

SourceStop Prevents PFAS Migration During Airport Expansion

**Construction-Integrated Sorptive Barriers
Protect Future Cargo and Cold-Storage Facilities**



Highlights

Site Type:

Airport cargo and cold-storage warehouse redevelopment

Location:

Alaska

Site Conditions:

Peat bog wetland requiring land surcharging and structural fill placement to support development

Contaminants:

Per- and polyfluoroalkyl substances (PFAS) associated with historical aqueous film-forming foam (AFFF) releases

Project Driver:

Site Redevelopment

Remedial Approach:

Construction-integrated PFAS migration control using SourceStop with non-frost susceptible (NFS) structural fill

Summary

Redevelopment of two adjacent warehousing parcels at an international airport in Alaska required construction across a peat bog wetland where PFAS impacts associated with historical AFFF use had been identified in soil and groundwater. To stabilize the area for expansion of cargo and cold-storage warehouse facilities, the project required surcharging of peat deposits and placement of structural fill, creating the potential to displace PFAS-impacted pore water during earthwork activities.

To address this risk, the project team implemented a construction-integrated PFAS migration control strategy using SourceStop®, an innovative solid colloidal activated carbon amendment, with non-frost susceptible (NFS) structural fill to create permeable sorptive barriers across multiple treatment areas. The approach comprised passive PFAS sorption within the area targeted for redevelopment, preventing the potential for downstream groundwater impacts while avoiding pumping, waste generation, and construction schedule disruptions.



Background

The airport redevelopment project included two adjacent cargo and warehouse parcels located within a peat bog wetland near an airport Aircraft Rescue and Fire Fighting (ARFF) facility. Historical use of AFFF at the ARFF facility resulted in PFAS impacts in soil, surface water, and groundwater that exceeded ADEC cleanup levels.

The site consists of saturated peat deposits overlying a confining clay layer, resulting in perched groundwater conditions throughout the bog. Construction of the warehouse facilities required surcharge loading and structural fill placement to increase load-bearing capacity and reduce settlement. As the peat compresses, pore water is displaced laterally through the bog deposits, creating the potential for PFAS-impacted water to migrate off-site if not controlled.

Figure 1

PFAS Sampling Results - Bog Area

PFAS soil and groundwater sampling across the bog area identified widespread PFAS impacts associated with historical AFFF releases near the airport facility. Source: DOWL



Remedial Strategy

The remediation strategy focused on creating a series of passive sorptive treatment zones within the construction footprint of two adjacent airport cargo redevelopment parcels. Together, these treatment zones provided approximately 2,000 linear feet of PFAS migration control and were designed to intercept two primary water movement pathways: shallow groundwater flow through the peat deposits and PFAS-impacted pore water displaced during peat compression and surcharging.

SourceStop was incorporated into NFS structural fill to create permeable adsorptive barriers and amended fill zones. As water moves through these treatment zones, PFAS compounds are retained on the carbon-coated matrix, reducing the potential for PFAS migration beyond the project boundary.

The combined treatment program included the following components:

Parcel 1:

Eastern Permeable Sorptive Trench Barrier	A 380 ft long trench barrier was installed along the eastern edge of the site to intercept shallow PFAS-impacted groundwater moving toward the project boundary.
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Parcel 2:

Northeast Permeable Trench Barrier	An approximately 880 ft long permeable trench barrier was installed along the northeastern portion of Parcel 2. The trench was excavated through peat deposits and backfilled with SourceStop-amended NFS material to form a passive sorptive barrier for shallow groundwater migration control.
Southern Boundary Amended Fill Zone	SourceStop-amended NFS fill was incorporated into selected structural fill to create a treatment zone approximately 700 ft long, 10 ft wide, and 2 ft deep. This component was designed to intercept water displaced during peat compression and provide lateral migration control along the southern boundary.
Utility Corridor Treatment	A localized treatment zone approximately 50 ft in length was constructed along a utility corridor to address potential preferential migration pathways associated with utility installation.

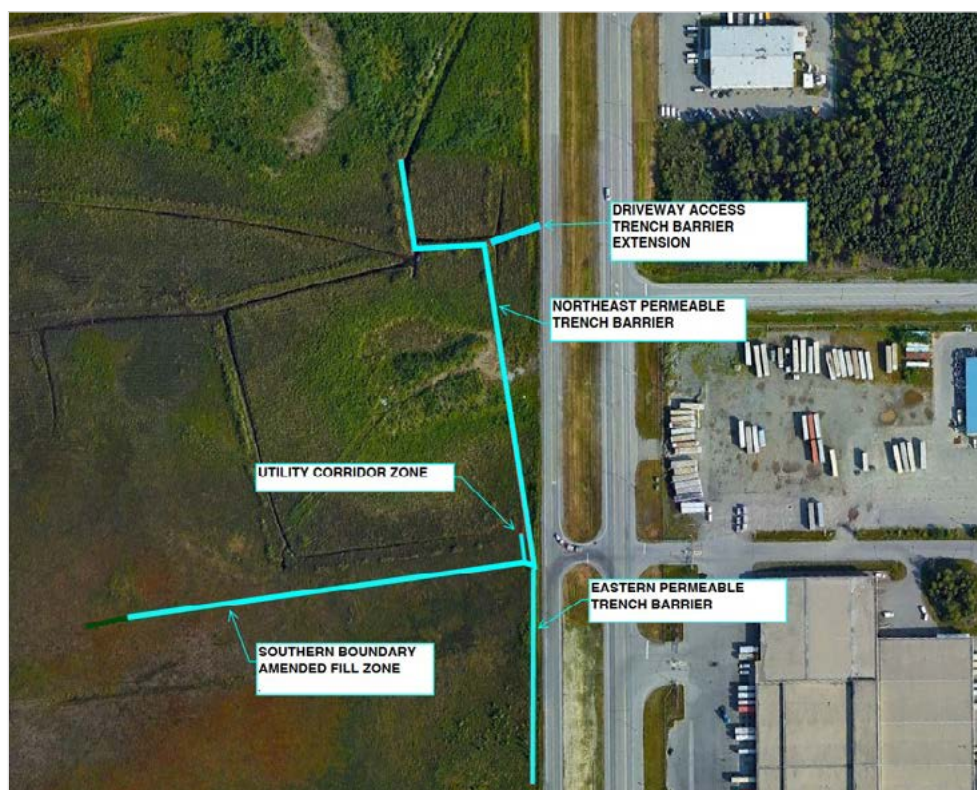
PlumeForce Design Modeling Software Used to Outline Dosing Rates

Predictive modeling was completed to guide the design and dosing using REGENESIS PlumeForce, a proprietary modeling software program developed to determine effective dosing rates. Starting concentrations used for modeling included PFOA – 1,000 µg/L and PFOS – 6,000 µg/L. These concentrations represent conservative, worst-case conditions used to evaluate system performance.

Figure 2

SourceStop Application Map

Map depicts approximate locations of treatment zones.



Construction Benefits of SourceStop-Amended Fill

In addition to providing effective PFAS sorption capacity, the use of SourceStop provided several practical advantages during construction.

- **Enhanced Contact with Soil Matrix:** Colloidal carbon particles provide increased surface area and improved distribution within the fill, supporting effective interaction with migrating PFAS in pore water.
- **Low Dust Application:** SourceStop application minimized airborne carbon dust compared to commodity powdered carbon products, improving site conditions and visibility during placement.
- **Compatibility with Earthwork Operations:** The amendment process was integrated directly into standard fill placement activities, requiring no specialized installation equipment or workflow changes.

These characteristics supported efficient field implementation and helped maintain construction productivity while installing the PFAS treatment system.

Construction and Application

SourceStop was incorporated into the NFS structural fill using a controlled field mixing and placement process designed to ensure uniform distribution within the treatment zones. On-site activities began with staging and coordination between the installation team and equipment operators to determine amendment volumes and batching requirements.



Winter Construction Schedule: Preparation and installation of the engineered fill and PFAS treatment zones.



SourceStop is mixed into NFS fill material before placement into trench barrier.



Excavation prior to installation of permeable trench barrier at Parcel 2

NFS material was segregated into controlled volumes and amended with SourceStop. SourceStop-amended fill placement was conducted incrementally during the surcharging process to form the sorptive treatment zones. This construction-integrated approach allowed the PFAS treatment system to be installed simultaneously with site earthwork activities to minimize disruption to construction operations.

Application Details

Site Conditions

Geology	Peat bog with perched groundwater
Peat thickness	approximately 3–13 ft
Groundwater velocity	estimated <0.5 ft/day

Barrier Lengths

Parcel 1 - Trench barrier	380 ft
Parcel 2 - Trench barrier	879 ft
Parcel 2 - Southern boundary fill integration	700 ft
Parcel 2 - Utility corridor	50 ft

SourceStop Quantity Applied

Parcel 1	50,400 lbs
Parcel 2	81,600 lbs
Total SourceStop applied	132,000 lbs



Results

The implementation of the barrier strategy for both parcels provided an effective, construction-integrated solution to manage PFAS migration during site development and decades into the future. As peat soils were compressed during surcharging, displaced water was directed through the SourceStop-treated zones, where PFAS compounds are adsorbed onto activated carbon, reducing the potential for contaminant migration beyond the project boundary.

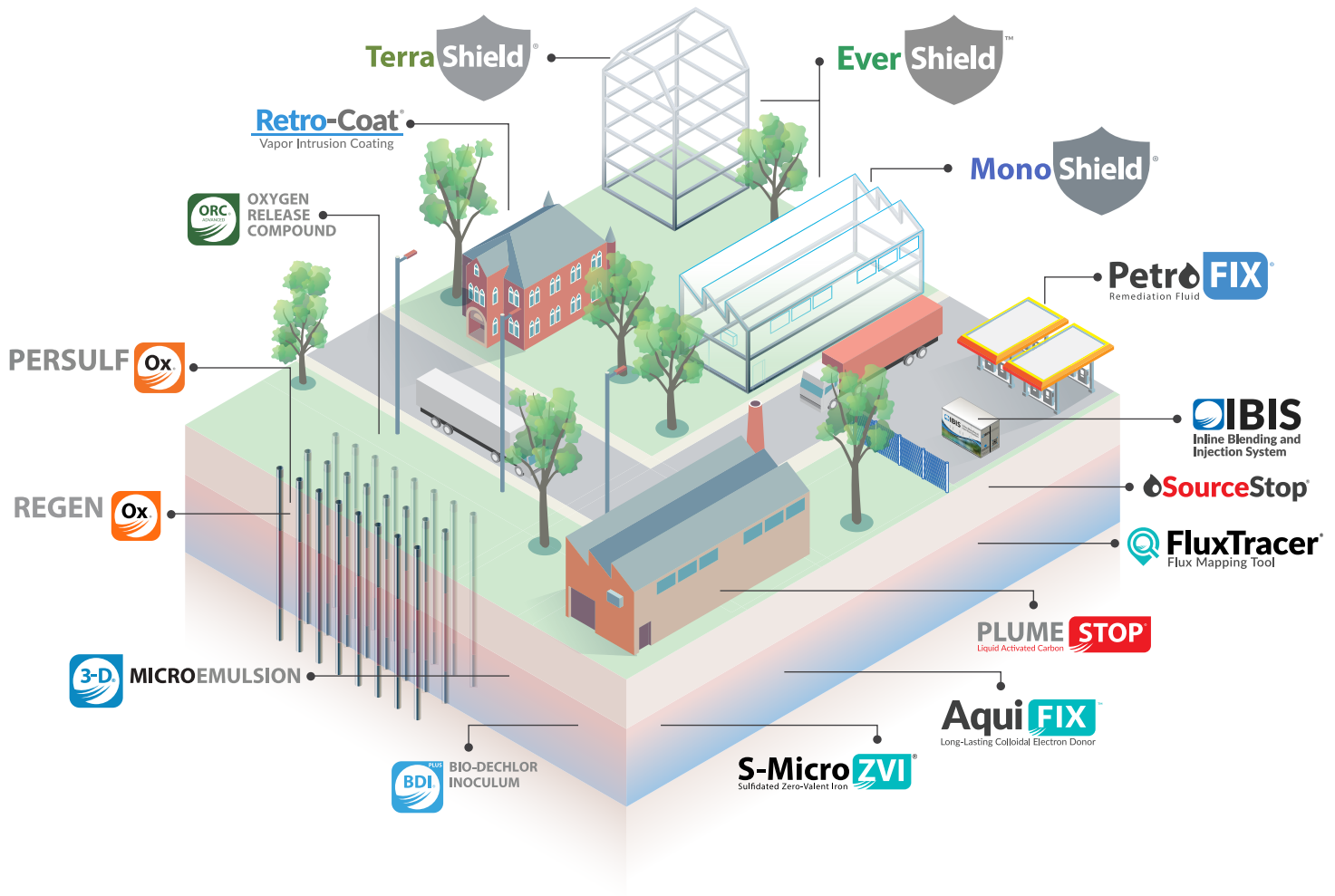
This passive remediation minimizes off-site PFAS transport and limits potential exposure to surrounding environmental receptors during and after construction. Because the approach relies entirely on passive sorption processes, it requires:

- ✓ no pumps
- ✓ no electrical power
- ✓ no ongoing operational maintenance
- ✓ no ongoing PFAS waste management

The remediation was implemented seamlessly alongside planned earthwork and surcharging operations, allowing treatment measures to be installed concurrently with construction. This eliminated the need for separate treatment infrastructure or schedule disruptions, helping to keep the project on track while proactively managing PFAS migration risk.

By integrating SourceStop with phased construction activities across multiple treatment zones, this project demonstrates how passive PFAS migration control strategies can be leveraged during site development to achieve remediation objectives and reduce downstream exposure risk.





About REGENESIS

At REGENESIS we value innovation, technology, expertise and people which together form the unique framework we operate in as an organization. We see innovation and technology as inseparably linked with one being born out of the other.

Inherently, innovation imparts new and better ways of thinking and doing. For us, this means delivering expert environmental solutions in the form of the most advanced and effective technologies and services available today.

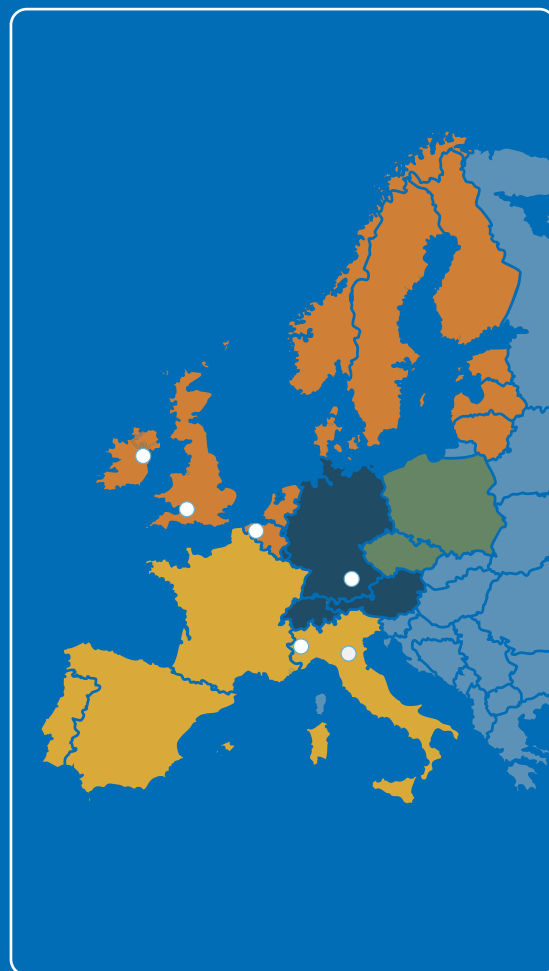
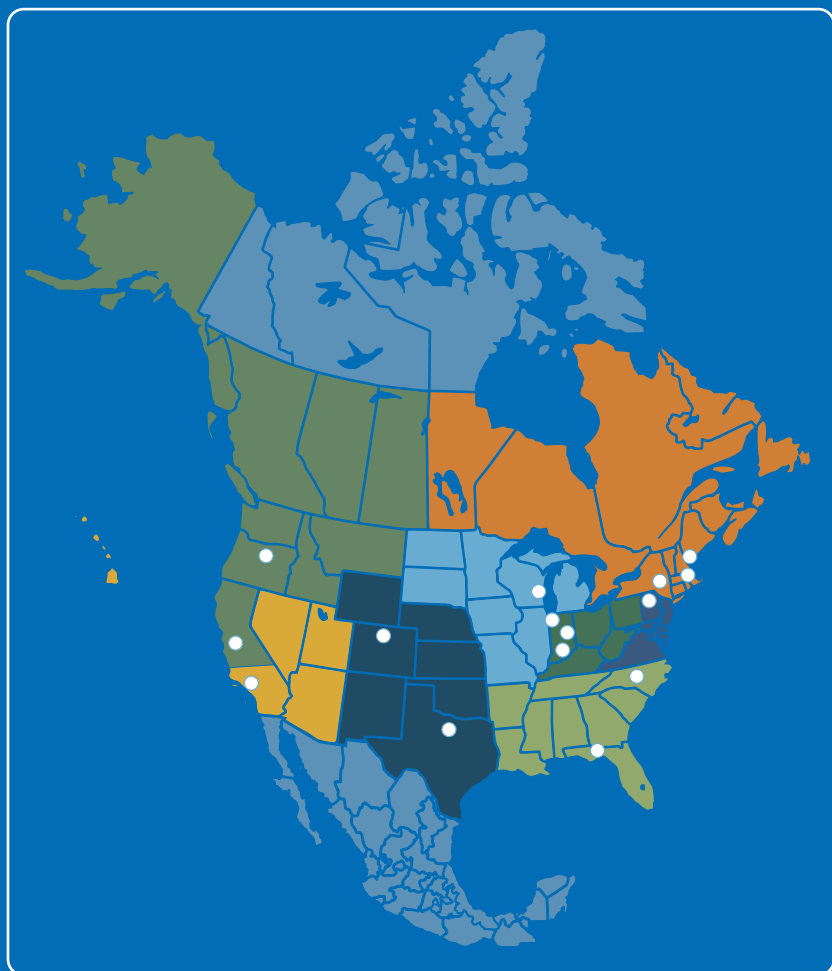
We value expertise, both our customers' and our own. We find that when our experienced staff collaborates directly with customers on complex problems, there is a high potential for success including savings in time, resources and cost.

At REGENESIS we are driven by a strong sense of responsibility to the people charged with managing the complex environmental problems we encounter and to the people involved in developing and implementing our technology-based solutions. We are committed to investing in lasting relationships by taking time to understand the people we work with and their circumstances. We believe this is a key factor in achieving successful project outcomes.

We believe that by acting under this set of values, we can work with our customers to achieve a cleaner, healthier, and more prosperous world.

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