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Audit Report

Management Controls over the Hanford Site Transuranic Mixed Tank Waste

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Department of Energy

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November 25, 2005

MEMORANDUM FOR THE PRINCIPLE DEPUTY ASSISTANT SECRETARY FOR ENVORONMENTAL MANAGEMENT

FROM: George W. Collard
Assistant Inspector General for Performance Audits
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Management Controls over the Hanford Site Transuranic Mixed Waste"

BACKGROUND

The Department of Energy (Department) has about 54 million gallons of radioactive, hazardous, and mixed waste stored in 177 large underground tanks at the Hanford Site. The Department established, in a 1997 Record of Decision, that tank waste would be retrieved from the tanks and separated into low-activity waste and high-level waste. In December 2003, the Department's Office of River Protection formally identified 11 underground storage tanks of waste at the Hanford Site that it believes contain contact-handled transuranic mixed (TRUM) waste. The Office of River Protection plans to retrieve, dry, and package the waste for shipment to the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico.

Prior to retrieving, treating, and disposing of the waste, the Department must obtain permits from the States of Washington and New Mexico. The State of Washington, Department of Ecology (Ecology) is responsible for granting the permit for retrieval, treatment, and if necessary, temporary storage of the waste at the Hanford site. The State of New Mexico Environment Department (NMED) is responsible for issuing the permit for the final disposal of the waste at WIPP.

We initiated this audit to determine whether the Office of River Protection had sufficiently addressed regulatory and permitting issues prior to proceeding with the TRUM waste project.

RESULTS OF AUDIT

Our audit disclosed that the Department had not sufficiently addressed regulatory and permitting issues prior to proceeding with the TRUM waste project. The Office of River Protection initiated the project and incentivized the contractor to complete work without fully addressing issues relevant to:

- Obtaining the necessary permits to retrieve, treat, and dispose of the waste; or
- Completing regulatory actions required under the *National Environmental Policy Act of 1969* (NEPA).

Specifically, the Office of River Protection did not resolve:

- NMED concerns about disposing of the waste at WIPP because it had previously been managed as high-level waste;

- Ecology concerns about permitting the retrieval, treatment, and temporary storage of the waste until there was an approved geologic repository, i.e., WIPP; and,

- Office of Environment, Safety and Health issues regarding the NEPA supplemental analysis for the TRUM project.

In April 2005, the Office of River Protection decided to curtail work on this project and requested its contractor to prepare a transition plan to, among other things, deploy equipment procured for the TRUM waste project to other projects. Had the Department followed key project management principles as outlined in DOE Order 413.3, its project management plan may have identified regulatory and permitting risks and implemented mitigation strategies, thereby eliminating the need to curtail the project.

Office of River Protection officials told us that they plan to renew work on the project once the necessary regulatory and permitting processes are complete and sufficient budget resources are available. However, should the Office of River Protection resume the project without mitigating the regulatory and permitting risks, the Department may not realize the approximately $459 million in savings by treating and disposing of the waste as TRUM as oppose to high-level waste and may not be able to fully benefit from the $40 million it has invested in the project to date. Additionally, the Office of River Protection may not fully benefit from the approximately $3.7 million of the incentive fee paid to the contractor to design and procure systems and equipment for the project.

MANAGEMENT REACTION

The Office of Environmental Management concurred with the recommendations in the report. Management stated that it intends to obtain the requisite NEPA coverage through the Tank Closure Environmental Impact Statement and to incorporate additional risk mitigation elements into the path forward consistent with DOE 413.3 requirements. We consider management's planned actions to be generally responsive to the recommendations. However, management expressed concerns about several points raised in the report. Management's concerns, along with the auditors' comments, are presented beginning on page 4.

Attachment

cc: Assistant Secretary for Environmental Management
Chief of Staff

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Regulation and Permits

The Office of River Protection (ORP) pursued the Transuranic Mixed Tank (TRUM) Waste Project without sufficiently addressing regulatory and permitting issues. In 2003, ORP initiated efforts through its contractor, CH2M Hill Hanford Group, Inc. (CHG) to proceed with the TRUM waste project. According to its plan, CHG would initiate retrieval of the TRUM waste from the tanks beginning in October 2004, and make its first shipment of the treated waste to Waste Isolation Pilot Plant (WIPP) in June 2005. To accomplish its plan, the Department incentivized CHG with $8 million in incentives. CHG initiated its design efforts on the project and in November 2003, issued an $11 million subcontract to acquire the necessary equipment. However, we found that the Department had not sufficiently addressed regulatory and permitting issues prior to incentivizing the contractor and proceeding with work on the project.

The Department has not yet completed the regulatory actions required under the *National Environmental Policy Act of 1969* (NEPA) prior to proceeding with the TRUM waste project. The initial NEPA analysis was performed in 1996 and evaluated the environmental impact of vitrifying the waste for disposal at a high-level waste (HLW) repository—a process very different than currently being pursued for the TRUM waste. On December 15, 2003, the Department's ORP approved and issued *Supplement Analysis for Hanford Tank Farm Contact-handled Transuranic Mixed Waste Treatment, Packaging, and Storage (Supplement Analysis)* to the 1996 Environment Impact Statement (EIS). However, the *Supplement Analysis* did not address key issues which the Department's Office of Environment, Safety and Health (EH) considered critical to the public. Specifically, EH noted the analysis did not:

- Clarify the waste classification in light of recent court decisions;
- Address the cost, feasibility, additional waste generation, and timing issues related to reversing the TRUM waste treatment process if the waste is not accepted for disposal at WIPP;
- Consider the environmental impact of reversing the action; and,
- Address potential worker impact for storing the waste above ground.

Although the above concerns were raised in 2003, ORP did not decide to begin addressing them until April 2005 as part of a broader EIS process on technologies to accelerate tank waste retrieval.

In addition, the Department had not sufficiently resolved permitting issues prior to initiating the TRUM waste project. As early as 2003, the State of New Mexico, Environment Department (NMED), which grants the permit for final disposal of the waste at WIPP, expressed concerns about disposing of the tank waste at WIPP because it had been managed as high-level waste (HLW). Additionally, the State of Washington, Department of Ecology (Ecology) officials indicated that they would not issue a permit to retrieve, treat, and temporarily store the waste above ground at the Hanford Site until there is an approved geological disposal site, for example, WIPP. Despite these concerns, ORP pursued the project without addressing NMED concerns. In July 2004, the Department and NMED signed an agreement, that for the interim, no tank waste would be sent to WIPP under the current permit. Subsequently, ORP drafted a permit to dispose of the tank waste at WIPP, but in April 2005, ORP decided to curtail work on the project.

ORP has requested its contractor to prepare a transition plan to, among other things, deploy equipment procured for the TRUM project to other projects. ORP officials told us they plan to renew work on the project once the necessary regulatory and permitting processes are complete and sufficient budget resources are available.

Project Management

ORP did not fully identify and mitigate risks associated with the TRUM waste project because it did not follow key project management principles. The Department's project management principles require the development of a project execution plan which, among other things, addresses the need for a risk management plan. An essential part of the plan is to ensure that the risks associated with a project have been identified, analyzed, and determined to be either eliminated, mitigated, or manageable. While the Department had developed the *Integrated Mission Acceleration Plan* in 2003, this plan addressed the retrieval, treatment, and disposal of waste from 177 waste tanks at Hanford. It was developed at a very broad level and did not focus on specific risks to the TRUM waste project; i.e. whether the waste would be accepted for disposal at WIPP under the existing permits. The development of such a plan would have assisted the Department in identifying risks and developing mitigation strategies.

Environmental Risks and Costs

If ORP had addressed regulatory and permitting issues early in the project, it may have avoided curtailment of work in 2005. As a result, ORP is at risk of not realizing approximately $459 million in savings that it estimated could be realized by treating and disposing of the waste as TRUM, as oppose to HLW. ORP may also not be able to fully benefit from the $40 million it has invested in the project to date. Additionally, ORP has paid the contractor about $3.7 million of the incentive fee for design and acquisition of retrieval systems and procurement of equipment. The contractor has also requested that ORP provide an equitable adjustment to its contract so that it has an opportunity to earn the remainder of the $8.3 million TRUM waste project-related incentives by performance on other projects.

RECOMMENDATIONS

We recommend that the Principal Deputy Assistant Secretary, Environmental Management, direct the Manager, Office of River Protection to:

1. Mitigate regulatory and permitting risks, including the concerns raised by EH before resuming work on the TRUM tank waste project; and

2. Ensure risk mitigation plans are developed in the future that identify project-specific risks and propose appropriate mitigation strategies before initiating projects and resuming the TRUM waste project.

MANAGEMENT REACTION AND AUDITOR COMMENTS

The Office of Environmental Management concurred with the recommendations in the report. However, management disagreed with certain facts and conclusions contained in the report.

With reference to the recommendations, management stated that it intends to obtain the requisite NEPA coverage through the Tank Closure EIS; have the State of New Mexico Environment Department and the U.S. Environmental Protection Agency conduct independent reviews; and incorporate additional risk mitigation elements into the path forward consistent with DOE 413.3 requirements. We consider management's planned actions to be generally responsive to the recommendations.

Nonetheless, management did not agree with several points raised in the report. Management's concerns, along with the auditors' comments, are presented below.

Management Comment: Management stated that ORP did have risk measures in place consistent with the Department's project management principles that addressed reasonably foreseeable technical and regulatory risks. ORP and its contractors had numerous exploratory meetings and discussions (including site visits) with both the Ecology and NMED to identify a path forward and associated risk. Additionally, ORP's mitigation strategy included provisions for using equipment purchased for the project on other ORP projects with similar needs.

Auditor Comment: We are aware that ORP has had multiple discussions and meetings with NMED and Ecology over the path forward for the transuranic mixed tank waste. However, ORP was unable to provide us with key project management documents, such as a written project execution plan, risk assessment, or risk mitigation plan specific to the TRUM waste project. While elements of these documents were included in the 1996 EIS, they were very general in nature and addressed all of the waste storage tanks at Hanford. Further, there are critical parts of the TRUM waste project, such as above ground waste storage, that were not addressed in the 1996 EIS.

While ORP identified a mitigation strategy for the equipment once it was determined the project could proceed no further without the necessary permits, such an approach is not effective in mitigating project risk. Rather, effective risk mitigation is addressed early on to ensure the project's success. The mitigation strategy to distribute equipment to other projects was employed by ORP after the project could proceed no further without necessary permits rather than early on as a means to evaluate whether the procurement should proceed at all. Waiting to mitigate risks after a project is being suspended can also result in unnecessary costs. In fact, CHG estimates it will cost the Government around $2 million to ramp-down this project including the closeout of contracts. This funding could have been invested in current operations, performing the NEPA process, and applying for the appropriate permits.

Management Comment: Management stated that the requirement for WIPP Class 3 Permit Application was not in place at the time the project was initiated and was not raised as a potential requirement by NMED.

Auditor Comment: The TRUM waste project started in FY 2003. As early as November 11, 2003, the Department became aware that tank waste would not be accepted after NMED filed a public

notice of intent proposing to approve an agency-initiated modification to the Hazardous Waste Facility Permit for WIPP. This modification would limit waste eligible for disposal at WIPP to the inventory identified when the permit was originally issued. According to NMED, there is a specific list of Transuranic waste types shown in the "Transuranic Waste Baseline Inventory Report" (TWBIR) that will be acceptable for final disposal at WIPP and waste in the Hanford underground tanks was not identified on the 1995 TWBIR. In July 2004, the Department agreed not to process tank waste for disposal at WIPP until a Class 3 Permit allowing them to do so was approved. Further, in September 2004, the Office of Inspector General briefed both ORP and Environmental Management of our concerns about proceeding with the project until the appropriate permits were approved that would allow the Department to process the waste as TRUM. Thus, the Department had ample time to reevaluate the project prior to the April 2005 curtailment.

Management Comment: Management stated that the draft report's reference to "waste classification" and "recent court decisions" does not appear to take into account that the waste in the eight tanks is not high-level waste by virtue of its origin. The court decision (which was subsequently remanded) applied to the use of the waste-incidental-to-reprocessing evaluation criteria in DOE Manual 435-1-1. Those criteria are not applicable to the eight tanks and were never intended to be applied.

Auditor Comment: The issues of waste classification and recent court decisions were raised by the Department's Office of Environment, Safety and Health in its comments on the *Supplement Analysis for Hanford Tank Farm Contact-handled Transuranic Mixed Waste Treatment, Packaging, and Storage.* Our point in discussing these issues is that ORP did not respond to them, although they were concerns raised about the completeness of its environmental analysis supporting the decision to pursue the TRUM project.

Appendix 1

OBJECTIVE

The objective of this audit was to determine whether the Office of River Protection had sufficiently addressed regulatory and permitting issues prior to proceeding with the TRUM waste project.

SCOPE

We conducted the audit from March 2004 to June 2005 at the Hanford Site near Richland, Washington. The scope of the audit focused on the Department's transuranic mixed tank waste project, which was initiated in Fiscal Year 2003, and its plans to treat waste from 11 underground storage tanks for disposal at the Waste Isolation Pilot Plant in Carlsbad, New Mexico.

METHODOLOGY

To accomplish the audit objective, we:

- Obtained and reviewed cost analysis alternatives, documents discussing origins of the waste, and a waste study calculating dose rates of single shell tank waste;
- Researched Federal and Departmental regulations;
- Reviewed implementing procedures for the *National Environmental Policy Act of 1969*;
- Reviewed findings from prior audit reports regarding the risks and uncertainties in the Department's plans to clean up the Hanford Site tank farm high-level waste;
- Reviewed the CH2M HILL Hanford Group Inc. statement of work for the Department's Office of River Protection;
- Assessed internal controls regarding project management; and,
- Interviewed key personnel in the Department's Office of Environmental Management; Office of Environment, Safety and Health; Office of General Counsel; Office of River Protection; Richland Operations Office and contractors; State of Washington Department of Ecology and the State of New Mexico Environment Department.

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. We assessed the Department's compliance with the *Government Performance and Results Act of 1993*. The Department did not establish specific performance measures for the transuranic mixed tank waste project. 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. Finally, we did not rely on computer-processed data to accomplish our audit objective.

An exit conference was held with Environmental Management and Office of River Protection officials on September 14, 2005.

PRIOR AUDIT REPORTS

Office of Inspector General Reports

- *Accelerated Tank Waste Retrieval Activities at the Hanford Site* (DOE/IG-0706, October 2005). The audit disclosed that, in terms of both schedule and cost, the Department will not meet its Tri-Party Agreement milestone for the retrieval of waste from the single-shell tanks located at the C-Tank Farm. Based on the Department's latest schedule baseline, completion of retrieval activities will not be completed until March 2007, or six months after the Tri-Party Agreement milestone. Further, the path forward for completion of retrieval activities is not encouraging. For example, the Department's schedule baseline is dependent upon operating 24 hours a day, seven days a week. However, we found that, at the time of the audit, CH2MHill Hanford Group, Inc. had not hired any additional personnel needed to enable the contractor to operate on such an expedited schedule. Further, the Department estimated that waste retrieval costs have increased to $215 million, more than doubling the initial estimate.

- *Sludge Removal Operations at the Hanford Site's K Basins* (DOE/IG-0698, September 2005). The audit disclosed that the sludge removal has continued to slip and has experienced significant cost overruns. Actual costs have exceeded budget costs by about $34 million since October 2002. The Department and its contractor Fluor Hanford, Inc. had not focused adequate attention on the sludge removal during the critical planning phase nor development of a risk management plan. As a result, cost overruns within the project could negatively impact the Department's ability to further accelerate cleanup work on the Hanford Site.

- *Transuranic Waste Retrieval and Processing at the Hanford Site* (DOE/IG-0624, October 2003). The audit identified that the Department faces significant challenges in its efforts to retrieve and process transuranic (TRU) waste at the Hanford Site. None of nearly 10,000 containers had been retrieved. Because the Waste Retrieval and Processing (WRAP) facility has been underutilized it cost the Department $413,000 to store about 4,000 containers of TRU waste at the Central Waste Complex. The Department had not performed sufficient analysis to determine the optimal operating level for the WRAP to meet cleanup milestones and minimize project costs

- *Disposal of Remote-Handled Transuranic Waste at the Waste Isolation Pilot Plant* (DOE/IG-0613, July 2003). The report concluded that opportunities exist for the Department to improve the efficiency of the remote-handled TRU waste disposal program over the next two decades.

- *Disposal of the Rocky Flats Environmental Technology Site's Low-Level Mixed Waste* (DOE/IG-0612, July 2003). The Department's preferred disposal sites were not accepting low-level mixed waste (LLMW) from other Department sites. The Department has considered blending the LLMW up to the level of transuranic waste and disposing of the waste at WIPP; however, this alternative could cost the Department an additional $320 million.

Appendix 2

Government Accountability Office

- *Nuclear Waste: Absence of Key Management Reforms on Hanford's Cleanup Project Adds to Challenges of Achieving Cost and Schedule Goals* (GAO-04-611, June 2004). GAO stated that there was "Inadequate planning to assess and mitigate the effects of a legal challenge to DOE's overall approach to treating and disposing of high-level radioactive waste." GAO reported that the treatment strategy rests heavily on the Department's ability to determine that a majority of its tank waste can be classified as other than high-level waste and treated with less expensive technologies. GAO believed a more thorough analysis and full disclosure are needed concerning the potential risk this legal issue poses to the waste treatment project at Hanford including potential impacts on the project's cost and schedule and the environmental risks associated with further delays. GAO believes full disclosure is important so that policy makers and others can undertake a more informed debate about the Department's high-level waste program.

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