PFASs in groundwater – a risk for Swedish drinking water?

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WHAT ARE PFASS?

Perfluoroalkyl and polyfluoroalkyl substances (PFASs) are a group of anthropogenic environmental pollutants that are found worldwide in the aquatic environment, wildlife and humans. PFASs have been produced since the 1950s and have multiple industrial uses, e.g. as water repellents in clothing, paper coatings or firefighting foam (Paul et al., 2009). The compounds are highly mobile in the aquatic environment, persistent and regarded as bioaccumulative (Trautmann et al., 2015).

PFASS IN DRINKING AND GROUNDWATER

PFASs-contaminated food and drinking water are assumed to contribute significantly to PFASs uptake of humans (Fromme et al., 2009). In general, conventional drinking water treatment does not fully remove PFASs. Sources for PFASs in groundwater include diffuse sources such as wastewater treatment plants and point sources like landfills and firefighting training areas (Eschauzier et al., 2013).

PFASS OCCURRENCE IN SWEDISH WATERS

In Sweden, former and current firefighting training areas are considered to be the major (point) sources for contamination of groundwater and surface water by PFASs containing firefighting foams. Hotspots of PFASs contamination are mainly concentrated around airports, both commercially operated and those run by the Swedish Armed Forces (Ahrens et al., 2014; Berglind et al., 2013).

The first environmental screenings for PFASs were carried out already 10 years ago in Sweden (Woldegiorgis et al., 2006). However, they did not receive much public attention. This changed dramatically in 2013, when a local groundwater based waterworks (Brantafors in Kallinge, Ronneby municipality) had to shut down due to PFASs concentrations of up to 10,000 ng/l in drinking water leaving the waterworks (Jakobsson et al., 2014).

DRINKING AND GROUNDWATER IN SWEDEN

Although a survey by Svenskt Vatten carried out in 2014 (Holmström et al., 2014) suggests that groundwater is less contaminated than surface water or areas of artificial recharge, groundwater is still significantly affected by PFASs. This is a serious concern as 50 % of Sweden's drinking water comes from groundwater. Moreover, exposure via contaminated drinking water was identified as being responsible for increasing PFASs concentrations in blood serum from young women in Uppsala (Gyllenhammar et al., 2015). The widespread occurrence of PFASs contamination of groundwater, the large number of Swedes who obtain their potable water from groundwater sources and the negative health effects associated with its consumption suggest that PFASs is a risk for Swedish drinking water.

Here we present a review of the current status of PFASs contamination of Swedish groundwater and compare this to the situation in Denmark and Germany.

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