

ACRONYMS

<u>Acronym</u>	<u>Meaning</u>
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	Aqueous Film Forming Foam
AFWERX	Air Force Work Project
ANG	Air National Guard
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DoD	Department of Defense
ECO	Electrochemical Oxidation
EPA	Environmental Protection Agency
ERA	Environmental Restoration Account
ESTCP	Environmental Security Technology Certification Program
FY	Fiscal Year
GAC	Granular Activated Carbon
GW	Groundwater
HALT	Hydrothermal Alkaline Treatment
IDW	Investigation-Derived Waste
IX	Ion Exchange
JRB	Joint Reserve Base
MAC	Magnetic Activated Carbon
MILDEP	Military Departments
NA	Not Applicable
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Systems Command
NDAA	National Defense Authorization Act
NDCEE	National Defense Center for Energy & Environmental
NF	Nanofiltration
PFAS	Per- and Polyfluoroalkyl Substances
PFAS	PFAS Foam Assisted Soil Treatment
RI	Remedial Investigation
RO	Reverse Osmosis
SAFF	Surface Active Foam Fractionation
SCWO	Super Critical Water Oxidation
SERDP	Strategic Environmental Research and Development Program
SFB	Space Force Base
SW	Surface Water
TBD	To Be Determined
TRL	Technology Readiness Level
UV	Ultraviolet
UV/SGM	Ultraviolet Activated Silica-Based Granular Media
WW	Wastewater

II. DOD NON-INCINERATION DESTRUCTION TECHNOLOGIES TESTING TO DATE

SERDP and ESTCP are DoD's science and technology and demonstration and validation programs, respectively, focusing on installation resilience, restoration, and conservation. Through ESTCP, DoD promotes the transfer of innovative technologies with established proof of concept studies to the field and/or production use.

Since 2011, SERDP and ESTCP have funded over 70 projects for PFAS non-incineration destruction technologies. Table 1 provides a list of non-incineration PFAS destruction technologies that have been or are being tested at DoD facilities or at bench-scale. These SERDP and ESTCP projects evaluate the treatment of groundwater (GW), spent absorbent materials (e.g., ion exchange (IX) resins, granular activated carbon (GAC), cyclodextrin), still bottoms from water filtration systems, investigation-derived wastes (IDWs), landfill leachate, membrane brine liquids, soils, and AFFF rinsate, AFFF concentrate, and foam fractionate. Certain projects in Table 1 use treatment trains that include concentration technologies such as IX and GAC. Results from these studies show that treatment trains combining concentration and destruction technologies may offer the most efficient options for PFAS destruction under DoD's real-world scenarios.

The following information is provided for the SERDP-ESTCP studies listed in Table 1 of Appendix A:

- Project number. Additional information about the technologies, including the testing results, can be found on the SERDP-ESTCP web page (<http://www.serdp-estcp.org>) by searching the project number.³
- Lead investigator name and organization, as well as applicable technical subcontractors.
- Tested technology and tested matrix.⁴
- Status of the project, either complete, in progress, or selected.⁵
- Location of the testing for field demonstrations.⁶
- Technology Readiness Level (TRL). The TRL is on a scale of one to nine. TRL 1 indicates the basic principles have been observed and reported; TRL 9 indicates the actual system has been proven through successful mission operations. DoD considers technologies with a TRL 7 to 9 as ready for operational-scale testing.
- Suitability for Operational-Scale Testing.
- Field- or bench-scale. If the technology has been or is being conducted at the field- or bench-scale. The technologies that have been tested only at the bench-scale have been included because these have shown promise and are likely to move to the field-scale within the next one to three years.

³ Some projects in Table 1 do not have test results posted because SERDP-ESTCP projects may take multiple years to complete. Test results will be posted on the SERDP-ESTCP website after the project is complete.

⁴ Matrices included GW (extracted and in place), soils (excavated and in place), and various treatment residuals. Please note that several projects often use a combination of technologies.

⁵ Projects noted as "Selected" are in the contracting process and are expected to be initiated in 2024.

⁶ For projects where only bench-scale testing was conducted, a site name and location indicate that field materials were collected from that site and tested in the laboratory.

