



March 2026

NUCLEAR WASTE CLEANUP

DOE Needs to
Improve the Accuracy
of Cost and Schedule
Information for Major
Projects and Activities

A report to congressional committees

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What GAO Found

The Department of Energy’s (DOE) Office of Environmental Management (EM) manages cleanup of hazardous and radioactive waste through capital asset projects and operations activities. Capital asset projects have defined start and end points, whereas operations activities are typically routine or reoccurring. As of August 2025, EM estimated costs for the most expensive capital asset projects ranging from \$69 million to \$18.5 billion, and costs for the most expensive operations activities ranging from \$1 billion to \$177 billion. EM’s data indicated that combined costs for the most expensive capital asset projects increased by more than \$2 billion, and combined costs for the most expensive operations activities increased by about \$75 billion since GAO last reported in 2022. EM officials said that these cost increases were already known to the agency and accounted for in previous life-cycle cost estimates that were communicated to Congress. As of May 2025, EM estimated that the remaining cleanup work at all its sites would cost more than half a trillion dollars.

EM has seen cost increases and schedule delays due to multiple factors, and the office struggles to maintain complete documentation and reconcile data discrepancies. Specifically, key project documents are not consistently accessible for headquarters review in DOE’s project management database. These documents could provide valuable information on reasons behind increases and recommendations to address underlying issues. Similarly, EM faces challenges providing current cost and schedule information for operations activities that is consistent across headquarters and sites, and EM officials could not easily coordinate to reconcile the inconsistencies. Ensuring availability of complete project information and improving coordination to address the accuracy and consistency of cost and schedule information will help EM manage its projects and activities, report more accurate information to Congress, and provide support to sites.

Even if EM improves the completeness and consistency of information on its projects and activities, its cost and schedule estimates may still reflect significant uncertainty. EM officials from several sites told GAO that final cleanup remedies at their sites still need to be determined, which may increase costs and schedules. GAO has reported that significant cost and schedule savings are still possible on several cleanup projects and activities.

Table: Potential Savings Identified for Selected Office of Environmental Management Capital Asset Projects and Operations Activities

• Grouting closed tanks at Hanford	\$18 billion
• Grouting remaining low-activity waste at Hanford	up to \$210 billion
• Optimizing transuranic waste shipments	\$700 million
• Optimizing high-level waste treatment at Hanford	Tens of billions

Source: GAO analysis of Department of Energy data. | GAO-26-107820

Why GAO Did This Study

EM is responsible for the cleanup of sites and facilities contaminated from decades of nuclear weapons production and nuclear energy research. GAO has identified DOE’s project management and environmental liability—or expected cleanup costs—as High-Risk areas. The department’s management and oversight record has left DOE vulnerable to fraud, waste, abuse, and mismanagement, and its expected future cleanup costs have ballooned over the last several decades.

Senate Report 118-58 includes a provision for GAO to provide a biennial report on the status of EM’s major projects and operations activities. This report (1) describes the status of EM’s largest capital asset projects and operations activities, including changes since GAO’s 2022 report; and (2) examines challenges and opportunities to improve the performance of EM’s largest capital asset projects and operations activities.

GAO analyzed documents and data and compared information with DOE and EM requirements for managing projects and operations activities. GAO also interviewed EM officials.

What GAO Recommends

GAO is making two recommendations to EM to improve the agency’s oversight of its most expensive capital asset projects and operations activities. These include that EM (1) ensure the completeness of cost and schedule information relevant to its capital asset projects and (2) coordinate with site officials and contractors to improve the accuracy of current and historical cost and schedule data for operations activities. DOE concurred with the recommendations.

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Abbreviations

AMPS	Advanced Modular Pretreatment System
AOC	Areas of Concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
D&D	decontamination and decommissioning
DOE	Department of Energy
EM	Office of Environmental Management
EMAD	Engine Maintenance, Assembly and Disassembly
EMWMF	Environmental Management Waste Management Facility
EPA	Environmental Protection Agency
FSLE	federal site lifecycle estimates
HEPA	high-efficiency particulate air
HLW	high-level radioactive waste
INTEC	Idaho Nuclear Technology and Engineering Center
IPABS	Integrated Planning, Accounting, and Budgeting System
LAW	low-activity waste
LLW	low-level radioactive waste
MDA	material disposal area
NMED	New Mexico Environment Department
NNSS	Nevada National Security Site
OEMS	One Enterprise Management System
PARS	Project Assessment and Reporting System
RCRA	Resource Conservation and Recovery Act of 1976, as amended
SDU	Saltstone Disposal Unit
SNF	spent nuclear fuel
SSCVS	Safety Significant Confinement Ventilation System
SWMU	Solid Waste Management Units
TRU	transuranic
TSCR	Tank-Side Cesium Removal
WIPP	Waste Isolation Pilot Plant
WTP	Waste Treatment and Immobilization Plant
Y-12	Y-12 National Security Complex

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March 2, 2026

Congressional Committees

The Department of Energy's (DOE) Office of Environmental Management (EM) is responsible for addressing hazardous and radioactive waste at sites and facilities nationwide that have been contaminated from decades of nuclear weapons production and nuclear energy research. As of May 2025, there were 15 sites across the country where EM's work was ongoing (see appendix I). EM estimated that the remaining cleanup work at these sites could continue until 2122 and cost more than half a trillion dollars.

EM divides its cleanup work into the following:

1. **Capital asset projects** are projects with defined start and end points required in the acquisition of capital assets, which include land, structures, and facilities for treating and disposing of waste. Capital asset projects go through management reviews and approval processes called "critical decisions," as projects move forward from planning and design to construction. EM has specific policies and guidance for managing capital asset projects, including DOE Order 413.3B on Program and Project Management for the Acquisition of Capital Assets.¹
2. **Operations activities** include facility or environmental operations, such as decontamination and decommissioning of buildings and soil and groundwater remediation; and routine or reoccurring mission support activities, such as land management and regulatory compliance. To manage operations activities, EM follows the requirements established in the 2020 Environmental Management Program Management Protocol, including the requirement to develop and maintain federal site lifecycle estimates (FSLE) for each site.²

Capital asset projects accounted for 15 percent (about \$1.3 billion) of EM's approximately \$8.5 billion fiscal year 2025 budget, and operations activities accounted for 85 percent (about \$7.2 billion). As of December

¹Department of Energy, *Program and Project Management for the Acquisition of Capital Assets*, DOE Order 413.3B (Change 7) (Washington, D.C.: June 21, 2023).

²Department of Energy, *Environmental Management Program Management Protocol* (Washington, D.C.: Oct. 30, 2020).

2024, EM had 37 active capital asset projects across seven sites and 58 operations activities across 13 sites. EM tracks cost and schedule estimates for its capital asset projects and operations activities, which serve as a baseline to assess project and activity performance.

In 2022, we issued a report examining EM's performance and progress in managing its major cleanup projects and operations.³ That report described a selection of the 15 capital asset projects and 11 operations activities with the highest estimated costs, which were in various stages of completion. We reported that most projects were due to be completed within their estimated time frames, but several projects and operations activities were facing key challenges inhibiting cleanup progress. These included insufficient staffing capacity and data limitations.

For many years, we have considered EM's cleanup effort to be at high risk for fraud, waste, abuse, and mismanagement or in need of transformation. In 1990, we designated DOE's acquisition and program management as a High-Risk area.⁴ We took this action because DOE's record of inadequate management and oversight of contractors left the department vulnerable to fraud, waste, abuse, and mismanagement. We identified ways that EM could address these issues in our February 2025 High Risk update, including that that EM should improve workforce planning and its approach to assessing and correcting root causes of issues that arise on its projects.⁵ EM agreed with our recommendations, but the recommendations remained open as of December 2025.

In 2017, we designated the federal government's environmental liability, or the estimated cost to clean up areas where federal activities have

³GAO, *Environmental Cleanup: Status of Major DOE Projects and Operations*, [GAO-22-104662](#) (Washington, D.C.: May 4, 2022).

⁴GAO, *High Risk: Letter to Congressional Committees Identifying GAO's Original High-Risk Areas* (Washington, D.C.: Jan. 23, 1990). In 2009, this area was narrowed to focus on the National Nuclear Security Administration (NNSA) and EM within DOE. GAO, *High-Risk Series: An Update*, [GAO-09-271](#) (Washington, D.C.: Jan. 22, 2009). We update our High-Risk List biennially at the start of each new Congress to highlight areas across the federal government that are vulnerable to waste, fraud, abuse, and mismanagement, or that are in need of transformation.

⁵GAO, *High-Risk Series: Heightened Attention Could Save Billions More and Improve Government Efficiency and Effectiveness*, [GAO-25-107743](#) (Washington, D.C.: Feb. 25, 2025).

contaminated the environment, as a High-Risk area.⁶ This estimate increased to \$666 billion in fiscal year 2024 from \$212 billion in fiscal year 1997. DOE is responsible for the largest share (\$544.5 billion in fiscal year 2024) of the federal government’s liability, which is related primarily to retrieving, treating, and disposing of nuclear and hazardous waste. In fiscal year 2022, when we issued our last report on EM’s major projects and activities, DOE’s environmental liability was \$520 billion. EM is responsible for almost 80 percent of DOE’s overall environmental liability. In our 2025 High-Risk update, we highlighted that DOE should revise EM’s cleanup policies, conduct root cause analyses of EM’s cost and schedule overruns, and assess options for more cost-effective treatment of certain waste.⁷ EM mostly agreed with these recommendations and has taken some steps toward implementing them, but all remain open as of December 2025.

Senate Report 118-58 includes a provision for GAO to provide a biennial report on the status of EM’s major projects and operations activities. This report (1) describes changes to costs and schedules for EM’s largest capital asset projects and operations activities since our 2022 report and the status of these projects and activities, and (2) examines challenges and opportunities to improve the performance of EM’s largest capital asset projects and operations activities.

To determine our sample of capital asset projects, we identified projects with a total project cost of at least \$100 million that were at the stage where EM had determined the approach for executing the project or were due to be completed within the time frames of our review.⁸ We identified 12 capital asset projects that generally met these criteria at the time of

⁶GAO, *High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others*, [GAO-17-317](#) (Washington, D.C.: Feb. 15, 2017). Federal agencies are required to report certain cost estimates for cleanup work—called environmental liabilities—on their annual financial statements, according to the federal accounting standards. These standards say that costs for cleanup work must be reported as environmental liabilities when they are both probable and reasonably estimable. “Probable” relates to whether a future outflow of resources will be required—specifically, that it is “more likely than not” that the agency will incur a financial liability. “Reasonably estimable” relates to the ability to reliably quantify in monetary terms the outflow of resources that will be required.

⁷[GAO-25-107743](#).

⁸EM had 37 active capital asset projects across seven sites, as of December 2024, according to EM data.

our review.⁹ To determine our sample of operations activities, we identified 11 EM sites that had at least one operations activity with an estimated lifecycle cost of at least \$1 billion, and we selected the operations activity with the highest lifecycle cost at each of those sites.¹⁰ We included two additional operations activities that were not in our 2022 report but now meet the selection criteria.¹¹ We chose a \$1 billion threshold to focus on operations activities with the highest dollar value. Using these criteria also allowed us to review a diversity of operations activities at a range of cleanup sites. We selected 13 operations activities using these criteria.

To obtain information on the status of our selected projects and activities and examine challenges and opportunities, we used a data collection tool to collect and compile cost, schedule, and risk information for each capital asset project and operations activity. For capital asset projects, we collected and analyzed information from DOE's Project Assessment and Reporting System (PARS). For operations activities, EM officials provided us with data from DOE's One Enterprise Management System (OEMS). To assess the reliability of PARS and OEMS data, we reviewed related documentation, conducted reviews and testing to assess data for errors or missing information, and conducted interviews with agency officials knowledgeable about the data. We also interviewed site officials at the 11 relevant EM sites to corroborate the cost and schedule data we received from EM, and gather information such as recent work completed, risks and opportunities, and upcoming milestones.

We determined that the PARS and OEMS data were reliable for the purposes of selecting the projects and operations activities and describing

⁹Our selection included four projects that were not included in our 2022 report. Three of these projects had not yet reached the stage where EM had determined the approach for executing the project when we were conducting our review for the 2022 report. These new projects include the Advanced Modular Pretreatment System (Hanford), X-333 Process Building Demolition Project (Portsmouth), and the F-Area Material Storage Building (Savannah River). Further, the fourth new project (the Advanced Manufacturing Collaborative Facility) had a total project cost estimate of less than \$100 million, but we included it because it was projected to finish within the time frame of our review.

¹⁰EM managed 58 operations activities at 14 nuclear cleanup sites, as of November 2024, according to EM data.

¹¹The Nevada National Security Site's Soil and Water Remediation operations activity and Hanford Site's Sitewide Services operations activity did not meet the selection criteria at the time of our 2022 report but were selected for this review based on their estimated lifecycle costs.

their cost and schedule performance, including changes in cost and schedule performance since our last report. However, as we note in the body of this report, we have concerns about the overall completeness and accuracy of the cost data. We identified challenges and opportunities using an analysis of the information we gathered through documentation and interviews, based on criteria including (1) how frequently the topics were mentioned for each project or activity and (2) potential impacts to cost and schedule. We assessed these challenges and opportunities against DOE requirements and federal standards for internal control. Summaries of EM's active cleanup sites are included in appendix I, and summaries of each of our selected projects and activities are included in appendices III and IV, respectively.

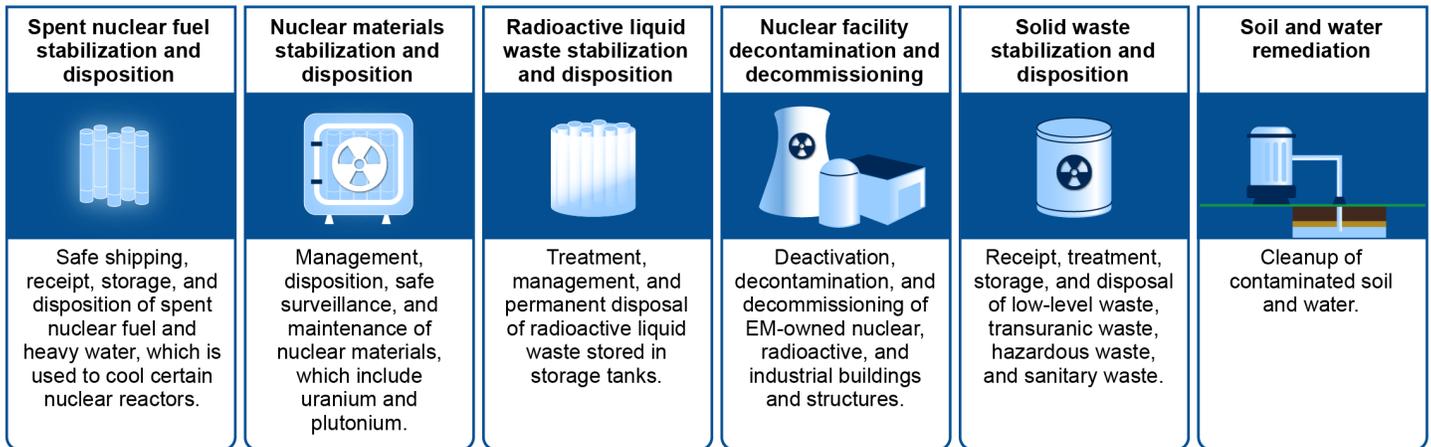
We conducted this performance audit from September 2024 to March 2026 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

EM's Cleanup Complex

EM was created in 1989 to address environmental contamination at sites that were involved in nuclear weapons production and research, some of which date back to the Manhattan Project in the 1940s. Since its creation, EM has shifted its mission from identifying and characterizing the waste at these sites to active site cleanup. EM's cleanup mission includes constructing and operating facilities to stabilize various waste forms, disposing of different waste types, deactivating and decommissioning contaminated facilities, and addressing contaminated soil and groundwater. EM divides its cleanup work into six work areas, as outlined in figure 1 below.

Figure 1: Department of Energy Office of Environmental Management (EM) Six Areas of Cleanup Work



Source: GAO analysis of Department of Energy information. | GAO-26-107820

Note: EM also conducts ongoing work, referred to as base operations, that supports the operations of the site but does not directly advance cleanup progress. Such activities may include maintenance of roads and grounds, maintenance of utilities, and conducting security operations.

Legal Framework for Cleanup at EM Sites

EM's cleanup activities are governed by many federal and state laws and regulations, DOE Orders, and cleanup agreements. We highlight some of the relevant legal framework below.

- **The Atomic Energy Act of 1954**, as amended, establishes a comprehensive regulatory scheme for military and domestic nuclear energy and generally authorizes DOE to regulate defense-related nuclear facilities and radioactive waste.
- **The Resource Conservation and Recovery Act of 1976, as amended (RCRA)**, is administered by the Environmental Protection Agency (EPA) and governs the generation, transportation, treatment, storage, and disposal of the hazardous waste, including the hazardous component of mixed waste.¹² Under RCRA, EPA can authorize states to administer their own hazardous waste regulatory programs to operate in lieu of the federal program. Many EM sites and facilities operate under permits issued and enforced by states under their authorized RCRA authority.

¹²The term "mixed waste" means waste that contains both (1) hazardous waste subject to RCRA, and (2) radioactive source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954, as amended. See 42 U.S.C. § 6903(41).

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- **The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA)**, is administered by the EPA and authorizes the President to respond to releases or threatened releases of hazardous substances to the environment. In the late 1980s, the President delegated these response authorities to EPA and other federal agencies, including DOE. If there is a release or threatened release from a federal facility, the agency that administers the facility—such as DOE—has the authority to take response actions under the act, subject to oversight by EPA and the states in which those facilities are located.¹³
 - **DOE Order 226.1B** establishes requirements and provides direction for implementing DOE’s Policy 226.2, Policy for Federal Oversight and Contractor Assurance Systems. It sets for DOE expectations for the implementation of a contractor oversight program by all DOE organizations.¹⁴
 - **DOE Order 435.1 and Manual 435.1-1** set forth procedures for the management and disposal of DOE’s radioactive wastes in a manner that is protective of worker and public health and safety as well as the environment.¹⁵
 - **Cleanup agreements** that DOE has negotiated with various regulatory entities, which establish hundreds of milestones that specify actions EM must take as it carries out its cleanup work. EM

¹³While the agency that administers a federal facility where there has been a release of hazardous substances will typically be the lead agency to undertake cleanup activities, EPA oversees CERCLA cleanup activities at federal facilities on its National Priorities List, which includes some of the most seriously contaminated federal and non-federal sites around the country. For federal facilities that are not on the National Priorities List, most cleanups are overseen by state agencies rather than EPA, as allowed by CERCLA.

¹⁴Department of Energy, *Implementation of Department of Energy Oversight Policy*, Order 226.1 (Change 1) (Washington, D.C.: May 3, 2022).

¹⁵Department of Energy, *Radioactive Waste Management*, Order 435.1, Chg 2(Admin Chg) (Washington, D.C.: Jan. 11, 2021); and *Radioactive Waste Management Manual*, Manual 435.1-1 Chg 3 (LtdChg) (Washington, D.C.: Jan. 11, 2021).

uses these milestones, along with other metrics, as a tool for managing and tracking the progress of on-site cleanup activities.¹⁶

Radioactive Waste at EM Sites

EM is responsible for managing several types of radioactive waste, including high-level radioactive waste, transuranic waste, low-level radioactive waste, and spent nuclear fuel. Further, much of EM's waste is mixed waste that has both radioactive and hazardous components. See table 1 for legal definitions and disposal expectations for certain radioactive waste types.

Table 1: Legal Definitions for Select Types of Radioactive Waste at Department of Energy's (DOE) Office of Environmental Management's (EM) Sites and Disposal Expectations for that Waste

Waste Type	Legal Definition	Disposal Expectations
Low-level radioactive waste (LLW)	LLW is defined in the Nuclear Waste Policy Act of 1982 as radioactive material that "(A) is not high-level radioactive waste, spent nuclear fuel, transuranic waste, or by-product material as defined in [42 U.S.C. § 2014(e)(2)]; and (B) the [Nuclear Regulatory] Commission, consistent with existing law, classifies as low-level radioactive waste." ^a	EM expects to dispose of LLW in certain near-surface facilities. There are several DOE LLW disposal facilities and two commercial LLW facilities available to EM.
Transuranic (TRU) waste	TRU waste is defined in the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act as "waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for (A) high-level radioactive waste; (B) waste that the Secretary [of Energy] has determined, with the concurrence of the Administrator [of the Environmental Protection Agency], does not need the degree of isolation required by the disposal regulations; or (C) 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]." ^b	EM expects to dispose of defense-related TRU waste at WIPP in New Mexico. WIPP is currently the only disposal option for TRU waste, and this waste can only be disposed of at WIPP if it was generated by atomic energy defense activities.

¹⁶These agreements include CERCLA federal facility agreements generally negotiated among DOE, state regulators, and EPA, as well as additional compliance agreements, compliance orders, and consent orders, and consent decrees. Federal facility agreements, also known as tri-party agreements, generally set out a sequence for accomplishing cleanup work, tend to cover a relatively large number of cleanup activities, and can include milestones that DOE must meet. Compliance agreements, consent orders, and consent decrees include agreements negotiated at a site subsequent to the initial federal facility agreement or other agreements with the state. These agreements may impose penalties for missing milestones and may amend or modify earlier agreements. Compliance orders are issued by regulators and require DOE to take specific actions to correct violations of laws, regulations, permits, or agreements. We reported in 2019 that DOE had entered into 72 cleanup agreements across what were then 16 EM cleanup sites. See GAO, *Nuclear Waste: DOE Should Take Actions to Improve Oversight of Cleanup Milestones*, [GAO-19-207](#) (Washington, D.C.: Feb. 14, 2019).

Waste Type	Legal Definition	Disposal Expectations
High-level radioactive waste (HLW)	HLW is defined in the Nuclear Waste Policy Act of 1982 as “(A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in the reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the [Nuclear Regulatory] Commission, consistent with existing law, determines by rule requires permanent isolation.” ^c	EM expects to dispose of HLW in a permanent deep geological repository. However, there is no current repository for HLW.
Spent nuclear fuel (SNF)	SNF is defined in the Nuclear Waste Policy Act of 1982 as “fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.” ^d	EM expects to dispose of SNF in a permanent deep geological repository. However, there is no current repository for SNF.

Source: GAO analysis of DOE documents and the Nuclear Waste Policy Act. | GAO-26-107820

^aPub. L. No. 97-425, § 2(16), 96 Stat 2201 (1983) (codified at 42 U.S.C. § 10101(16)). LLW is also defined by the Low-Level Radioactive Waste Policy Amendments Act of 1985 as “radioactive material that (A) is not high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in [42 U.S.C. § 2014(e)(2)]; and (B) the Nuclear Regulatory Commission, consistent with existing law and in accordance with paragraph (A), classifies as low-level radioactive waste.” The term does not include byproduct material as defined in 42 U.S.C. § 2014(e)(3) and (4). Pub. L. No. 99-240, § 102, 99 Stat 1842 (1986) (codified as amended at 42 U.S.C. § 2021b(9)). Commercial LLW disposal facilities that accept EM waste are subject to Nuclear Regulatory Commission regulations, which classify LLW as Class A, B, C, or Greater-Than-Class C based on radioactivity. DOE does not use the Nuclear Regulatory Commission’s classification system for LLW disposed of at DOE facilities.

^bPub. L. No. 102-579, § 2(20), 106 Stat. 4777 (1992). Transuranic waste is also defined in the Atomic Energy Act of 1954, as amended, as “material contaminated with elements that have an atomic number greater than 92, including neptunium, plutonium, americium, and curium, and that are in concentrations greater than 10 nanocuries per gram, or in such other concentrations as the Nuclear Regulatory Commission may prescribe to protect the public health and safety.” 42 U.S.C. § 2014(jj).

^cPub. L. No. 97-425, § 2(12), 96 Stat. 2201 (1983) (codified at 42 U.S.C. § 10101(12)). This definition is also cross-referenced in the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2014(ee), and the Waste Isolation Pilot Plant Land Withdrawal Act, Pub. L. No. 102-579, § 2(10), 106 Stat. 4777 (1992).

^dPub. L. No. 97-425, § 2(12), 96 Stat. 2201 (1983) (codified at 42 U.S.C. § 10101(23)). This definition is also cross-referenced in the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2014(ee), and the Waste Isolation Pilot Plant Land Withdrawal Act, Pub. L. No. 102-579, § 2(10), 106 Stat. 4777 (1992).

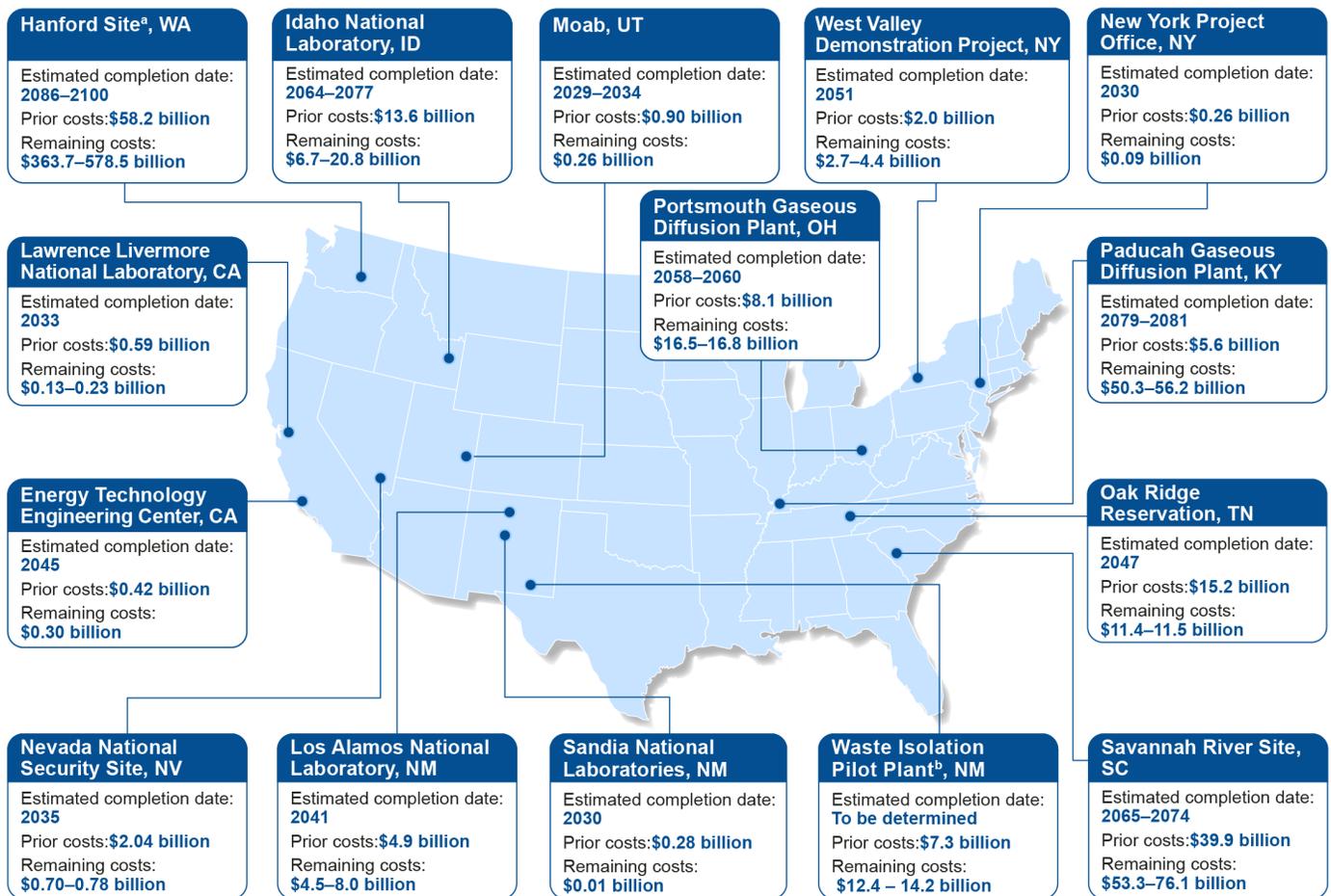
EM’s 15 Active Cleanup Sites

There are 15 sites where EM actively conducts cleanup activities. EM has estimated the lifecycle cost and schedule for completing the cleanup work at each site, which, according to EM officials, includes the estimated cost of future cleanup work and costs already incurred. EM also annually updates the estimated cost for future cleanup as part of calculating DOE’s environmental liability.¹⁷ Background information on each of EM’s active cleanup sites is included in appendix I. Figure 1 provides information on

¹⁷Estimates may be updated if there are changes in work scope (including changes based on new characterization information or new regulatory decisions), changes in schedule (such as rescheduling work based on funding availability), technical uncertainties, and other factors.

each site's cleanup costs spent in prior years, remaining costs, and estimated dates for completing cleanup.

Figure 2: Estimated Cleanup Costs and Completion Dates for the Office of Environmental Management's (EM) 15 Active Cleanup Sites, as of May 2025



Sources: GAO analysis of Department of Energy information; Map Resources (map). | GAO-26-107820

Note: The cost estimates for each site represent the lifecycle estimates developed by the Office of Environmental Management, which include costs for work that has already been completed and remaining costs. The costs in this figure are in escalated dollars.

^aEM's Hanford Site was historically counted as two separate sites (the Office of River Protection and the Richland Operations Office), but these were consolidated into one site office in 2024.

^bThis facility supports completion of EM work at other sites. Therefore, the end date will be determined by the completion of cleanup at other sites or reaching maximum waste storage capacity, as defined in the WIPP Land Withdrawal Act of 1992. Further, according to EM officials working at the site, their latest estimated year to complete WIPP operations is 2083. As of August 2025, this estimate was still awaiting approval by EM.

EM Project Management Requirements

Two primary policies establish requirements for EM's management of its capital asset projects and operations activities: DOE Order 413.3B and EM's Program Management Protocol. Generally, these policies establish procedures for developing the cost and schedule estimates for each capital asset project and operations activity; tracking the performance of projects and operations activities; and updating project and operations activities' cost and schedule estimates, as necessary.

DOE Project Management Order for Capital Asset Projects

EM is required to manage capital asset projects with an estimated total cost greater than or equal to \$50 million, in accordance with DOE Order 413.3B.¹⁸ The goal of this order is to deliver projects within their original approved cost and schedule estimates (baselines) and that meet mission performance and other requirements. Specifically, this order establishes five phases over the life of a project, each of which is marked by a major approval milestone.¹⁹ Specifically, the phases of a project include:

1. Approve mission need.
2. Approve alternative selection and cost range.
3. Approve performance baseline, including definitive scope, schedule and cost baseline estimates.
4. Approve start of construction/execution of the project.
5. Approve start of operations or project completion.

Under the order, EM conducts regular evaluations and reviews to assess project cost and schedule performance. For example, annual project peer reviews are required for all projects with an estimated cost of at least \$100 million after the alternative selection and cost range has been approved. These reviews evaluate technical, managerial, cost, scope, and other aspects of the project, as appropriate. The reviews may also include findings and recommendations for sites to implement to improve project performance. For projects with a total project cost of \$100 million or more, DOE must also develop an independent cost estimate and may conduct an independent cost review as appropriate at different stages of the project. The review validates the preliminary cost range for reasonableness and executability and includes a full accounting of

¹⁸According to the Order, DOE Under Secretaries may lower this threshold to \$10 million during the project development phase for nuclear projects or complex first-of-a-kind projects.

¹⁹DOE refers to these milestones as critical decisions.

lifecycle costs to support the alternative selection process and budgetary decisions.

All projects with a total project cost greater than \$50 million are required to report progress and provide documentation in DOE's PARS database. Among other information, EM sites provide monthly assessments with project cost and schedule updates, project tasks completed, contractor performance information, and upcoming milestones. PARS is also the primary database used to house accompanying project documentation, such as project peer reviews, for applicable projects.

EM's Protocol for Managing Operations Activities

To better define its program management process, in November 2020, EM issued the Program Management Protocol. Among other things, the Protocol requires that EM site offices develop their own lifecycle cost and schedule estimates for completing the cleanup of their respective sites and that these estimates go through an internal review process to ensure that the estimating process followed best practices. According to EM officials, prior to the issuance of the Protocol, EM sites each had lifecycle estimates for their cleanup work, which included a baseline developed by the contractors for the work included in the contract and an estimate developed by EM for the activities after the contract. The updated estimates (FSLEs) are developed and maintained by federal site officials. The FSLE includes the scope, cost, and schedule profiles for the work activities required to complete the EM mission at the site. It comprises three components: all prior year actual costs, estimated cost and schedule for the next 5 to 10 years, and an out-year cost and schedule estimate beyond 10 years.

EM headquarters is conducting a two-phase review process for the sites' FSLEs, and different sites are at different stages of the FSLE development and approval process. As of May 2025, EM officials told us four of the 15 active cleanup sites had received headquarters approval for these estimates. EM officials also told us that as of September 2025, FSLE reviews were ongoing but the agency had made them a lower priority due to ongoing staff shortages.

EM manages lifecycle cost and schedule data for reporting on operations activities in a central database (OEMS). EM began the transition to this data system in 2024, replacing the Integrated Planning, Accounting, and Budgeting System (IPABS) it had used previously. As of July 2025, EM and sites were using OEMS to manage the most recent cost and schedule information, and officials estimated that all historical data would be fully migrated into OEMS by 2027.

Cost Estimates for Four of 12 Capital Asset Projects and Nine of 13 Operations Activities Have Increased Since Our 2022 Report

Cost and Schedule Estimates Increased or Are Expected to Increase on Four Capital Asset Projects

According to EM's data, cost and schedule estimates for four of our 12 selected capital asset projects have increased or are expected to increase since our last report in 2022: the Waste Treatment and Immobilization Plant (Hanford), the Safety Significant Confinement Ventilation System (WIPP), the Utility Shaft (WIPP), and the Outfall 200 Mercury Treatment Facility (Oak Ridge) (see table 2).²⁰ Further, during the course of our review, four of our selected projects were completed: the Advanced Manufacturing Collaborative Facility (Savannah River), the Safety Significant Confinement Ventilation System (WIPP), the Utility Shaft (WIPP) and the Main Plant Process Building demolition (West Valley). The changes in estimated costs since our 2022 report amounted to a combined increase of about \$2 billion across all projects included in both reports.²¹

²⁰According to EM officials, they are in the process of updating the cost and schedule baseline for the Outfall 200 Mercury Facility, but the specific updates are currently unknown. However, EM site officials said they anticipate a potential cost increase of at least \$100 million and a potential schedule delay of 2 years. Further, EM anticipates a pause in major construction on this project through fiscal year 2026.

²¹The projects included in our 2022 report that are also included in the scope of this report are the Waste Treatment and Immobilization Plant (Hanford), the On-Site Waste Disposal Facility and the Outfall 200 Mercury Treatment Facility (Oak Ridge), the On-Site Waste Disposal Facility – Infrastructure Construction (Portsmouth), Saltstone Disposal Units 10-12 (Savannah River Site), the Safety Significant Confinement Ventilation System and the Utility Shaft (WIPP), and the Main Plant Process Building (West Valley).

Corrective Action Plans Based on Root Cause Analysis Could Prevent Cost Increases and Schedule Delays

The Office of Environmental Management (EM) requires its cleanup sites to conduct root cause analyses to identify reasons for cost increases or schedule delays when overruns exceed certain thresholds. Such analyses can help EM address underlying issues and prevent additional cost increases and schedule delays. However, current EM guidance does not include clear requirements for sites to develop corrective action plans to accompany such root cause analyses. We reported in June 2024 that if a site's cost estimates increase, there is no threshold at which EM is required to report such increases to Congress to ensure corrective actions are implemented in a timely and adequate manner. Among other things, we recommended that root cause analyses be accompanied by corrective action plans and that actions are tracked through completion when a site's cost estimate exceeds a certain threshold. As of July 2025, EM had drafted updated guidance to address this recommendation, but the draft guidance was undergoing internal reviews and had not been finalized. As a result, the recommendation remains open.

Sources: GAO analysis of EM document; [GAO-24-105975](#). | GAO-26-107820

Our 12 selected capital asset projects had estimated total project costs, based on EM's data, ranging from \$69 million for the Advanced Manufacturing Collaborative Facility to \$18.5 billion for the Hanford Waste Treatment and Immobilization Plant. Most of the projects included ongoing cleanup work in one of three areas: radioactive liquid waste stabilization and disposition, nuclear facility decontamination and decommissioning, or solid waste stabilization and disposition.

Table 2: Changes to Cost and Schedule Estimates Since Our 2022 Report for Selected Office of Environmental Management (EM) Capital Asset Projects, Based on EM Data as of August 2025

EM site	Capital asset project	Project cost estimate (dollars in millions)	Change since our 2022 report (dollars in millions)	Estimated date of completion	Change since our 2022 report
Hanford Site ^a (WA)	Waste Treatment and Immobilization Plant ^b	\$18,524	▲\$1,711	9/2027	Delay of over 4 years ^c
	Advanced Modular Pretreatment System	\$460–710	N/A	3/2029–6/2031	N/A
Oak Ridge Reservation (TN)	On-Site Waste Disposal Facility	\$335–555	N/A	5/2030	N/A
	Outfall 200 Mercury Treatment Facility	\$224	Anticipated increase ^d	9/2025	Anticipated delay
Portsmouth Gaseous Diffusion Plant (OH)	X-333 Process Building Demolition Project	\$537	N/A	6/2033	N/A
	On-Site Waste Disposal Facility – Infrastructure Construction	\$373	No change	9/2027	No change
Savannah River Site (SC)	Advanced Manufacturing Collaborative Facility ^e	\$69	N/A	6/2025	N/A
	F-Area Material Storage Building	\$64–138	N/A	9/2027–9/2029	N/A
	Saltstone Disposal Units 10-12	\$496	No change	7/2030	No change
Waste Isolation Pilot Plant (NM)	Safety Significant Confinement Ventilation System ^f	\$485	▲\$197	3/2025	Completed over 2 years late
	Utility Shaft	\$282	▲\$85	9/2025	Completed nearly 2 years late
West Valley Demonstration Project (NY)	Main Plant Process Building Demolition ^g	\$164	▼\$42	6/2025	Completed early by 1 month

Source: GAO analysis of Department of Energy (DOE) data. | GAO-26-107820

Note: N/A = not applicable. In [GAO-22-104662](#), we reported cost and schedule estimates for selected projects. Projects with cost or schedule changes marked as not applicable in this table were not included in [GAO-22-104662](#) or had not yet established a baseline.

The cost estimates included in this table are in escalated dollars.

^aPrior to 2024, EM operated two separate offices with distinct responsibilities at the Hanford site: The Office of River Protection (which primarily oversaw the tank waste cleanup) and the Richland Operations Office (which oversaw various cleanup including soil and groundwater and deactivation and decommissioning activities). As of October 2024, EM combined these responsibilities under one site office, collectively referred to as the Hanford Field Office, which manages cleanup at the Hanford site.

^bThis cost estimate reflects the costs for the Low-Activity Waste portion of the project and the design phase of the High-Level Waste Vitrification facility. It does not include costs for constructing and commissioning the High-Level Waste Vitrification Facility, which EM officials estimate could cost up to \$14 billion to complete.

^cAccording to EM officials, the delay is due to adding time for the design phase of the High-Level Waste Vitrification facility. The total estimated cost and completion date will increase based on the scope of work that needs to be added to provide the capability to treat Hanford's high-level waste.

^dAccording to EM officials, they are in the process of updating the cost and schedule baseline for this project, but the specific updates are currently unknown. However, EM site officials said they anticipate a potential cost increase of at least \$100 million and a potential schedule delay of 2 years. Further, EM anticipates a pause in major construction on this project through fiscal year 2026.

^eThis project has a total project cost estimate of less than \$100 million, but we selected it because it was projected to finish within the time frame of our review. The project was completed in June 2025.

^fIn 2022, EM increased cost and schedule estimates for this project to \$494 million and June 2026, respectively, before completing the project in March 2025.

^gThis project had an estimated total project cost of \$206 million and estimated completion date of July 2025, before being completed in June 2025.

Cost Estimates Increased on Nine Operations Activities

According to EM's data, since 2022, nine operations activities have seen increases in their estimated cost, and two have seen decreases, as shown in table 3. Further, seven operations activities have seen schedule delays since 2022, whereas four have seen either no change or an earlier estimated completion date. The changes in estimated costs since our 2022 report, based on EM's data, amounted to a combined increase of about \$75 billion across all operations activities included in both reports.²² EM officials said that these cost increases were already known to the agency and accounted for in previous lifecycle cost estimates that have been communicated to Congress. However, these increases were not reflected in EM's data until after our 2022 report, due to challenges EM headquarters faces in providing current, consistent, and comparable cost and schedule estimates and reconciling data discrepancies, as we note later in this report. Further, EM officials did not always understand why the sites' current cost and schedule estimates were different from headquarters'. EM's estimated costs for our 13 selected operations activities range from about \$1 billion for the Moab Uranium Mill Tailings operations activity to about \$177 billion for the Hanford Radioactive Liquid Waste Stabilization and Disposition operations activity. Most of the activities included ongoing cleanup work in one of three areas: radioactive liquid waste stabilization and disposition, nuclear facility deactivation and decommissioning, or soil and water remediation.

²²The operations activities included in our 2022 report that are also included in the scope of this report include all activities listed in table 3, with the exception of Sitewide Services (Hanford) and Soil and Water Remediation (Nevada).

Table 3: Changes to Cost and Schedule Estimates Since Our 2022 Report for Selected Office of Environmental Management (EM) Operations Activities, Based on EM Data as of November 2024

EM site	Operations activity	Lifecycle cost estimate (dollars in billions)	Change since our 2022 report (dollars in billions)	Estimated date of completion	Change since our 2022 report
Hanford Site ^a (WA)	Radioactive Liquid Tank Waste Stabilization and Disposition ^p	\$177	▲\$68	5/2079	Delay of 10 years
	Hanford Central Plateau	\$14.6	▲\$0.3	9/2126	Delay of 36 years
	Sitewide Services	\$41.2	N/A	9/2112	N/A
Idaho National Laboratory (ID)	Idaho Nuclear Technology and Engineering Center Infrastructure	\$1.9	▲\$0.1	9/2090	Delay of 30 years
Los Alamos National Laboratory (NM)	Los Alamos Soil and Water Remediation	\$5.3	▲\$1.8	7/2044	Delay of 13 years
Moab Site (UT)	Moab Uranium Mill Tailings Project	\$0.96	▲\$0.05	9/2029	Estimated completion 5 years earlier
Nevada National Security Site (NV)	Soil and Water Remediation	\$1.1	N/A	9/2032	N/A
Oak Ridge Reservation (TN)	Nuclear Facility Deactivation and Decommissioning – Y-12	\$2.17	▼\$0.37	9/2047	Delay of 2 years
Paducah Gaseous Diffusion Plant (KY)	Paducah Gaseous Diffusion Plant Deactivation and Decommissioning	\$24	▲\$3	9/2070	No change
Portsmouth Gaseous Diffusion Plant (OH)	Nuclear Facility Deactivation and Decommissioning	\$9.8	▲\$2.7	9/2043	No change
Savannah River Site (SC)	Radioactive Liquid Waste Stabilization and Disposition	\$30.3	▼\$7.5	9/2041	Delay of 1 year
Waste Isolation Pilot Plant (NM)	Carlsbad Waste Disposal Facility Operations	\$9.01	▲\$6.04	9/2039	Estimated completion 11 years earlier ^c
West Valley Demonstration Project (NY)	West Valley Nuclear Facility Deactivation and Decommissioning	\$2.8	▲\$0.6	9/2051	Delay of 6 years ^d

Source: GAO analysis of DOE data. | GAO-26-107820

Note: N/A = Not applicable. In [GAO-22-104662](#), we reported cost and schedule estimates for selected projects and activities. Operations activities with cost or schedule changes marked as not applicable in this table were not included in [GAO-22-104662](#) or had not yet established a baseline.

The cost estimates in this table are presented in constant year 2024 dollars and at the 80 percent confidence level, meaning that additional costs have been added to the estimate based on the results of an analysis of the likelihood and consequence of identified project risks.

^aPrior to 2024, EM operated two separate offices with distinct responsibilities at the Hanford site: The Office of River Protection (which primarily oversaw the tank waste cleanup) and the Richland Operations Office (which oversaw various cleanup including soil and groundwater as well as deactivation and decommissioning activities). As of October 2024, EM combined these responsibilities under one site office, collectively referred to as the Hanford Field Office, which manages cleanup at the Hanford site.

^bAccording to EM officials, EM and its regulators reached a settlement agreement in April 2024, which resulted in changes to the cleanup approach to address Hanford’s tank waste. These changes have not yet been reflected in the lifecycle cost estimate for the radioactive liquid waste stabilization and disposition operations activity. However, once the changes are incorporated, it will result in a decrease to the estimate for this activity.

^cAlthough the current schedule estimate reflects a decreased time frame since 2022, the site has submitted its federal site lifecycle estimate (FSLE), which reflects an estimated end date in 2083, according to site officials. Therefore, when the FSLE is approved, the estimates for this operations activity will reflect an increase since our last report.

^dIn our 2022 report, we reported an estimated completion date of fiscal year 2024 for this operations activity. However, since that report, EM officials told us that the phases of this activity have been organized differently in EM’s data system. Therefore, EM officials told us a more accurate comparison shows a 6-year delay.

Six Capital Asset Projects Have Been Completed Since 2022

Of the 15 active capital asset projects we reported on in 2022, six have been completed. Five of those six were completed at a lower cost and in less time than originally planned (see table 4).

Table 4: Selected Office of Environmental Management (EM) Capital Asset Projects That Were Completed Since Our 2022 Report

EM site	Capital asset project	Initial estimated project cost (dollars in millions)	Project cost at completion (dollars in millions)	Initial estimated completion date	Actual completion date
Hanford Site ^a (WA)	Plutonium Finishing Plant Demolition Project	\$73	\$204	8/2018	1/2022
	Tank-Side Cesium Removal System Demonstration	\$164	\$135	7/2022	4/2022
Portsmouth Gaseous Diffusion Plant (OH)	On-Site Waste Disposal Facility – Initial Infrastructure & Cells 1, 4 & 5 Liner construction	\$285	\$248	7/2024	8/2022
	X-326 Process Building Demolition	\$160	\$132	10/2025	7/2024
Savannah River Site (SC)	Saltstone Disposal Unit #7	\$159	\$127	3/2022	7/2021
	Saltstone Disposal Units 8 and 9	\$280	\$218	9/2024	3/2024

Source: GAO analysis of DOE data. | GAO-26-107820

EM Faces Challenges Providing Accessible and Consistent Data and Documents Amid Growing Costs but Has Opportunities to Save More than \$100 Billion

Note: In [GAO-22-104662](#), we reported cost and schedule estimates for 15 selected projects. Our selected projects also included the Sludge Processing Facility Buildouts Project at the Oak Ridge site. However, this project was cancelled in November 2023.

The cost estimates in this table are in escalated dollars.

^aPrior to 2024, the EM operated two separate offices with distinct responsibilities at the Hanford site: The Office of River Protection (which primarily oversaw the tank waste cleanup) and the Richland Operations Office (which oversaw various cleanup including soil and groundwater as well as deactivation and decommissioning activities). As of October 2024, EM combined these responsibilities under one site office, collectively referred to as the Hanford Field Office, which manages cleanup at the Hanford site.

Based on our review of EM's largest capital asset projects and operations activities across 11 sites, we made the following observations about EM's challenges and opportunities to improve performance:

Observation 1: Contractor performance issues, unanticipated site conditions, and other factors led to cost and schedule increases for DOE's largest capital asset projects. Moreover, key performance information is not consistently accessible.

According to site officials, multiple factors contributed to capital asset project delays and cost increases. Of the 12 EM capital asset projects we reviewed, nine have progressed far enough to have established cost and schedule baselines. As we previously noted, four of those nine are expected to be delayed or cost more than initially estimated. Multiple factors contributed to those cost increases and delays, for example:

- **Contractor performance.** According to site officials, the Safety Significant Confinement Ventilation System at the Carlsbad site, which manages WIPP, experienced cost increases and schedule delays in part due to performance issues with the construction subcontractor and the main WIPP site contractor's inadequate oversight of that subcontractor. For example, we reported in 2022 that the contractor at WIPP did not have dedicated risk managers or experienced cost account managers, and therefore did not recognize and correct a number of cost and schedule issues in a timely manner.²³ At the time, DOE conducted an analysis that identified the contractor's inexperience with managing capital asset projects and DOE's and the contractor's inability to attract and retain qualified staff as root causes of project delays. At Oak Ridge, the Outfall 200 Mercury Facility will be delayed in part due to safety concerns and

²³GAO, *Waste Isolation Pilot Plant: Construction Challenges Highlight the Need for DOE to Address Root Causes*, [GAO-22-105057](#) (Washington, D.C.: Mar. 15, 2022).

Sites Have Lost Key Staff, and Long-Term Effects Are Uncertain

Office of Environmental Management (EM) site officials reported losing key staff across most (9 out of 11) sites we spoke with since January 2025, and officials at about half (5 out of 11) sites we spoke with said because the federal workforce changes are ongoing, they are uncertain about the future impact these changes will have on the cost and schedule of capital asset projects and operations activities. During this time, EM officials said the Department of Energy remains committed to meeting its legal obligations under cleanup statutes, regulations, and agreements.

Key staff lost across sites include project and operations managers, facility representatives, and health and safety experts. Some sites reported losing institutional knowledge that could directly affect EM's ability to manage cleanup progress on certain projects. For example, according to site officials, the Nevada site lost about 30 percent of its staff to resignations and retirements as of May 2025. These departures included the site deputy operations manager, who officials said had the most experience in identifying drill site locations and potential safety concerns related to groundwater monitoring wells. Some staff chose to resign or retire through the Department of Energy's Deferred Resignation Program. Additionally, the Idaho site lost a range of key staff, including staff most familiar with the site's cost and schedule tracking.

Officials at four of 11 sites said staff vacancies could result in reduced project or contractor oversight for at least one capital asset project or operations activity. In contrast, officials at other sites said vacancies had little or no direct effect, in part because they have used contractors to take on duties previously held by EM officials.

Source: GAO. | GAO-26-107820

accidents that occurred under the first construction contractor, according to EM site officials.²⁴

- **Unanticipated site conditions.** Navigating unanticipated and challenging geologic conditions also contributed to cost increases and schedule delays at the Outfall 200 Mercury Facility. Specifically, during excavation work at the facility, the contractor found that portions of the bedrock were deeper than originally estimated, which required a redesign of certain elements of the project, according to EM site officials.
- **Technical challenges.** Hanford experienced cost increases and project delays due to a number of factors including technical challenges with the Waste Treatment and Immobilization Plant project.²⁵ As we reported in September 2024, the Waste Treatment and Immobilization Plant has been under construction for over 20 years and has faced many challenges, including technical challenges with the High-Level Waste Vitrification Facility that led DOE to slow its

²⁴According to EM officials, in November 2023, responsibility for construction of the facility was transitioned to a new contractor based on a mutual agreement among the agency and the contractors in light of a range of factors.

²⁵GAO, *Hanford Cleanup: DOE Should Validate Its Analysis of High-Level Waste Treatment Alternatives*, [GAO-23-106093](#) (Washington, D.C.: May 24, 2023).

construction from 2012 through 2022.²⁶ The challenges remain at least partially unresolved. In June 2024, DOE reported that a variety of technical challenges, and the time needed to resolve them, contributed to multiple schedule delays to complete the low-activity waste facility. These included mechanical and ventilation issues within the facility that required time and resources.

As mentioned previously, PARS serves as the primary database to track cost and schedule information for capital asset projects, including supporting documents that can provide insight into why cost and schedule estimates increase. However, EM does not maintain and share complete documentation for capital asset projects in PARS. For example, we found that nine capital asset projects were missing recent project peer reviews and independent cost estimate reports in PARS.

DOE Order 413.3B states that all projects with a total project cost greater than \$50 million are required to report progress and provide documentation in PARS, as stated previously. DOE Order 226.1B states that EM must maintain sufficient technical capability and knowledge of site and contractor activities to make informed decisions about hazards, risks, and resource allocation.

DOE Order 413.3B includes requirements and deadlines for updating PARS with project cost and schedule data, such as contractor performance data and baseline change proposals. However, EM does not have clear requirements to ensure other project documents, such as project peer reviews that provide information on potential issues that could affect costs and schedules, are consistently uploaded and available in PARS. EM officials acknowledged that they have not consistently ensured that copies of project peer review reports and other project documents were uploaded to PARS. EM officials plan to eventually revise their policies and procedures related to the peer review process by including a step to make sure copies of project peer review reports are uploaded to PARS. However, they do not have a concrete plan or time frames to develop this process.

Without access to key documents for capital asset projects that discuss issues that could affect the cost and schedule of projects, EM headquarters staff are limited in their ability to provide effective oversight

²⁶GAO, *Hanford Cleanup: Alternatives for Treating and Disposing of High-Level Waste Could Save Billions of Dollars and Reduce Certain Risks*, [GAO-24-106989](#) (Washington, D.C.: Sept. 26, 2024).

for EM sites or ensure projects stay on track. Further, insufficient oversight increases risks of additional cost and schedule overruns and, consequently, higher costs to the taxpayer.

Observation 2: Sites reported several factors contributing to cost and schedule changes for operations activities, but EM headquarters struggles to provide consistent and comparable cost and schedule estimates and reconcile data discrepancies.

According to EM site officials, changes in cost and schedule estimates for operations activities were due to several factors. The cost and schedule estimates for two of the 11 operations activities reviewed in our 2022 report either did not change or decreased since 2022.²⁷ For example, the estimated cost for the radioactive liquid waste operations activity at the Savannah River Site decreased because the contractor identified efficiencies to save costs and avoid excess work, according to site officials.

As we previously noted, nine of our selected operations activities have seen increased cost estimates and seven operations activities have seen schedule delays since 2022. The largest increases and delays were due to several factors, including the following:

- **Changes in tank waste retrieval plans.** According to EM officials, EM adjusted its plans for retrieving waste from several of the underground tanks at the Hanford Site. This new retrieval sequence limited EM's ability to simultaneously retrieve waste from some tanks, adding 32 years and additional costs to the lifecycle estimate for Hanford's radioactive liquid waste stabilization and disposition operations activity.²⁸
- **Capital asset project delays on site.** Officials at four sites noted that changes to the schedules of capital asset projects affect operations activities at their site, since many of those operations activities include providing electricity and water on-site while construction or demolition projects are ongoing. For example, officials at Hanford noted that the

²⁷[GAO-22-104662](#).

²⁸According to EM officials, EM and its regulators reached a settlement agreement in April 2024, which resulted in changes to the cleanup approach to address Hanford's tank waste. These changes have not yet been reflected in the lifecycle cost estimate for the radioactive liquid waste stabilization and disposition operations activity. However, once the changes are incorporated, it will result in a decrease to the estimate for this activity.

delay in the schedule for the Hanford Central Plateau operations activity was due to the extended timeline for the construction of the Waste Treatment Plant.

EM faces further challenges providing current cost and schedule estimates for operations activities that are consistent and comparable between headquarters and sites. Moreover, it faces challenges reconciling discrepancies found between sites' data and EM headquarters. Specifically, we found discrepancies between the current cost estimates provided to us by site officials and estimates provided to us by headquarters for six out of 13 operations activities. EM headquarters officials told us they did not always understand why the sites' current cost and schedule estimates were different from headquarters'. Current cost estimates provide EM with insight on the status of cleanup at its various sites, so coordination between EM headquarters and sites on this data is important for effective oversight.

EM also faces challenges coordinating with sites to reconcile discrepancies between sites' data and EM headquarters data for historical cost and schedule estimates, which were set when the activities first started. For example, the historical cost or schedule estimates provided by sites were inconsistent compared to those provided by EM headquarters for four out of 13 operations activities. EM has not yet moved all historical data over to OEMS from IPABS, and EM does not have a process to improve these data discrepancy issues before the transition is over.

EM officials told us they could not always identify the causes of discrepancies, and they could not easily coordinate with sites and provide updated estimates without spending additional time reviewing the data. According to officials, possible causes for data discrepancies and factors that make coordination more difficult and time consuming include the following:

- **Cost adjustments.** EM headquarters and sites make various adjustments to their cost estimates at different points in time, and EM is not able to easily provide current, consistent lifecycle cost estimates without lengthy internal review. According to EM officials, some discrepancies between headquarters and site estimates may be due to adjustments made by sites to account for projected future costs (called environmental liability adjustments), which are not immediately incorporated into the sites' lifecycle cost estimates tracked at the headquarters level. EM officials told us they attempt to make any adjustments in a site's lifecycle estimate as soon as is practical.

However, EM officials were not always able to confirm the extent to which these adjustments were the reason for discrepancies in cost estimates between EM headquarters and sites. EM officials said that because of inaccuracies in the lifecycle cost information related to operations activities, the cost increases we are reporting for these activities since 2022 were already known and accounted for in subsequent lifecycle cost estimates.

- **Delayed federal site lifecycle estimates (FSLE) updates.** As we previously noted, EM is in the process of updating all sites' FSLEs. The process of developing these updated estimates has been ongoing for years longer than originally planned, and different sites are at different stages of the process. EM officials told us that as of September 2025, FSLE reviews are ongoing but EM has made them a lower priority due to ongoing staff shortages at the agency. According to EM officials, as of May 2025, only four sites have developed FSLEs that have been approved by EM headquarters. For the other sites, EM officials said it may be more difficult for them to know how the sites come up with their cost estimates until EM reviews the sites' FSLEs.²⁹
- **Database transition.** EM officials we interviewed said that some discrepancies in the historical data are due to issues with the database transition from IPABS to OEMS. As stated previously, EM began transitioning information on cost and schedule from IPABS to OEMS in 2024. During the database transition, EM officials must rely on a contractor to retrieve historical cost data. EM officials said they cannot verify the accuracy of that data in cases where there were discrepancies between the cost information provided by sites and cost information provided by EM headquarters. According to officials, the transition may continue into 2027.

Further, in a recent audit of DOE's fiscal year 2025 financial statement, the independent accounting firm KPMG, LLP reported weaknesses in DOE's internal controls over reporting environmental liability at several sites, resulting in \$66.1 billion of unsupported or inaccurate environmental

²⁹Further, for sites without approved FSLEs, EM said it may not have full information on what is contained in the site estimate, which could make it more difficult to ensure the estimate reflects the latest cost and schedule information for cleanup activities. For example, EM said it had not assessed how Hanford builds its estimates but plans to resolve any discrepancies when they review Hanford's FSLE. According to officials, the Hanford Site is one of eleven sites that does not have an approved FSLE.

liability estimates.³⁰ According to the audit findings, these weaknesses were caused by insufficient resources at EM headquarters to adequately execute control activities, and by failure of field sites to design and implement proper policies, controls, and documentation processes, among other things. KPMG recommended that EM headquarters and field site managers assess resource needs and improve controls over baseline estimates and documentation. EM officials concurred with the recommendations.

EM's Program Management Protocol states that headquarters officials should provide technical and policy support in the planning and field execution of EM waste and materials disposition and deactivation and decommissioning of EM facilities. Further, as noted above, DOE requirements indicate that EM should maintain sufficient knowledge of site activities to make informed decisions about hazards, risks, and resource allocation.³¹ Moreover, according to federal standards for internal control, project managers should use quality information to achieve their objectives.³² Specifically, management should identify information requirements, obtain relevant data from reliable sources, and process data into quality information. Federal standards for internal control also state that management should externally communicate the necessary quality information to achieve the agency's objectives.

Absent steps to ensure consistent, current cost and schedule information and an ability to reconcile data discrepancies, EM officials are limited in their ability to identify activities that are behind schedule or have cost increases and may warrant root cause analysis and corrective actions. Further, easier access to and improved management of this information, which could be achieved by improved coordination with sites, would enhance EM's ability to provide technical and policy support to EM sites and report more accurate information to Congress.

³⁰DOE, *U.S. Department of Energy Agency Financial Report Fiscal Year 2025*, DOE/CF-0221 (Washington, D.C.: December 2025).

³¹DOE, *Implementation of Department of Energy Oversight Policy*, Order 226.1.

³²GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704](#) (Washington, D.C.: Sept. 2014).

Observation 3: Cost estimates for several projects and activities may increase due to pending decisions and new approaches could result in significant cost savings.

Current estimates may not capture the actual costs to complete several projects and activities because final cleanup remedies still need to be determined, according to officials from four sites. Notably, we and others have found that significant cost savings are still possible on several cleanup projects and activities.

According to EM site officials, current estimates for multiple operations activities assume selection of final cleanup remedies that are less costly than remedies that could be chosen. Therefore, if a costlier remedy is selected, the cost and schedule estimates could significantly increase, for example:

Cost Savings at the Savannah River Site

The Savannah River Site in South Carolina has over 30 million gallons of radioactive liquid waste, which could fill more than 45 Olympic-size swimming pools. We recommended in 2019 that the Department of Energy (DOE) use the essential elements of risk-informed decision-making—specifically, considering the trade-offs of environmental risks and costs, among other factors—to guide its cleanup. DOE officials said that in response to our recommendation, the Office of Environmental Management (EM) began adopting a more risk-informed approach to addressing its liquid waste at the Savannah River Site. At the Savannah River Site, EM incorporated an accelerated risk reduction strategy in a new liquid waste cleanup contract that focuses on prioritizing the removal of curies—that is, the amount of radioactivity present in the waste—from the storage tanks, rather than simply the number of gallons of waste. As a result of these efficiencies, which are based in part on our 2019 recommendation, DOE saved approximately \$5 billion.

Source: GAO analysis of EM documents, [GAO-19-339](#). | [GAO-26-107820](#)

- The estimate for the decontamination and decommissioning operations activity at West Valley currently includes costs for the lowest-cost remedy, which involves closing the Nuclear Regulatory Commission-licensed disposal area and waste tanks in place (along with any contaminated equipment) for final disposition of waste at the site. However, EM officials said that a costlier remedy, such as one that involves excavating the waste and sending it off-site, could be selected. We previously reported in 2021 that the additional cost to complete decommissioning activities at West Valley could be between \$1.4 billion and \$10.6 billion, depending on the chosen remedy, with excavating the site on the higher end of the estimate.³³
- Similarly, the Los Alamos site has 17 legacy landfills (called Material Disposal Areas, or MDAs) that still require cleanup action, including many for which the state regulator has not selected a final cleanup remedy. As we have previously reported in 2023, the lifecycle cost estimate at Los Alamos currently assumes that nearly half the MDAs will be addressed with a lower-cost remedy of installing an engineered

³³GAO, *Nuclear Waste: Congressional Action Needed to Clarify a Disposal Option at West Valley Site in New York*, [GAO-21-115](#) (Washington, D.C.: Jan. 13, 2021).

protective barrier over the landfill and sealing any waste in place.³⁴ However, in 2023, the state regulator proposed a final remedy that would involve excavating the contamination from one MDA (MDA-C), which would cost hundreds of millions of dollars more than EM's proposed approach. In June 2025, DOE sought to defer cleanup at MDA-C because it is associated with active facility operations. The state regulator disagreed with this action and, as of February 2026, the matter remained unresolved. Nonetheless, EM site officials at Los Alamos said the statements by the regulator on MDA-C may signal that it will also seek costlier cleanup remedies on the other remaining MDAs.

Our prior reports have stated that significant cost savings are still possible on several cleanup projects and activities, for example:

- We reported in 2021 that DOE estimated that the agency could save up to \$18 billion at the Hanford Site by filling the closed tanks with grout and leaving them in place, rather than exhuming them for disposal elsewhere, as the State of Washington may require.³⁵
- DOE plans to vitrify a portion of Hanford's low-activity waste—the portion of Hanford's tank waste with relatively lower levels of radioactivity—but it has not made a decision on how to treat and dispose of the roughly 40 percent of the low-activity waste referred to as supplemental low-activity waste. In 2017, we found that grouting supplemental low-activity waste could save tens of billions of dollars

³⁴GAO, *Nuclear Waste Cleanup: DOE Needs to Address Weaknesses in Program and Contractor Management at Los Alamos*, [GAO-23-105665](#) (Washington, D.C.: July 19, 2023).

³⁵GAO, *Hanford Cleanup: DOE's Efforts to Close Tank Farms Would Benefit from Clearer Legal Authorities and Communication*, [GAO-21-73](#) (Washington, D.C.: Jan. 7, 2021). In this report, we noted that State of Washington officials told us that they anticipated that most of the tanks on the site will eventually be grouted and left in place. However, those officials explained that if an individual tank in a tank farm has substantial effects that exceed safety limits to the long-term environment and public health, then they may require DOE to exhume that individual tank. We recommended that DOE use an independent mediator to help reach agreement with the state on a process for assessing soil contamination, and that DOE develop a long-term plan for its tank waste cleanup mission at Hanford. DOE concurred with these recommendations, but they remain open. Lastly, we recommended that DOE involve stakeholders in Hanford's tank closure process. DOE concurred with this recommendation and evaluated opportunities for stakeholders' feedback, including Hanford permitting and other actions that are subject to public comments. By assessing DOE's efforts to involve stakeholders in the Hanford tank closure process, we believe DOE's actions met the intent of our recommendation. As a result, the recommendation was closed as of September 2024.

and reduce certain risks compared to vitrification.³⁶ More recently, DOE reported in December 2020 that such alternative approaches may be feasible and could potentially save up to \$210 billion if applied at Hanford.³⁷ In January 2025, EM, EPA, and the State of Washington reached an agreement that includes a plan for EM to grout some of Hanford's low-activity tank waste and dispose of it at off-site facilities. The agreement contemplates that EM will grout low-activity waste from 22 tanks assuming EM has a regulatory pathway to grout the waste and dispose of it off-site.

- In May 2025, we reported that opportunities exist for EM to lower costs and optimize schedules for waste disposal through complex-wide analyses, such as optimization models.³⁸ We found that EM may be underestimating the volume of transuranic waste requiring disposal in the future. We developed a hypothetical optimization model and found that EM could reduce the costs associated with transuranic waste disposal by nearly \$700 million over the first 11 years, if it could overcome certain regulatory constraints.³⁹
- In early 2024, we worked with the National Academies of Sciences, Engineering, and Medicine to convene a panel of experts to discuss alternative approaches for addressing Hanford's high-level waste —or

³⁶GAO, *Nuclear Waste Disposal: Actions Needed to Enable DOE Decision That Could Save Tens of Billions of Dollars*, [GAO-22-104365](#) (Washington, D.C.: Dec. 9, 2021). We recommended that DOE expand future analyses of potential disposal options to include all federal and commercial facilities that could potentially receive grouted supplemental low-activity waste from Hanford. DOE concurred and implemented the recommendation by issuing a report documenting its analysis of potential disposal options for grouted low-activity waste. As of December 2025, the recommendation is closed.

³⁷DOE, *Evaluation of potential Opportunities to Classify Certain Defense Nuclear Waste from Reprocessing as Other than High-Level Radioactive Waste: Report to Congress* (Washington, D.C.: December 2020).

³⁸GAO, *Nuclear Waste: An Integrated Disposal Plan Could Help DOE Complete Its Cleanup Mission and Save Billions*, [GAO-25-107109](#) (Washington, D.C.: May 29, 2025). We made five recommendations, including that EM develop complex-wide analyses to identify optimal disposal pathways; develop a complex-wide plan; and create a forum for EM and cleanup site and disposal facility regulators to address regulatory constraints to optimal disposal approaches. EM neither agreed nor disagreed with the five recommendations in this report, and all remain open as of December 2025.

³⁹An optimization model is a mathematical method used to find the best possible outcome—such as the lowest cost or highest profit—while following specific rules and limitations. The hypothetical model considered the costs of transuranic waste storage, transportation, disposal, and did not take existing regulatory constraints into account. The model scenario that yielded \$700 million in savings over the first 11 years assumed no required shipments from EM sites.

the approximately 3 million gallons of Hanford's tank waste with relatively higher levels of radioactivity. EM currently plans to vitrify this waste in the yet-to-be-completed High-Level Waste Vitrification Facility.⁴⁰ Both DOE and experts who participated in our meetings found that there are additional opportunities for DOE to optimize the high-level waste mission at Hanford by pursuing alternative approaches that could be consistent with regulatory agreements, accelerate the tank waste cleanup mission, and save tens of billions of dollars.

Conclusions

EM's cleanup work at sites across the country makes up the majority of the federal government's overall environmental liability and is at high risk for fraud, waste, abuse, and mismanagement. Since 2022, EM has made progress at some of its sites, including completing several projects early and under budget. However, completing the remaining cleanup is estimated to cost more than half a trillion dollars. Despite this considerable cost, we have identified ways to save more than \$100 billion, and in recent reports we have recommended that DOE senior leadership pursue such cost savings initiatives. DOE officials have generally agreed with these recommendations and, in many cases, are in the process of implementing them.

Nonetheless, several of EM's most expensive capital asset projects have experienced cost increases and schedule delays since we last reported on them in 2022. Key project documents are not consistently accessible in EM's PARS database, including documents that could provide valuable information on reasons behind these increases and recommendations to address underlying issues. Without consistent access to these documents, EM officials are limited in their ability to help ensure projects stay on track.

EM also lacks consistent, current cost and schedule information for operations activities. As EM transitions to a new database for these activities, the office could take steps to ensure consistent, current cost and schedule information, and enhance coordination between

⁴⁰GAO-24-106989. We made 3 recommendations, including that EM pause its work on the High-Level Waste Vitrification Facility until it takes several actions, including considering other alternatives for addressing Hanford's high-level waste. EM agreed with two of our three recommendations and has taken some steps toward implementing them, but disagreed with the recommendation to pause work on the High-Level Waste Vitrification Facility. DOE stated that pausing activity on the facility would be in conflict with existing cleanup milestones and proposed changes to those. All recommendations remain open as of December 2025.

headquarters and sites. These steps could help officials better identify activities that are behind schedule, have cost increases, or need root cause analyses and corrective actions.

Recommendations for Executive Action

We are making the following two recommendations to the Department of Energy:

The Assistant Secretary for EM should ensure the completeness of information related to cost and schedule performance for EM's capital asset projects in DOE's Project Assessment and Reporting System. (Recommendation 1)

The Assistant Secretary for EM should improve coordination with officials and contractors at sites to enhance EM's ability to provide accurate, consistent historical and current lifecycle cost and schedule data for its operations activities and reconcile any data discrepancies. (Recommendation 2)

Agency Comments

We provided a draft of this report to DOE for comment. In its written comments, reproduced in appendix II, DOE concurred with our two recommendations and described steps the agency plans to take to address them. The agency also provided technical comments, which we incorporated as appropriate.

In its written comments, DOE stated that EM will revise its Standard Operating Policies and Procedures to incorporate a step requiring the upload of copies of project peer reviews and independent cost estimate reports into PARS. Additionally, to enhance EM's ability to provide consistent cost and schedule data, DOE stated that EM will complete the upload of historical change request data into its OEMS database by the end of fiscal year 2026.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Energy, and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at andersonn@gao.gov. Contact points for our Offices of Congressional Relations and Media Relations may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VI.

//SIGNED//

Nathan Anderson, Director, Natural Resources and Environment

List of Addressees

The Honorable Roger Wicker
Chairman

The Honorable Jack Reed
Ranking Member
Committee on Armed Services
United States Senate

The Honorable John Kennedy
Chair

The Honorable Patty Murray
Ranking Member
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate

The Honorable Mike Rogers
Chairman

The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

The Honorable Chuck Fleischmann
Chairman

The Honorable Marcy Kaptur
Ranking Member
Subcommittee on Energy and Water Development, and Related Agencies
Committee on Appropriations
House of Representatives

Appendix I: Office of Environmental Management (EM) Nuclear Waste Cleanup Sites: Background Information

The Department of Energy's (DOE) Office of Environmental Management (EM) is responsible for addressing hazardous and radioactive waste at sites that have been contaminated from decades of nuclear weapons production and nuclear energy research. This section contains background information on each of the 15 active EM cleanup sites.

Energy Technology Engineering Center

The Energy Technology Engineering Center occupies 90 acres within the 290-acre Santa Susana Field Laboratory 30 miles north of Los Angeles, California. The area was primarily used for DOE research and development activities. In the mid-1950s, part of the area was set aside for nuclear reactor development and testing, primarily related to the development of nuclear power plants and space power systems, using sodium and potassium as coolants. In the mid-1960s, the Energy Technology Engineering Center was established as a DOE laboratory for the development of liquid metal heat transfer systems to support the Office of Nuclear Energy Liquid Metal Fast Breeder Reactor program. DOE is now involved in the deactivation, decommissioning, and dismantlement of contaminated facilities on the site.

Hanford Site

The Hanford Site was established in Washington State during World War II to produce plutonium for the nation's nuclear weapons. From 1944 through 1988, plutonium production at Hanford generated about 525 million gallons of radioactive and hazardous waste. Some of the waste was dumped directly into the soil, some was encased in drums or other containers and buried, and about 54 million gallons were stored on-site in 177 underground tanks.

EM currently plans to treat much of Hanford's tank waste in the Waste Treatment and Immobilization Plant, which consists of facilities that are designed to separate the waste into various streams so they can be treated. The Waste Treatment and Immobilization Plant is the largest, most technically complex construction project within EM. It has been under construction for over 20 years, cost over \$17.5 billion to date, and has faced numerous technical challenges, cost overruns, and schedule delays.

Idaho National Laboratory

The Idaho National Laboratory site, an 890-square-mile DOE site located in eastern Idaho, was established in 1949 as the National Reactor Testing Station. Initially, the lab's missions included developing civilian and defense nuclear reactor technologies and management of spent nuclear fuel. Fifty-two reactors were built at the site, including the Navy's first prototype nuclear propulsion plant. Of the 52 reactors, four remained in operation as of May 2025.

The Idaho Cleanup Project was created to help accelerate cleanup of the environment at the Idaho National Laboratory Site. The Idaho Cleanup Project is addressing contamination from wastes generated from World War II-era conventional weapons testing, government-owned research and defense reactors, spent nuclear fuel reprocessing, laboratory research, and defense missions. The project is focused on safely remediating the Idaho site, including dispositioning transuranic waste, managing spent nuclear fuel, and treating high-level waste to protect the underlying aquifer and comply with federal and state agreements.

Lawrence Livermore
National Laboratory

Lawrence Livermore National Laboratory is a multidisciplinary research and development center focusing on weapons development, stewardship, and homeland security that was founded in 1952 in Livermore, California. Soil and groundwater contamination was discovered at two sites at the lab—the Livermore site and Site 300—in the 1980s. This contamination resulted from early research activities. In the case of the Livermore site, a portion of the soil and groundwater contamination also has been attributed to solvents and degreasers that were used to clean airplane engines while the site served as a U.S. Naval Air Station in the early 1940s. Cleanup efforts at the laboratory include removing contamination from the soil and groundwater, and decommissioning and demolishing contaminated excess facilities.

Los Alamos National
Laboratory

Work at Los Alamos National Laboratory began in 1943 as part of the Manhattan Project, with the mission of conducting nuclear weapons research and development. Efforts at Los Alamos resulted in the release of radioactive and hazardous materials. In particular, from 1956 to 1972, Los Alamos flushed water that contained chromium (a corrosion inhibitor) from cooling towers into Sandia Canyon and an underlying aquifer.

Cleanup areas at Los Alamos include former Los Alamos facilities, hillsides, canyon bottoms, and old landfills. Legacy cleanup activities include monitoring and remediating surface and groundwater, removing contaminated soil, and decontaminating and decommissioning surplus process-contaminated facilities. As of May 2021, more than half of the 2,100 contaminated sites originally identified have been investigated and remediated.

Moab

DOE's site at Moab, Utah, is a former commercial mill constructed in 1956 to produce yellowcake, a uranium concentrate that was sold to the U.S. Atomic Energy Commission through December 1970 for use in national defense programs. After 1970, mill production was primarily for commercial sales to nuclear power plants, until processing operations

were ceased in 1984. Moab milling operations created process-related wastes and mill tailings.¹ While a majority of the uranium was removed during processing, radium and other decay products remained in the mill tailings. These tailings were placed at a storage impoundment on the property, accumulating into a pile that is over 80 feet thick. Due to a lack of lining at the storage site, coupled with the already high water content present in the tailings, excess water in the pile infiltrated underlying media, resulting in contaminated soils and groundwater.

DOE assumed ownership of the Moab site in 2001.² The major cleanup actions ongoing at Moab today fall under two broad categories. The first is the relocation, primarily by rail, of approximately 16 million tons of uranium mill tailings and other residual radioactive material from the Moab site to the permanent disposal site. The second is the remediation of contaminated groundwater. Interim measures are in place, including groundwater extraction and injection of freshwater to form a hydraulic barrier. DOE is in the process of developing the Groundwater Compliance Action Plan, which will determine the final remedy for site cleanup.

Nevada National Security Site

In 1950, President Truman established what is now known as the Nevada National Security Site (NNSS) to perform nuclear weapons testing activities. In support of national defense initiatives, 928 atmospheric and underground nuclear weapons tests, were conducted at the NNSS between 1951 and 1992, when a moratorium on nuclear testing went into effect. Today, the NNSS is a large, geographically diverse research, evaluation, and development complex that supports homeland security, national defense, and nuclear nonproliferation. EM activities at the Nevada site include disposal of low-level, mixed low-level, and classified waste in support of DOE cleanup and activities at federal sites across the US; groundwater corrective actions, including identifying contaminant boundaries, restricting access to contamination, and implementing a comprehensive monitoring program, with sampling locations on and off the site; and environmental corrective actions, to include ongoing

¹Under the Uranium Mill Tailings Radiation Control Act of 1978, “tailings” are the remaining portion of a metal-bearing ore after some or all of such metal—such as uranium—has been extracted. 42 U.S.C. § 7911(8).

²Title I of the Uranium Mill Tailings Radiation Control Act of 1978 required DOE to remediate certain uranium ore processing sites across the country but not the Moab site. In 2000, the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 was enacted, which gave DOE responsibility for remediating the Moab site generally in accordance with title I of the 1978 act.

demolition and disposal work, at historically contaminated, industrial-type facilities at the NNSS.

New York Project Office

The New York Project Office or EMCBC-New York (formerly the Separation Process Research Unit Field Office) is an inactive facility located at the Knolls Atomic Power Laboratory in Niskayuna, New York, near Schenectady. The Mohawk River forms the northern boundary of this site. Built in the late 1940s, its mission was to research the chemical process to extract plutonium from irradiated materials. Equipment was flushed and drained, and bulk waste was removed following the shutdown of the facilities in 1953. Today, process vessels and piping have been removed from all the research unit's facilities. In 2010, cleanup of radioactivity and chemical contamination in the Lower Level Railroad Staging Area, Lower Level Parking Lot, and North Field areas was completed, and all site physical work finished in summer 2019. A storage facility containing 24 containers of TRU waste remains at the site.

Oak Ridge Reservation

In 1942, the U.S. Army Corps of Engineers began acquiring the 56,000 acres that would make up the Oak Ridge Reservation in Oak Ridge, Tennessee, in service of the Manhattan Project. There are three major cleanup areas at the Oak Ridge Reservation—the East Tennessee Technology Park, Oak Ridge National Laboratory, and the Y-12 National Security Complex (Y-12).

The original K-25 plant, now known as the East Tennessee Technology Park, used gaseous diffusion to produce weapons-grade enriched uranium. In 2020, EM completed removal of all facilities at the site. Ongoing cleanup activities on site include remediation of remaining soil and groundwater contamination. During the Cold War, Y-12 focused on producing lithium-6 for nuclear weapons, which created large amounts of mercury that entered the environment. Cleanup activities at Y-12 center on meeting CERCLA cleanup standards for an active DOE industrial site. According to EM site officials, mercury concentrations exceeding regulatory standards, in both contaminated facilities and the surrounding environment, are one of the largest challenges at Y-12. Current cleanup activities at Oak Ridge National Laboratory include demolition of contaminated facilities, processing and disposal of legacy transuranic debris waste and sludge, and remediation of soil and groundwater. As of 2025, EM has nearly completed the processing of legacy transuranic debris waste.

Paducah

In 1950, the U.S. Atomic Energy Commission selected a former WWII munitions plant near Paducah, Kentucky, to serve as the second of three

uranium enrichment plants in the U.S., alongside plants at Portsmouth, Ohio, and Oak Ridge, Tennessee. The Paducah Gaseous Diffusion Plant was originally used to enrich uranium for military reactors and nuclear weapons, though later the site was used to supply enriched uranium for commercial power plants. Uranium enrichment activities occurred at the site between 1952 and 2013, and it was the last government-owned uranium enrichment facility operating in the U.S. Today, Paducah continues to operate a Depleted Uranium Hexafluoride Conversion Facility, which converts depleted uranium hexafluoride into a more stable chemical form suitable for reuse or disposition.

More than 60 years of uranium enrichment and support activities at Paducah generated hazardous and radioactive waste and resulted in soil, groundwater, and surface water contamination. As of 2025, EM is focusing on a holistic cleanup strategy for the Paducah site, which includes the approval of three Records of Decision that will support cleanup of environmental media, demolition of the site's facilities, and a waste decision alternative that will support the construction of an on-site waste disposal facility, if selected. While EM develops these decision documents, the deactivation of large process buildings at the site will continue.

Portsmouth

Construction of the Portsmouth Gaseous Diffusion Plant in Ohio was completed in 1956. The mission of the site was to produce enriched uranium used to bolster the nuclear weapons program and the U.S. Navy during the Cold War. The site also enriched uranium for world-wide commercial nuclear power facilities through 2000. Gaseous Diffusion Plant operations generated hazardous and radioactive wastes. DOE established the Portsmouth cleanup program in 1989 to identify, control, and remediate environmental contamination at the site.

Broadly, cleanup activities at the site include the decontamination and decommissioning of inactive contaminated facilities; remediation of groundwater, soil, and burial grounds; and continued environmental monitoring. Near-term decontamination and decommissioning activities at Portsmouth concern three uranium enrichment-processing buildings. In addition, EM must conduct decontamination and decommissioning on hundreds of other support buildings and facilities. Waste and debris from these decontamination and decommissioning activities that meet the approved acceptance criteria will be disposed of in the On-Site Waste Disposal Facility. Ongoing soil and groundwater cleanup activities at the site include the monitoring and remediation of five groundwater plumes.

Sandia National Laboratory

The Sandia National Laboratory is composed of 2,820 acres within the boundaries of the Kirtland Air Force Base in New Mexico. Sandia was established in 1945 for nuclear weapons development, testing, and assembly for the Manhattan Project. This mission continued until, beginning in 1980, the mission shifted toward research and development for nonnuclear components of nuclear weapons. Subsequently, the mission was expanded to research on and development of nuclear safeguards and security, and multiple areas in science and technology.

Historical operations generated hazardous, radioactive, and mixed waste that requires remediation. Of the six remaining sites, three have contaminated groundwater that is being addressed, and the other three are deferred from cleanup activities, due to being located on an active site at Sandia.

Savannah River Site

The Savannah River Site in South Carolina was constructed during the early 1950s to produce the basic materials for nuclear weapons. Five reactors were built to produce these materials and a number of support facilities, including two chemical separations plants, a heavy water extraction plant, a nuclear fuel and target fabrication facility, a tritium extraction facility, and waste management facilities. Irradiated materials were moved from the reactors to one of the two chemical separations plants. In these facilities, known as “canyons,” the irradiated fuel and target assemblies were chemically processed to separate useful products from waste. After refinement, nuclear materials were shipped to other DOE sites for final application. The site produced about 36 metric tons of plutonium from 1953 to 1988.

Nuclear material production at Savannah River produced unusable by-products, such as liquid radioactive waste, which was stored on site in million-gallon tanks. Savannah River has closed eight such tanks. The 43 remaining high-level waste tanks at Savannah River contain approximately 34 million gallons of waste and are in various stages of the waste removal, cleaning, and closure process. Since approximately 2003, extensive cleanup and closure work has been completed at Savannah River under a concept known as Area Completion, which streamlines and accelerates the cleanup process. Area Completion focuses on cleaning up contamination in the environment by treating or immobilizing the source of the contamination to mitigate transport through soil and groundwater and to clean up or slow the movement of contamination that has already migrated from the source.

Waste Isolation Pilot Plant (WIPP)

Located near Carlsbad, New Mexico, WIPP serves as the only deep geologic repository in the U.S. for the disposal of a specific type of defense-related nuclear waste. WIPP is designed to safely dispose of defense-related transuranic waste generated by DOE's nuclear weapons research, production, and cleanup activities at sites across the country. The waste is disposed of in underground rooms mined out of an ancient salt formation more than 2,000 feet below the earth's surface. Since WIPP began to accept waste in 1999, DOE has depended on WIPP's capability to accept transuranic waste shipments.

In 2014, two accidents occurred in the underground area at WIPP. First, a salt truck fire created substantial smoke and soot that damaged key equipment and facilities. Second, a transuranic waste container breach, caused by a chemical reaction inside the container between materials that DOE later determined should not have been packaged together, resulted in a release of radiological material that contaminated a portion of the facility. DOE was forced to halt waste disposal operations while it worked to recover from the accidents. In 2017, DOE resumed waste disposal operations at WIPP on a limited basis, due to persistent airflow and ventilation issues resulting from the 2014 accidents. To provide the capabilities needed to resume full disposal operations at WIPP, DOE initiated two capital asset projects—the Safety Significant Confinement Ventilation System and the Utility Shaft. Together, these projects will act as one complete ventilation system to facilitate the return to full disposal operations and the planned increase in physical space at WIPP. In March 2025, EM completed the construction of the Safety Significant Confinement Ventilation System, and planned to begin operations in the summer of 2025.

West Valley

The Western New York Nuclear Service Center, or West Valley facility was established by the State of New York as a commercial facility under a public/private partnership between the state and a commercial entity. The facility was established for spent nuclear fuel reprocessing in response to an initiative of the U.S. Atomic Energy Commission—a predecessor federal agency to DOE and the Nuclear Regulatory Commission. The Atomic Energy Commission guaranteed a supply of spent nuclear fuel from government facilities to keep the West Valley facility operating because commercial nuclear power reactors could not supply enough to keep the facility economically viable.

When the West Valley facility operator decided to withdraw from the nuclear fuel reprocessing business, a significant amount of radioactive waste remained at the facility, including

- 600,000 gallons of liquid high-level waste in two underground steel storage tanks—part of a series of four tanks known as the Waste Tank Farm;
- the highly contaminated Main Plant Process Building; and
- more than 2 million cubic feet of solid radioactive waste in the site’s two disposal areas—one area principally designed for disposal of wastes from the reprocessing plant known as the Nuclear Regulatory Commission-licensed Disposal Area, and one commercial waste area known as the State-licensed Disposal Area.³

The West Valley Demonstration Project Act, enacted in 1980, brought DOE to West Valley to carry out certain cleanup activities.⁴ Since 1982, DOE has had possession of approximately 150 acres within the 3,300-acre West Valley site to carry out statutorily required activities.⁵ DOE has demolished a majority of the contaminated structures at the project site and has made progress in disposing of certain waste offsite and processing other waste interim on-site storage.

³DOE’s West Valley Demonstration Project includes the Waste Tank Farm, the Main Plant Process Building, and the Nuclear Regulatory Commission-licensed Disposal Area but does not include the State-licensed Disposal Area.

⁴The Western New York Nuclear Service Center is an approximately 3,300-acre area. The federal portion of the cleanup area, where DOE is conducting the West Valley Demonstration Project, is approximately 150 acres.

⁵ While DOE has exclusive use and possession West Valley Demonstration Project site in order to carry out its cleanup responsibilities, it does not hold title to the premises or any facilities. A New York state agency holds title to the entire West Valley facility, including the project site, in the name of the state of New York, and retains possession and control of the facility outside of the project site.

Appendix II: Comments from the Department of Energy



Department of Energy

Washington, DC 20585

February 12, 2026

Mr. Nathan Anderson
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

Dear Mr. Anderson:

The Department of Energy (DOE) appreciates the opportunity to comment on the Government Accountability Office's (GAO) draft report titled, *NUCLEAR WASTE CLEANUP: DOE Needs to Improve Oversight of Major Projects and Activities as Costs Recently Increased by Over \$75 Billion* (GAO-26-107820).

The Office of Environmental Management's (EM) mission represents the government's strong commitment to cleaning up the environmental legacy resulting from decades of nuclear weapons development and government-sponsored nuclear energy research. The program has made significant progress, spearheading one of the world's largest groundwater and soil remediation efforts. It has successfully opened and is operating the only deep geological repository for transuranic waste generated by atomic energy defense activities and has also constructed first-of-a-kind systems for treating tank waste at three EM sites. These achievements underscore EM's strong focus on mitigating risks and safely accomplishing its mission. EM remains committed to improving and enhancing project and program management throughout its complex.

EM concurs with the two recommendations in the draft report. EM's responses to the recommendations are provided in the enclosure. General and technical comments on the draft report were provided separately to GAO.

If you have any questions, please contact me or Mr. Steve Trischman, Associate Principal Deputy Assistant Secretary for Corporate Services, at (301) 903-7478.

Sincerely,

A handwritten signature in blue ink that reads "Timothy J. Walsh".

Timothy J. Walsh
Assistant Secretary
for Environmental Management

Enclosure

Enclosure

Management Response

GAO Draft Report: *NUCLEAR WASTE CLEANUP: DOE Needs to Improve Oversight of Major Projects and Activities as Costs Recently Increased by Over \$75 Billion*

Recommendation 1: The Assistant Secretary for EM should ensure the completeness of information related to cost and schedule performance for capital asset projects in DOE's Project Assessment and Reporting System.

DOE Response: Concur

The Project Assessment and Reporting System (PARS) is the Department of Energy's (DOE) performance management system for capital asset projects. It serves as the official system of record and central repository for key Departmental project information, used to measure, assess, and report on project performance. As stated in the report, the GAO team found that in some instances, copies of the most recent project peer reviews and independent cost estimate reports were not in PARS. At the time, the Office of Environmental Management (EM) promptly addressed this oversight by adding copies of the missing reports to PARS.

To ensure the completeness of information related to cost and schedule performance for capital asset projects, EM will revise its Standing Operating Policies and Procedures to incorporate a step requiring the upload of copies of project peer reviews and independent cost estimate reports into PARS.

Estimated Completion Date: September 30, 2026

Recommendation 2: The Assistant Secretary for EM should improve coordination with officials and contractors at sites to enhance EM's ability to provide current, consistent historical and current lifecycle cost and schedule data for its operations activities and reconcile any data discrepancies.

DOE Response: Concur

The One Enterprise Management System (OEMS) is EM's performance management system that supports multiple process areas such as financial, budgeting, forecasting, financial reporting, and data quality management. This system is used by both Headquarters and the sites. OEMS has a governance board that facilitates collaborative decision-making by recommending development priorities and aligning OEMS enhancements with EM's needs and its available budget. At the time of the audit, one of the approved enhancement requests by the governance board was the uploading of historical change request data into OEMS.

**Appendix II: Comments from the Department
of Energy**

2

To enhance EM's ability to promptly provide consistent historical and lifecycle cost and schedule data for operations activities, EM will complete the load of historical change request data into OEMS by the end of Fiscal Year 2026.

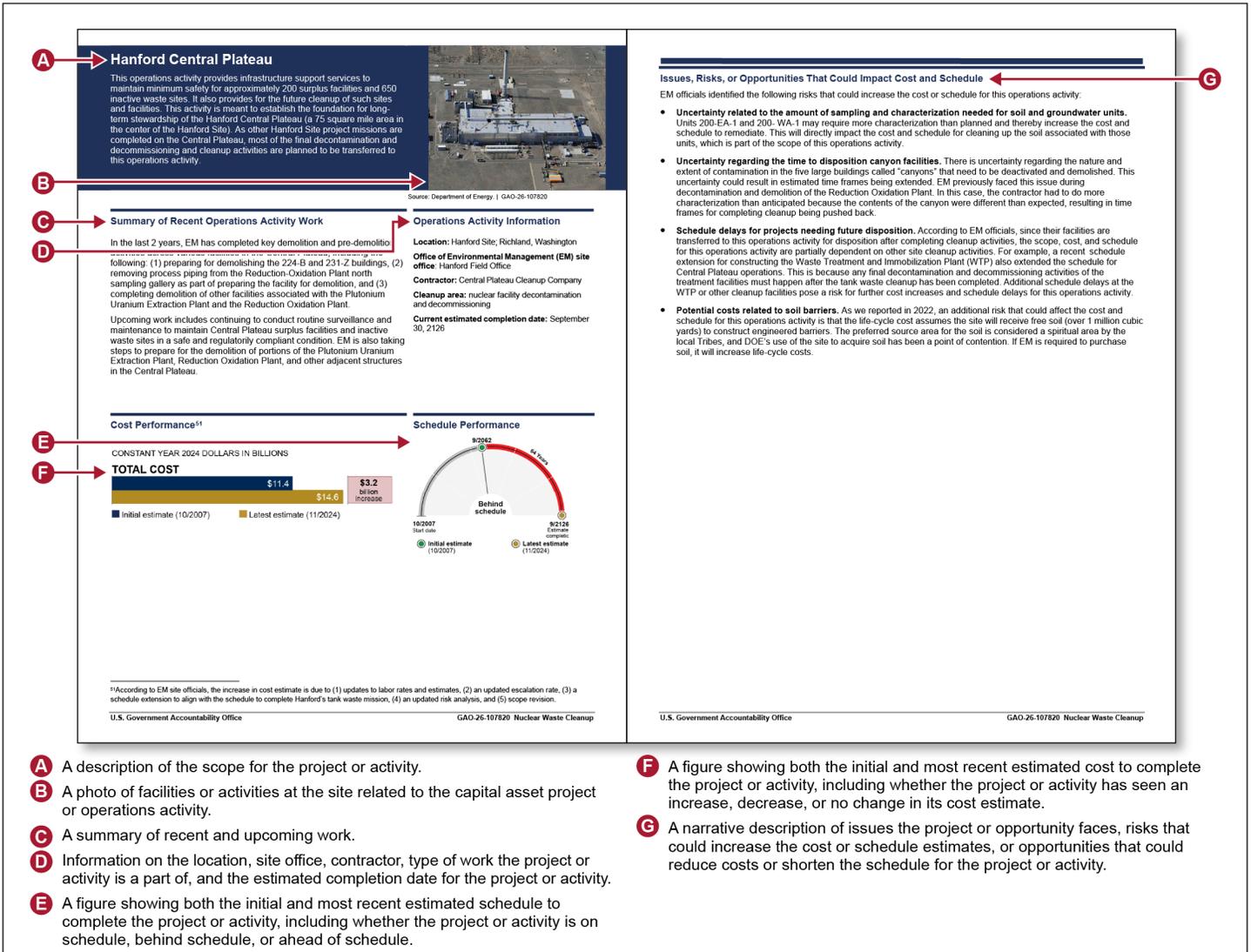
Estimated Completion Date: September 30, 2026

Appendix III: Summaries of Selected Office of Environmental Management (EM) Capital Asset Projects

This appendix provides individual summaries of the 12 capital asset projects we selected. The summaries include information on selected issues the projects have faced or currently face, future risks, or future opportunities that could impact their respective cost and schedule estimates. The information in the summaries comes from sources such as data collection instruments that we asked officials to fill out at each of the sites, data provided by Office of Environmental Management (EM) headquarters, and interviews with EM officials. Our interviews with EM site officials also highlighted key issues the projects had faced and future risks and opportunities. The figure that follows explains what type of content is included in each summary.

Appendix III: Summaries of Selected Office of Environmental Management (EM) Capital Asset Projects

Figure 3: Description of the Content of the Capital Asset Project and Operations Activity Summaries

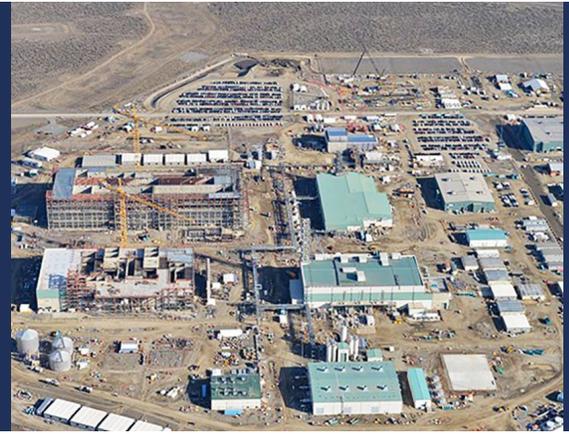


- A** A description of the scope for the project or activity.
- B** A photo of facilities or activities at the site related to the capital asset project or operations activity.
- C** A summary of recent and upcoming work.
- D** Information on the location, site office, contractor, type of work the project or activity is a part of, and the estimated completion date for the project or activity.
- E** A figure showing both the initial and most recent estimated schedule to complete the project or activity, including whether the project or activity is on schedule, behind schedule, or ahead of schedule.
- F** A figure showing both the initial and most recent estimated cost to complete the project or activity, including whether the project or activity has seen an increase, decrease, or no change in its cost estimate.
- G** A narrative description of issues the project or opportunity faces, risks that could increase the cost or schedule estimates, or opportunities that could reduce costs or shorten the schedule for the project or activity.

Source: GAO analysis of Department of Energy capital asset projects and operations activities. | GAO-26-107820

Waste Treatment and Immobilization Plant

The project scope of the Waste Treatment and Immobilization Plant (WTP) is to immobilize a portion of an estimated 54 million gallons of hazardous and radioactive waste stored in 177 aging underground tanks. The WTP currently includes two primary waste processing facilities and several support facilities. The low-activity waste (LAW) facility will immobilize the portion of the waste with comparatively low levels of radioactivity. The high-level waste (HLW) facility will immobilize the waste with comparatively higher levels of radioactivity



Source: Department of Energy. | GAO-26-107820

Project Summary

In 2023, EM approved a third baseline change for the LAW facility, which delayed the deadline to complete the project to June 2025, and increased the estimated costs to complete this portion of the WTP. After completing various tests to prepare the facility to begin vitrifying (turning to glass) LAW, EM completed the construction of the LAW facility in September 2025 and began treating waste in October 2025.

The HLW facility is in the early design stages. According to officials, EM plans to design 90 percent of the facility before beginning construction. Based on an agreement with the State of Washington and the U.S. Environmental Protection Agency (EPA), EM plans to complete 90 percent of the design by 2027, at which point it will revisit time frames for completing construction with the state. In the meantime, although EM has not completed design, it has begun adding some components to the facility, such as shield doors, which it does not anticipate changing based on further developments of the facility design.

Project Information

Location: Hanford Site; Richland, Washington

Office of Environmental Management (EM) site office: Hanford Field Office

Site contractor: Bechtel National, Inc.

Cleanup area: radioactive liquid waste stabilization and disposition

Related capital asset projects: Advanced Modular Pretreatment System

Current estimated completion date: September 30, 2027

Cost Performance

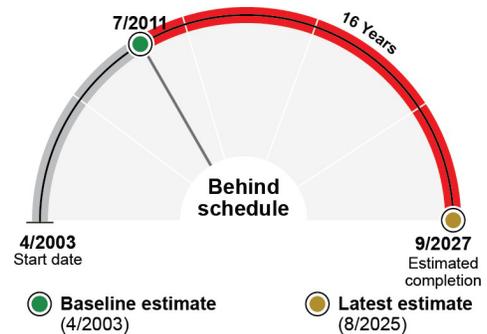
THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Note: This cost estimate reflects the costs for the Low-Activity Waste portion of the project and the design phase of the High-Level Waste Vitrification facility. It does not include costs or schedule for constructing and commissioning the High-Level Waste Vitrification Facility, which EM officials estimate could cost up to \$14 billion to complete.

Schedule Performance



Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this project:

- Uncertainty around design and construction of the HLW facility.** As mentioned above, EM is in the early stages of designing the HLW facility. According to EM officials, the full cost of constructing and commissioning the facility could be up to \$14 billion. However, these costs are not yet captured in the total cost of the WTP project, meaning the total project cost for the WTP will increase. Further, uncertainty remains regarding next steps with the HLW facility after design is completed. Future decisions with the regulators, Washington State, and EPA regarding these next steps have the potential to increase estimated costs and time frames to complete the facility.

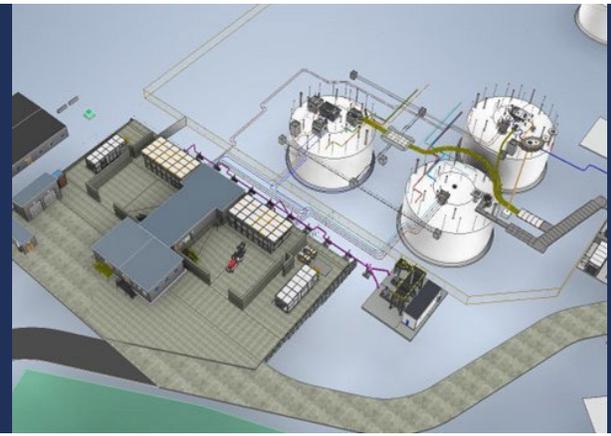
Opportunities for potential cost savings include the following:

- **Re-sizing HLW facility to treat reduced volume.** We have previously recommended DOE pause construction on the HLW facility while it reassesses the site's waste inventory.⁴⁶ DOE did not agree with our recommendation and, as of January 2025, had taken no action to implement it. However, according to experts, portions of Hanford's tank waste planned for treatment in the HLW facility could potentially be classified as low-level radioactive waste or transuranic waste based on the physical characteristics and level of risk posed by the waste. Doing so could allow DOE to treat those portions using methods that are less expensive. As a result, the volume of waste to be treated in the HLW facility could be much lower than currently estimated, which could reduce the size and capacity needed for a facility to treat that waste and save billions of dollars.

⁴⁶GAO, *Hanford Cleanup: Alternatives for Treating and Disposing of High-Level Waste Could Save Billions of Dollars and Reduce Certain Risks*, [GAO-24-106989](#) (Washington, D.C.: September 26, 2024).

Advanced Modular Pretreatment System

The Advanced Modular Pretreatment System (AMPS) project will provide pretreatment capability for certain tank waste at the Hanford Site. It will build on the tank-side cesium removal (TSCR) demonstration project. Like TSCR, AMPS will retrieve liquid waste from double-shelled tanks, pretreat it by removing cesium, and stage it in a holding tank for eventual direct feed to the Hanford Waste Treatment and Immobilization Plant's Low-Activity Waste facility to be immobilized in glass.



Source: Department of Energy. | GAO-26-107820

Project Summary

EM initiated AMPS after completing the TSCR demonstration project in 2022. AMPS is intended to eventually replace TSCR as a much larger pretreatment system that will treat waste twice as quickly (10 gallons per minute).

As of August 2025, EM hoped to complete the preliminary design of the project by the end of 2025 and construction by 2031. Since initiating the project design phase, EM has identified materials to request for procurement in advance of beginning construction. EM hopes beginning procurement of these long lead items will help avoid delays in the project schedule.

EM is applying lessons learned from TSCR, which it hopes will result in completing the facility at the lower end of the estimated cost range. For example, EM has established a Safety Design Integration Team for AMPS, which was also used during the TSCR project to effectively identify and manage challenges related to ensuring equipment design complied with safety protocols.

Project Information

Location: Hanford Site; Richland, Washington

Office of Environmental Management (EM) site office: Hanford Field Office

Construction contractor: Hanford Tank Waste Operations and Closure

Cleanup area: radioactive liquid waste stabilization and disposition

Related capital asset projects: Waste Treatment and Immobilization Plant

Current estimated completion date: March 31, 2029–June 30, 2031

Cost Performance

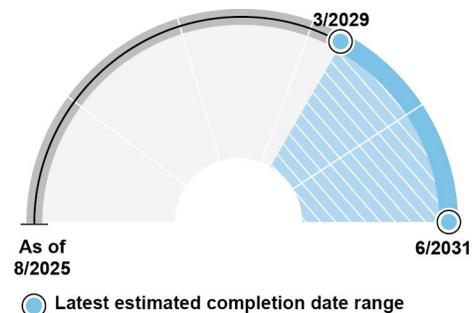
THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



This estimate is preliminary. Costs are uncertain, as the project is in the design phase.

Schedule Performance



Oak Ridge On-Site Waste Disposal Facility

This project is for the design and construction of the On-Site Waste Disposal Facility which will be constructed in the vicinity of the Y-12 National Security Complex in Oak Ridge, Tennessee. The facility is meant to provide on-site disposal for low-level and mixed low-level radioactive wastes generated through the cleanup of legacy facilities on the Oak Ridge Reservation. The facility is expected to provide a disposal capacity of up to 2.2 million cubic yards. The scope of this project is to plan, design, and construct one-third of the capacity of the engineered waste disposal facility, including all site development, infrastructure improvements, and support facilities. The scope does not include the cost of operations and final closure of the facility.



Source: Department of Energy. | GAO-26-107820

Project Summary

The On-Site Waste Disposal Facility phase 1 is the first of three projects planned for a new waste disposal facility on the Oak Ridge Reservation. The first subproject (Early Site Preparation) was completed in August 2024. The second subproject was the groundwater field demonstration test, for which field work concluded in July 2025. The demonstration will help the site gather information about how groundwater elevations change, which will inform the disposal facility design to finalize the elevation of the disposal cell liner above the groundwater. The demonstration is now being monitored, and data collection will be complete in March 2026. After data collection is complete, the facility design can be finalized, and the third subproject (Balance of Construction) will begin.

This project received approval to initiate the design phase in August 2018, but the design work for this facility was delayed by a dispute among the EPA, Tennessee Department of Environment and Conservation, and DOE over effluent limits for radionuclide-contaminated wastewater discharges from the disposal facility. In 2022, an approach for determining discharge limits was agreed upon by all parties. EM officials said this approach, and requirements related to the groundwater field demonstration test, pushed the estimated completion date to May 2030.

Project Information

Location: Oak Ridge Reservation; Oak Ridge, Tennessee

Office of Environmental Management (EM) site office: Oak Ridge Office of Environmental Management

Design contractor: URS/CH2M Oak Ridge, LLC

Construction contractor: United Cleanup Oak Ridge, LLC

Cleanup area: solid waste stabilization and disposition

Current estimated completion date: May 31, 2030

Cost Performance

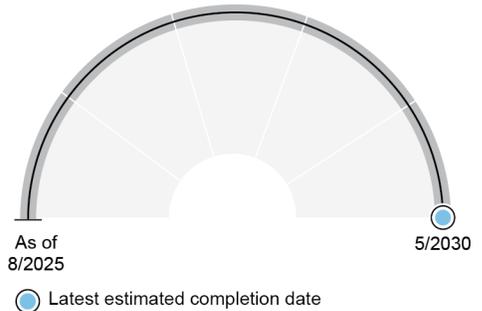
THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



This estimate is preliminary. Costs are uncertain, as the project is in the design phase.

Schedule Performance



Issues or Risks That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this project:

- **Delays in regulatory reviews.** According to officials, delays in regulatory reviews for different aspects of the project may increase the schedule. For example, EPA and the State of Tennessee must review documents such as the final design, waste acceptance criteria, and work plans for the final construction project.
- **Weather conditions.** Officials told us that adverse weather conditions can cause construction delays. For example, a large snowstorm in early 2024 delayed construction work at the site. Officials said adverse weather conditions are typical for the site, and site mitigation efforts strive to account for the unpredictability of weather impacts.

Outfall 200 Mercury Treatment Facility

To address residual mercury that will move through the environment during cleanup operations at the Y-12 National Security Complex, this project is to design and construct a Mercury Treatment Facility for an area known as the Outfall 200 flow. The project is comprised of two primary facilities—the headworks and the treatment facility. The headworks facility will capture creek flow on the west end of Y-12, store excess stormwater collected during heavy rains, remove grit from the water, and pump it through a pipeline to the treatment plant on the east side of Y-12. The treated water will then flow into the East Fork Poplar Creek. The treatment facility is designed to have a through-put capacity of 3,000 gallons of water per minute.



Source: Department of Energy. | GAO-26-107820

Project Summary

In recent years, this project has faced schedule delays due to contractor performance, unexpected site conditions, and design changes. EM officials told us that they experienced quality and safety concerns under the first construction contractor for the project. According to EM officials, in November 2023, responsibility for construction of the facility was transitioned to a new contractor based on a mutual agreement among the agency and the contractors in light of a range of factors. This transition led to work delays. The new contractor is expected to continue through 2025, with the potential for a longer-term contract. According to EM officials, this project will exceed initial cost and schedule baselines. As of August 2025, EM is in the process of updating the cost and schedule baseline for this project, but the specific updates are currently unknown.

Construction at the headworks site was delayed because of unexpected site conditions and design changes. According to EM officials, during excavation at the headworks facility, the contractor found that portions of the bedrock were deeper than estimated, which required a redesign of certain elements of the project. EM officials explained that the facility is designed to be supported on micropiles, which the contractor installed by drilling holes into solid bedrock.⁴⁷ Unstable slope conditions and unexpected variance in bedrock depth made the micropile installation process difficult, delaying construction.

According to EM officials, upcoming work will include placing steel construction components and installing tanks at the facility.

Project Information

Location: Oak Ridge Reservation; Oak Ridge, Tennessee

Office of Environmental Management (EM) site office: Oak Ridge Office of Environmental Management

Contractor: United Cleanup Oak Ridge, LLC

Cleanup category: soil and water remediation

Current estimated completion date: September 30, 2025⁴⁸

Cost Performance

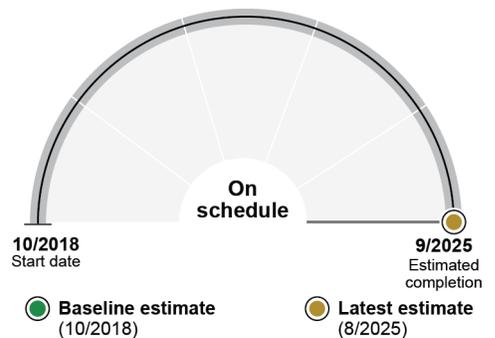
THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Note: EM site officials said they are in the process of updating the cost and schedule baseline for this project, and they anticipate a cost increase of at least \$100 million and a potential schedule delay of 2 years. Further, EM anticipates a pause in major construction on this project through fiscal year 2026.

Schedule Performance



⁴⁷According to EM officials, micropiles are formed by first drilling 4-to 6-inch diameter holes into bedrock, then inserting steel casings filled with steel-reinforced concrete.

⁴⁸This completion date will change based on the pending cost and schedule baseline for this project.

Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost and schedule for this project:

- **Poor past contractor performance.** Officials said that, given the past contractor-related issues on this project, contractor performance is a risk that they will continue to evaluate when moving forward with the new contractor.
- **Insufficient foundation of the headworks stormwater storage tank.** The purpose of the tank is to collect and hold excess storm water runoff that cannot be treated in the treatment facility, and the weight will require strong support. Based on the previously discovered conditions at the headworks site, the foundational support may need to be drilled deeper. EM officials told us that the current design may be insufficient, and the length of schedule delay would depend on the alternate design.

EM officials identified the following opportunities that could decrease the cost and schedule for this project:

- **Alternative contract strategy relying on the U.S. Army Corps of Engineers (Corps).** EM officials told us that in the past, they have had the Corps manage certain construction projects, and that the Department of Energy can sometimes receive more competitive bids from contractors by going through the Corps. EM is exploring this option for this project. In 2022, we reported that in the process of addressing issues with unexpected site conditions, EM determined that its current staff did not have sufficient expertise to properly oversee the necessary changes to the project's scope. To resolve this, EM brought in additional contract staff and experts from the Corps to assist management with corrective measures.

Portsmouth X-333 Process Building Demolition Project

This project involves the demolition of building X-333 at the Portsmouth site, which was constructed in 1952 and used to enrich uranium. Building X-333 is the second of three process buildings to be demolished, following the X-326 building, which was demolished in 2022. X-333 is the largest building in the DOE complex and contains a significant amount of uranium enrichment equipment that will be removed and disposed of as part of this project.



Source: Department of Energy. | GAO-26-107820

Project Summary

The controlled demolition of building X-333 began in April 2025. The initial stage of the project has focused on removing 15,000 transite siding panels, which can contain asbestos. EM then stacks, bundles, and transports these panels to the On-Site Waste Disposal Facility (OSWDF). The first shipment of asbestos siding to the OSWDF occurred on April 24, 2025. The full building demolition will be conducted using large industrial excavators, and the resulting debris will be size-reduced by the excavators before being transported to the OSWDF.

This project is incorporating several lessons learned from the demolition of the X-326 building, which was completed on July 3, 2024. For example, Portsmouth adapted cost estimates for the X-333 demolition to ensure they included sufficient funding for key areas, including the use of fixative application materials, required resources for maintenance, and required resources for technicians and support, all of which had been underestimated for the X-326 demolition.

Project Information

Location: Piketon, Ohio

Office of Environmental Management (EM) site office: Portsmouth/Paducah Project Office

Site/demolition contractor: Southern Ohio Cleanup Company

Design contractor: Arcadis (for water detention system)

Cleanup area: nuclear facility deactivation and decommissioning

Related capital asset projects: Portsmouth On-Site Waste Disposal Facility–Infrastructure Construction

Current estimated completion date: June 30, 2033

Cost Performance

THEN YEAR DOLLARS IN MILLIONS

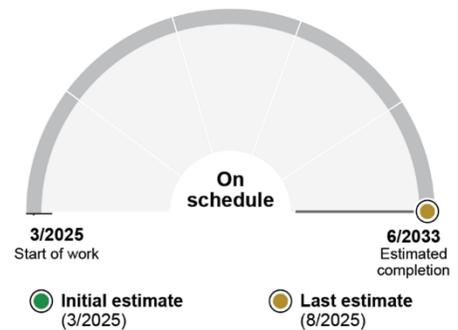
TOTAL COST



■ Initial estimate (3/2025)

■ Latest estimate (8/2025)

Schedule Performance



Issues, Risks, or Opportunities that Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this project:

- Unknown challenges related to decontamination process.** During the demolition of the X-333 building, EM will need to locate, fully characterize, and dispose of valves previously used for uranium enrichment. This is a new process for EM, which may increase the risk of encountering unanticipated challenges or other risks, according to EM site officials. Specifically, prior to demolition, site officials made the decision to limit characterization due to potential worker safety risks and instead to fully characterize the contamination after the valves are removed during demolition. According to officials, this tradeoff meant workers could avoid spending time climbing on other contaminated equipment to characterize the valves. However, retrieving the valves during demolition could require more time and resources than anticipated.

-
- **Equipment availability.** Risks associated with demolition equipment availability could affect the project's cost and schedule, according to site officials. In particular, officials noted that the demolition requires specialized large excavating equipment that is not built until the order is received. Further, large industrial shears are required and are not always available. For example, during the demolition of the X-326 building, the site struggled to find shears with the correct blades. Officials have taken steps to acquire this equipment with the hope of mitigating these risks for the X-333 project demolition.

EM officials identified the following opportunity that could decrease the cost or schedule for this project:

- **Efficiencies in equipment storage for future use.** EM could potentially reduce cost and schedule for this project by directly transferring potentially contaminated equipment to the next demolition project without fully decontaminating it. During the X-326 demolition, the equipment decontamination process was longer than anticipated because of the rigorous requirements associated with decontaminating equipment. Officials plan to apply that lesson learned to the X-333 project by storing the contaminated equipment for reuse on future demolition activities, which would save time on extensive decontamination activities.

Portsmouth On-Site Waste Disposal Facility – Infrastructure Construction

The On-Site Waste Disposal Facility is a specially engineered disposal site with a multi-layer liner and cap system designed to consolidate demolition debris and rubble into one centralized confined space that protects public health and the environment. The project scope includes the construction of significant supporting infrastructure and three disposal cells. The supporting infrastructure is required to accommodate full-scale operations of the disposal facility. This project's three disposal cells will provide a disposal capacity for the demolition of the X-333 building, which will be demolished as a capital asset project.



Source: Department of Energy | GAO-26-107820

Project Summary

In May 2025, the On-Site Waste Disposal Facility – Infrastructure Construction project began accepting soil waste. This waste is being placed in disposal cell 2. EM has also completed excavation and sandstone removal for disposal cells 3 and 6 within the facility.

EM also has ongoing and planned work related to the waste disposal facility's supporting infrastructure. Specifically, in the next 2 years, EM plans to implement an additional water treatment system and complete a road for transporting debris to the disposal facility. Additional future infrastructure will include a storage area to stage waste from demolitions and soil excavations.

Project Information

Location: Piketon, Ohio

Office of Environmental Management (EM) site office: Portsmouth/Paducah Project Office

Site/construction contractor: Southern Ohio Cleanup Company

Design contractor: Geosyntec and Arcadis for Water Treatment System

Cleanup area: solid waste stabilization and disposition

Related capital asset projects: X-333 demolition

Current estimated completion date: September 30, 2027

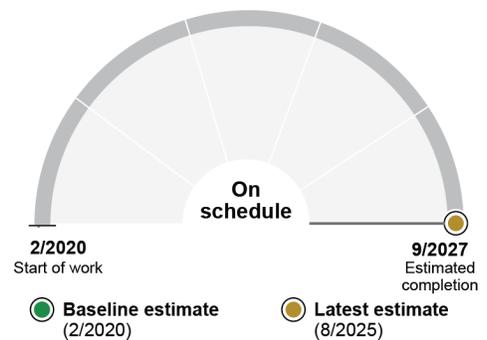
Cost Performance

THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Schedule Performance



Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this project:

- Unanticipated excavation needed in disposal cells.** In fiscal years 2024 and 2025, officials discovered that disposal cells 3 and 6 would require more excavation than originally planned, which lengthened the time frames for that stage of the project. Specifically, officials discovered occurrences of sandstone below the original planned excavation depth. Since sandstone is particularly permeable, it was important to excavate this to ensure a stable foundation for the disposal cell. EM has completed excavation and was in the process of backfilling those cells as of April 2025.
- Workforce reductions.** As of April 2025, loss of staff through the deferred resignation program had created uncertainty around project responsibilities, and future impacts of additional workforce reductions on this project remain

uncertain. Officials said that some key positions affecting this project had been vacated, including the lead employee responsible for obtaining key project approvals. To mitigate loss of staff, Portsmouth has redistributed responsibilities among remaining staff, but officials noted that this may cause additional challenges such as more limited contractor oversight.

- **Other potential risks.** As of April 2025, other major project risks included those associated with project design and construction, weather risks, and unanticipated costs associated with materials or other resources.

EM officials identified the following opportunities that could decrease the cost or schedule for this project:

- **Efficiencies in procurement.** As a result of constructing disposal cells 3 and 6 in the same calendar year, EM expects cost savings associated with the bulk procurement of cell liner materials.
- **Optimized project planning.** EM has streamlined the project scope by eliminating certain tasks including 1) the relocation of a water treatment structure and b) the construction of a public road overpass.

Advanced Manufacturing Collaborative Facility

This facility was built on the University of South Carolina-Aiken campus to provide accessible laboratory space and offices that can be used to drive collaboration among the National Laboratories, industry, and academia. The National Laboratories offers research and technology development focused on DOE missions and commercial entities are expected to bring new technologies (process intensification, smart manufacturing, etc.) and best practices. In addition, workers will be trained at the facility in the advanced technologies and methods expected to become a significant part of EM's cleanup and closure technology in the future.



Source: Department of Energy. | GAO-26-107820

Project Summary

Construction for this facility began in 2023, was completed in June 2025, and the facility began operating in August 2025. According to EM officials, the construction costs were higher than expected due to supply chain issues related to COVID-19 and severe weather. For example, EM officials told us that they were unable to acquire the ventilation systems required to achieve the standard of environmental certification they originally planned. Instead, EM decided to install a different type of ventilation system and designed the facility in a way that it could be upgraded in the future. However, the total project cost decreased because move-in costs post-construction were lower than anticipated.

EM officials told us that because this building is not on DOE property, it was built to commercial standards rather than the standards associated with nuclear facilities. According to EM officials, the design and construction of this facility was completed under a type of contract that is not generally feasible for nuclear facilities on EM property. EM officials told us that because commercial standards are less complex than those for constructing nuclear facilities, the contractor took on much of the cost and schedule risk for the project, such as responding to supply chain challenges.

Project Information

- Location:** University of South Carolina- Aiken; Aiken, South Carolina
- Office of Environmental Management (EM) site office:** Savannah River Operations Office
- Contractor:** North Wind Construction Services
- Completion date:** June 20, 2025

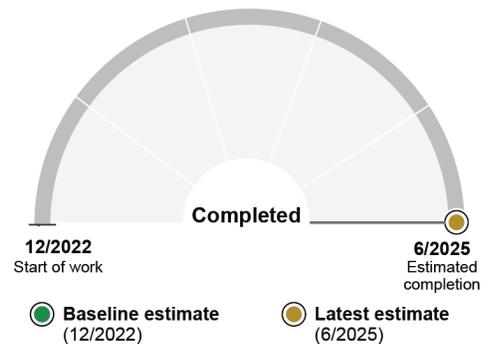
Cost Performance

THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Schedule Performance



F-Area Material Storage Building In-Situ Decommissioning

The F-Area Material Storage Building (235-F) previously served several defense-related uses, including receipt and storage of plutonium-bearing materials. In 2006, plutonium storage was consolidated in a different location at the site, and the deactivation of the building began in 2020. The scope of this decommissioning project includes filling the two-story building with cement-like grout to permanently address the radiological materials inside.



Source: Department of Energy. | GAO-26-107820

Project Summary

The design for this project is currently underway. Once the site receives approval 1) for the project's cost and schedule baselines and 2) to begin executing decommissioning activities, the site will begin grouting the structure for the in-place decommissioning.

EM officials told us that a primary risk that could increase cost or schedule for this project is potential remaining contamination. There is a possibility that contaminants could be released during the decommissioning process. To mitigate the risk, the site will incorporate controls during their design and planning process to ensure the demolition is safe for workers and the environment. Such controls could include applying fixatives or spraying water to prevent or reduce the release of contaminants.

According to officials, after the facility is decommissioned and goes through a safety assessment, its hazard category—which is based on a nuclear facility's radioactive material inventory and potential consequences to the public, workers, and the environment—may be reduced because there are fewer risks. If that happens, the site can decrease surveillance and maintenance, such as groundwater and air monitoring, which will reduce costs.

Project Information

Location: Savannah River Site; Aiken, South Carolina

Office of Environmental Management (EM) site office: Savannah River Operations Office

Contractor: Savannah River Nuclear Solutions, LLC

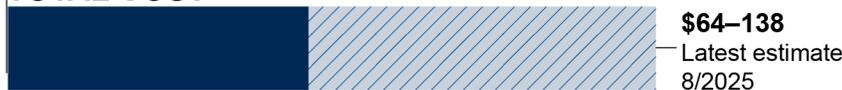
Cleanup category: nuclear facility decontamination and decommissioning

Current estimated completion date: September 30, 2027–September 30, 2029

Cost Performance

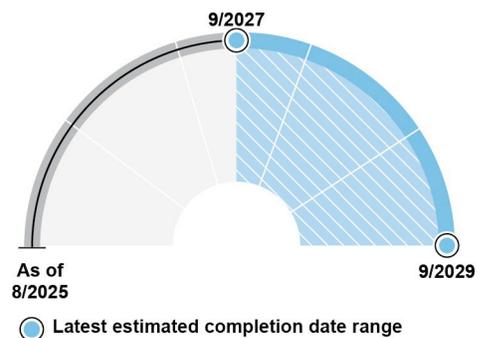
THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



This estimate is preliminary. Costs are uncertain, as the project is in the design phase.

Schedule Performance



Saltstone Disposal Units 10–12

Saltstone disposal units (SDU) 10–12 are the next in a series of projects at the Savannah River Site to contain and dispose of decontaminated salt solution (generated by the treatment of liquid nuclear waste) in the form of a cement-like grout called saltstone. The Saltstone Disposal Units 10–12 project is to construct three 32-million-gallon cylindrical tanks, called disposal cells. Each tank will be 375 feet in diameter and 43 feet high. Once the SDUs are constructed and filled with saltstone produced by the Saltstone Production Facility, they will be capped and serve as a permanent landfill for the low-activity waste on-site.



Source: Department of Energy. | GAO-26-107820

Project Summary

Construction of SDUs 10–12 was approved by the Department of Energy in September 2021. According to EM officials, the SDUs are at various stages of construction. SDU 10 construction is nearly complete. As of March 2025, the site finished all major concrete placements for the tank, and the liner installation was nearing completion. Construction of SDU 11 began in spring 2025. According to site officials, the construction of all three SDUs is on schedule.

The design and construction of SDUs 10–12 is very similar to the prior SDUs constructed on the site, with minor changes based on lessons learned. The SDU 6–9 capital asset projects are complete and prepared to receive saltstone grout. The site also has five smaller completed SDUs.

Project Information

Location: Savannah River Site; Aiken, South Carolina

Office of Environmental Management (EM) site office: Savannah River Operations Office

Site and design contractor: Savannah River Mission Completion, LLC

Construction contractor: DN Tanks

Cleanup category: radioactive liquid waste stabilization and disposition

Current estimated completion date: July 8, 2030

Cost Performance

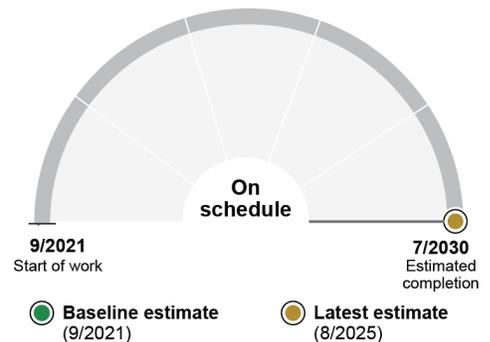
THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



■ Baseline estimate (9/2021) ■ Latest estimate (8/2025)

Schedule Performance



Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this capital asset project:

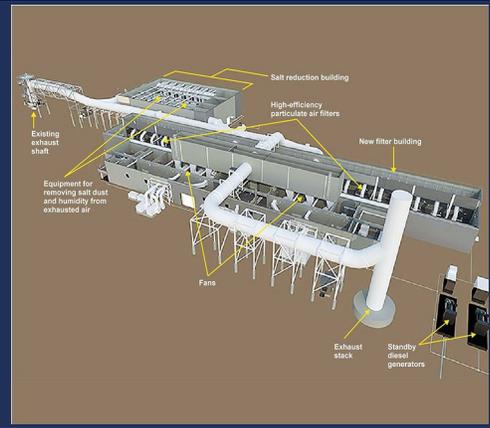
- **Parts that are difficult to source.** Officials told us that some of the materials used in SDU construction are difficult to source because they are not standard. For example, the specific type of cement used for the SDUs is supplied by a small number of companies. A delay in shipments for any reason would lead to an increase in schedule.
- **Issues with the Saltstone Production Facility.** The Saltstone Production Facility on-site is close to the SDUs, so an accident or release of contaminants at the facility would delay work on the SDUs, according to officials.

EM officials identified the following opportunity that could decrease the cost or schedule for this capital asset project:

- **Previous SDU lessons learned.** EM officials told us that lessons learned from the construction of other SDUs on-site would improve the design and construction process for SDUs 10–12. For example, the designs for SDUs 7–9 were improved based on lessons learned from SDU 6. The new designs included flat instead of sloped floors and modified columns, both of which made the installation process of the interior liner system easier.

Safety Significant Confinement Ventilation System (SSCVS)

This project includes the design and construction of a new ventilation system for the Waste Isolation Pilot Plant (WIPP) underground repository. The ventilation system is designed to supply enough filtered air underground to support full-scale daily operations at WIPP and simultaneous underground activities, such as mining and waste emplacement, to increase operational efficiency. According to site officials, SSCVS construction was completed in March 2025 and the system began startup activities in July 2025.



Source: Department of Energy. | GAO-26-107820

Project Summary

The project scope included constructing the surface infrastructure and equipment for the ventilation system, including high-efficiency particulate air (HEPA) filters and fans. The ventilation system will work in tandem with a new utility shaft, which will provide airflow through the WIPP underground area. The ventilation system construction included two buildings: the New Filter Building and the Salt Reduction Building. The Salt Reduction Building pre-filters air coming from underground before sending it to the New Filter Building, where the air can go through HEPA filters, if necessary, to remove contaminants before it is released into the environment.

The project was completed in March 2025, exceeding original estimates but within the new cost and schedule baseline approved in 2022. EM approved a baseline change in 2022 to address challenges resulting in part from performance issues with the project's construction subcontractor as well as the WIPP management and operating contractor's inadequate oversight. According to officials, the primary factor in completing the project within the new baseline was proper project management by the new management and operating contractor, who took over the project in February 2023. Officials cited the ability to demonstrate full operability of the project prior to completion of the readiness assessments as an additional factor.

According to officials, all commissioning requirements for the ventilation system are complete, and DOE authorized the project for startup. The first startup task was to tie the underground duct work to the SSCVS ductwork to ensure the final connection is complete.

Project Information

Location: WIPP; Carlsbad, New Mexico

Office of Environmental Management site office: Carlsbad Field Office

WIPP management and operating contractor: Salado Isolation Mining Contractors

Design contractor: Chicago Bridge and Iron, Longenecker and Associates; Juno Management

Construction contractor: Kiewit-The Industrial Company

Cleanup area: solid waste stabilization and disposition

Related projects: Utility Shaft

Completion date: March 12, 2025

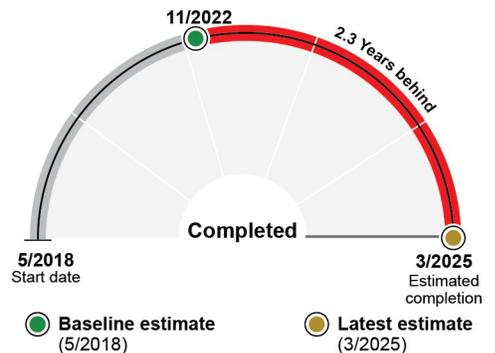
Cost Performance

THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Schedule Performance



Utility Shaft

This project is to construct a new 2,275-foot vertical shaft and supporting infrastructure for the Waste Isolation Pilot Plant (WIPP) underground repository's new ventilation system, the Safety Significant Confinement Ventilation System. The ventilation system was completed in March 2025, and the utility shaft will support the system by replacing the existing air intake shaft and allowing EM to reconfigure how the ventilation system moves air through the underground repository. As part of this reconfiguration, the existing air intake shaft is to be converted into an exhaust shaft that will provide EM with an unfiltered pathway to discharge air that contains salt dust from mining operations.



Source: Department of Energy. | GAO-26-107820

Project Summary

This project experienced increased costs and schedule delays early on in construction due to the COVID-19 pandemic. As a result, EM approved a baseline change in July 2023 to increase the project cost estimate and extend the completion date from December 2023 to November 2026.

In June 2025, EM officials reported that the mining for the Utility Shaft's underground repository was complete. The next steps were to grout behind the concrete liner to reduce water inflow to the shaft and install new fans and duct work on the surface. According to site officials, the last steps before startup testing included installation of new fans, ductwork, and supporting electrical systems.

EM completed the project in September 2025, exceeding original estimates but within the new approved cost and schedule baseline.

Project Information

Location: WIPP; Carlsbad, New Mexico

Emergency Management (EM) site office: Carlsbad Field Office

Design contractor: Vigil Engineering, Cementation, RPKA Engineering, RJR Engineering, SRK Consulting, NWP Engineering

Construction contractor: Harrison Western-Shaft Sinkers

Cleanup category: solid waste stabilization and disposition

Related projects: Safety Significant Confinement Ventilation System

Completion date: September 24, 2025

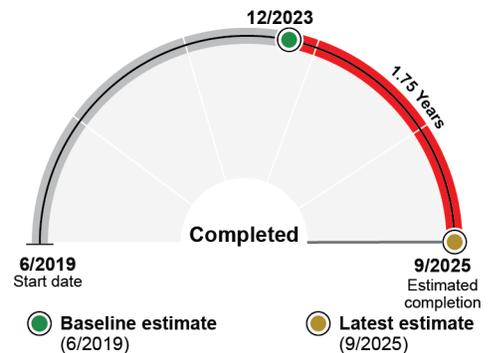
Cost Performance

THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Schedule Performance



West Valley Main Plant Process Building Demolition Project

The Main Plant Process Building is contaminated with radioactive and hazardous materials from past operations involving reprocessing spent nuclear fuel. The scope of this project is the demolition of the above ground portions of the building and includes the transportation and disposal of low-level radioactive and industrial waste generated during the demolition. Any transuranic waste generated during the project will be packaged and transported to an on-site storage facility to await a final decision on its disposal.



Source: Department of Energy. | GAO-26-107820

Project Summary

The demolition of the Main Plant Process Building's above ground-level structure was completed in June 2025. While a work stoppage during the COVID-19 pandemic delayed the start of demolition, this project was completed one month ahead of schedule and cost less than originally estimated.

The next phase of demolition, removing the below ground-level structure of the facility and residual contamination, is not included in the scope of this capital asset project. Until planning for the second phase of demolition is complete, a temporary cap will protect the area and prevent infiltration into the surrounding groundwater. According to site officials, the final stage of cleanup at West Valley will entail a complete decommissioning of the remaining facility and disposal of waste at the site, but a final remedy has not yet been chosen.

Project Information

Location: West Valley, New York

Office of Environmental Management (EM) site office: Environmental Management Consolidated Business Center

Contractor: CH2M Hill BWXT West Valley, LLC

Cleanup category: nuclear facility decontamination and decommissioning

Completion date: June 17, 2025

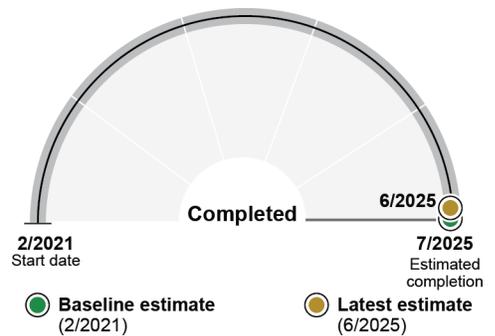
Cost Performance

THEN YEAR DOLLARS IN MILLIONS

TOTAL COST



Schedule Performance

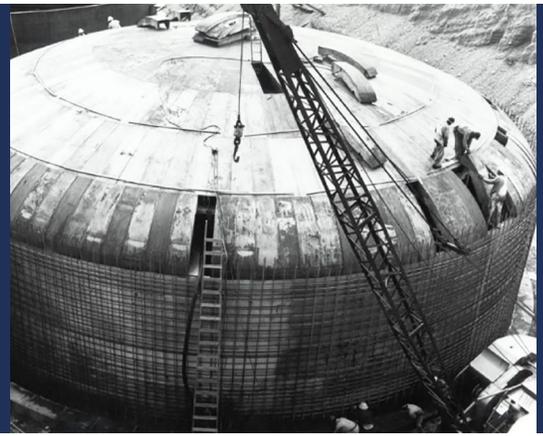


Appendix IV: Summaries of Selected Office of Environmental Management (EM) Operations Activities

This appendix provides individual summaries of the 13 operations activities we selected. The summaries include information on selected issues the operations activities have faced or currently face, future risks, or future opportunities that could impact their respective cost and schedule estimates. The information in the summaries comes from sources such as data collection instruments that we asked officials to fill out at each of the sites, data provided by Office of Environmental Management (EM) headquarters, and interviews with EM officials. Our interviews with EM site officials also highlighted key issues the operations activities had faced and future risks and opportunities.

Hanford Radioactive Liquid Tank Waste Stabilization and Disposition

The scope of this operations activity includes actions required to manage and stabilize approximately 54 million gallons of radioactive and hazardous waste stored in 177 underground tanks, including waste retrieval, treatment, and disposal. Operations provide for safe storage of waste, reduce the volume of waste through evaporation, and provide laboratory and other support activities.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

Before treating the Hanford tank waste, EM plans to separate it into two streams: (1) a more highly radioactive portion, which EM calls the high-level waste (HLW) and (2) a less radioactive portion, which EM calls low-activity waste (LAW). For the LAW treatment mission (which comprises about 95 percent of the tank waste at the site), EM has pre-treated more than 830,000 gallons of LAW using the Tank-Side Cesium Removal facility built in 2022. The pre-treatment process involves retrieving waste from the underground tanks, removing cesium, and staging the waste to be transferred to the Direct-Feed Low-Activity Waste facility. EM completed construction of this facility in September 2025 and began turning the pre-treated LAW into glass (also known as vitrification) in October 2025. EM will ultimately dispose of the vitrified LAW at the Integrated Disposal Facility on-site.

For the HLW portion of the tank waste mission, EM completed an analysis of alternatives in January 2023, which considered several options for vitrifying Hanford's HLW. In January 2025, EM finalized an agreement with the State of Washington and the U.S. Environmental Protection Agency (EPA) which includes a plan for EM to pursue a direct-feed approach to treating the HLW. This approach would involve directly sending waste from tanks to the HLW treatment facility, rather than first routing it through a separate pre-treatment facility. As of July 2025, EM hopes to begin treating Hanford's HLW in 2033.

Upcoming work for this operations activity includes continuing to vitrify the LAW, and to retrieve and pre-treat waste using the Tank-Side Cesium Removal facility.

Operations Activity Information

Location: Hanford Site; Richland, Washington

Office of Environmental Management (EM) site office: Hanford Field Office

Contractors: Hanford Tank Waste Operations and Closure

Cleanup area: radioactive liquid waste stabilization and disposition

Current estimated completion date: September 30, 2079

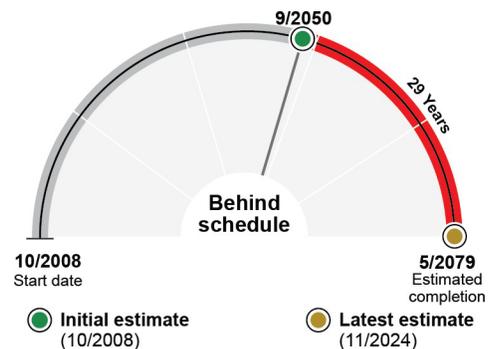
Cost Performance⁴⁹

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



⁴⁹The large cost and schedule increases since this activity was initiated in 2008 are largely the result of delays in key project activities such as the construction of the Waste Treatment and Immobilization Plant.

Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Equipment and infrastructure challenges.** Aging infrastructure and tank integrity issues could cause cost increases and schedule delays. For example, EM discovered corrosion in some of the double-shelled tanks, which was caused by moisture accumulating in the pipes between the tank and liner. EM has had to put resources toward treating this corrosion in the past 2 years, but the office may ultimately need to replace the pipes to ensure tank integrity for the duration of the tank waste cleanup mission.
- **Uncertainty regarding the future of Hanford's HLW.** Uncertainty related to how and when EM will treat and dispose of Hanford's HLW poses a risk of future cost and schedule increases. Although EM and its regulators have agreed to a direct-feed approach to treating this waste, as mentioned above, this approach is in the early design stages. Further, it remains unclear how EM would prepare the HLW for treatment in the absence of a separate pretreatment facility or how it would design the HLW facility for the direct-feed approach.
- **Uncertainty regarding treatment for remaining LAW.** EM's current plan is to vitrify about 60 percent of the site's LAW. However, EM has not decided on a treatment method for the remaining LAW (which is referred to as "supplemental LAW"), which could extend the schedule for the tank waste mission. EM has evaluated building another vitrification facility or grouting the waste (combining with a concrete mixture).

Opportunities for potential cost savings include the following:

- **Alternative cleanup approaches.** EM's January 2025 agreement with EPA and Washington State includes a plan for EM to grout (or combine with a concrete mixture) LAW from 22 tanks by 2040. This will result in a significant cost savings compared to prior agreements under which EM would have had to vitrify this waste.
- **Classification of Hanford's HLW.** We have previously reported that, according to experts, portions of Hanford's HLW could potentially be classified as low-level radioactive waste or transuranic waste based on the physical characteristics and level of risk posed by the waste. Doing so could allow DOE to treat those portions using methods that are less expensive than vitrification and to dispose of them in existing facilities.

Hanford Central Plateau

This operations activity provides infrastructure support services to maintain minimum safety for approximately 200 surplus facilities and 650 inactive waste sites. It also provides for the future cleanup of such sites and facilities. This activity is meant to establish the foundation for long-term stewardship of the Hanford Central Plateau (a 75 square mile area in the center of the Hanford Site). As other Hanford Site project missions are completed on the Central Plateau, most of the final decontamination and decommissioning and cleanup activities are planned to be transferred to this operations activity.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

In the last 2 years, EM has completed key demolition and pre-demolition activities across various facilities in the Central Plateau, including the following: (1) preparing for demolishing the 224-B and 231-Z buildings, (2) removing process piping from the Reduction-Oxidation Plant north sampling gallery as part of preparing the facility for demolition, and (3) completing demolition of other facilities associated with the Plutonium Uranium Extraction Plant and the Reduction Oxidation Plant.

Upcoming work includes continuing to conduct routine surveillance and maintenance to maintain Central Plateau surplus facilities and inactive waste sites in a safe and regulatorily compliant condition. EM is also taking steps to prepare for the demolition of portions of the Plutonium Uranium Extraction Plant, Reduction Oxidation Plant, and other adjacent structures in the Central Plateau.

Operations Activity Information

Location: Hanford Site; Richland, Washington
Office of Environmental Management (EM) site office: Hanford Field Office
Contractor: Central Plateau Cleanup Company
Cleanup area: nuclear facility decontamination and decommissioning
Current estimated completion date: September 30, 2126

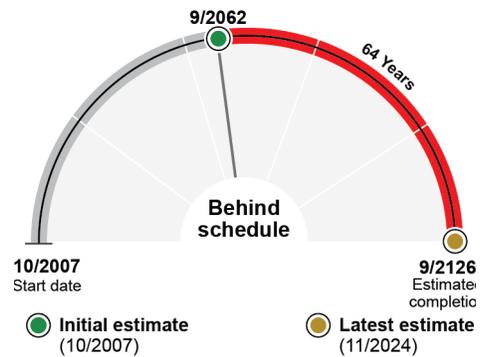
Cost Performance⁵⁰

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



⁵⁰According to EM site officials, the increase in cost estimate is due to (1) updates to labor rates and estimates, (2) an updated escalation rate, (3) a schedule extension to align with the schedule to complete Hanford's tank waste mission, (4) an updated risk analysis, and (5) scope revision.

Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Uncertainty related to the amount of sampling and characterization needed for soil and groundwater units.** Units 200-EA-1 and 200- WA-1 may require more characterization than planned and thereby increase the cost and schedule to remediate. This will directly impact the cost and schedule for cleaning up the soil associated with those units, which is part of the scope of this operations activity.
- **Uncertainty regarding the time to disposition canyon facilities.** There is uncertainty regarding the nature and extent of contamination in the five large buildings called “canyons” that need to be deactivated and demolished. This uncertainty could result in estimated time frames being extended. EM previously faced this issue during decontamination and demolition of the Reduction Oxidation Plant. In this case, the contractor had to do more characterization than anticipated because the contents of the canyon were different than expected, resulting in time frames for completing cleanup being pushed back.
- **Schedule delays for projects needing future disposition.** According to EM officials, since their facilities are transferred to this operations activity for disposition after completing cleanup activities, the scope, cost, and schedule for this operations activity are partially dependent on other site cleanup activities. For example, a recent schedule extension for constructing the Waste Treatment and Immobilization Plant (WTP) also extended the schedule for Central Plateau operations. This is because any final decontamination and decommissioning activities of the treatment facilities must happen after the tank waste cleanup has been completed. Additional schedule delays at the WTP or other cleanup facilities pose a risk for further cost increases and schedule delays for this operations activity.
- **Potential costs related to soil barriers.** As we reported in 2022, an additional risk that could affect the cost and schedule for this operations activity is that the lifecycle cost assumes the site will receive free soil (over 1 million cubic yards) to construct engineered barriers. The preferred source area for the soil is considered a spiritual area by the local Tribes, and DOE’s use of the site to acquire soil has been a point of contention. If EM is required to purchase soil, it will increase lifecycle costs.

Hanford Sitewide Services

This operations activity includes services that support the Hanford cleanup mission, such as electrical and water utility delivery, road and sewer system maintenance, and fire protection and emergency management. This activity also includes producing the Hanford Lifecycle Scope, Cost, and Schedule report every 3 years, as required by the site's Federal Facility Agreement among the Department of Energy, Washington State, and EPA.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

Recent work completed as part of Hanford sitewide services includes constructing and maintaining key infrastructure. For example, as of October 2025, EM had completed a water treatment facility to support operations in the Central Plateau portion of the Hanford site. They have also provided maintenance and infrastructure support for the Direct Feed Low-Activity Waste Facility, including doing maintenance on piping.

The scope will continue to evolve based on what supporting services or infrastructure are needed as EM continues to make progress on completing its cleanup mission. For example, in response to a recent agreement among DOE, Washington State, and EPA under which EM plans to grout (or immobilize in concrete) a portion of Hanford's low-activity waste, EM has begun planning for a substation to support related future anticipated site needs and activities.

Operations Activity Information

Location: Richland, Washington

Office of Environmental Management (EM) Site Office: Hanford Field Office

Site contractor: Hanford Mission Integration Solutions

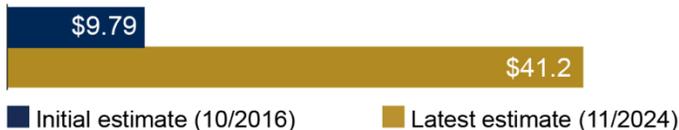
Cleanup area: base operations

Current estimated completion date: September 30, 2112

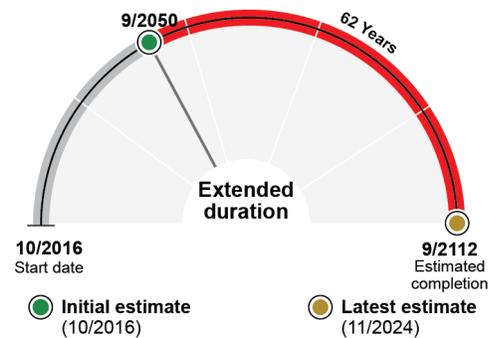
Cost Estimate⁵¹

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Estimate⁵²



⁵¹The initial estimate of \$9.97 billion does not include contingency, whereas the latest estimate of \$41.2 billion does.

⁵²According to EM officials, the schedule for this operations activity reflects evolving priorities based on risk and response as well as other technical and programmatic changes related to completing the Hanford cleanup mission. Further, the cost and schedule estimates for this operations activity are directly dependent on other projects.

Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Aging infrastructure.** A number of different facilities will require upgrades in the near future, according to officials. In particular, various water pumping stations, which pump water from the river to the Central Plateau portion of the Hanford Site, that were built in the 1940s will likely need be upgraded. In addition, the site's electrical distribution system is in the process of being replaced, which includes installing new distribution lines in part of the site.
- **Economic uncertainty.** Officials said that changing economic policies could increase the costs associated with procuring materials needed for projects. Specifically, site contractors have expressed concern about the impact of tariffs and inflation on the ability of EM to purchase materials needed for infrastructure support projects. EM is attempting to mitigate these risks by expediting procurement of certain materials before potential cost increases.
- **Costs for carbon emissions.** EM officials told us that under the state's Climate Commitment Act, the Hanford Site may soon have to pay additional fees for carbon emissions, which would increase the costs of this operations activity.

Idaho Nuclear Technology and Engineering Center Infrastructure

This operations activity covers the maintenance and support operations at the Idaho Nuclear Technology and Engineering Center (INTEC) at the Idaho National Laboratory. EM must regularly conduct preventive and corrective maintenance of the facilities to support cleanup and other activities, such as spent nuclear fuel management, that are ongoing at INTEC. This operations activity includes providing the utilities infrastructure and fuel needs for all of INTEC, and the personnel necessary for maintaining INTEC facilities, such as engineers, skilled trades, support personnel (quality assurance personnel, safety personnel, etc.), and management.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

Decades of defense activities at Idaho National Laboratory produced two forms of waste at the site that EM has managed as high-level radioactive waste (HLW): liquid sodium-bearing waste and granular calcine waste. Under an agreement with the state, DOE must treat HLW at Idaho National Laboratory so that it is ready to be moved out of Idaho for disposal by a target date of 2035. The site also has spent nuclear fuel that must eventually be shipped offsite for disposal.

We reported in 2019 that the site faces challenges moving these wastes offsite for disposal.⁵³ These challenges include (1) the absence of a deep geologic repository for HLW and spent nuclear fuel disposal and (2) a statutory prohibition on the disposal of HLW and certain legacy tank waste at the nation's only deep geological repository, the Waste Isolation Pilot Plant near Carlsbad, New Mexico. Site officials noted that until these different wastes can be shipped, they must remain in a facility on-site, further prolonging INTEC's mission and the need for this operations activity. Further, according to site officials, there have been delays with certain cleanup projects at the site, including the Spent Fuel Packaging and Calcine Waste projects. These projects also require support services included in INTEC's infrastructure scope and further delays with the projects could impact the cost and schedule of this activity.

Operations Activity Information

- Location:** Idaho National Laboratory: Idaho Falls, Idaho
- Office of Environmental Management (EM) site office:** Idaho Operations Office
- Contractor:** Idaho Environmental Coalition, LLC
- Cleanup category:** radioactive liquid waste stabilization and disposition
- Current estimated completion date:** September 30, 2090

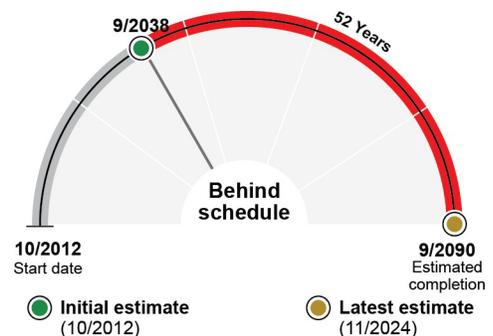
Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



⁵³GAO, *Nuclear Waste Cleanup: DOE Faces Project Management and Disposal Challenges with High-Level Waste at Idaho National Laboratory*, GAO-19-494 (Washington, D.C.: Sept. 9, 2019).

Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Aging infrastructure.** The most significant risk, according to site officials, is for facilities, systems, equipment, and infrastructure to fail due to age and obsolescence. The lack of commercial availability of replacement parts and resulting redesign processes could impact cost and schedule. For example, electrical equipment components and replacements have lead times extending out to 18 months or more. In 2022, we reported that many facilities at INTEC are nearing the end of their expected lifespan, and site officials regularly discuss how to prioritize available resources to meet their maintenance needs.
- **Uncertainty around disposal path for sodium-bearing waste and calcine waste.** EM has managed both sodium-bearing waste and granular calcine waste on-site as HLW. However, EM has not yet officially classified these wastes. The classification of these wastes will determine how and where it will be disposed of, which may impact cost or schedule estimates. There is no current disposal site for HLW, so cost and schedule estimates to dispose of this waste remain uncertain.
- **Workforce capacity.** In 2023, we reported that the site noted workforce capacity issues—due to inflation in labor costs, staff turnover, and limited availability of skilled labor—contributed to cost increases.⁵⁴

⁵⁴GAO, *DOE Nuclear Cleanup: Clear Guidance on Categorizing Activities and an Assessment of Contract Cost Effectiveness Needed*, [GAO-23-106081](#) (Washington, D.C.: Aug. 31, 2023).

Moab Uranium Mill Tailings Project

The scope of this operations activity includes all nuclear cleanup activities at the Moab site, including the transportation of mill tailings and debris to a disposal cell located in Crescent Junction, Utah, primarily via rail. Under the Uranium Mill Tailings Radiation Control Act of 1978, as amended, “tailings” are the remaining portion of a metal-bearing ore after some or all such metal, such as uranium, has been extracted. This operations activity also includes construction of an engineered disposal cell and disposal cell cover; active groundwater remediation, including freshwater injection and extraction of contaminated water; and demolition and disposal of site infrastructure and equipment.



Source: Department of Energy. | GAO-26-107820

Project Summary

Half of this operations activity includes disposing of tailings and residual radioactive material in a disposal cell 30 miles away from the Moab site in Crescent Junction, Utah. The site reached a major milestone in 2023 with the final expansion of the disposal cell in Crescent Junction.

According to site officials, the Moab site is on track to ship over 1 million tons of contaminated material to the disposal cell for its third consecutive year. Officials expect all remaining residual radioactive material at Moab to be disposed of by the end of fiscal year 2027.

The other half of this operations activity involves groundwater cleanup. Moab is currently operating an injection and extraction system as an interim cleanup remedy, which is designed to protect surface water quality and to recover ammonia, uranium, and other contaminants prior to discharge to the Colorado River. The Groundwater Compliance Action Plan, which will determine the final remedy for site cleanup, is in the process of being developed. According to EM officials, the plan will be 60 percent complete by 2026, at which point it will be reviewed by the Nuclear Regulatory Commission.

Project Information

Location: Grand County, Utah

Office of Environmental Management (EM) site office: Moab

Remedial action contractor: North Wind Portage Inc.

Technical assistant contractor: S&K Mission Support

Cleanup area: soil and water remediation

Current estimated completion date: September 30, 2029

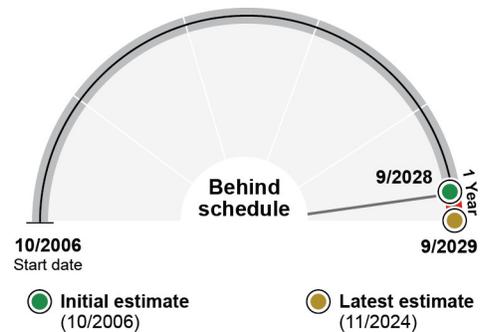
Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



Issues and Risks That Could Impact Cost and Schedule

EM officials identified the following risks that could affect the cost or schedule for this operations activity:

- **Transportation issues between Moab and Crescent Junction.** For example, cliff erosion leading to fallen rocks on the tracks or flash flooding can delay shipments of contaminated material via rail between the two sites. Officials noted that maintaining an experienced crew mitigates some of this risk.
- **Failure of critical equipment.** For example, the gantry crane used on-site is the only way to pick up the containers of contaminated material and place them on the train. If the crane is damaged, the containers could not be shipped. To

mitigate this risk, the Moab site maintains a backup gantry crane in good condition and relies on a corrective maintenance program with experienced mechanics.

- **Increased amounts of tailings or residual radioactive material.** According to site officials, the risk of additional, unaccounted-for contamination is less likely to occur than when we originally reported on it in 2022.⁵⁵ The original estimate on the quantity of material seems accurate, and they do not foresee coming across anything unexpected.

⁵⁵GAO, *Environmental Cleanup: Status of Major DOE Projects and Operations*, GAO-22-104662, (Washington, D.C.: May 4, 2022).

Los Alamos Soil and Water Remediation

The Los Alamos National Laboratory soil and water remediation operations activity includes the investigation and remediation of contamination created from past operations and practices. The activity also includes the characterization and monitoring of surface water and groundwater at the Laboratory and at Solid Waste Management Units (SWMU) and Areas of Concern (AOC) under the Resource Conservation and Recovery Act of 1976, as amended. These areas are left to be investigated, remediated, or closed following the evaluation of human health and ecological risks. SWMUs and AOCs at the site include areas where hazardous wastes, hazardous constituents, solid wastes, or mixed wastes may have been disposed.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

Recent work has included a variety of cleanup actions to address contaminated soil, groundwater, and legacy landfills called Material Disposal Areas (MDA) at the site. For example, EM completed a new groundwater monitoring well, and investigation and sampling activities at multiple MDAs and contaminated soil areas. EM also submitted an evaluation report to its regulator, the New Mexico Environment Department (NMED), recommending a final remedy for MDA-C that would seal the waste in place using an engineered cover. However, NMED has proposed selecting a remedy for MDA-C that consists of excavating the waste instead. In June 2025, EM sought to defer cleanup at MDA-C because it is associated with active facility operations. In July 2025, NMED disagreed with this action and, as of February 2026, the matter remained unresolved.

EM has continued its efforts to address a chromium plume in the groundwater on the site using multiple methods to control the migration of the plume and reduce its footprint, such as pumping out water for treatment and injecting it back into the aquifer. In 2024, EM and NMED convened an expert technical review regarding how to address the chromium plume. As of July 2025, EM was in the process of working with NMED to determine next steps to address the recommendations from that review. Throughout this process, EM is gathering additional data to characterize the extent of the groundwater contamination. In November 2025, NMED directed EM to cease the injection of treated water into the aquifer, which was a step in EM's interim measure to address the contamination. In response, EM ceased operation of the interim measure.

Operations Activity Information

Location: Los Alamos National Laboratory; Los Alamos, New Mexico

Office of Environmental Management (EM) site office: Los Alamos Field Office

Site contractor: Newport News Nuclear BWXT-Los Alamos, LLC

Cleanup area: soil and water remediation

Current estimated completion date: July 1, 2044

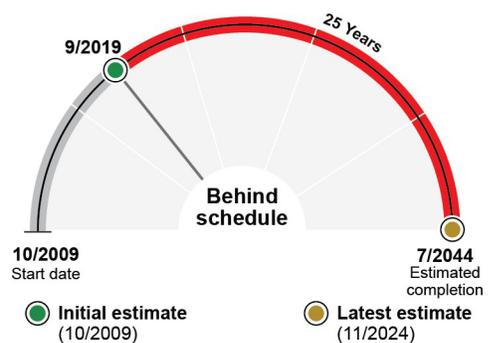
Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



Issues or Risks That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Potential alternative to address treated groundwater.** EM's interim treatment of the site's chromium plume has included extracting chromium-contaminated groundwater, treating it, and reinjecting the clean water back into the aquifer. However, EM officials stated that NMED has signaled that it may require EM to dispose of a portion of the treated groundwater on the land, rather than reinjecting it into the aquifer, which officials said could mean additional costs. Further, EM officials stated that there would be significant constraints related to how this approach could be applied, which could negatively affect the efficiency of the chromium interim measure. For example, according to EM officials, reinjecting water helps to create a protective barrier around the plume to prevent it from migrating, and removing the reinjection process could mean losing this barrier. Accordingly, EM officials believe this could increase long-term costs and time frames needed to fully address the contamination.
- **New potential requirements for groundwater wells.** According to EM officials, the state regulator is considering new requirements for groundwater wells that could significantly increase the costs associated with installing wells. Specifically, officials said that EM could be required to construct wells with "single screens" rather than "double screens," which increases the total number of wells needed. EM and the state regulator are determining a path forward as they work through the recommendations from the recent expert technical review. If single screens are required for groundwater wells moving forward, EM would need to add additional wells to its scope, which would increase costs and delay time frames, according to EM officials.
- **More frequent excavation of sediments due to severe weather.** EM has certain structures that collect sediments as a byproduct of ongoing cleanup activities, and severe weather could increase the frequency needed to empty these structures and dispose of sediments. Specifically, wildfires and heavy rainfall can result in a significant increase in volume of sediment. More frequent disposal of these sediments poses the risk of increased associated costs.
- **Uncertainty of final cleanup remedy.** EM has various MDAs, including MDA-C mentioned above, for which a final cleanup remedy must be determined. EM's current cost estimates assume a less costly remedy (sealing the waste in place with an engineered cover), but if NMED requires EM to fully excavate the waste instead, this could mean an increase of hundreds of millions of dollars in cleanup costs.

Nevada Soil and Water Remediation

This operations activity includes soil and water remediation, long-term monitoring, and deactivation and decommissioning of contaminated facilities. According to site officials, EM has completed the soil cleanup mission at the site, and the majority of the remaining work includes implementing a long-term monitoring plan for a contaminated groundwater plume and deactivating and decommissioning facilities formerly associated with rocket engine testing.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

As of May 2025, EM has closed three out of the Nevada site's four groundwater cleanup areas, closed 1,801 support facilities, and addressed all soils contaminated from atmospheric weapons testing. Over the past 2 years, key activities have included deactivating and demolishing buildings and structures. Specifically, EM completed asbestos removal for two buildings in the Engine Maintenance, Assembly and Disassembly (EMAD) facility and in ancillary buildings and structures in the Test Cell C area (historically used for nuclear testing). EM also completed the demolition of a water tower and electrical substations within the EMAD facility, and Test Cell C and its related structures.

Upcoming work includes completing three new groundwater monitoring wells and the demolition of building 3900 within the EMAD facility. EM is also preparing its groundwater model to support a proposed final remedy of monitored natural attenuation (allowing the contamination to decay naturally while it is monitored), which it plans to implement if it receives approval from the state regulator.

Operations Activity Information

Location: Nye County, Nevada

Office of Environmental Management (EM) site office: Nevada National Security Site

Site contractor: Navarro Research and Engineering

Cleanup area: soil and water remediation

Current estimated completion date: September 30, 2032

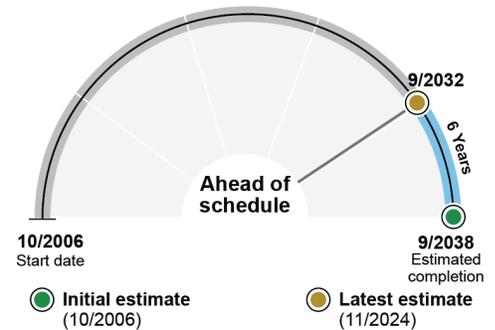
Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance⁵⁶



Issues, Risks, or Opportunities that Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- Underestimated contamination levels.** Building 3900 is a large nuclear facility that served as a space to dismantle rocket engines. The cells within the building have been closed for 30–40 years and are difficult to enter because the door mechanics do not work, according to EM officials. While officials have estimated the contamination level inside

⁵⁶EM site officials told us the cleanup work is ahead of schedule by 6 years because 1) the groundwater cleanup required fewer resources for data collection than originally planned, and 2) the state regulator approved a cleanup plan with requirements that were less strict than originally planned.

the cells, there is a risk that the contamination level is higher than expected, which could cause cost increase and schedule delays due to additional measures needed to properly address the contamination. For example, beryllium is a potential contaminant within the facility, and it has specific waste disposal requirements that may take more time to follow.

- **Failure of groundwater monitoring wells.** EM is actively drilling several monitoring wells to support groundwater cleanup. While drilling wells, there is a risk that the well collapses in on itself, at which point the well is lost. Although this is not a common occurrence, wells cost about \$8 million, meaning such an occurrence would have a significant cost impact.
- **Potential need for groundwater model to be refined.** Before implementing a final groundwater cleanup remedy, the site must get the state regulator's approval of the groundwater model, according to EM officials. Although EM has been refining the model and believes it to be comprehensive, there is a possibility that additional data will be required to further reduce uncertainties and achieve closure. The modeling is particularly challenging because the groundwater wells are located in a very large geographical area and are very deep in the ground, according to officials. If the state regulators see enough uncertainties in the model, they may seek further revisions, and this could delay EM's time frames for completing the groundwater cleanup.

EM officials identified the following opportunity that could decrease the cost or schedule for this operations activity:

- **Some planned monitoring wells may not be required to complete groundwater cleanup.** EM's current cost estimate to complete this operations activity includes constructing five monitoring wells to support groundwater cleanup. EM is currently drilling three wells, but there is a chance the two additional wells will not be needed if EM determines the three existing wells provide sufficient monitoring capacity. This could result in cost reductions.

Oak Ridge Nuclear Facility Deactivation and Decommissioning Y-12

This operations activity includes surveillance and maintenance of the excess facilities awaiting future deactivation and decommissioning at the Y-12 National Security Complex (Y-12). This activity also includes management of the water resources restoration program, which monitors groundwater and surface water within the entire Oak Ridge Reservation to assess the effectiveness of cleanup actions. Additionally, the activity includes operation of the Environmental Management Waste Management Facility (EMWMF) low-level waste disposal site as well as several other landfills.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

Officials cited that the most significant work they are doing to complete this operations activity is monitoring excess facilities that await deactivation and decommissioning (D&D) at Y-12. Excess facilities no longer have a purpose or use to DOE's mission. Any delays with D&D work at Y-12 require longer periods of surveillance and maintenance and therefore increase the cost and schedule of this operations activity.

In addition, the contractor recently began investigations to determine the extent of contamination at the Bear Creek Valley landfill and White Wing Scrap Yard.

Site officials also continued operating the multiple landfills at the site. Each landfill accepts different waste streams, including low-level radioactive waste, industrial waste, facility demolition debris, and hazardous waste. These landfills accept waste from multiple cleanup efforts, including from the Zone 2 soil cleanup and Alpha-2 complex demolition projects.

Operations Activity Information

Location: Oak Ridge Reservation; Oak Ridge, Tennessee

Office of Environmental Management (EM) site office: Oak Ridge Office of Environmental Management

Contractor: United Cleanup Oak Ridge, LLC

Cleanup category: nuclear facility deactivation and decommissioning

Current estimated completion date: September 30, 2047

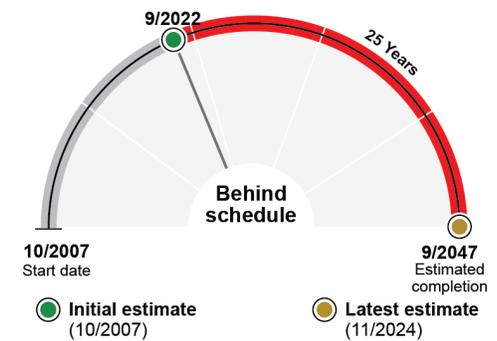
Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



Issues or Risks That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **D&D delays at Y-12.** Any delays to Y-12 facility D&D work will result in cost and schedule increases because support activities will need to continue for a longer period, such as surveillance, maintenance, and waste disposal.
- **Capital asset project delays.** The On-site Waste Disposal Facility (OSWDF) and the Outfall 200 Mercury Treatment Facility capital asset projects have both faced a risk of delays, which could result in schedule and cost increases for this activity. In 2022, we reported that potential delays during the planning and design phase for the new OSWDF

project may pose a risk to this operations activity.⁵⁷ EM officials stated that the existing facility for low-level waste disposal (the EMWMF) will be full before D&D work is completed for this operations activity, meaning additional disposal space will be needed for this waste. The OSWDF could provide this space once it is constructed. However, if that project is not finished by the time the EMWMF becomes full, D&D work at Y-12 would need to pause until the OSWDF is completed and can begin accepting waste. In addition, the estimated completion date of the Outfall 200 Mercury Treatment Facility is unknown because the baseline cost and schedule estimates are changing.

⁵⁷GAO-22-104662.

Paducah Gaseous Diffusion Plant Decontamination and Decommissioning

The Paducah Gaseous Diffusion Plant Decontamination and Decommissioning operations activity includes deactivation, remediation, and operations work. The deactivation work includes the removal of equipment in the C-333 and C-337 process buildings. The operations work includes general activities, such as project management support, utility operations and optimization, environmental monitoring and surveillance, and maintenance.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

According to EM officials, cleanup under this operations activity thus far has included implementing a range of interim remedies and conducting small facility demolitions while EM works toward decisions on final cleanup approaches. For example, in the past 2 years, EM completed characterization of the C-333 process building. EM officials also reported completing the removal of 363 pieces of contaminated large-process gas equipment (called converters) from the building, a key step in the ongoing deactivation process.

Other ongoing work includes operating an interim pump and treat remedy for the site's groundwater, disposing of the site's inventory of R- 114 refrigerant (a hazardous substance that had been used to regulate temperatures during uranium enrichment operations), and initiating characterization and deactivation of the C-337 process building.

Upcoming work includes completing the deactivation of the C-333 process building and initiating the characterization and deactivation of the C-337 process building. Additional work will include completing key investigations and regulatory documents to support final cleanup remedies for environmental media remediation and the demolition of the site's facilities.

Operations Activity Information

Location: Paducah, Kentucky

Office of Environmental Management (EM) site office: Portsmouth/Paducah Project Office

Site contractor: Four Rivers Nuclear Partnership, LLC

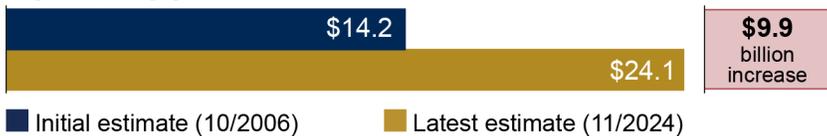
Cleanup area: nuclear facility decontamination and decommissioning

Current estimated completion date: September 30, 2070

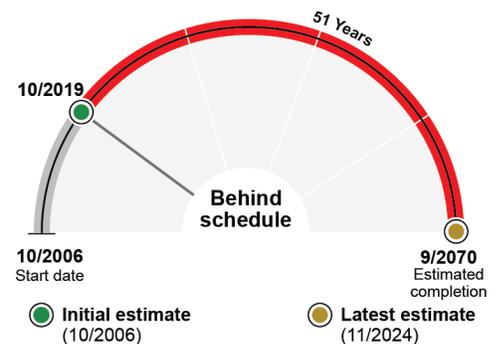
Cost Performance⁵⁸

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



⁵⁸According to site officials, lifecycle costs have increased for this activity in part as a result of rebaselining cost and schedule estimates to better reflect the actual costs of cleanup, including based on knowledge gained from additional experience with similar demolition projects at the Oak Ridge and Portsmouth sites.

Issues, Risks, and Opportunities that Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Aging infrastructure.** Due to the age of facilities and infrastructure, EM may face additional unplanned work including facility repairs and asbestos abatement. Officials said many facilities are from the 1950s and continue to degrade as they age. This increases maintenance costs because many parts for these aged buildings no longer exist, meaning repairs require costly retrofitting. Ultimately, more time waiting to demolish these buildings could continue to result in unplanned maintenance costs.
- **Uncertainty around final cleanup remedies.** Future regulatory decisions create uncertainty and pose potential cost and schedule risks. Since Paducah is in the early stages of cleanup, it still must come to agreement on final cleanup remedies in conjunction with its regulators—EPA and Commonwealth of Kentucky. According to EM officials, Paducah has already had disputes with EPA regarding what the appropriate level of cleanup should be for radionuclides in water discharged from the site. Paducah officials said they will continue to work with regulators on agreeing to final cleanup remedies at the site.
- **Future decontamination and decommissioning costs.** Officials stated that the majority of buildings—roughly 200 facilities—still need to undergo decontamination and decommissioning. There will likely be five buildings for which decontamination and decommissioning will cost over \$50 million each, marking them as capital asset projects under the Department of Energy's Order 413.3B. The facilities are C-331, C-333, C-335, C-337, and C-720.

EM officials identified the following opportunity that could decrease the cost or schedule for this operations activity:

- **Streamlined strategy to seek regulatory approvals.** EM formalized a new cleanup strategy that officials said has reduced cost and schedule estimates for completing cleanup at the site. Under this strategy, EM plans to consolidate 51 future cleanup decisions into four broader decision documents. EM plans to propose three of those for submittal to the state regulator and EPA by 2029. The three decision documents are expected to cover cleanup remedies for (1) combined environmental media areas (soils, surface water, etc.); (2) decontamination and decommissioning for multiple buildings; and (3) a final waste disposal alternative.

Portsmouth Nuclear Facility Deactivation and Decommissioning

This operations activity includes actions to address contamination resulting from the plant's historical uranium enrichment operations, facility decontamination and decommissioning, and surveillance and maintenance activities. Such work includes preparing the uranium processing buildings for demolition, including removing equipment contaminated with high-risk radioactive and hazardous materials



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

Work completed within the last 3 years includes the demolition of building X-326 (including placing the associated debris in the on-site waste disposal facility), completing the deactivation of building X-333 (including removing hazardous materials), initiating the demolition of building X-333, and excavating contaminated soil from two legacy landfills.

Upcoming work includes completing the deactivation of building X-330 and completing the demolition of several buildings such as X-621, X-760, and X-625. According to EM officials, the site has a total of 415 facilities that will be demolished in the coming years.

Operations Activity Information

Location: Piketon, Ohio

Office of Environmental Management (EM) site office: Portsmouth/Paducah Project Office

Site Contractor: Southern Ohio Cleanup Company

Cleanup area: nuclear facility decontamination and decommissioning

Current estimated completion date: September 30, 2043

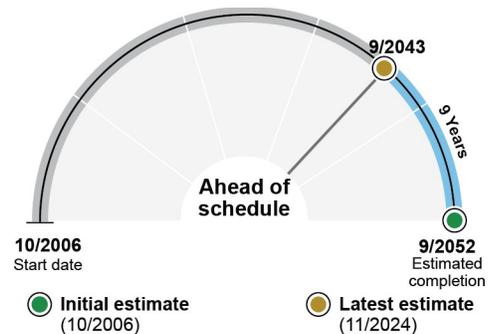
Cost Performance⁵⁹

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



Issues or Risks That Could Impact Cost and Schedule

EM officials identified the following risk that could increase the cost or schedule for this operations activity:

Equipment stability and availability. The demolition process can be hard on equipment, which EM officials found during the demolition of the X-326 building. Although they have implemented routine maintenance and inspection programs to mitigate this risk, demolition equipment damage or failure could delay future demolition projects and result in increased cost and schedule estimates. Equipment availability has also posed a risk for prior cleanup work under this operations activity, with large shears, knife edges, and specialty loading equipment being unavailable or difficult to procure. EM officials said they plan to mitigate this risk by initiating the procurement process early to minimize the impact from potential delays.

⁵⁹According to EM site officials, the increased costs have been due to factors including adjusted escalation rates, incorporating contingency into the estimate, and accounting for costs that had not originally been included, such as landlord costs.

Savannah River Radioactive Liquid Waste Stabilization and Disposition

This operations activity covers the liquid waste program at the Savannah River Site, which seeks to treat and dispose of approximately 34 million gallons of salt and sludge waste in 43 active underground tanks. Eight underground tanks have been closed. To address remaining waste, EM constructed the Salt Waste Processing Facility, Defense Waste Processing Facility, Saltstone Production Facility, and Effluent Treatment Facility. Each facility treats portions of the waste as either (1) high-level radioactive waste that is vitrified into glass, which must be stored while awaiting the development of a permanent repository; or (2) solid low-level radioactive waste disposed of on-site in the Saltstone Disposal units.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

According to EM officials, the Savannah River Site has treated nearly 6 million gallons of salt waste over the last 2 years. Since May 2024, the site has emptied six underground tanks. EM officials expect that two more will be emptied by the end of 2025, and three tanks will be closed by 2028. EM officials told us that the site plans to complete processing salt and sludge waste and close all tanks, ancillary structures, and facilities by December 2037.

In 2022, we reported that because there is currently no permanent repository for disposing of high-level radioactive waste, the site planned to double-stack the canisters it uses to store vitrified high-level radioactive waste in an effort to more efficiently use its storage facilities.⁶⁰ One of the two glass waste storage buildings was fully modified in April 2024 to allow the double-stacking of canisters, and modifications to the second building are currently in process. According to EM officials, these changes will provide sufficient space to store all canisters required to complete the site's cleanup mission.

Operations Activity Information

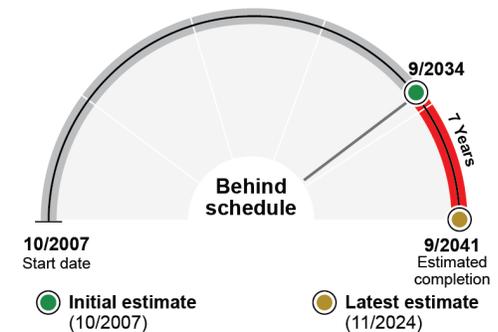
Location: Savannah River Site; Aiken, South Carolina
Office of Environmental Management (EM) site office: Savannah River Operations Office
Contractor: Savannah River Mission Completion
Cleanup category: radioactive liquid waste stabilization and disposition
Current estimated completion date: September 30, 2041

Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS



Schedule Performance



Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Unknown tank conditions.** EM officials told us that because engineers cannot look inside the tanks when designing plans for waste extraction, field conditions can be different than design documents. The site is mitigating this by incorporating lessons learned from tanks opened in the past.

⁶⁰GAO-22-104662.

- **Defense Waste Processing Facility outage.** EM officials said an outage with this facility or a failure in related equipment is a risk, because it can slow down the entire waste treatment process. To mitigate this risk, the site keeps extra equipment like pumps so that parts can be replaced quickly.
- **Transfer line leakage.** Waste tanks are connected by transfer lines, or pipes that lead to a hub that is almost 65 years old. EM officials said that the age of the lines and hub means there is a risk of leakage. To mitigate this risk, EM officials said they make sure there are multiple paths for the waste to travel and work on emptying multiple tanks at once so that if waste extraction stops on one tank, the waste processing does not have to stop altogether.

EM officials identified the following opportunities that could decrease the cost or schedule for this operations activity:

- **Implementing lessons learned.** By examining data and lessons learned from the previous tank closures, the site could identify closure activities that could reduce cost and schedule.
- **Consolidating control rooms.** Operations in the tank farms are controlled from multiple control rooms located in different areas. By combining the number of control rooms, the site could reduce the number of operators required over time, which could decrease costs.

Carlsbad Waste Disposal Facility Operations

This operations activity includes all activities necessary for operating a nuclear facility and for the disposal of defense-related transuranic waste at the Waste Isolation Pilot Plant (WIPP). At WIPP, transuranic waste is disposed of 2,150 feet underground in an ancient layer of salt to isolate the waste from the surrounding environment. This activity includes (1) safe maintenance of WIPP, such as the maintenance and repair of infrastructure in compliance with all applicable laws and regulations and (2) monitoring and verifying WIPP's performance to ensure it remains in compliance with EPA's certification of WIPP's compliance with applicable disposal regulations.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

EM has worked to increase the number of waste shipments disposed of each year at WIPP since 2017, when WIPP ended a 3-year pause on shipping operations due to a radiological incident. In 2024, WIPP received 490 shipments of transuranic waste.

The new Safety Significant Confinement Ventilation System at WIPP was completed in March 2025 and startup activities began in July 2025. The system is designed to supply enough filtered air underground to support full-scale daily operations at WIPP.

At WIPP, the waste is disposed of in underground "panels," made up of rooms that are mined out of the salt formation, where transuranic waste is placed for permanent disposal. In 2024, the site began mining Panel 11 to create additional space for placing future shipments of waste. Upcoming work includes upgrades to the hoist system that lowers materials to the underground, which site officials said is critical to mission success.

The site is currently in the process of updating the lifecycle cost estimate for this operations activity.

Operations Activity Information

Location: Waste Isolation Pilot Plant, Carlsbad, New Mexico

Office of Environmental Management (EM) site office: Carlsbad Field Office

Contractor: Salado Isolation Mining Contractors

Cleanup category: solid waste stabilization and disposition

Current estimated completion date: September 30, 2039

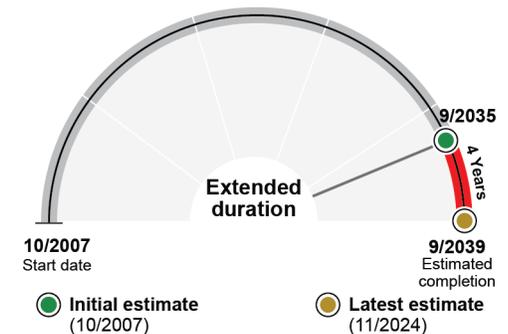
Cost Estimate

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Estimate⁶¹



Issues, Risks, or Opportunities That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost and schedule for this operations activity:

⁶¹The estimated completion date will be updated when the site's federal site lifecycle estimate (FSLE) is approved. According to site officials, the FSLE estimates an estimated end date of 2083. Further, the cost and schedule estimates for this operations activity are directly dependent on other projects.

-
- **Insufficient capacity for all transuranic waste.** In 2025, we reported that DOE's estimates show that WIPP could have capacity for all the transuranic waste under consideration for disposal among EM sites, but unplanned waste could come close to exceeding WIPP's capacity. The Waste Isolation Pilot Plant Land Withdrawal Act limits the volume of transuranic waste that can be disposed of at WIPP to 6.2 million cubic feet, or roughly 175,564 cubic meters. According to the 2024 Annual Transuranic Waste Inventory Report, an estimated 77,600 cubic meters of transuranic waste is planned for future disposal, leaving 22,364 cubic meters (about 13 percent) of disposal capacity remaining at WIPP before reaching its statutory capacity.
 - **Aging and degrading infrastructure.** Officials cited aging infrastructure as a risk to cost and schedule. For example, upgrades to the radio communication equipment may be necessary if the technology becomes obsolete. Other equipment degrades as it is exposed to the salt over time, like the steel-framed bin that is used to stage mined salt before it is lifted to the surface. This could result in the suspension of mining, which in turn could cause schedule delays. To mitigate this concern, the site completed a project to demolish and replace the bin in September 2025.

West Valley Nuclear Facility Deactivation and Decommissioning

This operations activity includes site operations, maintenance, and the demolition of all facilities at the West Valley Demonstration Project site. It also includes operating several facilities that are to be closed in place, including the Remote Handled Waste Facility, Main Plant Process Building, State Licensed Disposal Area, Nuclear Regulatory Commission Licensed Disposal Area, and Waste Tank Farm.



Source: Department of Energy. | GAO-26-107820

Summary of Recent Operations Activity Work

In June 2025, West Valley completed the demolition of the Main Plant Process Building's above ground-level structure. EM site officials told us that the next phase of cleanup at the site will include removing the below-grade portion of the Main Plant Process Building and demolishing the remote handled waste facility and warehouse. However, EM site officials told us that the remote handled waste facility cannot be taken down until a decision is made about the disposal of the site's transuranic waste. As we reported in 2021, the Department of Energy (DOE) has identified two facilities as potential pathways for disposal of West Valley's transuranic waste, but neither facility is currently authorized to accept this type of waste.⁶² DOE is also required to wait for congressional action before making a final decision on where to dispose of its inventory of greater-than-class C waste, which DOE has reported includes West Valley's transuranic waste.⁶³

EM site officials are now evaluating options for the final remedy for the second phase of site cleanup, which will address four underground waste tanks and two on-site disposal areas, among other things. Potential remedies include closing the site waste in place, full exhumation, and hybrid alternatives. Site officials also told us that they had awarded the contract for conducting an environmental analysis needed to move forward with a final remedy decision.

Operations Activity Information

Location: West Valley, New York

Office of Environmental Management (EM) site office: West Valley

Contractor: West Valley Cleanup Alliance

Cleanup category: nuclear facility decontamination and decommissioning

Current estimated completion date: September 30, 2051

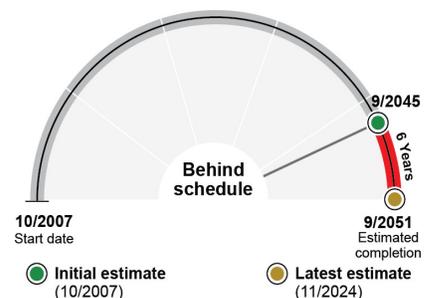
Cost Performance

CONSTANT YEAR 2024 DOLLARS IN BILLIONS

TOTAL COST



Schedule Performance



⁶²GAO, *Nuclear Waste: Congressional Action Needed to Clarify a Disposal Option at West Valley Site in New York*, GAO-21-115 (Washington, D.C.: Jan. 13, 2021).

⁶³The Nuclear Regulatory Commission identifies four classes of low-level waste in its regulations for disposal purposes on the basis of the concentrations of specific radionuclides: Class A, B, C, and greater-than-Class C (GTCC). GTCC has concentrations of certain radionuclides exceeding the class C limits as provided in 10 C.F.R. § 61.55(a)(2)(iii), and requires isolation from the human environment for a longer period of time than do Class A, B, and C wastes, which are disposed of in existing commercial disposal facilities. The Nuclear Regulatory Commission's low-level waste classification system does not apply to DOE because DOE is not a Nuclear Regulatory Commission licensee. However, DOE often describes West Valley transuranic waste as GTCC or GTCC-like because it has characteristics similar to those of GTCC waste, and there may be no path for disposal of it at the present time.

Issues or Risks That Could Impact Cost and Schedule

EM officials identified the following risks that could increase the cost or schedule for this operations activity:

- **Tank farm ventilation system failure.** According to EM site officials, the ventilation system at the waste tank farm reduces humidity in certain tanks and maintains a stable temperature to mitigate corrosion. Site officials said failure of the system would increase costs by about \$1.2 million.
- **Final remedy decision.** Right now, the cost estimate for final waste disposition at the site reflects the lowest cost remedy, which includes closing certain waste in place rather than exhuming it. If a more costly remedy is selected, then the cost and schedule of this operations activity will increase.

Appendix V: Image Sources

This section contains source information for figures in this product when that information was not listed adjacent to the figure.

Waste Treatment and Immobilization Plant, Page 46: GAO analysis of Office of Environmental Management (EM) documentation and information provided by EM officials (cost performance and schedule performance).

Advanced Modular Pretreatment System, Page 48: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Oak Ridge On-Site Waste Disposal Facility, Page 49: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Outfall 200 Mercury Treatment Facility, Page 50: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Portsmouth X-333 Process Building Demolition Project, Page 52: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Portsmouth On-Site Waste Disposal Facility – Infrastructure Construction, Page 54: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Advanced Manufacturing Collaborative Facility, Page 56: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

F-Area Material Storage Building In-Site Decommissioning, Page 57: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Saltstone Disposal Units 10-12, Page 58: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Safety Significant Confinement Ventilation System, Page 60: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Utility Shaft, Page 61: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

West Valley Main Plant Process Building Demolition Project, Page 62: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Hanford Radioactive Liquid Tank Waste Stabilization and Disposition, Page 64: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Hanford Central Plateau, Page 66: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Hanford Sitewide Services, Page 68: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Idaho Nuclear Technology and Engineering Center Infrastructure, Page 70: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Moab Uranium Mill Tailings Project, Page 72: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Los Alamos Soil and Water Remediation, Page 74: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Nevada Soil and Water Remediation, Page 76: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Oak Ridge Nuclear Facility Deactivation and Decommissioning – Y-12, Page 78: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Paducah Gaseous Diffusion Plant Decontamination and Decommissioning, Page 80: GAO analysis of EM documentation and

information provided by EM officials (cost performance and schedule performance).

Portsmouth Nuclear Facility Deactivation and Decommissioning, Page 82: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Savannah River Radioactive Liquid Waste Stabilization and Disposition, Page 83: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Carlsbad Waste Disposal Facility Operations, Page 85: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

West Valley Nuclear Facility Deactivation and Decommissioning, Page 87: GAO analysis of EM documentation and information provided by EM officials (cost performance and schedule performance).

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

Nathan J. Anderson, andersonn@gao.gov

Staff Acknowledgments

In addition to the contact named above, Jeffrey T. Larson (Assistant Director), Rachel H. Pittenger (Analyst in Charge), Claudia Hadjigeorgiou, and Natalie L. Hurd made key contributions to this report. Also contributing to this report were Adrian Apodaca, Gina Hoover, and Caitlin Scoville.

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