

**Defense Environmental Programs
Annual Report to Congress
for Fiscal Year 2018**



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I. INTRODUCTION

This Defense Environmental Programs Annual Report to Congress for Fiscal Year (FY) 2018 contains information to satisfy the following requirements:

- The funding invested in and progress of the Department of Defense's (DoD) environmental programs – Environmental Restoration, Environmental Quality (EQ), and Environmental Technology – in accordance with title 10, United States Code (U.S.C.), section 2711 (Sections II-IV);
- The Department's ongoing decontamination activities on withdrawn or reserved lands in accordance with section 2916(b) of the National Defense Authorization Act (NDAA) for FY 2014 (Public Law 113-66) (Section V); and
- A list of DoD installations and Formerly Used Defense Sites (FUDS) properties where DoD obligated funding for environmental restoration activities in FY 2018, as well as reasons for increases in cleanup cost estimates since FY 2017, in accordance with language in House Report (H.R.) 113-113, accompanying H.R. 2397, the Department of Defense Appropriations Bill, 2014 (Section VI, Appendix A, and Appendix B).

The Department's priorities for its environmental programs are: (1) protect the environment to ensure that DoD has the land, water, and airspace needed for military readiness; (2) protect the health of the military and civilian personnel and their families who live and work on DoD bases; (3) ensure DoD operations do not adversely affect the health or environment of surrounding communities; and (4) preserve resources for future generations. To achieve these objectives, DoD is committed to continuous improvement, greater efficiency, and the use of new technology where feasible. In FY 2018, DoD obligated approximately \$3.7 billion for its environmental programs. This includes \$1.6 billion for environmental restoration activities, \$1.9 billion for EQ activities, and \$225 million for environmental technology activities. In the President's FY 2020 budget, DoD is requesting just over \$3.6 billion for its environmental programs to continue ensuring the protection of human health and the environment, and to sustain the resources required to support the readiness of our Nation's Armed Forces.

Table 1 summarizes the overall DoD environmental program funding from FY 2014 through FY 2020.

Table 1: Overall DoD Environmental Program Funding (millions of dollars)*

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Environmental Restoration							
Active Installations and FUDS	\$1,286.5	\$1,221.0	\$1,161.1	\$1,082.3	\$1,210.4	\$1,235.2	\$1,071.8
Base Realignment and Closure (BRAC) Locations*	\$697.5	\$609.6	\$415.5	\$347.0	\$351.5	\$319.3**	\$253.7**
Restoration Total	\$1,984.0	\$1,830.6	\$1,576.6	\$1,429.3	\$1,561.9	\$1,554.6	\$1,325.5
EQ							
Compliance	\$1,379.5	\$1,306.0	\$1,271.8	\$1,511.8	\$1,356.6	\$1,556.9	\$1,608.3
Natural and Cultural Resources	\$444.6	\$377.2	\$443.4	\$429.0	\$498.1	\$427.3	\$444.9
Pollution Prevention	\$97.2	\$94.3	\$87.1	\$67.2	\$62.8	\$71.8	\$66.3
EQ Total	\$1,921.3	\$1,777.5	\$1,802.3	\$2,008.0	\$1,917.5	\$2,056.0	\$2,119.5
Environmental Technology							
Technology Total	\$203.1	\$184.5	\$189.4	\$183.0	\$224.8	\$216.3	\$177.5
DoD Total***	\$4,108.5	\$3,792.6	\$3,568.3	\$3,620.3	\$3,704.2	\$3,826.8	\$3,622.5

* Includes all applicable congressional funding additions for FY 2014 through FY 2019.

+ BRAC FY 2014 through FY 2018 actuals include prior year funds and land sale revenue. BRAC FY 2016 through FY 2020 omits Defense Logistics Agency (DLA) actuals.

** Excludes \$85.1 million of planned obligations from prior year funds and anticipated land sale revenue.

** Excludes \$53.9 million of planned obligations from prior year funds and anticipated land sale revenue.

*** Due to rounding, subtotals may not equal FY totals.

For more information on DoD's environmental programs, please visit:

<https://www.denix.osd.mil>.

II. ENVIRONMENTAL RESTORATION PROGRAM

The Department began environmental restoration in 1975 with the Installation Restoration Program (IRP). The IRP addresses contamination from hazardous substances, pollutants, or contaminants at active installations, FUDS properties, and BRAC locations in the United States. In 2001, DoD established the Military Munitions Response Program (MMRP) to address former defense sites (i.e., closed military ranges) known or suspected to contain unexploded ordnance (UXO), discarded military munitions, or munitions constituents. These sites are referred to as munitions response sites (MRSs). Through these programs, DoD complies with the federal cleanup law - the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund.

The Department remains focused on continuously improving its environmental restoration program by developing technologies to reduce costs and accelerate cleanup, and establishing policies and guidance that maximize cleanup program efficiency and effectiveness. DoD also partners with regulatory and community stakeholders throughout the cleanup process to maximize transparency, public participation, and collaboration. Partnering is vital to ensuring DoD makes cost-effective and efficient decisions. These initiatives help ensure that DoD makes the best use of available resources to steadily move sites through the cleanup process and achieve program goals while protecting human health, safety, and the environment. The Department measures cleanup progress against the Response Complete (RC) milestone, which occurs when the cleanup activities are complete (although DoD or a subsequent owner may continue to monitor the site). Of the nearly 39,500 IRP sites and MRSs in the inventory, DoD has achieved the RC milestone at over 33,500 sites (85 percent).

Environmental Restoration Goals

The Department maintains and tracks against environmental restoration goals to assist in driving cleanup progress toward achieving the RC milestone. The DoD Components prioritize resources to meet the goals listed in Table 2 in a cost-effective manner. The goals demonstrate progress in a streamlined and transparent fashion.

Table 2 lists the RC goals and summarizes the Department’s progress toward achieving them. The table presents the number of sites subject to these goals, the total number and percentage of sites that have achieved the goals from the beginning of the program through FY 2018, the number and percentage of sites projected to achieve the goals in FY 2019 and FY 2020, and the total number and percentage of sites projected to achieve the goals from the beginning of the program through FY 2020.

Table 2: RC Goals and Progress*

Goals	Number of Sites Subject to the Goals	Total Number (and Percentage) of Sites that Achieved the Goals through FY 2018	Number (and Percentage) of Sites Projected to Achieve the Goals in FY 2019	Number (and Percentage) of Sites Projected to Achieve the Goals in FY 2020	Total Number (and Percentage) of Sites Projected to Achieve the Goals through FY 2020
Achieve RC at 90% and 95% of IRP sites and MRSs at active installations and BRAC locations, and IRP sites at FUDS properties, by the end of FY 2018 and FY 2021, respectively	36,897	32,346 (88%)	371 (1%)	820 (2%)	33,537 (91%)

* Excludes FUDS MRSs; potentially responsible party sites, which are sites where DoD has identified that an individual or company is potentially responsible for contributing to the contamination; and sites where a DoD Component cannot obtain rights of entry to complete investigations.

Through FY 2018, the Department achieved RC at 88 percent of IRP sites and MRSs at active installations and BRAC locations, and IRP sites at FUDS properties, falling just short of the FY 2018 RC goal. DoD is currently projecting that it will also fall short of the FY 2021 RC goal; it anticipates achieving RC at 92 percent of IRP sites and MRSs at active installations and BRAC locations, and IRP sites at FUDS properties, by the end of FY 2021. This projection is based on the sites in the Defense Environmental Restoration Program (DERP) inventory as of the end of FY 2018.

The Department is also focusing on reducing the potential risk to human health and the environment posed by FUDS MRSs. To accomplish this objective, the Department began interim risk management activities in FY 2015. These activities include mailing letters that provide explosives safety education material to property owners and establishing a call center to answer questions. As of the end of FY 2018, DoD has mailed over 20,000 letters and received over 600 calls.

Additional information about the status of DoD’s cleanup efforts and funding can be found on the DoD Cleanup Landing website at <https://www.denix.osd.mil/cleanup/>.

IRP Site Status and Funding

Table 3 summarizes the cleanup status of IRP sites at active installations, FUDS properties, and BRAC locations. The table presents the number of sites in the inventory, the number of sites at Remedy In Place (RIP)¹ and RC through FY 2017 and FY 2018, and the changes in RIP and RC status from FY 2017 to FY 2018.

Table 3: IRP Site Status

	Total IRP Inventory (FY 2018)	RIP			RC		
		Number of IRP Sites at RIP through FY 2017	Number of IRP Sites at RIP through FY 2018	Change in RIP Status from FY 2017 to FY 2018	Number of IRP Sites at RC through FY 2017	Number of IRP Sites at RC through FY 2018	Change in RC Status from FY 2017 to FY 2018
Active Installations							
Army	11,281	10,569	10,615	46	10,267	10,331	64
Department of the Navy (DON)*	3,995	3,756	3,693	-63*	3,506	3,446	-60*
Air Force	6,924	6,135	6,113	-22**	5,607	5,639	32
DLA	218	195	194	-1**	185	185	0
Active Total	22,418	20,655	20,615	-40	19,565	19,601	36
FUDS Properties							
FUDS Total	3,115	2,596	2,665	69	2,554	2,621	67
BRAC Locations							
Army	2,111	2,019	2,020	1	1,970	1,982	12
DON*	1,160	1,062	1,117	55	928	985	57
Air Force	5,137	4,966	5,005	39	4,805	4,861	56
DLA	48	48	48	0	47	47	0
BRAC Total	8,456	8,095	8,190	95	7,750	7,875	125
DoD Total	33,989	31,346	31,470	124	29,869	30,097	228

* DON includes Navy and Marine Corps; DON manages Navy and Marine Corps environmental restoration activities as a combined program.

+ The number of sites at RIP and RC decreased because DON made corrections to historic data in FY 2018, such as removing duplicate sites from its DERP inventory.

** The number of sites at RIP decreased because the Air Force moved sites from its DERP inventory to its Compliance Cleanup program in FY 2018; the Air Force moved these sites because they are not eligible for the DERP.

+** The number of sites at RIP decreased because additional studies are required at a site reported at RIP in FY 2017.

¹ The Department measures the number of sites at RIP, which occurs when cleanup systems are constructed and operational.

Table 4 summarizes IRP funding from FY 2014 through FY 2020 at active installations, FUDS properties, and BRAC locations. The funding in the FY 2020 request is consistent with previous President Budget requests, while the FY 2018 actuals and FY 2019 appropriated amounts reflect significant Congressional additions.

Table 4: IRP Funding* (millions of dollars)

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Active Installations							
Army	\$201.9	\$216.8	\$200.5	\$139.6	\$195.8	\$180.3	\$178.3
DON⁺	\$262.1	\$240.9	\$243.5	\$238.5	\$289.6	\$308.1	\$272.1
Air Force	\$403.4	\$398.2	\$352.9	\$333.1	\$336.3	\$339.7	\$228.8
Defense-wide^{**}	\$11.0	\$7.9	\$5.8	\$6.6	\$7.7	\$19.0	\$8.2
Active Total	\$878.4	\$863.9	\$802.8	\$717.8	\$829.4	\$847.0	\$687.5
FUDS Properties							
FUDS Total	\$172.3	\$143.8	\$156.5	\$149.4	\$147.0	\$182.6	\$127.7
BRAC Locations^{**}							
Army	\$207.2	\$106.1	\$66.7	\$43.9	\$50.1	\$47.0	\$33.2
DON⁺	\$119.2	\$181.1	\$149.9	\$148.9	\$185.3	\$186.2	\$123.6
Air Force	\$154.3	\$94.1	\$79.0	\$81.9	\$64.4	\$63.2	\$50.4
Defense-wide^{**}	\$3.2	\$2.6	\$2.0	\$2.5	\$3.0	\$3.0	\$1.8
BRAC Total	\$483.8	\$384.0	\$297.7	\$277.2	\$302.9	\$299.4	\$209.0
DoD Total^{***}	\$1,534.4	\$1,391.6	\$1,256.9	\$1,144.5	\$1,279.3	\$1,329.0	\$1,024.2

* This table includes funding for all program management requirements at active installations, FUDS properties, and BRAC locations.

⁺ DON includes Navy and Marine Corps; DON manages Navy and Marine Corps environmental restoration activities as a combined program.

^{**} Defense-wide accounts include other defense agencies and DLA.

⁺⁺ BRAC FY 2014 through FY 2018 actuals include prior year funds and land sale revenue. FY 2019 appropriated and FY 2020 requested amounts also include prior year funds and anticipated land sale revenue.

^{***} Due to rounding, subtotals may not equal FY totals.

In recent years, the presence of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) in drinking water has become an emerging issue. PFOS and PFOA are part of a class of man-made chemicals used in many industrial and consumer products to make the products resist heat, stains, water, and grease. These substances are not uniquely attributable to DoD activities and are far more ubiquitous in consumer and industrial products. In the 1970s, DoD began using aqueous film forming foam (AFFF), which contains PFOS, and in some cases PFOA. AFFF is mission critical because it quickly extinguishes petroleum-based fires. As a result of AFFF use, PFOS and PFOA have been detected at a number of DoD installations.

On May 19, 2016, the U.S. Environmental Protection Agency (EPA) issued Safe Drinking Water Act (SDWA) Lifetime Health Advisories (LHAs) recommending the individual or combined levels of PFOS and PFOA in drinking water be at or below 70 parts per trillion. Despite the fact that the drinking water LHA for PFOS and PFOA is only an advisory, DoD has:

- 1) Taken quick action to address PFOS and PFOA in the drinking water it supplies;
- 2) Implemented response actions in accordance with CERCLA; and
- 3) Committed significant funds in research and development to identify and test fluorine-free AFFF.

The Department followed a comprehensive approach to identify installations where it stored or used AFFF containing PFOS or PFOA. As of July 2018, DoD had identified 401 active installations and BRAC locations with at least one area where there is a known or suspected release of PFOS or PFOA. The DoD Components then determined whether there was exposure through drinking water and, if so, the priority was to address high exposure levels. DoD's actions are consistent with EPA's LHA recommended actions, which include treatment of drinking water or closing drinking water wells and providing alternative water supplies, such as bottled water or connecting private residents to public drinking water systems.

Additionally, the NDAA for FY 2018 required the Secretary of Health and Human Services, acting through the Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry (ATSDR), in consultation with DoD, to conduct an exposure assessment and a study on the human health implications of Per- and Polyfluoroalkyl Substances (PFAS). Under the NDAA for FY 2018, DoD provided \$10 million to ATSDR for this purpose. Under the NDAA for FY 2019, DoD provided an additional \$10 million for FY 2018 and \$10 million for FY 2019.

Once the exposure pathway is broken, the DoD Components are prioritizing sites for further actions using the normal CERCLA process to fully investigate the releases and determine the appropriate cleanup actions based on risk. This longstanding site prioritization process is based on "worst first," meaning the DoD Components will address sites that pose a greater potential risk to human health and the environment first. The known or suspected PFOS and PFOA release areas are in various stages of assessment, investigation, and cleanup. Although the EPA LHA level is only guidance under the SDWA and is not an enforceable drinking water standard, DoD considers EPA's LHA toxicity information when assessing risk to human health under CERCLA consistent with EPA's risk assessment guidance.

Environmental cleanup costs are increasing due to the cleanup of emerging contaminants, such as PFOS and PFOA. Now that DoD has an initial inventory of known or suspected PFOS and PFOA release areas, it is determining the potential cleanup costs as it collects information on the nature and extent of the releases. These costs will be fully incorporated into the remaining cost-to-complete estimates over the next few years as investigations are completed and more is known about the sites.

MRS Status and Funding

Table 5 summarizes the cleanup status of MRSs at active installations, FUDS properties, and BRAC locations. The table presents the number of MRSs in the inventory; the number of MRSs at RIP and RC through FY 2017 and FY 2018; and the changes in RIP and RC status from FY 2017 to FY 2018.

Table 5: MRS Status

	Total MRS Inventory (FY 2018)	RIP			RC		
		Number of MRSS at RIP through FY 2017	Number of MRSS at RIP through FY 2018	Change in RIP Status from FY 2017 to FY 2018	Number of MRSS at RC through FY 2017	Number of MRSS at RC through FY 2018	Change in RC Status from FY 2017 to FY 2018
Active Installations							
Army	1,385	1,130	1,145	15	1,129	1,139	10
DON*	420	182	188	6	179	186	7
Air Force	1,020	768	805	37	765	805	40
DLA	7	0	0	0	0	0	0
Active Total	2,832	2,080	2,138	58	2,073	2,130	57
FUDS Properties							
FUDS Total	2,301	1,014	1,029	15	1,014	1,029	15
BRAC Locations							
Army	180	131	131	0	130	130	0
DON*	40	20	20	0	19	19	0
Air Force	140	126	127	1	123	124	1
DLA ⁺	0	N/A	N/A	N/A	N/A	N/A	N/A
BRAC Total	360	277	278	1	272	273	1
DoD Total	5,493	3,371	3,445	74	3,359	3,432	73

* DON includes Navy and Marine Corps; DON manages Navy and Marine Corps environmental restoration activities as a combined program.

⁺ DLA does not have MRSs at BRAC locations.

Table 6 summarizes MMRP funding from FY 2014 through FY 2020 at active installations, FUDS properties, and BRAC locations.

Table 6: MMRP Funding (millions of dollars)*

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Active Installations							
Army	\$67.5	\$53.1	\$34.3	\$30.6	\$40.0	\$55.6	\$29.2
DON⁺	\$53.9	\$45.4	\$56.2	\$50.8	\$76.3	\$57.7	\$63.8
Air Force	\$16.1	\$30.8	\$15.0	\$38.4	\$16.2	\$26.2	\$73.9
Defense-wide^{**}	\$0.2	\$0.0	\$2.6	\$1.6	\$0.1	\$0.0	\$0.9
Active Total	\$137.7	\$129.3	\$108.2	\$121.3	\$132.6	\$139.5	\$167.8
FUDS Properties							
FUDS Total	\$98.2	\$84.1	\$93.7	\$93.6	\$101.4	\$66.1	\$88.8
BRAC Locations⁺⁺							
Army	\$129.9	\$181.8	\$42.1	\$48.2	\$24.7	\$67.8	\$24.3
DON⁺	\$14.4	\$22.0	\$11.8	\$12.3	\$17.1	\$15.2	\$24.8
Air Force	\$5.0	\$2.6	\$1.1	\$0.4	\$0.0 ^{***}	\$0.0 ^{***}	\$0.0 ^{***}
Defense-wide^{**}	N/A	N/A	N/A	N/A	\$0.0	\$0.0	\$0.0
BRAC Total	\$149.3	\$206.4	\$55.0	\$60.9	\$41.8	\$83.1	\$49.0
DoD Total⁺⁺⁺	\$385.2	\$419.8	\$256.9	\$275.9	\$275.7	\$288.7	\$305.6

* This table does not include program management for the MMRP.

⁺ DON includes Navy and Marine Corps; DON manages Navy and Marine Corps environmental restoration activities as a combined program.

^{**} Defense-wide accounts include other defense agencies and DLA. DLA does not have MRSs at BRAC locations.

⁺⁺ BRAC FY 2014 through FY 2018 actuals include prior year funds and land sale revenue. FY 2019 appropriated and FY 2020 requested amounts also include prior year funds and anticipated land sale revenue.

^{***} Air Force BRAC funding for FY 2018 through FY 2020 is less than \$0.1 million.

⁺⁺⁺ Due to rounding, subtotals may not equal FY totals.

BRAC Planning and Compliance Funding

Table 7 summarizes funding for planning and compliance projects, such as facility assessments and surveys, at BRAC locations from FY 2014 through FY 2020.

Table 7: BRAC Planning and Compliance Funding* (millions of dollars)

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
BRAC Locations							
Army	\$46.9	\$18.5	\$64.5	\$10.7	\$10.0	\$21.3	\$49.6
DON⁺	\$0.7	\$0.4	\$0.2	\$0.0	\$0.0	\$0.6	\$0.0
Air Force	\$16.7	\$0.3	\$0.1	\$0.5	\$0.0	\$0.0	\$0.0
Defense-wide^{**}	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
DoD Total⁺⁺	\$64.3	\$19.2	\$64.9	\$11.2	\$10.0	\$21.9	\$49.6

* Includes prior year funding and land sale revenue.

⁺ DON includes Navy and Marine Corps; DON manages Navy and Marine Corps environmental restoration activities as a combined program.

^{**} Defense-wide accounts include other defense agencies and DLA.

⁺⁺ Due to rounding, account subtotals may not equal FY totals.

Beginning in FY 2014, Congress consolidated the BRAC accounts, providing DoD with increased flexibility to use unobligated prior year funds across the BRAC cleanup inventory. The Department continues to use its remaining balances from prior years and its anticipated land sale revenue to supplement its annual appropriations and accelerate BRAC cleanup. Table 8 summarizes BRAC funding, including annual appropriations, prior year funds, and land sale revenue, from FY 2018 through FY 2020.

Table 8: BRAC Funding Breakout (millions of dollars)

	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Army			
Annual Appropriation	\$43.1	\$54.2	\$55.0
Prior Year Funds	\$41.7	\$41.3	\$47.0
Land Sale Revenue	\$0.0	\$40.7	\$5.0
Army Total Funding*	\$84.9	\$136.2	\$107.0
DON[†]			
Annual Appropriation	\$183.6	\$202.0	\$148.4
Prior Year Funds	\$8.8	\$0.0	\$0.0
Land Sale Revenue	\$10.0	\$0.0	\$0.0
DON Total Funding*	\$202.3	\$202.0	\$148.4
Air Force			
Annual Appropriation	\$52.1	\$63.1	\$50.3
Prior Year Funds	\$11.8	\$0.0	\$0.0
Land Sale Revenue	\$0.4	\$0.1	\$0.1
Air Force Total Funding*	\$64.3	\$63.2	\$50.4
DLA^{**}			
Annual Appropriation	\$0.0	\$0.0	\$0.0
Prior Year Funds	\$3.0	\$3.0	\$1.8
Land Sale Revenue	\$0.0	\$0.0	\$0.0
DLA Total Funding*	\$3.0	\$3.0	\$1.8
DoD Total⁺⁺⁺			
Annual Appropriation	\$278.8	\$319.3	\$253.7
Prior Year Funds	\$62.3	\$41.3	\$47.0
Land Sale Revenue	\$10.4	\$40.8	\$5.1
DoD Total Funding	\$351.5	\$401.4	\$305.8

* Due to rounding, subtotals and the DoD Total may not equal FY totals.

† DON includes Navy and Marine Corps; DON manages Navy and Marine Corps environmental restoration activities as a combined program.

** Funding is from a settlement DLA received from Sunoco to perform cleanup activities at the former Defense Supply Center Philadelphia.

+++ DoD total does not include DLA.

III. EQ PROGRAMS

The Department’s EQ Programs address compliance with environmental laws and regulations, protection of natural and cultural resources on DoD lands, and pollution prevention.

Compliance

The Department provides resources through its Compliance Program to comply with applicable requirements, such as Federal, State, and local environmental laws, regulations, and ordinances, for installations located in the United States. Additionally, the Compliance Program includes applicable environmental compliance, remediation, and planning requirements for installations located outside of the United States. Under this program, DoD activities include sampling and analyzing pollutant discharges to air and water, maintaining environmental permits for regulated activities, providing safe drinking water, and disposing of regulated waste. The Compliance Program also includes projects to upgrade wastewater treatment facilities and install air pollution controls to meet new regulatory standards. In FY 2018, the Department maintained a Clean Water Act permit compliance rate above 90 percent and a drinking water compliance rate above 93 percent, exceeding the national average. In addition, DoD’s overall solid waste diversion rate including non-hazardous solid waste and construction and demolition debris was 68 percent in FY 2018, an increase of 6 percent from 2017.

Table 9 summarizes Compliance Program funding from FY 2014 through FY 2020 for the Army, Navy, Air Force, Marine Corps, and Defense-wide accounts.

Table 9: Compliance Program Funding (millions of dollars)

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Army	\$380.2	\$347.6	\$368.6	\$397.5	\$383.6	\$427.4	\$455.8
Navy	\$374.3	\$354.9	\$359.8	\$351.1	\$362.0	\$399.7	\$424.9
Air Force	\$293.9	\$283.5	\$302.2	\$358.6	\$288.8	\$334.8	\$358.2
Marine Corps	\$115.6	\$148.1	\$103.4	\$119.1	\$106.4	\$103.7	\$114.9
Defense-wide*	\$215.5	\$171.9	\$137.8	\$285.5	\$215.8	\$291.3	\$254.5
DoD Total⁺	\$1,379.5	\$1,306.0	\$1,271.8	\$1,511.8	\$1,356.6	\$1,556.9	\$1,608.3

* Defense-wide accounts include DLA and other defense agencies.

⁺ Due to rounding, account subtotals may not equal FY totals.

Overall Trend Analysis

Overall DoD Compliance Program funding decreased from FY 2014 through FY 2016, in part because the Budget Control Act (BCA) led to a trend in reduced funding across the Department. In FY 2017, DoD total funding increased across most of the DoD Components to fund efforts that were delayed in previous FYs due to the BCA. In FY 2018 and FY 2019, funding levels fluctuate due to military construction projects required to maintain legal compliance. The FY 2020 requested funding remains relatively consistent with FY 2019.

Explanation of Significant Changes in Funding Amounts

- From FY 2017 to FY 2018, Air Force funding decreased by 19.5 percent to fund other Air Force Programs. Marine Corps funding decreased by 10.7 percent due to completion of a Clean Air Act related project at Marine Corps Air Station Cherry Point. Defense-wide funding decreased by 24.4 percent primarily due to military construction project completions and DLA compliance-related cleanup reductions at petroleum, oils, and lubricants (POL) sites.
- From FY 2018 to FY 2019, Army funding increases by 11.4 percent due to manpower cost increases and compliance-related cleanup. Navy funding increases by 10.4 percent due to investments in hazardous material and hazardous waste facilities and higher manpower costs. Air Force funding increases by 16 percent to ensure the Air Force meets its full compliance obligations after reductions in the FY 2018 program. Defense-wide funding increases by 35 percent primarily because of the addition of a military construction project at Joint Base Langley-Eustis during FY 2019. In addition, there is compliance-related cleanup of DLA POL facilities planned at three installations.
- From FY 2019 to FY 2020, Marine Corps requests an increase of 10.8 percent mainly for increased environmental impact statement support to the Pacific relocation. The Defense-wide request funding decreases by 12.6 percent due to completion of some hazardous waste disposal in the Missile Defense Agency and completion of some compliance-related cleanup at DLA.

The Department is committed to ensuring safe drinking water for the people living and working on our installations. DoD provides drinking water to approximately 2 million people on its installations worldwide. The Department began testing DoD-operated drinking water systems worldwide in June 2016 to identify drinking water that exceeded EPA's LHA for PFOS and PFOA. DoD completed testing of all 524 DoD-owned drinking water systems worldwide in August 2017. These tests determined that 24 DoD drinking water systems contained PFOS and/or PFOA above the EPA LHA. Accordingly, though not required by law or regulation, DoD has followed the EPA LHA recommendations, to include providing consumers bottled water or additional water treatment. In cases where DoD purchases drinking water, the Department identified 12 drinking water systems where the results were above the EPA LHA level. These installations are working with the drinking water supplier(s) to take appropriate actions. Currently, no one is known to be drinking water above the LHA level.

Natural and Cultural Resources

The Department manages its natural and cultural resources and complies with existing laws (e.g., Endangered Species Act, Sikes Act, National Historic Preservation Act) to enable continued access to testing and training lands, and ensure the long-term sustainability of our Nation’s natural and cultural heritage. The Department manages more than 26 million acres of land that contain high quality, often unique habitats, that provide food and shelter for more than 550 species at-risk and nearly 500 federally listed threatened or endangered species. Of these species, 60 listed species and 74 species at-risk are found only on DoD lands. The Department also manages and maintains cultural resources at nearly 350 DoD installations that contain more than 136,000 archaeological sites.

Table 10 summarizes natural and cultural resources funding from FY 2014 through FY 2020 for the Army, Navy, Air Force, Marine Corps, and Defense-wide accounts.

Table 10: Natural and Cultural Resources Funding (millions of dollars)

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Army	\$174.6	\$182.2	\$187.3	\$209.2	\$189.8	\$178.0	\$187.8
Navy	\$75.0	\$57.2	\$65.6	\$60.5	\$79.1	\$73.7	\$77.6
Air Force	\$80.0	\$53.4	\$88.4	\$53.4	\$99.5	\$47.0	\$55.1
Marine Corps	\$46.1	\$27.3	\$26.8	\$36.8	\$33.4	\$36.9	\$43.4
Defense-wide*	\$68.9	\$57.1	\$75.3	\$69.1	\$96.3	\$91.7	\$81.0
DoD Total⁺	\$444.6	\$377.2	\$443.4	\$429.0	\$498.1	\$427.3	\$444.9

* Defense-wide accounts include DLA and other defense agencies.

+ Due to rounding, account subtotals may not equal FY totals.

Overall Trend Analysis

Funding for natural and cultural resources activities increased overall between FY 2014 and FY 2018, primarily due to a congressional add in FY 2018 for the Readiness and Environmental Protection Integration (REPI) Program. In addition, Air Force funding increased in FY 2018 due to additional Integrated Natural Resources Management Plans (INRMPs) and Threatened and Endangered (T&E) Species requirements. FY 2019 total appropriated funding decreases with a return to normal funding levels for the Air Force. The FY 2020 natural and cultural resources total funding request increases slightly.

Explanation of Significant Changes in Funding Amounts

- From FY 2017 to FY 2018, Navy funding increased by 30.7 percent in part because of project management needs and challenges associated with managing agricultural lands. Air Force funding nearly doubled due to INRMP and T&E Species requirements. Defense-wide funding increased by 39.4 percent mostly due to increases in REPI Program funding.
- From FY 2018 to FY 2019, Air Force funding decreases by 52.8 percent to return to FY 2017 funding levels.

- From FY 2019 to FY 2020, DoD anticipates Air Force funding will increase by 17.2 percent to address T&E species. Marine Corps funding is expected to increase by 16.8 percent for historic building surveys and other requirements in support of efforts to optimize the Marine Corps facilities footprint. Defense-wide funding is expected to decrease by 11.7 percent reflecting a return to normal funding levels after a congressional add for the REPI Program in FY 2019.

Pollution Prevention

The Department created the Pollution Prevention Program to reduce or eliminate the use of hazardous materials, minimize waste generation, and reduce air emissions from industrial processes and pollutant discharges to wastewater treatment systems. DoD also implements energy, water, and fuel efficiency measures that, while not funded with environmental dollars, further reduce pollution and better use existing resources. Together, these pollution prevention investments have the potential to reduce costs throughout DoD. The flexible framework for this program not only helps DoD prioritize cost-effective initiatives, but also ensures safe, uninterrupted operations, and sustains military readiness.

Table 11 summarizes Pollution Prevention Program funding from FY 2014 through FY 2020 for the Army, Navy, Air Force, Marine Corps, and Defense-wide accounts.

Table 11: Pollution Prevention Program Funding (millions of dollars)

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Army	\$31.6	\$36.2	\$27.4	\$21.2	\$22.5	\$17.9	\$12.6
Navy	\$7.4	\$4.1	\$8.3	\$4.2	\$4.6	\$5.1	\$3.4
Air Force	\$30.1	\$21.0	\$23.0	\$18.2	\$18.0	\$19.7	\$21.7
Marine Corps	\$21.2	\$20.7	\$13.4	\$12.9	\$6.8	\$15.7	\$15.1
Defense-wide*	\$6.9	\$12.3	\$15.0	\$10.7	\$10.9	\$13.4	\$13.5
DoD Total⁺	\$97.2	\$94.3	\$87.1	\$67.2	\$62.8	\$71.8	\$66.3

* Defense-wide accounts include DLA and other defense agencies.

⁺ Due to rounding, account subtotals may not equal FY totals.

Overall Trend Analysis

Overall funding for the Pollution Prevention Program decreased from FY 2014 through FY 2018. The DoD Components reduced pollution prevention funding to preserve funding for other programs as most Pollution Prevention is proactive, but not directly linked to legal requirements.

Explanation of Significant Changes in Funding Amounts

- From FY 2017 to FY 2018, Marine Corps funding decreased by 47.3 percent due to reductions in funding for hazardous materials and hazardous waste management efforts.

- From FY 2018 to FY 2019, Army funding decreases by 20.4 percent due to Army achieving most of the pollution prevention goals. Marine Corps funding increases by over 100 percent to return to previous funding levels.
- From FY 2019 to FY 2020, the funding request for the Army decreases by 30 percent as funding was diverted to higher priority mission needs. Air Force funding is expected to increase by 10.2 percent to address the use of hazardous materials and to reduce hazardous and solid waste.

IV. ENVIRONMENTAL TECHNOLOGY PROGRAMS

The Office of the Secretary of Defense oversees the Military Departments' and Defense-wide environmental technology programs and manages the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP). The mission of the environmental technology programs is to address high-priority environmental challenges. The DoD Components' environmental technology investments focus on unique Military Service requirements and complement other Defense-wide investments. SERDP, ESTCP, and the DoD Components work together to coordinate and leverage these investments.

Table 12 summarizes environmental technology program funding from FY 2014 through FY 2020 for the Army, Navy, Air Force, and Defense-wide accounts.

Table 12: Environmental Technology Program Funding (millions of dollars)

	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Appropriated	FY 2020 Requested
Army*							
Army Total	\$47.5	\$44.9	\$54.7	\$60.3	\$90.9	\$75.0	\$28.6
DON†							
DON Total	\$37.3	\$28.8	\$35.5	\$33.4	\$34.3	\$34.4	\$37.2
Air Force							
Air Force Total	\$10.6	\$9.3	\$8.3	\$0.0	\$0.0	\$0.0	\$0.0
Defense-wide**							
SERDP**	\$62.3	\$56.4	\$54.3	\$63.2	\$63.1	\$76.3	\$66.2
ESTCP**	\$39.8	\$39.4	\$31.3	\$21.2	\$31.4	\$24.7	\$39.2
Defense Warfighter Protection Program	\$5.6	\$5.7	\$5.3	\$4.9	\$5.1	\$5.9	\$6.3
Defense-wide Total	\$107.7	\$101.4	\$90.9	\$89.3	\$99.6	\$106.9	\$111.7
DoD Total***	\$203.1	\$184.5	\$189.4	\$183.0	\$224.8	\$216.3	\$177.5

* The National Defense Center for Energy and Environment is included in the Army Program line.

† DON includes Navy and Marine Corps.

** Defense-wide accounts include other defense agencies.

†† SERDP/ESTCP values are for environmental projects only and do not include energy projects.

*** Due to rounding, account subtotals may not equal FY totals.

Overall Trend Analysis

The Department's funding for environmental technology decreased from FY 2014 to FY 2015 due to congressional funding reductions to meet the BCA. Funding increased between FY 2015 and FY 2016, but decreased in FY 2017 because DoD progressively captured environmental technology requirements in other funding lines such as material substitution, production processes, operation and maintenance, and weapons system acquisition program elements. Funding increased again significantly in FY 2018 due to additional investment in Defense-wide environmental technology initiatives, including research and product development

to address replacing AFFF containing PFOS and PFOA. DoD funding decreases from FY 2018 to FY 2020 due to reprioritization of SERDP and ESTCP funds and decreases in Army funding after congressional adds in FY 2018 and FY 2019.

Explanation of Significant Changes in Funding Amounts

- From FY 2017 to FY 2018, Army funding increases by 50.7 percent due to a congressional add. ESTCP funding increased by 48.1 percent as a return to prior funding levels.
- From FY 2018 to FY 2019, Army funding decreases by 17.5 percent despite a congressional add as funds were reprioritized to support Army modernization initiatives. SERDP funding increases by 20.9 percent and ESTCP decreases by 21.3 percent due to a rephasing correction to synchronize obligation and expenditure rates.
- From FY 2019 to FY 2020, Army funding request decreases by 61.9 percent due to the congressional adds in FY 2019.

Progress in Achieving Objectives and Goals

Advances in environmental technology have allowed the Department to be more cost-efficient when spending resources for environmental cleanup and compliance. For example, DoD is developing and using groundwater cleanup technologies across the Department and throughout the private sector. DoD anticipates that it will achieve RC at 92 percent of IRP sites and MRSs at active installations and BRAC locations, and IRP sites at FUDS properties, by the end of FY 2021. Through its environmental technology programs, DoD is currently improving its fundamental understanding of these sites and developing new technologies to manage or remediate them.

Another example of the Department transitioning technologies to reduce costs and increase efficiencies occurred in the munitions response area. DoD transitioned SERDP- and ESTCP-sponsored research on advanced geophysical classification, a process for determining whether a buried metal object is likely a military munition or harmless debris, to the contractor community. DoD accredited seven private firms through the DoD Advanced Geophysical Classification Accreditation Program (DAGCAP) in FY 2018 for a total of 12 firms accredited as of the end of FY 2018. The DAGCAP ensures that private-sector practitioners can collect high-quality data, and correctly analyze the data in support of DoD cleanup projects. These environmental technology program efforts benefit both the environment and the military mission.

Looking ahead, environmental technology investments will focus on DoD's evolving needs. SERDP solicited research into the occurrence, fate, transport, and remediation of PFOS and PFOA shortly after the EPA released the 2009 Provisional Health Advisories for these compounds. Follow-on research targeted developing several approaches for treating groundwater containing PFOS and PFOA and this research matured into demonstrations under ESTCP. In FY 2018, ESTCP continued demonstrating these groundwater treatment options for PFOS and PFOA with additional demonstrations to begin in FY 2019. Further, research projects investigating new in situ and ex situ treatment methods for groundwater and soil began in FY 2018, and in FY 2019 projects will be initiated that are focused on developing improved sampling and analytical methodologies for Per- and polyfluoroalkyl substances (PFAS). SERDP

started two projects in FY 2017 and five in FY 2018 aimed at developing fluorine-free fire-fighting foams to replace AFFF containing PFOS and PFOA. ESTCP has also requested proposals to demonstrate and validate more environmentally sustainable firefighting AFFFs in FY 2019. Additional work will be initiated in FY 2020 primarily focused on improved sampling and analysis of PFAS. The Department continues to assess the impacts from adopting the American Conference of Governmental Industrial Hygienist's stringent threshold limit values for chromium compounds, and is developing a technology roadmap in FY 2019 to identify future technology investments to help minimize exposure to chrome.

The Department will continue to invest in current initiatives and focus on future initiatives, including developing and demonstrating technologies to address munitions in the underwater environment; identifying the science and tools needed to meet DoD's obligations to adapt to a changing environment; and researching technologies to manage and treat chemicals of emerging concern. The Department is also continuing the critical work of reducing future liability and life-cycle costs by eliminating toxic and hazardous materials from the production, operation, and maintenance processes.

V. ONGOING DECONTAMINATION ACTIVITIES

In accordance with section 2916(b) of the NDAA for FY 2014, the Department maintains “decontamination” programs to remove UXO resulting from Defense-related activities on withdrawn or reserved lands. Below are updates on DoD’s “decontamination” activities during FY 2018 at ranges identified in the NDAA for FY 2014 (Public Law 113-66).

Limestone Hills Training Area, Montana

The Army did not conduct decontamination activities on the withdrawn land at the Limestone Hills Training Area.

White Sands Missile Range, New Mexico

The Army did not conduct decontamination activities on the 5,100 acres of withdrawn land at White Sands Missile Range.

Chocolate Mountain Aerial Gunnery Range California

The Marine Corps did not conduct any decontamination activities on the withdrawn lands at Chocolate Mountain Aerial Gunnery Range.

Marine Corps Air Ground Combat Center Twentynine Palms, California

The Marine Corps did not conduct any decontamination activities on the withdrawn lands at Marine Corps Air Ground Combat Center Twentynine Palms.

Naval Air Weapons Station China Lake, California

The Navy conducted ongoing decontamination activities on 5,000 acres of withdrawn land at Naval Air Weapons Station China Lake, including surface clearance, trash removal, destroying UXO, venting operations, soil stabilization, and grading target sites.

VI. FY 2018 FUNDING FOR ENVIRONMENTAL RESTORATION ACTIVITIES AND REASONS FOR INCREASES IN COST ESTIMATES SINCE FY 2017

H.R. 113-113, accompanying H.R. 2397, the DoD Appropriations Bill, 2014, requests that the Secretary of Defense provide information regarding funds invested in the DERP and the cost to complete cleanup at environmental restoration sites (hereinafter referred to as the “cost estimate”). Specifically, the report must:

1. Provide the amount of funding obligated at each DoD installation and FUDS property for environmental restoration activities in FY 2018; the change in the cost estimate from FY 2017 to FY 2018; and an explanation if the cost estimate did not decrease by at least the amount obligated in FY 2018 (detailed in Appendix A); and
2. Account for any increase of 10 percent or more in an installation’s or property’s projected cost estimate over the prior year estimate (detailed in Appendix B).

Appendix A lists the 510 DoD installations and 437 FUDS properties where DoD obligated funds for environmental restoration activities in FY 2018. It also compares the cost estimates at the end of FY 2017 and FY 2018 to determine how much the Department reduced its liability at each location.² At 147 DoD installations and 241 FUDS properties, the cost estimates either decreased by the amount invested or decreased to zero, and therefore no explanation is needed. At the remaining 363 DoD installations and 196 FUDS properties, the cost estimates did not decrease by at least the amount invested for environmental restoration activities in FY 2018. Appendix A includes an explanation of why the liability was not reduced by the amount of funding invested at each of these locations.³

Appendix B lists the 252 DoD installations and 129 FUDS properties where the FY 2018 cost estimates increased by 10 percent or more over the FY 2017 estimates. It compares the cost estimates at the end of FY 2017 and FY 2018 to determine the dollar amount and percentage increases at each location.² Appendix B also includes the reason(s) the cost estimates increased between FY 2017 and FY 2018 at each location.⁴

² The FY 2017 cost estimates are adjusted for inflation and work completed in FY 2018 to compare the estimates more accurately.

³ If a location’s liability was not reduced by the amount of funding invested for environmental activities in FY 2018, but the cost estimate change was less than \$25,000, DoD did not provide an explanation because it considers \$25,000 to be within the margin of error for that location.

⁴ If a location’s FY 2018 cost estimate increased by 10 percent or more over the FY 2017 estimate, but the cost estimate change was less than \$25,000, DoD did not provide an explanation because it considers \$25,000 to be within the margin of error for that location.