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GAO

Report to the Subcommittee on Energy and Water Development, Committee on Appropriations, House of Representatives

June 2007

NUCLEAR WASTE

Plans for Addressing Most Buried Transuranic Wastes Are Not Final, and Preliminary Cost Estimates Will Likely Increase

GAO-07-761

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Highlights

Highlights of GAO-07-761, a report to the Subcommittee on Energy and Water Development, Committee on Appropriations, House of Representatives

Why GAO Did This Study

Since the 1940s, the development of nuclear weapons technologies has generated transuranic wastes—materials contaminated by certain man-made radioactive elements. These wastes can remain dangerous for thousands of years. Until 1970, the Department of Energy's (DOE) predecessors buried these wastes in shallow pits and trenches. Today, state officials and communities near DOE's major disposal sites have expressed concerns that such wastes might contaminate important ground and surface water resources.

GAO was asked to (1) determine the legal requirements and policies affecting DOE's efforts to address transuranic wastes buried before 1970, (2) determine what DOE is doing to address sites where these transuranic wastes are buried, and (3) assess the reliability of DOE's estimated costs to address these sites.

We met with federal and state officials at five DOE sites containing buried transuranic wastes, reviewed environmental laws and guidance, and obtained buried waste cleanup cost estimates from each site.

In commenting on this report, DOE generally agreed with our findings, and provided some clarifying comments.

What GAO Recommends

GAO is not making recommendations at this time.

www.gao.gov/cgi-bin/getrpt?GAO-07-761.

To view the full product, including the scope and methodology, click on the link above. For more information, contact James Cosgrove, 202-512-3841 or cosgrovej@gao.gov.

What GAO Found

Cleanup agreements with federal and state agencies require DOE to investigate and clean up the five major DOE sites where transuranic and other hazardous wastes were buried. While DOE has long considered pre-1970s buried wastes permanently disposed, in 1989, the sites where most of these wastes are buried were listed as "Superfund" sites subject to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). CERCLA requires that DOE determine the nature and extent of contamination at each waste site and determine what cleanup action, if any, is needed to protect human health and the environment. All five disposal sites are scheduled to have cleanup completed by 2025.

DOE is addressing the transuranic wastes buried at two sites, but it is still investigating cleanup options at the other three locations. At Oak Ridge and Savannah River, DOE is leaving the transuranic wastes in place under an earthen cap designed to prevent the wastes from migrating and taking steps to prevent animal and human access to the sites. In contrast, DOE is still investigating cleanup options at the Idaho National Laboratory, the Hanford Site, and the Los Alamos National Laboratory—where about 90 percent of DOE's transuranic wastes are buried. DOE has begun to remove a small amount of waste at the Idaho and Hanford sites, but how much buried transuranic wastes eventually will be removed or treated in place at these sites is currently undetermined.

DOE's preliminary estimate of the cost to address the five waste sites where transuranic wastes are buried is about $1.6 billion in 2006 dollars, but the estimate is likely to increase for several reasons. For example, the estimates reflect the costs of leaving most waste under earthen barriers—typically the least expensive approach. If DOE is required to retrieve substantial portions of these wastes, costs would increase dramatically. In addition, the estimates exclude unknown costs, such as the cost of disposing wastes off-site, if necessary. For example, DOE's lifecycle cost estimate to remove transuranic wastes buried near the Columbia River at the Hanford site could triple once options and costs for disposal are fully evaluated. As DOE further evaluates the risks, benefits, and costs of cleanup options, its policies require it to improve the reliability of cost estimates. Thus, GAO is not making recommendations at this time.

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
DOE	Department of Energy
EPA	Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act of 1976, as amended
WIPP	Waste Isolation Pilot Plant

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GAO
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United States Government Accountability Office
Washington, DC 20548

June 22, 2007

The Honorable Peter J. Visclosky
Chairman
The Honorable David L. Hobson
Ranking Member
Subcommittee on Energy and Water Development
Committee on Appropriations
House of Representatives

Since the 1940s, the Department of Energy (DOE) and its predecessors have operated a nationwide complex of facilities used to research, design, and manufacture nuclear weapons and related technologies. While these activities are important for national defense, they have left a legacy of radioactive and other hazardous wastes that have contaminated or could contaminate the environment. Among them is a large quantity of transuranic wastes—typically, discarded rags, tools, equipment, soils, or other solid materials that have been contaminated by man-made radioactive elements, such as plutonium or americium. Transuranic wastes remain radioactive for extremely long periods—hundreds of thousands of years, in some cases. Inhaling or ingesting even miniscule quantities of some transuranic elements can cause cancer in humans.

According to DOE, the department has buried or stored approximately 238,000 cubic meters of transuranic wastes (equal to the volume of about 100 Olympic-sized swimming pools) at its sites. About 111,000 cubic meters of these wastes were generated mostly after 1970, and then stored at various locations with the bulk of these wastes intended for transfer to the Waste Isolation Pilot Plant (WIPP)—a deep geologic repository in New Mexico designed for permanent disposal of transuranic wastes.[1] The other 127,000 cubic meters of transuranic wastes were disposed of, generally before 1970, when DOE buried these wastes in shallow pits and trenches,

[1]This report refers to wastes that were generated after 1970 and subsequently stored for deep geologic disposal at WIPP as "stored" transuranic wastes. At some locations, these stored wastes were placed in containers and then buried underground.

often with other radioactive and hazardous wastes.[2] DOE estimates that most of these transuranic wastes are buried at its Hanford Site in Washington state and the Idaho National Laboratory, while almost all of the remaining transuranic wastes are buried at the Los Alamos National Laboratory in New Mexico, the Oak Ridge National Laboratory in Tennessee, and the Savannah River Site in South Carolina.

In addition to the threats that buried transuranic wastes may pose, the other radioactive and hazardous wastes buried with them may pose additional threats. Some of these wastes emit skin-penetrating radiation and cannot be directly handled by humans. Other wastes, such as organic solvents and toxic metals, are volatile. In some cases, these wastes can migrate readily through soil, especially if exposed to water, and may contaminate surface waters and groundwater.

Given the potential long-term threat that buried transuranic and other radioactive and hazardous wastes may pose to human health and the environment, including their potential to contaminate water resources, state environmental protection officials and communities adjacent to these disposal sites have expressed concerns about these wastes. You asked us to (1) determine the legal requirements and policies governing DOE's efforts to address transuranic wastes buried before 1970, (2) determine what DOE is doing to address sites where these transuranic wastes are buried, and (3) assess the reliability of DOE's estimated costs to address these sites.

To conduct our work, we visited the five DOE sites that contain most of DOE's transuranic wastes buried before 1970. We met with local DOE officials at these five largest burial sites, which include the Hanford Site, the Idaho National Laboratory, the Los Alamos National Laboratory, the Savannah River Site, and the Oak Ridge National Laboratory. To determine the legal requirements and policies governing DOE's efforts to address its buried transuranic wastes, we reviewed federal environmental laws and regulations; DOE guidance concerning hazardous and radioactive wastes;

[2]Transuranic waste was first identified as a separate waste category in 1970, and its original statutory definition was revised in 1982. For ease of discussion, this report refers to all wastes contaminated with transuranic elements as transuranic wastes, regardless when it was generated or disposed or whether it meets the current statutory definition. Transuranic wastes that were disposed of at shallow or intermediate depths before issuance and implementation of a 1970 directive prohibiting this practice are referred to as "buried transuranic wastes."

Federal Facility Agreements and Orders; a May 2006 federal district court decision; and internal DOE, federal, and private studies on the storage and disposition of transuranic wastes. To better understand these laws, regulations, agreements, and policies we interviewed state environmental protection officials and Environmental Protection Agency (EPA) officials that oversee each of the buried waste locations. To determine what DOE is doing to address sites where transuranic wastes are buried, we reviewed waste cleanup planning documents that DOE prepared for these sites. In this context, we also interviewed scientific experts, DOE site project managers, state environmental regulatory officials, and EPA officials providing management and oversight at buried waste locations. Finally, to assess the reliability of DOE's estimates of the cost of addressing sites where transuranic wastes are buried, we analyzed each DOE field location's fiscal year 2006 estimates for projects that included cleaning up buried transuranic wastes. A more detailed description of our scope and methodology is presented in appendix I. We performed our work between May 2006 and May 2007 in accordance with generally accepted government auditing standards.

Results in Brief

Cleanup agreements entered into with federal and state environmental agencies require DOE to investigate and, as necessary, clean up sites where radioactive and other hazardous wastes, including transuranic wastes, were buried from the 1940s through 1970s. While DOE considered transuranic wastes buried prior to 1970 to have been permanently disposed of, the sites where most of these wastes are buried have since become subject to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), also known as "Superfund," and other environmental laws. Under CERCLA, EPA evaluates waste sites for possible inclusion on the National Priorities List—EPA's list of the nation's most serious contaminated sites that contain radioactive or other hazardous substances. In 1989, EPA placed the sites where DOE buried most of its transuranic wastes on the National Priorities List (Hanford Site, Idaho National Laboratory, Oak Ridge National Laboratory, and the Savannah River Site). CERCLA requires DOE to determine the nature and extent of contamination at each of these sites; identify options for addressing the wastes and the relative risks, effectiveness, and costs of each option; and to enter into a cleanup agreement with EPA for the expeditious completion of all necessary cleanup actions. DOE has entered into agreements with EPA and the affected states for carrying out cleanup activities at these four sites. In addition, the Los Alamos National Laboratory, which is not listed on the National Priorities List, is being cleaned up in accordance with similar

agreements with New Mexico under other environmental laws. The agreements for the five sites set milestones by which DOE is expected to complete cleanups at the sites. Of the five sites, the latest scheduled completion date is for the Idaho National Laboratory in 2025.

DOE has made cleanup decisions and is addressing the transuranic wastes buried at Oak Ridge and Savannah River, but it is still investigating cleanup options at the other three locations. At Oak Ridge and Savannah River, where about 10 percent of DOE's transuranic wastes are buried, DOE is leaving the transuranic wastes in place under a man-made barrier constructed of layered vegetation, soil, clay, and synthetic liners designed to prevent water from reaching the wastes and causing them to migrate through the soil. DOE is also implementing controls, such as perimeter fencing, to prevent animal intrusion and control human access to the burial sites. DOE officials, in conjunction with the federal and state environmental agencies, decided to contain the buried wastes in place after concluding that it would be as safe or safer for workers and the environment and less costly than removing the wastes from the ground. Federal and state environmental agencies agreed with DOE's decisions. DOE finished constructing the barriers at Oak Ridge in September 2006 and expects to complete the barrier at Savannah River by summer 2007. In contrast, at the other three sites—the Idaho National Laboratory, the Hanford Site, and the Los Alamos National Laboratory—where about 90 percent of DOE's transuranic wastes are buried, DOE is in varying stages of investigating cleanup options. A federal district court ruled in May 2006 that a 1995 agreement between DOE and Idaho requires DOE to remove all of the stored and buried transuranic wastes at the Idaho site. DOE has appealed this ruling, and, as an interim action, is removing a small amount of transuranic wastes from the site. In the meantime, DOE is evaluating cleanup options for the site and expects to select a cleanup approach by 2009. At Los Alamos and Hanford, DOE is still in the early stages of investigating waste areas and plans to evaluate cleanup options; a cleanup approach will be decided for these sites by 2007 and 2013, respectively. At Hanford, DOE has already agreed to remove a small amount of buried transuranic waste that threatens the Columbia River. In general, state environmental agencies have expressed concern that leaving the transuranic wastes in place at the three sites, even with additional controls to limit intrusion, may not adequately prevent the buried contaminants from spreading to the environment in the long term. How much, if any, buried transuranic wastes will eventually be removed from these sites is undetermined, and final decisions are years away.

DOE's preliminary estimate of the cost to address the five waste sites where transuranic wastes are buried is about $1.6 billion (in fiscal year 2006 dollars), but this estimate will likely increase substantially for two principal reasons. First, DOE's estimate reflects the costs of leaving most of the waste in place under engineered barriers, as DOE is doing at Savannah River and Oak Ridge. This is typically the least expensive approach for addressing buried waste. However, if DOE is required by EPA or state environmental agencies to remove substantial portions of these wastes, costs are likely to increase dramatically. For example, at Idaho, where DOE and the state disagree over the extent to which DOE must remove buried transuranic wastes, preliminary DOE cost estimate indicates that removing all of the transuranic wastes would increase costs from about $1 billion to about $8.2 billion. Second, DOE's estimate excludes unknown costs, such as the cost of disposing wastes off-site, if necessary. For example, some wastes scheduled for exhumation may not meet the waste acceptance criteria established for on-site disposal facilities and may have to be packaged and transported elsewhere, which would increase costs. According to DOE's Inspector General, the $113 million estimate to remove transuranic wastes buried near the Columbia River at Hanford could triple once options and costs for disposal are fully evaluated. As DOE moves these projects forward and further evaluates the risks, benefits, and costs of various cleanup options, its project management policies require it to revise these cost estimates to improve their reliability. Thus, we are not making recommendations at this time.

We provided a draft of this report to DOE for its review and comment. Overall, DOE generally agreed with our findings. However, with regard to the volume of transuranic wastes intended for disposal at WIPP, DOE stated that it regularly adjusts its forecasts and does not currently project that waste volumes will exceed WIPP capacity. While we agree that DOE's current projections do not indicate WIPP capacity will fall short of future requirements, cleanup decisions are still pending at the Hanford Site and the Idaho National Laboratory, which together comprise the bulk of DOE's total inventory of buried transuranic wastes. If substantial portions of the transuranic wastes at these sites must be exhumed and disposed of off-site, WIPP's authorized capacity may be insufficient. DOE also provided technical clarifications, which we have incorporated in this report as appropriate.

Background

DOE's current and former nuclear weapons complex includes dozens of sites nationwide containing nuclear reactors, chemical processing buildings, plants, laboratories, and maintenance facilities that

manufactured thousands of nuclear warheads and together conducted more than one thousand nuclear explosion tests. The environmental legacy of nuclear weapons production includes contaminated buildings, soils, water resources, and large volumes of radioactive and hazardous wastes that require treatment, stabilization to prevent migration, and disposal. DOE estimated in 2006, that the future cost to clean up, dispose, and provide long-term oversight of all wastes will be more than $230 billion over the next 75 years.

Among the sites requiring environmental cleanup are the five sites addressed in this report. The Hanford Site is located on the arid east side of Washington state near Richland and adjacent to the Columbia River. The site was established to produce plutonium for nuclear weapons during World War II and, according to DOE, subsequently produced the majority of the nation's plutonium during the Cold War. The Idaho National Laboratory, located near Idaho Falls in the southeastern Idaho desert, was established in 1949 as the National Reactor Testing Station and was the site of the largest concentration of nuclear reactors—52—in the world. Los Alamos National Laboratory, located in a mountainous area of northern New Mexico, was established in 1943 and played a central role in researching the advanced technologies required for nuclear weapons manufacture. It is where the first atomic bomb was assembled. The Oak Ridge National Laboratory near Knoxville, Tenn., was established in 1943 to pilot the processing of uranium during World War II. The Savannah River Site, near Aiken, S.C., was built in the 1950s to produce basic materials needed in nuclear weapons manufacture, such as tritium and plutonium.

DOE's Office of Environmental Management is responsible for cleaning up contamination left behind at these sites after decades of nuclear production and research. Environmental management officials at DOE field sites plan and oversee the cleanup activities at those sites, but the work itself is carried out primarily by private firms contracted by DOE. Officials from EPA, as well as environmental agency officials from the states in which DOE sites are located, enforce federal and state environmental laws and oversee and advise DOE on its cleanup efforts.

Transuranic elements, which have an atomic weight greater than uranium, are man-made radioactive elements produced in nuclear reactors. Transuranic wastes are created when materials such as clothing and tools come into contact with plutonium and other transuranic elements during processing activities and cannot be reused for other purposes. They were first generated during operations to produce and recover plutonium for

nuclear weapons manufacture and are still being produced in small quantities at laboratories where nuclear research continues today. Federal law currently defines transuranic waste as waste containing more than 100 nanocuries of alpha-emitting transuranic elements (radiation) per gram and with half-lives greater than 20 years with certain exceptions.[3] A half-life is the amount of time required for an element to decay by half, and nanocuries are a measure of radioactivity. Alpha-emitting radiation cannot pass through objects, including human skin, but is extremely dangerous if inhaled or ingested. Some buried wastes contaminated with transuranic elements may not meet the current legal definition of transuranic wastes. For ease of discussion in this report, however, we refer to these wastes as buried transuranic wastes.

Cleanup Agreements Require DOE to Address Sites Where Transuranic Wastes Are Buried

The cleanup agreements DOE entered into with federal and state environmental agencies require DOE to investigate and take action as necessary to clean up sites where transuranic and other wastes were buried. The legal and regulatory framework governing management and disposal of transuranic wastes has changed significantly over the past 50 years, particularly in 1970. Before 1970, there was no separate category for what is now defined as transuranic waste. Consequently, the federal government managed this waste as low-level radioactive waste, which it buried along with hazardous wastes in unlined, shallow pits and trenches, as shown in figure 1.

[3]The definition of transuranic waste specifically excludes (1) high-level radioactive waste; (2) waste that DOE has determined with the concurrence of EPA, does not need the degree of isolation required by the disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case by case basis in accordance with 10 C.F.R. part 61. See *Waste Isolation Pilot Plant Land Withdrawal Act*, Pub. L.No. 102-579, § 2(20), 106 Stat. 4777-79 (1992).

Figure 1: Typical Disposal of Transuranic and Other Wastes in Unlined Trench at the Hanford Site Prior to 1970

Source: DOE.

In 1970, in response to concerns that transuranic elements remain radioactive for an extremely long time and scientific research recommending deep geologic disposal for this waste, the Atomic Energy Commission—a DOE predecessor—directed sites that generated transuranic wastes to begin segregating them from other wastes and storing them in retrievable packages for an interim period of 20 years, pending disposal in a repository.[4] In late 1979, Congress authorized DOE to develop a deep geologic repository in New Mexico to permanently dispose of transuranic wastes, including these stored transuranic wastes.[5] In October 1992, Congress gave DOE management responsibility for the land,

[4]U.S. Atomic Energy Commission, Immediate Action Directive, IAD No. 0511-21, March 20, 1970.

[5]Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980, Pub. L. No. 96-164, 93 Stat. 1259, 1265 (1979).

and gave EPA substantial responsibility for regulating many of DOE's activities at the repository.[6] This repository, known as the Waste Isolation Pilot Plant (WIPP), began operating in the late 1990s and, in 1999, received its first shipment of transuranic wastes generated after the 1970 directive to segregate and store such wastes.

The Atomic Energy Commission's 1970 directive did not apply to transuranic wastes buried prior to 1970, and DOE considered these wastes permanently disposed. However, the sites where these wastes are buried have since become subject to CERCLA and other environmental laws. In particular, section 120 of CERCLA[7] requires EPA to evaluate federal waste sites for possible inclusion on the National Priorities List. In 1989, EPA included on this list, the waste sites that contain most of DOE's buried transuranic wastes—Hanford, Idaho, Oak Ridge, and Savannah River.[8] With this designation, CERCLA requires DOE to evaluate the nature and extent of contamination at these sites and determine what cleanup actions, if any, are necessary to protect human health and the environment. The buried transuranic waste sites at Los Alamos were evaluated but were not placed on the list. Cleanup of Los Alamos is being carried out under other authorities. At Los Alamos, the cleanup is being conducted under agreements with New Mexico—implementing the Resource Conservation and Recovery Act of 1976, as amended (RCRA) and state law—and under DOE's Atomic Energy Act authority. The provisions of the Los Alamos cleanup agreements are similar to those under CERCLA requirements, including a schedule for conducting the cleanup. Los Alamos has multiple waste sites that contain buried transuranic wastes, and DOE's agreements with the state of New Mexico address each waste area separately.

To carry out the cleanup of its National Priorities List sites under CERLCA, DOE must follow a process that includes extensive consultation between DOE, EPA, and state environmental agencies, as well as opportunities for public participation, to reach a decision on how DOE should clean up the respective site. The process begins with DOE consulting EPA and state environmental agencies and investigating the

[6]Waste Isolation Pilot Plant Land Withdrawal Act, Pub. L. No. 102-579, 106 Stat. 4777 (1992), *as amended* by the Waste Isolation Pilot Plant Land Withdrawal Amendment Act, Pub. L. No. 104-201, 110 Stat. 2851 (1996).

[7]42 U.S.C. § 9620.

[8]See 54 *Fed. Reg.* 48184 (Nov. 21, 1989).

nature and extent of contamination at each site and undertaking a feasibility study to identify and evaluate possible approaches for cleaning up each site. After evaluating the approaches, DOE selects a "preferred alternative" that meets CERCLA requirements and presents, for public comment, a proposed plan explaining its preferred approach for cleaning up the wastes. DOE considers the public's comments and consults with EPA and the state environmental agency to determine a cleanup approach.

Once the parties have reached agreement, the approach and the rationale for selecting it are published in a legally binding Record of Decision. In addition, DOE must enter into an interagency agreement with EPA that includes, among other things, a schedule for completing cleanup of the site. The environmental agency in the affected state is also a party to the agreements for Hanford, Idaho, Oak Ridge, and Savannah River. If the selected cleanup approach will involve leaving hazardous substances at the site, DOE must monitor the effectiveness of the approach and review the action every 5 years to determine whether any additional actions are necessary to protect human health and the environment.[9] The provisions of the agreements, including the milestones, are legally enforceable and can be revised, as necessary, to incorporate new information and address changing conditions. As shown in table 1, DOE is currently scheduled to complete cleanup actions at all five sites by 2025.

[9]CERCLA, § 121(c), 42 U.S.C. § 9621(c). Under Executive Order 12580, DOE is responsible for conducting 5-year reviews at DOE sites.

Table 1: Interagency Agreement Schedule for Addressing DOE Sites Containing Buried Transuranic Wastes

	Estimated volume of buried transuranic waste (in cubic meters)	Site investigation completed	Alternatives proposed	Remedy selected	Remedial action completed
Oak Ridge National Laboratory[a]	7,450	1997	1998	2000	2006
Savannah River Site[a]	4,530	1994	2001	2002	2008
Los Alamos National Laboratory[b]	11,800	2006	2007	2007	2015
Hanford Site	66,700	2011	2011	2013	2024
Idaho National Laboratory	36,800	2006	2007	2008	2025

Source: Data provided by DOE.

[a]For Oak Ridge and Savannah River, the dates for completing site investigation, proposing alternatives, selecting a remedy and completing remediation are actual, rather than scheduled. In addition, the remedy implemented at Oak Ridge is considered interim, until a final cleanup decision—expected in 2015—is reached. The final cleanup decision could involve additional remedial action to address transuranic wastes buried there.

[b]The dates in the table represent the latest date by which Los Alamos is scheduled to complete cleanup of the final buried transuranic waste site, Material Disposal Area G.

DOE Is Containing Buried Transuranic Wastes in Place at Two Sites but Is Still Developing Cleanup Plans at the Largest Waste Sites

DOE has made cleanup decisions and is addressing transuranic wastes at Oak Ridge and Savannah River, but the department is still investigating cleanup options at the other three locations where most of DOE's transuranic wastes are buried. DOE plans to leave transuranic wastes buried at Oak Ridge and Savannah River in place under an engineered barrier and take additional measures to prevent intrusions that could expose humans and the environment to the buried contaminants. In contrast, DOE is still evaluating cleanup options at the Idaho National Laboratory, Hanford Site and Los Alamos National Laboratory, where about 90 percent of its buried transuranic wastes are located. The extent to which DOE will be required to retrieve buried wastes or will be allowed to manage these wastes in place is currently unknown, and cleanup decisions for the majority of these wastes are several years away. However, DOE has agreed to retrieve some of the wastes buried at

Hanford and Idaho, because the wastes may threaten nearby surface waters and groundwater.

Cleanup Agreements at Oak Ridge and Savannah River Call for Containing Buried Transuranic Wastes in Place

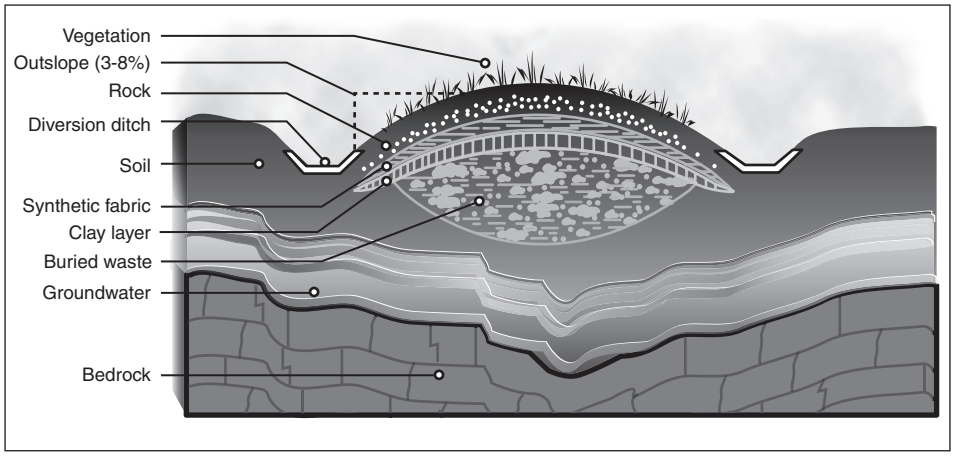
In accordance with CERCLA's requirements, DOE evaluated a number of approaches for addressing transuranic wastes buried at Oak Ridge and Savannah River. At both sites, DOE had originally disposed of the wastes in near-surface burial pits and trenches, often with other radioactive or hazardous wastes, including cesium, strontium, and volatile organic compounds. The two sites contain about 10 percent of the estimated 127,000 cubic meters of transuranic wastes buried across the five DOE sites. DOE officials at both sites considered several cleanup options, ranging from managing the wastes in place to removing them from the ground and disposing of any exhumed transuranic wastes at WIPP.

DOE, EPA, and state environmental agencies at both sites agreed that DOE should manage the buried wastes in place, because doing so would be equally or more protective of human health and the environment, and less costly than removing the wastes. Because DOE lacked adequate information on the specific location, condition, or concentration of the wastes in the burial sites, DOE and environmental agency officials said they were concerned that workers attempting to remove buried wastes would expose themselves to harmful contaminants or release contaminants into the environment. DOE and environmental agency officials told us that without adequate information on the location, condition or concentration of the wastes, efforts to mitigate the risks associated with retrieving the wastes would have been costly, requiring specialized enclosures for the waste areas, protective suits for workers, frequent rotation of workers to minimize their potential exposure, or other measures. According to these officials, attempts to determine the specific locations and other characteristics of the buried contaminants would likely expose workers and the environment to these same risks, because workers would be required to dig into the burial grounds in order to sample buried wastes. Furthermore, the officials were concerned that sampling buried wastes would not yield reliable information.

As a result, DOE, EPA, and state environmental agencies at the two sites agreed that DOE should manage the wastes in place by constructing engineered barriers over the top of the burial grounds and implementing additional controls to limit access to the burial grounds and help ensure the barriers' effectiveness. The barriers' overall purpose is to prevent rainwater, animals, or other intrusions from entering the burial ground and potentially causing wastes to migrate into the air, groundwater, or nearby surface waters. Barriers are generally composed of multiple layers of

earthen and synthetic materials (see fig. 2), depending on the site-specific conditions. Surface vegetation and soil function to absorb moisture, promote evaporation, and prevent water from filtering down to the wastes beneath the barrier. A diversion ditch carries surface water away from the waste site. Layers of rock, clay, and synthetic fabrics redirect moisture away from the buried wastes—and protect the wastes from burrowing animals.

Figure 2. Example of an Engineered Barrier Constructed over a Burial Ground Containing Radioactive or Hazardous Wastes



Source: DOE.

Note: This figure depicts a barrier intended to remediate a waste site in a wet climate. Barriers constructed at arid sites may differ.

DOE finished constructing the engineered barriers at Oak Ridge in September 2006 and expects to complete construction at Savannah River by summer 2007 (see fig. 3). The Oak Ridge barriers are considered an interim measure under CERCLA, in part because DOE and the state are still assessing the conditions under which long-lived radioactive wastes, including transuranic wastes, should be permanently disposed of in-place. DOE officials at Oak Ridge said they expect a final cleanup decision by 2015, at which time additional remedial actions to address the buried transuranic wastes could be required.

In addition to the barriers, DOE plans to establish physical and long-term administrative controls at the two sites aimed at limiting access to areas where buried wastes were left in place. For example, DOE plans to install perimeter fencing and gates at both sites and restrict activities to maintenance of the engineered barriers. DOE also plans to prohibit certain

types of land uses in these areas, such as residential use. It will transfer land-use restrictions at Savannah River to any future occupants, should the federal government decide to sell or lease land that includes the burial grounds. Furthermore, DOE officials from both sites will evaluate and repair the cap, as needed, and provide physical controls or sampling of the groundwater or surface waters in these areas for evidence of contamination. DOE conducts formal reviews of the barriers and related controls every 5 years. If EPA determines the measures are not fully effective, DOE may be required to take further actions, including removing some or all of the buried wastes.

Figure 3: Aerial View of an Engineered Barrier under Construction at Oak Ridge

Source: DOE.

DOE Is Still Developing Cleanup Plans at the Three Locations Where Most Transuranic Wastes Are Buried, but Some Waste Removal Is Already Under Way

DOE is still evaluating cleanup options for most of the waste at the three remaining sites—the Hanford Site, the Idaho National Laboratory, and the Los Alamos National Laboratory—where about 90 percent of DOE's transuranic wastes are buried.

Hanford Site

The Hanford Site contains about 66,700 cubic meters of buried transuranic wastes, or about 53 percent of DOE's total inventory of such wastes. These wastes were primarily disposed of in trenches in a 272-acre area located in the central portion of the site and near the Columbia River. DOE is in the early stages of site investigations to determine the extent and type of contamination for most of its burial sites, and according to DOE, the department is scheduled to evaluate cleanup options and determine its preferred cleanup approach by 2013. However, DOE officials said that about 1,100 of the estimated 66,700 cubic meters of buried transuranic wastes are located in another area of the Hanford site closer to the Columbia River than other sites. In 2001, DOE agreed to remove the transuranic wastes buried in this area, as part of an interim effort to mitigate a plume of tritium, a radioactive (but not transuranic) contaminant that is migrating and could contaminate the Columbia River. Cleanup is scheduled for completion by 2012. Overall, although a cleanup decision for most of Hanford's buried transuranic wastes is years away, EPA and Washington state environmental officials have expressed concern that leaving much of the buried transuranic and other hazardous wastes in place under engineered barriers—even with additional controls to limit intrusion—may not provide adequate long-term protection for human health and the environment, and some removal of these wastes may be necessary. Citizen groups, such as the Hanford Advisory Council expressed similar concerns regarding the risks of leaving long-lived radioactive wastes, such as transuranic wastes, in place.

Idaho National Laboratory

The Idaho National Laboratory contains about 36,800 cubic meters of buried transuranic wastes, or about 29 percent of DOE's inventory of such wastes. DOE officials at the Idaho site have prepared a draft feasibility study identifying possible alternatives for cleaning up the subsurface disposal area—a 97-acre area where transuranic, as well as other radioactive and hazardous wastes, are buried—which the department submitted to EPA and state environmental officials for review in March 2007. The alternatives described in the draft study ranged from containing most of the buried wastes in place under an engineered barrier to

retrieving some or all of the wastes and permanently disposing of the transuranic portion at WIPP. DOE, EPA, and the state environmental agency are scheduled to document the selected cleanup approach in a record of decision by 2008. In 2005, DOE began removing some transuranic and other wastes buried in a 3-acre section of the 97-acre disposal area. DOE agreed to remove the wastes to prevent the contaminants from migrating to the Snake River aquifer, a drinking water source located about 580 feet below the disposal area.

Although a cleanup approach has not yet been determined for most of the 97-acre disposal area, DOE may be required to remove a significant portion of the buried transuranic wastes that remain. DOE and Idaho state officials have a long-standing disagreement regarding the amount of transuranic wastes that DOE had agreed to remove from the Idaho site under a 1995 settlement agreement with the state, in a case concerning shipments of spent nuclear fuel into Idaho. The state of Idaho subsequently sought to enforce terms of the agreement in court, and in 2006, a federal district court ruled that DOE is obligated under the agreement to remove all the transuranic wastes at the Idaho National Laboratory site.[10] DOE has appealed the district court's decision,[11] but, in accordance with CERCLA requirements and the cleanup agreement for the site, the department is continuing to work with EPA and the state environmental agency to decide on a cleanup approach for most of the wastes buried at the site.

Los Alamos National Laboratory

Los Alamos National Laboratory has about 12,000 cubic meters of buried transuranic wastes, or almost 10 percent of DOE's inventory of such wastes. These wastes, which also include hazardous wastes, such as volatile organic compounds, according to DOE, are in four disposal areas that comprise about 85 acres of the Los Alamos site. DOE is currently conducting site investigations to determine the extent and nature of

[10]*Public Service Company of Colorado v. Kempthorne*, CV 91-035-S-EJL (D. Idaho, May 25, 2006). The court stated that unless something is encountered that would prohibit its removal, the 1995 agreement obligates the United States to remove all transuranic wastes, with the buried transuranic waste being on a time schedule dictated by CERCLA and the Federal Facility Agreement and Compliance Order. The court further stated that should EPA ultimately conclude that removal of certain waste is too dangerous and Idaho disagrees, the court would necessarily have to resolve that dispute and retained jurisdiction to do so.

[11]*United States v. Andrus*, No. 06-35661 (9th Cir. filed July 24, 2006).

contamination at the disposal areas and plans to evaluate cleanup options for those areas.

Unlike the other four DOE sites containing buried transuranic wastes, Los Alamos was not included on the National Priorities List and, therefore, transuranic wastes buried there are not being addressed through the CERCLA process. Instead, cleanup of the buried waste sites is being carried out under a combination of other federal and state environmental laws and internal DOE orders.

Hazardous wastes buried at Los Alamos are being addressed through RCRA. RCRA requires owners and operators of facilities that treat, store, or dispose of hazardous wastes to obtain a permit from EPA, or an authorized state, specifying how the facilities will safely manage that waste. RCRA further authorizes EPA (or an authorized state) to require facilities holding or seeking permits to clean up contamination at those facilities. As provided under RCRA, EPA has authorized New Mexico to carry out a RCRA hazardous waste program under state law in lieu of the federal program. The cleanup process under the RCRA program is generally similar to CERCLA, including an investigation of contaminated areas and evaluation of cleanup options to select a cleanup approach.

DOE will address radioactive wastes, which have been commingled with hazardous wastes at Los Alamos, under provisions of the Atomic Energy Act of 1954, as amended, which allows DOE to direct the process of investigating and cleaning up radioactive contamination according to its own regulations and internal directives. DOE has an agreement with the state environmental agency that it would investigate its buried waste sites containing transuranic wastes by 2006 and complete any cleanup actions by 2015.[12]

[12]Radionuclides are regulated under DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, and DOE Order 435.1, *Radioactive Waste Management.*

Estimated Costs to Address Waste Disposal Areas in Which Transuranic Wastes Are Buried Will Likely Increase

DOE's preliminary cost estimates for addressing the five waste sites where transuranic and other hazardous wastes have been buried total about $1.6 billion (in fiscal year 2006 dollars). Because these wastes are commingled, the cost of addressing just the buried transuranic wastes cannot be separately determined. DOE's estimates are based on the costs of managing most of these wastes in place rather than removing them for off-site disposal. However, DOE cautions these estimates are preliminary and not entirely reliable because some wastes may need to be retrieved and disposed of off-site, which would increase costs substantially. In addition, some costs are not included because they are not yet known. As DOE moves these projects forward to further evaluate its various cleanup options, DOE's policies require it to revise cost estimates, accordingly.

DOE Has Developed Cost Estimates to Address Geographic Areas Containing Transuranic and Other Waste

DOE has not separately estimated the costs to address only buried transuranic wastes, but estimates that the costs to address the burial grounds in which transuranic and other hazardous wastes have been disposed are about $1.6 billion through 2035. The specific costs associated with addressing only transuranic wastes cannot be determined because DOE's Office of Environmental Management, which is charged with cleaning up the disposal areas that include transuranic wastes, defines cleanup projects by geographic waste disposal areas, rather than by contaminant types. This is because many types of wastes and contaminants were disposed together in a specific geographic area; and in general, the Office of Environmental Management intends to address various wastes buried in each geographic disposal area as a group. The estimates to address the burial grounds reflect the "lifecycle" of each project—that is the total estimated expenditures for all aspects of managing a cleanup project from start to finish. These cost estimates are reported in DOE's annual budget request to the Congress and comprise a portion of DOE's environmental liabilities estimate included in its annual financial statement.

As shown in table 2, DOE's estimated lifecycle baseline costs to address the burial grounds containing transuranic wastes range from $36 million at the Savannah River Site—where officials are in the final stages of completing construction of a cap to contain the wastes—to $1 billion at the Idaho National Laboratory, where DOE has begun to remove selected wastes for disposal off-site, but is still evaluating options to address most of the remaining buried waste.

Table 2: Summary of DOE Estimated Lifecycle Costs to Address Disposal Areas Containing Buried Transuranic and Other Hazardous Wastes

In constant 2006 dollars

Location	Total waste disposal area containing transuranic wastes (in acres)	Estimated total lifecycle cost to address disposal areas containing transuranic wastes (in millions of dollars)[a]	Remedy assumed by DOE for cost estimation purposes	Year cleanup action will be completed	Estimated percent of total transuranic waste volume buried at each location
Oak Ridge Laboratory, Oak Ridge, TN	140	$90.3[b]	Surface cap and land use controls	2006	6
Savannah River Site, Aiken, SC	76	36.1	Surface cap and institutional controls	2008	4
Idaho National Laboratory, Idaho Falls, ID	97[c]	1,027.4	Retrieval of hazardous and radioactive wastes from targeted 3-acre area, surface cap, organic vapor extraction, institutional controls	2025	29
Hanford Site, Richland, WA	272	320[d]	Retrieval of some wastes from targeted 13-acre area, surface capping, and institutional controls	2035[d]	52
Los Alamos National Laboratory, Los Alamos, NM	85	113.9	Surface cap designed for arid conditions and institutional controls	2015	9
Total	**670**	**$1,587.7**			**100**

Source: Data provided by DOE.

[a]Costs largely exclude those associated with long-term oversight of the waste site, which are costs that will be assumed by the long-term steward, rather than the Office of Environmental Management. Such costs are included, however, as part of the DOE estimate for environmental liabilities reported to the Congress, and elsewhere. See *A Report to Congress on Long-Term Stewardship*, DOE/EM-0563, January 2001.

[b]Cleanup has been completed at an actual cost of $90.3 million.

[c]Only 17 acres of the 97-acre burial site at Idaho is suspected of containing transuranic wastes.

[d]Cleanup is scheduled to be completed before 2025. This date is when the Office of Environmental Management will transfer final control of the property to the long-term steward. Cost estimate includes maintenance and monitoring of the buried waste sites until 2035.

Cost Estimates Are Preliminary and Likely Understate the Actual Cost of Addressing Buried Wastes

DOE's lifecycle cost estimates for addressing buried waste sites are preliminary because DOE is still evaluating and choosing cleanup options for the majority of its buried waste, and some of the probable costs associated with cleanup efforts are currently unknown. DOE has stated that it is only 50 percent confident that its lifecycle estimates accurately reflect the costs of addressing buried waste sites. DOE's estimates will likely increase, perhaps substantially, for several reasons.

First, the estimates are based upon treatment and remedy assumptions that may be different from the final cleanup decision. The estimates are based on DOE's assumption that it will manage most of the buried wastes in place under engineered barriers and will monitor these barriers' effectiveness for as long as necessary to ensure protection of human health and the environment. This is typically the lowest-cost approach for addressing buried waste. DOE cost estimates are preliminary until an actual cleanup decision has been reached, at which time the cost estimates are revised to reflect that decision. If DOE is required to retrieve substantial portions of the buried transuranic wastes and dispose of it off-site at WIPP or elsewhere, costs could increase dramatically. For example if DOE must retrieve all the buried transuranic from the Idaho National Laboratory site, the department estimates that costs would increase from about $1 billion to about $8.2 billion. According to DOE, the substantially higher costs are the result of activities to excavate wastes and the associated construction and operation of new facilities to treat and dispose of formerly buried wastes and new wastes created by the retrieval process.

Second, the authorized capacity of the WIPP is currently insufficient to allow emplacement of large volumes of buried transuranic wastes beyond those being exhumed at the Idaho site. Specifically, WIPP is statutorily authorized to receive a maximum of 175,600 cubic meters of transuranic wastes. The majority of that capacity has been reserved for about 108,000 cubic meters of transuranic wastes that were generated and placed in storage at various DOE sites after 1970 and had not yet been emplaced at WIPP as of 2002, the most recent year for which data are available. About 8,000 cubic meters of waste had already been emplaced at WIPP by 2002. Wastes DOE has agreed to exhume from the Idaho National Laboratory are expected to consume another 17,000 cubic meters of WIPP capacity. In addition, DOE expects to generate about 17,000 cubic meters of additional transuranic wastes from future nuclear research and waste cleanup activities, and these wastes also are intended for disposal at WIPP. In total, DOE estimates that stored wastes, newly generated wastes and the wastes being exhumed currently at Idaho together will consume about 150,000

cubic meters of WIPP's authorized capacity, leaving only about 25,600 cubic meters for disposal of other transuranic wastes. DOE has estimated that if current plans to manage most wastes in place change and buried transuranic wastes across the weapons complex must be exhumed and disposed of off-site, up to 85,000 additional cubic meters could potentially require disposal at the WIPP. Developing alternative disposal paths for the estimated 60,000 cubic meters of transuranic wastes exceeding current WIPP capacity could further increase costs.

Third, other assumptions DOE has incorporated into its cost estimates may also be incorrect, causing DOE's cost estimates to increase. For example, DOE's preliminary cost estimates assume that installing a barrier over one of the Los Alamos burial grounds will safely contain buried wastes. However, DOE reports that if further analysis shows this assumption is incorrect and a more complex solution, such as grouting or vitrification is required, then cost estimates would increase significantly. Grouting is a process that uses concrete to bind wastes together and impede their migration through soil. Vitrification immobilizes the wastes in glass. At two other locations, DOE has assumed that federal and state regulators will not require further characterization or excavation. However, if additional characterization is required, DOE reports that costs could increase.

Finally, DOE has not included in its estimate some probable cost amounts that are currently unknown. For example, at DOE's Hanford site, highly radioactive and hazardous wastes were buried under 10 to15 feet of earth in vertical pipes and other containers at a site that is near the Columbia River. DOE has reported that the lifecycle cost to remove these wastes is about $113 million. However, according to DOE's Inspector General, this estimate does not include all potential costs to store, monitor, and dispose of this waste once it has been removed, which could increase the cost to more than $300 million.[13] According to DOE officials, DOE had not yet evaluated methods for retrieving and disposing of the waste and, as a result, the costs for these actions were unknown. In addition, both Hanford and the Idaho National Laboratory lifecycle cost estimates exclude administrative costs and management fees that will eventually be negotiated with the private firms contracted to manage the cleanup effort.

[13]U.S. Department of Energy, Office of Inspector General, *Remediation of the Waste Burial Grounds at the Hanford Site*, Washington, D.C.: October 2006; DOE/IG-0743.

Since contracts have not yet been awarded for much of the buried waste cleanup, those costs have yet to be determined.

As DOE moves forward to further evaluate the risks, benefits, and costs of various buried waste cleanup options, DOE's cost estimating and project management policies expect staff to refine the estimates.[14] According to DOE guidance, the cost uncertainty is greatest during the period that site investigations and evaluations of cleanup options are being conducted. Typically, DOE includes what it calls an "unfunded contingency" in its lifecycle estimates to account for unanticipated future events, but officials said they do not include the contingency at a project level that includes buried waste cleanup estimates. DOE expects cost estimates to become somewhat more accurate during the design phase of a project and to become substantially more accurate once a cleanup remedy has been chosen and construction has been authorized.

Agency Comments and Our Evaluation

We provided a draft of this report to the DOE for its review and comment. In its comments, the department generally agreed with our report. The department agreed that uncertainties surround the disposition of buried transuranic wastes and that the volume of such wastes intended for WIPP could increase. However, the department stated that EPA's recertification process for WIPP, which occurs every 5 years, includes a forecast of waste disposal volumes and that current projections do not indicate insufficient WIPP capacity. The department further stated that it is prepared to manage the uncertainties regarding the future disposition of these wastes. While we agree that current projections do not indicate WIPP capacity will fall short of future requirements, at the time of our review, cleanup decisions were still pending at the Hanford Site and the Idaho National Laboratory. These two sites comprise over 80 percent of DOE's total estimated inventory of buried transuranic wastes and it is unclear how much of these buried wastes ultimately must be exhumed. As we stated in our report, if substantial volumes of the transuranic wastes at these sites must be exhumed and disposed of off-site, WIPP's authorized capacity could be inadequate.

DOE provided additional technical comments, including clarifications on terminology and ongoing litigation at the Idaho National Laboratory. We

[14] DOE G 430.1-1, *Cost Estimating Guide*; DOE G 430.1-1X, *Cost Estimating Guide for Program and Project Management.*

incorporated these clarifications as appropriate. DOE's comments are presented in appendix II.

We will send copies of this report to the Secretary of Energy, and we also will make copies available to others on request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you, or your staff, have any questions about this report or need additional information, please contact me at (202) 512-3841 or cosgrovej@gao.gov. Contact points for our Office of Congressional Relations and Public Affairs can be found on the last page of this report. Other staff contributing to this report can be found in appendix III.

James Cosgrove
Acting Director, Natural Resources and Environment

Appendix I: Scope and Methodology

To conduct our work, we visited buried waste landfills and stored waste facilities, and we met with local Department of Energy (DOE) officials at each of DOE's five largest transuranic waste burial sites—the Hanford Site, the Idaho National Laboratory, the Los Alamos National Laboratory, the Savannah River Site, and the Oak Ridge National Laboratory. We also reviewed studies and scientific reports by DOE and other federal agencies and the National Academy of Sciences on the storage and disposition of transuranic wastes, and interviewed experts in the field.

To determine the extent to which legal requirements and policies govern DOE's efforts to address buried transuranic wastes, we reviewed the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), the Resource Conservation and Recovery Act of 1976, as amended (RCRA), the Atomic Energy Act of 1954, as amended, and Environmental Protection Agency (EPA) and DOE regulations and guidance concerning radioactive and hazardous wastes. We also reviewed the Federal Facility Agreements and Orders between DOE, EPA, and each state with a site where DOE has buried transuranic wastes, as well as a May 2006 federal district court decision interpreting an agreement between DOE and the state of Idaho concerning DOE's obligation to remove buried transuranic wastes from the Idaho National Laboratory site. To better understand the implementation of these laws, regulations, policies, and agreements at DOE sites, we interviewed state environmental regulatory officials and EPA officials that oversee each of the buried waste locations. We did not interview EPA officials in New Mexico because EPA has authorized the state of New Mexico to carry out a state RCRA program under state law in lieu of the federal program.

To determine how DOE plans to address buried waste at each of its sites, we reviewed the planning documents DOE has prepared to comply with CERCLA or RCRA requirements, feasibility studies describing remediation alternatives, records of decision for sites that have selected a remedy for buried waste, and internal DOE reports regarding buried transuranic wastes, and interviewed the project managers and engineers responsible for overseeing the remediation of each buried waste site.

To determine DOE's estimated costs for addressing disposal sites containing buried transuranic wastes and to evaluate the accuracy of those estimates, we analyzed each field location's fiscal year 2006 lifecycle baseline estimates for specific projects that included cleaning up previously disposed transuranic wastes. Because DOE has generally defined cleanup projects by geographic waste disposal areas rather than by waste types, we were unable to determine the specific costs associated

with addressing only transuranic wastes. To better understand the lifecycle cost estimates, we reviewed DOE cost estimating and project management guidance and interviewed officials responsible for preparing and reporting cost estimates to DOE. All cost estimates in this report are in constant 2006 dollars.

In reporting the volumes of transuranic wastes buried at DOE sites, we relied on estimates made by DOE in 1999 and reported in 2000, the most recent available comprehensive inventory of such wastes.[1] In reporting the inventory of buried transuranic wastes, we included wastes buried at both shallow depths (less than 100 feet) and intermediate depths (between 100 and 1,000 feet). In addition, we adjusted the buried waste inventory reported for Los Alamos and Hanford because officials there had subsequently developed more accurate inventory data that showed a somewhat lower volume than had been reported in 2000. At other locations, DOE officials said they believed the 2000 report reflected the most accurate data available. With regard to the inventory of stored transuranic wastes reported in 2000, we used data from a 2001 DOE report.[2] Some of that waste has now been disposed of permanently at the Waste Isolation Pilot Plant (WIPP) in New Mexico. The inventory of the remaining volume of transuranic wastes currently in storage at DOE sites continues to change because of ongoing shipments to WIPP for permanent disposal and was not available from DOE.

We performed our work between May 2006 and May 2007 in accordance with generally accepted government auditing standards.

[1]Department of Energy, *Buried Contaminated Transuranic Waste Information for U.S. Department of Energy Facilities*, June 2000.

[2]Department of Energy, *Summary Data on the Radioactive Waste, Spent Nuclear Fuel and Contaminated Media Managed by the U.S. Department of Energy*, April 2001.

Appendix II: Comments from the Department of Energy

Department of Energy
Washington, DC 20585

June 4, 2007

Mr. James Cosgrove
Acting Director
Natural Resources and Environment
United States Government Accountability Office
Washington, D.C. 20548

Dear Mr. Cosgrove:

This letter provides the Department of Energy's (DOE) comments on your draft report entitled *Nuclear Waste: Plans for Addressing Most Buried Transuranic Wastes Are Not Final and Preliminary Cost Estimates Will Likely Increase* (GAO-07-761). We are pleased that the Government Accountability Office has no recommendations on DOE's policy framework for making site-specific, risk-informed decisions about remediation of buried transuranic-contaminated wastes.

We agree there are uncertainties associated with DOE's plans for buried transuranic-contaminated wastes. As you note, future decisions could increase the volume of transuranic wastes that would have to be disposed of at the Waste Isolation Pilot Plant (WIPP) in New Mexico. However, we update our forecasts and reapply every five years to the Environmental Protection Agency for WIPP certification. Our latest certification application indicates we do not currently project that waste volumes would exceed WIPP's capacity. We believe our existing planning processes are sufficient to manage this uncertainty.

The enclosure provides a markup of the draft report, to better distinguish pre-1970 buried waste from post-1970 wastes, and to clarify litigation and cleanup activities at the Idaho National Laboratory. If you have any questions, please contact Mr. Frank Marcinowski, Deputy Assistant Secretary for Regulatory Compliance, at (202) 586-0370.

Sincerely,

Charles E. Anderson (Acting for)
Assistant Secretary for
Environmental Management

Enclosure

Printed with soy ink on recycled paper

Appendix III: Contact Information and Staff Acknowledgments

GAO Contacts

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Staff Acknowledgments

In addition to the individuals named above, Bill Swick, Assistant Director; Doreen Feldman; Michael Meleady; Mehrzad Nadji; James Noel; Alison O'Neill; Jeff Rueckhaus; and Ginny Vanderlinde made key contributions to this report.

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