

## **Written evidence submitted by the Department for Environment, Food and Rural Affairs**

### **How can water quality in UK rivers be improved and pollution minimised?**

#### **Defra Evidence to the EAC**

##### **Introductory comments**

Since the 1990s there has been significant improvement to our water with indicator species such as sea trout and otter returning to England's rivers. The Environment Agency's work with water companies in the last two decades means there is now 67% less phosphorus and 79% less ammonia in waste water discharging into rivers

Since 2010, new measures by Government and increased investment and action by water companies have produced improvements in key areas, despite the countervailing challenges of climate change and population growth which have slowed overall progress in more recent years

The period of the first river basin management plans (RBMPs, 2009-15) saw a net increase in water bodies achieving good ecological status or better for phosphorus, a key pollutant from sewage and fertiliser, and a net improvement in fish populations. Our coastal bathing waters have remained at a very high standard. In 2019 98.3% of designated bathing waters met the minimum standard with 71.4% classified as excellent; a rise from just over 50% at excellent in 2010. Investment to clean up the 1,500 km of rivers polluted by abandoned metal mines has improved 100 km of rivers since 2011. Work to deal with Britain's coal mining legacy has improved 350 km of rivers since 1994 and protects the drinking water supplies for 500,000 people.

Due to pressure from human populations, industry and agriculture, over the course of its implementation, it has become clear that it will be very challenging for the UK and EU Member States to achieve the ambitions of the Water Framework Directive (WFD). When this Directive was introduced, it was accepted that some water bodies which have been modified for industrial or social purposes would never reach good status and flexibilities were built into WFD to account for this. Even using these flexibilities, it will be a challenge to meet the WFD ambitions for Europe's waters within the time frame of the first three planning cycles. Nevertheless, the Government is working towards a cleaner and healthier water environment, outlined in the 25 Year Environment Plan and a commitment for at least one legally binding water target in the Environment Bill. Defra is now consulting on four water targets.

## **1. What are the best indicators for river water quality that could be used as targets being developed under the Environment Bill?**

Good Ecological Status (GES) is a metric for assessing surface water ecology. It was developed through many years of scientific research and practice that is internationally agreed and understood. The Defra 25 Year Environment Plan reflects GES, defining its clean water objective as water 'as close to its natural condition as possible'. GES is intended to serve as an indicator of long-term sustainable management of the water environment and can be thought of as an indicator of 'health'. This goal and the framework that supports it are retained in UK statute. The Environment Bill requires Government to set at least one target for water. The targets for water we are considering under the Bill relate to acute pressures that affect our progress towards the goal of GES. These pressures include both pollution as it is commonly understood, from agriculture and urban waste water management, and pressures that would not normally be understood to be pollution but are part of the overall human impact on the ecology of water. For example, water abstraction.

This work is informed by the Environment Agency (EA) analysis presented in its recent Challenges and Choices consultation which provided a view of existing pressures and their relative prevalence. The environmental targets policy paper published on 19 August 2020 stated that setting targets will provide a strong mechanism to deliver long-term environmental outcomes.

We want to develop targets that will drive action in areas that matter the most, rather than limiting our targets to areas that are easy to measure and improve. Where possible, targets will be based on environmental outcomes. Therefore, we will use expert analysis to identify meaningful long-term and interim targets to address the most significant human pressures on the water environment.

We will need to take an approach which looks at each pollutant or pressure in its own terms, identify the best points of intervention and the metrics that best show whether the intended effects are realised. This assessment will also need to factor in the time-lag between implementing policies to achieve our targets and seeing the resulting recovery of the water environment.

Currently, Defra are looking at four targets to make progress towards achieving our overall objective set out in the 25 Year Environment Plan. The targets will aim to reduce nutrient pollution from agriculture and waste water, reduce water demand and reduce the impact from abandoned metal mines.

There will be opportunity for public scrutiny of both the evidence and proposed targets throughout the development process. The Water Expert Advisory Group has been set up to provide independent advice to Government in relation to water targets, as required by the Environment Bill long-term target framework. The group is expected to meet bi-monthly to advise on the target development process. Stakeholders will also be engaged on a bi-monthly basis in regular fora where they can offer evidence or support.

## **2. How could drainage and sewage management plans, introduced by the Environment Bill, play a role in reducing sewer discharges?**

Sewerage companies have a number of duties, under the Water Industry Act 1991, in relation to drainage and sewerage, including a specific duty to ensure their areas of operation are “effectually drained”. Unlike water resources planning, sewerage companies have no statutory duty to undertake drainage and sewerage management planning. Through the [21st Century Drainage Programme](#), non-statutory Drainage and Wastewater Management Plans will be introduced following consultation, in 2023.

The Environment Bill includes the provision to make the drainage and sewerage management planning process statutory. It will place a new legal duty on sewerage companies through an amendment to the Water Industry Act 1991. Statutory planning will better enable sewerage companies to fully assess network capacity. It will promote closer working and development of collaborative solutions with others who are responsible for parts of the drainage network, such as local authorities. Statutory drainage and sewerage management planning aims to deliver more actions to help sewerage companies better address the risks that some sewerage assets, such as storm overflows, may pose to the environment.

## **3. How adequate are the monitoring and reporting requirements around water company discharges? How can technology improve and assist with transparency and enforcement?**

All discharges to the water environment, including storm overflows, require a permit issued by the EA under the Environmental Permitting (England and Wales) Regulations 2016. These permits contain the necessary conditions to regulate the discharge and protect the environment. For storm overflows, the conditions will normally include storage volume and aesthetic control requirements to mitigate the impact of any storm overflow discharges. Monitoring and reporting requirements are also included in the conditions attached to the permit. Where discharges occur outside of these conditions, the EA investigates and takes appropriate action. This includes enforcement action if necessary.

Water companies have now installed monitoring technology (known as ‘Event Duration Monitoring’ or EDM) on the vast majority of storm overflows (13,000 overflows out of a total of around 15,000 by 2020). This will improve our understanding of discharge events and trigger investigations and improvements when overflows operate too frequently. As a result of the work of the Storm Overflows Taskforce, water companies have committed to expanding and accelerating their monitoring programme so that the duration of all storm overflow spills is monitored by 2023. Starting this year, water companies will publish this data on an annual basis, with the EA publishing the data for all the companies.

As well as publishing annual data, water companies have agreed to make available real-time monitoring data on sewage discharges from storm overflows at designated bathing waters all year round. The EA is also assessing plans to link water company discharges to their early warning ‘real-time’ system to monitor and inform the public of the fluctuations in water quality at bathing waters.

In the next 5-year business planning period (2020-2025) water companies will invest in a significant programme of improvements to the monitoring and management of storm overflows at a cost of around £1.1 billion and undertake around 800 investigations and 800

improvement schemes to storm overflows. As a result of the work of the Taskforce, water companies have identified opportunities to increase the number of storm overflow investigations and improvements the industry will carry out over the next 5 years.

Water and sewerage company performance is reported annually via the Environmental Performance Assessment (EPA), which includes waste water discharge compliance data. The EA plans in the future and to expand and improve the EPA for 2021-2025. A revised EPA methodology was released on 30 October 2020 for use from 1 January 2021.

It was announced on 22 January, that the Storm Overflows Taskforce has agreed to set a long-term goal to eliminate harm from storm overflows.

#### **4. What is the impact of plastic pollution and other materials on drainage and water quality in rivers and what should be done to mitigate it?**

Plastic litter on land and in the ocean is a very visible environmental problem. Waste prevention is a core aim of the Government's Waste and Resources Strategy and the Environment Bill includes measures to reduce the amount of waste which is washed out to sea, particularly plastic waste. Extended producer responsibility will ensure producers of plastic packaging are more responsible for its full cost. The Bill also contains powers to establish a deposit return scheme for drinks containers which will also reduce unrecycled plastic waste.

The key focus of concern for water quality is the extent and impact of microplastics. There has been substantive research reporting the presence and impacts of microplastics in the marine environment. However, little evidence is yet available about their sources, release and impact on freshwaters and their transport to the marine environment.

Defra published the final reports of research it commissioned, in conjunction with Queen Mary University London, into this problem in 2019<sup>1</sup>. In addition, Defra published the findings from [research](#) it has funded with Plymouth University and others investigating the sources and pathways of synthetic fibre and vehicle tyre wear contamination into the marine and river environment. The outcomes from these research projects will be used in the development of policy options to help mitigate the impact of microplastics in the aquatic environment.

Defra is working with the EA and the UK water industry to establish methods to detect, characterise and quantify microplastics entering waste water treatment works and to evaluate the efficiency of treatment processes for their removal from domestic waste water.

Other materials such as oils and detergents can be harmful if they enter rivers and streams. Impacts may include lowering of oxygen levels, toxic effects from oils and cleaning chemicals, and fungal growth from phosphates in detergents. These impacts can lead to a drop in the quality of aquatic life, and there is often a chronic impact from the accumulation of low-level sources of this type of pollution from our highways, towns and cities.

To manage these adverse impacts on the water environment, Defra and the EA advise that oils and detergents should be disposed of correctly to foul sewers or appropriately permitted waste management facilities. Suitably designed sustainable drainage systems and oil capture infrastructure should be implemented where appropriate. Such measures to prevent

---

<sup>1</sup> [Evidence Reviews on Analysis, Prevalence & Impact of Microplastics in Freshwater and Estuarine Environments \(3 reports\)](#).

these materials entering the water environment via sewers are essential as removal through waste- water treatment is costly and inefficient.

## **5. How can consumers be persuaded to change their behaviour to minimise pollution?**

The Catchment Based Approach (CaBA) was established in 2013 to drive integrated catchment management across England. 23,000 stakeholders are engaged in delivering around 1,000 projects a year. CaBA is driven by data and evidence to engage stakeholders and target local action. At the community level, CaBA has had success in increasing public understanding of water pollution issues and involving the public directly in local projects to improve water quality. The need for education and collaboration as a driver for behavioural change in addition to regulation, was a clear theme from the EA's Challenges and Choices consultation. Engagement with local catchment partnerships by farmers and water companies, in addition to local wildlife and conservation groups, was regarded a key to this.

Defra and its partners have carried out a number of studies and public campaigns, some in conjunction with the water industry, that show individual behavioural change can be achieved by small changes to products and settings, such as labelling and signage. For example, evidence suggests that the predominant cause of sewer blockages consist of 'un-flushable' wipes. A [project](#) led by Manchester University and the Tyndall Centre is taking a 'practices' approach to understand why these products are flushed and potential interventions to prevent it. Defra is working with the water and wet wipe industries to promote joint-industry work on improved product labelling and consumer awareness. The water industry has created a 'Fine to Flush' product standard, which manufacturers can apply to use if they can show that their wipe product disintegrates when flushed and does not harm the environment.

## **6. What is the required investment level needed to minimise storm overflows vs the scope for sustainable drainage and nature-based solutions?**

The evidence for assessing options and their relative feasibility, costs and benefits is not complete or up to date. One of the most important early work strands of the Storm Overflows Taskforce has been to commission a research project to gather a comprehensive evidence base about the costs, benefits and feasibility of different options to decrease the frequency and harm of storm overflow discharges. This will enable (a) a dialogue with stakeholders based on the best available evidence, (b) the Taskforce to advise the Government on options for addressing the harm caused by storm overflows and (c) the Government to take decisions based on sound evidence and stakeholder views. This research project is due to be completed by late spring.

Based on current evidence, there is a range of cost associated with minimising storm overflows depending on which solutions are adopted and indeed, a range of different options may be needed for different sites. At one end of the scale, the costs of re-working the sewerage systems of whole cities and widely preventing or reducing surface water entering the system is unknown but has been estimated at well in excess of £10 billion and could run into tens of billions.

Comparing these costs with green infrastructure solutions is difficult. The cost implication of sustainable drainage systems (SuDS) and nature-based solutions (NbS) will vary based on the local context. These systems may deliver a range of wider environmental and societal

benefits (e.g. increased tree coverage or green space in towns) but could increase flood risk where surface water is diverted from entering existing sewers unless the local context is carefully considered. The Government is encouraging water and sewerage companies to consider green infrastructure solutions and work will increase in this space (see Question 9., below).

## **7. How effective are the planning policy and standards around sustainable drainage systems to reduce urban diffuse pollution in England?**

The National Planning Policy Framework (NPPF) establishes that Sustainable Urban Drainage Systems (SuDS) should be given priority in new developments within flood risk areas. SuDS are expected to be provided in all new major developments, unless demonstrated to be inappropriate. In August 2018, Government published a review of the application and effectiveness of planning policy for SuDS.<sup>2</sup> The review found that almost 90% of the sampled, approved planning applications for major and minor developments, explicitly stated that SuDS would feature in the proposed development.

SuDS are likely to be effective in reducing urban diffuse pollution. The SuDS Manual includes data indicating the performance of SuDS components in reducing urban runoff contamination.<sup>3</sup>

The NPPF sets out that SuDS incorporated into new major developments should, where possible, provide multifunctional benefits, i.e. flood risk management, improvements to water quality, amenity and biodiversity benefits. Defra is currently undertaking research into whether updating the current Non-Statutory Technical Standards for SuDS could help provide for multiple benefit SuDS, including a review of barriers and enablers for delivering them. Defra will consider how the findings of this research could inform future approaches to boost uptake of effective SuDS and support the aims of the NPPF.

## **8. Should local authorities and highways agencies be given a duty to prevent pollution to watercourses without prior treatment?**

In urban areas pollutants entering the water environment do so as a result of 'urban run-off': a mixture of pollutants that have accumulated on hard surfaces such as roads and car parks and then are washed into the sewer network during heavy rain. Where this run-off enters conventional surface water drainage systems the pollutants enter the water environment untreated where they cause acute or chronic impacts as well as tending to accumulate in sediment.

Run-off from roads alone is a significant problem due to geographic scale (there are estimated to be in the region of 1 million outfalls across England discharging runoff from highways). In addition, current regulation, duties and responsibilities in this area are split across government agencies and Local Authorities (LAs). Water company assets may also be involved. LAs are responsible for urban road drainage but have no specific obligation for water quality. The discharge of urban road runoff does not normally require consent under the Environment Permitting Regulations.

---

<sup>2</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/734684/Review\\_of\\_SuDS\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734684/Review_of_SuDS_Report.pdf)

<sup>3</sup> [https://www.ciria.org/Memberships/The\\_SuDs\\_Manual\\_C753\\_Chapters.aspx](https://www.ciria.org/Memberships/The_SuDs_Manual_C753_Chapters.aspx)

Changes to regulation and statutory duties may not be enough given the scale of the problem and the huge costs of retro-fitting urban roads with necessary collecting systems. Alternative options may include realistic action plans based on more research into the nature of the problem and cost-effective solutions, such as SuDS, non-infrastructure measures such as frequent road sweeping or reduction in de-icing treatments and changes to vehicle design. Tyres and brake linings are sources of toxic metals and microplastics, even from greener, electric vehicles. In addition, behavioural change and reducing road traffic volumes may need to play a part in a long-term strategy.

### **9. How effective is Ofwat's remit and regulation of water companies? Does it facilitate sufficient investment in improvements to water quality, including sustainable drainage systems and nature-based solutions such as constructed wetlands?**

Defra and the water regulators including Ofwat have invited water companies to submit proposals to accelerate existing plans and environmental priorities within the agreed 2020-25 plans. We have invited water companies to bring forward 'enhancement investment' proposals from 2025 and beyond; and implement specific new, innovative ideas to support the country's green economic recovery. A number of these proposals include increased investment in water quality improvements and NbS.

The government set out its strategic priorities for Ofwat's regulation of the water sector in England in 2017.<sup>4</sup> This includes setting an expectation that Ofwat should challenge water companies to improve planning and investment to meet waste water needs of current and future customers. Furthermore, investment should offer best value for money over the long term and have appropriate regard to the wider costs and benefits to the economy, society and the environment. This could include promoting, adopting or maintaining SuDS. Government expects to develop a further strategic policy statement in advance of Price Review 2024 and will provide a strategic steer in terms of key priorities for Ofwat.

Since privatisation of the water industry, around £30 billion has been invested in environmental improvements through integrated solutions, including £4.6 billion for the period 2020 to 2025. This covers improvements in sewage treatment and in sewer overflows. This investment overall has secured significant environmental benefits.

### **10. Is adequate investment being made in adapting water treatment systems to future climate change?**

The water industry has begun to invest in low energy treatment including NbS approaches such as waste water pond technology and wetland systems. It should be noted that water companies' direct emissions account for around half of their overall carbon footprint. The water industry is a heavy user of power from the grid. This derives from treatment but also from pumping. Water companies are well placed to locally harness renewable energy, mainly from processing sewage waste in anaerobic digestion and using heat generated from some treatment processes.

The water industry has committed to achieving net zero emission by 2030. It was the first sector in the UK to make such a commitment and Ofwat is supporting and challenging this

---

<sup>4</sup> <https://www.gov.uk/government/publications/strategic-policy-statement-to-ofwat-incorporating-social-and-environmental-guidance>

work, ensuring that the drive to net zero 2030 is achieved efficiently. WaterUK published the [routemap to net zero](#) in November 2020.

In addition to 'end of pipe' solutions, reducing water demand and water pollution will avoid increases in carbon-heavy water treatment output.

Water companies are responsible for planning to meet future supply requirements through the production of water resource management plans, including taking account of the implications of climate change.

The government recognises that demand on water supply must be tackled through reducing the amount of water lost through leaks and reducing the volume consumed by customers. The government is exploring the possibility of a statutory target to reduce water demand using powers in the Environment Bill.

The EA published a National Framework for water resources in March 2020 and will support water companies to plan regionally and with other sectors to achieve the right balance of measures to increase resilience of water supplies for both customers and the environment.

## **11. How could the designation of inland bathing waters by water companies affect the costs of achieving the associated water quality standards?**

Water companies do not play any part in the process of designating a bathing water, other than as a consultee. The Secretary of State is responsible for designating sites as bathing waters. Applications for designation are usually submitted by local authorities. If a different organisation makes the application, it must have the support of the local authority for the area.

We do not have any specific costings for meeting bathing water standards in rivers. Rivers are currently managed for ecological quality rather than public health (bacterial) standards. The main cause of water failing to reach the microbial standards, during the bathing season, which are required for bathing water designation, are discharges from sewer overflows or treatment works and faecal matter in run-off from farms. Some of these costs would therefore be associated with measures to reduce discharges from storm overflows and urban areas or diffuse pollution from farms upstream of river bathing waters and would be site specific. We continue to work with farmers through advice and incentives. We will offer a slurry investment scheme to help reduce this form of pollution by improving slurry storage. We plan to publish details of the scheme, as they are formed, in the second quarter of 2021 and expect to be making funding available from Autumn 2022/23.

It should be noted that to achieve GES, however, stretches of river designated as bathing waters may still need remedial measures to address other pressures such as low flow levels, physical modification and invasive non-native species.

*February 2021*