

Position Statement



& ' \$) *) / (\$)) ? ! (- " \$) " *) — -) \$? / -

October 2024

Pollution in water is driving an unprecedented global crisis. Water bodies including lakes, rivers, groundwaters, coastal waters and oceans are widely contaminated with cocktails of toxic chemicals and plastics. Contaminants of Emerging Concern (CECs) represent a troubling subset of pollutants, which are often unregulated and poorly understood. However, what is well-evidenced is that they are impacting our environment, resulting in adverse consequences for ecosystems and human health. We urgently need a comprehensive approach to CECs that complements remediation strategies and combines monitoring, regulation, interdisciplinary research and collaboration. The Royal Society of Chemistry (RSC) is therefore calling on our governments and regulators for ambitious (R)33 (a) an

to point sources, diffuse sources of pollution are harder to identify, manage and regulate, due to their high variability, both temporally and spatially, and the number of stakeholders that are involved. This has led to a fragmented policy landscape.²¹

That said, new, scalable laboratory and modelling methods are already emerging that together can help with source apportionment (e.g. the process of identifying sources of pollution and their contributions to overall pollution levels), and to help unravel the complexity of mixtures present in water.^{22,23} In addition, any approach aiming to tackle CEC sources needs to be resilient to cope with changing consumption

+ - / \$. * - QÁ2ÂcÀ à Qà / \$ * -

Despite this, our understanding of fate and impact of contaminants in the marine environment has had a limited focus to date, potentially due to historic misconceptions on the ability of the oceans to dilute chemical pollution. However, recent studies have demonstrated that contaminants finding their way into oceans are not gone forever. For example, one recent study²⁵ estimated that more PFAS is released into the atmosphere via waves in coasts than industrial emissions. The limited understanding of chemical pollution in marine environments, has resulted in a severe lack of knowledge and data to inform policy action.

0 - - 2/ / - " 0 '\$ ^)\$) / #

Following / # • . 3 \$ / ! European Union (EU), two major EU water management policies were retained in the UK:

- x The Water Framework Directive (WFD)³⁶ and its relevant daughter directives (Environmental

Northern Ireland	Northern Ireland Environment Agency • Water Management Unit Drinking Water Inspectorate	Public body Northern Ireland Water is responsible for water supply and treatment	Sustainable Water 20152040 Living With Water Programme * - / # -) - ') / - • . 2021-2046
------------------	--	--	---

Whilst the WFD and UWWTD in their original form were retained in the UK following its exit from the EU, these two major water policies are currently undergoing review and potential reformation in 2024 in the EU.^{28,29} Included in the suite of proposed changes are actions recognising that current legislation is not protective enough against CECs entering the environment. Suggested amendments have included greater monitoring of CECs in surface waters, groundwaters and in effluents and sludge, along with additional levels of treatment in WWTPs to remove a broad spectrum of micropollutants. As the UK is no longer within the EU, they are not required to implement these changes.

Furthermore, an EU Watch List was established in 2016 to improve information to highlight substances of concern, with EU Member States required to monitor substances annually and report results to the European Commission. This list is updated every two years, with the most recent update occurring in 2022.³¹ The UK is required to monitor chemicals that are under the watchlist when they were a part of the EU, but do not need to monitor any new ones that get added to subsequent updates. Furthermore, as the EU Watch List process for setting environmental quality standards no longer applies in the UK, a new process for setting new standards is also required.

Each UK nation is now free to diverge from the WFD, yet the Windsor Framework mandates that Northern Ireland also complies with the urban wastewater treatment amendments that apply to the Republic of Ireland. These new dynamics may lead to significant differences in scale, scope and frequency of CEC monitoring between UK nations and between the UK and the EU, making long-term trends in the dispersion of environmentally mobile contaminants much more challenging to capture and respond to in an evidence-informed way.

Water policy in the UK risks being too narrowly focused. Water companies are rightly receiving increasing scrutiny and significant public attention in the UK due to 14 (i)-3 (g)4 (ht)7 (4 (e)-3 (ce)-5 (i)-3 (v)9 (i)-3 (n)5

research area. This, however, is not without challenges due to the diversity of mixtures in the environment that can be constantly changing.

Furthermore, it is not just the parent chemicals themselves, but transformation products (including metabolites) that can cause adverse effects. In some cases, transformation products can be more persistent and have greater toxicity than the corresponding parent chemicals. For example, transformation products of the antiepileptic drug carbamazepine have been found more toxic than carbamazepine itself.⁴⁸

Risk assessment approaches may need to be improved to consider potential effects in both ecosystems and humans following inadvertent chronic exposure to low levels of CECs in water. This is particularly pertinent in the case of contaminants emerging as a particular threat.

32 (p) 139a) 4 (9) 49 (15) 92 (3) 49

3. Tackling sources of pollution

Preventing CECs entering waters

Similar to water ' "\$. ' / \$ *) \$) / # v 2 . . / ' \$. # ! * ' ' * 2 \$) " and
UK has been developing a wider UK Chemicals Strategy. Due to uncertainties and delays around
chemicals regulation in the UK, the RSC has called for a dedicated National Chemicals Agency (Box 2).

Furthermore, at-source strategies include ensuring responsible innovation and use. Industries have a
responsibility for ensuring sustainable innovation, 0 0 595 >-l595 >-l6v n63 EM (e)-3 (n)5 (su)5 (r)14 (i)-3

Our governments and regulators must:

1. Implement effective, comprehensive and resilient monitoring strategies to identify and monitor trends in CEC occurrence in water, and also in humans, wildlife, air, sediments, and soil. Monitoring should begin now and continue over the years ahead to determine long-term trends and to provide information on the evolving fate of CECs
2. Ensure monitoring programmes are adequately resourced and there is a harmonised approach within the UK. Whilst water policy is devolved in the UK, where possible some degree of harmonisation in monitoring (e.g. standardised methods, CECs in scope) should be done to avoid loss of long-term spatial data sets
3. Implement improved risk assessments that assess the biological impact that chemical mixtures can have on ecosystems and human health. Such methods could include effect-based methods e.g. techniques that can measure the effects of chemical mixtures on organisms and/or cells and importantly also including New Approach Methodologies (NAMs).
4. (+ ' () / . / - *) " - € + * ' ' 0 / - + by making \$) \$ + '

Contact

The Royal Society of Chemistry would be happy to discuss any of the issues raised in this position statement in more detail. Any questions should be directed policy@rsc.org.

About us

¹¹ United Nations Environment Programme. 2023. Bracing for Superbugs: Strengthening environmental action in the One Health response to antimicrobial resistance. Geneva. <https://www.unep.org/resources/superbugs/environmentalaction>

¹² Larsson, D.G. and Flach, C.F., 2022. Antibiotic resistance in the environment. Nature Reviews Microbiology, 20(5), pp. 257-270. <https://www.nature.com/articles/s4157902100649x#Sec9>

¹³ Position Statement on Antimicrobial Resistance. Royal Society of Chemistry, 2024. <https://www.rsc.org/globalassets/22new-perspectives/health/ourpolicy-position-antimicrobial-resistance.pdf>

¹⁴ Antimicrobial Resistance. World Health Organisation. <https://www.who.int/news>

15
e B w , h d e - 2 4 (.) 3 1 4
© Royal Society of Chemistry 2024. Registered charity number 207890
@RSC_Paint (t) 5 st 5 - 244 (d) 24 h

