# Perspectives from the Government Accountability Office

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## Plutonium Disposition: Proposed Dilute and Dispose Approach Highlights Need for More Work at Waste Isolation Pilot Plant (GAO-17-390)

Objectives:

1. To what extent did DOE's revised cost estimate for completion of construction of the MOX facility, and the revised life-cycle estimate for completion the Plutonium Disposition Program using the MOX approach meet cost estimating best practices?
2. What is the status of NNSA's development of a life-cycle cost estimate for completion the Plutonium Disposition Program using the dilute and dispose approach?
3. To what extent does DOE have sufficient disposal space and statutory capacity at WIPP to dispose of all defense TRU waste, including the diluted plutonium resulting from the dilute and dispose approach?

## Objective 1: MOX Construction and Program Life-cycle Cost Estimates

- DOE's MOX construction estimate for $17.2 billion substantially met cost estimating best practices and can be considered reliable.

- NNSA did not use best practices when revising its $56 billion life-cycle cost estimate for the Plutonium Disposition Program using the MOX approach.

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## Objective 2: Status of the Dilute and Dispose Approach

- NNSA is developing a life-cycle cost estimate for the Plutonium Disposition Program using the dilute and dispose approach—originally expected to be completed in late 2018.

- NNSA's life-cycle is expected to include all major program elements, including:
  - Plutonium pit disassembly and conversion
  - Plutonium dilution
  - Waste disposal

# Objective 3: WIPP Disposal Space and Statutory Capacity

- WIPP does not have sufficient space to dispose of the TRU waste identified in its 2016 Annual TRU Waste Inventory Report.

| Amount of Waste Planned for Disposal at the Waste Isolation Pilot Plant (WIPP) Compared to Available Disposal Space at WIPP | | | |
|---|---|---|---|
| **Type of Transuranic (TRU) Waste** | Amount of Waste Planned for Disposal In 2016 annual TRU waste inventory report | Projected Amount of Disposal Space Available at WIPP | Disposal Space Shortfall |
| **Contact-handled Waste** | 68,350 $m^3$ | 25,350 $m^3$ | -43,000 $m^3$ |
| **Remote-handled Waste** | 3,160 $m^3$ | Unknown | Unknown |

# Objective 3: WIPP Disposal Space and Statutory Capacity

- DOE updates its TRU Waste Inventory Report annually using data from waste generator sites.

- The 2016 Annual TRU Waste Inventory Report:
  - Includes 6 MT of non-pit plutonium DOE EM is diluting at SRS
  - Includes waste volumes expected to be produced from MOX
    - This waste would not be produced if NNSA switched to dilute and dispose
  - Does not include the estimated volume of 34 MT of diluted plutonium

- GAO identified possible sources of TRU waste not included in the 2016 inventory:
  - Buried waste subject to future CERCLA action
  - Waste produced from future decontamination and decommissioning of nuclear facilities
  - Waste produced after 2050

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# Objective 3: WIPP Disposal Space and Statutory Capacity

- DOE will need to excavate at least 2 additional panels to dispose of the waste identified in the 2016 TRU Waste Inventory Report.
- To accommodate the waste from the dilute and dispose approach, WIPP would need an additional 1.5 panels.
- Disposing of all remote-handled waste would likely require additional space unless changes are made to how this waste is disposed of in WIPP.

# Objective 3: WIPP Disposal Space and Statutory Capacity

- Future sources of TRU waste could exceed WIPP's statutory capacity

| Statutory Disposal Capacity of the Waste Isolation Pilot Plant (WIPP) When Including Wastes Not Currently Planned for Disposal at WIPP<br><br>Statutory capacity remaining is a cumulative total of the preceding rows to indicate how the addition of each waste source would affect the remaining capacity under the statutory limit. | | |
|---|---|---|
| **WIPP Statutory Disposal Capacity (figures in cubic meters)** | | 175,565 |
| **Waste source** | Volume of waste | Cumulative statutory capacity remaining after including waste source volume |
| **Waste already disposed of at WIPP** | 91,100 | 84,465 |
| **Waste planned for WIPP in 2016 TRU waste inventory Report** | 71,510[a] | 12,955 |
| **Potential waste** | 3,094[b] | 9,861 |
| **Greater-than-Class C** | 12,000[c] | -2,139 |
| **34 metric tons of diluted plutonium** | 23,800 | -25,939 |

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# Objective 3: WIPP Disposal Space and Statutory Capacity

- DOE is reviewing two potential changes to how waste disposal volumes at WIPP are counted against its statutory capacity:
  - Counting the volume of waste inside containers
  - Counting the volume of inner containers
- Congress could also amend the 1992 WIPP Land Withdrawal Act to increase the disposal capacity.

# Recommendations for DOE

- Develop a schedule for deciding whether the volumes of "potential waste" identified in the annual TRU waste inventory report can be disposed of at WIPP.

- Develop guidance that helps sites produce a more comprehensive estimate for the volumes of TRU waste that may be generated in the future from cleanup operations, including estimates of buried waste, waste that may be generated from decontamination and decommissioning of nuclear facilities, and waste that may be generated past WIPP's expected closure date of 2050.

- Develop a long-term plan for disposing of DOE's TRU waste that includes:
  - the need for excavating additional disposal space at WIPP and an integrated schedule that describes how DOE will complete the regulatory approval process and construction of new space before WIPP's existing space is full, and
  - a timeline to help determine whether DOE can change its method of counting waste volumes to meet NNSA's 2020 milestone for resolving potential disposal space constraints at WIPP.

# Status of Recommendations

- DOE concurred with all 4 recommendations
- Stated that they will develop guidance on how to make the TRU Waste Inventory more comprehensive
- Stated that they will develop plans for physical expansion and a proposal for changing the waste volume accounting method by the end of 2018

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# Issues Not Addressed in Our Report

- NNSA and DOE plans for addressing all U.S. surplus plutonium
- Transportation and security of plutonium throughout the disposal process
- The material NNSA plans to use to dilute the 34 MT of plutonium
- The design of future waste disposal panels at WIPP
- Disposing of additional waste streams at WIPP