Mixed Low-Level Waste at Los Alamos National Laboratory

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Presented at WM '07 Symposium
Tucson, Arizona
February 28, 2007
LANL Manages Three Categories of Mixed Waste

MLLW
(mixed low-level waste)
Can be treated and land-disposed.
LANL inventory is down to about 5 m³ from 800 m³ ten years ago

MTRU Waste
(mixed transuranics)
Greater than 100 nCi/g, destined for the WIPP repository

“Alpha MLLW”
(10-100 nCi/g mixed waste)
MTRU that will be re-classified to MLLW
Estimated removal of up to 800 m³ from the TRU inventory
History of Mixed Waste at LANL

- Under a Federal Facilities Compliance Order, the DOE and NM Environment Department negotiated a Site Treatment Plan (STP) in 1995 that set milestones for disposition of the Laboratory’s MLLW. MTRU was also included with a requirement for disposition to WIPP.

- LANL has completed the first set of milestones by disposing of it’s 800 m³ legacy MLLW volume in 2005, one year ahead of schedule.

- Any MLLW stored over one year must be added to the STP Compliance Plan Volume in the annual update to NMED.
Technical Area 54, Area L
Mixed Low-Level Waste
Volume Decrease since 1995
Technical Area 54 Area L in 2006

- Area L—Mixed Low-Level Waste after inventory reduction (only about 5 m³ remain)
Mixed Waste Destination

A small portion, about 5%, of the waste that has been treated to meet the EPA’s Land Disposal Restrictions is returned to LANL for disposal at TA-54, Area G.
Current Mixed-Low-Level Waste Operations

- MLLW generation (~20 m³/year) from Lab operations is decreasing each year and is stored an average of 8 months before shipment to off-site commercial facilities. Less than 1% has no current disposal path, and has been added to the STP Compliance Plan volume.

- Substantial amounts (~50 m³/year) of additional MLLW comes from other activities, and is usually sent directly off-site to commercial facilities.
  - Environmental Restoration activities such as soil cleanups
  - Decommissioning, decontamination, and demolition of buildings
Waste Reduction

- Combined strategies have significantly decreased Mixed Low-Level Waste generation at LANL over the last decade.

- Waste minimization procedures that substitute non-hazardous materials, reduce reagent use, decrease packaging, etc.
- Sort-survey-decon procedures that remove surface radioactivity
- More accurate characterization of suspect waste
- Labpacking and consolidation of similar waste streams
- Generator treatment such as neutralization
- Recycling of 50+ cubic meters of steel and lead within DOE
LANL “Orphan MLLW”

- About 5 cubic meters in inventory
- Primarily high tritium waste
  - “Cryotraps” – Mercury and tritium contamination
  - “Squib Assemblies” – Lead and tritium contamination
  - Other MLLW with tritium
- Tritium levels between 3,000 and 40,000 Curies
Additional Examples of “Orphan MLLW”
MLLW from the LANL TRU Waste Inventory

- Project that about 5,000 drums (1,000 m³) of LANL TRU waste (10%) may be < 100 nCi/g after WIPP assay
- 25% to 75% may be mixed waste
- Plan to characterize and ship MLLW to commercial sites for treatment and to NTS for disposal in FY08, FY09, and FY10
- Plan to dispose of most LLW on site at LANL, but some could be disposed at NTS
High Activity Mixed Waste at LANL

- Includes both debris and homogeneous wastes such as cemented wastewater treatment sludges
- Expect most to fall between 10 to 100 nCi/g, although some could be < 10 nCi/g because some TRU waste was placed into storage when TRU waste was defined as > 10 nCi/g
- Variety of hazardous constituents expected
Current Status of LANL High Activity MLLW

- LANL is evaluating options for management of the 10-100 nCi/g Mixed Low-Level Waste category
  - Estimates of volumes and costs for treatment by commercial treatment facilities are being compiled for planning purposes
  - Prefer to have site that treats waste also ship directly to NTS for disposal, but LANL can ship to NTS from LANL under its certification program if required
  - A pilot waste stream has been profiled to a commercial treatment facility
  - Schedule for MLLW from TRU driven by TRU Waste Disposition Project budget; emphasis primarily on high activity TRU in FY07. Recognize window for disposal of MLLW at NTS ends in December 2010
Summary

- LANL has successfully used commercial treatment and disposal of MLLW, and believes that this approach will also be successful for orphan and 10-100 nCi/g MLLW (with disposal at NTS).
- LANL continues to dispose of its operational MLLW within one year of generation and is developing options to dispose of all remaining Mixed Low-Level Waste items.
- LANL is preparing to meet the challenge of treating and disposing of the next category of 10-100 nCi/g MLLW.