

Note 13. Environmental and Disposal Liabilities

Environmental and Disposal Liabilities as of September 30, 2018, and 2017

(In billions of dollars)

	2018	2017
Department of Energy.....	494.0	383.8
Department of Defense.....	70.4	68.3
All other entities	12.9	12.4
Total environmental and disposal liabilities	577.3	464.5

During World War II and the Cold War, DOE (or predecessor entities) developed a massive industrial complex to research, produce, and test nuclear weapons. This included nuclear reactors, chemical-processing buildings, metal machining plants, laboratories, and maintenance facilities that manufactured tens of thousands of nuclear warheads and conducted more than 1,000 nuclear tests.

At all sites where these activities took place, some environmental contamination occurred. This contamination was caused by the production, storage, and use of radioactive materials and hazardous chemicals, which resulted in contamination of soil, surface water, and groundwater. The environmental legacy of nuclear weapons production also includes thousands of contaminated buildings and large volumes of waste and special nuclear materials requiring treatment, stabilization, and disposal.

Estimated cleanup costs at sites for which there are no current feasible remediation approaches, such as the Nevada nuclear test site, are excluded from the estimates, although applicable stewardship and monitoring costs for these sites are included. DOE has not been required through regulation to establish remediation activities for these sites.

Estimating DOE's environmental cleanup liability requires making assumptions about future activities and is inherently uncertain. The future course of DOE's environmental cleanup and disposal will depend on a number of fundamental technical and policy choices, many of which have not been made. The sites and facilities could be restored to a condition suitable for any desirable use, or could be restored to a point where they pose no near-term health risks. Achieving the former conditions would have a higher cost but may (or may not) warrant the costs, or be legally required. The environmental and disposal liability estimates include contingency estimates intended to account for the uncertainties associated with the technical cleanup scope of the program. Congressional appropriations at lower than anticipated levels or unplanned delays in project completion would cause increases in life-cycle costs.

DOE's environmental and disposal liabilities also include the estimated cleanup and post-closure responsibilities, including surveillance and monitoring activities, soil and groundwater remediation, and disposition of excess material for sites. The Department is responsible for the post-closure activities at many of the closure sites as well as other sites. The costs for these post-closure activities are estimated for a period of 75 years after the balance sheet date, i.e., through 2093 in fiscal year 2018 and through 2092 in fiscal year 2017. While some post-cleanup monitoring and other long-term stewardship activities post-2093 are included in the liability, there are others DOE expects to continue beyond 2093 for which the costs cannot reasonably be estimated.

A portion of DOE's environmental and disposal liabilities at various field sites includes anticipated costs for facilities managed by DOE's ongoing program operations which will ultimately require stabilization, deactivation, and decommissioning. The estimate is largely based upon a cost-estimating model. Site specific estimates are used in lieu of the cost-estimating model, when available. Cost estimates for ongoing program facilities are updated each year. For facilities newly contaminated since fiscal year 1997, cleanup costs allocated to future periods and not included in environmental and disposal liabilities amounted to \$0.9 billion for both fiscal years 2018 and 2017.

The predominant change in the DOE's environmental liabilities estimates in fiscal year 2018 resulted from Waste Treatment and Immobilization Plant (WTP) construction and operating costs, and the updated tank farm retrieval and closure cost. Other changes resulted from inflation adjustments to reflect constant dollars for the current year; improved and updated estimates for the same scope of work, including changes resulting from deferral or acceleration of work; revisions in technical approach or scope, including additional contamination; updated estimates of projected waste volumes; changes in the DOE's allocable percentage share of future costs; legal and regulatory changes; and cleanup activities performed.

On October 9, 2018, the U.S. Court of Appeals for the Fourth Circuit lifted the Preliminary Injunction, allowing DOE to move forward with termination of construction of the Mixed Oxide (MOX) facility. With termination of the MOX facility, which was the fiscal year 2018 approach for plutonium disposition, DOE will pursue a Dilute and Dispose approach in fiscal year 2019. The lower cost of the Dilute and Dispose approach is expected to reduce the program liability. DOE remains committed to disposing of 34 metric tons of plutonium.

Please refer to the financial statements of DOE for detailed information regarding DOE's environmental and disposal liabilities, including cleanup costs.

Beginning in fiscal year 2018, DOD's individual amounts are reported together as a single line total for its portion of Environmental and Disposal Liabilities. DOD must restore active installations, installations affected by base realignment and closure, and other areas formerly used as DOD sites. DOD also bears responsibility for disposal of chemical weapons and environmental costs associated with the disposal of weapons systems (primarily nuclear powered aircraft carriers and submarines).

DOD follows the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, *Superfund Amendments and Reauthorization Act*, *Resource Conservation and Recovery Act (RCRA)* and other applicable federal or state laws to clean up contamination. The CERCLA and RCRA require the DOD to clean up contamination in coordination with regulatory entities, current owners of property damaged by the Department, and third parties that have a partial responsibility for the environmental restoration. Failure to comply with agreements and legal mandates puts the DOD at risk of incurring fines and penalties.

DOD uses engineering estimates and independently validated models to estimate environmental costs. The engineering estimates are used after obtaining extensive data during the remedial investigation/feasibility phase of the environmental project.

For general PP&E placed into service after September 30, 1997, DOD expenses associated environmental costs systematically over the life of the asset using two methods: physical capacity for operating landfills and life expectancy in years for all other assets. DOD expenses the full cost to clean up contamination for stewardship PP&E at the time the asset is placed into service. DOD has expensed the costs for cleanup associated with general PP&E placed into service before October 1, 1997, except for costs intended to be recovered through user charges; for those costs, DOD has expensed cleanup costs associated with that portion of the asset life that has passed since it was placed into service. DOD systematically recognizes the remaining cost over the remaining life of the asset. The unrecognized portion of the estimated total cleanup costs associated with disposal of general PP&E as of September 30, 2018 was \$4.8 billion; this amount was unknown as of September 30, 2017.

DOD is unable to estimate and report a liability for environmental restoration and corrective action for buried chemical munitions and agents, because the extent of the buried chemical munitions and agents is unknown at this time. DOD is also unable to provide a complete estimate for the Formerly Utilized Sites Remedial Action Program. DOD has ongoing studies and will update its estimate as additional liabilities are identified. DOD has the potential to incur costs for restoration initiatives in conjunction with returning overseas DOD facilities to host nations. However, DOD is unable to provide a reasonable estimate at this time because the extent of required restoration is unknown.

Please refer to the financial statements of DOD for further information regarding DOD's environmental and disposal liabilities, including cleanup costs.