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Report to the Committee on Armed Services, U.S. Senate

March 2015

DOE FACILITIES

Better Prioritization and Life Cycle Cost Analysis Would Improve Disposition Planning

Accessible Version

GAO-15-272

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GAO Highlights

Highlights of GAO-15-272, a report to the Committee on Armed Services, U.S. Senate

Why GAO Did This Study

Seventy years of nuclear weapons production and energy research by DOE and its predecessor agencies generated radioactive waste, resulting in thousands of contaminated facilities. Some facilities pose risks to workers near the facilities and to the environment. NNSA, a separately organized agency within DOE, now manages many of these contaminated facilities, and though many are no longer in use, others are still operational. Once NNSA considers these facilities to be nonoperational, they may be eligible for transfer to EM, whose mission includes disposing of contaminated facilities through decontamination and decommissioning. In 2007, EM updated its facility transfer process, but until EM accepts these facilities, NNSA is responsible for their maintenance.

The Senate Armed Services Committee Report accompanying the National Defense Authorization Act for Fiscal Year 2014 mandated GAO to assess the inventory of facilities that NNSA plans to transfer to EM for disposition. This report examines (1) how many facilities NNSA has identified for transfer to EM for disposition and their condition and (2) the extent to which EM considers risks of NNSA's contaminated nonoperational facilities and the costs to maintain them when prioritizing its cleanup activities. GAO reviewed documents and interviewed officials from NNSA and EM and visited two NNSA sites that have some of the most contaminated facilities.

What GAO Recommends

GAO recommends, among other things, that EM integrate into one prioritized list all NNSA facilities that meet EM's transfer requirements. EM neither agreed nor disagreed with the recommendation, stating it has formed a working group that may address GAO's findings.

View GAO-15-272. For more information, contact David C.Trimble at (202) 512-3841 or trimbled@gao.gov.

What GAO Found

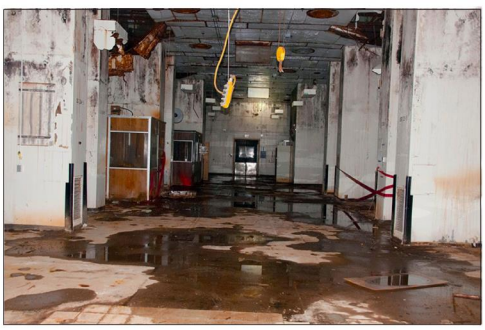
The National Nuclear Security Administration (NNSA) has identified 83 facilities at six of its eight sites for transfer to the Department of Energy's (DOE) Office of Environmental Management (EM) for disposition, and the condition of NNSA's facilities awaiting transfer continues to degrade. NNSA plans to transfer all 83 facilities to EM over the next 25 years. Twenty-seven of them are still operational but are expected to become nonoperational in the next 25 years, and 56 are nonoperational now. In 2009, EM agreed to accept 14 NNSA facilities when it had funds available to begin decontamination and decommissioning. Six years later, none of these facilities have been transferred, and EM officials said they may not be able to accept these or other NNSA facilities until at least 2030 due to budget uncertainties and other priorities. Meanwhile, as NNSA maintains contaminated nonoperational facilities, the facilities' condition continues to worsen, resulting in increased costs to maintain them, and NNSA documents show that some facilities will require significant additional maintenance to prevent the spread of contamination. For example, the Alpha-5 facility at NNSA's Y-12 National Security Complex in Tennessee has degraded to the extent that site officials now detect contaminants, such as mercury, in areas where they were not detected 2 years earlier, and additional funds are needed to repair its failing roof.

EM does not consider the risks of NNSA's nonoperational facilities when prioritizing its cleanup activities. Specifically, when developing its annual facility disposition plans, EM does not consider the human health or environmental risks of NNSA's contaminated nonoperational facilities that meet its transfer requirements but have not yet been transferred. A 2006 DOE Deputy Secretary Program Decision Memorandum stated that EM is to incorporate DOE's contaminated nonoperational facilities into its planning for decontamination and decommissioning, commensurate with the risk such activities pose. EM officials told GAO that they do not include facilities maintained by NNSA in their planning until they have available funding to begin cleanup work. However, without integrating NNSA's inventory of nonoperational facilities into its process for prioritizing facilities for disposition, EM may be prioritizing cleanup for lower-risk facilities under its management ahead of facilities at NNSA that may present a higher risk of spreading contamination.

Alpha-5, a Nonoperational Facility, Shows Degradation Over 2 Years

First floor of Alpha-5 in 2011

2013 with water intrusion



Source: DOE. | GAO-15-272

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	Department of Energy

EM	Office of Environmental Management
EPA	Environmental Protection Agency
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
NNSA	National Nuclear Security Administration
RCRA	Resource Conservation and Recovery Act
Y-12	Y-12 National Security Complex

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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March 19, 2015

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

Seventy years of nuclear weapons production and energy research by the Department of Energy (DOE) and its predecessor agencies generated large amounts of radioactive waste, spent nuclear fuel, excess plutonium and uranium, contaminated soil and groundwater, and thousands of contaminated facilities, including land, buildings, and other structures and their systems and equipment. As the agency responsible for the management and security of the nation's nuclear weapons, the National Nuclear Security Administration (NNSA), a separately organized agency within DOE,[1] now manages many of the department's contaminated facilities,[2] as directed by DOE policy.[3] NNSA's facilities may be contaminated with chemicals and, in some cases, radiological materials, which present some risk to workers near the facilities and the environment. These facilities are located at six sites, and many of them are nonoperational and no longer needed by NNSA,[4] whereas others are still operational but expected to become nonoperational in the next 25

[1]Congress created NNSA as a semiautonomous agency within DOE under title 32 of the National Defense Authorization Act for Fiscal Year 2000. Pub. L. No. 106-65, § 3211 (1999).

[2]In this report, our scope is to report on buildings, but not land; we will refer to buildings as facilities for the remainder of this report.

[3]The DOE-wide approach to real property asset management is described in the DOE order *Real Property Asset Management*, DOE O 430.1B (Washington, D.C.: April 25, 2011).

[4]NNSA sites that manage contaminated facilities that may become nonoperational over the next 25 years include Lawrence Livermore National Laboratory in Livermore, CA; Los Alamos National Laboratory in Los Alamos, NM; the Nevada National Security Site in Mercury, NV; the Savannah River Site in Aiken, SC; and the Y-12 National Security Complex in Oakridge, TN.

years.[5] Once NNSA determines that a contaminated facility is nonoperational, and DOE finds it is not needed by other program offices, it may be eligible for transfer to DOE's Office of Environmental Management (EM).

EM has not accepted any facilities from DOE's program offices for cleanup in over a decade.[6] EM's mission includes decontaminating and decommissioning facilities that are contaminated from decades of nuclear weapons production and nuclear energy research.[7] Since its inception in 1989, EM has assumed responsibility for the disposition of 4,885 nonoperational nuclear, radiological, and industrial facilities. EM reported at the end of fiscal year 2012 that it had completed the decontamination and decommissioning of 1,927 (about 39 percent) of these facilities, leaving 2,958 (about 61 percent) that remain under EM's responsibility. For its first decade of operation, all nonoperational DOE facilities—and, in some cases, entire sites—that needed cleanup work were transferred to EM as a general policy. In 2001, however, EM stopped accepting facilities from other program offices and declared that each DOE program office, including NNSA, was responsible for the disposition of its own contaminated facilities. According to EM documents, this decision was due in part to the large number of facilities it had already accepted and the cost of the required maintenance.

In 2006, DOE directed EM to take responsibility for disposing of the department's contaminated nonoperational facilities. Specifically, a 2006 DOE Deputy Secretary Program Decision Memorandum stated that EM is responsible for all work required to complete cleanup and dispose of

[5]NNSA determines that a facility is "nonoperational" when it is no longer needed for NNSA's mission; a facility is considered "excess" when DOE has determined that it is not needed by any other program offices within DOE.

[6]Although EM has not accepted facilities for transfer since 2001, it did apply funding it received under the American Recovery and Reinvestment Act to funding cleanup activities conducted by NNSA and other program offices. The Recovery Act appropriated more than $5 billion for DOE to expand and accelerate its cleanup activities. Pub. L. No. 111-5 (2009).

[7]EM generally uses the phrase "deactivation and decommissioning" in reference to its work to decontaminate facilities; we use the phrase "decontamination and decommissioning" in this report. In addition to decontaminating and decommissioning facilities, EM's mission includes all aspects of managing high level radioactive wastes, spent nuclear fuel, and environmental remediation of contaminated soils and ground water.

NNSA and other program offices' facilities that were contaminated from nuclear weapons production and nuclear energy research, as well as contaminated soil and groundwater, wastes, spent nuclear fuel, and surplus nuclear materials.[8] The memorandum also stated that EM is to incorporate all of DOE's contaminated nonoperational facilities into its planning commensurate with the risk such cleanup activities pose. It further directed EM to resume accepting contaminated nonoperational facilities from DOE program offices into its program for decontamination and decommissioning.

As a result of the policy change, EM updated its policy in 2007 for DOE's program offices, including NNSA, to transfer their contaminated nonoperational facilities to EM for decontamination and decommissioning. Until they are transferred to EM, however, NNSA is responsible for maintaining its facilities and incurring associated maintenance costs to protect human health and the environment from the risk of contamination. NNSA's responsibilities may last for several years, or even decades, depending on when EM is able to accept the facilities. For example, NNSA's Los Alamos National Laboratory (LANL) in New Mexico has been maintaining a nonoperational facility contaminated with tritium—a radioactive isotope of hydrogen used to enhance the power of U.S. nuclear weapons—since 1994 while it awaits transfer to EM.[9]

The Senate Armed Services Committee Report accompanying the National Defense Authorization Act for Fiscal Year 2014 directs GAO to assess and report on the inventory of facilities that NNSA plans to transfer to EM.[10] This report focuses on NNSA's contaminated facilities and examines (1) how many facilities NNSA has identified for transfer to EM for disposition and the facilities' condition and (2) the extent to which

[8]*Program Decision Memorandum: FY 2008-FY2012 Corporate Program Review*, PDM EM-08-12, Rev.1. (Washington, D.C.: Aug. 10, 2006). While the memorandum expired in 2012, EM and NNSA officials told us that, absent updated guidance from DOE, it is still serving as the basis for current facility transfer decisions and, as a practical matter, is treated by EM and NNSA officials as current and applicable guidance.

[9]Although EM generally accepted all nonoperational facilities for disposition during the time this facility became nonoperational, this and other facilities were being evaluated for use by other program offices and were not transferred before EM stopped accepting facilities in 2001. According to DOE, this particular facility was proposed for transfer to EM in 2001.

[10]S. Rep. No. 113-44, at 260 (2013).

EM considers risks of NNSA's contaminated nonoperational facilities and the costs to maintain them when prioritizing its cleanup activities.

Scope and Methodology

To identify the number of facilities NNSA has identified to transfer to EM and their condition, we reviewed DOE and NNSA policies, guidance documents, and data related to the management of facilities. Specifically, we reviewed NNSA's 25-year site plans, which identify each site's plans for the disposition of contaminated facilities they manage and generally plan for the years 2013 through 2037. We also analyzed data NNSA uses to track the condition of its facilities and their associated surveillance and maintenance costs. Specifically, we used NNSA's data to identify contaminated nonoperational facilities, operational facilities that will be considered nonoperational over the next 25 years, and the annual cost to maintain these facilities. NNSA collects these data from its sites biannually and combines them into one database. To assess the reliability of the data elements needed to answer our objectives, we reviewed NNSA's processes for verifying these data and related documents and interviewed agency officials knowledgeable about the data. We also corroborated the data obtained from NNSA headquarters with data we collected from the six NNSA sites that manage these facilities. On the basis of these steps, we determined that the data were sufficiently reliable for our purposes. We also reviewed planning and policy documents that NNSA uses to identify and manage facilities before they are transferred to EM. In addition, we visited two of the six NNSA sites with contaminated facilities—Lawrence Livermore National Laboratory (LLNL) in California and the Y-12 National Security Complex (Y-12) in Tennessee—to view contaminated facilities and interview officials that are familiar with facility surveillance and maintenance. We selected these two sites because NNSA identified them as having some of the most contaminated facilities and because these sites have both operational and nonoperational facilities; because this is a nonprobability sample, our observations at these sites cannot be generalized to all NNSA sites but provide illustrative examples of sites with contaminated operational and nonoperational facilities. We also interviewed officials in NNSA's Office of Infrastructure and Capital Planning, which is responsible for collecting the facility data from the sites, as well as the Office of Field Financial Management.

To determine the extent to which EM considers the risks of NNSA's contaminated nonoperational facilities and the costs to maintain them, we reviewed DOE and EM policies and guidance documents related to the facility transfer process and prioritization of EM's cleanup work. Specifically, we reviewed DOE's Transition Implementation Guide and

EM's Standard Operating Policies and Procedures for Excess Facility Transfer to the Office of Environmental Management, among others. We also interviewed officials at EM's Office of Deactivation and Decommissioning and Facility Engineering, which developed EM's transfer process. To identify if and how a facility's risk was factored into the transfer process, we reviewed NNSA memorandums that identify risks associated with its contaminated facilities and those outlining transfer decisions between EM and NNSA. To learn how EM prioritizes cleanup work and funding, we interviewed officials from EM's Program Planning and Budget Office. We also interviewed officials at EM's site offices for Y-12 and LANL because those sites have some of the oldest and most contaminated facilities, according to NNSA documents. Additionally, we interviewed EM officials to compare EM's actions to assess and prioritize risks with federal standards for internal control.[11]

We conducted this performance audit from December 2013 to March 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

NNSA is one of the largest organizations in DOE, overseeing nuclear weapons, nuclear nonproliferation, and naval reactor missions at eight sites across the United States. NNSA is responsible for providing the United States with safe, secure, and reliable nuclear weapons in the absence of underground nuclear testing and maintaining core competencies in nuclear weapons science, technology, and engineering. Operating with a budget of $11.2 billion in fiscal year 2014, work activities to support NNSA's national security missions are largely carried out by management and operating contractors; an arrangement with historical roots. Since the Manhattan Project produced the first atomic bomb during World War II, NNSA and its predecessor agencies have depended on the expertise of private firms, universities, and others to carry out research and development work and efficiently operate the facilities necessary for

[11]GAO, *Standards for Internal Controls in the Federal Government*, GAO/AIMD-00-21.3.1 (Washington, D.C.: November 1999).

the nation's nuclear defense.[12] Ensuring a safe and reliable nuclear weapons stockpile is an extraordinarily complicated task and requires state-of-the-art experimental and computing facilities, as well as the skills of top scientists in the field.

The life cycle of an NNSA facility includes several phases, including planning and acquisition, maintenance, operation, and disposal. According to DOE's policy on asset management, a program office, such as NNSA, must notify DOE's Office of Acquisition and Project Management when it determines that a facility is not fully utilized or is not needed for the mission of the program office.[13] DOE then determines whether the facility could be used by another program office. If the facility is not accepted for use by another program office, DOE determines it to be excess. At this point, if the facility is contaminated with chemicals and/or radiological materials as a consequence of nuclear weapons production and/or nuclear energy research, the facility becomes eligible for potential transfer to EM for decontamination and decommissioning.

EM established a multistep transfer process in 2011 for NNSA and other DOE program offices to transfer their contaminated facilities to EM for decontamination and decommissioning.[14] EM's transfer process consists of nine steps beginning with NNSA or another program office nominating a facility for transfer. Once nominated, EM reviews the facility to confirm that it meets EM's eligibility requirements for transfer—the facility must be

- considered excess to all DOE mission needs, not just to the program office;

[12]The Manhattan Project was a U.S. government research project from 1939 to 1946 that produced the first atomic bombs.

[13]Department of Energy, *Real Property Asset Management*, DOE O 430.1B (Washington, D.C.: Apr. 25, 2011).

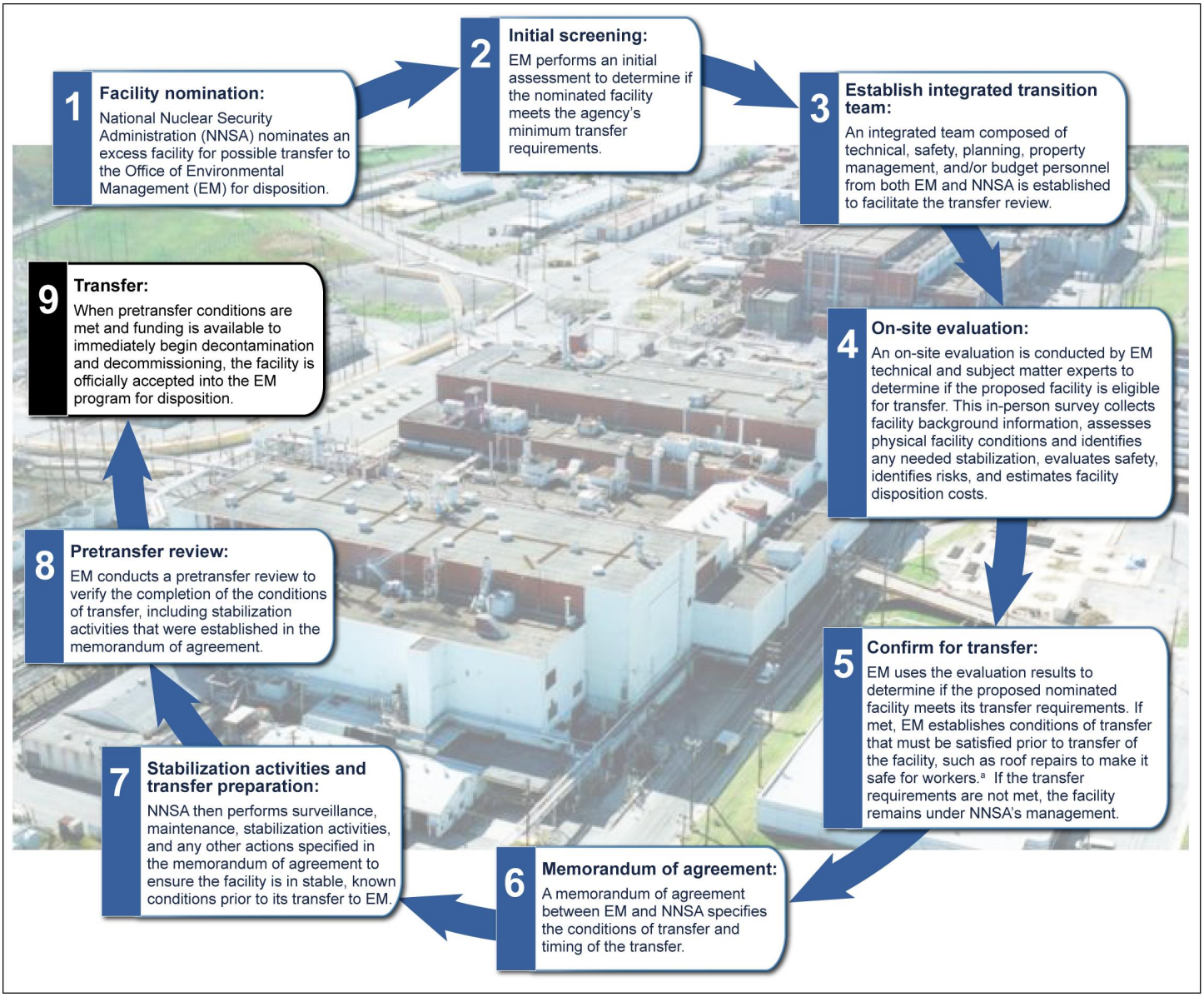
[14]DOE Order 430.1B, *Real Property Asset Management*, is the primary directive that establishes the general framework for transferring excess facilities from one DOE program office to another. DOE Guide 430.1-5, *Transition Implementation Guide*, provides guidance on the technical approach used to transfer excess facilities from one DOE program office to another. EM's *Standard Operating Policies and Procedures #34, Excess Facility Transfer to the Office of Environmental Management*, published in 2011, establishes the criteria EM utilizes to determine if an excess facility is eligible for transfer to EM and the procedures for transferring facilities to EM.

- contaminated with chemical or radiological contaminants resulting from nuclear weapons research and/or production, not contamination resulting solely from construction material, such as asbestos; and
- an individual, self-contained facility, and not part of a larger complex.[15]

After EM confirms a facility is eligible for transfer, EM evaluates it in more detail and, if necessary, the program office performs necessary stabilization activities, such as structural repairs and any other identified actions to ensure the facility is in stable condition prior to transfer to EM (see fig. 1).

[15]According to EM's *Standard Operating Policies and Procedures #34*, 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 DOE program office requesting the transfer.

Figure 1: The Office of Environmental Management's Process for Transferring Facilities from the National Nuclear Security Administration and Other Program Offices for Disposition



Source: GAO analysis of DOE documents. | GAO-15-272

Note: All DOE program offices follow this process to transfer facilities to EM for disposition.

[a]Even if a facility meets EM's transfer requirements and is approved, EM does not accept facilities until it has available funding to begin disposition work.

When EM confirms a facility is eligible for transfer, however, the facility is not transferred to EM until it has funding available to immediately begin decontamination and decommissioning. EM adopted this funding-dependent disposition policy, as a practice, in 2007 and formalized it as part of its transfer policy in 2011. Prior to 2001, EM had been given responsibility for hundreds of excess facilities from other DOE program offices without any additional resources to manage them, according to EM officials. Until EM has funds available to immediately begin disposition, program offices, such as NNSA, are responsible for maintaining their nonoperational facilities through activities known as surveillance and maintenance. Surveillance and maintenance activities may include, for example, periodic inspections of structures, as well as preventive, predictive, and corrective maintenance. These activities may also include the maintenance of selected systems and equipment essential for transition and disposition activities, such as maintaining ventilation systems, to ensure, at a minimum, that any contamination is adequately contained and that the potential hazards to workers, the public, and the environment are eliminated or mitigated and controlled.

Cleanup work at DOE's sites is governed by one or more regulatory agreements or orders that establish the scope of work to be performed at a given site and the dates by which specific cleanup milestones must be achieved. Cleanup work is performed at some sites under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).[16] CERCLA, commonly known as Superfund, provides federal authority to respond to releases or threatened releases of hazardous substances, pollutants, and contaminants that may endanger public health or the environment, and it established a trust fund to pay for cleanup activities. Portions of the cleanup work are also subject to the Resource Conservation and Recovery Act of 1976 (RCRA), which generally prohibits the treatment, storage, or disposal of hazardous waste without a permit.[17] The Environmental Protection Agency (EPA) may authorize states to adopt and enforce their own hazardous waste management programs (including issuing permits) as long as the state programs are at least equivalent to and consistent with RCRA. In

[16]Pub. L. No. 96-510 (1980), codified as amended at 42 U.S.C. §§ 9601-9675. Federal agencies, however, cannot use the Superfund trust fund to finance their cleanup activities and must, instead, use their own or other appropriations.

[17]Pub. L. No. 94-580 (1976), codified as amended at 42 U.S.C. §§ 6901-6992k.

addition, the Federal Facilities Compliance Act of 1992 made federal facilities subject to state hazardous waste permitting and enforcement authorities.[18] Under these authorities, EM has entered into Federal Facility Agreements with EPA and state regulatory agencies that establish cleanup deadlines and milestones, as well as reporting and other requirements.

NNSA Has Identified 83 Facilities to Be Transferred to EM for Disposition, and the Condition of Nonoperational Facilities Continues to Degrade

NNSA has identified 83 contaminated facilities for potential transfer to EM for disposition over a 25-year period, 56 of which are currently nonoperational. NNSA is maintaining these facilities for future transfer to EM, but the condition of nonoperational facilities continues to degrade, resulting in increasing costs to NNSA to maintain them to prevent the spread of contamination.

NNSA Has Identified 83 Contaminated Facilities for Transfer to EM

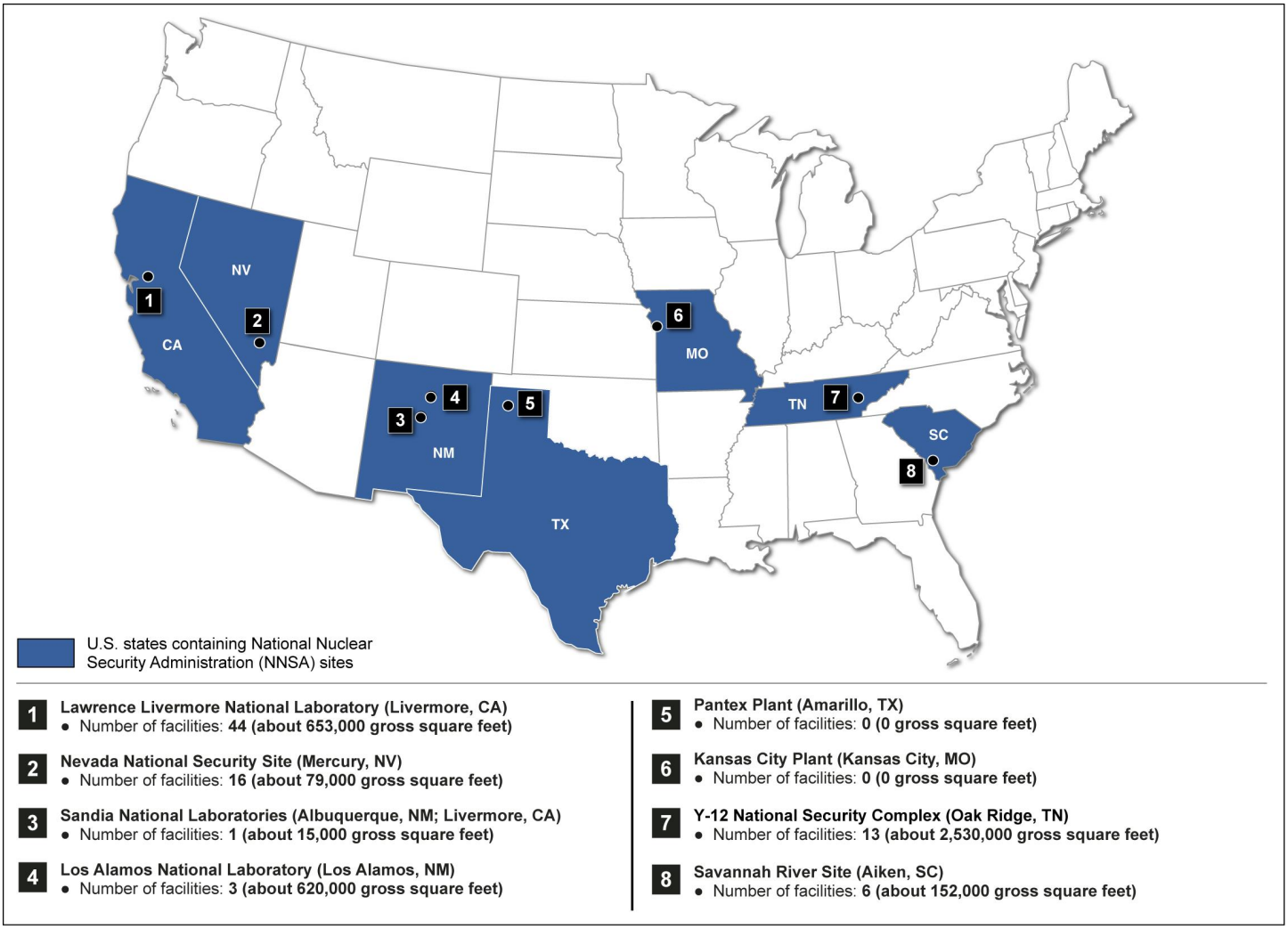
According to NNSA facility data, NNSA has identified 83 contaminated facilities at six of its eight sites for potential transfer to EM for disposition over 25 years, 27 of which are operational, and 56 are nonoperational (see fig. 2).[19] NNSA identified these facilities as part of each site's process for planning for the disposition of contaminated facilities it manages over a 25-year period; most sites completed their planning process in 2013. Of the 27 contaminated facilities currently in operation, NNSA expects 9 (33 percent) will be ready for disposition within the next 10 years. Most of the 27 operational facilities have been in operation for

[18]Pub. L. No. 102-386, § 102 (1992), codified at 42 U.S.C. § 6961.

[19]The number of facilities that NNSA has identified for transfer to EM over 25 years is current as of December 2014. The number of facilities may change from year to year as NNSA determines if facilities meet EM's transfer requirements. For example, NNSA may remove a facility from consideration for transfer to EM because NNSA determines that it is not contaminated with radiological or chemical contaminants that resulted from nuclear weapons production and/or nuclear energy research. NNSA may also add a facility for consideration for transfer to EM if a site changes the status of a facility, and NNSA determines that it now meets EM's transfer requirements.

decades—19 of them (70 percent) were constructed more than 50 years ago. Appendix I lists the 83 facilities that NNSA has identified for potential transfer to EM over 25 years.

Figure 2: National Nuclear Security Administration Sites and Inventory of Contaminated Facilities that May Be Eligible for Transfer to the Office of Environmental Management



Sources: NNSA; Map Resources (map). | GAO-15-272

According to NNSA facility data, the 56 nonoperational contaminated facilities total over 1.5 million gross square feet of space. These facilities range in size, use, and age. For example, one of NNSA's smallest

contaminated nonoperational facilities is a 1,694 gross square foot building that once served as a cryogenic lab located at Nevada National Security Site.[20] NNSA's largest contaminated nonoperational facility, located at Y-12, is over 613,000 gross square feet and was built to enrich uranium for the Manhattan Project. Forty-five of NNSA's 56 contaminated nonoperational facilities (about 80 percent) were constructed 50 years ago and, in some cases, have been nonoperational for decades. For example, the Livermore Pool Type Reactor at LLNL, which was used for nuclear weapons research and radiation studies, among other things, has been nonoperational since 1980.

NNSA first nominated some of the 56 nonoperational facilities for disposition in December 2008, after EM updated its process to transfer contaminated facilities and requested NNSA and DOE's Offices of Science and Nuclear Energy to nominate facilities for transfer to EM.[21] In 2008, NNSA nominated 39 nonoperational facilities from five sites for transfer to EM, and EM agreed to accept 14 when it received funding to begin decontamination and decommissioning, although none have completed the transfer process and are part of the 56 nonoperational facilities still maintained by NNSA.[22] In 2009 when EM confirmed 14 of the facilities for future transfer, it did not consider facilities that were

[20]A cryogenic laboratory is used for physics research that requires very low temperatures.

[21]The mission of the Office of Science is the delivery of scientific discoveries and major scientific tools to transform our understanding of nature and to advance the energy, economic, and national security of the United States. The primary mission of the Office of Nuclear Energy is to advance nuclear power as a resource capable of meeting the nation's energy, environmental, and national security needs by resolving technical, cost, safety, proliferation resistance, and security barriers through research, development, and demonstration, as appropriate.

[22]The Office of Science nominated 50 facilities for transfer to EM, 23 of which were approved by EM for future transfer; the Office of Nuclear Energy nominated 50 facilities, and 36 were approved by EM for future transfer. In 2008, EM prioritized the facilities it confirmed are eligible for transfer from other program offices to establish a basis for the timing of facility transfers and to justify requests for funds in submissions to DOE's future annual budget justifications.

nominated at Y-12 because of their inclusion in a separate cleanup project (see table 1).[23]

Table 1: Status of National Nuclear Security Administration Facilities Nominated in 2008 for Transfer to DOE's Office of Environmental Management

	Number of facilities		
Site	**Facilities nominated**	**Confirmed for transfer**	**Not approved**
Lawrence Livermore National Laboratory	4	4	0
Los Alamos National Laboratory (LANL)	11[a]	1	10[b]
Nevada National Security Site	5	6[c]	0
Savannah River Site	1	3[d]	0
Y-12 National Security Complex	18	0	18[e]
Total	**39**	**14**	**28**

Source: GAO analysis of National Nuclear Security Administration (NNSA) and Office of Environmental Management Data. | GAO-15-272

Note: The 14 facilities that were confirmed for transfer by EM have met EM's transfer requirements, as shown in step 5 of figure 1.

[a]Nine of the facilities nominated by LANL were part of the Pulsed High Energy Machine Emitting X-rays Complex.

[b]The Office of Environmental Management (EM) did not approve 10 facilities nominated by LANL in 2008 because they were not contaminated with chemical or radioactive contaminants from nuclear weapons research or production—one of the transfer requirements.

[c]The Nevada National Security Site originally nominated 5 facilities for transfer to EM, but an additional facility was identified by the site after the initial round of NNSA facility nominations, resulting in 6 facilities being approved by EM.

[d]The Savannah River Site nominated 1 facility for transfer to EM, but EM confirmed two additional structures associated with the contaminated facility.

[e]Facilities nominated by the Y-12 National Security Complex were not considered for transfer to EM because their disposition was being planned in a separate cleanup project. In parallel to EM's request for facility nominations in 2007, facility disposition work at Oak Ridge National Laboratory and at Y-12 was being planned through the Integrated Facilities Disposition Project—a large scale project to complete cleanup of the two sites by fiscal year 2037. This project, though it has not begun, incorporates contaminated facilities managed by NNSA, including those at Y-12, and other DOE program offices.

[23]Facilities nominated by the Y-12 National Security Complex were not considered for transfer to EM because their disposition was being planned in a separate cleanup project. In parallel to EM's request for facility nominations in 2007, facility disposition work at Oak Ridge National Laboratory and at Y-12 was being planned through the Integrated Facilities Disposition Project—a large-scale project to complete cleanup of the two sites by fiscal year 2037. This project, though it has not begun, incorporates contaminated facilities managed by NNSA, including those at Y-12, and other DOE program offices.

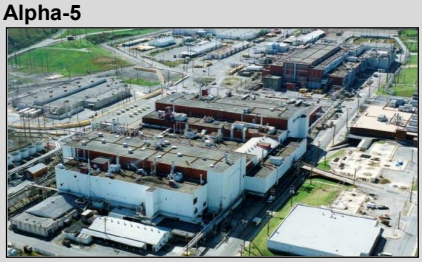
EM officials stated that, while EM confirmed in 2009 that 14 NNSA facilities were eligible for transfer to EM, none of those facilities have been transferred and remain part of the 56 nonoperational facilities managed by NNSA. According to officials in NNSA's Office of Infrastructure & Capital Planning, EM's Office of Deactivation and Decommissioning and Facility Engineering, and EM's Office of Program Planning and Budget, EM has not accepted the facilities because funding is not available for EM to immediately begin cleanup activities. EM officials told us that the program initially expected to have funds available to accept and begin disposition of several of the 14 facilities in fiscal year 2017, but not enough funds are expected to be available at that time due to competing priorities for cleanup work. As a result, EM officials told us they estimate that EM may not be able to accept any facilities for transfer until at least 2030 due to budget uncertainties. Until funds are available to decontaminate and decommission facilities from the other program offices, including NNSA, EM plans to focus its disposition resources on the excess facilities it is currently responsible for, and NNSA remains responsible for maintaining its contaminated facilities until they are transferred to EM.

The Condition of NNSA's Contaminated Nonoperational Facilities Continues to Worsen, Resulting in Increased Maintenance Costs

The condition of some of NNSA's contaminated nonoperational facilities continues to worsen, resulting in increased costs to maintain them. During the last phases of a facility's life cycle, according to DOE's policies, an agency is to ensure that surveillance and maintenance are adequate to maintain the facility in stable and known conditions until it is transferred to EM for disposition. Yet, NNSA documents show that several nonoperational facilities will require more than the current level of surveillance and maintenance as they continue to degrade and pose new risks to workers and the environment.

At a facility known as Alpha-5 at Y-12, conditions have significantly degraded since the last major maintenance activities 4 years ago, causing maintenance costs to increase substantially. According to a 2014 internal NNSA document examining risks posed by nonoperational facilities, multiple concrete ceiling panels are collapsing at Alpha-5, which pose risks for workers who conduct the surveillance and maintenance activities on the facility. The most dangerous of these failing panels have been reinforced from within the facility to prevent complete collapse, and temporary patches have been applied to the roof immediately above these panels. Furthermore, even though DOE obligated over $100 million in American Recovery and Reinvestment Act funds to remove asbestos floor tiles and other contaminated material and equipment from

Alpha-5



Source: Y-12. | GAO-15-272

Site: Y-12 National Security Complex

Gross square feet: 613,642

Year deactivated: 2000

Annual anticipated surveillance and expenditures: $3,394,000

Total estimated disposition cost: $345,488,000

Commissioned in 1944, Alpha-5 performed uranium enrichment for the Manhattan Project and later played a central role during the Cold War. Contaminants, including mercury, beryllium, and black mold, now cover 75 to 80 percent of the facility. The facility is located adjacent to active facilities and approximately a third of a mile from a residential neighborhood. Since the facility was deactivated, the roof has experienced substantial degradation, and water has entered and damaged the facility. Entrance into most areas of the facility requires personal protective equipment, including a full-face respirator. For fiscal year 2015, site officials estimated they need $15 million to replace the failing roof at the facility. Despite temporary patches and repairs, the roof has continued to degrade, and water continues to enter the facility, resulting in flooding and the spread of radiological and toxicological contamination within the facility. Alpha-5 also has a leaking steam system, which accelerates mold growth and the spread of contamination. Roadways and sidewalks immediately outside the facility are regularly used by site workers, according to NNSA information on the facility. They could be injured or exposed to contamination by falling concrete, ceiling panels, and roofing materials from the facility.

Alpha-5, with the hope of reducing the facility's risk and maintenance costs,[24] the condition of Alpha-5 has continued to degrade. Specifically, site officials now detect radiological and toxicological contaminants—beryllium, mercury, and black mold—in areas where they were not detected 2 years earlier (see fig. 3).[25] The degrading condition at Alpha-5 not only increased the risk, surveillance and maintenance costs increased from an annual average of about $1.2 million from 2009 to 2011 to an average of almost $4 million annually in 2012 and 2013. Additional repair activities were planned in fiscal year 2014, but even with these additional repairs, according to NNSA documents, the overall risk of the facility to workers and the environment will not be significantly reduced.

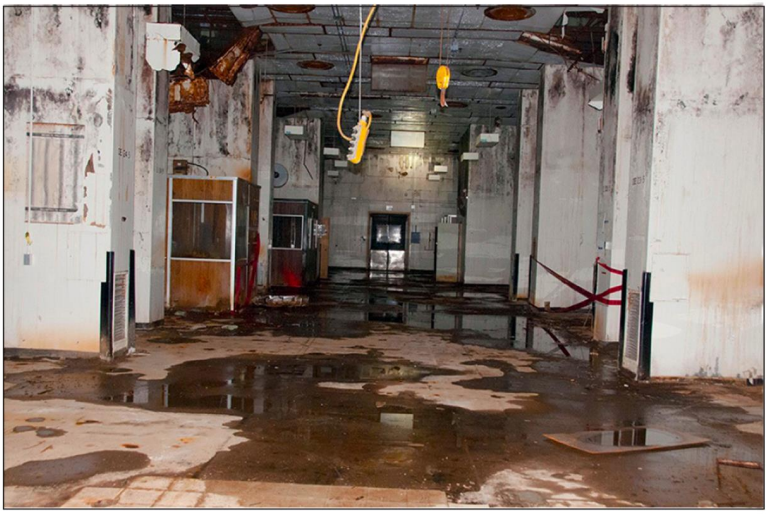
[24]Pub. L. No. 111-5 (2009). The Recovery Act appropriated more than $5 billion for DOE to expand and accelerate its cleanup activities.

[25]Beryllium is a lightweight and strong metal that that is used in a wide array of products, such as aircraft, spacecraft, X-ray equipment, and nuclear weapons. Beryllium is considered hazardous to human health. Scientists have linked exposure to beryllium with an inflammatory lung condition now called chronic beryllium disease, which can be debilitating and, in some cases, fatal. National and international organizations now consider beryllium a human carcinogen. Mercury is a naturally occurring metallic substance that exists as a liquid or vapor in its elemental form and can be a solid or liquid in its compound form. Mercury is toxic to both humans and animals. Exposure can affect neurological development, especially in children and developing fetuses, which are especially susceptible to mercury exposure. Mercury exposure at high levels can also harm the brain, heart, kidneys, lungs, and immune systems of all ages.

Figure 3: Photos of the Alpha-5 Facility at the Y-12 National Security Complex Show Degradation over 2 Years

First floor of Alpha-5 in 2011

2013 with water intrusion



First floor of Alpha-5 in 2011

2013 with structural degradation

Source: DOE. | GAO-15-272

Heavy Elements Facility

Source: LLNL. | GAO-15-272

Site: Lawrence Livermore National Laboratory (LLNL)
Gross square feet: 31,809
Year deactivated: 1995
Annual anticipated surveillance and expenditures: $607,044

Total estimated disposition cost: $62,000,000

Commissioned in 1956, the Heavy Elements Facility performed research activities associated with underground nuclear testing and on the behavior of heavy elements. The facility is located half a mile from a residential neighborhood. According to a National Nuclear Security Administration (NNSA) document about the facility's risks, significant radiological and chemical contamination is present throughout the facility, including in the walls, floors, air filtration systems, and ducting. Beryllium contamination may be present in some localized areas as well. The facility's roof has failed and is leaking over contaminated areas. Radiological contaminants have migrated, and there are areas of the facility that are inaccessible because of contamination. In 2003, the site spent about $22,000,000 to remove materials and equipment from the facility and reduce hazards, but contamination remains dispersed throughout the facility and its systems. NNSA now estimates that mitigating the risks associated with the facility's failing roof and air filtration systems will cost at least $1,000,000.

In addition, the Heavy Elements facility at LLNL, which discontinued operation in 1995, also faces significant degradation and increasing maintenance costs as it awaits transfer. Specifically, the facility has radiological contamination, possible beryllium contamination in localized areas, and roof leaks above highly contaminated areas, among other risks, according to the 2014 internal NNSA document. The facility's degrading condition has caused the roof to fail and allowed water to seep into the facility's contaminated areas, resulting in increased surveillance and maintenance costs from $15,766 in fiscal year 2009 to $607,044 in fiscal year 2013. In addition to the current level of surveillance and maintenance activities, an additional $1,000,000 will be required to extend the life of the facility's failing roof and for other repairs while it awaits transfer to EM for decontamination and decommissioning.[26]

NNSA data show that the agency spent almost $34 million maintaining the 27 facilities still in operation that will become nonoperational within the next 25 years and over $10 million in fiscal year 2013 on surveillance and maintenance activities for the 56 nonoperational facilities (see table 2).

[26]The costs of facility upgrades, such as new roofs, which are sometimes needed to ensure safety, are not included in the department's surveillance and maintenance costs.

Table 2: Surveillance and Maintenance Costs for Selected National Nuclear Security Administration Nonoperational Facilities for Fiscal Year 2013

Site	Nonoperational facilities
Lawrence Livermore National Laboratory	$2,034,973
Los Alamos National Laboratory	$168,777
Nevada National Security Site	$4,900
Sandia National Laboratories	$0
Savannah River Site	$500,000
Y-12 National Security Complex	$7,500,000
Total	**$10,208,650**

Source: GAO analysis of National Nuclear Security Administration (NNSA) data. | GAO-15-272

Note: Lawrence Livermore National Laboratory maintains facility-specific data to track the actual surveillance and maintenance costs for each facility, whereas the other NNSA sites record surveillance and maintenance costs using a distributed cost model that allocates these costs by square footage.

Site officials at both Y-12 and LLNL told us that nonoperational facilities continue to degrade because of limited surveillance and maintenance resources. Officials at Y-12 said that balancing the needs of operational facilities with the need to prevent the spread of contamination at nonoperational facilities is a challenge with limited resources because both types of facilities require maintenance to protect workers and the environment.

EM Does Not Consider Risks or Costs of NNSA's Contaminated Nonoperational Facilities When Prioritizing Cleanup Activities

When developing its annual plans and schedules for decontaminating and decommissioning facilities, EM does not consider the human health and environmental risks of NNSA's contaminated nonoperational facilities that are eligible for transfer, but have not yet been transferred to EM. Furthermore, when establishing its cleanup priorities, EM does not take into account the costs of deferring disposition of NNSA's contaminated nonoperational facilities.

EM Does Not Consider the Risks of NNSA's Nonoperational Facilities When Prioritizing Cleanup Activities

EM considers the risks to human health and the environment of the facilities it is responsible for when prioritizing them for decontamination and decommissioning, but it does not consider the risks posed by facilities it has not yet accepted from NNSA. Consequently, nonoperational facilities maintained by NNSA that meet EM's transfer requirements may continue to degrade while lower-risk facilities already under EM's responsibility are decontaminated and decommissioned.

EM prioritizes its facilities for decontamination and decommissioning each year as part of its process for preparing its submission to DOE's annual budget justification. Under this process, EM asks each site to create a prioritized list of facilities for disposition and other cleanup activities for the forthcoming fiscal year.[27] When developing such lists, officials at EM's sites consider facilities currently under EM's responsibility. These site-level lists prioritize cleanup activities based on a number of site-specific factors, including regulatory commitments, footprint reduction goals, agreements with EPA and states, and risks to worker safety and the environment.[28] However, EM does not include in its prioritized lists contaminated nonoperational facilities maintained by NNSA that meet EM's transfer requirements.

In some cases, NNSA's contaminated nonoperational facilities may pose greater human health and environmental risks than facilities EM plans to decontaminate and decommission. For example, in 2014 EM completed the decommissioning of two uncontaminated water towers at LANL at a cost of $575,667, which contributes to the site's goal of reducing the amount of land and facilities used by the site and, according to site officials, to prepare the land to be transferred to the county. According to one EM official at LANL, these water towers posed very little risk to human health and the environment. In contrast, NNSA's Ion Beam Facility at LANL, a contaminated nonoperational facility that has been awaiting transfer to EM for 20 years, poses human health and environmental risks, according to NNSA documents and officials.

[27]EM refers to these site level work priority lists as Integrated Priority Lists.

[28]Footprint reduction refers to DOE efforts to decrease the land and facilities requiring DOE cleanup.

Ion Beam Facility

Source: LANL. | GAO-15-272

Site: Los Alamos National Laboratory (LANL)
Gross square feet: 56,259
Year deactivated: 1999 (vacated in 1994)
Annual anticipated surveillance and expenditures: $169,000

Total estimated disposition cost: $14,000,000

Commissioned in 1953, the Ion Beam Facility supported post-World War II scientific research, including nuclear physics experiments. Large sections of the facility are contaminated with radiological or chemical materials, including tritium and possibly mercury. According to a National Nuclear Security Administration (NNSA) document describing the facility's risks, the facility is located adjacent to the most populated area of the site, and less than a quarter mile from an active mission facility. The facility is also in close proximity to a wooded canyon and, if a wildfire spread to the facility, according to the NNSA documents, it could result in the uncontrolled release of contamination and force an evacuation of LANL's main technical area. Tritium contamination at the facility cannot be addressed until disposition occurs due to the nature of the contamination. In the meantime, maintaining the integrity of the building is critical to prevent water infiltration and the spread of contamination, but roof maintenance is challenging because of the facility's height. In the mid-2000s, NNSA invested over $2 million to mitigate hazards associated with contaminated systems at the Ion Beam Facility, but the facility continues to degrade. Before 2019, according to NNSA information, the facility will require more than the current level of surveillance and maintenance to protect workers, the public, and the environment.

According to the 2006 DOE Deputy Secretary Program Decision Memorandum, EM is to incorporate DOE's contaminated nonoperational facilities into its planning for decontamination and decommissioning, commensurate with the risk such activities pose. Additionally, federal standards for internal control state that, in conducting risk assessments, management needs to comprehensively identify risks and should consider all significant interactions between the entity and other parties, as well as internal and external factors at both the entitywide and activity levels.[29] EM officials told us that EM does not include contaminated nonoperational facilities maintained by NNSA and other program offices in its planning until EM officials believe they will have available funding to begin decontamination and decommissioning. At that time, they will consider which facilities to fund. However, without developing a prioritized, risk-based list of facilities for disposition that includes facilities from NNSA, it is unclear whether EM's planning is consistent with the 2006 memorandum, and EM may not be providing Congress with the most complete information on its cleanup needs and priorities in its annual budget submissions. Such planning would also help inform EM's annual budget submission.

[29]GAO/AIMD-00-21.3.1.

EM Does Not Consider the Costs of Deferring Cleanup of NNSA's Nonoperational Facilities When Developing Cleanup Schedules

EM's process for prioritizing facilities for cleanup does not take into account the costs associated with deferring the disposition of NNSA's nonoperational facilities. A 2010 EM study considered the cost of deferring decontamination and decommissioning several facilities and found that hundreds of millions of dollars could be saved if EM disposed of the facilities earlier than planned, but no analysis has been done for facilities already accepted by EM or nonoperational facilities at NNSA. Specifically, EM conducted a life cycle cost analysis in 2010 to determine if costs would be saved by disposing of contaminated facilities at five DOE Office of Science sites earlier than it had originally planned. Based on that analysis, EM concluded that, if disposition work began in 2010 rather than 2017 as it had originally planned, the early cleanup would result in life cycle savings of about $734 million, primarily by avoiding future surveillance and maintenance costs. According to one senior official from EM's Office of Deactivation and Decommissioning and Facility Engineering, EM did not begin disposition of these facilities after EM performed the life cycle cost analysis because EM did not request funds to accelerate the cleanup. Although EM has not performed such analyses for NNSA's nonoperational facilities that meet EM's transfer requirements, one senior official from EM's Office of Deactivation and Decommissioning and Facility Engineering told us that such an analysis may show that hundreds of millions of dollars could be saved by avoiding future surveillance and maintenance costs and increased disposition costs.

Conditions at many of NNSA's contaminated facilities, some of which have been nonoperational for many years, continue to worsen, resulting in increased costs and risks, which are not considered by EM when prioritizing its cleanup work. As previously discussed, facility life cycle costs—including surveillance and maintenance and disposition costs—and risks to human health and the environment continue to increase as facilities degrade. For example, site officials estimate that about $2.6 million in repairs and structural upgrades will be needed for two nonoperational contaminated facilities at LLNL prior to 2019—11 years before EM officials estimate they may be able to accept any facilities from NNSA for disposition, as shown in the following examples:

- The MARS E-Beam Facility: This facility will require an estimated $700,000 to temporarily extend the life of its roof for 5 to 8 years and remove air filtration systems that could release contaminants. The facility stopped operating in 1999 and has a structurally failing roof above contaminated areas that has resulted in water intrusion, which NNSA documents state could spread contamination.

- The Rotating Target Neutron Source Facility: This facility stopped operating in 1987 and will need an estimated $1.9 million to mitigate the risks of a failing roof above highly contaminated areas, which has resulted in water intrusion that could spread tritium contamination.

A 2011 EM report found that the longer facilities sit idle, the further they degrade, and the more dangerous and costly they are to maintain or dispose of.[30] The report also stated that some older facilities have a limited life before major investments and structural upgrades must be considered to maintain the ability to safely enter them for cleanup activities. According to the GAO Cost Estimating and Assessment Guide, which is a compilation of cost-estimating best practices drawn from across industry and government, agencies should consider all life cycle costs, risks, and trade-offs to support the best decisions for allocating existing and future resources.[31] Nevertheless, EM does not consider the remaining life cycle costs of NNSA's contaminated nonoperational facilities, such as NNSA's costs for surveillance and maintenance and structural upgrades, in developing its lists of cleanup priorities, according to EM officials. Officials from EM's Office of Deactivation and Decommissioning and Facility Engineering told us that, in their view, EM does not need to evaluate the surveillance and maintenance costs of facilities for which it is not responsible.

[30]U.S. Department of Energy, Office of Environmental Management, *Facility Deactivation & Decommissioning (D&D): Executive Overview* (Washington, D.C.: June 13, 2011).

[31]GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: March 2009).

Beta-4

Source: Y-12. | GAO-15-272

Site: Y-12 National Security Complex
Gross square feet: 313,771
Year deactivated: 2007
Annual anticipated surveillance and expenditures: $1,735,000

Total estimated disposition cost: $194,357,000

Commissioned in 1945, Beta-4 originally performed uranium enrichment during World War II, but transitioned to lithium enrichment and weapons fabrication support during the Cold War. The facility is contaminated with radiological and other hazardous materials including uranium alloys, asbestos, lead, and mercury. Beta-4 is located adjacent to active facilities and is approximately a third of a mile from a residential neighborhood. The facility is degrading and, according to site officials, structural failures could result in releases of radiological and chemical contamination in the event of a fire. According to National Nuclear Security Administration documents, areas of the facility's roof leak and windows are loosening from their casements. Water intrusion due to the deteriorating roof could result in the spread of contamination. Further, according to the documents, if a fire occurred, workers could be exposed to chemical and radiological materials, and water runoff from fire suppression activities could contain contaminants. The facility also obstructs access to soil suspected to require remediation.

EM documents have identified several benefits of early disposition that could be realized if life cycle costs are considered in the cleanup prioritization process. In 2005, EM finished a $6.5 billion, 10-year accelerated cleanup of the Rocky Flats Site located 16 miles northwest of Denver, Colorado, even though DOE had estimated in 1995 that the cleanup and disposition activities at Rocky Flats would require $27 billion over 65 years.[32] Disposition activities at Rocky Flats required the decontamination and decommissioning of 800 nonoperational facilities, including structures contaminated with radiological and chemical materials. We reported in July 2006 that the accelerated schedule was one of four factors that contributed to the early completion of Rocky Flats' cleanup.[33] In a 2009 report to Congress, EM estimated that its early disposition and cleanup of Rocky Flats resulted in $20.5 billion in life cycle cost savings, including savings on future surveillance and maintenance costs, and 50 years in schedule savings.[34]

EM's accelerated cleanup of the Fernald Site in Harrison, Ohio, produced similar results.[35] EM's cleanup of Fernald included the decontamination and decommissioning of over 178 facilities. By pursuing closure and disposition of the Fernald Site earlier than planned, cleanup was completed 23 years early and for $200 million less than EM originally estimated. In 2008, EM considered the costs of deferring cleanup at a facility within the Savannah River Site in South Carolina. In considering such costs, EM chose to decontaminate and decommission Building 711-L, a facility with a collapsing roof, earlier than it had originally planned, which allowed the program office to avoid spending operating funds repairing and maintaining a deteriorating nonoperational facility that would later be demolished. By weighing the full life cycle costs and

[32]From 1952 to 1994, the Rocky Flats Site's primary mission was producing nuclear and nonnuclear weapons components for the nation's nuclear stockpile, including plutonium pits.

[33]*GAO, Nuclear Cleanup of Rocky Flats: DOE Can Use Lessons Learned to Improve Oversight of Other Sites' Cleanup Activities*, GAO-06-352 (Washington, D.C.: July 10, 2006).

[34]U.S. Department of Energy, Office of Environmental Management, Report to Congress, *Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War (Washington, D.C.:* January, 2009).

[35]From 1951 to 1989, the Fernald Site produced high-purity uranium metal products for the nation's nuclear arsenal.

deciding to perform accelerated disposition, EM documents show that there are other benefits beyond cost savings of avoiding future surveillance and maintenance costs, including:

- reducing disposition costs by avoiding future repairs,
- reducing environmental and safety risks from highly contaminated and degraded facilities, and
- making areas of land and infrastructure available to support agency missions and reduce sites' footprints.

Conclusions

EM faces an enormous task in the disposition of the nation's contaminated facilities that were used to develop and produce nuclear weapons, many of which still contain radioactive and other hazardous substances. Assessing all of the nonoperational contaminated facilities across NNSA's sites, prioritizing them for decontamination and decommissioning, as well as conducting cleanup activities is a complicated undertaking for EM. However, EM is not comprehensively integrating risks posed by NNSA's nonoperational contaminated facilities, as called for by the 2006 Deputy Secretary Program Decision Memorandum and federal internal control standards. By not integrating nonoperational facilities from NNSA with its own lists of cleanup priorities, EM is not including all risks from NNSA in its planning and may be putting lower-risk facilities under its responsibility ahead of deteriorating facilities managed by NNSA that are of greater risk to human health and the environment. Without developing such a prioritized, risk-based list, EM is not providing Congress with complete information about EM's current and future cleanup obligations as Congress deliberates annually about appropriating funds for cleanup activities. As EM has previously demonstrated in its analysis of the costs of deferring facility disposition and by cleaning up the Rocky Flats and Fernald sites earlier than planned, analyzing life cycle costs of nonoperational facilities shows that accelerating cleanup of some facilities, while others are maintained in their current states, could offer significant cost savings. EM does not currently analyze and consider life cycle costs for facilities it does not manage because it does not accept facilities for transfer until funding is available to carry out the decontamination and decommissioning work. However, because EM is not considering the full life cycle costs of such facilities, EM cannot ensure that its plans for decontaminating and decommissioning facilities result in the most cost-effective use of its limited resources. Once EM has a full understanding of the costs of

deferring disposition, it can better communicate its cleanup priorities to Congress.

Recommendations for Executive Action

We recommend the Secretary of Energy direct the Office of Environmental Management (EM) to take the following two actions to aid EM in its decision making on which facilities to accept and decontaminate and decommission:

- To ensure that EM's annual process to prioritize facilities for decontamination and decommissioning considers all relevant risks from NNSA, EM should integrate its lists of facilities prioritized for disposition with all NNSA facilities that meet EM's transfer requirements, and EM should include this integrated list as part of the Congressional Budget Justification for DOE.

- To better inform its prioritization of facilities for cleanup and identify opportunities for cost savings, EM should analyze remaining life cycle costs of all nonoperational NNSA facilities that meet its transfer requirements and incorporate the information into its prioritization process.

Agency Comments and Our Evaluation

We provided a draft of this report to DOE for review and comment. Responding on behalf of DOE, EM provided written comments in a letter dated March 4, 2015, which are summarized below and reprinted in appendix II. In its written comments, DOE stated that it concurred with the issues identified in our report and described actions it plans to implement to address them. DOE, however, did not state whether it concurred with the report's recommendations. Specifically, DOE, in response to a DOE Office of Inspector General report, is establishing a working group on excess contaminated facilities with representation from DOE's major program offices, including NNSA and EM, and states that the efforts of the working group will address the substantive issues identified by both reports.

We have not examined the mission or operation of the working group, and although DOE states that the efforts of the working group will address our recommendations, it is not clear from DOE's written comments whether the working group will do so. We continue to believe that implementing our recommendations will help to provide Congress with complete information about EM's current and future facility disposition obligations, the relative risks they pose, and ensure that EM's plans for

decontaminating and decommissioning facilities result in the most cost-effective use of its limited resources.

Additionally, in its written comments, DOE stated that the 2006 DOE Deputy Secretary Program Decision Memorandum referenced in our report provided guidance for fiscal years 2008-2012, and therefore is not currently operative. We added text to our report describing its effective dates, but this memorandum's expiration does not affect our finding that EM does not incorporate NNSA's contaminated nonoperational facilities into its planning for decontamination and decommissioning. Notwithstanding its expiration, senior officials in EM's Office of Deactivation and Decommissioning and Facility Engineering and officials in NNSA's Office of Infrastructure and Capital Planning told us that they treat this memorandum as current and applicable guidance and it is still serving as the basis for current facility transfer decisions. DOE also provided technical comments that we incorporated as appropriate.

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

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or trimbled@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 key contributions to this report are listed in appendix III.

David C. Trimble
Director, Natural Resources and Environment

Appendix I: 83 Facilities Identified by the National Nuclear Security Administration for Transfer to the Office of Environmental Management, 2014

Facility ID number	Facility name	Year built	Gross square feet	Status of facility
Site: Los Alamos National Laboratory				
03-0029	CMR Laboratory	1953	563,601	Operational
03-0154	Hot Waste Pump House	1962	400	Operational
03-0016	Ion Beam Facility	1953	56,259	Nonoperational
Site: Lawrence Livermore National Laboratory				
LS222	B222 remaining footprint	1953	0	Nonoperational
LS412	B412 Hot Cells	1943	1,124	Nonoperational
431	Beam Research Center	1953	54,545	Operational
231	Devlmt & Assbly Engng	1954	142,403	Operational
OS858B	Drop Tower - vacant	1965	0	Nonoperational
251	Heavy Elements Facility	1956	31,128	Nonoperational
280	Livermore Pool Type Reactor	1956	5,469	Nonoperational
175	MARS E-Beam Facility	1980	16,656	Nonoperational
LS212	Remaining 212 footprint	1943	0	Nonoperational
292	Rotating Target Neutron Source Facility	1979	20,811	Nonoperational
865	Advanced Test Cell Accelerator Facility	1982	61,360	Nonoperational
281	Unnamed facility	1956	18,505	Nonoperational
212	Slab and sub-grade	1943	3,770	Nonoperational
241	Unnamed facility	1960	54,369	Nonoperational
435	Unnamed facility	1960	57,724	Nonoperational
261	Unnamed facility	1954	52,655	Nonoperational
341	Unnamed facility	1964	44,184	Nonoperational
343	Unnamed facility	1960	27,368	Nonoperational
243	Unnamed facility	1959	20,000	Nonoperational
345	Unnamed facility	1963	9,467	Nonoperational
802A	Unnamed facility	1955	3,264	Nonoperational
850	Unnamed facility	1960	5,095	Nonoperational
446	Unnamed facility	1960	1,743	Nonoperational
812A	Unnamed facility	1960	2,656	Nonoperational
363	Unnamed facility	1963	1,584	Nonoperational
880	Unnamed facility	1963	2,839	Nonoperational
830	Unnamed facility	1957	1,764	Nonoperational
834D	Unnamed facility	1960	1,694	Nonoperational

Facility ID number	Facility name	Year built	Gross square feet	Status of facility
856	Unnamed facility	1960	1,613	Nonoperational
834L	Unnamed facility	1969	1,281	Nonoperational
OS812C	Unnamed facility	1957	1,007	Nonoperational
OS812B	Unnamed facility	1957	1,000	Nonoperational
811	Unnamed facility	1959	1,081	Nonoperational
834C	Unnamed facility	1960	751	Nonoperational
834B	Unnamed facility	1960	751	Nonoperational
834F	Unnamed facility	1960	649	Nonoperational
834G	Unnamed facility	1960	527	Nonoperational
834J	Unnamed facility	1969	511	Nonoperational
812D	Unnamed facility	1971	325	Nonoperational
874A	Unnamed facility	1980	279	Nonoperational
874B	Unnamed facility	1980	279	Nonoperational
828C	Unnamed facility	1964	258	Nonoperational
828A	Unnamed facility	1967	212	Nonoperational
828B	Unnamed facility	1965	199	Nonoperational
Site: Nevada National Security Site				
24-A-09	A-09 Storage	1978	687	Operational
06-CP-40	Comm. and Electronics	1964	7,762	Operational
06-CP-95	Control Point 95	1960	7,976	Operational
06-CP-162	CP-162 Craft Shop	1979	5,334	Nonoperational
25-3232	Cryogenic Lab	1961	1,694	Nonoperational
25-3220	Equipment building	1961	6,801	Nonoperational
25-3124	Experimental Test Lab	1962	3,647	Nonoperational
23-702	Foil	1965	555	Nonoperational
25-3901	Locomotive storage shed	1965	5,257	Nonoperational
25-3230	Motor drive building	1961	3,915	Nonoperational
26-2102	Port Gaston	1958	4,722	Operational
25-3231	Pump shop	1961	740	Nonoperational
25-4320	Sample Mgmt Facility	1966	13,682	Operational
25-4838	Service station	1967	2,372	Nonoperational
06-CP-161	Sheet metal shop	1960	2,064	Operational
24-A-01	Weapons Test	1980	11,968	Operational
Site: Sandia National Laboratories				
6588	Annular Core Research Reactor	1964	14,958	Operational

Facility ID number	Facility name	Year built	Gross square feet	Status of facility
Site: Savannah River Site				
232000	Manufacturing building	1955	71966	Nonoperational
217000	Storage vault	1958	0[a]	Operational
234000	Manufacturing Building No 3	1958	62083[a]	Operational
236000	Pressure Testing Facility	1966	1622	Operational
237000	Storage and Processing Facility	1970	16672[b]	Operational
238000	Reclamation building	1970	0[b]	Operational
Site: Y-12 National Security Complex				
9202	Dev. labs & offices	1943	157,228	Operational
9203	Dev. labs. & offices	1944	31,107	Operational
9203[A]	Dev. labs. & offices	1968	13,881	Operational
9996	DU Binary	1950	34,233	Operational
9998	Maint., machine shops	1954	152,134	Operational
9995	Plant Laboratory	1951	81,655	Operational
9212	Production	1945	442,317	Operational
9215	Production	1956	188,729	Operational
9206	Production	1944	57,812	Nonoperational
9201-05	Production (Alpha-5)	1944	613,642	Nonoperational
9204-04	Production (Beta-4)	1945	313,771	Nonoperational
9201-01	Production (Alpha-1)	1943	270,988	Operational
9204-02E	Production (Beta-2e)	1969	172,892	Operational

Source: GAO analysis of National Nuclear Security Administration data. | GAO-15-272

[a]The two facilities, Manufacturing Building No. 3 and Storage Vault are joined. As such, the square footage for these two facilities is captured under Manufacturing Building No. 3.

[b]The two facilities, Storage and Processing Facility and Reclamation Building are joined. As such, the square footage for these two facilities is captured under Storage and Processing Facility.

Appendix II: Comments from the Department of Energy

Department of Energy
Washington, DC 20585

March 4, 2015

Mr. David Trimble
Director, Natural Resources
and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Trimble:

This letter provides the Department of Energy's (DOE) response to the two recommendations identified in the U.S. Government Accountability Office (GAO) draft report entitled, "DOE FACILITIES: Better Prioritization and Life Cycle Cost Analysis Would Improve Disposition Planning", GAO-15-272. DOE appreciates the opportunity to review the subject report.

DOE concurs with the issues identified in the report, but seeks to clarify that the 2006 DOE Deputy Secretary Program Decision Memorandum referenced in the report provided planning guidance only for the FY 2008-2012 OMB budget submissions, and therefore, is not currently operative. Enclosure 1 provides the actions DOE plans to implement. DOE believes that implementation of these actions through the work of the Excess Contaminated Facilities Working Group will improve the management and eventual disposition of not only NNSA's process-contaminated and high-risk facilities, but also will benefit EM in better planning and prioritizing D&D. Enclosure 2 contains management comments to clarify several points made in the report.

Should you have any questions or comments, please contact Mr. Mark Gilbertson, Deputy Assistant Secretary for Site Restoration, at (202) 586-0755.

Sincerely,

Mark Whitney
Acting Assistant Secretary
Office of Environmental Management

Enclosures

Enclosure 1

Response to Recommendations:
***DOE FACILITIES: Better Prioritization and Life Cycle Cost Analysis Would Improve Disposition Planning* (GAO-15-272)**

GAO Recommendation #1:
To ensure that EM's annual process to prioritize facilities for decontamination and decommissioning considers all relevant risks from NNSA, EM should integrate its lists of facilities prioritized for disposition with all NNSA facilities that meet EM's transfer requirements, EM should include this integrated list as part of the Congressional Budget Justification for DOE.

GAO Recommendation #2:
To better inform its prioritization of facilities for cleanup and identify opportunities for cost savings, EM should analyze remaining life-cycle costs of all non-operational NNSA facilities that meet its transfer requirements and incorporate the information into its prioritization process.

DOE Response:
Concur with the issues identified in the report. In response to the DOE Office of Inspector General Report, *The Department of Energy's Management of High-Risk Excess Facilities (DOE/IG-0931, January 2015)*, the Secretary of Energy directed the establishment of a working group on excess contaminated facilities chartered through the National Laboratory Operations Board (LOB), with representation from DOE's major program offices including, but not limited to, the Office of Environmental Management and the National Nuclear Security Administration. Based on the similar nature of the recommendations within DOE/IG-0931 and GAO-15-272, the Department will address the substantive issues identified by both reports through the efforts of the LOB Excess Contaminated Facilities Working Group (ECFWG). The ECFWG held its first meeting in February 2015.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the individual named above, Nathan Anderson, Assistant Director; Wyatt R. Hundrup; Emily C. Pinto; and Cody J. Raysinger made key contributions to this report. Richard Burkard, R. Scott Fletcher, Cindy Gilbert, Paul Kinney, Alison D. O'Neill, Karen Richey, Jack Wang, and Jessica Wintfeld also made important contributions.

Appendix IV: Accessible Data

Data Table for Figure 1: The Office of Environmental Management's Process for Transferring Facilities from the National Nuclear Security Administration and Other Program Offices for Disposition

Flow chart section	Section text
1	Facility nomination: National Nuclear Security Administration (NNSA) nominates an excess facility for possible transfer to the Office of Environmental Management (EM) for disposition.
2	Initial screening: EM performs an initial assessment to determine if the nominated facility meets the agency's minimum transfer requirements.
3	Establish integrated transition team: An integrated team composed of technical, safety, planning, property management, and/or budget personnel from both EM and NNSA is established to facilitate the transfer review.
4	On-site evaluation: An on-site evaluation is conducted by EM technical and subject matter experts to determine if the proposed facility is eligible for transfer. This in-person survey collects facility background information, assesses physical facility conditions and identifies any needed stabilization, evaluates safety, identifies risks, and estimates facility disposition costs.
5	Confirm for transfer: EM uses the evaluation results to determine if the proposed nominated facility meets its transfer requirements. If met, EM establishes conditions of transfer that must be satisfied prior to transfer of the facility, such as roof repairs to make it safe for workers.[a] If the transfer requirements are not met, the facility remains under NNSA's management.
6	Memorandum of agreement: A memorandum of agreement between EM and NNSA specifies the conditions of transfer and timing of the transfer.
7	Stabilization activities and transfer preparation: NNSA then performs surveillance, maintenance, stabilization activities, and any other actions specified in the memorandum of agreement to ensure the facility is in stable, known conditions prior to its transfer to EM.
8	Pretransfer review: EM conducts a pretransfer review to verify the completion of the conditions of transfer, including stabilization activities that were established in the memorandum of agreement.
9	Transfer: When pretransfer conditions are met and funding is available to immediately begin decontamination and decommissioning, the facility is officially accepted into the EM program for disposition.

Source: GAO analysis of DOE documents. GAO-15-272.

Data Table for Figure 2: National Nuclear Security Administration Sites and Inventory of Contaminated Facilities that May Be Eligible for Transfer to the Office of Environmental Management

Site number	Site description
1	**Lawrence Livermore National Laboratory (Livermore, CA)** Number of facilities: 44 (about 653,000 gross square feet)
2	**Nevada National Security Site (Mercury, NV)** Number of facilities: 16 (about 79,000 gross square feet)
3	**Sandia National Laboratories (Albuquerque, NM; Livermore, CA)** Number of facilities: 1 (about 15,000 gross square feet)
4	**Los Alamos National Laboratory (Los Alamos, NM)** Number of facilities: 3 (about 620,000 gross square feet)
5	**Pantex Plant (Amarillo, TX)** Number of facilities: 0 (0 gross square feet)
6	**Kansas City Plant (Kansas City, MO)** Number of facilities: 0 (0 gross square feet)
7	**Y-12 National Security Complex (Oak Ridge, TN)** Number of facilities: 13 (about 2,530,000 gross square feet)
8	**Savannah River Site (Aiken, SC)** Number of facilities: 6 (about 152,000 gross square feet)

Sources: NNSA; Map Resources (map). GAO-15-272.