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U.S. Department of Energy
Office of Inspector General
Office of Audits and Inspections

Audit Report

The Office of Environmental Management's Disposition of Transuranic Waste

OAS-L-13-09

May 2013

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Department of Energy
Washington, DC 20585

May 28, 2013

MEMORANDUM FOR THE DEPUTY ASSISTANT SECRETARY FOR WASTE MANAGEMENT

FROM: David Sedillo, Director
Western Audits Division
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "The Office of Environmental Management's Disposition of Transuranic Waste"

BACKGROUND

The Waste Isolation Pilot Plant (WIPP) is the Department of Energy's (Department) underground repository for contact-handled (CH) and remote-handled (RH) transuranic (TRU) waste. The WIPP Land Withdrawal Act limits WIPP's total capacity for TRU waste to 175,600 cubic meters (m^3), of which no more than 7,080 m^3 can be RH waste. Under the Act, the U.S. Environmental Protection Agency regulates repository waste disposal operations and shares that responsibility with the State of New Mexico. In October 1999, the New Mexico Environment Department (New Mexico) granted a Hazardous Waste Facility Permit to the Department to begin storage and disposal of TRU waste, although RH disposal did not commence until 2007. The Permit requires approval by New Mexico of any planned changes to the permitted facility that may result in noncompliance with permit requirements.

At the beginning of Fiscal Year (FY) 2011, the Office of Environmental Management (EM) established a strategic goal, in addition to operational goals, to complete disposition of 90 percent of the Department's legacy TRU waste by the end of FY 2015. While EM is also responsible for the TRU waste that the Department continues to generate, newly generated waste is not specifically included in the strategic goal. To achieve the 90 percent goal, EM needed to dispose of approximately 40,000 m^3 of waste, or an average of 8,000 m^3 per year. EM did not establish specific goals for CH or RH disposal within the overall metric. The planned annual metric was reduced to 6,000 m^3 for FY 2012 and 4,500 m^3 for FY 2013 because of funding limitations. We initiated this audit to determine whether EM was effectively managing and disposing of its TRU waste relative to its strategic 90 percent waste disposal goal.

RESULTS OF AUDIT

We found that while EM had made progress in meeting its operational disposal goals, it was not on track to meet its goal to dispose of 90 percent of the Department's legacy TRU waste by the end of FY 2015. In particular, EM faces a number of challenges in meeting its planned 90

percent waste disposal goal by 2015. Additionally, without further modifications to the repository or existing waste disposal practices, WIPP may not have capacity for disposal of the current RH inventory. EM is aware of the challenges and has identified alternative actions to alleviate the situation.

EM TRU Waste Goals

We found that EM surpassed its annual TRU waste disposition metrics for FYs 2011 and 2012. Specifically, EM disposed of a cumulative 14,866 m^3 compared to its revised 2-year target of 14,000 m^3. However, we determined that EM is behind schedule and is not likely to achieve its goal to dispose of 90 percent of legacy TRU waste by the end of FY 2015. To achieve this goal, EM needed to achieve its original metrics, which totaled 16,000 m^3 in FYs 2011 and 2012. EM officials recognize that they are behind and explained that when this goal was formulated it was an ambitious measure requiring sustained funding at levels obtained under the American Recovery and Reinvestment Act of 2009 (Recovery Act). WIPP's peak annual funding during the Recovery Act in FYs 2010 and 2011 exceeded $270 million while its FY 2012 budget dropped to approximately $228 million. Its FY 2013 budget further decreased to $202 million. EM officials also told us that recent funding decreases at generator sites adversely affected achievement of the goal by limiting the amount of waste processed for disposal.

EM officials told us that they focused on removing the easiest to process waste first and that remaining waste will be more difficult and potentially more expensive to process because of its current storage condition. Accordingly, meeting disposal goals with less funding will be difficult. EM Program officials told us that they will not be able to achieve the 90 percent goal under current funding scenarios, but noted that EM had not completely abandoned the 90 percent goal. However, one Program official acknowledged that annual TRU waste disposal performance targets do not support achieving the 90 percent goal by the end of FY 2015. EM officials also explained that progress toward the 90 percent goal was adversely affected by recent New Mexico wildfires that caused them to reprioritize their efforts and not focus solely on legacy TRU waste.

Although EM faces challenges in achieving its 90 percent TRU disposition goal, at the time of our audit, it was on-track to meet its current state commitments for waste disposal. For example, the Department and New Mexico established a non-binding agreement to address the highest risk, above-ground TRU waste at Los Alamos National Laboratory. This agreement, known as the Framework Agreement, committed the Department to dispose of approximately 3,706 cubic m^3 of above-ground TRU waste by June 30, 2014. EM surpassed its FY 2012 metric for meeting the Framework Agreement requirements. Similarly, the 1995 Settlement Agreement between the Department and the State of Idaho requires the Department to disposition all of the TRU waste at Idaho National Laboratory's Advanced Mixed Waste Treatment Project, estimated at 65,000 m^3, prior to December 31, 2018. While the Department is currently on schedule to meet its commitments to New Mexico and Idaho, potential budget cuts may affect waste disposal progress.

RH Disposal Capacity at WIPP

We also found that EM has underutilized WIPP's approved disposal capacity for RH TRU waste. Specifically, as of the end of FY 2012, EM had used only 299 m^3 of RH TRU disposal capacity

of the potential 1,023 m^3 capacity. This equates to a loss of 71 percent of RH waste disposal capacity available to date. WIPP's current regulatory approved design allows waste disposal in eight underground disposal units that are referred to as panels. EM emplaces RH waste into the walls of the panels then places the CH waste on the floors of those same panels. EM loses any unused RH capacity as they fill a panel with CH waste, since the RH positions in the walls can no longer be accessed. We previously identified the underutilization of RH capacity in our report on *Disposal of Remote-Handled Transuranic Waste at the Waste Isolation Pilot Plant* (DOE/IG-0613, July 2003), which concluded that if EM continued to focus on CH waste emplacement, the repository would not be able to accommodate all of the planned RH shipments. In response, the Department disagreed with the results and recommendations of the report. Since that report was issued, EM's emplacement practices have not changed significantly and the Department has continued to underutilize WIPP's RH capacity, thus narrowing its options to remedy the situation. Assuming current waste emplacement practices, WIPP may run out of RH waste disposal capacity. Specifically, we found that EM estimates that it has approximately 3,538 m^3 of RH TRU waste to dispose of and that WIPP currently has a remaining RH disposal capacity of 2,912 m^3. This potential lack of disposal capacity exists without factoring in about 1,500 m^3 of additional RH waste that may eventually require disposal at WIPP.

According to EM, factors other than the full utilization of WIPP's RH disposal capacity were the primary drivers of the program. In particular, EM has focused on large volume reductions of legacy TRU waste, the majority of which is CH waste, which requires less time, effort and money to process compared to RH waste. Further, large volumes of CH waste were readily available for disposal, thus allowing large volume reductions by focusing on CH waste. In addition, EM's current focus is meeting states' compliance commitments, which focus primarily on CH waste. EM officials also told us they recognize the need to continually refocus the TRU waste program and indicated that its focus going forward is more balanced and will include maximizing repository capacity.

Currently, EM is considering two options that could enable WIPP to accommodate more RH waste. First, in August 2011, EM submitted a request to the Environmental Protection Agency to relocate two of WIPP's planned disposal panels from the main access tunnels to the area south of the other disposal panels, which could allow emplacement of additional RH waste. Second, in November 2012, New Mexico granted a Permit modification to allow disposal of RH waste in shielded containers. Shielded containers allow certain RH waste streams to meet the reduced radiation dose rate limits for CH waste containers so that they can be emplaced in the repository in a manner similar to CH waste. While these two options may increase RH disposal capacity, we determined that they may not be sufficient to completely solve the problem. We found that only a little more than half of the RH inventory could potentially qualify for shipment and disposal in shielded containers. Furthermore, based on previous production costs of shielded containers, we estimate the cost to manufacture enough shielded containers for the potentially qualifying RH inventory to be more than $200 million which, given the current budget situation, may be cost-prohibitive. While EM officials asserted that transportation and other efficiencies will likely more than offset the costs of the shielded containers, the details of these efficiencies were not provided.

EM officials told us that they recognize the potential repository capacity issues and believe that other factors may come into play that would affect its plans for resolving the issue. In particular,

because funding levels have decreased and CH waste streams are anticipated to be more difficult to dispose of than they have been in the past, the rate of emplacement of CH waste may decrease allowing EM to utilize a greater percentage of WIPP's RH capacity. EM officials also recognize, however, that the cost to dispose of RH waste is higher than that for CH and that funding levels may not provide for higher RH waste disposition rates. Further, while we were told that some of EM's Department-wide projected RH inventory may qualify as either CH or low-level waste, the extent to which this may occur is unknown. EM officials also stated that another possible solution would be to physically separate RH waste disposal from CH waste disposal, but they did not explain how this would occur under the current design of the repository.

Future Plans

EM is at risk of not having sufficient RH TRU waste disposal capacity at the WIPP under existing disposal practices. While EM's planned actions may improve RH capacity utilization, until these actions are fully implemented WIPP's ability to accommodate all of EM's RH waste is uncertain. In addition, by not achieving disposition of 90 percent of legacy TRU waste by the end of FY 2015, the risk reduction originally envisioned when the goal was established may not occur. This change may lead to increased costs and a decrease in public confidence and credibility with states. EM officials asserted that its current priorities actually achieve greater risk reduction sooner than would have been realized if the focus remained on achieving the 90 percent goal.

SUGGESTED ACTIONS

In recognition of the potential risks facing the National TRU Program, we suggest that the Deputy Assistant Secretary for Waste Management continue to assess and monitor the options for meeting the challenges facing the TRU disposition program.

Attachment

cc: Deputy Secretary
Acting Administrator, National Nuclear Security Administration
Senior Advisor for Environmental Management
Chief of Staff

OBJECTIVE, SCOPE AND METHODOLOGY

OBJECTIVE

The audit objective was to determine whether the Office of Environmental Management (EM) was effectively managing and disposing of its transuranic (TRU) waste relative to its strategic 90 percent waste disposal goal.

SCOPE

The audit was performed between April 2012 and May 2013. We conducted the audit at the Waste Isolation Pilot Plant (WIPP) and Carlsbad Field Office (Carlsbad), located in Carlsbad, New Mexico; Los Alamos National Laboratory (Los Alamos) in Los Alamos, New Mexico; and the Idaho National Laboratory (Idaho), near Idaho Falls, Idaho.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed applicable laws, regulations, and state commitments pertaining to TRU waste disposal;
- Held discussions with Federal and contractor personnel at Carlsbad, Los Alamos, and Idaho;
- Assessed EM's past performance and their future plans regarding TRU waste disposal; and,
- Reviewed WIPP's design and capabilities.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. The audit included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. In particular, we assessed the Department's implementation of the *GPRA Modernization Act of 2010* and concluded that the Department had established performance measures for managing the disposition of TRU waste. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We conducted an assessment of computer-processed data relevant to our audit objective and concluded that it was sufficiently reliable.

An exit conference was held on May 3, 2013.

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