal method: inadvertent human intrusion, construction and operational experience, post-closure care, and cost
- Programmatic factors

Preferred alternative could be a combination of two or more alternatives, based on the considerations above

Remaining Steps for Fulfilling Statutory Responsibility



In accordance with Section 631 of the Energy Policy Act of 2005 (include requirements outlined in Section (3)(b)(3) of Low-Level Radioactive Waste Policy Amendments Act), the Report to Congress will:

- Propose actions to ensure safe disposal of such identified radioactive wastes
- Describe alternatives under consideration
- Identify the Federal and non-Federal options for disposal
- Describe projected costs
- Identify options for ensuring that the beneficiaries of the activities resulting from the generation of GTCC waste bear all reasonable costs of disposing of such wastes
- Identify statutory authority required for disposal of GTCC waste

- DOE is currently finalizing the proposed Final GTCC EIS.
- The proposed Final GTCC EIS is anticipated to include a preferred alternative. Once the EIS is approved by DOE formally, DOE will share the preferred alternative.
- GTCC EIS publication and distribution estimated in the next 6 months or so, contingent on DOE formal review.