

WORSHIPFUL COMPANY OF WATER CONSERVATORS (WCWC)
STREAMLINING OF ENVIRONMENTAL WATER LEGISLATION IN ENGLAND
WITH PARTICULAR REFERENCE TO RIVERS

THOUGHTS AND SUGGESTIONS
V1.0 8th MARCH 2023

EXECUTIVE SUMMARY

The Worshipful Company of Water Conservators (WCWC) has produced this comprehensive think-piece on streamlining, as part of its continuing contribution to the conversations about the future of water conservation. It provides the detailed thinking which underpins a short form edition.

The WCWC is mindful of the intense national interest in river water quality and that there is open discussion on streamlining of legislation, particularly that arising from the Retained EU Law (Revocation and Reform) Bill 2022. Drawing upon the decades of experience of its members it makes the following suggestions to aid that discussion.

A. The evidence on current river quality and a suggestion for change in reporting

The headline statistics for Good Ecological and Good Chemical Qualities do not fully represent the overall state of the quality of English rivers. That insight does not gainsay recognition of the need to continue with the efforts to improve the actual quality, or the separate effort to reduce sewer overflows. In this, the WCWC found that its interpretation matched those of the Environment Agency and Defra.

The WCWC suggests that the first and urgent step is to provide a better insight into river water quality. This might be achieved by an initial modification of existing regulations as a prelude to streamlining.

B. Suggestions for a streamlined framework for integrating all the needs of rivers within catchments which builds on the approaches of the Water Framework Directive Regulations and which draw on past experiences

The WCWC reiterates a suggestion, made previously in response to Defra Consultations, for a ‘**road map**’ of initiatives and for a **national strategy** in which uses of river stretches are agreed by local public consultation, based on sets of recognisable uses; and then stretch quality objectives are produced from those agreed uses by combining nationally agreed quality criteria for each recognisable use. This should sit within an overarching strategy for water management in England. New criteria need to take better account of biological conditions by including ecological objectives for health, diversity and productivity as well as physical form, which allow the creation of new and better environments. This would draw on the strengths of the river use objectives system which preceded the introduction of the Water Framework Directive Regulations; but reflect current attitudes, technologies and accountabilities. The WCWC suggests that such an approach could underpin the streamlining processes.

C. Creating a national consensus building structure & Commission

The WCWC also reaffirms its suggestion made in its Governance Think-piece that there would be great value in having a national Commission to produce recommendations to government for developing **a framework for an overarching national water strategy**; a ‘common hymn sheet’ for all interested parties. The Commission would be accountable to an appropriate Secretary of State and have core membership of relevant government departments and regulators as well as those sectors responsible for the delivery of the objectives, such water companies and agriculture. Membership could include relevant NGOs.

The decision to pursue the notion of river quality objectives should be taken at the same time as that to establish a Commission.

FULL SUMMARY

S1 This think-piece is produced by the Worshipful Company of Water Conservators, the City of London Livery Company focussed on the long-term health of our water resources and the broader environment. Our members include senior professionals from water, environmental and related industries and regulators, along with others who share our passion for water and the environment. Our experience and knowledge ranges from the complexities of environmental sciences, through the application of engineering to deliver the goals identified by those sciences, and the subsequent management of the assets created. The Company’s purpose is *Promoting a diverse and sustainable environment*.

Why has the Worshipful Company produced this paper?

S2 In recent times there has been a great increase in concern in England about water quality, including the impact of storm sewage overflows, water resources during droughts, and the performance of water companies and their regulators. Some criticism is justified, some is less well informed. A more reasoned debate is needed in order to ensure that, whatever changes are made, they are well founded and focussed on productive, properly prioritised, improvements.

S3 During 2022-23, not only did the state of the rivers of England become a matter of debate in the media and in politics, but as part of routine business, Defra issued several consultation documents on matters related to water conservation and the WCWC has responded (these are to be found on its website under Consultation Responses)

S4 The WCWC is striving to provide opportunities for constructive conversations on water conservation and to aid that process it is producing a series of think-pieces on the delivery of future water conservation in England. This think-piece on the way river water quality could be managed in future is part of that initiative. It recognises the diversity of views on river quality and the challenge in reconciling these. This Summary highlights the issues explored and make suggestions on the way forward.

S5 The WCWC is seeking to offer the experiences and wisdom of its members to the discussion on any streamlining of legislation particularly that arising from the Retained EU Law (Revocation and Reform) Bill 2022.

S6 In preparing its responses to consultations and in producing think-pieces, the WCWC has found it useful to compile a timeline and reference summary of key events over the last 160

years. This is archived on its website and will be kept up-to-date as much as possible and highlights the complexity of the accumulated legislation, policy and practices.

Insights into the current situation

S7 The WCWC observes that in sifting through all the evidence it found that the headline statistics for Good Ecological and Good Chemical Qualities do not fully represent the overall state of the qualities of English rivers. That insight does not gainsay the need to continue with the efforts to improve the actual quality or the separate effort to reduce sewer overflows. In this, the WCWC found that its interpretation matched those of the Environment Agency and Defra (paragraphs 46-47).

S8 Headline statistics have coalesced with regulatory concerns about storm overflows, water demand, and aquatic algae caused by phosphate (the control of which has been the cause of conflict with housing development), opportunities for wild swimming, aquatic biodiversity, and even with concerns over the nature of water company ownership (see the WCWC think-piece on governance of water services). The WCWC recognises that any evolution of reporting could be criticised a lowering of standards. The range of differing views may be revealed by an Internet search of the phrase ‘quality of English rivers.’ Therefore, effective communication within any evolution of legislation and its streamlining will be crucial.

S9 The current real and apparent deterioration of quality is down to climate change, very big demands for development, pressure to cut costs, pressure from investors etc., but very importantly much more extensive monitoring. Has river water quality gone down or is our insight into quality got better? Monitoring technology is much better now than in 1989, so our understanding is better. Since 1974, when Water Authorities were formed, the actual quality as measured by conventional criteria, such as BOD (biochemical oxygen demand), dissolved oxygen, suspended solids and ammonia has improved, while the goal posts have changed to reflect rising environmental aspirations (paragraphs 27-29, 33-39).

Some thoughts on what to do next

A. Modify current reporting

S10 On the basis of the evidence presented, the WCWC suggests that the first and urgent step is to modify the current reporting system to provide a better insight into river water quality. This might be achieved by an initial modification of existing regulations as a prelude to streamlining. This will certainly help to create better informed discussion.

B. Develop an integrated strategic framework based on use objectives

S11 The WCWC very much supports any initiative to ensure that the rivers of England are not only fit for use but are havens for wildlife. It reiterates a suggestion, made previously in response to Defra Consultations, for a ‘road map’ of initiatives and a for a national strategy. The WCWC then sets out what could be the basis of the streamlining process.

S12 In this, there would be agreed sets of quality criteria for recognisable uses. New standards need to take better account of biological conditions by setting ecological objectives

for health, diversity and productivity as well as physical form which allow the creation of new and better environments. The heart of the suggested approach is:

- a) Agree a national set of recognisable uses of rivers including the care of habitats;
- b) Agree the set of quality criteria applicable for each of these uses;
- c) In individual river stretches, regulators consult and agree with local people on uses;
- d) The quality specification / objective of each stretch is created by combining the national criteria for each of the agreed uses;
- e) These should then be used to determine catchment management strategies, including land management practices, discharge consents, abstractions and river flow regimes, using models such as SIMCAT or SimBasinQ based on Monte Carlo simulations; and
- f) This exercise must incorporate the costs associated with delivering desired outcomes, which will fall to a number of organisations and sectors, not just the water sector.

S13 This would draw on the strengths of the river use objectives system which preceded the introduction of the Water Framework Directive Regulations; but these could still be incorporated into the next iteration of River Basin Management Plans in ways which reflect current attitudes, technologies and accountabilities. The WCWC suggests that such an approach could underpin the streamlining processes. But it would be of benefit if means could be found of introducing changes in advance of the next iteration of the Plans.

S14 A much greater emphasis on impact mitigation would be encouraged and it would drive a move away from the current focus on ‘end of pipe’ approaches. Incorporating more relevant local responses and would give a logical basis to prioritise storm overflows and phosphate removal, the designation of bathing waters, and a better idea about abstractions, particularly those newer ones near the saline limit, for example. Compliance would then be judged against river quality specifications “...are the rivers fit for purpose of the agreed uses including the sustenance of appropriate local ecosystems?” This should lead to an even greater focus on catchments and allow wider benefits to be realised at lower overall cost (paragraphs 12-13, 52-56).

S15 The WCWC has already produced a think piece on water resources and the pivotal role of rivers in the context of this integrated approach, and in its further deliberations, it suggests there needs to be more emphasis on restoration of river flows, especially in chalk catchments where abstractions from aquifers have removed the source waters. There is a significant role in the overall plans for quality and quantity management (paragraph 14).

S16 The WCWC supports the extension of rigorous monitoring, using best available techniques including self-monitoring. In some cases, emergent data show matters are worse than had been previously measured and generate a requirement for the Regulators to adopt appropriate data mining techniques to analyse the data to gain an insight into what is really happening (paragraph 55).

C. Create a national consensus – A National Water Commission for England

S17 Historically, at moments of intense national debate, one way forward has been to create national commissions, of one sort or another, to recommend a framework for resolving differences by drawing on the knowledge, experience and aspirations of all parties involved. This minimises the risk of conflicting and variously informed attitudes being expressed in public. Debate is welcome, confusion is not. A framework helps with agreement on prioritisation and with the balance of resources and needs. The future of water management in England is surely a candidate for such a Commission.

S18 The WCWC reaffirms suggestion made in its Governance think-piece that there would be great value in having a National Water Commission for England to recommend to government a 'common hymn sheet' for all the interested parties. The Commission would be accountable to a relevant Secretary of State and have core membership comprising relevant government departments and regulators as well as those sectors responsible for the delivery of the objectives, such as water companies, industry, and agriculture. Membership could include relevant NGOs subject to suitable selection criteria would take independent advice.

S19 It would be appropriate for such a Commission to look at the creation of a national river quality and use framework within a broader strategy for water management, then leave each government department and regulator to execute its own responsibilities. The WCWC does not foresee the Commission engaging in fine details (for instance, in how the WFD UK TAG might refine the criteria used to plan, monitor and report on river quality). The notion of a Commission in such circumstances is not novel (paragraphs 57-59).

S20 As time is of importance, the WCWC suggests that the decision to explore the use of river quality objectives might be taken at the same time as that to establish a Commission. Indeed, producing recommendations for the creation of the framework would be a priority task.

Ready to help

S21 The WCWC stands ready to share further insights and aid the process of the evolution of water strategy.

MAIN DOCUMENT

I. RISING PUBLIC ANGST

1 For some time there has been growing concern about the quality of rivers driven by the statistics of the assessments arising from the application of the EU Water Framework Directive Regulations 2017 expressed in River Basin Management Plans and by public concerns over the impact of sewer overflows.

2 During 2022-03 the state of the rivers of England has become a matter of debate in the media and in politics. Defra issued several consultation documents on matters related to water conservation and the WCWC has responded ([Consultation Responses - The Worshipful Company of Water Conservators](#)).

3 The WCWC is now engaged in producing a series of think pieces on the future of water conservation to assist that debate. Themes include the management of river quality, groundwater quality, water resources (primarily from a quantitative aspect), and the qualities of enclosed inland waters, and marine waters. This think-piece is focussed predominantly on river quality management.

4 Much of the current foci are on the classification of river quality (ecological and chemical status), the pollution of rivers by storm overflows from sewers, low flows caused by over - abstractions (hence reduction of demand), damage to ecosystems especially by phosphate (often associated with the occurrence of algal blooms), the demand for widespread, even universal, inland swimming, and calls for outcome-based regulation rather than end of pipe regulation. The media have many views and stories are expressed regularly on these topics.

5 The pace and content of debate at the start of last year was defined by the Report of the Environment Audit Committee 'Water Quality in Rivers'. Defra has taken action on defining targets for phosphates, water demand, biodiversity and storm overflows, all of which will impact water company investments.

6 There is also debate over how the transposed 2017 Water Framework Directive Regulations might be updated under the Retained EU Law (Revocation and Reform) Bill for inclusion in Regulations under the Environment Act 2021, and the WCWC suggests that a system based on river quality objectives could provide a useful basis for discussion.

II. WHAT THE WCWC HAS SAID SO FAR

The need for a 'Road Map'

7 The WCWC has maintained a consistent theme that there is a need for a 'road map' to explain how the current and future water management initiatives relate to each other. As presented, they have been a collection of seemingly *ad hoc* proposals which need to be integrated with other relevant initiatives and policies. For example, targets for phosphate in river waters are addressed in the consultation on 25 Year Environment Plan Targets (reduce phosphorus loadings from treated wastewater by 80% by 2037 against a 2020 baseline), in the 'Water industry national environment programme' (WINEP) and in the concept of nutrient neutrality in planning for 'EU Habitat' sites. Nitrogen and phosphate recovery should be seen as a source of nutrients in an increasingly challenging agro-economy. The 2023

Environmental Improvement Plan seeks to address some of this:
(<https://www.gov.uk/government/publications/environmental-improvement-plan>)

8 In addition, the latest iteration of the River Basin Management Plans and targets leaves a network of criteria difficult to unravel to all but the most engaged participants in delivery (see paragraph 16). Bathing in inland waters has not been discussed as a stand-alone national issue; any debate has occurred either in consultation with respect to specific *ad hoc* locations or in the Consultation on storm sewage. Further consultation is planned for this year.

Inland bathing water challenges

9 The current drive for ‘wild swimming’ and the designation of inland bathing waters has further confused matters, because achieving good ecological or chemical status does not necessarily make water fit to swim in. There are advocates for all rivers to be designated for swimming. The last hot Summer generated more interest. For example, the Times on 2nd April 2022 ran an article ‘Bathing alerts to dish dirt on our rivers’. In it, the article encouraged readers to apply for inland bathing water status and pointed out how easy it can be and provides a map of the numerous sites, where people have asked for alerts when sewage is released. There is some ambiguity because such designations require much more than monitoring and notification and put additional demands on quality management. The Times (9th April 2022) subsequently focussed on enclosed controlled waters, such as lakes which present more manageable challenges than river waters. The WCWC has submitted that bathing water status will not guarantee that the water is clean and safe - there are always going to be hazards in an open environment, whether bacteria or viruses from wallowing livestock, wild birds or even bacteria or viruses from well-treated sewage effluent. Boats, strong currents, submerged vegetation, or even temperature all constitute additional hazards. The WCWC has submitted that this should be made clearer in any strategy for inland bathing waters.

10 Discarded single use plastic sanitary items cause blockages of sewers and unacceptable sewer overflows. Sanitary litter is a very visible sign of pollution and causes disgust, but Defra has only focussed in its consultation on a ban of single use wet wipes. The response is awaited. Water Companies have been driving campaigns to reduce sewer blockages. The WCWC has advocated a broader approach to a national ‘bag it and bin it’ strategy which would require a series of enabling regulatory initiatives.

11 The WCWC has submitted that the concepts of changing water quality would be clearer if they were all linked as actions in the 25-year Plan. The lack of the ‘road map’ is a reflection of the seeming absence of an overarching strategy for water management as advocated in its paper on the governance and economic regulation of water companies in England. It has suggested that there is a need for a national water strategy, which should contain a co-ordinated framework for dealing with river use and quality. It acknowledges that the River Basin Management Plans arguably set out elements of that ‘road map’ but, in particular, the criteria used are very complex.

III. A Framework based on Quality Objectives

12 The WCWC supports any initiative to ensure that the rivers of England are not only fit for use but are havens for wildlife. It reiterates a suggestion, made previously in response to Defra Consultations, for a ‘road map’ of initiatives and a national strategy in which there are

agreed sets of quality criteria for recognisable uses. New standards need to take better account of biological conditions by setting ecological objectives for health, diversity and productivity as well as physical form which allow the creation of new and better environments. The heart of the suggested approach is to:

- a) Agree a national set of recognisable uses of rivers including the care of habitats;
- b) Agree the set of quality criteria for each of these uses;
- c) In individual river stretches, regulators consult and agree with local people on uses;
- d) The quality specification / objective of each stretch created by combining the national criteria for each of the agreed uses;
- e) These should then be used to determine catchment management strategies, including land management practices, discharge consents, abstractions and river flow regimes, using models such as SIMCAT or SimBasinQ based on Monte Carlo simulations; and
- f) That this exercise must incorporate the costs associated with delivering desired outcomes, which will fall to a number of organisations and sectors, not just the water sector.

13 This would draw on the strengths of the river use objectives system, which preceded the introduction of the Water Framework Directive Regulations but reflect current attitudes, technologies and accountabilities. The WCWC suggests that ways could be found to speed up the reform and streamlining process. Compliance would then be judged against the river quality specifications which would include the sustainability of appropriate local ecosystems. This should lead to a greater focus on catchments. It would allow a much greater emphasis on impact mitigation and move away from the current focus on ‘end of pipe’ solutions. It would allow more relevant local solutions and would give a more logical basis to prioritise storm overflows and phosphate removal, the designation of bathing waters, and a better idea about abstractions particularly those new ones near the saline limit (See the WCWC think-piece on water resources and also here in paras 52-56).

14 The WCWC think-piece on water resources focusses on the pivotal role of rivers in the context of an integrated approach, and in its further deliberations, it suggests there needs to be more emphasis on restoration of river flows, especially in chalk catchments where abstractions from aquifers have removed the source waters. This could involve pumping highly treated sewage effluents back into source areas (aquifer recharge as well as release to the river) to supplement river abstractions. Local water recycling must play a significant role in the overall plans for quality and quantity management.

IV. WHAT ARE THE PROBLEMS?

Parameters of “Quality Status”

15 The timeline document archived on the WCWC website highlights the evolution of classification strategies. The system of assessing river quality on a comparative basis started in 1958 and evolved into the current approach, which coalesces the need for a general comparative system of classification with a framework to ensure that river waters are fit to

use for some, but not all purposes on a local basis. For several years this involved the concept of river quality objectives but is now driven by the concepts of Good Ecological Status and Good Chemical Status derived originally from the EU Water Framework Directive (WFD). These Status standards are linked in part to absolute standards and in part on use related standards. The concepts are expressed in Regulations the last iteration being in 2017. It is notable, for example that water use standards underpin the permitting of storm overflows from sewers, which have been the subject of much controversy (<https://www.gov.uk/government/publications/water-companies-environmental-permits-for-storm-overflows-and-emergency-overflows>).

16 The WFD Regulations work through a series of 6-year cycles of River Basin Management Planning. The Plans were updated in December 2022 with some modifications which are discussed in paragraph 26. Defra and the EA state that these Plans over the next five years are backed by £5.3bn of funding (<https://www.gov.uk/guidance/river-basin-management-plans-updated-2022>).

17 The primary objectives are to prevent deterioration and, where necessary, achieve ‘Good Ecological Status’ (GES) or ‘Good Ecological Potential’ (GEP) for surface water or ‘Good Status’ for groundwater and to achieve full compliance with chemical criteria defining ‘Good Chemical Status’. The plans embrace most relevant issues including the impact of abstractions on river flows (<https://www.data.gov.uk/dataset/41cb73a1-91b7-4a36-80f4-b4c6e102651a/wfd-classification-status-cycle-2>).

18 The current system recognises the notion of defining water uses and associated quality criteria. In pursuance of the Regulations, the Environment Agency has prepared registers of protected areas where measures may have to be taken to meet the requirements of overlapping directives relating to the aquatic environment. Details of what the registers include are given in Appendix 1.

19 Reporting on these measures is included in the Plans. For example, the latest data on bathing water quality released by the Environment Agency in 2022 showed that out of the 419 bathing waters measured in England, 407 (97.1%) met at least the minimum standard of the Bathing Water Regulations, with 302 (72.1%) meeting the Excellent standard. This is a substantial improvement from 1995 when only 46% of bathing waters tested passed.

20 The Status standards against which the assessments were made were set originally for the UK by the WFD UK Technical Advisory Group (WFD UKTAG) in 2008 drawing on EU limits but added to later. There are basic criteria for common indicators such as dissolved oxygen, ammonia, and acidity, but in addition, there are many relating to hazardous substances.

21 The government has said that ‘water is critical to all aspects of life’. Pressure comes from all our activities and is exacerbated by population growth and climate change. Left unchecked we will see a deterioration from 14% of waters at good ecological status to 6% by 2027 unless current interventions are maintained and new interventions introduced to halt further decline (<https://www.gov.uk/guidance/river-basin-management-plans-updated-2022>). All of society from individuals to organisations and sectors (interactions with energy, food, and waste for example) have a role to play in securing and improving our shared water. For surface waters, good chemical status means that no concentrations of priority substances exceed the relevant the Environmental Quality Standards (EQS) established in the

Environmental Quality Standards Directive 2008/105/EC (as amended by the Priority Substances Directive 2013/39/EU). EQSs aim to protect the most sensitive species from direct toxicity, including predators and humans via secondary poisoning. A smaller group of priority hazardous substances were identified in the Priority Substances Directive as uPBT (ubiquitous, present, appearing or found everywhere), persistent, bioaccumulative and toxic). The uPBTs are mercury, brominated diphenyl ethers (pBDE), tributyltin and certain polyaromatic hydrocarbons (PAHs)'. The term uPBTs is one that is part of the established formal nomenclature.”

22 The Environment Agency and Defra has published detailed data which give more revealing insights into the actual status of rivers.

<https://www.gov.uk/government/publications/state-of-the-water-environment-indicator-b3-supporting-evidence/state-of-the-water-environment-indicator-b3-supporting-evidence>
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/709493/State_of_the_environment_water_quality_report.pdf

23 Under the headline of only 14% of English river waters being classified as good, were the following data sets:

Biology

Fish: 42% at good status.

Invertebrates: 76% at good status.

Macrophytes and phytobenthos: 45% at good status.

Physical modification

Morphology: 49% at good status.

Flow regime: 88% at good status.

Water quality

Dissolved oxygen: 82% at good status.

Ammonia: 92% at good status.

Phosphorus: 45% at good status.

24 Chemical status is reported as having zero compliance, because of uPBTs, referred to in paragraph 21. If they are excluded there would be 92% at good status.

25 Compliance for drinking water protected zones (DrWPAs) is essential, and in many ways reflects the long-established principles of use protection advocated by the WCWC. There are 485 surface water DrWPAs and 234 are deemed to be risk of deterioration resulting in 144 surface water safeguard zones. These are catchment areas that influence the water quality for their respective DrWPAs. They are identified where the protected area has been assigned as being “at risk” of failing the drinking water protection objectives of the 2017 Regulations Directive) (England & Wales). They are a non-statutory, joint initiative between the Environment Agency and water companies. Surface water safeguard zones define areas where actions and measures will be targeted to address water contamination and avoid or minimise extra treatment needed by water companies.

<https://www.data.gov.uk/dataset/6ac22521-2e77-4dc8-ba90-6bb55d2ea3b8/drinking-water-safeguard-zones-surface-water>

Reasons for such designations were:

- pesticides: 43%
- sediment: 30%
- algae: 19%
- nitrate: 4%
- microbiology: 3%
- other: 1%

The principal challenges are in the complexities of the treatment technologies needed to be employed by Water Companies.

26 These reports demonstrate the complexity and diversity of causes of failure. Until late 2022 the target was full compliance by 2027, but this has been adjusted in the latest Plans (www.gov.uk/government/publications/river-basin-management-plans-updated-2022-current-condition-and-environmental-objectives/river-basin-management-plans-updated-2022-current-condition-and-environmental-objectives).

The WCWC would welcome the regular publication of consistent historic inland water quality and abstraction data since 1990 (or earlier where possible). This would enable discussions about inland water quality to be based upon agreed-upon information.

Good Ecological Status (GES)

27 This is the WFD default objective for all water bodies and is defined as a slight variation from undisturbed conditions. Key elements that make up Ecological Status include:

- biological elements (including fish, macro-invertebrates, macrophytes and diatoms);

and

- supporting elements (made up of hydromorphology, ammonia, pH, phosphates, dissolved oxygen and pollutants including some heavy metals and pesticides).

A lowest common denominator rule is applied to the elements, so the lowest scoring element denotes the overall status of the water body. For example, if a biological quality element was at moderate and other quality elements were at good, it would be assumed that the water body as a whole is at moderate status.

Challenges with Ecological Status

28 The complexities of the contributing factors make statistical compliance that much more challenging and the headline figure does not represent an accurate description of river quality. It is also difficult to understand the connection between the ecological status of, say, fish populations and chemical status.

29 The River Basin Management Plans show how complex and challenging achievement and maintenance of Good Ecological Status is going to be with significant investment required from water companies and agriculture in particular. It is, therefore, important that all investment has to have value for money embedded. The experiences of our members recognise the complexity of resolving practical ‘front line’ problems. Understanding what is

actually happening in a river requires the integration of knowledge from different sources. In discussions within the WCWC experiences have been recalled from some years ago in which chemical monitoring of some river sites revealed satisfactory status, but the age profile of local fish populations was skewed and did not accord with good chemical data. This was found to be due to the impact of manure storage run-off during extreme storms and the problem was solved by improving storage protection. Today, it is possible that this would be picked up more quickly and easily through continuous monitoring systems.

30 As the data in paragraphs 23 & 25 show, there are a complexity of factors which contribute to the notion of Ecological Status and whilst there is a need to condense these into simple statistics for communication, in so doing the accuracy of reporting has been distorted. The WCWC suggests that resolving this dichotomy must be a priority, perhaps through an evolution of the notion of local quality objectives, as outlined in paragraphs 12-13.

Chemical Status

31 To elaborate upon the information in paragraph 21, the management of chemicals in the water environment focuses on those chemicals posing the greatest risk to people and wildlife. EQSs are used and regularly reviewed to assess these chemicals. There are two categories of chemicals when assessing the chemical status of surface waters:

31.1 For surface waters, good chemical status means that *no concentrations of priority substances exceed the relevant EQS* established in the Environmental Quality Standards Directive 2008. For priority substances, emissions of these substances must be progressively reduced to meet the EQSs in all water bodies. A water body achieves good chemical status under the WFD when the concentration of each priority substance is below EQS thresholds.

31.2 *Priority hazardous substances* are a subset of priority substances, considered to be extremely harmful. As well as meeting EQSs to achieve good chemical status, the aim is ultimately to cease or phase out emissions, discharges and losses of these substances. However, in 2018 twelve new priority substances (pollutants presenting a significant risk to drinking water or the aquatic environment) were introduced through the Priority Substances Directive, along with tighter standards for some existing regulated substances, such as the insecticide cypermethrin.

32 The UK also classifies *specific pollutants* – a different category to European-wide priority or priority hazardous substances. These are pollutants released in significant quantities to UK waters. UK water quality standards are set in accordance with EU technical guidance. The precise values for standards have been set with advice from the UK WFD UK TAG. Where environmental levels do not meet EQSs, the water body does not achieve good ecological status rather than good chemical status.

33 There are now 52 determinands against which Chemical Status is assessed as Good or Failing. The failure against EQS values is determined by the Environment Agency through its monitoring programmes. In 2019 the new priority substances and improved analytical techniques resulted in 0% surface water bodies, principally rivers, meeting the criteria for achieving good chemical status compared to 97% passing in 2016. If the new assessments for uPBTs are excluded, then only 6.2% of surface water bodies fail the chemical tests (93.8% pass); this is focussed on the classic determinands such as dissolved oxygen, BOD and ammonia.

Is there a Chemical Status Problem?

34 The public perception is that many of our rivers are in an appalling state is driven by the ‘headline’ that no river in England complies with Good Chemical Status. The media often reports this information alongside pictures and companion stories of storm overflow problems. So, the statistic of zero compliance with Good Chemical Status often coalesces with statistics about storm overflows. **The WCWC observes that this obscures the good news that, apart from compliance with the long list of ubiquitous toxic substances, chemical water quality is relatively good and the long-term trends show improvement** (www.gov.uk/government/publications/state-of-the-water-environment-indicator-b3-supporting-evidence/state-of-the-water-environment-long-term-trends-in-river-quality-in-england).

35 The challenge with compliance with toxic substances is that the very length of the list makes the statistical chance of failure high. The list has lengthened, and analytical techniques have improved the threshold of detection, while expectations for river water quality have risen. Limits are defined in terms of parts per billion (i.e., milligrams per tonne). But what are the consequences of failure, what do breaches of the EQS values really mean in practice in terms of environmental damage or river use limitation?

36 At the time of writing, it has not been possible to find a detailed, but clear understanding of the reasons for failure. For example, how many assessments fail on one determinand, or two, or three etc. What is the frequency of occurrence of the uPBTs? What is the impact on compliance with the needs of protected areas? What are the consequences of failure?

37 Whatever the answers to the questions in the previous paragraph, just as in the evaluation of Good Ecological Status, there is a complexity of contributing factors and there is a need to condense these into a simple headline figure, but in doing so that figure has been misleading and the WCWC suggests needs urgent review.

38 Defra already recognises the problem. It stated in the launch of the latest RBMPs (see paragraph 16) that over 90% of England’s water bodies would be at Good Chemical Status were it not for the presence of a limited number of uPBTs. It stated that the WFD ‘one out all out’ rule requires that water must be at Good for all elements and will fail overall if just one element fails. So, three uPBTs (Mercury, Perfluorooctane sulfonate (PFOS) and Polybrominated diphenyl ethers (PBDEs)) are generally causing water body failure out of around 50 priority substances monitored. Almost 80% of individual tests meet the threshold for good ecological status, but only 16% of surface waters achieve ‘good ecological status.’ Publication and analysis of more subsets of data would help understanding.

39 Of the chemicals of concern many are so called ‘legacy’ chemicals, sometimes referred to as ‘forever’ chemicals. Eradicating them from the environment is going to be difficult and, of course, all citizens contribute to this in one way or another. To achieve the targets will require efforts across the community and whilst some substances may be contributed to the water environment *via* sewage effluent, the water companies always cannot be held directly responsible. This will require solutions which do not rely on ‘end of pipe technologies’ To exemplify this, detail on mercury is taken from a Environment Agency report in paragraphs 40-43. To complete the evidence narrative on the most common causes of failure, similar evidence on PFOS and PBDE is given in Appendix 2.

The example of mercury

40 There are numerous reports on these chemicals and to provide even more insight into the issues surrounding the most common uPBTs, this think-piece provides extracts from the report dealing with mercury by the Environment Agency. This was highlighted as a widespread problem by Defra in the launch of the 2022 RBMPs (https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/mercury-pressure-rbmp-2021.pdf.)

41 The Environment Agency reported that at approximately 80% of freshwater sites sampled, the measured mercury residues in fish are at concentrations above the relevant environmental quality standard (EQS; 20 µg/kg). In estuarine and coastal waters fish were only sampled from a small number of locations, but all had mercury residues above the EQS. Of the total mercury load about 10% comes from sewage effluents and much of that comes from the use of mercury in dentistry. The greatest proportion comes from direct discharges from industry and hence the question has to be asked about the focus of discharge limits.

42 Where levels are above the EQS, there may be an increased risk to those animals taking and consuming local fish. However, the levels observed in fish are well below the food regulatory limit for mercury in fish and fisheries products and do not represent a risk to the human consumer providing advice from the Food Standards Agency is followed. In previous river basin planning cycles, assessment of environmental concentrations against the water column based annual average EQS, demonstrated a high degree of compliance with the 2008 Environmental Quality Standards Directive (EQSD, 2008/105/EC) in England. This water column based annual average standard was withdrawn in the updated EQSD (2013/39/EU). The 2021 River Basin Management Plans adopted a new approach, based on robust evidence, to report compliance for substances that accumulate in animals and food chains.

43 Whilst most of these substances are not a concern, mercury is ubiquitous in the environment as a result of historic use and accumulates in sediment and biota. The EA biota monitoring programme shows mercury concentrations in fish and mussels are greater than the relevant EQS threshold.

Other perspectives

44 There is a paradox in that some of the common uses of river water are not reflected in the web of criteria used. For example, for farm irrigation. Some of the members of WCWC recall managing the drought of 1976 when chloride in river water became a factor in resources management and it was necessary to set chloride limits on discharges. Where do bacterial standards sit, bearing in mind the contribution of natural sources? In yet another example the evidence does not seem to support the need for the universal reduction of phosphate in sewage effluent.

V. WHAT NEXT?

45 The WCWC suggests that any exercise to streamline the legislation of river water quality must first take account of the fact that oversimplification of the statistics is distorting understanding of the true picture. The WCWC suggests that these need urgent review (paragraphs 51-59) and the WCWC is not alone in this regard.

46 In November 2022, the Environment Agency Chief Executive was reported to have said that “The government has embarked on an exercise to remove, revise or retain the body of EU-derived law currently in force, much of which is the basis for most environmental regulation in this country. We welcome that”. The water framework directive is a key law he would change, claiming the testing regime was too complex and could be misleading about the real state of those waters. “Because the directive stipulates that waters can only get ‘good’ status if they tick all of several different boxes, it can force regulators to focus time and resources on indicators that may not make much difference to the actual water quality, taking focus away from things that would,” said Bevan. “I wouldn’t repeal the WFD. But I would reform it, to ensure it drives action that will deliver the clean and plentiful water we all want”.

<https://www.endsreport.com/article/1803864/ea-chief-scrap-floods-directive-reform-water-framework-directive>.

This was repeated in February 2023 when he welcomed the increased public scrutiny over water quality during his seven years in the post, but also warned that there are “wild assertions, myths, and outright untruths flying around” in the debate surrounding the issue. <https://www.newcivilengineer.com/latest/outgoing-environment-agency-chief-challenges-nation-to-tackle-flatlining-water-quality-improvements-22-02-2023/>. But this was responded to in the media with claims that the EA data are not reliable as its monitoring programmes are inadequate.

47 In paragraph 38 & 40, the WCWC highlighted that recognition that a very few uPBTS are causing the failure of chemical status and in recognition of the challenges the government has controversially amended in the latest RBMPs the target dates for some chemicals to 2063 for a small number of uPBTS. Defra states that ‘there is, however, an exemption (from the target of 2027) for these substances. This exemption is compliant with the WFD Regulations. It states that it recognises that although we have taken action to prevent them entering the water – including national and international bans – there is no feasible technical solution to remove them entirely and they will take time to naturally drop to required levels’. The 2063 date for these persistent chemicals mentioned is not a new target, it is a modelling prediction by the Environment Agency on how long it will take for the levels to dissipate under the exemption. In fact, as stated in paragraph 38, Good Chemical Status would rise to 90% if these were to be excluded from assessments. But in many ways, this is just adjusting the margins of the problem. It would be helpful to see exactly what compliance looks like now with the exemptions included.

48 Almost 80% of individual tests meet the threshold for good ecological status, only 16% of all surface waters, including rivers, achieve overall good ecological status. It would be better if there was more clarity on the purpose of this information; are the statistics to aid registering of protected areas, reporting on quality not strictly in the WFD criteria (such as Bathing Water), classifying for simple public communication, or for investment planning at specific sites? Bearing in mind the diversity of sources of regulation and targets this can be bewildering.

49 Not only is this whole issue one of debate, and indeed ‘cherry-picking’ of data by the media, there is added focus arising from the Retained EU Law (Revocation and Reform) Bill. The 2018 so called ‘Brexit’ or Great Repeal Act was never intended to sit on the statute book indefinitely. The intention is to end the special status of retained EU Law in the UK statute book on 31st December 2023. The Bill will abolish this special status by 31st December 2023

and will enable the Government, Parliament to amend, repeal and replace retained EU Law more easily. The Bill will also include a sunset date by which all remaining retained EU Law will either be repealed or assimilated into UK domestic law; this may be extended for specified pieces of retained EU Law until 2026. This will provide an opportunity for regulatory streamlining but has caused a great deal of debate already. The WCWC offers no comment on the timescale or complexity of this, but it is suggesting that the ideas set out in paragraphs 10-14 offer a starting point for discussion on a way forward.

VI. SOME CONCLUSIONS ON THE DELIBERATIONS

50 The WCWC stands ready to contribute its experiences and insights to aid the processes of reform. It has three principal suggestions.

A. Swift changes to current reporting as a prelude to streamlining

51 At the very least, the way in which the current assessments are reported needs an urgent re-think as a prelude to streamlining.

B. Streamlining based on an integrated framework based on river quality objectives

52 The WCWC reaffirms its suggestion that there should be a reappraisal of the value of river quality objectives in the way it has described before in several of its consultation responses as set out in paragraphs 10-14. It is suggested that this could drive the outcome of the streamlining processes (paragraph 13, 49) and could enhance the current approach in the WFD regulations and several other sets of Regulations, such as those for Bathing Waters. The execution of this Framework might involve a significant role for the WFD UK TAG.

53 The WCWC recognises that there will be a lot of preparatory work for the WFD UK TAG in developing the national sets of criteria. A major effort will be required to establish the basis for biosphere level objectives with the river as a component of these. Perhaps in the long-term execution of a new strategy, and once the UK TAG has done its work, the national list of agreed uses and associated criteria would be best expressed in a schedule in the new regulations which can be modified from time to time using appropriate Parliamentary processes.

54 In reaching these suggestions concern was expressed on how risk can be incorporated into the quality criteria and indeed in defining the ways in which those criteria are applied. The information set out for mercury highlights this dilemma.

55 The WCWC very much supports the extension of monitoring, including self-monitoring, even if the emergent data shows that in some places, matters are worse than had previously been measured. And it supports the role of properly integrated Citizen Science.

56 Appendix 3 lists Regulations and Plans which might be replaced or affected by such a review. Whatever emerges must at least pass the government's 'fit for purpose test' involving the seven principles of the Better Regulation Framework.

C. A National Water Commission

57 The WCWC also reaffirms its suggestion made in its Governance Think-piece that there would be great value in having a National Commission to look at water strategy; a common ‘hymn sheet’ for all the interested parties. The Commission would be accountable to a relevant Secretary of State (no Department is suggested at this time) and have core membership of relevant government departments and regulators as well as those sectors responsible for the delivery of the objectives, such as water companies and agriculture. Membership could include relevant NGOs.

58 In such circumstances, it would be appropriate for such a Commission to take on the role of including recommendations for the creation of a national river quality and use framework within the overall strategy. Once the recommendations for the strategy and framework have been accepted, this would leave each government department and regulator to then execute its own responsibilities. The WCWC does not foresee the Commission engaging in the detail for instance in how the WFD UKTAG might refine the criteria used to plan, monitor and report on river quality. The notion of a Commission in such circumstances is not novel. But time is of importance. So, the WCWC suggests that the decision to explore that use of river quality objectives might be taken at the same time as that to establish a Commission. Indeed, the creation of the framework would be a priority task.

59 The WCWC recognises that this suggestion for a quality and use framework could be the subject of debate, but if such an overarching approach was to be developed by the Water Commission it would have the benefit of being a national consensus, rather than an initiative promoted by water companies or agriculture and it would not be a feature of political policies or of the interests of a particular regulator. So, communication strategies must be key in this evolution of regulation. The WCWC also notes the range of very strongly held views in this regard.

Some extra reading

60 In addition to the cited references, the following provide further information:

https://consult.environment-agency.gov.uk/environment-and-business/challenges-and-choices/user_uploads/chemicals-in-the-water-environment-challenge-rbmp-2021-2.pdf

<https://deframedia.blog.gov.uk/2020/09/18/latest-water-classifications-results-published/>

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005590/State_of_the_environment_water_resources_report.pdf

[20160217 Tony Warn - Water Quality Planning.pdf](#)

Mark Everard: Water Quality Objectives as a Management Tool, 1994.

<http://hdl.handle.net/1834/22159>

APPENDIX 1

REGISTERS OF PROTECTED AREAS UNDER THE WATER FRAMEWORK DIRECTIVE REGULATIONS

The registers must include the following protected areas—

- (a) a drinking water protected area;
- (b) an area or body of water for the time being designated or otherwise identified as requiring special protection under any EU instrument providing for the protection of surface water and groundwater or for the conservation of habitats or species directly depending on water, or any enactment implementing such an EU instrument, including, in particular—
 - (i) areas designated for the protection of economically significant aquatic species (including shellfish water protected areas);
 - (ii) bodies of water designated as recreational waters;
 - (iii) nutrient-sensitive areas;
 - (iv) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in the protection of the habitats or species such as Natura 2000 sites.

Some areas may require special protection under more than one set of regulations. In these cases, all the objectives and standards must be met. Where WFD water body boundaries overlap with areas protected under another directive, the most stringent objective applies — the requirements of one particular set will not undermine the requirements of another, for example those for Bathing Water and Protected Habitat sites.

APPENDIX 2

DETAILS ON TWO KEY uPBTs CAUSING FAILURE OF CHEMICAL STATUS

A2.1 PFOS Extracted from the EA report

https://consult.environment-agency.gov.uk/environment-and-business/challenges-and-choices/user_uploads/perfluorooctane-sulfonate-and-related-substances-pressure-rbmp-2021.pdf

Perfluorooctane sulfonate (PFOS) belongs to a large, diverse group of man-made substances known collectively as perfluoroalkyl and polyfluoroalkyl substances (PFASs). Substances in this group are known for their water, grease and stain repellent properties. Over the past 50 years, perfluoroalkylated substances such as PFOS and PFOS related substances have been used in a diverse range of domestic consumer products, as well as in industrial processes and in aqueous film forming foams (AFFFs) used in fire-fighting. PFOS is extremely persistent, toxic and bioaccumulates through the food chain. Most uses of PFOS have now been phased out, banned or restricted under a number of UK, EU and international regulations. PFOS was listed as a persistent organic pollutant (POP) in Annex B (restriction) of the UNEP Stockholm Convention on POPs in 2009.

In the Priority Substances Directive (2013/39/EU), PFOS is classed as a Water Framework Directive priority hazardous substance and as a ubiquitous persistent, bioaccumulative and toxic substance.

A2.1.1 Despite the restrictions on use, older consumer products such as carpets, textiles and upholstery that have been treated with PFOS or PFOS-related substances will continue to act as a source of PFOS. Emissions can occur during the use, washing and disposal of such items, entering the environment *via* wastewater treatment works or waste management facilities. Evidence in the scientific literature suggests the limited removal of PFOS is likely to occur via adsorption to sludge. Academic studies suggest that PFOS may also be formed during wastewater treatment as a result the transformation of other PFOS related substances.

A2.1.2 Additional, potentially significant sources of PFOS to the environment include landfill sites, industrial discharges and local historical contamination – especially around sites such as military bases and airports where there may have been significant use of AFFFs during fire-fighting training. PFOS can be present in soil from such historical sources or from the spreading of sewage sludge to land. Because PFOS is very water soluble and consequently very mobile, it can enter surface waters from contaminated soil as well as leach to groundwater.

A2.1.3 The concentration of PFOS has been found to be close to, or above, the EQS in samples collected upstream of many WwTWs (UKWIR, 2017; 2019) as well as downstream, indicating that local WwTW discharges are often not the only source. In such situations, whilst the WwTW discharge is not the sole cause of the downstream EQS exceedance, the additional discharge from the WwTW may increase the level by which the EQS is exceeded. The influence of upstream concentrations of PFOS to the overall load measured downstream of some WwTWs highlights the need to consider upstream and wider catchment issues. This includes the extent of urbanisation and the nature of any legacy or local industrial emissions. Additionally, it may in part, explain the wide variability in measured loads of PFOS observed across English surface waters.

A2.2 PBDE Extracted from the EA Report https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/polybrominated-diphenyl-ethers-pressure-rbmp-2021.pdf

Polybrominated diphenyl ethers (PBDEs) are a group of man-made organobromine compounds. They have been used as flame retardants in a wide range of products including electrical and electronic equipment, textiles and foams. The persistent and bioaccumulative properties of PBDEs, along with their potential adverse effects on aquatic life and humans have led to commercially supplied penta-, octa- and deca- BDE being classified as persistent organic pollutants under the Stockholm Convention. In addition, the specific compounds tetra-, penta-, hexa-, and hepta- BDE, also components of commercial penta- and octaBDE, are designated priority hazardous substances and ubiquitous persistent, bioaccumulative and toxic compounds under the Water Framework Directive (WFD) in the related Environmental Quality Standards Directive (EQSD) (2008/105/EC amended by 2013/39/EU).

A2.2.1 There are a wide range of old consumer products used in homes and businesses which contain PBDEs. Releases occur during use and disposal of these products and they continue to enter wastewater treatment works (WwTWs). Much of the PBDEs in WwTWs partition to

the sewage sludge, however there are continuing widespread low-level emissions of PBDEs to surface waters via WwTWs' effluent. Evidence shows that concentrations of PBDEs in effluent have reduced compared with those measured earlier this decade, with over 30% reduction in average concentrations in effluents observed within a few years for 2 of the key congeners.

A2.2.2 The stability of these substances also means that they are not amenable to destruction by traditional wastewater treatment technology, making 'end of pipe' control difficult. Most of the PBDE load will be removed to sludge. If the current trends in reducing emissions from WwTWs continue, PBDE concentrations in effluents are estimated to reduce to an order of magnitude lower in the next 10 years. Advanced treatment could be considered at WwTWs to further reduce emissions of PBDEs, but even should this prove technically feasible this would be very costly and energy intensive and it is uncertain what this would deliver in terms of improved compliance with biota standards.

APPENDIX 3

WHAT LEGISLATION AND PLANS MIGHT BE AFFECTED BY STREAMLINING

Regulations ... substantially driven by Regulations arising from the EU Directives

- The Water Framework Directive Regulations 2017 River Basin Management Plans. These were discussed earlier.
- Nitrate Directive 1991. Nitrate Vulnerable Zones in The Nitrate Pollution Prevention (Amendment) Regulations 2016.
- The Urban Wastewater Treatment Directive 2001 Regulations aim to protect the water environment from being damaged by urban wastewater and certain industrial discharges. Designation of nutrient sensitive areas.
- The Marine Strategy Framework Directive Regulations 2010 establishes marine regions on the basis of geographical and environmental criteria; development of strategies to protect marine waters.
- The Bathing Water Directive Regulations 2007 aim to protect public health and the environment by keeping coastal and inland bathing waters free from pollution. In the UK most have been for coastal water.
- The Habitats and Birds Directive Regulations 2017 aim to protect wild plants, animals, birds and habitats. The Habitats Regulations mean any plans or projects that would impact on rare habitat or our most vulnerable species must go through a rigorous assessment.
- Environment Act 1995 and Permitting Regulations including the Environment Permitting Charges Permitting to provide more money for monitoring have embraced the implementation of several EU Directives.
- Environment Act 2021. The Environmental Improvement Plan (EIP) 2023 and Targets including phosphates, abstractions and storm overflows.

- There might be some implication for legislation covering trade effluent discharges to sewer
- Water and Flood Management Act 2010

Management Plans

- River basin management plans (RBMPs) arising from the WFD Regs set the legally binding locally specific environmental objectives that underpin water regulation (such as permitting) and planning activities. They provide a stable planning base for economic development.
- Flood Risk Management Plans
- Water Industry National Environment Improvement Programme (WINEP) and WINSER
- Strategic water resources solutions being developed by the Regulators Alliance for Progressing Infrastructure Development (RAPID)
- Government's new environmental land management schemes and England Trees Action Plan