

441 G St. N.W.
Washington, DC 20548

June 8, 2021

The Honorable Frank Pallone
Chairman
Committee on Energy and Commerce
House of Representatives

Department of Energy: Environmental Liability Continues to Grow, but Opportunities May Exist to Reduce Costs and Risks

Dear Mr. Chairman:

The Department of Energy (DOE) has the difficult task of cleaning up hazardous and radioactive waste at sites across the country. The waste was created by nuclear weapons research and production dating back to World War II and the Cold War. DOE's cleanup mission includes addressing contaminated soil and groundwater; deactivating and decommissioning contaminated facilities; and designing, constructing, and operating facilities to treat millions of gallons of radioactive waste.

DOE's Office of Environmental Management (EM) is responsible for most of the department's cleanup activities. EM's estimate of the probable costs for the future cleanup of this waste is known as its environmental and disposal liability (or environmental liability). EM's environmental liability is a major driver of overall federal environmental liabilities. In February 2017, we added the federal government's environmental liabilities to our list of agencies and program areas that are at high risk for fraud, waste, abuse, and mismanagement or that are most in need of transformation.

We prepared this report under the authority of the Comptroller General to assist Congress with its oversight responsibilities. This report describes the status of DOE's environmental liability and challenges and opportunities GAO has identified that DOE faces in managing its cleanup responsibilities. To conduct this work, we reviewed prior GAO reports and synthesized key findings and recommendations related to DOE's environmental liability, challenges, and opportunities. We updated data using publicly available reports, including DOE's Agency Financial Report for Fiscal Year 2020 and the Financial Report of the United States Government for Fiscal Year 2020.¹

In summary, we found that DOE's environmental liability is large and growing. In managing cleanup responsibilities related to this liability, DOE faces challenges in contract and project management. DOE has opportunities to reduce costs and risks, including using alternative treatment approaches and reprioritizing the cleanup of higher-risk facilities. Enclosure I provides

¹Department of Energy, *Agency Financial Report: Fiscal Year 2020*, DOE/CF-0170 (Washington, D.C.: Nov. 16, 2020); and Department of the Treasury, *Financial Report of the United States Government: Fiscal Year 2020* (Washington, D.C.: Mar. 25, 2021).

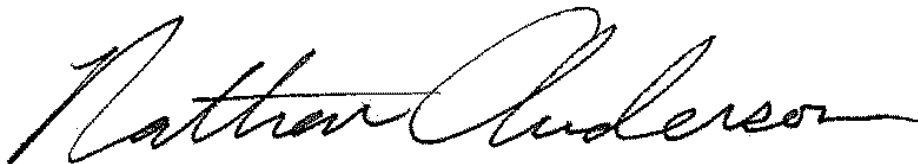
further information on EM's environmental liability. Enclosure II provides a list of related GAO products.

We conducted our work from April 2021 to June 2021 in accordance with all sections of GAO's Quality Assurance Framework that are relevant to our objectives. The framework requires that we plan and perform the engagement to obtain sufficient and appropriate evidence to meet our stated objectives and to discuss any limitations in our work. We believe that the information and data obtained, and the analysis conducted, provide a reasonable basis for any findings and conclusions in this product.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Energy, and other interested parties. In addition, the report will be 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 andersonn@gao.gov. Contact points for our offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report were Amanda Kolling (Assistant Director) and Katherine Killebrew (Analyst in Charge). Other contributors to this report include Antoinette Capaccio, Cynthia Norris, and Dan Royer.

Sincerely yours,

A handwritten signature in black ink that reads "Nathan Anderson". The signature is written in a cursive, flowing style.

Nathan Anderson
Director, Natural Resources and Environment

Enclosure(s) – 2



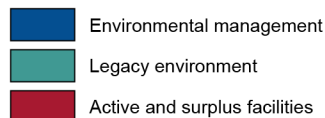
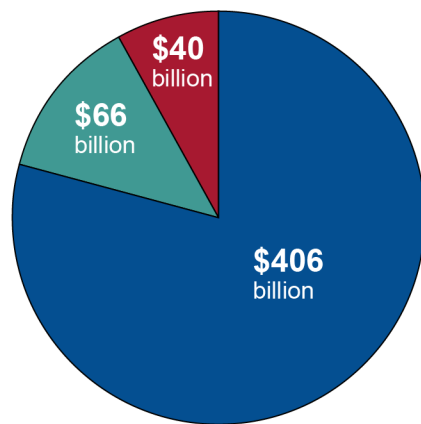
Natural Resources and Environment

JUNE 2021

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

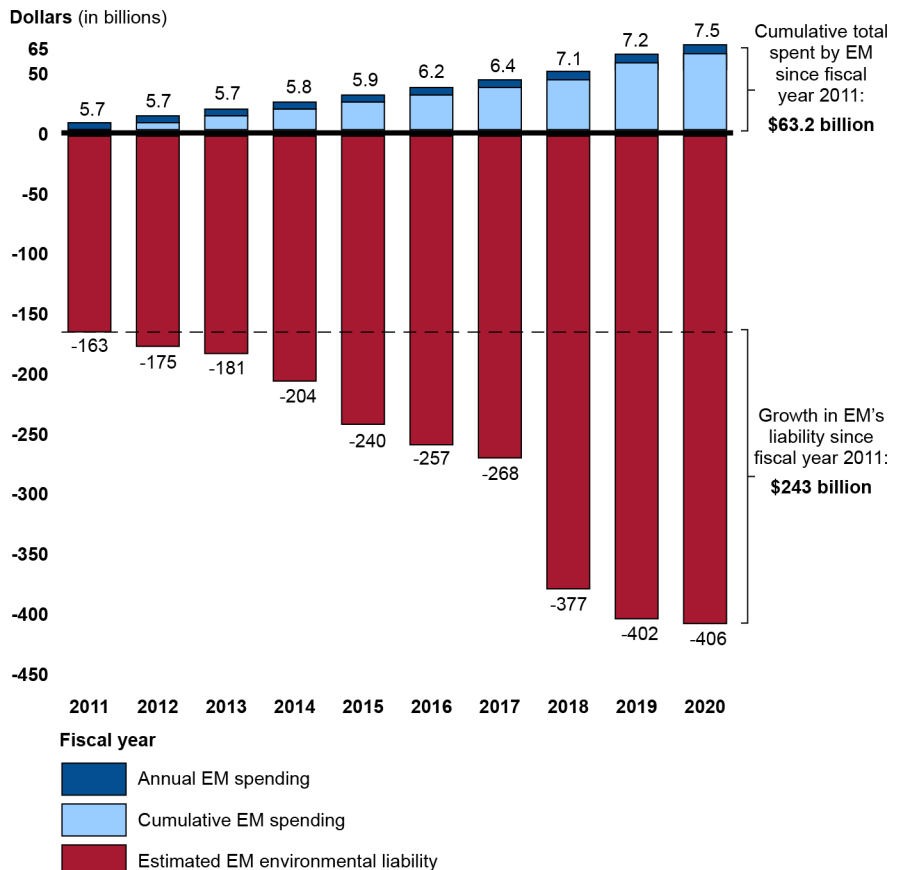
- storing and treating radioactive and hazardous waste from underground tanks;
- addressing soil and groundwater contamination;
- deactivating and decommissioning facilities;
- managing and treating solid waste, such as contaminated tools;
- preparing and disposing of surplus nuclear materials and spent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

¹DOE, *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).

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

ENCLOSURE II

Related GAO Products

High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas. [GAO-21-119SP](#). Washington, D.C.: March 2, 2021.

Hanford Cleanup: DOE's Efforts to Close Tank Farms Would Benefit from Clearer Legal Authorities and Communication. [GAO-21-73](#). Washington, D.C.: January 7, 2021.

Nuclear Waste Disposal: Better Planning Needed to Avoid Potential Disruptions at Waste Isolation Pilot Plant. [GAO-21-48](#). Washington, D.C.: November 19, 2020.

Hanford Waste Treatment Plant: DOE Is Pursuing Pretreatment Alternatives, but Its Strategy Is Unclear While Costs Continue to Rise. [GAO-20-363](#). Washington, D.C.: May 12, 2020.

Nuclear Cleanup: Actions Needed to Improve Cleanup Efforts at DOE's Three Former Gaseous Diffusion Plants. [GAO-20-63](#). Washington, D.C.: December 17, 2019.

Environmental Liabilities: DOE Would Benefit from Incorporating Risk-Informed Decision-Making into Its Cleanup Policy. [GAO-19-339](#). Washington, D.C.: September 18, 2019.

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

Department of Energy: Environmental Liability Continues to Grow, and Significant Management Challenges Remain for Cleanup Efforts. [GAO-19-460T](#). Washington, D.C.: May 1, 2019.

Nuclear Waste Cleanup: DOE Could Improve Program and Project Management by Better Classifying Work and Following Leading Practices. [GAO-19-223](#). Washington, D.C.: February 19, 2019.

Nuclear Waste: DOE Should Take Actions to Improve Oversight of Cleanup Milestones. [GAO-19-207](#). Washington, D.C.: February 14, 2019.

Department of Energy: Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability. [GAO-19-28](#). Washington, D.C.: January 29, 2019.

High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others. [GAO-17-317](#). Washington, D.C.: February 15, 2017.

Nuclear Waste: Opportunities Exist to Reduce Risks and Costs by Evaluating Different Waste Treatment Approaches at Hanford. [GAO-17-306](#). Washington, D.C.: May 3, 2017.

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

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