



U.S. Department of Energy
Office of Inspector General
Office of Audit Services

Audit Report

Planned Characterization Capability At The Waste Isolation Pilot Plant

DOE/IG-0577

December 2002



U. S. DEPARTMENT OF ENERGY
Washington, DC 20585

December 18, 2002

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman (Signed)
Inspector General

SUBJECT: INFORMATION: Audit Report on "Planned Characterization
Capability at the Waste Isolation Pilot Plant"

BACKGROUND

The Waste Isolation Pilot Plant (WIPP), located near Carlsbad, New Mexico, is the Department of Energy's underground repository for defense-generated Transuranic (TRU) waste. TRU waste consists of such items as clothing, gloves, and tools contaminated with small amounts of radioactive elements. TRU waste that can be safely handled without special equipment when contained is referred to as contact-handled TRU waste. As of December 2000, the Department was responsible for the safe disposal of an estimated 167,000 cubic meters of contact-handled TRU waste at 26 sites in 15 states nationwide.

Currently, contact-handled TRU waste is characterized before it is sent to WIPP. In June 2001, however, the Department notified the New Mexico Environmental Department of its intention to establish a centralized characterization capability for this material at the WIPP site. The Department estimated that the proposed capability – consisting of new equipment, modification of an existing building, new processes, and additional personnel – would expedite the removal of contact-handled TRU waste from temporary storage sites and minimize total costs of disposal. The objective of our audit was to determine whether the centralized capability would, in fact, meet these expectations.

RESULTS OF AUDITS

The planned waste characterization capability at WIPP is unlikely to expedite the removal of waste or save costs to the extent of management's estimates. In fact, our audit disclosed that of the 26 sites with contact-handled TRU waste, the vast majority would not benefit from the centralized capability. Although the Department contended that additional characterization capabilities would inherently speed up the waste disposal process and save at least \$100 million over the life of the contact-handled TRU waste characterization program, it did not perform a complete analysis to demonstrate where and how efficiencies would be gained. Without such an analysis, the Department risks investing time and resources in an unnecessary capability, ultimately delaying cleanup, increasing costs, and creating new health and safety concerns. We recommended that the Assistant Secretary for Environmental Management suspend the establishment of contact-handled TRU waste characterization capabilities at WIPP until a complete analysis of associated costs and risks is performed.

In a number of previous reports, the Office of Inspector General has identified the need for the Department to take a more comprehensive and coordinated approach to the management, and ultimately the disposal, of various types of waste. In our *Special Report on Management Challenges at the Department of Energy* (DOE/IG-0538, December 2001), we identified Environmental Standards and Stewardship as one of the most difficult challenges the Department faces.

MANAGEMENT REACTION

Management concurred with our finding and recommendations.

Attachment

cc: Deputy Secretary
Under Secretary for Energy, Science and Environment
Assistant Secretary for Environmental Management
Manager, Carlsbad Field Office

PLANNED CHARACTERIZATION CAPABILITY AT THE WASTE ISOLATION PILOT PLANT

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CHARACTERIZATION CAPABILITY AT THE WASTE ISOLATION PILOT PLANT

Characterization Capability

In its June 2001 Hazardous Waste Facility Permit Modification, the Department of Energy (Department) notified the New Mexico Environment Department of its intention to establish a centralized characterization capability for contact-handled Transuranic waste (CH-TRU) at its Waste Isolation Pilot Plant (WIPP). According to the permit modification, the proposed capability would enable the Department to expedite the removal of CH-TRU inventories from smaller sites and supplement the characterization done at six larger sites, while minimizing overall characterization costs. The December 2000 Environmental Impact Statement Supplemental Analysis noted that additional characterization capabilities would inherently speed up the cleanup process. In related documentation, the Carlsbad Field Office (Field Office) estimated that the Department could save \$5 million at each of the 20 smaller sites – \$100 million in total – by eliminating the need for characterization at those locations.

According to Department documentation, the central characterization capability at WIPP would operate within the existing WIPP facility, which would be modified to accommodate the equipment necessary for supporting the characterization activities. The capability would involve both non-intrusive and intrusive test equipment, including radiography and gloveboxes. The Field Office estimated that an additional 35 personnel would be needed to operate the capability.

Department Estimates

We concluded that the Department's plans for a centralized waste characterization capability at WIPP are unlikely to expedite CH-TRU cleanup or minimize costs to the extent of management's estimates. We found that the vast majority of sites with CH-TRU would not benefit from a centralized capability, that management did not consider many associated costs, and that expected efficiency gains were not explicitly identified. More specifically:

- A central characterization capability would provide no benefit to 16 of the Department's 20 smaller CH-TRU waste sites. A survey of these sites indicated that three were utilizing mobile characterization units, and one was scheduled for the next deployment of a mobile unit; five had non-defense waste, which does not meet the current disposal criteria at WIPP; and, seven were negotiating characterization agreements with larger sites. If 16 of 20 sites do not use the capability, at least \$80 million of the projected \$100 million in savings appears unattainable. Additionally, because of federal requirements governing transport of radioactive materials, all sites would still have to characterize the waste before it could be transported to

WIPP. In fact, characterizing the waste for transportation is more than 50 percent of the cost of fully characterizing the waste.

- Similarly, we determined that a central characterization facility was unlikely to provide significant benefits to most of the six larger sites. One site, for example, was bound contractually to treat waste onsite and would not be allowed, under terms of its contract, to ship waste to WIPP for characterization. Another site already had a fully operable characterization facility and a third was building a new facility, with construction 60 percent complete at the time of our audit. Remediation at a fourth site is expected to be complete by 2006, thus diminishing the window of opportunity for a WIPP characterization capability to expedite cleanup. Finally, a fifth site expressed interest in retaining its mobile unit characterization to supplement its ongoing characterization capability.
- The Field Office's estimate of savings did not include detail on how \$5 million was to be saved at each of the smaller sites, nor did it include an analysis of costs associated with establishing the additional capability at WIPP. A life-cycle cost analysis – to include costs of the permit modification, transportation and training, facilities and infrastructure, facility operations, and decontamination and decommissioning activities – was not prepared. Further, the cost to decontaminate and decommission the facilities was not formally estimated.
- Although management stated that establishing an additional CH-TRU waste characterization capability at WIPP would expedite cleanup, it did not specify how cleanup would be expedited or how much effort could be avoided.

Cost Analysis

The estimated benefits and savings associated with establishing the new characterization facility at WIPP were not credible because the Field Office did not fully evaluate the cost of the proposed capability or the cost of all reasonable alternatives when it evaluated the environmental impacts of the proposed capability. Management stated that the planned expenditures were not significant enough to warrant a full cost evaluation.

Our audit also disclosed other factors and alternatives that had not been fully considered in the decision to establish the WIPP capability. For example, the Department has, or soon will have, six characterization

facilities and three mobile characterization units available at its sites. Additional mobile units could also be contracted or procured. The Field Office had not developed a scenario for using these existing facilities prior to committing to an additional centralized capability at WIPP.

As another example, in response to a recommendation in the Department's recent *Top-to-Bottom Review* report, the Field Office proposed that three existing characterization facilities be used as hubs for processing the smaller sites' CH-TRU waste in conjunction with the mobile characterization units and the centralized capability. This alternative approach, however, was not subjected to a cost/benefit analysis comparing all alternatives under consideration. Without such an analysis, it is not clear whether the hub concept should be used in lieu of the centralized capability, in conjunction with it, or at all.

Schedule, Cost, and Risk

Instead of accelerating cleanup and reducing costs, establishing a centralized capability at WIPP could have the opposite effect. The Field Office has already spent at least \$2 million on facility modifications and equipment, and will spend more to establish and operate the capability at WIPP. Additionally, the Department has incurred costs for the preparation, submission and coordination of the permit modification; however, it cannot determine how much has been spent on the permit process. Regardless of the amount spent, these expenditures appear premature since the modification to the permit had not been approved, and possibly will not be approved, by the New Mexico Environment Department.

Clearly, the benefit of having a centralized waste characterization capability at WIPP will continue to diminish as the larger sites begin full-scale operations and the mobile characterization units continue cleanup at the smaller sites. The Field Office contends that the permit modification could be approved as early as calendar year 2004. However, this appears to be overly optimistic, since the original permit process required 4.5 years to complete.

Finally, characterizing CH-TRU waste at WIPP increases the likelihood that prohibited waste might be shipped from the sites, resulting in additional costs and health and safety risks. The Field Office's current plan for central characterization would allow shipment of CH-TRU waste based on "acceptable knowledge" rather than full characterization. Under the acceptable knowledge approach, a list of drum contents would be compared to transportation regulatory

requirements. If no discrepancies were identified, the drum would be sent to WIPP for the final disposal characterization. A likely occurrence, however, would be that a percentage of drums would eventually be rejected based on full characterization.¹ Additional costs would then be incurred to deal with the waste, and additional safety risks could arise.

RECOMMENDATIONS

We recommend that the Assistant Secretary for Environmental Management direct the Field Office to:

1. Conduct a cost and schedule analysis comparing the costs for establishing characterization capability at WIPP versus new construction at small quantity sites and utilizing existing characterization at the larger sites.
2. Not proceed with establishing a characterization capability at WIPP pending the results of the analysis.

MANAGEMENT REACTION

In written comments included as Appendix 1 to this report, the Assistant Secretary for Environmental Management agreed that a cost analysis should be performed, and that activities associated with the capability should not proceed until the analysis is completed. The Assistant Secretary also offered some clarifying comments that have been incorporated into the report.

¹To illustrate the concern, at the mobile characterization unit being used at the Savannah River Site, 354 of 2,419 drums meeting the "acceptable knowledge" requirement have been rejected during the characterization process.

memorandum

DATE: November 26, 2002

REPLY TO
ATTN OF: EM-23 (D. Tonkay, 301-903-7212)


SUBJECT: Draft Report on "Planned Characterization Capability at the Waste Isolation Pilot Plant"

TO: Frederick D. Doggett, Deputy Assistant Inspector General for Audit Services

Thank you for the opportunity to review the Office of Inspector General draft report, "Planned Characterization Capability at the Waste Isolation Pilot Plant." While I agree with the general conclusion that a cost analysis should be performed by the Carlsbad Field Office (CBFO) on centralized characterization capability for transuranic (TRU) waste at the Waste Isolation Pilot Plant (WIPP), I would like to clarify a couple of other points and request that the recommendations be rewritten in your draft report so that we can reach a full agreement.

The draft report recommends that CBFO conduct this cost analysis for establishing a centralized characterization capability at the WIPP in accordance with the National Environmental Policy Act (NEPA) process. There is no need to do any additional analysis under the NEPA process, because it was satisfactorily completed for this proposed action on December 19, 2000, resulting in a revision to the *Record of Decision for the Department of Energy's Waste Management Program: Treatment and Storage of Transuranic Waste*. For this reason, it is necessary that an alternative recommendation be made in your report. The Supplement Analysis supporting this decision did take into account the other factors you cite, such as health and safety risk, and estimated the \$100 million cost savings. The finding should be rewritten to conduct a cost and schedule analysis to confirm the \$100 million cost savings estimate, by comparing the costs for establishing characterization capability at WIPP versus new construction at our small quantity sites and utilizing characterization at the larger sites. A cost study is beneficial at this time to analyze our characterization options, now that Performance Management Plans are in place for Environmental Management sites and implementation planning is moving ahead to place acceleration process lines, composed of mobile modular systems, for TRU waste characterization at Hanford Site, Savannah River Site, and Los Alamos National Laboratory. The recommendation in your draft report should be rewritten to say that activities associated with TRU waste characterization capability at WIPP will not proceed until the cost study is complete.

With your agreement with my suggested revisions to the recommendations, I will direct CBFO by this memorandum to begin this cost analysis for my review and approval. If you have any further questions, please contact me at (202) 586-7709 or Ms. Patrice M. Bubar, Associate Deputy Assistant Secretary, Office of Integration and Disposition, at (202) 586-5151.


Jessie Hill Roberson
Assistant Secretary for
Environmental Management

PRIOR REPORTS

Office of Inspector General

- *Utilization of the Department's Low-Level Waste Disposal Facilities (DOE/IG-0505, May 2001)*. This report identified that the Department did not adequately utilize existing low-level waste disposal capacity at the Hanford Site or Nevada Test Site because it did not have a comprehensive approach to maximize waste disposal. As a result, the Department did not realize the maximum benefit from its \$30 million investment for low-level waste disposal operations at Hanford and Nevada.
- *The Department's Management and Operating Contractor Make-or-Buy Program (DOE/IG-0460, February 2000)*. This report showed that the Department of Energy Contract Reform Team concluded that the Department and its contractors should make more rational decisions concerning whether a contractor should "make" or "buy" services. The report recommended that field offices monitor the contractor implementation of make-or-buy programs by conducting thorough cost/benefit analyses prior to approval of any make-or-buy decisions.
- *Disposal of Low-Level and Low-Level Mixed Waste (DOE/IG-0426, September 1998)*. The audit revealed that the Department incurred \$5.3 million in unnecessary disposal costs for low-level waste between FYs 1993 and 1996 and incurred \$27.1 million to build low-level waste disposal facilities at Savannah River and Oak Ridge even though off-site disposal would have been more cost-effective.

General Accounting Office

- *Low-Level Radioactive Wastes: Department of Energy has Opportunities to Reduce Disposal Costs (GAO/RCED-00-64, April 2000)*. The General Accounting Office (GAO) concluded that the Department did not have complete, comparable, and consistent information on the life cycle costs for its disposal facilities so that accurate cost comparisons could be made.

Appendix 3

OBJECTIVE

The objective of the audit was to determine whether a centralized waste disposal characterization capability at WIPP would expedite the removal of CH-TRU waste and minimize costs.

SCOPE

The audit was performed between January and September 2002 at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico; the Hanford Site in Richland, Washington; and the Savannah River Site (SRS) in Aiken, South Carolina. We reviewed the activities associated with establishing a CH-TRU waste characterization capability at WIPP. The audit identified a material internal control weakness that management should consider when preparing its yearend assurance memorandum on internal controls.

METHODOLOGY

To accomplish the audit objective, we:

- Researched applicable Federal and Departmental regulations;
- Reviewed prior audit reports related to the audit objective;
- Interviewed Department and/or contractor personnel at Department Headquarters, WIPP, Hanford, and SRS;
- Analyzed the Department's National TRU Waste Management Plan;
- Toured the proposed central characterization building at WIPP, and the permanent characterization facility and mobile characterization unit at the SRS;
- Queried the 26 CH-TRU waste sites regarding plans for disposing of waste; and,
- Reviewed the FY 2002 budget for the planned TRU waste characterization capability at WIPP.

The audit was conducted in accordance with generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Accordingly, we assessed internal controls and performance measures established under the *Government Performance and Results Act of 1993* related to the Department's management of WIPP. Because our review was limited,

Appendix 3 (Continued)

it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not assess the reliability of computer-processed data because only a very limited amount of such data was used during the audit.

We held an exit conference with the Director, Waste Isolation Pilot Plant Office in Environmental Management's Office of Integration and Disposition, and Carlsbad Field Office personnel, on December 12, 2002.

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