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Natural Resources and Environment

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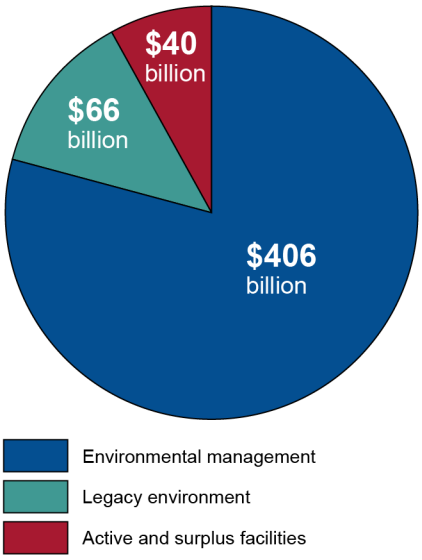
The Department of Energy's (DOE) cleanup mission includes remediating contaminated soil and groundwater, deactivating and decommissioning contaminated buildings, and building facilities to treat millions of gallons of radioactive waste. The estimated cost of this future cleanup—known as DOE's environmental liability—was $512 billion in fiscal year 2020.

DOE'S ENVIRONMENTAL LIABILITY

DOE's Environmental Liability, by Category (Fiscal Year 2020)



Source: GAO analysis of DOE financial data. | GAO-21-585R

Note: "Legacy environment" liability includes long-term management of sites after cleanup is complete. "Active and surplus facilities" liability includes future deactivation and decommissioning of DOE facilities.

Environmental Management Cleanup Activities

EM's $406 billion environmental liability is an estimate of the probable future cost of

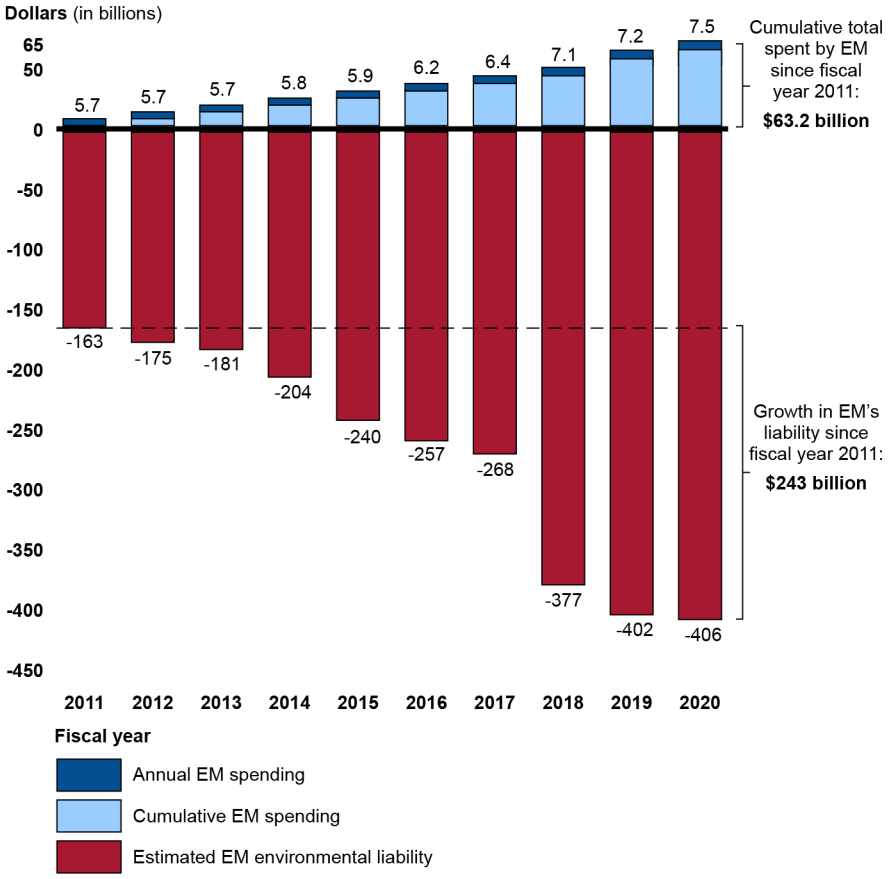
- storing and treating radioactive and hazardous waste from underground tanks;
- addressing soil and groundwater contamination;
- deactivating and decommissioning facilities;
- managing and treating solid waste, such as contaminated tools;
- preparing and disposing of surplus nuclear materials and spent nuclear fuel; and
- supporting cleanup through maintenance, repair, and other activities.

DOE's Environmental Liability Is Large and Growing

Of DOE's $512 billion environmental liability, DOE's Office of Environmental Management (EM)—which is responsible for most of DOE's cleanup activities—accounted for $406 billion in fiscal year 2020. This portion of the liability reflects cleanup estimates for 16 sites across the United States.

As shown below, EM's environmental liability has grown at a rate that has outpaced its spending on cleanup activities. Its liability may continue to grow, in part because EM may have underestimated the cost to complete some of its largest projects, such as the Waste Treatment and Immobilization Plant at the Hanford, Washington, site.

EM's Annual Spending and Estimated Environmental Liability (Fiscal Years 2011 - 2020)



Source: GAO analysis of DOE financial and budget data. | GAO-21-585R

Challenges to Progress

DOE is responsible for the largest share of the federal government's environmental liability—about 85 percent in fiscal year 2020. In 2017, GAO added the U.S. government's environmental liability to the list of areas that are at high risk for fraud, waste, abuse, and mismanagement or in need of transformation. GAO identified contract and project management problems as a key contributor to DOE's growing environmental liability. EM's contract and project management has been on GAO's High-Risk List since 1990.

GAO's March 2021 high-risk update found that, in both high-risk areas, DOE had not fully met any of the five criteria for removal from the High-Risk List. The update noted that addressing the root causes of EM's unsustainable growth in cleanup costs will require enhanced leadership commitment not only in EM but also in the highest levels of DOE.

Examples of Challenges Facing EM, and Corresponding GAO Reports

No risk-informed strategic plan

GAO reported that, although EM developed a strategic vision in 2020, it has not developed a strategic plan that incorporates the principles of risk-informed decision-making (i.e., an approach that helps agencies prioritize cleanup, using factors such as cost and risks to human health and the environment).

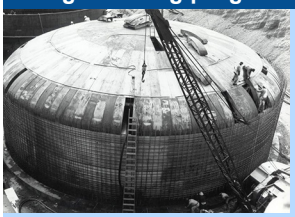
GAO-19-28 GAO-19-339

Unreliable cost and schedule estimates

For cleanup activities at several EM sites, GAO identified unreliable cost and schedule estimates, which affect the accuracy of reported liabilities and may affect cleanup operations. For example, GAO found that because DOE does not have a reliable schedule for adding waste disposal space at the Waste Isolation Pilot Plant in New Mexico, DOE does not have assurance the space will be ready in time to avoid interrupting disposal operations.

GAO-19-494 GAO-20-63 GAO-21-48

Long-standing program and project management issues



GAO found that EM has not followed leading practices for program and project management that could help keep cleanup on schedule and control costs. For example, GAO reported that EM does not have a long-term plan—a leading practice—for its efforts to retrieve nuclear waste from underground tanks at the Hanford site.

GAO-19-223 GAO-20-363 GAO-21-73

Inaccurate and incomplete reporting on cleanup progress

GAO reported that EM does not accurately track or report whether cleanup milestones were met, missed, or postponed. GAO also found that information EM has reported to Congress on its cleanup efforts has been incomplete or inaccurate. For example, GAO found that EM reported old and incomplete data to Congress on the sufficiency of funds for cleaning up three former gaseous diffusion plants used for uranium enrichment.

GAO-19-28 GAO-19-207 GAO-20-63

Sources: GAO (data); DOE (first, third, and fourth photos from top); GAO (second photo from top). | GAO-21-585R

For more information about this topic, contact: Nathan Anderson, Director, Natural Resources and Environment, andersonn@gao.gov

Source: DOE (cover photo).

Key Opportunities

Using Alternative Treatment Approaches

- DOE plans to treat a portion of the low-activity radioactive waste at the Hanford site—which holds the majority of EM's environmental liability—by immobilizing it in glass. DOE could reduce certain risks, treat waste sooner, and save tens of billions of dollars by adopting alternative treatment approaches, as reported in GAO-17-306.
- DOE reported in December 2020 that such alternative approaches may be feasible and could potentially save up to $210 billion if applied at Hanford.[1]

Deciding How to Address Hanford's Tanks

- DOE has not yet decided how to address certain empty tanks that previously held radioactive waste at DOE's Hanford site, as reported in GAO-21-73.
- According to a DOE analysis, DOE could save about $18 billion by closing the tanks in place, compared with the costs of exhuming the tanks for disposal elsewhere.[2]

Accelerating or Reprioritizing Cleanup of Contaminated Facilities

- EM does not consider cleanup of excess facilities from the National Nuclear Security Administration, even though EM will be tasked with cleaning up these facilities. As a result, EM may be prioritizing lower-risk facilities for cleanup ahead of facilities that present a higher risk of spreading contamination, as reported in GAO-15-272.
- Accelerating or reprioritizing the cleanup of higher-risk facilities could reduce the number of years DOE would need to fund maintenance activities—potentially saving up to $2.7 billion in life-cycle costs, as reported in GAO-19-28.

Developing a Strategy for How to Address Idaho's Tank Waste

- EM does not have a strategy for treating and disposing of certain waste from Idaho National Laboratory, as reported in GAO-19-494.
- DOE's December 2020 report stated it could save up to $15 billion by revisiting Idaho National Laboratory's treatment plans.

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

[2]DOE, *Clean Closure Practicability Demonstration for the Single-Shell Tanks,* DOE/ORP-2014-02 (Richland, WA: May 2014).