McMAHON SERVICES

PFAS Contamination Management

Background

Per- and Polyfluoroalkyl Substances (PFAS) are a class of manufactured chemicals that have been used since the 1950s to make products that resist heat, stains, grease and water. There are over 6,000 individual PFAS identified to date. Of these, there are two that are commonly referred to which are Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA).

Perhaps the most prominent application of PFAS are those used in firefighting foams referred to as Aqueous Film Forming Foam (AFFF). AFFF has been used extensively worldwide, and within Australia, from about the 1970s by both civilian and military authorities, due to its effectiveness in extinguishing liquid fuel fires.

The historic use of PFAS-containing fire fighting foams has resulted in areas within Defence bases and Airports around Australia becoming contaminated with PFOS and PFOA. Over the past five decades, these chemicals have worked their way through the soil to contaminate surface and ground water, and have also migrated into adjoining land areas.

As well as firefighting foams, PFAS have had many uses in common household and industrial applications. These include stain resistant applications for furniture and carpets, fast food or packaged food containers, make up, personal care products and cleaning products.

The biggest environmental concern about PFOS and PFOA is that they do not breakdown in the environment and can travel long distances in water and air currents. They have been shown to be widespread global contaminants and many countries are now monitoring and restricting their use.

PFOS and PFOA have been shown to be toxic to some animals, and because they do not breakdown they can bioaccumulate and biomagnify in some wildlife, including fish. This means that fish and animals higher in the food chain may accumulate high concentrations of PFOS and PFOA in their bodies. This also extends to humans.

McMahon Services is a specialist treatment contractor providing proven and innovative solutions in the management of PFAS contaminated soil and water.

Aqueous Fire Fighting Foam (AFFF) is one of the most common applications of PFAS.

PFAS Contaminant Management

The McMahon Services Solution

McMahon Services as a specialist environmental remediation contractor provides the equipment and know-how in treating PFAS with a range of reagent products. We are able to do this by having an understanding of the technical requirements of treating PFAS, as well as using state-of-the-art, innovative treatment equipment.

Innovative Soil Treatment

Treatment of PFAS contaminated soil centres on the Komatsu Reterra BZ210-1 G-Mode, a specialised soil recycler. The Reterra is specifically designed to handle a range of contaminated soils and accurately dose with a variety of reagents. Dosing hoppers and liquid manifolds are used to add the reagents with the PFAS contaminated soil. The G-Mode model offers a dramatically improved and increased workload capability and soil improvement efficiency.

The PFAS contaminated soil and reagents are mixed in a chamber consisting of a soil cutter and three flailing hammers, then discharged via another soil cutter. This ensures there is effective mixing between the reagent and the contaminants. The whole process is controlled with an on board computer system, which monitors throughput of reagents and soil to ensure volumes of material processed are accurately known.

PFAS Contaminated Water Treatment

To safely and successfully treat PFAS contaminated water, a custom designed water treatment plant is required to filter the contaminants. The design specifications for the water treatment plant consists of the following items:

- Plug and play system with short set up time (~ 48 hours);
- Fully automated PLC operation with HMI;
- Media vessels capable of treating PFAS in water to a level that is acceptable for discharge;
- Fully automated system with level and pressure controls;
- Instantaneous and totalised flow readings;
- Remote communication via SMS with alarm notification (high level, over pressure, leak detection etc.) Remote stop/start/reset system functions.

In Summary

McMahon Services are a highly experienced environmental remediation contractor capable of delivering unique, complex and large-scale treatment projects. We can deliver an innovative and compliant approach to the management and treatment of PFAS contaminated soil and water.

A business unit of McMahon Services, Groundwater Treatment Solutions (GTS) can deliver practical and cost effective treatment solutions for PFAS contaminated water through the execution of treatment techniques.

GROUNDWATER
TREATMENT SOLUTIONS