Joint statement: The case for urgent, group-based, regulation to prevent continued PFAS pollution in the UK environment

May 2022

There is now clear and unequivocal evidence that demonstrates global contamination of the environment, wildlife and human populations by per- and polyfluorinated alkyl substances, PFAS.

- Widespread PFAS-use has created an irreversible toxic legacy of global contamination.
- PFAS are accumulating in our bodies and those of our children.
- PFAS exposure poses an immediate threat to human health.
- PFAS pollution is fuelling the biodiversity crisis.
- PFAS pollution is a threat to UK drinking water.
- PFAS in products create a barrier to the circular economy and a waste problem yet to be solved.
- PFAS-free solutions already exist, yet PFAS continue to be added unnecessarily to many consumer products.
- With the planetary boundary for chemical pollution already largely exceeded, there is no time to wait.

The undersigned organisations therefore call on the UK Government to:

1. Restrict the production and use of ALL PFAS as one group by 2025, with the following recommendations and exemptions:
    a. Take immediate action to phase-out PFAS where suitable alternatives are already in regular use across the UK market (e.g. in food packaging).
    b. Take immediate action to prevent products containing high levels of PFAS being marketed as 'compostable'.
    c. Grant time-limited exemptions (with caveats, see points 2a-c below) where the continued use of PFAS is proven to be essential for the health, safety or functioning of society, AND where no suitable alternative currently exists.
2. Where an exemption for continued use is granted the following conditions must apply:
    a. Stringent risk-management requirements must be in place to ensure zero-emission to the environment at all stages of the life-cycle.
    b. Regular reassessment should be carried out to ensure the conditions of the exemption remain valid.
    c. Exemptions should be time-limited, ensuring a full phase-out by 2035.
3. Ensure sufficient funding and support is available to drive research and innovation towards safe and sustainable PFAS alternatives.
4. Submit a proposal to the Stockholm Convention for global elimination of ALL PFAS.

Chemical pollution has passed the safe limit for humanity, and with scientists urging immediate action to reduce the production and release of novel entities it is vital that we do not delay measures to address the growing and persistent problem of PFAS.

Context

There is now clear and unequivocal evidence that demonstrates global contamination of the environment, wildlife and human populations by per- and polyfluorinated alkyl substances, PFAS. This clearly shows that current regulatory approaches to PFAS management, both in the UK and abroad, are inadequate in preventing their release to the environment. There are 1000s of different PFAS available for use, however, only two, PFOS and PFOA, are adequately understood and regulated globally. Due to their extreme persistence, and the growing evidence base linking exposure to harmful impacts on wildlife and human health, this creates an **unacceptable risk for both current and future generations.**

With the UK Government currently considering regulatory options for the management of PFAS, we have an opportunity to address this growing chemical crisis, to halt the never-ending cycle of regrettable substitution and to create a regulatory framework that sets an example for others to follow. As NGOs representing public interest across health and environment, **we strongly urge the UK Government to take this opportunity to implement stringent, group-based legislation, to eliminate all unnecessary sources of these harmful chemicals and to drive innovation towards safer and greener alternatives.**

Widespread PFAS-use has created an irreversible toxic legacy of global contamination

Despite no natural sources and only ~60 years since their first commercial use, **the extreme persistence, mobility and widespread use of PFAS has resulted in global contamination of water, air, soils, wildlife and human populations**. PFAS and their precursors are now found in drinking water across Europe[1] and the US[2], are ubiquitous in UK freshwater[3], and are accumulating in the marine environment[4]. PFAS contaminate soils and crops and bioaccumulate along food chains[1], with some showing half lives in the environment of over 1000 years[5]. They contaminate air and dust and through long-range atmospheric transport reach even the most remote regions of the globe, from high altitudes to both poles[6], [7], [8]. With current analytical methodologies restricted to a minority of PFAS, and fewer still being actively monitored, **our current understanding of environmental contamination represents only the tip of the iceberg[9]. Continuing to condone this widespread degradation of natural resources risks devastating consequences for future generations.**

PFAS are accumulating in our bodies and those of our children

Many of the PFAS already studied have been shown to be toxic to humans; they bioaccumulate and they persist in our bodies. People in the UK are exposed to PFAS through food, water, consumer products as well as materials in our homes and workplaces. PFAS concentrations build-up in human body fluids and have been found in blood, urine, placenta, the umbilical cord and breastmilk[10], [11]. **Today, children are born pre-polluted with PFAS[12], [13], putting the health prospects of future generations at risk**.

Human biomonitoring studies provide clear evidence that PFAS are also accumulating in the blood serum of populations worldwide, with exposure linked to occupational risk and age cohort[1]. **Intake in children is almost double that of adults[1]; babies are born with PFAS already in their bodies from**

prenatal exposure, are fed PFAS-contaminated breast-milk or formula[14], [1]**, and ingest significant quantities of PFAS in contaminated house-dust**[1]. For example:

- In 2005, an EU-wide family biomonitoring study found PFOA and/or PFOS in the blood of *all* participating children[15].
- A German environmental survey, carried out in 2014 and 2017 found both PFOS and PFOA widespread amongst children and adolescents (100% and 86% respectively)[16], despite global restrictions mandated under the Stockholm convention for PFOS in 2009.
- In 2020, the European Food Safety Authority (EFSA) re-evaluated the evidence on PFOA and PFOS toxicities, concluding that parts of the European population will exceed the new tolerable weekly intake levels due to the widespread contamination of food and drinking water[1].
- EFSA's 2020 report also concluded that toddlers and other children are the most exposed population groups due to exposure during pregnancy and breastfeeding[1].

As levels of PFOS and PFOA start to decline in response to stringent restrictions, **there has been a concurrent rise in the novel PFAS substances that have quickly replaced them**[1]**. This undermines the impact of hard-won regulatory controls and provides a worrying glimpse of the problems future generations will be forced to address.**

PFAS exposure poses an immediate threat to human health

PFAS exposure has been linked to an array of adverse health effects, from thyroid disease, liver damage, reduced birth weight, obesity, diabetes, high cholesterol and reduction in response to **vaccination**, to an increased risk of breast, kidney and testicular **cancer**[1], [17], [18], [19]. There's also growing evidence suggesting impacts on **fertility**, development and behavioural problems[20]. Yet, despite this wide-ranging list of human health concerns, we still lack adequate toxicological data to assess the safety of the vast majority of PFAS.

The risk from harmful chemicals is further exacerbated when exposure occurs in vulnerable groups. It is our children, pregnant women and the developing foetuses of the next generation that will pay the price for today's inaction[21].

Of particular concern is the consistent trend emerging in PFAS research, where increased knowledge of a substance leads to increased evidence of harm. For example, in 2020 EFSA lowered the recommended tolerable intake of PFOA by over 2,000-fold compared to 2008[1], and in 2021 the US EPA reduced their PFOA-reference dose by over 13,000-fold compared to 2016[22]. A similar trend is seen for GenX (a PFAS commonly used as a replacement for PFOA), for which the EPA lowered the reference dose 26-fold in 2021 compared to 2018[23]. Whilst continual assessment and re-evaluation is necessary, and adjustments to safety limits are inevitable, **the dramatic extent to which these limits have changed in recent years clearly demonstrates a failure to adequately protect the public, particularly those living with exposure levels now recognised as unsafe**. **It also raises serious concern over the many thousands of PFAS for which toxicological data is still lacking.**

Failing to take appropriate action on these highly persistent chemicals would be a clear breach of the duty to protect public health, jeopardising not only the health of the current population but also undermining that of future generations.

PFAS pollution is fuelling the biodiversity crisis

Anthropogenic chemical pollution is acknowledged as one of the main, yet underestimated, drivers of the biodiversity crisis[24]. Due to the extreme environmental persistence of PFAS (some PFAS have half-lives of over 1000 years), and their continued and widespread use across modern society, **PFAS represent a major and increasing burden on wildlife. This both directly impacts population survival and reduces resilience to other stressors such as climate change and habitat loss.**

PFAS are highly mobile in the environment with research showing the ability of some to both bioaccumulate and biomagnify. As such, PFAS are now detected in numerous species across the UK, from freshwater fish and terrestrial birds, to top predators such as otters, seabirds and marine mammals[25], [26], [27]. Recent research also points to the impact PFAS can have on key species such as pollinators, risking knock-on implications across UK agriculture and food production. For example:

- In **marine mammals**, PFAS exposure has been linked to impacts on immune, blood, liver and kidney function in bottlenose dolphins, immune function in sea otters and has even been linked to neurological impacts in polar bears[28].
- In **marine birds**, higher levels of PFAS are correlated with disruption of the thyroid hormone and poorer body conditions[29].
- In **fish**, PFAS have been shown to disrupt reproduction, thyroid activity, metabolism and development[30].
- Exposure of **bee colonies** to PFOS has been shown to increase mortality and affect colony activity, with PFOS bioaccumulating in bee tissues[31].

The threat of persistent chemicals is not new. Legacy contaminants such as PCBs continue to threaten UK wildlife decades after restrictions were first introduced[32]. **It is therefore vital that we act with urgency to stem all unnecessary sources of these persistent pollutants if we are to learn from past mistakes, protect wildlife and safeguard the resilience of our natural environment for future generations.**

PFAS pollution is a threat to UK drinking water

Humans rely on the environment, and the natural resources it provides, for our most basic and fundamental needs, from clean drinking water to food security. There is already widespread concern about the threat of drinking water supply, with the chief executive of the Environment Agency warning that we could run out in a matter of a couple of decades[33]. And across the world, we already see the impacts that PFAS pollution has on this vital resource. We must act now to reduce the threat that PFAS pose to UK drinking water:

- **Due to their high mobility in water, PFAS can easily move from sources of discharge to drinking water.** It is estimated that between 2-17 % of PFAS accumulation in humans in

Europe is due to intake from drinking water[34], and this will only increase if levels of PFAS in water continue to rise.

- **PFAS cannot be removed easily from drinking water.** EurEau states that "*While technologies exist to remove most PFAS, they are unsustainable, mainly due to their technical complexity, resource intensity (water, energy, treatment chemicals etc.) and the generation of PFAS-containing residues. Reliance on end-of-pipe solutions creates a substantial stumbling block on the water sector's journey towards climate neutrality"*[34].
- **Even when partial removal is possible, it leaves the water industry with PFAS-contaminated waste to dispose of.** Currently, a portion of this residual waste (sewage sludge or biosolids) is spread on land. Contaminants like PFAS are then transferred to the environment and potentially into the food chain[35].

PFAS in products create a barrier to the circular economy and a waste problem yet to be solved

It is now widely accepted that moving towards a circular economy is a vital step in creating a more sustainable society and in addressing the climate crisis. To achieve this, **we need to rethink how we use and manage chemicals, avoid locking harmful chemicals into successive product loops and prevent contamination of otherwise useful waste streams.** We know that PFAS already contaminate a range of recycled paper and board products, where they serve no function, therefore creating unnecessarily exposure to the public. And through the agricultural application of contaminated compost and wastepaper pulp, PFAS can be taken up by food crops and enter the wider environment. For example:

- Recent product testing found widespread **PFAS contamination of paper and board food packaging** items not intentionally treated with PFAS[36], [37], suggesting recycled content as the primary source.
- Moulded fibre **compostable food packaging** has repeatedly been shown to contain high levels of PFAS, with concentrations an order of magnitude higher than comparable paper and board products. If composted as advised, this represents a direct source of PFAS into the environment[36], [37].
- **Paper sludge** contaminated with PFAS and spread onto arable land, resulted in significant levels of soil and groundwater contamination in the area of Rastatt in Baden-Wuerttemberg, PFAS were also recorded in **crops** at levels exceeding those deemed safe for human consumption[38].

Even when we move away from the idea of circularity, PFAS are almost impossible to destroy, requiring specialised high temperature incineration, and even then the efficiency of incineration in practice remains debated[39]. Discarding PFAS-treated consumer products with general household waste, whether to landfill or incineration, ultimately acts as a source of emissions to the environment[40]. **The continued production and use of PFAS, without adequate means of disposal, is therefore highly unsustainable.**

PFAS-free solutions already exist, yet PFAS continue to be added unnecessarily to many consumer products

PFAS are regularly used in a huge range of consumer products, often to provide a function that is either ineffective or unnecessary, or where alternatives already exist. For example:

- A survey carried out by environmental charity Fidra demonstrated no change in consumer behaviour, either in washing frequency or garment longevity, in **clothing** treated with PFAS-based stain resistance[41].
- In 2020, PFAS was detected in **food-packaging** sold across 8 out of 9 major UK supermarkets and 100% of UK takeaways tested[36], and in 2021, these results were corroborated by further studies considering food packaging across the UK and EU[42]. These findings come more than 5 years after a major Danish supermarket eradicated PFAS from its own brand food packaging, clearly demonstrating the availability of market suitable alternatives.
- A recent study looking at PFAS use in **cosmetics** sold on the US and Canadian market found PFAS in more than half of the samples tested. However, the study also showed the availability of a wide range of popular cosmetics that met customer expectations without the need for PFAS[43].

Whilst PFAS-free products may be available, with little or no requirement for product labelling or publicly available information, consumer choice remains limited. Even within supply chains, awareness of PFAS is low and chemical content often unavailable for the vast majority of products. **Clear legislative action is therefore essential to reduce public exposure to PFAS, and to prevent ongoing environmental contamination.**

With the planetary boundary for chemical pollution already largely exceeded, there is no time to wait

Chemical pollution has passed the safe limit for humanity[44], and with scientists urging immediate action to reduce the production and release of novel entities it is vital that we do not delay measures to address the growing and persistent problem of PFAS.

With over 5,000 PFAS compounds identified, and toxicological data available for only a handful, it is impossible to perform a full risk assessment for each individual substance. Allowing PFAS to continue accumulating in our bodies and the natural environment while we wait potentially decades for research to catch up, cannot be an option. Neither can we continue to rely on a substance-by-substance approach to regulation, allowing the never-ending cycle of regrettable substitution that has undermined genuine progress towards safe and sustainable alternatives. **The extreme persistence of ALL PFAS, and the irreversibility of global PFAS contamination, has already created a toxic legacy, the burden of which will be felt for generations to come. We must act now to halt this damage**.

We therefore call on the UK Government to ensure the precautionary principle, as enshrined within the Environment Act, is implemented to full effect with regard to PFAS regulation[45].

PFAS must be restricted as a group to protect current and future generations

The undersigned organisations are calling on the UK Government to:

1. Restrict the production and use of ALL PFAS as one group by 2025, with the following recommendations and exemptions:
    a. Take immediate action to phase-out PFAS where suitable alternatives are already in regular use across the UK market (e.g. in food packaging).
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    c. Exemptions should be time-limited, ensuring a full phase-out by 2035.
3. Ensure sufficient funding and support is available to drive research and innovation towards safe and sustainable PFAS alternatives.
4. Submit a proposal to the Stockholm Convention for global elimination of ALL PFAS.

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