United States Government Accountability Office

Report to Congressional Committees

September 2024

CONTAMINATED EXCESS FACILITIES

Use of Key Practices Would Strengthen DOE's Disposition Planning Efforts

GAO-24-107173

GAO Highlights

Highlights of GAO-24-107173, a report to congressional committees

September 2024

CONTAMINATED EXCESS FACILITIES

Use of Key Practices Would Strengthen DOE's Disposition Planning Efforts

Why GAO Did This Study

Effective management of DOE's contaminated excess facilities could reduce the U.S. government's environmental liability, which is on GAO's High Risk List. Deactivating and decommissioning such facilities is crucial for reducing risks and costs as the condition of facilities worsens over time. Since 2016, DOE has been required by statute to regularly plan for deactivating and decommissioning contaminated excess facilities.

Senate Report 118-58 includes a provision for GAO to evaluate DOE's efforts to develop a plan for deactivating and decommissioning contaminated excess facilities, which is due March 2025 and every 4 years afterward. GAO examined (1) DOE's approach to deactivating and decommissioning NNSA's contaminated excess facilities and (2) the extent to which DOE's planning efforts addressed statutory requirements and key practices. GAO analyzed DOE's fiscal year 2023 data on contaminated excess facilities, assessed DOE's 2022 deactivation and decommissioning plan, and interviewed NNSA and EM officials, including officials at seven sites with NNSA contaminated excess facilities.

What GAO Recommends

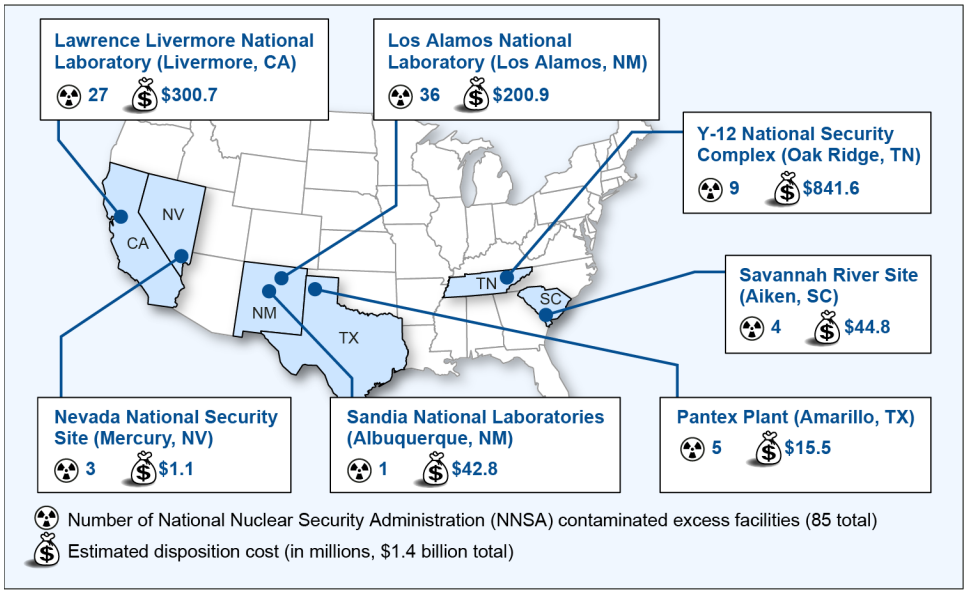
GAO is making four recommendations, including that DOE ensure that its 2025 deactivation and decommissioning plan address all statutorily required elements and its 2025 disposition planning efforts fully incorporate GAO's key practices for planning for results of federal efforts. DOE concurred with all of GAO's recommendations.

View GAO-24-107173. For more information, contact Nathan Anderson at (202) 512-3841 or andersonn@gao.gov.

What GAO Found

As of fiscal year 2023, the Department of Energy (DOE) estimated that it would cost $1.4 billion to deactivate and decommission 85 contaminated excess facilities owned by the National Nuclear Security Administration (NNSA) and that are no longer needed to support DOE's missions. NNSA prioritizes disposition activities to align with its mission to maintain and modernize infrastructure for the U.S. nuclear weapons stockpile. NNSA has the authority to deactivate and decommission certain contaminated excess facilities but needs the Office of Environmental Management (EM) to carry out this work on some of the more complex and costly facilities. EM can do so once it has funding and contracting mechanisms in place and the facilities meet certain criteria.

NNSA Contaminated Excess Facilities at Seven Sites, as of Fiscal Year 2023



Sources: GAO analysis of Department of Energy (DOE) data; Map Resources (map). | GAO-24-107173

DOE officials said that the deactivation and decommissioning plan due in March 2025 would be similar to previous iterations. However, GAO found that DOE's most recent plan, issued in 2022, did not include four of the six statutorily required elements or fully incorporate the three key practices for planning for results of federal efforts. Addressing all statutorily required elements, such as by including a list of contaminated excess facilities prioritized based on the potential to reduce risk and maximize cost savings, may better provide Congress with a clearer picture of how DOE might most effectively help reduce the environmental liability that the remaining contaminated excess facilities pose. Also, DOE faces barriers, such as the availability of funding and contracting mechanisms, that affect its ability to deactivate and decommission facilities. Fully incorporating key practices, such as defining strategies to mitigate barriers, may help ensure that DOE understands and communicates what DOE is trying to achieve, how DOE will achieve it, and barriers limiting DOE's ability to do so.

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
DOE	Department of Energy
EM	Office of Environmental Management
EMAD	Engine Maintenance Assembly and Disassembly
EMLA	EM Los Alamos Field Office
FIMS	Facilities Information Management System
IDIQ	indefinite delivery indefinite quantity
LLNL	Lawrence Livermore National Laboratory
LANL	Los Alamos National Laboratory
M&O	management and operating
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
SNL	Sandia National Laboratories
SRS	Savannah River Site
WEPAR	West End Protected Area Reduction

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Congressional Committees

In 2022, the Department of Energy (DOE) estimated that it would cost $14.7 billion to deactivate and decommission 1,077 excess facilities that are no longer needed to support DOE's missions. DOE and its predecessor agencies constructed some of these facilities beginning in the 1940s to produce nuclear weapons and conduct nuclear energy research, which resulted in radiological and chemical contamination of those facilities.[1] The deactivation and decommissioning of contaminated excess facilities is crucial for reducing risks and costs as the condition of facilities worsens over time.[2] Effective management of these facilities also could reduce the U.S. government's environmental liability, which has been on our High Risk List since 2017.[3] DOE is responsible for the largest share of this liability—$534 billion, as of fiscal year 2023.[4]

The National Nuclear Security Administration (NNSA)—a separately organized agency within DOE—and other DOE entities such as the Office of Science and the Office of Nuclear Energy are responsible for managing

[1]For the purposes of our report, the term "contaminated excess facility" is synonymous with "nonoperational defense nuclear facility" as defined in 50 U.S.C. § 2603(f)(3). As defined therein, the term "nonoperational defense nuclear facility" means a production facility or utilization facility (as those terms are defined in 42 U.S.C. § 2014) under the control or jurisdiction of the Secretary of Energy and operated for national security purposes that is no longer needed for the mission of DOE, including the National Nuclear Security Administration (NNSA). Deactivation, decommissioning, disposition, and other key terms used in this report are defined below.

[2]The deactivation and decommissioning of facilities is collectively referred to as the disposition of facilities. The disposition of a facility may also include activities such as stabilization as well as surveillance and maintenance. Stabilization can include repairs to roofs, safety systems, or confinement structures. Surveillance and maintenance can include regular inspection and maintenance of structures, systems, and equipment. The purpose of stabilization and surveillance and maintenance is to help ensure that risks to workers, the public, and the environment are eliminated or mitigated and controlled while a facility awaits final disposition.

[3]The U.S. government's environmental liability is the probable and reasonably estimable cost of future environmental cleanup responsibilities. Our High Risk List identifies federal programs and operations that are high risk because of their vulnerabilities to fraud, waste, abuse, and mismanagement or that need transformation. GAO, *High-Risk Series: Efforts Made to Achieve Progress Need to Be Maintained and Expanded to Fully Address All* Areas, GAO-23-106203 (Washington, D.C.: Apr. 20, 2023).

[4]Department of Energy, *Agency Financial Report: Fiscal Year 2023*, DOE/CF-0201 (Washington, D.C.: Nov. 15, 2023).

and maintaining their contaminated excess facilities until the facilities can be deactivated and decommissioned.[5] Generally, the Office of Environmental Management (EM) is responsible for cleaning up sites contaminated by radioactive and other hazardous materials resulting from decades of nuclear weapons production and nuclear energy research. EM also deactivates and decommissions contaminated excess facilities owned by NNSA and other DOE entities, in cases where residual radioactivity, hazardous materials, and other aspects of the facilities present more complex challenges. While EM's most complex and costly mission area is the treatment and disposition of tank waste and the permanent closure of tanks at certain sites, deactivating and decommissioning its own excess facilities and those owned by other DOE entities represents the second costliest portion of EM's work.[6]

Since 2016, DOE has been required by statute to regularly plan for deactivating and decommissioning contaminated excess facilities.[7] In 2022, the statutory requirement was amended to require that every 4 years, DOE develop and subsequently carry out a plan to deactivate and decommission contaminated excess facilities, with the first plan due on March 31, 2025.[8] The plan must include a prioritized list of contaminated excess facilities to deactivate and decommission based on the potential to reduce risks and maximize cost savings. For NNSA contaminated facilities that are determined to be excess as of September 30, 2024, DOE is also required, during 2025, to develop and subsequently carry out

[5]National Defense Authorization Act for Fiscal Year 2000, Pub. L. 106-65, div. C, tit. XXXII, § 3211, 113 Stat. 512, 957 (1999) (codified at 50 U.S.C. § 2401). NNSA is responsible for the nation's nuclear weapons stockpile, nonproliferation efforts, and nuclear propulsion systems for the U.S. Navy.

[6]EM's cleanup activities are governed in part by federal laws, including the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA); the Resource Conservation and Recovery Act of 1976, as amended; and the Atomic Energy Act of 1954, as amended. Dozens of agreements, which DOE negotiated with various regulatory entities, also may govern cleanup activities. Deactivation and decommissioning are typically completed under CERCLA as "non-time critical" removal actions, which, along with remedial actions, are the types of cleanup actions the government can perform under CERCLA.

[7]National Defense Authorization Act for Fiscal Year 2016, Pub. L. No. 114-92, div. C, tit. XXXI, § 3133, 129 Stat. 726, 1205-07 (2015) (codified as amended at 50 U.S.C. § 2603).

[8]James N. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub L. No. 117-263, div. C, tit. XXXI, subtit. B, § 3114, 136 Stat. 2395, 3053 (2022) (codified at 50 U.S.C. § 2603).

a plan to transfer responsibility for decontaminating and decommissioning the facilities from NNSA to EM by March 31, 2029.[9]

Senate Report 118-58 includes a provision for GAO to evaluate DOE's efforts to develop the 2025 plan for deactivating and decommissioning contaminated excess facilities, including DOE's plan for transferring the responsibility for certain contaminated excess facilities from NNSA to EM, and to recommend efficiencies and cost savings that could be achieved as the department plans for the transfer and final disposition of excess facilities. This report examines (1) the status of NNSA's contaminated excess facilities and DOE's approach for funding the deactivation and decommissioning of those facilities and (2) the extent to which DOE's prior planning efforts for deactivating and decommissioning contaminated excess facilities addressed all statutorily required elements and incorporated key practices for planning.

To address our first objective, we analyzed fiscal year 2023 data on excess facilities from DOE's Facilities Information Management System (FIMS)—DOE's real property database. We assessed the reliability of the data by reviewing relevant documentation, interviewing knowledgeable officials about data quality, and manually testing data for missing values or outliers. We determined that the data were sufficiently reliable for determining which NNSA contaminated facilities are or will be excess facilities through September 2024, and for describing the status of those facilities. We also reviewed relevant documents, including DOE orders, guides, program plans, and budget documentation.

To address our second objective, we compared DOE's 2022 *Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities* with statutory requirements and GAO's relevant key practices

[9]Under the prior statutory requirement, DOE was likewise required to plan for the transfer of responsibility for decontaminating and decommissioning certain NNSA contaminated excess facilities from NNSA to EM by 2019. DOE included this plan for the transfer of responsibility as a part of its 2016 *Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities: Report to Congress* (Washington, D.C.: December 2016).

for planning for results.[10] We assessed whether DOE's 2022 plan included or did not include each element required by statute. We also assessed whether DOE's 2022 plan fully incorporated, partially incorporated, or did not incorporate the key practices we determined were relevant for planning for results. Specifically, we assessed the extent to which DOE's 2022 plan (1) defined goals, (2) identified strategies and resources for achieving those goals, and (3) assessed the environment, including any factors that could act as barriers to achieving those goals. These practices can help agencies provide a clearer picture of what they are trying to achieve, how they will achieve it, and what barriers limit their ability to do so.

For both objectives, we interviewed NNSA and EM officials to obtain their perspectives on deactivating and decommissioning NNSA's contaminated excess facilities, including barriers to doing so, and the requirement to transfer responsibility for decontaminating and decommissioning such NNSA facilities to EM. This included NNSA and EM officials from headquarters as well as the seven sites with NNSA contaminated excess facilities: Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Nevada National Security Site, Pantex Plant, Sandia National Laboratories, Savannah River Site, and Y-12 National Security Complex.[11] Appendix I presents a more detailed description of our scope and methodology.

We conducted this performance audit from December 2023 to September 2024 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

[10]Department of Energy, *Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities: Report to Congress* (Washington, D.C.: July 2022) and GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 12, 2023). As required by statute, DOE submitted deactivation and decommissioning plans to Congress every 2 years from 2016 to 2022. In 2022, the statutory requirement was amended to require the submission of a deactivation and decommissioning plan every 4 years starting in 2025. To develop the key practices, GAO distilled them from hundreds of actions identified in GAO's past work as effective for implementing federal evidence-building and performance management activities.

[11]Kansas City National Security Campus is responsible for manufacturing and procuring nonnuclear components for nuclear weapons. NNSA has excess facilities at the site, according to NNSA officials. However, none of the facilities have radiological and chemical contamination from mission operations, according to our analysis of FIMS data.

that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

NNSA's and EM's Roles and Responsibilities for Deactivating and Decommissioning Contaminated Excess Facilities

According to DOE's policy on real property asset management, DOE may determine a facility to be excess if it is not needed for the mission of any DOE entity.[12] The DOE entity that owns the excess facility—which can be NNSA, EM, or another program such as the Office of Science—is responsible for managing and maintaining its excess facility until it is deactivated and decommissioned. Generally, EM is responsible for the deactivation and decommissioning of DOE's process-contaminated excess facilities.[13] NNSA may decontaminate and decommission its own contaminated excess facilities if the effort is within certain estimated project cost limits. Contaminated excess facilities must meet certain criteria before they can be transferred from other DOE entities to EM for deactivation and decommissioning.

NNSA's Office of Infrastructure manages the agency's Infrastructure and Operations program, which is to maintain, operate, and modernize NNSA's infrastructure in a safe, secure, and cost-effective manner. This includes managing contaminated excess facilities that may present some risk to workers near these facilities and the environment, and stabilizing the facilities as necessary to meet EM transfer requirements. In addition to funding facility operations and maintenance, the program has recently funded certain deactivation and decommissioning projects for contaminated excess facilities.

To execute its missions, NNSA relies on contracted services for most of its work at eight government-owned sites—collectively known as the nuclear security enterprise. NNSA's largest contracts are generally management and operating (M&O) contracts to carry out its program and

[12]Department of Energy, *Real Property Asset Management*, DOE Order 430.1C (Washington, D.C.: Sept. 17, 2020).

[13]The contaminated excess facilities discussed in this report include only those with process contamination, which refers to radioactive and/or chemical contamination resulting from mission operations. Such contamination does not include contamination from construction activities and associated materials, such as asbestos and lead-based paint.

project work at the sites.[14] The M&O contractors are generally responsible for managing daily operations and executing program and project activities at the sites.

To fund EM's work, EM's budget office works with the DOE sites with active cleanup work to develop a budget request for the upcoming fiscal year.[15] EM's fiscal year 2024 appropriation for defense environmental cleanup activities—which includes cleanup of legacy defense production and research sites and waste—was $7.3 billion. Of that, $415 million was appropriated for cleanup activities at NNSA-managed sites, including deactivation and decommissioning activities for NNSA's contaminated excess facilities at specific sites.

To execute its cleanup mission, EM also relies on contracted services for a wide range of activities. As part of its budgeting process, EM typically categorizes work as either (1) in support of site operations (base operations) or (2) directly advancing the cleanup mission (progress activities).[16] The disposition of excess facilities typically falls under EM's progress category because such activities directly contribute to cleanup progress at the sites.

EM has established a policy that defines procedures, criteria, and expected stabilization conditions for transferring contaminated excess facilities and other materials to EM for deactivation and decommissioning activities.[17] Under the policy, transfer includes turning over the ownership,

[14]M&O contracts are agreements under which the government contracts for the operation, maintenance, or support, on its behalf, of government-owned or government-controlled research, development, special production, or testing establishments wholly or principally devoted to one or more major programs of the contracting federal agency. 48 C.F.R. § 17.601.

[15]EM has active cleanup work at 15 sites. These include the Office of River Protection and Richland Operations Office, which are associated with the Hanford Site, and the following: Energy Technology Engineering Center; Idaho National Laboratory; Lawrence Livermore National Laboratory; Los Alamos National Laboratory; Moab; Nevada National Security Site; Oak Ridge; Paducah Gaseous Diffusion Plant; Portsmouth Gaseous Diffusion Plant; Sandia National Laboratories; Savannah River Site; Waste Isolation Pilot Plant; and West Valley Demonstration Project.

[16]For more information on EM's budget categories, see GAO, *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).

[17]Office of Environmental Management, *Excess Facility, Material, and Waste Transfer to the Office of Environmental Management,* Standing Operating Policies and Procedures #34 (Washington, D.C.: Oct. 22, 2021).

management responsibility, liability, and control of a facility to EM to support the transition from one disposition phase to another. It also includes the assignment of temporary operational control for a stabilized facility to EM to deactivate and decommission it while its ownership remains with the originating office. EM officials said that assigning temporary operational control is the preferred method of transferring responsibility.

A facility must meet certain criteria before transfer to EM for deactivation and decommissioning, including the following:

1. The facility must be determined to be excess to all DOE mission needs.

2. The facility must be contaminated with chemical or radiological substances, such as plutonium, uranium, beryllium, or mercury, resulting from mission operations, and not only from construction activities and associated materials, such as asbestos, lead-based paint, and polychlorinated biphenyls.

3. With limited exceptions, the facility must be an individual, self-contained facility, and not part of a larger complex.[18]

4. The facility must be in a stable and known condition and configuration.[19]

[18]If a portion of an excess contaminated facility (e.g., a wing) is proposed for transfer, a physical separation of common systems, utilities, and infrastructure must be accomplished or funded by the program office requesting the transfer.

[19]Under the prior statutory requirement for DOE to plan for transfer of responsibility of certain excess facilities, DOE was to transfer to EM responsibility for decontaminating and decommissioning certain NNSA excess facilities by 2019. Until 2022, the statute only required DOE to transfer responsibility for NNSA contaminated excess facilities to EM when the facilities met EM's requirements for transfer. Under the amended statutory language, codified at 50 U.S.C. § 2603(c), the requirement that such facilities meet EM's requirements for transfer was removed.

Further, according to EM's policy, EM will not accept facilities for transfer until adequate funds are available to begin disposition work.[20]

EM performs what is known as a "walkdown" to examine a facility and assess whether the facility's conditions meet the requirements for transfer to EM. EM may identify additional work for NNSA or other DOE entities to complete before EM accepts the transfer. According to EM officials, in some cases EM may have to walkdown the facility a second time to ensure NNSA or the other DOE entities completed the activities described in the initial walkdown report before EM accepts the transfer. Once EM has accepted a facility, EM will typically assume operational control of the facility under a memorandum of agreement or other written agreement, without transferring the facility's ownership. In March 2015, we reported that EM established this process in 2011 for NNSA and other DOE entities to transfer contaminated excess facilities to EM for deactivation and decommissioning.[21]

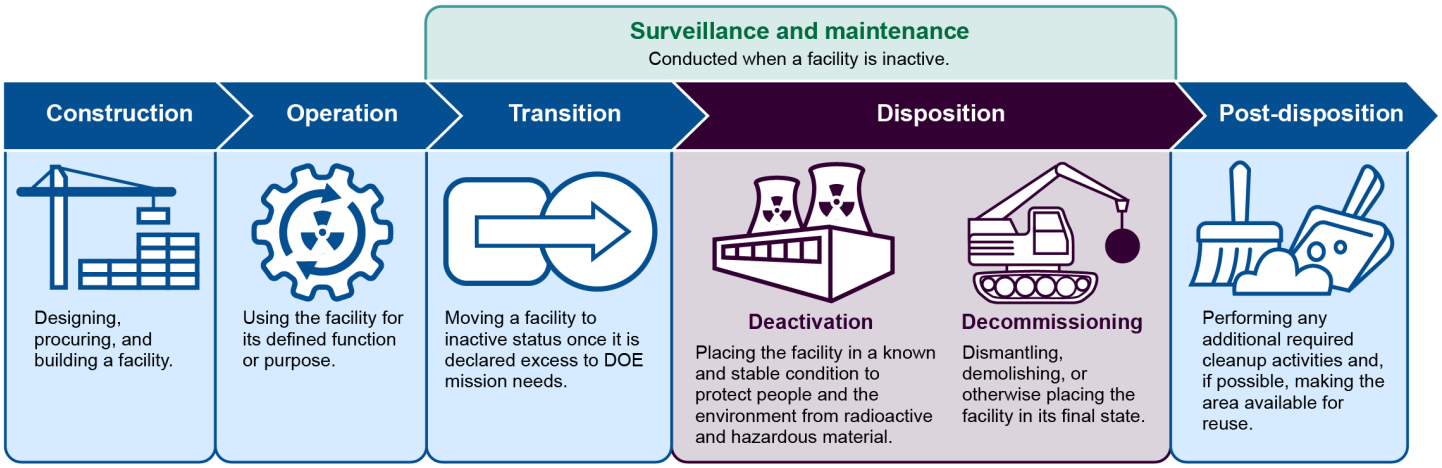
Life Cycle of a Defense Nuclear Facility

The life cycle of a DOE defense nuclear facility includes phases from construction and operation to disposition and post-disposition (see fig. 1).

[20]According to EM, this requirement is based on congressional direction. Specifically, DOE's 2022 *Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities* notes that the Explanatory Statement accompanying the Consolidated Appropriations Act, 2016, Pub. L. No. 114-113, directs EM not to accept ownership or responsibility for cleanup of any NNSA facilities or sites without funding specifically designated for that purpose and directs DOE to identify all requests for transfers of facilities in its budget request justification in future years.

[21]GAO, *DOE Facilities: Better Prioritization and Life Cycle Cost Analysis Would Improve Disposition Planning,* GAO-15-272 (Washington, D.C.: Mar. 19, 2015).

Figure 1: Life Cycle of a Department of Energy (DOE) Defense Nuclear Facility



Sources: GAO analysis of DOE order and guides; GAO (illustrations). | GAO-24-107173

Note: The lines between life cycle phases may blur depending on each facility's unique circumstances. For instance, some activities taking place during the transition phase may continue into the deactivation phase.

Below, we describe each phase and note those phases in which responsibility for a contaminated excess facility may be transferred to EM for deactivation and decommissioning.

1. **Construction.** Activities that entail a combination of engineering, procurement, fabrication, erection, installation, assembly, or demolition to create a new facility (also referred to as an asset). Construction includes the design of the facility, related site preparation and land improvements, and installed equipment.

2. **Operation.** Activities of a repetitive and ongoing nature that use a facility for a defined function or purpose. The activities are dependent on the facility's purpose, and for NNSA can vary from plutonium pit production to research activities to the assembly of nuclear weapons.

3. **Transition.** Activities that occur between the operation and disposition phases in a facility's life cycle. The transition phase begins once a facility has been declared or forecast to be excess to current and future DOE needs. It includes placing the facility in a stable condition and eliminating or mitigating hazards. For contaminated excess facilities, the transfer of operational control

from NNSA or another DOE program office to EM may take place during this phase.

4. **Surveillance and maintenance.** Activities are conducted when a facility is inactive (in transition and disposition phases) that are intended to maintain the safety of the facility. Activities may include regular inspection and maintenance of structures, systems, and equipment to ensure that any contamination is adequately contained and that potential hazards to workers, the public, and the environment are eliminated or mitigated and controlled.

5. **Disposition.** Activities performed on a facility following the completion of its program mission that include but are not limited to surveillance and maintenance, deactivation, and decommissioning.

    - **Deactivation.** A subset of disposition activities intended to stabilize a facility while also mitigating its associated hazards. This interim stabilization process may limit costs incurred by long-term stabilization, and surveillance and maintenance activities, while awaiting a facility's ultimate decommissioning. For contaminated excess facilities, the transfer of operational control from NNSA or another DOE program office to EM may take place during this phase.
    - **Decommissioning.** The final process of closing and securing a nuclear, radiologically contaminated, or radioactive material storage facility consistent with the facility's established end state. During this phase, the facility is taken to its ultimate end state through decontamination, dismantlement, and demolition or entombment. After decommissioning is complete, the facility or surrounding area may require DOE control for protection of the public and the environment or for environmental remediation. The goal of decommissioning is unrestricted release or restricted use of the site.

6. **Post-disposition.** Activities that may be required following the disposition of a facility, such as remedial action for soils and water. Once any additional cleanup activities are complete, EM may transfer operational control back to NNSA or another DOE program office and the area may be available for reuse.

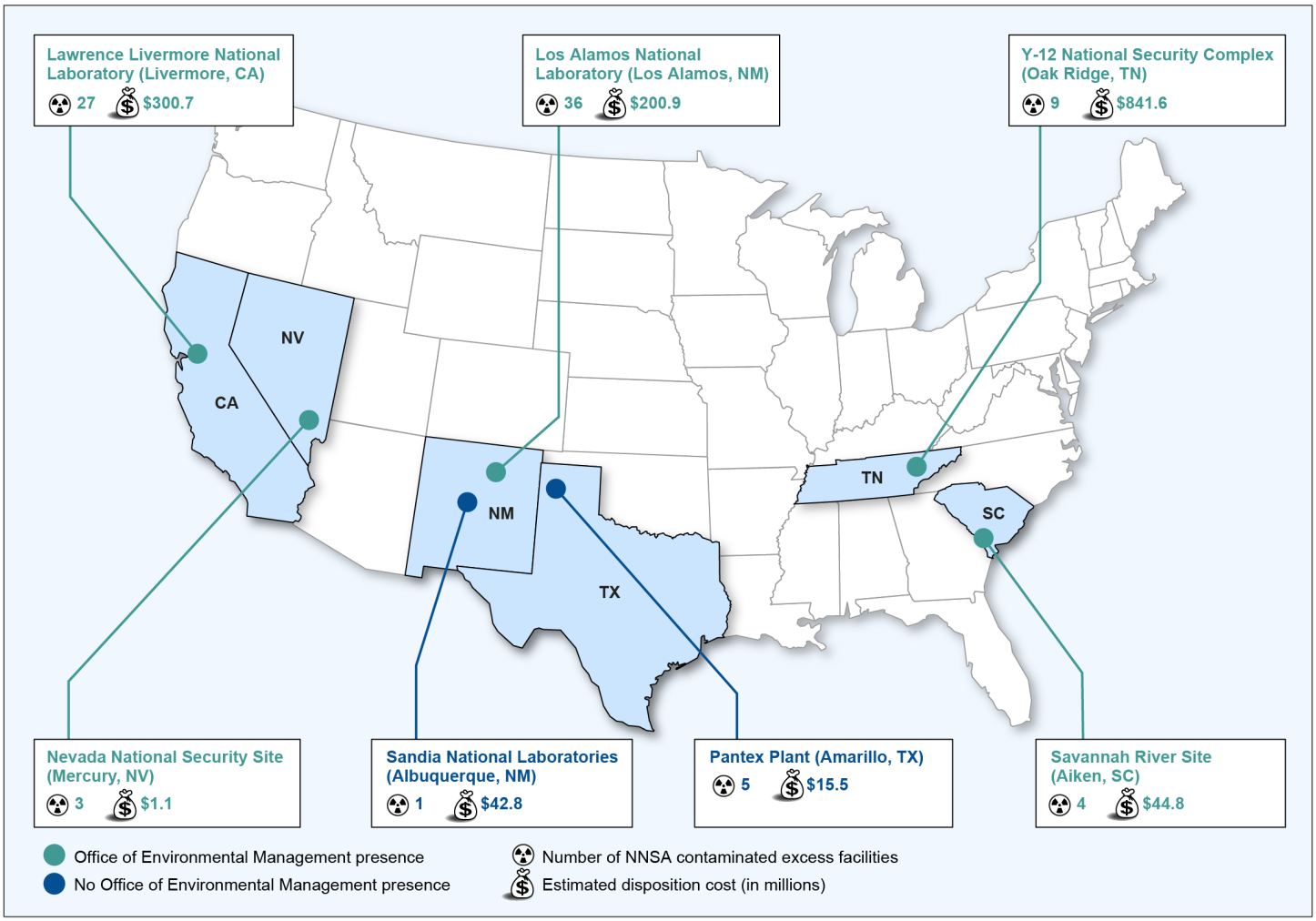
DOE Used Multiple Mechanisms for Disposition of NNSA's Contaminated Excess Facilities and Officials Identified Barriers

As of the end of fiscal year 2023, NNSA had 85 contaminated excess facilities at seven sites. DOE has used various funding sources and contracting mechanisms to conduct disposition work on NNSA's contaminated excess facilities and identified barriers to more effectively executing disposition work.

NNSA Has 85 Contaminated Excess Facilities at Seven Sites

According to our analysis, DOE estimated that it would cost $1.4 billion to deactivate and decommission NNSA's 85 contaminated excess facilities at seven sites, as of fiscal year 2023. Figure 2 shows the seven sites where NNSA had contaminated excess facilities, as of fiscal year 2023. EM had a physical on-site presence at five of these sites.

Figure 2: Sites with National Nuclear Security Administration (NNSA) Contaminated Excess Facilities, as of Fiscal Year 2023



Sources: GAO analysis of Department of Energy data; Map Resources (map). | GAO-24-107173

The majority of NNSA's contaminated excess facilities and associated disposition costs were at three sites—Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Y-12 National Security Complex. Appendix II profiles each of the seven sites, providing site-specific information about the status of NNSA's and EM's respective deactivation and decommissioning activities at each site's contaminated excess facilities. Appendix III lists NNSA's 85 process-contaminated excess facilities by site, as of fiscal year 2023.

NNSA Prioritizes Facilities for Disposition and DOE Uses Multiple Funding and Contracting Mechanisms

NNSA prioritizes deactivation and decommissioning activities to align with its mission to maintain and modernize infrastructure for the U.S. nuclear weapons stockpile. In recent years, NNSA's scope of work and budget have increased and are centered on simultaneously modernizing nuclear weapons and modernizing and recapitalizing its infrastructure. This work includes five multibillion-dollar weapon modernization programs; numerous multibillion-dollar construction projects; hundreds of smaller construction and revitalization projects; and programs to support stockpile science, research, and development.

NNSA prioritizes funding disposition activities that support NNSA's modernization plans or that reduce the risks that contaminated excess facilities pose until EM can carry out the disposition of them, according to NNSA's program management plan for infrastructure life cycle management.[22] This includes prioritizing and eliminating contaminated excess facilities to create space for construction of new facilities. After sites and contractors submit projects for funding consideration, NNSA ranks the disposition projects using the following weighted criteria:

1. risk reduction (based on the facilities' Excess-Facility Risk Index) score, weighted at 70 percent; [23]
2. cost-effectiveness (based on total square footage reduction divided by total project cost), weighted at 20 percent; and
3. cost savings (based on the cost of operations and maintenance divided by total project cost), weighted at 10 percent.

NNSA uses these prioritization criteria, along with the site's priority ranking and stakeholder interests, to inform the final list for funding requests for a given fiscal year. Officials from NNSA's Office of Infrastructure said the current prioritization and transfer processes meet NNSA's needs. Specifically, officials said that under their current process,

[22]National Nuclear Security Administration, Office of Infrastructure Lifecycle Management, *Program Management Plan* (Washington, D.C.: October 2023).

[23]According to NNSA's 2023 guide on real property asset management, NNSA uses the Excess-Facility Risk Index to identify the relative risk of each facility by assessing condition, the type and extent of contaminants in the facility, and proximity of the facility to the public, site employees, and mission activities. The index provides a score of (1 to 100) of relative risk based on risk of all facilities that are currently excess or will be excess within 25 years. NNSA converts the index scores to inform FIMS fields on risk of facilities to public health and environment, worker safety, and mission.

NNSA can effectively manage and mitigate risks associated with the contaminated excess facilities to its site operations and to health and safety. This would not be the case, however, if such facilities were transferred to EM before EM could begin deactivation and decommissioning activities. EM officials agreed and explained that deactivating and decommissioning NNSA's contaminated excess facilities is and should be based on NNSA's priorities. EM officials said the sites that NNSA manages have unique challenges that NNSA would be able to navigate more effectively. This is especially true at sites that have smaller footprints or have complexities in the work that needs to occur before disposition.

DOE has used the following funding and contracting mechanisms to deactivate and decommission NNSA's contaminated excess facilities.

NNSA funds certain disposition activities at its contaminated excess facilities. NNSA annually funds an array of maintenance, operations, and modernization activities at all of its facilities on each site, according to the NNSA Office of Infrastructure's program plan and NNSA officials. NNSA expects its M&O contractors to carry out disposition of contaminated excess facilities below a certain cost threshold using funding from the site's annual appropriations. NNSA may also seek to fund specific disposition projects for contaminated excess facilities through its annual budget process. According to a program plan from NNSA's Office of Infrastructure, NNSA addresses contaminated excess facilities as follows:

- For disposition projects estimated to cost less than $1 million (e.g., trailers, temporary buildings, or structures), NNSA generally expects M&O contractors to systematically work through the backlog of facilities using funding for which they have discretion for site operations.
- For contaminated excess facilities estimated to cost from $1 million to $75 million for disposition, NNSA headquarters directs its M&O contractors to consult with the site's NNSA disposition program manager to identify the appropriate funding program for disposition project proposals. According to NNSA officials, the agency will typically either request funding for these projects as a part of the annual budgeting process or use other appropriate and available funding to undertake the projects. NNSA has the authority to

decontaminate and decommission its contaminated excess facilities when the total estimated project cost is less than $75 million.[24]

- For contaminated excess facilities that are estimated to cost over $75 million for disposition, NNSA may fund some deactivation activities—for example characterization, deinventorying, and stabilization.[25] In such cases, NNSA works with EM to get the necessary funding for additional deactivation and decommissioning work.

NNSA has used its authority to decontaminate and decommission certain contaminated excess facilities. For example, in DOE's 2022 plan for deactivating and decommissioning facilities, NNSA reported that it completed the disposition of contaminated excess facilities at the Los Alamos National Laboratory, Pantex Plant, and Y-12 National Security Complex in fiscal years 2020 and 2021. Moreover, since the 2022 plan, NNSA has completed the disposition of two facilities at Los Alamos National Laboratory and one facility at Savannah River Site, according to NNSA officials. NNSA also completed utility reroutes to support future deactivation and decommissioning of two facilities at the Y-12 National Security Complex. DOE included these five facilities in the 2022 plan's high-risk excess facility appendix, which lists relatively higher-risk DOE contaminated excess facilities on the basis of DOE's qualitative assessment.

EM funds and contracts for certain disposition activities at NNSA's contaminated excess facilities. EM funds disposition projects for NNSA's contaminated excess facilities through annual appropriations designated for a specific site or facility. For the annual budget process, the sites' EM program managers develop a list of activities that they

[24]The National Defense Authorization Act for Fiscal Year 2018, Pub. L. No. 115-91, div. C, tit. XXXI, subtit. B, § 3111(b)(2)(i)(II), 131 Stat. 1283, 1881 (2017), provided NNSA with the authority to carry out the decontamination, decommissioning, and demolition of NNSA process-contaminated facilities that have a total estimated project cost of less than $50 million. The National Defense Authorization Act for Fiscal Year 2022, Pub. L. No. 117-81, div. C, tit. XXXI, subtit. B, § 3116(2), 135 Stat. 1541, 2227 (2021), increased the project cost limit to less than $75 million.

[25]According to the program plan, characterization is the evaluation of a facility to determine critical information needed to identify risks, define project scope, and/or document existing conditions in preparation for facility transfer. Deinventorying is the removal of materials (including hazardous or radioactive materials), personal property, and equipment as necessary to establish a stable and known condition and to manage risks to human health and the environment. Stabilization includes repair to roofs, safety systems, or confinement structures to manage risks to human health and safety and minimize migration of hazardous or radioactive materials while a facility awaits demolition or transfer.

estimate EM could perform during the fiscal year under consideration, according to EM headquarters officials. EM headquarters officials then prioritize these activities across sites using a variety of considerations, including legal agreements, regulatory milestones, and safety requirements. EM relies on NNSA's M&O contractors, its own cleanup contractors, or others to execute the work.

Since at least fiscal year 2018, EM's appropriations have periodically included funds specifically designated for EM to deactivate and decommission certain non-EM facilities. For example, the Consolidated Appropriations Act, 2018 included $100 million for EM to deactivate and decommission the Building 280 pool-type reactor and other excess facilities at Lawrence Livermore National Laboratory (see fig. 3).[26] For Building 280, NNSA's M&O contractor performed some deactivation work, and EM partnered with the U.S. Army Corps of Engineers under interagency agreements to remove the reactor and demolish the structure.

[26]Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, 132 Stat. 348.

Figure 3: Deactivation and Decommissioning of the Building 280 Pool-Type Reactor at Lawrence Livermore National Laboratory

Source: Lawrence Livermore National Laboratory, Department of Energy. | GAO-24-107173

Note: The Livermore pool-type reactor was constructed in the mid-1950s and was used for nuclear weapons research and radiation studies. The reactor has been nonoperational since 1980. In 2010, site officials observed cracks in the reactor shield that, if breached, could release radiation and beryllium contamination. Demolition and removal of the reactor was completed in 2022, and demolition of the building and its slab began in 2024.

In July 2020, EM established an indefinite delivery indefinite quantity (IDIQ) contract with the purpose of creating a contract mechanism that DOE could use nationwide to acquire services for the deactivation and decommissioning of NNSA's, other DOE program offices', and other federal agencies' excess facilities.[27] This IDIQ contract was awarded to a pool of nine contractors that could be selected to execute the work of any given task order. As of July 2024, EM had awarded three task orders under this contract:

[27]IDIQ contracts are typically used when the exact quantities and timing for products or services are not known at the time of contract award. Such contracts provide for the issuance of task orders for specific products or services—such as deactivation and decommissioning work—during the period of the contract. These contracts can be single-award contracts, which are awarded to a single contractor, or multiple-award contracts, which are awarded to more than one contractor.

- EM awarded one task order in July 2021 for Lawrence Livermore National Laboratory's Building 251—Heavy Element Facility—with a value of approximately $28 million.
- EM awarded one task order in July 2023 for Los Alamos National Laboratory's Ion Beam Facility with a value of approximately $68 million.
- EM awarded one task order in March 2024 for Lawrence Livermore National Laboratory's Building 281—a facility adjacent to Building 280 that supported the reactor's operations—with a value of approximately $16 million.

In May 2024, EM announced that it had established another IDIQ contract to provide for deactivation and decommissioning services for NNSA and other DOE program offices. According to EM, this IDIQ contract, as a small business set-aside contract, was awarded to a pool of 14 contractors that could be selected to execute the work of any given task order. As of its May 2024 announcement, EM had not yet awarded a task order under this contract for work on an NNSA facility.

Officials Identified Barriers to More Effective Disposition of NNSA's Contaminated Excess Facilities

NNSA and EM officials at the seven sites identified barriers to more effectively deactivating and decommissioning NNSA's contaminated excess facilities. Below, we describe barriers identified by officials at more than one site.

- **Adjacent operational and soon-to-be dispositioned facilities.** A contaminated excess facility that is ready for deactivation and decommissioning activities and adjacent to an operational facility can be a barrier, according to officials at three sites. For example, the disposition of such facilities requires time and resources to reroute utilities that are linked among the excess and operational facilities. Although all seven sites with NNSA contaminated excess facilities are active with mission operations, this may be especially consequential for sites with relatively small footprints, such as the Lawrence Livermore National Laboratory and Y-12 National Security Complex.
- **Availability of future funding, contractors, and contracting mechanisms to support disposition activities.** Officials at two sites raised concerns regarding the possibility that multiple NNSA facilities could be transferred to EM to meet the statutory requirement that DOE transfer by 2029 certain NNSA facilities to EM for decontamination and decommissioning. Those officials explained that EM is not funded to take on the additional deactivation and

decommissioning work that would come with the potential transfer of such facilities from NNSA to EM. Officials at one of these sites said that NNSA would need increased funding to meet an accelerated time frame for transferring operational control to EM. EM would then need additional funds to accept NNSA contaminated excess facilities. Officials at the second site said that EM does not have a contracting mechanism at that site to execute the work. Further, EM officials at the second site said that contractor procurement lead times are typically at least 18 months, and EM does not have the resources to make those procurements or to adequately oversee additional work at the site. Officials at a third site told us that because they do not have an EM cleanup contractor for their site, they are actively getting the site's future work on the radar of subcontractors, since procurement can be a lengthy process.

- **Coordination of walkdowns between NNSA and EM.** NNSA and EM headquarters officials said they have a standing monthly meeting to discuss deactivation and decommissioning activities. This allows the two agencies to discuss the status of efforts and plans for walkdowns or future disposition activities. However, officials at three sites indicated that walkdowns could be improved. Officials at two of these sites shared that since there is no EM presence already at their sites, coordinating EM walkdowns for facilities they anticipate may require EM's expertise for deactivation and decommissioning seems more difficult. NNSA officials and contractor representatives at the third site explained that in certain instances after a walkdown, EM's requirements for transfer seemed like a "moving target." NNSA officials at this site and from headquarters said that the requirements for transfer outlined in EM's policy do not seem to be static.[28] These officials said that EM has not consistently defined an endpoint at which NNSA's stabilization work is considered complete so that EM can accept a facility for deactivation and decommissioning. The policy describes the general requirements that must be met and the process for determining the specific stabilization activities that must be completed before EM may accept transfer. EM officials said that they use a general walkdown checklist, modified to the unique circumstances of each facility, through the assessment process to track the stabilization activities that have been completed.

[28]Department of Energy, Office of Environmental Management, *Excess Facility, Material, and Waste Transfer to the Office of Environmental Management,* Standing Operating Policies and Procedures #34 (Washington, D.C.: Oct. 22, 2021).

DOE Has Not Fully Addressed Required Elements or Incorporated Key Practices into Planning Efforts

DOE officials said the 2025 plan would be similar to the 2022 deactivation and decommissioning plan and that EM is the lead office for the 2025 planning effort. We found that DOE's 2022 plan did not include all of the elements required by statute and partially incorporated key practices for planning for results. DOE has the opportunity to address all statutorily required elements and fully incorporate key practices into its 2025 plan.

DOE Has the Opportunity to Address All Statutorily Required Elements in the 2025 Plan

DOE officials said that the deactivation and decommissioning plan that is due in March 2025 would be similar to previous iterations and that EM is the lead office for the 2025 planning effort. However, we found that DOE's 2022 plan did not address all statutorily required elements. By statute, this plan should address contaminated excess facilities from across DOE—including those owned by NNSA, DOE's Office of Science, and DOE's Office of Nuclear Energy—and should also address certain elements. We found that DOE's 2022 plan included two of the six elements required by statute (see table 1).

Table 1: Extent to Which the Department of Energy's (DOE) 2022 Plan for the Deactivation and Decommissioning of Contaminated Excess Facilities Addressed Statutorily Required Elements

Statutorily required element[a]	Does DOE's plan address element?	Summary of findings
A list of contaminated excess facilities prioritized for deactivation and decommissioning based on potential to reduce risks to human health, property, or the environment and to maximize cost savings	No	DOE's plan includes an appendix with a list of higher-risk contaminated excess facilities organized in two tiers. The list includes estimated disposition costs and annual operations and maintenance costs for each facility. However, the list is tiered based on risk without consideration of cost savings.
An assessment of the life cycle costs of each contaminated excess facility from the period of the plan submission date to the earlier of the estimated deactivation and decommissioning date or 25 years after the plan is submitted	Yes	DOE's plan includes a list of higher-risk facilities with estimated life cycle costs (i.e., estimated operations and maintenance costs through estimated deactivation and decommissioning date) for each facility.
An estimate of the cost needed to deactivate and decommission each contaminated excess facility	Yes	DOE's plan includes an overall range of magnitude cost estimate ($14.7 billion) to deactivate and decommission DOE's 1,077 contaminated excess facilities. The list of higher-risk facilities includes estimated deactivation and decommissioning costs for each facility.
An estimate of the time needed to deactivate and decommission each contaminated excess facility	No	DOE's plan includes a list of higher-risk facilities with estimated year for disposition for each facility, but does not include an estimate of the amount of time needed to deactivate and decommission each facility.
A schedule for when the Office of Environmental Management (EM) will accept each contaminated excess facility for deactivation and decommissioning	No	DOE's plan does not include a schedule for when EM will accept each facility for deactivation and decommissioning. The plan states that EM's ability to accept additional facilities is limited and that acceptance of additional facilities depends on the availability of funding.
An estimate of costs that could be avoided by accelerating cleanup of contaminated excess facilities or by other means, such as reusing such facilities for another purpose	No	DOE's plan includes options to avoid costs and states that deactivating and decommissioning facilities reduces costs associated with maintenance. The list of higher-risk facilities includes annual operations and maintenance costs. However, the plan does not include an estimate of costs that could be avoided by accelerating cleanup using the approaches described.

Source: GAO analysis of DOE's 2022 Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities and 50 U.S.C. § 2603. | GAO-24-107173

[a]The statutorily required elements for DOE's *Plan for the Deactivation and Decommissioning of Contaminated Excess Facilities* are codified at 50 U.S.C. § 2603(b). For the purposes of this report, the term "contaminated excess facility" is synonymous with "nonoperational defense nuclear facility" as defined in 50 U.S.C. § 2603(f)(3).

In 2025, DOE is also statutorily required to develop and subsequently carry out a plan to transfer responsibility for decontamination and decommissioning of certain NNSA contaminated excess facilities from NNSA to EM by 2029. DOE included information on the transfer of

responsibility in the biennial deactivation and decommissioning plans it issued in 2016, 2018, 2020, and 2022. According to DOE officials, the 2025 deactivation and decommissioning plan will likely continue to meet both planning requirements in a single plan.

In the *Plan for Transfer of Responsibility for Certain Facilities* section of the 2022 plan, DOE states that EM must prioritize the facilities whose deactivation and decommissioning is required by regulation or compliance agreements. The plan states that DOE plans to continue improving data collection on the deactivation and decommissioning of excess facilities, evaluate strategies that increase efficiencies for deactivation and decommissioning, and conduct walkdowns of excess facilities. However, the section does not describe how or when DOE will transfer responsibility for NNSA's contaminated excess facilities to EM for decontamination and decommissioning.

EM officials said they have an effort under way to assess funding that EM may need to address some of the statutory requirements. EM officials said in June 2024 that this assessment would include a description of the funding requirements necessary for EM to take responsibility for deactivating and decommissioning certain NNSA contaminated excess facilities by March 2029. EM's preliminary conclusion is that EM may require an additional $500 million in funding per year for fiscal years 2026 through 2029 (in addition to the approximately $100 million planned) to accept responsibility and begin the deactivation and decommissioning work on NNSA's facilities. EM officials said that the 2025 plan would include the results of their funding requirements assessment.

EM's funding requirements assessment may help address elements not addressed in the 2022 deactivation and decommissioning plan, such as the requirement to include a schedule for EM's acceptance of facilities. However, it may not address other elements missing from the 2022 plan, such as considering potential cost savings in its prioritized list of facilities. According to DOE's 2022 plan, DOE considered risks to human health and the environment when creating its higher-risk tiers. In its 2025 deactivation and decommissioning plan, DOE has an opportunity to address all statutorily required elements, which would provide Congress with a clearer picture of how DOE might most effectively reduce the environmental liability that the remaining contaminated excess facilities pose. For example, DOE could include a list of contaminated excess facilities prioritized on the basis of risk and potential cost savings, such as by using a methodology similar to the one NNSA uses when prioritizing its disposition projects for funding.

DOE Has the Opportunity to Incorporate Key Practices for Planning for Results as It Develops the 2025 Plan

DOE's 2022 plan did not fully follow the three key practices for planning for results of federal efforts. In prior work, we identified key practices that can help executive branch leaders and employees at any organizational level manage and assess the results of federal efforts by developing and using evidence.[29] Three of these key practices relate to planning for results and can be used for long-term strategic planning and implementation planning. Although these key practices are not required by statute, DOE's plan could better help the agency achieve desired results if DOE improves its incorporation of these practices into its 2025 disposition planning efforts. These key practices include (1) defining goals, (2) identifying the strategies and resources needed to achieve those goals, and (3) assessing the environment to address or mitigate any barriers affecting the ability to achieve those goals (see table 2).

[29]GAO-23-105460. To develop the key practices, GAO distilled them from hundreds of actions identified in GAO's past work as effective for implementing federal evidence-building and performance-management activities.

Table 2: Extent to Which Department of Energy's (DOE) 2022 Plan for the Deactivation and Decommissioning of Contaminated Excess Facilities Incorporates Selected Key Practices

Key practice	Extent DOE's plan incorporates key practice	Summary of findings
Defining goals	◐	DOE's plan defines the primary goals as meeting established cleanup priorities—including deactivating and decommissioning contaminated excess facilities—and identifies accelerated cleanup and resulting cost savings as desirable outcomes. The plan does not specify targets or time frames for achieving the primary goals. DOE's plan is established by relevant DOE program offices and describes interagency collaboration.
Identifying strategies and resources	◐	DOE's plan describes its overall strategy as focusing on risk reduction by deactivating and decommissioning relatively higher-risk contaminated excess facilities across DOE sites without transferring ownership to the Office of Environmental Management (EM). DOE's plan does not comprehensively identify resources required to execute the strategies presented.
Assessing the environment	◐	DOE's plan identifies factors that influence EM's priorities for deactivation and decommissioning work, such as the availability of adequate funds. DOE's plan does not identify how DOE will address or mitigate all factors that act as barriers to implementing its goals.

Legend:

● – DOE's plan fully incorporates key practice.

◐ – DOE's plan partially incorporates key practice.

○ – DOE's plan does not incorporate key practice.

Source: GAO analysis of DOE's 2022 Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities and GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 12, 2023). | GAO-24-107173

Defining goals. This key practice includes actions such as defining goals for all activities, identifying both long-term outcomes and near-term measurable results, and aligning those goals across organizational levels.

DOE's 2022 plan describes DOE's goals (i.e., deactivation and decommissioning priorities), which are to stabilize degraded, relatively higher-risk facilities, characterize hazards and conditions, remove hazardous materials, place facilities in the lowest-risk condition possible, and ultimately deactivate and decommission each facility to its specified end state predominantly through demolition. The plan identifies the desirable outcome of meeting its goals as accelerating cleanup of contaminated excess facilities. Accelerating cleanup will reduce risks to safety and the environment and avoid the costs for continued long-term surveillance and maintenance that these facilities would otherwise accrue, according to the plan. However, the plan does not identify specific

targets or time frames for DOE to achieve its goals or these associated outcomes.

The section of DOE's 2022 plan that addresses the transfer of responsibility for certain NNSA facilities describes a goal of having EM continue to conduct walkdowns. It states that EM and NNSA will continue to walkdown newly identified higher-risk contaminated excess facilities through fiscal year 2023. However, the plan does not specify how many walkdowns EM intends to conduct, which facilities EM plans to walkdown, or how many walkdowns are needed over the planning period. The plan also does not identify outcomes related to the transfer of responsibility for certain facilities from NNSA to EM, such as the number of facilities EM anticipates accepting from NNSA for the given planning period based on walkdowns conducted. EM officials said that they collaborate with NNSA to identify which facilities require walkdowns on a more frequent than annual basis and therefore did not include specific information in the 2022 plan related to the number of walkdowns or the outcomes of those walkdowns through the planning period.

Because of the missing actions, we determined that DOE's 2022 plan partially incorporates this key practice. Fully incorporating this practice may help DOE communicate the results that it seeks to achieve, such as by communicating strategic objectives and performance goals for activities related to transferring facilities from NNSA to EM.

Identifying strategies and resources. This key practice includes actions such as identifying strategies for each goal identified; coordinating with other organizations, programs, and activities contributing to each goal; and identifying the resources needed to achieve each goal.

To achieve its primary goals, the 2022 plan states that DOE's overall strategy is an approach that focuses on risk reduction and deactivating and decommissioning relatively higher-risk contaminated excess facilities across DOE sites. This includes EM implementing the IDIQ contract specifically for deactivating and decommissioning NNSA's and other programs' contaminated excess facilities. It also includes EM collaborating with NNSA and other DOE programs to better understand DOE-wide challenges in managing contaminated excess facilities. DOE estimated in the plan that it would cost $12.1 billion to address the DOE-wide contaminated higher-risk facility scope in the near term. NNSA and EM officials said that additional resources would be necessary to support the execution of the activities and the strategies presented in the plan. However, DOE did not identify a comprehensive set of resources required

to fully execute this strategy or explain how DOE would seek to obtain those resources.

The 2022 plan also states that one part of its overall strategy is that EM, NNSA, and other DOE programs collaborate to decide when EM accepts transfer of responsibility for deactivating and decommissioning non-EM facilities without changing the facility's ownership. However, DOE did not identify a comprehensive set of resources required to execute this. For example, with walkdowns being a key part of the process for EM to accept responsibility, the plan does not identify any specific strategy for EM to continue to conduct walkdowns or the resources tied those activities.

Because of the missing actions, we determined that DOE's 2022 plan partially incorporates this key practice. Fully incorporating this practice into its plan would help DOE determine the strategies and resources it needs to achieve its goals.

Assessing the environment. This key practice includes actions such as identifying external and internal factors that could affect or act as barriers to achieving goals, and defining strategies to address or mitigate those barriers.

DOE's plan identified the availability of adequate funds to carry out disposition of a facility as a factor affecting DOE's ability to transfer responsibility for certain facilities from NNSA to EM. EM's *Standing Operating Policies and Procedures* states that EM is not to schedule transfers for any facility, including NNSA's contaminated excess facilities, without funding available to initiate deactivation and decommissioning activities.

However, DOE's plan did not identify a comprehensive strategy to address or mitigate this barrier to achieving DOE's goal. For example, the plan states that in July 2020, DOE established an IDIQ contract as a means to acquire services for deactivating and decommissioning some contaminated excess facilities, including those not owned by EM. While this addresses some of the funding constraints the plan and officials cited, the plan does not describe how DOE plans to leverage the contract mechanism beyond the two sites with NNSA facilities currently included in task orders.

Further, the plan does not include some of the barriers that NNSA and EM site officials identified. Deactivating and decommissioning excess

facilities at sites with active and increasing mission operations warrants additional attention and planning, especially when EM may need to fund and manage the work. Incorporating more information about barriers identified across sites and how DOE may address or mitigate those barriers would yield a more robust assessment of the environment.

Because of the missing actions, we determined that DOE's 2022 plan partially incorporates this key practice. Fully incorporating this practice into its 2025 disposition planning efforts would enable DOE to communicate its strategies for addressing or mitigating any barriers affecting its ability to achieve its disposition and transfer goals. DOE therefore has an opportunity in its 2025 disposition planning efforts to fully incorporate key practices for planning for results. Doing so would help ensure that DOE understands and communicates a clearer picture of what DOE is trying to achieve, how and when DOE will achieve it, and what barriers limit DOE's ability to do so.

Conclusions

Effective management of DOE's contaminated excess facilities could reduce the U.S. government's environmental liability, which has been on our High Risk List since 2017. Deactivating and decommissioning such facilities is crucial for reducing risks and costs as the condition of facilities worsens over time. DOE has been required by statute to regularly plan for deactivating and decommissioning its contaminated excess facilities since 2016. DOE's 2022 plan included a list of relatively higher-risk contaminated excess facilities and identified one of DOE's goals as reducing risk by deactivating and decommissioning these facilities. However, the 2022 plan did not address all elements required by statute or key practices for planning for results of federal efforts.

DOE has the opportunity to improve its next deactivation and decommissioning plan, due March 2025, in two ways: addressing all statutorily required elements of the plan and fully incorporating key practices for planning for results. Addressing all statutorily required elements, such as including a list of contaminated excess facilities prioritized on the basis of risk and potential cost savings, may better provide Congress with a clearer picture of how DOE could most effectively help reduce the environmental liability that the remaining contaminated excess facilities pose. Also, fully incorporating key practices into DOE's 2025 disposition planning efforts, such as defining strategies to mitigate barriers affecting DOE's ability to deactivate and decommission contaminated excess facilities, may help ensure that DOE understands and communicates a clearer picture of what DOE is trying to

achieve, how DOE will achieve it, and barriers limiting DOE's ability to do so.

Recommendations for Executive Action

We are making the following four recommendations to DOE:

The Senior Advisor for EM should ensure that DOE's 2025 plan for deactivation and decommissioning of contaminated excess facilities addresses all statutorily required elements, such as by including a list of facilities prioritized based on the potential to reduce risks to human health, property, or the environment and maximize cost savings and by including a schedule for when EM will accept facilities for deactivation and decommissioning. (Recommendation 1)

The Senior Advisor for EM should ensure that DOE's 2025 disposition planning efforts for contaminated excess facilities define goals for each activity, such as by including measurable outcomes for the near and long term. (Recommendation 2)

The Senior Advisor for EM should ensure that DOE's 2025 disposition planning efforts for contaminated excess facilities identify the strategies and resources needed to achieve defined goals, such as by including the resources needed to meet each of the stated goals. (Recommendation 3)

The Senior Advisor for EM should ensure that DOE's 2025 disposition planning efforts for contaminated excess facility assess the environment by defining strategies to address or mitigate barriers affecting DOE's ability to achieve its goals, such as by including strategies to address the potential effects of budgetary constraints. (Recommendation 4)

Agency Comments

We provided a draft of this report to DOE for review and comment.

In its comments, reproduced in appendix IV, DOE concurred with our recommendations. In its comments, DOE described actions it is taking or planning to take to address these recommendations. DOE also provided technical comments, which we incorporated as appropriate throughout the report.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Energy, the Administrator of NNSA, and other interested parties. In addition, this 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 (202) 512-3841 or andersonn@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made significant contributions to this report are listed in appendix V.

Nathan Anderson
Director, Natural Resources and Environment

List of Committees

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

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

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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: Objectives, Scope, and Methodology

Senate Report 118-58 includes a provision for GAO to evaluate the Department of Energy's (DOE) efforts to develop the 2025 plan for deactivating and decommissioning contaminated excess facilities, including DOE's plan for transferring responsibility for certain contaminated excess facilities from the National Nuclear Security Administration (NNSA) to the Office of Environmental Management (EM), and to recommend efficiencies and cost savings that could be achieved as the department plans for the transfer and final disposition of excess facilities. This report examines (1) the status of NNSA's contaminated excess facilities and DOE's approach for funding the deactivation and decommissioning of those facilities and (2) the extent to which DOE's prior planning efforts for deactivating and decommissioning contaminated excess facilities addressed all statutorily required elements and incorporated key practices for planning.

To address our first objective, we analyzed fiscal year 2023 data on excess facilities from DOE's Facilities Information Management System (FIMS)—DOE's real property database—to describe the status of NNSA's contaminated facilities. We assessed the reliability of the FIMS data by reviewing relevant documentation, interviewing knowledgeable officials about data quality, and manually testing data for missing values or outliers. We determined that the FIMS data were sufficiently reliable for determining which NNSA contaminated facilities are or will be excess facilities through September 2024 and for describing the year each facility was declared excess, its fiscal year 2023 operations and maintenance costs, and its estimated disposition costs and year.

To examine NNSA and EM's funding sources and contracting mechanism for disposition work on NNSA's contaminated excess facilities, we reviewed relevant documents, including DOE orders, guides, program plans, and budget documentation. For example, we reviewed DOE's order on real property asset management and related guides, which discuss how DOE determines facilities to be excess and activities included in deactivation and decommissioning.[1] We also reviewed agency-specific documents such as EM's policy for transferring excess facilities, EM's program plan, NNSA's real property asset management

[1]Department of Energy, *Real Property Asset Management*, DOE Order 430.1C (Washington, D.C.: Sept. 17, 2020); *Implementation Guide for Surveillance and Maintenance During Facility Transition and Disposition*, DOE Guide 430.1-2 (Washington, D.C.: Sept. 29, 1999); *Deactivation Implementation Guide,* DOE Guide 430.1-3 (Washington, D.C.: Sept. 29, 1999); *Decommissioning Implementation Guide*, DOE Guide 430.1-4 (Washington, D.C.: Sept. 2, 1999); and *Transition Implementation Guide*, DOE Guide 430.1-5 (Washington, D.C.: Apr. 24, 2001).

guide, and NNSA's 2023 program management plan for its Office of Infrastructure Lifecycle Management.[2]

To address our second objective, we reviewed DOE's 2022 *Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities* to determine which required statutory elements the plan addressed.[3] The required elements include (1) a list of contaminated excess facilities prioritized for deactivation and decommissioning based on potential to reduce risks to human health, property, and the environment and to maximize cost savings; (2) an assessment of the life cycle costs of each facility during the period beginning on the date the plan is submitted and ending on the earlier of the estimated date of deactivation and decommissioning or 25 years after the date the plan is submitted; (3) an estimate for the cost to deactivate and decommission each facility; (4) an estimate for the time needed to deactivate and decommission each facility; (5) a schedule for when EM will accept each facility for deactivation and decommissioning; and (6) an estimate of costs that could be avoided by accelerating cleanup or other means, such as facility reuse.[4] To assess whether DOE's 2022 plan included or did not include each element required by statute, two GAO analysts independently compared the plan against each element. The two analysts came to an agreement on all assessments of whether the plan addressed each element.

To determine whether DOE's 2022 plan incorporated key practices for effectively managing and assessing the results of federal efforts, we reviewed the plan against select key practices.[5] We reported in July 2023

[2]Office of Environmental Management, *Excess Facility, Material, and Waste Transfer to the Office of Environmental Management,* Standing Operating Policies and Procedures #34 (Washington, D.C.: Oct. 22, 2021); Office of Environmental Management, *EM Program Plan 2022* (Washington, D.C.: 2022); National Nuclear Security Administration, Office of Infrastructure, *Real Property Asset Management (RPAM) Guide* (Washington, D.C.: 2023); and National Nuclear Security Administration, Office of Infrastructure Lifecycle Management, *Program Management Plan* (Washington, D.C.: October 2023).

[3]Department of Energy, *Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities: Report to Congress* (Washington, D.C.: July 2022). As required by statute, DOE submitted deactivation and decommissioning plans to Congress every 2 years from 2016 to 2022. In 2022, the statutory requirement was amended to require the submission, and subsequent carrying out, of a deactivation and decommissioning plan every 4 years starting in 2025.

[4]50 U.S.C. § 2603(b).

[5]GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 12, 2023).

that these key practices were distilled from hundreds of actions identified in GAO's past work as effective for implementing federal evidence-building and performance management activities. We focused our analysis on the three key practices for planning for results of federal efforts, which can help an agency provide a clearer picture of what it is trying to achieve, how it will achieve it, and barriers limiting its ability to do so. The key practices for this topic include (1) defining goals, (2) identifying strategies and resources for achieving those goals, and (3) assessing the environment by identifying any factors that could act as barriers to achieving those goals and defining strategies to address or mitigate those barriers. We selected these three key practices because they are the most relevant to DOE's disposition planning efforts.

To assess DOE's 2022 plan against key practices for planning for results, two GAO analysts independently compared the plan against actions related to each of the three key practices. We assessed whether DOE's 2022 plan fully incorporated, partially incorporated, or did not incorporate each key practice based on the following parameters:

- We determined that DOE's plan fully incorporated the key practice if the plan addressed all related key actions.
- We determined that DOE's plan partially incorporated the key practice if the plan addressed at least one related key action.
- We determined that DOE's plan did not incorporate the key practice if the plan did not address any related key actions.

The two analysts came to an agreement on all assessments of whether the plan incorporated each relevant action and, when considered together, each key practice.

For both objectives, we interviewed officials from NNSA and EM to obtain their perspectives on deactivating and decommissioning NNSA's contaminated excess facilities, including barriers to doing so, and the requirement to transfer decontamination and decommissioning responsibility for certain NNSA contaminated excess facilities to EM. We interviewed NNSA and EM officials from headquarters that manage programs with responsibility for managing deactivation and decommissioning at the sites. These included NNSA's Office of Infrastructure, EM's Office of Infrastructure and Deactivation and Decommissioning, and EM's Office of Budget and Planning.

We also interviewed officials and contractor representatives at all of the seven sites with NNSA contaminated excess facilities: Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Nevada National Security Site, Pantex Plant, Sandia National Laboratories, Savannah River Site, and Y-12 National Security Complex.[6] We conducted a site visit to Lawrence Livermore National Laboratory, during which we interviewed NNSA and EM officials and contractor representatives and toured the site's contaminated excess facilities. We selected Lawrence Livermore National Laboratory because it was among the sites with the highest number of facilities within our scope and represented a site where both NNSA and EM are funding disposition activities. To describe barriers to deactivating and decommissioning NNSA's contaminated excess facilities, we analyzed the interviews with officials and contractor representatives to identify commonly cited barriers across sites and barriers that are more specific to each site.

We conducted this performance audit from December 2023 to September 2024 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.

[6]Kansas City National Security Campus is responsible for manufacturing and procuring nonnuclear components for nuclear weapons. NNSA has excess facilities at the site, according to NNSA officials. However, none of the facilities have radiological and chemical contamination from mission operations, according to our analysis of FIMS data.

Appendix II: Profiles of Sites with National Nuclear Security Administration (NNSA) Contaminated Excess Facilities

In the seven profiles that follow, we provide the status of NNSA's and the Office of Environmental Management's (EM) respective efforts for funding and executing the deactivation and decommissioning work at each site's contaminated excess facilities.

We obtained information about each contaminated excess facility's estimated cost and time frame of disposition primarily from the fiscal year 2023 snapshot of data from the Department of Energy's (DOE) Facilities Information Management System (FIMS)—DOE's real property database. We included contaminated facilities that are or will be excess facilities through September 2024 and that FIMS data indicate are owned by NNSA.

Because the facilities included are owned by NNSA, the estimated disposition costs and years of disposition for these facilities are NNSA's estimates and may not reflect EM's input. The estimated disposition costs include costs to deactivate and decommission the facility (i.e., building or structure) and do not include additional costs associated with removing the slab of the building or additional cleanup activities such as remedial actions for soils and water. Further, the estimated disposition costs reflect costs to carry out the disposition of that specific facility and do not include costs to carry out the disposition of adjacent or nearby excess facilities that may or may not be contaminated. For example, NNSA and EM may need to deactivate and decommission an excess facility that is in the fall zone of a nearby contaminated excess facility before initiating other disposition activities.

We also obtained information from DOE, NNSA, and EM documentation and from interviews with NNSA and EM officials. Interviews included NNSA and EM officials from headquarters and officials and management and operating (M&O) contractor representatives at each of the seven sites with NNSA contaminated excess facilities—Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Nevada National Security Site, Pantex Plant, Sandia National Laboratories, Savannah River Site, and Y-12 National Security Complex.

Lawrence Livermore National Laboratory (LLNL) Livermore, California

LLNL is a design laboratory that is responsible for the safety and reliability of the nuclear explosives package in nuclear weapons. It supports surveillance, assessment, and refurbishment of the nuclear weapons stockpile. LLNL comprises two sites: Site 200, a 1-square-mile footprint that houses the main campus and administrative center, and Site 300, a 11-square-mile remote testing site. LLNL's M&O contractor is Lawrence Livermore National Security, LLC.

Source: Lawrence Livermore National Laboratory, Department of Energy. | GAO-24-107173

Does EM have a site presence?

Yes. EM established an on-site presence in 2018. Since then, a Federal Project Director from EM's Consolidated Business Center has worked closely with NNSA and the M&O contractor on the disposition of contaminated excess facilities.

How is disposition work funded and executed?

NNSA funds disposition work through annual appropriations for site operations and infrastructure programs, and NNSA's M&O contractor executes the NNSA-funded work. EM funds the work through appropriations specific to certain excess facilities. The EM-funded work is executed by a combination of NNSA's M&O contractor through work authorizations, the U.S. Army Corps of Engineers through an interagency agreement, and contractors through EM's awarded contract for disposition.

What are barriers to the disposition of facilities?

Officials at LLNL said barriers include:

1. **Active laboratory on a small footprint.** Excess facilities are physically close to operating facilities, making logistics more complex to avoid interruptions.
2. **Disposal capacity**. LLNL does not have a rail spur or disposal cells, so equipment and waste are moved by road.
3. **Workforce capacity**. Managing multiple projects requires increased levels of federal resources on site.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	27
Years built (range)	1943 to 1990
Years declared excess (range)	2006 to 2022
Estimated disposition cost (total)	$301 million
Estimated disposition years (range)	2023 to 2042

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

Fifteen facilities—NNSA officials said that EM may need to deactivate and decommission 15 facilities. As of July 2024, EM officials at LLNL said they had completed disposition of one of these facilities. NNSA plans to deactivate and decommission one of the remaining facilities, and disposition of the other 11 facilities is yet to be determined.

How many of these facilities has EM accepted?

Eight facilities—Buildings 175, 212, 241, 251, 281, 292, 343, and 435 have been walked down and meet EM's transfer criteria, according to officials at LLNL. Buildings 175, 212, 251, and 281 are under active written agreements for deactivation and decommissioning work by EM. Because ownership of Building 280 was previously transferred from NNSA to EM, it is not included in totals for NNSA.

What is some recent or upcoming disposition work?

Building 175, the MARS E-Beam Facility, was constructed in 1980 and stopped operating in 1999. It had a failing roof that resulted in water intrusion into contaminated areas. DOE considers it a higher-risk excess facility. EM funded work, executed by the M&O contractor, to begin demolition of the building in 2021 (see photograph), leaving the slab and soil in place. Disposition of Legacy Site 175 is under way with EM funding and managing the work and the M&O contractor executing the work.

Source: Lawrence Livermore National Laboratory, Department of Energy. | GAO-24-107173

Los Alamos National Laboratory (LANL)
Los Alamos, New Mexico

LANL is a design laboratory responsible for the safety and reliability of the nuclear explosives package in nuclear weapons. LANL has unique capabilities in neutron scattering, enhanced surveillance, radiography, and plutonium science and engineering. LANL also is a future site for plutonium pit production. LANL's footprint is about 40 square miles. LANL's M&O contractor is Triad National Security, LLC.

Source: Department of Energy. | GAO-24-107173

Does EM have a site presence?

Yes. The EM Los Alamos Field Office's (EMLA) scope is focused on cleanup of legacy contamination from LANL's Manhattan Project and Cold War operations. EMLA's cleanup scope includes soil and groundwater remediation.

How is disposition work funded and executed?

NNSA funds disposition work through annual appropriations for site operations and infrastructure programs, and NNSA's M&O contractor executes the work. EM funds work with appropriations for certain facilities and through annual appropriations for LANL. NNSA's M&O contractor and EM's cleanup contractor execute work. EM's future work will be executed by its cleanup contractor and through a recently awarded contract for disposition.

What are barriers to the disposition of facilities?

Officials at LANL said barriers include:

1. **Complex scopes of work for facilities in a shared complex.** Some facilities are underground with associated soil contamination, making dividing work between parties more difficult.
2. **Workforce capacity.** EMLA does not have capacity to procure or oversee any additional contracts for disposition work on site.
3. **Increasing mission demand.** Expanding missions at LANL necessitate infrastructure investments to meet programmatic demands on a limited footprint.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	36
Years built (range)	1944 to 2019
Years declared excess (range)	1992 to 2024
Estimated disposition cost (total)	$201 million
Estimated disposition years (range)	2024 to 2034

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

Nineteen facilities—NNSA and EM officials identified the Ion Beam Facility, underground tank facilities, and others in the PHERMEX complex as potentially needing EM for disposition. NNSA plans to deactivate and decommission the remaining 17 facilities. As of July 2024, officials at LANL said they had completed disposition of four of these facilities.

How many of these facilities has EM accepted?

One facility—a written agreement to transfer operational control of the Ion Beam Facility from NNSA to EM was in development as of July 2024.

What is some recent or upcoming disposition work?

The Ion Beam Facility (see photograph) is the focus for disposition work at LANL, according to officials at LANL. Its construction was completed in 1953 to support post-World War II scientific research, and it housed nuclear experimentation equipment. DOE declared the facility excess in 1999 and considers it a higher-risk facility. NNSA has funded work executed by its M&O contractor to clean out inventory from the facility. In July 2023, EM awarded a task order under an indefinite delivery indefinite quantity contract to Aptim Federal Services, LLC, to deactivate and decommission the Ion Beam Facility.

Source: Triad National Security, LLC, and Los Alamos National Laboratory. | GAO-24-107173

Source: Nevada National Security Site. | GAO-24-107173

Nevada National Security Site (NNSS)

Mercury, Nevada

NNSS is responsible for conducting nuclear and nonnuclear experiments supporting NNSA's nuclear weapons Stockpile Stewardship Program. NNSS is also the primary site for experiments with radiological and other high-hazard materials, and where high-explosive plutonium experiments are conducted at weapon scale. In accordance with the U.S. moratorium on nuclear explosive testing, such experiments are subcritical. NNSS comprises 10 locations, and its main footprint consists of approximately 1,360 square miles. NNSS's M&O contractor is Mission Support and Test Services, LLC.

Does EM have a site presence?

Yes. The EM Nevada program is responsible for cleanup of the nuclear testing locations and support facilities at NNSS. EM Nevada is managed and staffed by EM's Consolidated Business Center.

How is disposition work funded and executed?

NNSA funds disposition work through annual appropriations for site operations and infrastructure programs, and EM funds disposition work through annual appropriations for NNSS. NNSA's M&O contractor and EM's Environmental Program Services contractor (Navarro Research and Engineering, Inc.) execute the work.

What are barriers to the disposition of facilities?

NNSA and EM officials did not identify any barriers to the disposition of facilities at NNSS. Officials stated that they believe their disposition process has been working well and that it effectively integrates all parties to execute the work. Officials also noted that all three of NNSA's contaminated excess facilities are "cold and dark," with little to no surveillance and maintenance costs or safety issues.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	3
Years built (range)	1962 to 1965
Year declared excess	2016
Estimated disposition cost (total)	$1 million
Estimated disposition years (range)	2026 to 2031

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

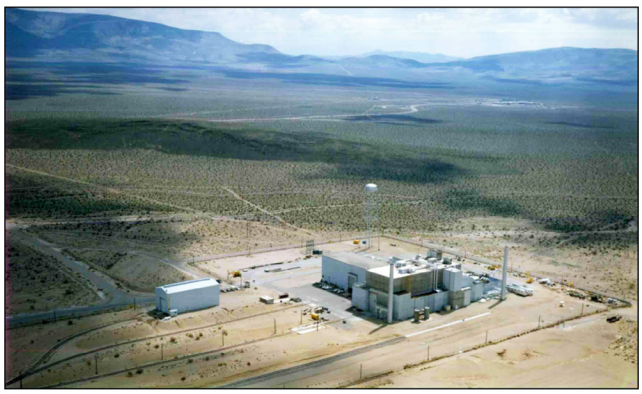
One facility—NNSA and EM officials said that EM needs to deactivate and decommission Building 25-3901, a train storage shed in the Engine Maintenance Assembly and Disassembly facility (EMAD) complex. NNSA plans to deactivate and decommission the other two facilities—Buildings 25-3124 and 25-3113A—starting in 2026.

How many of these facilities has EM accepted?

One facility—NNSA and EM officials said that Building 25-3901 is included in EM's planned work, and EM plans to deactivate and decommission it along with the rest of the EMAD complex.

What is some recent or upcoming disposition work?

The EMAD complex (see photograph) includes Building 25-3901. It was constructed in the 1960s to support nuclear propulsion rocket development. DOE declared Building 25-3901 excess in 2016 and does not consider it to be higher risk. Deactivation and decommissioning work on the complex began in 2021. EM funds the disposition work for Building 25-3901, and EM's Environmental Program Service contractor executes it. Officials at NNSS said that EM and its contractor coordinate closely with NNSA and its M&O contractor to execute the work.



Source: National Nuclear Security Administration / Nevada Field Office. | GAO-24-107173

Pantex Plant

Amarillo, Texas

Pantex Plant is a production site responsible for manufacturing and testing high-explosive components, weapons assembly and disassembly, and interim staging and storage of nuclear components from dismantled weapons. Pantex also performs pit requalification, surveillance, and packaging. Pantex's footprint is about 30 square miles. Pantex's M&O contractor is Consolidated Nuclear Security, LLC.

Source: Pantex Photography©2023, Department of Energy / National Nuclear Security Administration / Pantex Plant . | GAO-24-107173

Does EM have a site presence?

No. EM does not have an established on-site presence at Pantex.

How is disposition work funded and executed?

NNSA funds disposition work through annual appropriations for site operations and infrastructure programs. NNSA's M&O contractor would execute this work. EM does not currently have disposition work funded at Pantex.

What are barriers to the disposition of facilities?

NNSA officials at Pantex said one barrier is that Pantex facilities have security-related access restrictions, which would make transferring facilities to EM logistically complex.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	5
Years built (range)	1942 to 1986
Years declared excess (range)	2011 to 2024
Estimated disposition cost (total)	$16 million
Estimated disposition years (range)	2025 to 2030

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

Two facilities—NNSA officials said EM will need to deactivate and decommission Buildings FS-004 and FS-004A at Firing Site 4. NNSA plans to disposition the remaining three facilities, which were all used for explosives work.

How many of these facilities has EM accepted?

None

What is some recent or upcoming disposition work?

The two Firing Site 4 facilities (see photograph of FS-004A) were constructed in 1953, and DOE declared them excess in 2014. Firing Site 4 was one of 16 units at Pantex that were deferred for future evaluation in its *Record of Decision for Groundwater, Soil and Associated Media*, which was issued in September 2008. While some disposition work is needed for these facilities, the majority of the effort will relate to soil cleanup. The estimated date for the disposition of these two Firing Site 4 facilities is 2027.

Source: Pantex Photography©2023, Department of Energy / National Nuclear Security Administration / Pantex Plant. | GAO-24-107173

Sandia National Laboratories (SNL) Albuquerque, New Mexico

SNL is responsible for developing, testing, and producing specialized nonnuclear components and quality assurance and systems engineering for all U.S. nuclear weapons. SNL's primary location is in Albuquerque, New Mexico, and has a footprint of about 21 square miles. SNL also has locations in Livermore, California; Kauai, Hawaii; and Tonopah, Nevada. SNL's M&O contractor is National Technology and Engineering Solutions of Sandia, LLC.

Source: Sandia National Laboratories. | GAO-24-107173

Does EM have a site presence?

No. EM does not have an established on-site presence at SNL. Staff from EM's Consolidated Business Center may provide support and travel to the site as needed.

How is disposition work funded and executed?

In general, NNSA funds disposition work through annual appropriations for site operations and infrastructure programs. NNSA's M&O contractor executes the work.

What are barriers to the disposition of facilities?

NNSA officials at SNL said that to declare facilities excess and carry out disposition of them, the site needs a replacement facility available for asset relocation. Officials said that completion of construction of new facilities is often delayed, making it difficult to plan accurately.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	1
Year built	1962
Year declared excess	2017
Estimated disposition cost	$43 million
Estimated disposition year	2035

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

One facility—NNSA officials said that EM will need to deactivate and decommission Building 6580, the Hot Cell Facility.

How many of these facilities has EM accepted?

None

What is some recent or upcoming disposition work?

NNSA officials at SNL said they do not currently have any actively funded disposition work for contaminated excess facilities. NNSA officials at SNL said that SNL is conducting a study on whether Building 6580 (center of photograph) and other facilities may be leveraged to support future mission work instead of being dispositioned. Officials said that if the study shows reusing Building 6580 is a good option, NNSA will not consider the building as an excess facility. In addition, Building 6588, a research reactor facility that may continue operations until the 2030s, is connected to and shares utilities with Building 6580. NNSA officials at SNL said it would be more efficient to carry out disposition of Building 6580 at the same time as Building 6588.

Source: Sandia National Laboratories. | GAO-24-107173

Savannah River Site (SRS)
Aiken, South Carolina

SRS is a production and cleanup site. NNSA operates facilities at SRS to supply and process tritium, a radioactive form of hydrogen that is a key component of nuclear weapons. SRS is also a future site for plutonium pit production. EM operates facilities in support of tank waste cleanup, nuclear material storage and disposition, and research and development. SRS's footprint is about 310 square miles. SRS's M&O contractor is Savannah River Nuclear Solutions, LLC.

Source: U.S. Department of Energy at Savannah River. | GAO-24-107173

Does EM have a site presence?

Yes. EM has a site office at SRS. EM is considered the landlord of SRS; however, landlord responsibility will shift to NNSA in fiscal year 2025. Officials said that EM and its site office will remain integral to SRS as the cleanup and nuclear material missions continue.

How is disposition work funded and executed?

NNSA funds disposition work through annual appropriations for site operations and infrastructure programs, and EM funds the work through annual appropriations for SRS. EM has overseen the M&O contractor's execution of the disposition work.

What are barriers to the disposition of facilities?

Officials at SRS said barriers include:

1. **Extended time between declaring a facility excess and starting disposition work.** Officials said that they must maintain a safe posture in the facility even after it is declared excess. Knowledgeable staff who operated the facility may be key to maintaining that posture but may move on to other facilities or retire before disposition work begins.
2. **Adequate funding to complete a disposition project**. Once deactivation and decommissioning work begins on large nuclear facilities, it cannot be easily paused.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	4
Years built (range)	1955 to 1969
Years declared excess (range)	2013 to 2022
Estimated disposition cost	$45 million
Estimated disposition years (range)	2025 to 2041

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

Two facilities—NNSA and EM officials said that EM will need to deactivate and decommission Buildings 232-H and 295-H, which is a stack for 232-H. NNSA plans to deactivate and decommission the other two facilities (Buildings 236-H and 238-H).

How many of these facilities has EM accepted?

None

What is some recent or upcoming disposition work?

NNSA has been deactivating and decommissioning Building 236-H, a pressure testing facility, (see photographs) and Building 238-H, a reclamation facility. Both buildings were constructed in the 1960s to support SRS's tritium mission. DOE declared the facilities excess in 2018 and 2022, respectively. DOE considers both facilities to be higher risk. As of July 2024, NNSA officials said they had completed disposition of Building 236-H. NNSA is funding the work to disposition Building 238-H.

Before

After

Source: U.S. Department of Energy at Savannah River. | GAO-24-107173

Y-12 National Security Complex
Oak Ridge, Tennessee

Y-12 is a production site that manufactures, evaluates, and tests uranium and special materials components for nuclear weapons and supplies enriched uranium for the U.S. Navy. Y-12 supplied enriched uranium for the first atomic bomb. Y-12 continues to have an emphasis on the processing and storage of uranium and the development of technologies associated with such activities. Y-12's footprint is about 1¼ square miles. Y-12's M&O contractor is Consolidated Nuclear Security, LLC.

Source: Y-12 National Security Complex, Department of Energy, 2023, Consolidated Nuclear Security, LLC. | GAO-24-107173

Does EM have a site presence?

Yes. EM's on-site presence is within the Oak Ridge Reservation site office. This site office manages cleanup activities at Y-12 as well as other areas of the Oak Ridge Reservation.

How is disposition work funded and executed?

NNSA funds disposition work through annual appropriations for site operations and infrastructure programs, and NNSA's M&O contractor, Consolidated Nuclear Security, LLC, executes the work. EM funds disposition work through annual appropriations for Y-12, and EM's cleanup contractor, United Cleanup Oak Ridge, LLC., executes most of the work.

What are barriers to the disposition of facilities?

Officials at Y-12 said barriers include:

1. **Active production site on a small footprint.** Contaminated excess facilities are physically close to operating facilities, and access may be limited because of the high-security posture.
2. **Increasing mission demand.** With a small footprint, new construction to meet the mission depends on the disposition of excess facilities to make space.
3. **Integration between NNSA and EM.** Projects being executed by NNSA's M&O contractor and EM's prime contractor require careful coordination.

What is the status of NNSA's contaminated excess facilities?

Number of NNSA contaminated excess facilities	9
Years built (range)	1944 to 2004
Years declared excess (range)	2008 to 2015
Estimated disposition cost (total)	$842 million
Estimated disposition years (range)	2024 to 2038

Source: GAO analysis of Department of Energy information. | GAO-24-107173

How many of these facilities may need EM for disposition?

Six facilities—NNSA officials said that EM may need to deactivate and decommission six of the nine facilities. NNSA plans to deactivate and decommission disposition the remaining three facilities.

How many of these facilities has EM accepted?

None

What is some recent or upcoming disposition work?

Beta 4 (see photograph) was constructed in 1945 to house calutrons for uranium separation and was later used for lithium production. DOE declared Beta 4 excess in 2014 and considers it higher risk with contaminants including beryllium, mercury, and uranium. NNSA's ongoing project—the West End Protected Area Reduction (WEPAR)—will provide easier access to Beta 4 and others for disposition. WEPAR's delay has delayed EM's work in the area. NNSA and EM officials at Y-12 said that they anticipate transferring operational control from NNSA to EM for Beta 4 later in 2024 for limited activities. NNSA has funded work executed by its M&O contractor to deinventory Beta 4 and may fund additional work to prepare for deactivation and decommissioning. EM will fund future deactivation and decommissioning work that its cleanup contractor will execute.

Source: Y-12 National Security Complex, Department of Energy, 2023, Consolidated Nuclear Security, LLC. | GAO-24-107173

Appendix III: List of the National Nuclear Security Administration's (NNSA) Contaminated Excess Facilities

The following table lists NNSA's 85 process-contaminated excess facilities by site, as of fiscal year 2023. We identified the 85 contaminated facilities that are or will be excess through September 2024 from the Department of Energy's (DOE) Facilities Information Management System (FIMS)—DOE's real property database. We obtained each facility's identification number, year declared excess, fiscal year 2023 operations and maintenance costs, and estimated disposition year from FIMS. We obtained each facility's name or description and information on whether NNSA or DOE's Office of Environmental Management (EM) currently plans to carry out disposition of the facility from DOE documentation and interviews with NNSA and EM officials.

We calculated the fiscal year 2023 operations and maintenance costs by combing two FIMS data fields for each facility—actual annual maintenance costs and total operating costs. These fields are reported for each facility, but the costs may not be the precise maintenance costs or operating costs for each facility. Specifically:

- Actual annual maintenance costs calculations vary by site. Some sites track it precisely by facility while others use a calculation that distributes costs across all facilities (excess or not) based on factors such as square footage.
- Total operating costs are typically calculated at the site level and then distributed across all facilities (excess or not) based on factors such as square footage and hours of operation.

These fields, when combined, give a reasonable estimate of each facilities' annual costs.

Because NNSA owns these facilities, the estimated disposition year is NNSA's estimate and may not reflect EM's input. Additionally, since this information is as of fiscal year 2023, we indicated in the estimated disposition year column of Table 3 the facilities for which NNSA or EM have completed deactivation and decommissioning.

Table 3: NNSA's Contaminated Excess Facilities, as of Fiscal Year 2023

Facility ID number	Facility name or description	Year declared excess	Fiscal year 2023 operations and maintenance costs (dollars in thousands)	Estimated disposition year	DOE entity planning disposition of facility
Los Alamos National Laboratory (36 facilities)					
03-0016	Ion Beam Facility	1999	854.2	2027	EM
03-0154	Hot waste pump house	2014	5.8	2034	NNSA
08-0032	Magazine facility	2010	3.2	2024*	NNSA
11-0024	Shop / assembly building	2010	111.8	2024*	NNSA
11-0036	High explosives magazine facility	2010	2.2	2024*	NNSA
14-0005	Bunker	1994	5.1	2024	NNSA
15-0009	Communications / control center	1992	4.3	2024	NNSA
15-0027	Control building	2010	8.0	2024	NNSA
15-0041	Storage building	2010	10.6	2024	NNSA
15-0044	Control building	2000	7.6	2024	NNSA
15-0045	Control building	2010	10.9	2024	NNSA
15-0184	PHERMEX chamber amp facility	2014	145.8	2031	EM
15-0185	PHERMEX power control facility	2014	189.5	2031	EM
15-0186	Detection chamber (PHERMEX)	2011	36.5	2031	EM
15-0189	PHERMEX power supply facility	2014	6.5	2031	EM
15-0198	PHERMEX tunnel	2014	11.9	2031	EM
15-0199	PHERMEX tunnel	2010	29.1	2031	EM
15-0200	PHERMEX tunnel	2010	10.1	2031	EM
15-0201	PHERMEX tunnel	2010	12.5	2031	EM
15-0233	Carpenter shop	2010	23.2	2024	NNSA
15-0263	Laboratory building	2009	18.5	2024	NNSA
15-0289	Camera bunker (PHERMEX)	2017	0.9	2031	EM
15-0290	Signal chamber (PHERMEX)	2017	1.4	2031	EM
15-0310	PHERMEX operations facility	2010	45.9	2031	EM
16-0380	High explosives powder inspection facility	2017	57.3	2017	NNSA
21-0107	Underground acid tank	2016	0	2032	EM
21-0108	Underground acid tank	2016	0	2032	EM
21-0257	Rad liquid waste disposal facility	2009	60.8	2032	EM
21-0503	Underground tank	2016	0	2032	EM
21-0504	Underground tank	2016	0	2032	EM

Facility ID number	Facility name or description	Year declared excess	Fiscal year 2023 operations and maintenance costs (dollars in thousands)	Estimated disposition year	DOE entity planning disposition of facility
21-5009	Concrete slab	2019	0	TBD	EM
21-8419	Industrial waste piping facility	2016	0	TBD	NNSA
33-0026	Storage building	1992	2.5	2028	NNSA
36-0019	Instrument chamber facility	2013	1.6	2024	NNSA
43-0001	Health research laboratory	2024	3,250.1	2028	EM
52-0001	Laboratory / office facility	2013	461.3	2024*	NNSA
Lawrence Livermore National Laboratory (27 facilities)					
182	Toxic gases research building	2021	4.1	2024	NNSA
212	Accelerator facility	2017	7.6	2025	EM
241	Pluto Project Testing & Fabrication Facility	2017	109.3	2027	EM
243	Materials science building	2022	40.2	2027	EM
251	Heavy element facility	2014	62.6	2027	EM
261	Weapons design facility	2014	105.9	2029	TBD
281	Energy & Environment laboratory	2014	37.2	2025	EM
281A	Lead-lined bunker	2021	0.1	2025	EM
292	Rotating Target Neutron Source Facility	2017	41.9	2030	EM
343	Explosive & High-Pressure Testing Facility	2014	55.0	2027	EM
345	Chemistry and material science facility	2007	19.0	2030	TBD
435	Fusion research facility	2014	116.1	2030	EM
446	Bioreactor facility	2006	3.5	2030	EM
LS175	Legacy site from Building 175 (MARS E-Beam Facility)	2022	0	2023	EM
LS212	Legacy site from Building 212 (accelerator facility)	2017	0	2025	EM
LS377	Legacy site from Building 377 (biology facility)	2021	0	2023*	EM
LS412	Legacy site from Building 412 (hot cell facility)	2021	0	2023	EM
LS431	Legacy site from Building 431	2007	0	2031	EM
802A	Site 300 facility	2007	10.5	2026	TBD
812A	Site 300 facility	2014	8.6	2031	TBD
812B	Site 300 facility	2014	3.2	2031	TBD

Facility ID number	Facility name or description	Year declared excess	Fiscal year 2023 operations and maintenance costs (dollars in thousands)	Estimated disposition year	DOE entity planning disposition of facility
812C	Site 300 facility	2014	3.3	2031	TBD
812D	Site 300 facility	2014	1.1	2031	TBD
834B	Site 300 facility	2014	2.4	2042	TBD
834C	Site 300 facility	2014	2.4	2042	TBD
834G	Site 300 facility	2014	1.7	2042	TBD
834J	Site 300 facility	2014	1.7	2042	TBD
Y-12 National Security Complex (9 facilities)					
9201-05	Alpha 5 production facility	2008	2,525.6	2036	EM
9204-04	Beta 4 production facility	2014	2,400.3	2029	EM
9206	Production facility	2014	325.0	2038	EM
9404-17	De-minimization pumphouse	2014	4.9	2035	EM
9720-17	Warehouse / industrial facility	2014	15.1	2024	NNSA
9811-03	Tanker transfer station	2014	3.7	2024	NNSA
9828-01	Bag filter system	2015	2.0	2035	EM
9828-03	Bag filter house	2015	2.0	2035	EM
9983-HF	Decontamination shower facility	2008	1.3	2024	NNSA
Pantex Plant (5 facilities)					
11-018	Explosives testing facility	2011	7.7	2030	NNSA
12-063	High explosives pressing facility	2024	62.2	2025	NNSA
12-063E2	High explosives pressing equipment shed	2024	0.5	2025	NNSA
FS-004	Firing Site 4 facility	2014	4.2	2027	EM
FS-004A	Firing Site 4 facility	2014	0.2	2027	EM
Savannah River Site (4 facilities)					
232H	Manufacturing building	2013	58.4	2041	EM
238H	Reclamation building	2022	9.0	2025	NNSA
236H	Pressure testing facility	2018	1.3	2025[a]	NNSA
295H	Stack for Building 232 F&H	2013	0	2041	EM
Nevada National Security Site (3 facilities)					
300578	25-3901 train storage shed in EMAD complex	2016	8.7	2031	EM

Facility ID number	Facility name or description	Year declared excess	Fiscal year 2023 operations and maintenance costs (dollars in thousands)	Estimated disposition year	DOE entity planning disposition of facility
408157	25-3124 treatability facility	2016	6.1	2026	NNSA
408287	25-3113A storage bunker for Test Cell A	2016	1.5	2026	NNSA
Sandia National Laboratories (1 facility)					
6580	Hot cell facility	2017	118.7	2035	EM

Legend:

EM – Office of Environmental Management

NNSA – National Nuclear Security Administration

TBD – To be determined

Source: GAO analysis of data from the Department of Energy's (DOE) Facilities Information Management System, DOE documents, and NNSA and EM interviews. | GAO-24-107173

[a]According to NNSA and EM officials, these facilities have been deactivated and decommissioned since the end of fiscal year 2023.

Appendix IV: Comments from Department of Energy

Department of Energy
Washington, DC 20585

September 13, 2024

Mr. Nathan Anderson
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, DC 20548

Dear Mr. Anderson:

The Department of Energy (DOE) Office of Environment Management (EM) appreciates the opportunity to comment on the U.S. Government Accountability Office (GAO) draft report, *CONTAMINATED EXCESS FACILITIES: Use of Key Practices Would Strengthen DOE's Disposition Planning Efforts (GAO-24-107173).*

EM is dedicated to continuing its cleanup mission addressing legacy waste from nuclear weapons production and government-sponsored nuclear energy research. Significant cleanup progress has been made over the past few decades, including addressing contaminated excess facilities. EM will continue to collaborate across the Department to maximize risk reduction and accomplish overall cleanup goals.

EM concurs with GAO's recommendations, which are consistent with EM's dedication to the cleanup of excess facilities across the DOE complex. EM's responses to the recommendations are provided in the enclosure. Technical comments on the draft report have been provided separately.

If you have any questions, please contact me or Ms. Kristen G. Ellis, Associate Principal Deputy Assistant Secretary for Regulatory and Policy Affairs, at (202) 586-5810.

Sincerely,

Candice Trummell Robertson

Candice Trummell Robertson
Senior Advisor for Environmental Management

Enclosure

Enclosure

Management Response to Recommendations
GAO-24-107173 Draft Report, *CONTAMINATED EXCESS FACILITIES: Use of Key Practices Would Strengthen DOE's Disposition Planning Efforts*

Recommendation 1: The Senior Advisor for EM should ensure that the 2025 plan for deactivation and decommissioning of contaminated excess facilities addresses all statutorily required elements, such as including a list of facilities prioritized based on the potential to reduce risks to human health or the environment and to maximize cost savings and by including a schedule for when EM will accept facilities for deactivation and decommissioning.

Management Response: Concur.

The Department of Energy (DOE) will ensure that statutorily required elements will be addressed in the 2025 Plan for Deactivation and Decommissioning (D&D) of Nonoperational Defense Nuclear Facilities Report to Congress (D&D Report to Congress). The D&D Report to Congress will include a list of facilities based on risk, as appropriate, and potential cost savings. The Office of Environmental Management (EM) will provide a notional schedule for EM's acceptance of facilities for D&D, recognizing uncertainties in future funding. Facilities will not transfer to EM for D&D until funding for D&D of such facilities is provided to EM.

Estimated Completion Date: June 30, 2025.

Recommendation 2: The Senior Advisor for EM should ensure that its 2025 disposition planning efforts for contaminated excess facilities defines goals for each activity, such as by including measurable outcomes for the near and long term.

Management Response: Concur.

DOE will define near and long-term goals for each element included in the 2025 D&D Report to Congress. Outcomes for near-term goals will be for a 5-year timeframe in areas such as project completion, accelerating cleanup of process contaminated excess facilities, and enhancing processes, communication, and planning. Long-term goals directed for periods beyond five years will address the outlook for high-risk facilities that are currently excess and those planned to become excess during this period.

Estimated Completion Date: June 30, 2025.

Recommendation 3: The Senior Advisor for EM should ensure that its 2025 disposition planning efforts for contaminated excess facilities identify the strategies and resources needed to achieve defined goals, such as by including the resources needed to meet each of the stated goals.

Management Response: Concur.

DOE will identify the strategies and resources needed to successfully achieve the goals established in recommendation 2.

Estimated Completion Date: September 30, 2025.

Recommendation 4: The Senior Advisor for EM should ensure that its 2025 disposition planning efforts for contaminated excess facilities assess the environment by defining strategies to address or mitigate barriers affecting DOE's ability to achieve its goals, such as by including strategies to address the potential effects of budgetary constraints.

Management Response: Concur.

DOE will define the strategies to address and/or mitigate barriers affecting DOE's ability to achieve the goals established in recommendation 2. Non-financial barriers, such as interfacing with mission demand, workforce, and regulatory climate/requirements will be considered and the associated mitigation strategies will be discussed to provide a broader understanding of DOE's approach to excess process-contaminated facilities.

Specific funding requests are outside the scope of the D&D report. Funding priorities will be considered during the preparation of the President's budget request in conjunction with other requirements and in consultation with Chief Financial Officer and the Office of Management and Budget.

Estimated Completion Date: September 30, 2025.

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Nathan Anderson at (202) 512-3841 or andersonn@gao.gov

Staff Acknowledgments

In addition to the contact named above, Wyatt R. Hundrup (Assistant Director), Elizabeth Luke (Analyst in Charge), Rebecca Conway, Cindy Gilbert, Claudia Hadjigeorgiou, Mae Jones, Geovana Mendoza, and Dan C. Royer made key contributions to this report. Also contributing to this report were Keith Cunningham, Gina Hoffman, and Susan Murphy.