

**Strategic Environmental Research and Development Program
(SERDP)**

FY 2016 STATEMENT OF NEED

Environmental Restoration (ER) Program Area

ECOTOXICITY OF PERFLUORINATED COMPOUNDS

1. Objective of the Proposed Work

The objective of this Statement of Need (SON) is to solicit proposals to develop an improved understanding of the ecotoxicity of compounds associated with the release of Aqueous Film Forming Foam (AFFF). AFFF has been used by the Department of Defense (DoD) since approximately 1970 for fire-training and emergency response activities; the possibility of environmental release is substantial. Of particular importance are an improved understanding of the ecotoxicity of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) and defining their relative toxicity, as well as a suite of relevant poly- and perfluoroalkyl substances (PFASs) found in environmental media as a result of AFFF release.

Proposed research should focus on one or more of the following specific objectives in order to fill gaps in the current knowledge base:

- Produce data to support development of toxicity reference values (TRVs) for birds, reptiles and amphibians for PFOS and PFOA using controlled data from laboratory investigations.
- Determine the relative toxicity of “other” PFASs compared to PFOA and PFOS in order to enhance risk management decisions and address risk communication concerns. Define relative potency factors using qualitative or quantitative methods using environmentally relevant concentrations, PFASs, species, and endpoints.

Proposers should provide the rationale and justification for the species selected for study and should describe how the proposed effort builds on and complements previous research.

2. Expected Benefits of Proposed Work

The knowledge of the potential environmental risk of PFASs associated with AFFF will assist in the development of appropriate site-specific risk assessments and the decisions related to mitigation of exposures and/or future environmental cleanup.

3. Background

PFASs, such as PFOA and PFOS, have been used to manufacture a variety of industrial, commercial and military products, including (through 2001) PFOS-based fluorochemical surfactants (FCSs) used in AFFF. AFFF is used to extinguish flammable liquid (e.g., hydrocarbon)

fires. Military Specification MIL-F-24385F mandates the use of FCSs in AFFF to meet performance requirements. Additional ingredients include organic solvents (i.e., glycol ether), foam stabilizers, and corrosion inhibitors. Over the past several years, manufacturers of FCSs have shifted to a telomerization process to produce FCSs for use in AFFF. While telomer-based FCSs do not contain or break down into PFOS, they may contain trace levels of perfluorocarboxylic acids (e.g., PFOA) as an impurity.

Environmental releases of AFFF occur from tank and supply line leaks, use of aircraft hangar fire suppression systems, and from firefighting training activities. Site investigations under the Defense Environmental Restoration Program (DERP) have not typically included analysis for PFASs given their emerging status. However, approximately 600 DERP sites are categorized as Fire/Crash/Training areas and thus have the potential for PFASs contamination due to historical use of AFFF.

PFOA and PFOS have attracted increased regulatory scrutiny because of their resistance to degradation, ability to bioaccumulate, and growing evidence of toxicity in animal studies. The U.S. Environmental Protection Agency (EPA) published Provisional Health Advisory values of 0.4 µg/L for PFOA and 0.2 µg/L for PFOS in drinking water. Additionally, the Agency for Toxic Substances and Disease Registry released a draft toxicological profile on perfluoroalkyls for public comment. Several state regulatory agencies have moved to establish action levels and guidelines for PFOA and PFOS. Minnesota established a health risk level of 0.3 µg/L in drinking water for PFOA and PFOS. New Jersey established a drinking water guidance value of 0.04 µg/L for PFOA. These levels are several orders of magnitude lower than concentrations of PFOA and PFOS observed in groundwater at historical fire training areas. EPA released draft documents on the health effects for PFOA and PFOS for public comment to better support future regulatory evaluations and decisions.

Due to their chemical structure, PFASs are very stable in the environment and are resistant to biodegradation, photo-oxidation, direct photolysis, and hydrolysis. While PFASs have been found to negatively affect autotrophic and heterotrophic food webs, additional data is needed to improve the understanding of their ecotoxicity. In addition, determining the toxicity of other PFASs in comparison to PFOS and PFOA will provide a more comprehensive understanding of the risk drivers.

4. Cost and Duration of Proposed Work

The cost and time to meet the requirements of this SON are at the discretion of the proposer. Two options are available:

Standard Proposals: These proposals describe a complete research effort. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. SERDP projects normally run from two to five years in length and vary considerably in cost consistent with the scope of the effort. It is expected that most proposals will fall into this category.

Limited Scope Proposals: Proposers with innovative approaches to the SON that entail high technical risk or have minimal supporting data may submit a Limited Scope Proposal for funding

up to \$150,000 and approximately one year in duration. Such proposals may be eligible for follow-on funding if they result in a successful initial project. The objective of these proposals should be to acquire the data necessary to demonstrate proof-of-concept or reduction of risk that will lead to development of a future Standard Proposal. Proposers should submit Limited Scope Proposals in accordance with the SERDP Core Solicitation instructions and deadlines.

5. Point of Contact

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For Core proposal submission due dates, instructions, and additional solicitation information, visit the SERDP web site at www.serdp-estep.org/Funding-Opportunities/SERDP-Solicitations.