

# Case Study

## Stabilisation of PFAS Soil at a Swedish Military Site - Reducing the Carbon Footprint

### Background

The installation of a new petroleum storage tank was planned at an active fire training area at a military site in Sweden. Routine fire-fighting training had resulted in the area being contaminated with Per- and Polyfluoroalkyl substances (PFAS). For the tank installation, a total of 1,000 tonnes of excavated soil required management, with total PFAS concentrations ranging between 140 and 1,100 µg/kg.

Historically, construction projects of this type have been carried out using a dig-and-dump strategy. This involves categorising the soil as a waste (which prevents it from being reused on-site) and transporting it to a remote landfill site that accepts PFAS. Virgin fill material is then imported to site. Not only is this strategy unsustainable, but it has a relatively high carbon footprint.

### Methodology

For this project, a new, more sustainable approach was proposed. The soil was excavated and categorised as usual, but then it was stabilised with 1 to 2% RemBind, reducing the leachability of PFAS in soil.

### Outcomes

Treatment of the soil with RemBind resulted in significant reductions in leachability of all PFAS species tested, as determined by test method EN12457/3 (L/S 2). The main PFAS analyte, PFOS, was reduced by >99.9% from 400,000 ng/L to <10 ng/L (Table 1). This allowed the soil to be re-categorised and reused as fill material on-site.

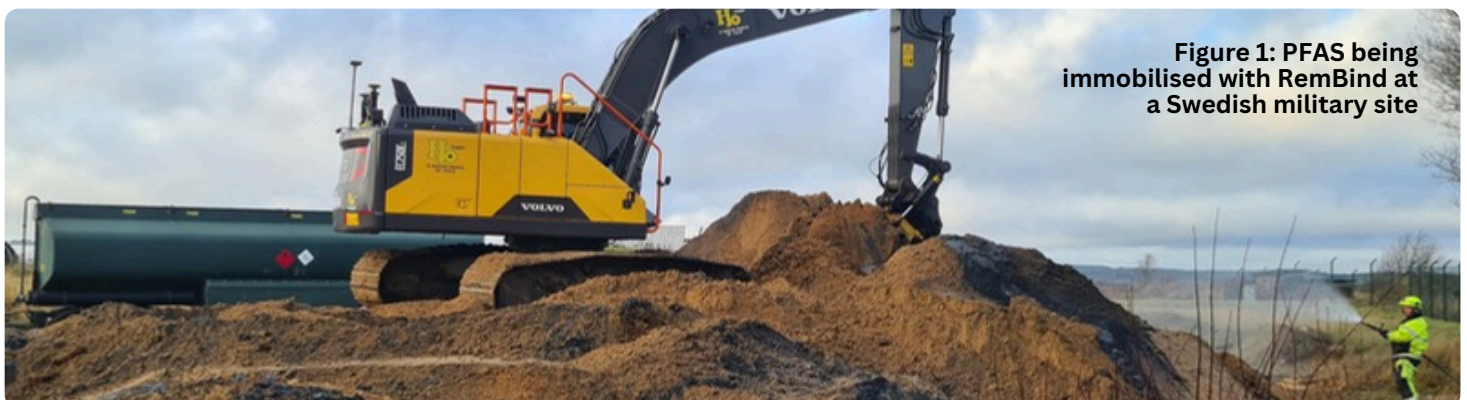
**Table 1: PFAS leachability before and after stabilisation**

PFAS Analytes	Units	Untreated Soil	Treated Soil	Reduction in Leachability
6:2 FTS	ng/l	1300	<10.0	>99%
PFBA	ng/l	220	<10.0	>98%
PFBS	ng/l	120	<10.0	>96%
PFDA	ng/l	<100	<10,0	>95%
PFHpA	ng/l	270	<10,0	>98%
PFHxA	ng/l	1200	23 ±7	>98%
PFHxS	ng/l	500	<10,0	>99%
PFNA	ng/l	<100	<10,0	>95%
PFOA	ng/l	830	<10,0	>99%
PFOS	ng/l	400 000	<10,0	>99%
PFPeA	ng/l	480	<10,0	>99%

Note 1: Method EN12457/3 (L/S 2) was used to test PFAS leachability.  
 Note 2: Where a measurement was below level of reporting (LOR), a value of 50% of the LOR was used.

### Conclusions

Overall, the solution adopted saved the project owner significant time and money and had a lower carbon footprint than the normal dig-and-dump process. This paves the way for a more sustainable approach to these types of projects going forward, consistent with the principles of a Circular Economy.



**Figure 1: PFAS being immobilised with RemBind at a Swedish military site**