

# Per- & Polyfluoroalkyl Substances Investigation and Drinking Water Sampling and Reporting at Southern Vermont Regional Airport

**STONE**  
ENVIRONMENTAL  
100% EMPLOYEE-OWNED

## Services / Expertise

DEC Program Oversight  
PFAS Monitoring  
Site Specific Health and Safety Plan (HASP)  
Site Investigation Work Plan (including Conceptual Site Model)

## Markets

State Government

## Project Location

North Clarendon, Vermont

## Date Completed

2019–Present

## Project Owner

Vermont Agency of Transportation

## Project ID#

19-043

## Project Manager

Les Carver, PG  
[lcarver@stone-env.com](mailto:lcarver@stone-env.com)

## Project Team

Michael Smith  
Katrina Mattice, PE  
Daniel Voisin  
Laura Rajnak  
Sarah Rathay  
Barb Patterson  
Mary Haley



*Southern Vermont Regional Airport AFFF testing and training areas.*

In 2018, the Vermont Department of Environmental Conservation (VT DEC) and the Vermont Agency of Transportation (VTTrans) evaluated the Southern Vermont Regional Airport (SVRA) in North Clarendon, Vermont for potential impacts related to the use of aqueous film-forming foam (AFFF) in firefighting apparatus during firefighting training and fire response activities. A phased sampling of bedrock groundwater monitoring wells revealed that groundwater in bedrock was impacted by common constituents of AFFF known as per- and polyfluoroalkyl substances (PFAS). Subsequently, PFAS were detected in residential and a public non-community, non-transient (NTNC) water system bedrock water supply wells on and off the airport property. A limited site investigation was performed at one known firefighting training area, including soil and shallow groundwater sampling.

In 2019, VTTrans contracted with Stone to perform periodic monitoring of approximately 45 residential water supply wells, including six with point-of-entry treatment systems (POETs), and a NTNC public water treatment and supply system serving a local business park. This work also included maintenance of the residential POET systems. As part of this project, Stone has reviewed the as-built drawings, developed a sampling procedure for the business park water system, and maintained compliance with the VT DEC Drinking Water Division.

Stone also completed groundwater, surface water, sediment, and spring monitoring at and near the SVRA in 2019 to evaluate further the distribution, fate, and transport of PFAS from suspected source areas. This work included resampling groundwater monitoring wells previously installed in the primary AFFF training area (Bravo) and collecting 16 surface water, 9 sediment, 3 spring, and 3 stormwater outfall samples. Sampling and subsequent testing confirmed migration of PFAS from the Bravo



# Per- & Polyfluoroalkyl Substances Investigation and Drinking Water Sampling and Reporting at Southern Vermont Regional Airport

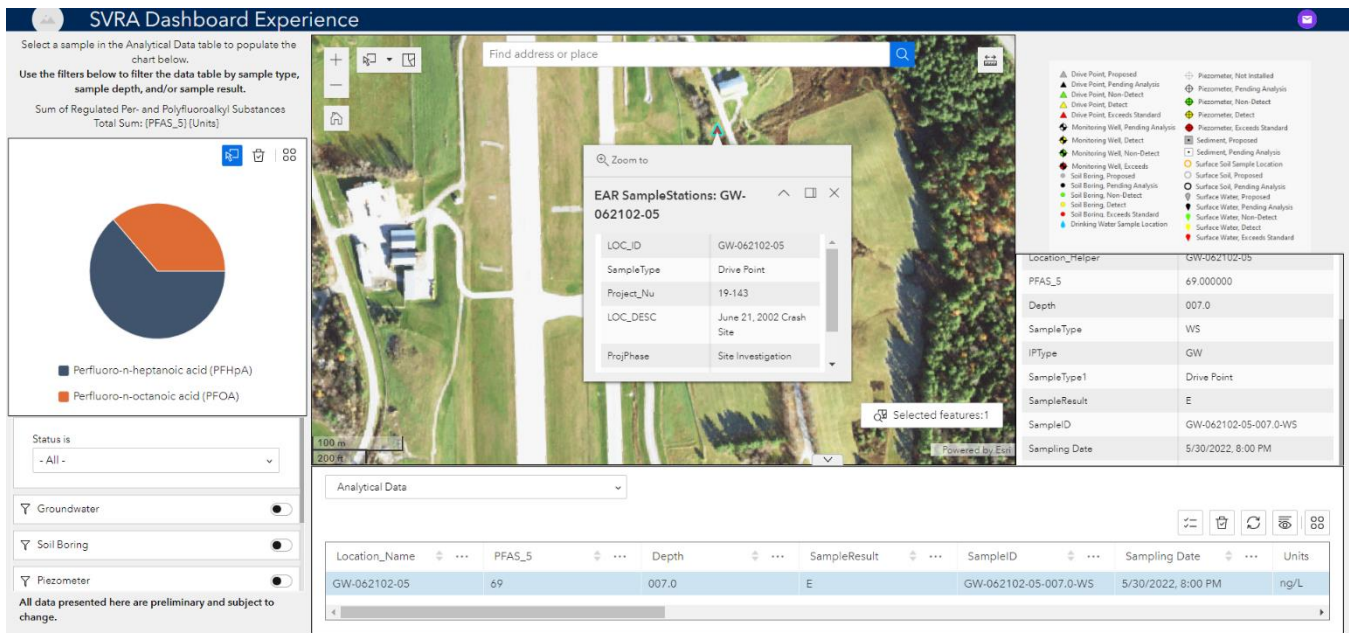


training area to the Mill River, located south of the airport, and to an unnamed first-order stream northeast of the training area. Further assessment is required to determine whether PFAS detected in airport storm drain infrastructure results from stormwater runoff or groundwater infiltration.

Between 2020-2021, the Vermont Geological Survey—in conjunction with Middlebury College, the University of Vermont, and the State University of New York (SUNY) Plattsburgh—completed surficial bedrock mapping, spatial analysis of well reports, geophysical logging of bedrock wells, and chemical tracing to identify potential groundwater and PFAS transport pathways in bedrock. This work characterized bedrock structures and hydrogeology at and near SVRA, improving our understanding of subsurface conditions that affect the fate and transport of PFAS.

A high-resolution site investigation occurred in the summer of 2022 to further investigate potential source areas and assess the impact on shallow, overburdened groundwater, soils, and surface waters. Work plan development included reviewing historical information to develop a chronology of airport construction, and AFFF use to inform and update the Conceptual Site Model (CSM). Work began in April 2022 by first evaluating the site-wide hydrogeology of the unconsolidated aquifer. In addition, we completed soil and groundwater assessments within each fire training and emergency response area and crash sites in October 2022. This work utilized both screening level and definitive analytical methods to guide a dynamic work strategy to delineate PFAS source areas. The site investigation includes quarterly sampling of surface water and stormwater runoff and quarterly groundwater monitoring to evaluate temporal trends in PFAS concentrations and the role stormwater infrastructure plays in PFAS transport at the site.

In 2022, Stone created an Experience Builder application in ArcGIS Online to display analytical data and a map in a dashboard format. These visuals make it easier for users to understand the sampling results. While work was going on in the field and analysis results were reported from the lab, Stone brought the results into ArcGIS Online and incorporated it into the dashboard. Users can see an overall view of the sampling results in a pie chart or information for individual sampling sites in a table.



A screenshot showing the SVRA Dashboard Experience. When a user selects a sampling point, the other dashboard elements filter for that point. Filters are also available in the bottom left to further refine the information shown.

