



Alaska International Airport System Fairbanks International Airport

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FAI PFAS Environmental Mitigation Pilot Program

Fairbanks International Airport was awarded an Environmental Mitigation Pilot Program (EMPP) grant by the FAA in 2022 to test the viability of performing onsite PFAS remediation of soil and water using technologies pioneered by Aquagga and ASRC Consulting & Environmental Services. The project was awarded as a collaboration between 6 public and private entities, Shannon and Wilson, Inc., Aquagga, Inc., ASRC Consulting & Environmental Services, LLC(ACES), Alaska Department of Transportation and Public Facilities (AKDOT&PF), Alaska Department of Environmental Conservation (ADEC) and the American Association of Airport Executives (AAAE).

Project work began in early 2023 with Shannon and Wilson reviewing site history, performing site characterization and collaborating with the other project partners to select an ideal work area. It was decided to set up the project near FAI's former Fire Training Pit(FTP) as the surrounding areas had high PFAS soil concentrations, and access to PFAS contaminated groundwater via the FTP sump. The area also included a graded gravel pad which proved ideal for staging equipment and material stockpiles.

The soil treatment portion of the project was performed by ACES using their Mobile Remediation System-1 unit (MRS-1). MRS-1 is a two-stage technology that relies on electric induction to indirectly heat and thermally desorb PFAS and other organic contaminants from material conveyed under a low vacuum through a rotary drum. The thermal desorption unit (TDU) consists of a rotary drum seated inside three induction coils. The drum is inductively heated to precisely controlled temperatures. Flighting inside the drum conveys soil forward while it is conductively heated in contact with the drum. Laboratory, bench-scale, and field-scale pilot testing has established residence times that desorb PFAS contamination from the soil to non-detect levels. The exhaust, however, is still PFAS-laden, and is passed on to a pollution control train which begins with a thermal oxidation unit (TOU).

In the TOU, a high-temperature thermal oxidizer briefly heats the exhaust stream to break remaining fluorine bonds and mineralize any PFAS compounds present. The superheated exhaust stream is then rapidly cooled and passed through a robust pollution control module

Aquagga led the water treatment portion of the project. Aquagga's scope of work involved three distinct efforts, all focused on addressing the PFAS-impacted liquids in the FTP, and in previous fire truck

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cleaning efforts at FAI. To accomplish this, Aquagga combined Foam Fractionation (FF) technology to remove and concentrate PFAS from the affected media before destroying it with their Hydrothermal Alkaline Treatment (HALT) technology.

HALT is a PFAS destruction process capable of destroying and defluorinating all PFAS compounds in liquid matrices. HALT leverages high pressures (>3,000 psi), high temperatures (>300 °C), and a high pH (>14) at subcritical water conditions to drive PFAS destruction in an aqueous phase. Sodium hydroxide (NaOH) is typically used to increase the pH, ultimately converting a PFAS-rich liquid into a treated brine effluent with low PFAS levels and higher total dissolved solids (TDS) levels.

The project progressed through the summer of 2023, with Aqaugga and ACES completing their onsite work in September. In total the companies treated over 1300 tons and 20,000 gallons of PFAS contaminated soil and water, removing all regulated PFAS compounds to undetectable levels. Furthermore, the remediation activities had a minimal effect on airport operations successfully proving the viability of onsite remediation of PFAS at airports.

For more information regarding the project please contact FAI Environmental Manager, Jake Matter at jake.matter@alaska.gov, or Statewide Aviation PFAS Coordinator, Melanie Bray at melanie.bray@alaska.gov



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