Ongoing ITP Projects

FY	Title	Synopsis
2022	Tempe cell method for PFAS leaching	The primary objective of the demonstration is to develop and validate a leaching method using Tempe cells by extending the retention curve analysis to allow sampling of porewater from intact cores under controlled conditions. Validation of the method will be completed using two primary lines of evidence: comparison with lysimeter porewater sampling through intact cores collected proximal to prior lysimeters and comparison of transient water release and imbibition sampling at various points on the soil moisture retention curve and numerical simulations. The goal is to develop a commercial method of leaching tests that can be reliably conducted by contract laboratories, enabling widespread adoption by practitioners and providing a realistic estimate of leaching potential for vadose zone soils containing PFAS.
2022	Osorb Passive Samplers for PFAS in Groundwater and Surface Water	The project will build upon the initial field testing of the Osorb passive sampler through a robust demonstration at multiple sites. The project will collect sufficient field data in ground and surface water over a range of environmental variables to assess the optimal use of passive sampler results for various applications (e.g., screening evaluations, risk assessments, and remedial action performance monitoring). Ultimately, the project will facilitate commercialization of analysis and promote adoption of the passive sampler for widespread use.
2022	Field Validation of a Modified HYDRUS Model for Simulating PFAS Leaching in the Vadose Zone	The purpose of this project is to develop a methodology for modeling PFAS fate and transport in vadose zones, particularly for characterizing the transport between the source zones and the groundwater table. Specifically, this project will evaluate, demonstrate, and validate the use of the commercially available and widely used HYDRUS unsaturated flow and transport model for use at F.E. Warren AFB, WY.
2022	Can the REMChlor-MD Model be Used to Evaluate Passive and Active PFAS Remediation Alternatives?	The overall objective is to evaluate, demonstrate, and validate the innovative use of a commercially available fate-and-transport model for assessing PFAS fate and transport in the saturated zone. In particular, the project team will test the feasibility, reliability, and limitations of the existing REMChlor-MD groundwater remediation model for simulating PFAS plume migration and forecasting the future outcomes of active and passive PFAS plume remediation strategies.
2022	PFAS modeling	The overall objective of this project is to evaluate use of commercially available fate-and-transport (F&T) models for assessing PFAS F&T at industrial sites. Specifically, this project will evaluate, demonstrate, and validate the use of two readily available F&T modeling systems; the Transport of Unsaturated Groundwater and Heat (TOUGH) and MODFLOW with Un-Structed Grids (MODFLOW-USG) families of codes, for assessing PFAS persistence in the environment and migration from sources to receptors through the vadose zone and saturated zones.
2022	Rapid field-scale characterization of PFAS	The overall goal of this project is to fully demonstrate the capabilities of a field-scale electrical geophysical technique,

	source zones with electrical geophysics	known as spectral induced polarization, for rapid characterization of AFFF source zones.
2022	On-site removal and destruction of PFAS using Surface Active Foam Fractionation and DeFluoro Technologies	This project will demonstrate a cost-effective, sustainable, on-site separation, concentration, and destruction solution for regulated PFAS compounds in surface water and/or groundwater at Hanscom AFB. The demonstration will represent the first ever coupling of SAFF® and DE-FLUORO™ for a complete on-site treatment process.
2022	In Situ Treatment of PFAS-Impacted Stormwater Emanating from AFFF Source Areas	The overall goal of this project is to demonstrate the use of commercially available, engineered pre-cast concrete vaults to divert, capture, and remove PFAS present in stormwater in situ in an easy-to-implement and cost-effective manner at Dobbins ARB, GA. This project proposes to treat PFAS-impacted stormwater in situ by diverting, capturing, and directly funneling stormwater outfall through pre-cast concrete vaults containing filtration and PFAS adsorption media.
2022	Demonstration of a Treatment Train with Foam Fractionation and Hydrated Electron for Cost-Effective Removal and Destruction of PFAS	The objectives of this project are to (A) demonstrate the proposed treatment train for effective removal and destruction of PFAS in the source area groundwater; (B) optimize the on-site PFAS treatment train unit using the field test data collected at March ARB; (C) generate field cost and performance data to aid in estimating costs at full-scale; (D) evaluate and demonstrate the cost-effectiveness of the proposed treatment train compared to other remediation options; and (E) transfer the technology and knowledge to site project managers, technical support staff, contractors, and the environmental industry. The treatment train proposed in this effort includes (1) a semi-continuous multi-stage foam fractionation system to remove (i.e., strip) and concentrate (i.e., enrich) PFAS from the feedwater source (e.g., extracted groundwater), and (2) an ultraviolet (UV)/sulfite system to destroy the concentrated PFAS.
2022	Retrofitting Stormwater Pond Outlets for Surface Water PFAS Remediation	The project will design and retrofit an existing pond outlet structure at Fairchild Air Force Base to remove PFAS from contaminated water as it is released downstream. The goal of the project is to develop a methodology that can be applied to other pond outlet structures with minimal effort. The conceptual design consists of a diversion box that will provide low pressure to force flow through a conduit filled with granulated activated carbon (GAC) media.
2022	Supercritical Water Oxidation Destruction of PFAS Concentrated Spent Media	This project will use Supercritical water oxidation (SCWO) to destroy PFAS waste streams generated through pump and treat remediation systems. SCWO is proposed to demonstrate and validate at Air Force installations for on-site destruction of remediation derived PFAS wastes such as spent GAC, spent ion exchange resins, innovative sorbents, or other concentrate rejects.
2022	PFAS Treatment Gates for Surface Water Management in Drainage Systems	This project will demonstrate PFAS treatment gates to reduce PFAS migration in drainage channels. The processes include two permeable filtration gates to pretreat and remove PFAS followed by one bioretention polishing gate for residual and shorter chain PFAS uptake. The pretreatment gate will utilize low-cost mixture of mulch, biochar or powered activated carbon to significantly reduce biological, natural organics, co-contaminants and PFAS loading to the primary treatment gate. The primary PFAS treatment gate will comprise AquGate+RemBind. RemBind has demonstrated high removal efficiency of PFAS and low PFAS leachability. The third

		“gate” is designed for plant uptake for residual and shorter chain PFAS. The three treatment gates in series have the functions of “pretreat, treat and polish” and will be designed to be low-cost, low O&M, green and replaceable.
2022	Treatment of PFAS in Mixed Media	This project will conduct a demonstration and validation of smoldering treatment that was evaluated under the U.S. Department of Defense Strategic Environmental Research Development Program. The objectives of this project are (A) assess if exchange resins (IX) can serve as a fuel that supports smoldering-based combustion; (B) generate performance data on the ability of smoldering combustion to treat PFAS and other co-contaminants in soils, granular activated carbon or IX to meet regulatory criteria, including the U.S. Environmental Protection Agency Lifetime Health Advisory for perfluorooctanoic acid and perfluorooctane sulfonic acid; and (C) assess the impact of soil permeability, moisture content, soil type, and PFAS concentrations on treatment robustness and effectiveness.