RemBind® Inject

Case Study

RemBind teamed with an Australian injection contractor to demonstrate the injection of RemBind powdered reagent using conventional drilling, pumps and mixing tooling, and to assess its PFAS immobilisation performance.

Site Overview

A PFAS impacted site adjacent to an international airport was chosen as the demonstration site. 11 months prior to injection, the highest groundwater concentration was 3,300 and 6,400 ng/l for the PFOS+PFHxS, and Σ (30) PFAS, respectively, while the PFOS total concentration in the silty clay was around 4,400 ng/kg.

Average groundwater levels started at 0.9 m below ground surface (bgs) and wells were screened at around 1.0 to 4.0 m bgs.

Methodology

RemBind product was injected as a 9% slurry into a network of 9 direct push injection points with an average of 5.5 discrete intervals spaced vertically 0.5 m.

Injection intervals at adjacent points were offset by 2 m horizontally and 0.25 m vertically (from the previous point) to ensure robust delivery and coverage of the 128 m^3 treatment zone.

R450-02 09/26

RemBind® Inject
Case Study

Results

Average hydraulic conductivity (K) for the target well and an untreated upgradient well were calculated as 3.15 x 10^{-4} and 7.52 x 10^{-4}, respectively, indicating that the injected RemBind had no significant reductions of the overall seepage velocity through the treatment zone.

Additionally, other field parameters such as pH, ORP, DO, and conductivity quickly returned to background levels following the injection process.

The injection program was designed to immobilise both the existing PFAS in the treatment zone, and 'new' PFAS mass migrating through the zone in slow moving groundwater over the longer-term. Results showed significant reductions in PFOS+PFHxS (99.85% reduction) Σ (30) PFAS (97.4% reduction) in the treatment zone (see figure 2 below).

Based on the total binding capacity of the injected RemBind, the PFAS levels, and the groundwater velocity, the injection solution would be expected to last for a prolonged period of time with little or no ongoing management apart from monitoring.

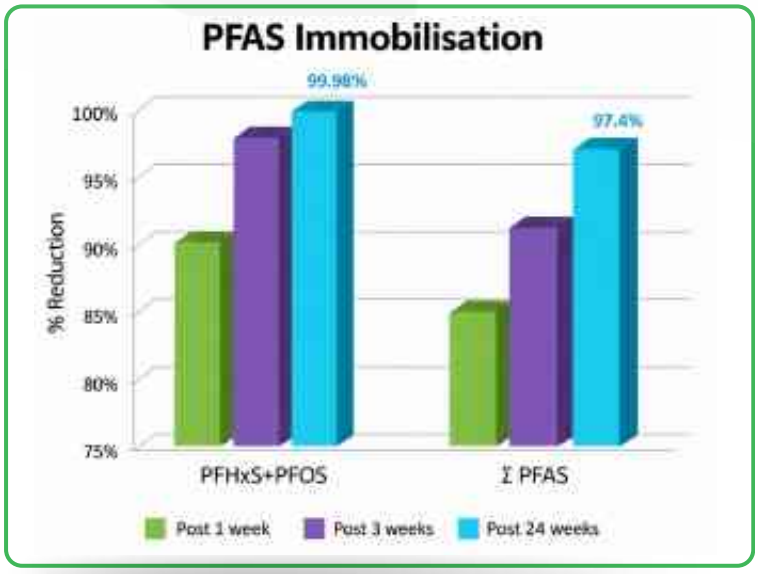

Figure 2: PFAS reductions in groundwater after treatment with RemBind® Inject

Given the depth and area of impacts, RemBind® Inject proved to be an efficient and cost-effective method for treating a large plume migrating from an off-site source. Commercial-scale design would involve emplacement of permeable absorptive barriers across the site to intercept the contaminants. Barriers can be placed in areas that minimise impacts to ongoing site operations, allowing for the immediate commencement of site activities after injections are complete.

This ground-breaking application demonstrates a method for safe, sustainable and economical management of PFAS contaminated aquifers.