20230808 Appendix 1

Additional text for REACH PFAS restriction consultation VEWIN / UvW

Ad III, Non confidential Comments

Vewin, the Association of Dutch drinking water companies and the Dutch Water Association (UvW) strongly support the proposed PFAS restriction. PFAS measurements in drinking water, as reported by RIVM in October 2022 [1], emphasize the need for action to protect the sources of our drinking water, the water system in general and our consumers.

PFAS is a serious risk for drinking water

Based on the 2020 EFSA report on "Risk to human health related to the presence of perfluoroalkyl substances in food", the Dutch national institute for Public Health (RIVM) derived a health-based guidance value of 4,4 ng/l PFOA Equivalents.

In the mentioned study by RIVM, PFAS concentrations exceeded this threshold in over half of the measurements of drinking water produced from surface water. For drinking water from groundwater, this was the case for 1 in 10 measurements. These concentrations need to be brought down to ensure people's PFAS intake from drinking water does not become too high.

Areas with the highest PFAS concentrations in drinking water are located in the Western part of the Netherlands, where drinking water is mostly produced from river water. Concentrations the environment slowly decline because PFAS are widely present, do not or barely degrade and are difficult to remove in water treatment. Given this fact, a precautionary approach based on source-protection like a the proposed PFAS restriction, is the way forward.

Projections of future PFAS concentrations in ground- and surface water as a source for drinking water indicate that without tackling the source of PFAS all drink water sources will eventually surpass these threshold values [2]. KWR research in 2022 on PFAS in European waters[3] suggests that PFAS is raising similar high concern in other EU countries as well.

PFAS is a risk for the water system in general

In addition to the risks for drinking water specifically, it is important to stress that PFAS is a serious risk to the water system in its entirety. If people would only come into contact with PFAS through drinking water, the problem would be less serious. However, there are several other ways in which people are exposed to PFAS.

Furthermore, several examples can be mentioned in which PFAS has negative consequences for the water quality. Additional sources of PFAS in the water system, for example, are the supply of PFAS

[1] https://www.rivm.nl/en/news/pfas-levels-in-drinking-water-from-river-water-need-to-be-brought-down
[2] 589870 (wur.nl)
[3] https://www.rijksoverheid.nl/documenten/rapporten/2022/12/31/pfas-in-europees-water-een-verkenning

from upstream rivers and the deposition of PFAS through the air. PFAS has a negative effect on ecology, including toxic effects, accumulation in organisms and subsequently within the food chain.

PFAS also has a negative impact on other water functions like swimming, recreation in general on or close to the water, fishing, irrigation and livestock watering. We see waters in which the concentration of PFAS is already ten thousand times too high, and it is very difficult or even impossible to eliminate PFAS once it is present in the water system.

PFAS also contains a risk to water soils and circular ambitions. Dredging activities are sometimes necessary to preserve the water system including the water quality. When PFAS accumulates within water soils, the dredge should ultimately be disposed which is very expensive. When it comes to sludge which can be derived from sewage treatment plants, it becomes impossible to reuse the wastewater. In reference a circular economy this is an undesirable effect.

TFA as an extreme threat

Especially the occurrence of the ultrashort PFAS TriFluoroacetic Acid (TFA) in surface water, groundwater and drinking water is an extreme threat. Data from Rijkswaterstaat and RIWA as stored in the Norman database (June 2023) show concentrations of TFA up to 3 microgram/l. The drinking water advisory threshold value for TFA as a single compound is set to 2200 ng/l (RIVM, 2023)[4] , but combined with other PFAS the proposed threshold-value is in the Netherlands is 4,4 ng PFOA Equivalents (PEQ)/l. In which TFA is given relative potency factor of 0,002. Neuwald (2022) and Sadia (2023) found concentrations in the order of 1 microgram/l which exceed the limits as given by the European Drinking Water Directive [5] [6]. In this directive, which took effect on 12 January 2021, a limit of 0.5 µg/l for all PFAS is included. TFA alone exceeds this threshold. This TFA originate from various industrial use, domestic use and degradation products and are found in high concentrations in the environment and drinking water. illustrating once more that only a (global) ban can be the way forward to prevent the ubiquitous emissions of this compound and its precursors [7].

The claim that TFA is of natural origin is convincingly refuted by Joudan (2022) [8]

Clean, deeper groundwater reserves for drinking water will be lost in the future without a ban

At this moment especially drinking water produced from river water is strongly affected by the PFAS pollution. Inevitability, drinking water from groundwater will also be affected without a ban. Given the ubiquitous presence of PFAS from air-emissions and deposition at the soil-surface, this amount of PFAS will gradually and continuously infiltrate to the deeper aquifers, polluting the previously unaffected reservoirs of clean drinking water for the Dutch and European costumers, leading to extreme purification costs and efforts. The infiltration-rate of PFAS to the deeper underground is

[4] DMG-2023-0011 Bijlage Advies 14434A02_Drinkwaterrichtwaarde TFA_07122022.pdf (rivm.nl)

[5] https://pubs.acs.org/doi/abs/10.1021/acs.est.1c07949

[6] https://pubs.acs.org/doi/full/10.1021/acs.est.2c06015

[7] https://open.rws.nl/publish/pages/178609/eindrapp_brononderzoek_drinkwaterrelevante_stoffen_20221216_1-1_optimized.pdf

[8] https://pubs.rsc.org/en/content/articlelanding/2021/EM/D1EM00306B

modelled by KWR[9]. This might take decades, but will, without a ban, eventually end up with the pollution of all existing European Groundwater bodies up to levels that exceed the threshold values for PFAS that are proposed in the current revision of the Water Framework Directive (WFD) and its daughter Directives on Environmental Quality Standards (WFD-EQSD) and Groundwater Directive (WFD-GD)), where Environmental Quality Standards (EQS) are proposed for a group of 24 PFAS on al level of 4,4 ng/l PFOA Equivalents.

Banning PFAS in is crucial for several reasons

Health Risks and Consumer Protection

PFAS have been associated with numerous adverse health effects, including developmental issues, liver damage, thyroid disruption, immune system impairment, and certain types of cancer. These substances can enter the human body through various routes, including drinking water. By banning PFAS in Europe, the aim is to reduce exposure to these harmful chemicals and protect public health. The Dutch National Public Health Institute (RIVM) has already calculated that Dutch citizens take in too much PFAS already. A ban on PFAS is absolutely necessary to ensure a safe living environment for European citizens now and in the future.

Water Treatment Challenges and Costs

Removing PFAS from water sources is challenging and costly for drinking water treatment facilities. Due to their unique properties, PFAS are resistant to traditional water treatment processes, making their removal extremely difficult, and moreover, advanced treatment methods, such as activated carbon filtration or reverse osmosis, require 5-20 % more source water, where (groundwater) sources of drinking water are becoming more scarce as a result of climate change and drought.

In addition to this, there are currently no efficient techniques available to eliminate PFAS from waste water through sewage treatment plants. In most cases, existing techniques to reduce PFAS are very expensive and little effective in case of a small source, especially considering the high contribution of additional sources of PFAS through the air and upstream supplies. These techniques are also require a huge amount of energy, which is not desirable in relation to climate change. It is much more effective and environmentally friendly to prevent PFAS from getting into the environment in the first place. As the vast majority of PFAS in river water (Rhine and Meuse) entering the Netherlands is emitted somewhere in the international river-basin, a European, cross-border approach is the only logical approach to minimize this pollution.

PFAS removal techniques are insufficient and mostly moving PFAS from one medium to another

PFAS is a very persistent group of chemicals with no natural decay. PFAS removal from drinking water is moving PFAS from one medium to another. Waste streams of PFAS containing activated carbon or membrane concentrate is the result. Removal of PFAS from water might be the solution for drinking water, but leads to extra pollution of (surface) water, air and landfills, as the waste-streams of standard purification (PFAS containing activated carbon, sludge or concentrate) ends up somewhere in the environment. Verma at al. (2023)[10] described low performance of thermal and non-thermal treatment technologies in large scale applications.

[9] https://edepot.wur.nl/589870

[10] Recent advances on PFAS degradation via thermal and nonthermal methods - ScienceDirect

The need for a ban on PFAS

Banning PFAS in Europe would lead to a reduction in their presence in water sources, easing the burden on water treatment facilities. This, in turn, can alleviate the costs associated with the specialized treatment required for PFAS removal. By preventing further contamination, it allows resources to be focused on enhancing overall water quality and improving treatment efficiency.

In conclusion, banning PFAS in Europe, particularly in the context of drinking water production, is essential for protecting public health, safeguarding the environment, and limiting public costs and even droughts. Droughts, because additional purification with for example membranes, requires extra source waters from rivers and aquifers that are threatened for over-exploitation during long dry periods like the summer of 2023, where drinking water facilities throughout Europe feared for shortages. Furthermore, banning PFAS aligns with global efforts to regulate and restrict these substances. It demonstrates Europe's commitment to environmental protection and encourages international harmonization in the control of PFAS. By taking decisive action, Europe can lead the way in creating a safer and more sustainable future, ensuring clean and healthy drinking water for its population and setting an example for the rest of the world.

All PFAS are a threat

As we have learned, PFAS are emitted along various pathways and are ubiquitous: everywhere in the world PFAS are found. Unwanted emissions occur during production, use, and disposal.

The total occurrence and emissions of lots of PFAS and precursors are not well known. According to the Pubchem classification browser [11], there are more than 6 million various PFAS that fit the OECD PFAS definition of the Restriction dossier. Removal and remediation is practically impossible. Even burning leads to smaller PFAS-fragments and transformation products like TFA. Claims of industry that there are less harmful PFAS have led to regrettable substitutions, for example from PFOA to GenX (HFPO-DA). Similar claims of harmless PFAS-subgroups like fluoropolymers are refuted in literature by Lohmann et al. [12]. Somewhere in the process of production, use and disposal PFAS will enter the environment and accumulate in water, soil, air and the foodchain. The supports the conclusion that the only way to prohibit further emissions and accumulation of PFAS in our environment is a complete ban. Vewin strongly supports the broad scope of the PFAS definition in the restriction proposal. The need for a broad scope is also necessary as the health based drinking water advisory level as derived by RIVM has no limitation and contains every PFAS (Including TFA) with an established Relative Potency Factor (RPF-value) translated to PFOA equivalents and should not exceed the level of 4,4 ng/l PFOA equivalents per litre. This list of PFAS is theoretically enormous.

[11] https://pubchem.ncbi.nlm.nih.gov/classification/#hid=120

[12] Are Fluoropolymers Really of Low Concern for Human and Environmental Health and Separate from Other PFAS? | Environmental Science & Technology (acs.org)

The need of fast implementation and no exemptions

This restriction-proposal does not come as a surprise or unannounced. The societal risks and costs of the use of PFAS have been described many times, for example by Chemsec in 2023 [13]. Given the time between the (announcement of the) proposal (2022) and suggested start of the implementation (2025), there will be enough time for industry to prepare. Therefore exemptions should not be tolerated and only be granted under very strict conditions and for a period as short as possible

Textile, paper and firefighting-foam industry have proven that there are always alternatives available for PFAS. It takes some years of a transformation period, but it is possible, as proven by the H&M group during the ZeroPM workshop in February 2023 [14]. Recently (june 2023), Martin Scheringer published a comment in science, with the same conclusion [15].

Claims that PFAS are essential for societal favourable transitions like the energy transition should be critically assessed, The fact that PFAS are used for "essential" and high valued products, doesn't automatically mean that PFAS are essential in these products. There will always be an alternative that will also better fit with the European ambitions of a circular economy. PFAS containing products are probably impossible to re-use. In order to prevent further pollution of the European environment and the sources of our drinking water a fast implementation with no exemptions is the way forward.

Only restriction of emissions is an illusion

Claims that the PFAS containing products are not the problem, but only the production, and that the emissions during production could be regulated is misleading. As stated by Lohmann (2020), emissions occur during production, use and disposal [16]. Removing of PFAS is an illusion. Removal of PFAS from air or water moves the PFAS from one phase to another, for example from water tot activated carbon or membrane concentrate. These PFAS containing waste-streams ends up in landfills or are burned at standard temperatures, leading to new/other and unmeasured smaller PFAS compounds that will re-enter the environment by leaching to soil and air. Again supporting the proposal for a complete ban.

Additional supporting documentation

Commissioned by Vewin, KWR has compiled an overview of recent relevant scientific literature information that is important for the current restriction proposal. This report is attached as appendix 2. Relevant conclusions from this research are:

- PFAS have documented adverse effects on human health and the environment, and that (drinking) water is an important exposure route for humans to PFAS;

[13] https://chemsec.org/reports/the-top-12-pfas-producers-in-the-world-and-the-staggering-societal-costs-of-pfas-pollution/

[14] https://www.youtube.com/watch?v=opaJACkecJQ&t=11s

[15] https://www.science.org/doi/10.1126/science.adj7475

[16] https://pubs.acs.org/doi/full/10.1021/acs.est.0c03244

- The amount of literature and evidence on adverse health effects of PFAS is still growing;
- Many of reported removal methods have the potential to efficiently remove PFAS from water. Nevertheless, it should be noted that these findings are novel and sometimes promising, but it remains yet unclear if their implementation on a large scale is feasible;
- The restriction of PFAS can indeed result in lower exposure and thus risks to humans and the environment;
- It is argued that all PFAS, including fluoropolymers, give rise to emissions of harmful PFAS at some stage of their life cycle. Therefore, some authors support the broad definition of PFAS used in the restriction proposal and the resulting ban on fluoropolymers and other PFAS alike.
- It was noted that the authors supporting the exemption of fluoropolymers from a ban represent or are affiliated with PFAS-producing companies;
- 97 % of China's PFOA/PFO emissions originated from the production of fluoropolymers;
- Emerging PFAS can induce toxicity like legacy PFAS like PFOS and PFOA;
- The justification for managing PFAS as a single chemical class to reduce PFAS-related risks is provided in the scientific literature. It is argued that a class-based approach can be implemented to eliminate non-essential uses of PFAS more effectively, develop safer alternatives, and clean up highly contaminated areas.
- A restriction of PFAS can indeed result in lower exposure and thus risks to humans and the environment;

The overall conclusion of Vewin is that there is strong scientific support for a complete ban of all PFAS according to the proposed PFAS definition, including subgroups as TFA and fluoropolymers.