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Congressional Committees

Subject: *Nuclear Waste: DOE's Environmental Management Initiatives Report Is Incomplete*

The Department of Energy (DOE) spends billions of dollars annually to clean up nuclear waste at sites across the nation that produced nuclear weapons from the 1940s through the end of the Cold War. This waste can threaten public health and the environment. For example, contaminants at DOE's Hanford site in Washington have migrated through the soil into the groundwater, which generally flows toward the Columbia River. The river is a source of irrigation for agriculture and drinking water for downstream communities as well as a major route for migrating salmon. Cleanup projects decontaminate and demolish buildings, remove and dispose of contaminated soil, treat contaminated groundwater, and stabilize and dispose of solid and liquid radioactive wastes, among other things. DOE's Office of Environmental Management currently oversees more than 80 of these cleanup projects, primarily at government-owned, contractor-operated sites throughout the nation. Some of these highly complex projects have completion dates beyond 2050.

We have issued numerous reports on DOE's management of its cleanup projects. For example, since 2006 we have issued 12 reports examining DOE's contract and project management. In March 2009, we testified that 9 of the 10 major cleanup projects that we reviewed had experienced cost increases—in total, DOE estimated that it needed an additional \$25 billion to \$42 billion to complete these cleanup projects.¹ We also reported in September 2008 that these major cleanup projects had experienced delays from 2 to 15 years.² These problems were the result of inconsistent application of project management tools and techniques on the part of DOE and its contractors. Furthermore, since 1990, we have designated DOE's contract management as a high-risk area for fraud, waste, abuse, and mismanagement because of the department's record of inadequate management and oversight of its projects. In January 2009, we narrowed the scope of this high-risk area to focus on the two major offices remaining within DOE that continue to experience significant problems—the Office of Environmental Management and the National Nuclear Security Administration

¹GAO, *Department of Energy: Contract and Project Management Concerns at the National Nuclear Security Administration and Office of Environmental Management*, [GAO-09-406T](#) (Washington, D.C.: Mar. 4, 2009).

²GAO, *Nuclear Waste: Action Needed to Improve Accountability and Management of DOE's Major Cleanup Projects*, [GAO-08-1081](#) (Washington, D.C.: Sept. 26, 2008).

(NNSA).³ Together, these two program offices account for about 60 percent of the department's annual budget.

Under Section 3130 of the National Defense Authorization Act for Fiscal Year 2008 (the Act),⁴ DOE was required to report to the congressional defense committees and to the Comptroller General of the United States by September 30, 2008, on the status of the environmental management initiatives that it has undertaken to more rapidly reduce the environmental risks and challenges resulting from the legacy of the Cold War. In particular, the Act required DOE to include five elements in its report, (1) a discussion and assessment of progress made in reducing environmental risks and challenges; (2) an assessment of whether legislative changes or clarifications would improve or accelerate environmental management activities; (3) a listing of major mandatory milestones and commitments DOE faces; (4) an estimate of the life-cycle cost of DOE's current environmental management program; and (5) a description of the process DOE follows for nominating and accepting new work scope into the environmental management program, and schedules to address new work. DOE's Office of Environmental Management issued the required report in January 2009.⁵

Section 3130 of the Act also required GAO to review DOE's report and report to the congressional defense committees. As agreed with your staffs, this report addresses the extent to which the report that DOE prepared discusses the five elements called for under the Act.

To determine the extent to which the DOE report contains all of the elements required by the Act, we reviewed the report and compared it with the Act's requirements. We also reviewed prior GAO work on DOE's management of its cleanup projects. In addition, we interviewed DOE Office of Environmental Management officials at DOE headquarters in Washington, D.C. We conducted this performance audit from January through June 2009 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 based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings.

DOE's Report Fully Discusses One Element, Partially Discusses Three Elements, and Does Not Discuss One Element

DOE's report only partially addresses the five elements required by the Act. Specifically, only one element—an estimate of the life-cycle cost of DOE's current environmental management program—was fully discussed. Three elements—discussing progress in reducing environmental risks and challenges, listing major mandatory milestones, and describing new work scope processes—were partially

³GAO, *High-Risk Series: An Update*, [GAO-09-271](#) (Washington, D.C.: January 2009).

⁴Pub. L. No. 110-181 (2008).

⁵DOE, *Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War* (Washington, D.C.: Jan. 16, 2009).

discussed. For example, in discussing progress in reducing environmental risks and challenges, DOE did not always clearly connect progress in environmental cleanup with environmental risk reduction. The remaining element—an assessment of whether legislative changes or clarifications would improve or accelerate environmental management activities—was not discussed in the report. DOE officials told us that certain elements were only partially discussed or were not discussed for several reasons, including, in the case of suggested legislative changes, because the department did not want to preempt any nuclear cleanup policy changes the new presidential administration might announce.

Element One—Environmental Risk Reduction: DOE’s Report Discusses Cleanup Progress at Its Sites, but in Some Cases Does Not Explain How This Progress Reduced Environmental Risks

Section 3130(b)(1) of the Act required DOE’s report to include “a discussion and assessment of the progress made in reducing the environmental risks and challenges” in the following areas:

- acquisition strategy and contract management;
- regulatory agreements;
- interim storage and final disposal of high-level waste, spent nuclear fuel, transuranic waste, and low-level waste;
- closure and transfer of environmental remediation sites;
- achievements in innovation by contractors of the department with respect to accelerated risk reduction and cleanup; and
- consolidation of special nuclear materials and improvements in safeguards and security.

DOE’s report discusses progress in each of these areas. For example, the report has significant detail on improvements that the department has made in acquisition, contract, and project management. These improvements include, among other things, transitioning to performance-based contracts, standardizing the acquisition process, and enhancing personnel capabilities as well as applying project management principles and monitoring project performance. In addition, in its discussion of regulatory agreements, DOE’s report notes that the department is working with its regulators to identify actions that can accelerate cleanup, because setting cleanup priorities solely on the basis of achieving compliance milestones would not necessarily support the greatest risk reduction. Furthermore, the report discusses many examples of cleanup progress, such as the disposal of approximately 9 million cubic meters of low-level waste and mixed low-level waste; the removal of all spent nuclear fuel from basins at Hanford; and the removal of transuranic waste

from 14 sites.⁶ DOE also discusses innovations in cleanup technologies, including, for example, a technology to reduce the amount of strontium—a metal found in nuclear waste—that can contaminate groundwater.

Nevertheless, in some cases, DOE's report does not sufficiently assess the progress made in reducing environmental risks as required. For example, the report cites 1,000 acres of soil remediated at DOE's Oak Ridge Reservation in Tennessee as evidence of its progress. However, the report does not note whether these 1,000 acres were of high, medium, or low environmental risk, nor does it describe the potential environmental consequences of failing to remediate this soil. Similarly, DOE's report notes that the department has deactivated 112 buildings and structures totaling 1.3 million square feet at DOE's Idaho National Laboratory since May 2005. However, the report does not assess how deactivating these buildings—some of which may have housed offices and other nonhazardous operations—reduced environmental risks at the site.

Element Two—Legislative Changes: DOE's Report Does Not Assess Potential Legislative Changes to Improve or Accelerate Environmental Management Activities

Section 3130(b)(2) of the Act required DOE's report to include an assessment of whether legislative changes or clarifications would improve or accelerate environmental management activities. Despite this requirement, DOE's report does not contain such an assessment.

DOE officials told us that the department did not want to suggest legislative changes for nuclear cleanup in advance of decisions the new presidential administration might issue, nor did the department want to be perceived as dictating policy changes. These officials also said that DOE could provide suggested new legislation upon congressional request.

Element Three—Major Mandatory Milestones: DOE's Report Lists Major Mandatory Milestones as Required, but Does Not Include Categories for Noncompliance

Section 3130(b)(3) of the Act required DOE's report to list the major mandatory milestones and commitments, by site, type of agreement, and year, to the extent that they are currently identified. The report is also required to contain a summary of the major mandatory milestones, by site, that are projected to be missed or are in jeopardy of being missed, along with categories to explain the reason for noncompliance.

For 12 DOE cleanup sites, the department lists 345 mandatory milestones as well as identifies 47 of these milestones at 4 sites that are at risk of not meeting commitment

⁶Low-level waste includes items that have become contaminated with radioactive material or have become radioactive through exposure to neutron radiation, and mixed low-level waste is low-level waste that also contains a hazardous chemical. Spent nuclear fuel is generated from research associated with nuclear power, and production of nuclear materials for use in nuclear weapons, scientific research, and medicine. Transuranic waste is a type of radioactive waste that contains elements with atomic numbers greater than uranium, which has an atomic number of 92.

dates. However, DOE does not provide categories of reasons for noncompliance as required by the Act. Instead, DOE states that certain circumstances, such as unanticipated obstacles that affected the original scope of work, explain the majority of at-risk milestones. According to DOE officials, the department did not include categories of reasons for noncompliance because the list would not provide a clear picture of reasons for noncompliance. Specifically, 23 of 47 milestones had noncompliance reasons that fell into two or more of the four categories—funding, technical difficulty, project performance, and unrealized assumptions. DOE officials provided us with the list of milestones and categories for noncompliance that had been created for an earlier draft of their report. In commenting on a draft of our report, DOE officials told us that site-specific reasons for noncompliance were not included in their report because they believed a higher-level summary would be more useful to the reader. They also noted that the specific reasons for noncompliance are reported to the appropriate states and are available to the public.

Element Four—Life-Cycle Costs: DOE’s Report Discusses Cleanup Projects’ Life-Cycle Costs

Section 3130(b)(4) required DOE’s report to include an estimate of the life-cycle cost of the current scope of the environmental management program by project baseline summary, and summarized by site. The Act states that this discussion should include the assumptions impacting cost projections and descriptions of the work to be done at each site.

As required, DOE discusses life-cycle cost estimates for the current scope of the environmental management program from 1997 to 2008 by project baseline summary, provides a list of work to be done, and describes assumptions affecting cost projections for the program. DOE’s report estimates the current life-cycle cost of the environmental management program to be from \$274 billion to \$330 billion. In addition, the department provides an estimated cost range of \$205 billion to \$261 billion and planned completion dates for 25 sites through 2062. The report also describes the remaining work at each of these sites.

Element Five—New Work Scope: DOE’s Report Discusses the Process for Adding New Work Scope to the Environmental Management Program, but Does Not Include a Schedule for Addressing This Work

For environmental cleanup liabilities and excess facilities projected to be transferred to the environmental management program, Section 3130(b)(5) of the Act required DOE’s report to include a description of the process for nomination and acceptance of new work scope into the program, a listing of pending nominations, and life-cycle cost estimates and schedules to address them.

To comply with this section, DOE provides a list of pending nominations and life-cycle cost estimates for cleanup activities that may be transferred to the environmental management program from other DOE entities, such as NNSA and DOE’s Office of Science. Specifically, the department reports that approximately 5.8 million square feet of excess facilities have been proposed for transfer to the

environmental management program, and that these facilities would add approximately \$3.7 billion to \$9.1 billion of life-cycle cleanup costs to current DOE estimates. DOE's report notes that the environmental management program requests other DOE offices to nominate cleanup activities annually. The program then consolidates this information and formalizes it with agreements between the environmental management program and the other DOE offices concerning the proposed transfer period and budget responsibilities.⁷

However, DOE's report does not include schedules for addressing new work scope as required by the Act. DOE officials told us that the report does not include schedules because the program cannot accept additions to its current scope of work until 2017, and, thus, it would be unreasonable to develop schedules for cleanup that cannot occur until then. In commenting on a draft of this report, DOE officials told us the department was able to accept additional work scope into the environmental management program using funding received as a result of the American Recovery and Reinvestment Act.⁸

Agency Comments and Our Evaluation

We provided a draft of this report to DOE for its review and comment. On May 15, 2009, we met with DOE officials, including DOE's Acting Assistant Secretary of Environmental Management, to obtain oral comments on our draft report. DOE officials generally agreed with our findings that the report the department prepared to comply with the Act does not discuss legislative changes to improve or accelerate environmental management activities, and that DOE's report lacks schedules for addressing excess facilities that could be transferred into the program. These officials noted that additional cleanup work associated with excess facilities will be transferred to the environmental management program and will be addressed using funding obtained as a result of the American Recovery and Reinvestment Act. However, DOE officials disagreed with our assessment of this element as "partially discussed" because, according to these officials, "the Act required numerous data points regarding excess facilities" and "only one specific data point was not fully addressed." Nevertheless, the Act specifically required DOE's report to contain a discussion of the schedules to address additional cleanup work. This discussion, as DOE officials conceded, is not included. Therefore, we maintain that our assessment of this element as partially discussed is appropriate.

DOE officials also agreed that the department's report lacks the linkage of specific reasons for noncompliance to at-risk milestones identified in the report, but disagreed that this omission was the result of a desire to protect DOE from legal action as our draft report stated. These officials explained that numerous factors affect the ability to meet compliance milestones, and that DOE could not always link at-risk milestones to one specific category. Instead, DOE officials said that categories for noncompliance with major mandatory milestones were omitted

⁷Detailed information on the process that DOE uses to nominate and accept additional cleanup work is available in DOE Guide 430.1-5, *Transition Implementation Guide*.

⁸The American Recovery and Reinvestment Act is Pub. L. No. 111-5 (2009).

because they believed a higher-level summary would be more helpful to the reader. We modified our report accordingly. DOE officials again disagreed with our assessment of this element as “partially discussed” because they believed this assessment does not fully indicate the quantity of information DOE’s report includes in this element. Nevertheless, the Act specifically required DOE’s report to contain a “summary of the major mandatory milestones by site that are projected to be missed or are in jeopardy of being missed along with categories to explain the reason for noncompliance.” Notwithstanding DOE officials’ belief that a higher-level summary would be more helpful to the reader, DOE’s failure to include categories to explain the reason for noncompliance as required by the Act justifies our assessment of this element as partially discussed.

DOE officials also disagreed with our finding that the department’s report only partially discussed the first element required by the Act—a discussion and assessment of the progress made in reducing environmental risks and challenges. Again, DOE officials felt that our assessment of this element as “partially discussed” insufficiently captured the extensive amount of information DOE included in its report to demonstrate its progress in reducing environmental risk. We agree that DOE’s report contains extensive discussion of the department’s cleanup progress to date, and we have modified our report to include several more examples that DOE cited in its report. However, we maintain that, in some cases, the examples that DOE’s report uses as evidence of the progress it has made do not clearly demonstrate a reduction in environmental risk. For example, the report’s discussion of the number of buildings that DOE has demolished at several of its sites does not clearly indicate a corresponding reduction in environmental risk. This is because these demolished buildings may have consisted of offices or contained other nonhazardous activities. Without a clear explanation of the relative environmental risks posed by specific buildings, we maintain that an aggregated measure of demolished buildings does little to demonstrate a reduction in environmental risk.

Finally, given our report’s objective of addressing the extent to which the report that DOE prepared discusses the five elements called for under the Act, DOE officials questioned the relevance of our discussion in our draft report’s introduction of the cost increases and schedule delays experienced by DOE cleanup projects. These officials also questioned the relevance of our discussion of DOE’s contract management as a high-risk area for fraud, waste, abuse, and mismanagement. We disagree. In our view, the discussion of the significant cost increases and schedule delays experienced by major cleanup projects managed by the DOE’s Office of Environmental Management provides important context to understand the challenges that the department faces in completing this cleanup work. Furthermore, the first element of the Act requires a discussion of the progress that DOE has made in addressing the department’s contract management challenges. Therefore, our discussion of DOE contract management as a high-risk area is appropriate, given the objective of our report. We made no changes to our report as a result of this comment.

DOE officials also provided technical comments that we have incorporated throughout the report, as appropriate.

We are sending copies of this report to the Secretary of Energy, the appropriate congressional committees, and other interested parties. This report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at (202) 512-3841 or aloisee@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report include Ryan T. Coles, Assistant Director; Sandra Kerr; and Michelle K. Treistman. Omari Norman and Cheryl Peterson also contributed to this report.

A handwritten signature in black ink that reads "Gene Aloise". The signature is written in a cursive style with a large, looping initial "G".

Gene Aloise
Director, Natural Resources and Environment

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