



Addressing Soil, GW and Potable Water Sources Affected by PFAS Type Contaminants

Jean Paré, CHEMCO

Sarah Suehnholz, Intrapore

The intensive use of PFAS, described as eternal and considered carcinogenic, are a source of contamination in various environments and can be transported over very long distances, particularly in air and water thus leading to contamination of drinking water sources (aquifer, lake, rivers, underground potable water wells) that must be addressed.

PFAS contaminants are not found naturally and are not easily chemically or microbiologically degraded thus the use of new materials for in situ control of PFAS groundwater movement utilizing sorption processes. In situ permeable adsorption barriers (PAB) based on injectable colloidal modified clays and/or activated carbon can effectively and sustainably halt the rapid advance of PFAS plumes that could affect downgradient sensitive receptors.

This presentation will include a real-life case study at a major civilian airport in Sweden, where a fire training facility used PFOS-containing firefighting foams from the 1980s until 2003. The long-term use of these PFAS-containing foams led to contamination in the soil and groundwater. Untreated groundwater PFAS levels varied widely, reaching as high as 70,000 ng/L.

In September 2021, Intraplex colloidal carbon was injected into the aquifer from the surface down to bedrock, located 6-7 meters below. Over a 15-month monitoring period, a permeable reactive barrier (PRB) was evaluated for its efficiency in removing PFAS from groundwater across three distinct soil layers: sand, clay, and moraine where reductions exceeded 80% and often surpassed 90%.

The longevity of such barrier showed that the expected barrier lifetime for PFOS (high affinity) and PFPeA (low affinity) ranges from 35 to 90 years, exceeding the requested >20-year lifetime.

Jean Pare

Jean Pare, P.Eng., has a degree in Chemical Engineering from Laval University. He has been involved for the last 30 years in the evaluation, development, design, and promotion of both conventional and innovative environmental technologies. As Vice President with Chemco Inc., his responsibilities include the remediation design, technico-economical analysis and technology supply for chemical oxidation and reduction, soil washing, and enhanced bioremediation. Last year, he worked with over 400 sites applying his expertise to various types of organic and inorganic contaminants in soil and groundwater. He is also involved with many environmental organizations such as CLRA, CBN, ESAA, BCEIA and Réseau-Environnement where he is an active technical committee member and regular technical speaker.