

Groundwater Treatment of PFAS using PerfluorAd

PerfluorAd®, developed by Cornelsen, is a proven, field-tested, and ideally suited pre-treatment process for remediation of PFAS contaminated groundwater.

Advantages include:

- Active liquid ingredient generated micro floccs
- Precipitation and particulate filtration remove the majority of PFAS compounds
- Flexible process - matches varying inlet concentrations, desired treatment targets
- Treats a wide range of PFC/PFAS compounds
- Not limited by high Dissolved Organic Carbon
- **Significant savings** over carbon adsorption with groundwater containing high concentration of PFC compounds and associated organic and inorganic substances

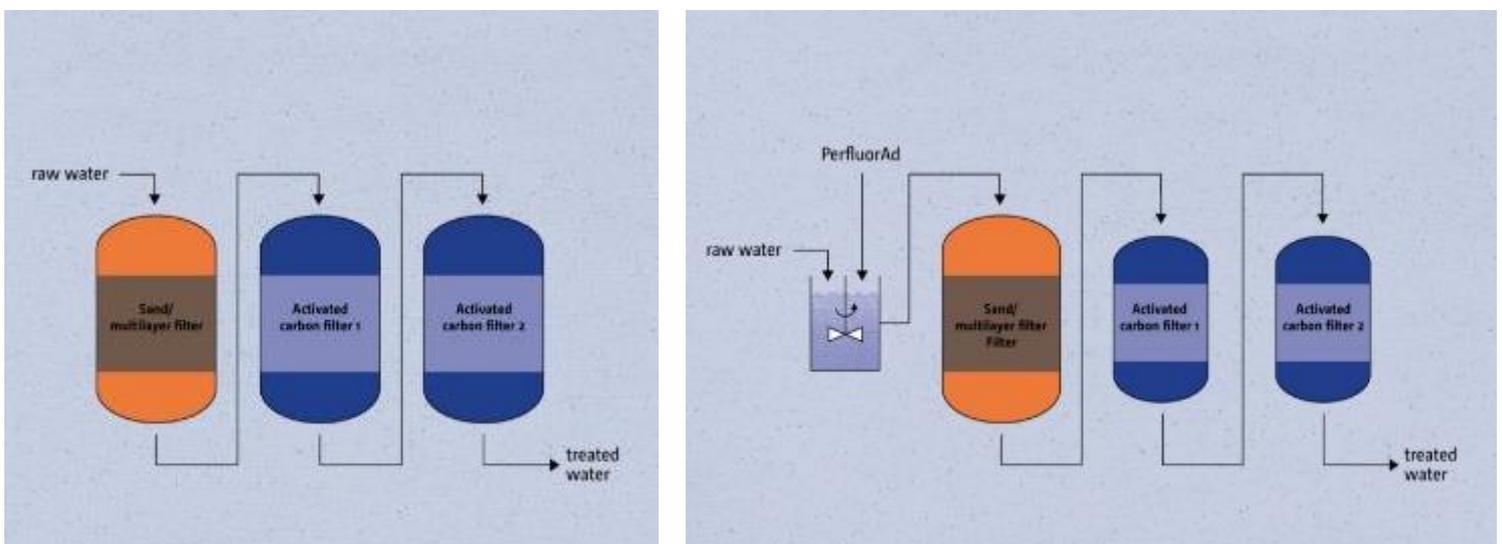


Figure 1. Traditional carbon adsorption vs PerfluorAd treatment process

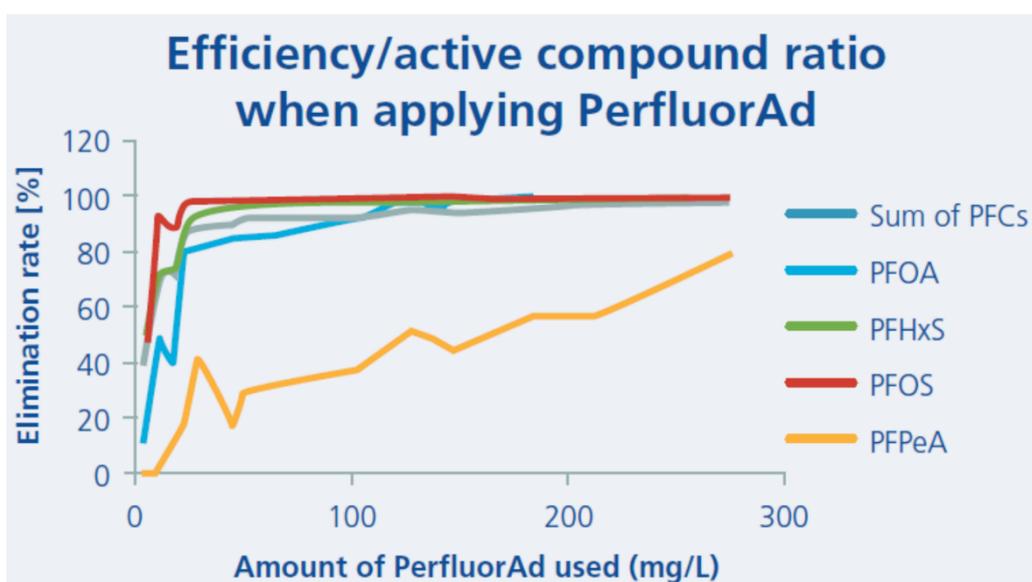


Figure 2.

PFAS Groundwater Treatment Case Study (Nuremburg, Germany)

Background

A fire training area, which had been in use for several years, exists on the airport in Nuremburg in the South of Germany. Investigations in 2012 identified contamination with PFC (PFAS) in soil and groundwater. The maximum level of PFC in the groundwater reached 777 µg/l (PFOS, PFHxS, PFHxA).

The groundwater is characterized with elevated concentrations of iron (up to 33 mg/l) and a pH-level of about 5,6 (average). Multiple remedial techniques (ion exchange, activated carbons, nanofiltration, reverse osmosis, electrochemical) were tested on both the groundwater and municipal water in the laboratory. At the conclusion, PerfluorAd was selected as the most economical solution with highest performance technique for a field demonstration, then full-scale system with a flow rate of 2 m³/hr.



Results

Site data demonstrate that the removal rate for PFC is higher than 90%. The table below shows data for the first three months. The columns in the table are providing concentrations of PFC in the groundwater from the well (inlet), behind the pre-treatment step with PerfluorAd (effluent pre-treatment) and behind the carbon vessels (effluent GAC). As a result of this performance of the pre-treatment step with PerfluorAd, where more than 90% of the PFC are removed, the activated carbon life is significantly extended. Therefore, costs for operation of the plant are significantly reduced.

