

A Case History of PFAS at Historical Fire Training Area OU1, Ellsworth Air Force Base, South Dakota

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Background/Objectives. OU-1 at EAFB is a former fire protection training area (FPTA), which was operational from 1942 to 1990. Waste materials burned included solvents, oils, aviation fuels, and jet propellant-4. Extinguishing chemicals used during fire training exercises included aqueous film forming foam (AFFF), Halon, protein foams, carbon dioxide, and dry chemicals. Because remedial actions occurred since the 1990s relative to the petroleum hydrocarbon and chlorinated solvent contamination, there are additional potential associated source areas, including injection trenches and dredged pond sediment spoil piles. A case history of PFAS at the historical FPTA will be presented. The nature and extent of PFASs in soil, groundwater, surface water, and sediment from the historical FPTA, associated multiple source areas, and surrounding area based on two stages of the Remedial Investigation (RI) will be presented.

Approach/Activities. Stage 1 investigations involved the installation of over 50 direct push boreholes and temporary wells for the collection of soil and groundwater samples and the collection of surface water and sediment samples for the analysis of 12 PFASs by EPA Method 537 Modified. Stage 2 of the Remedial Investigation includes the installation of 19 monitoring wells and sampling of over 50 monitoring wells, including at off-site and residential property locations, sampling of private wells, investigation and evaluation of the PFAS vertical soil profile within the former FPTA, and a more comprehensive surface water and sediment investigation. All Stage 2 investigation samples will be analyzed in accordance with PFAS LCMS/MS QSM 5.1 Table B-15.

Results/Lessons Learned. The presentation will discuss the regulatory context that changed over the duration of the project and the impacts that changing context had on the two stages of investigation. Considerations of field sampling and analytical protocols relative to the PFAS contamination will be discussed. Stage 1 investigations showed PFAS concentrations in soil as high as 7.2 mg/kg for PFOA and 38.3 mg/kg for PFOS. PFOA-PFOS combined concentrations in groundwater were as high as 551 ug/L and exceeded the health advisory levels over 1,400 feet downgradient from the source area. PFAS concentrations, predominantly PFOS, were observed in surface water and sediment samples from a surface water body adjacent to the fire training area. PFOA/PFOS are the primary PFASs of interest, but other PFASs will be discussed as well. Stage 2 investigations will be completed in early fall 2017. The Stage 2 data will be used to evaluate the nature and extent of PFAS impacts, the fate and transport of PFAS within the environmental media, vertical distribution of PFAS in the soil column within the FPTA, and the interrelationship of PFAS between groundwater and surface water. The PFAS compounds observed at the site will be discussed relative to the types and manufacturers of AFFF known to have been used at the site. The human health and ecological risk assessment of select PFCs included within the scope of the RI, as well as limitations to those risk assessments, will be discussed.