Written evidence submitted by the Cam Valley Forum

Executive Summary

- The UK has a global responsibility for the protection and restoration of Chalk streams. The 224 examples in the UK represent 85% of the world total. Apart from a handful of protected rivers, Chalk streams are largely treated in practical and policy terms as 'just another type of watercourse'. This under-recognition of their ecological significance needs to change.

- While the Committee's inquiry focuses on pollution from the water industry and urban diffuse sources, these particular challenges need to be set in a wider context. Chalk streams have been degraded over many decades by a combination of groundwater abstraction, pollution, and habitat modification. An integrated approach needs to be taken in finding solutions.

- In particular, flows need to be restored to Chalk springs and headwaters by reducing abstraction from public water supply boreholes and taking water instead from the rivers downstream. Chalk streams should then enjoy adequate flows that sustain their ecology all year, every year. Without flows, there is no dilution of pollutants, and their environmental impacts are intensified.

- The threshold for stripping phosphate from treated wastewater should now be reduced so that this is required at all works that serve more than 1,000 people, not just those that serve more than 10,000. Treatment works discharging into Chalk streams should be prioritised for action to reduce phosphate levels and to reduce, and where possible avoid entirely, the use of combined sewer overflows. Actions are also needed at source to reduce sewer inputs of surface water.

- 'Riverscape Opportunity Areas', corridors 50 metres either side of major watercourses, should be targeted for action to tackle diffuse pollution. Within them, developers, homeowners and land managers should be encouraged to maximise green cover, avoid sealing surfaces, replace sealed surfaces with porous surfaces, reduce the intensity of land use, restore wildlife habitats, and encourage natural river processes. All major roads should be equipped with silt traps to capture run-off and thereby reduce inputs to water of silt, hydrocarbons and other pollutants.

- A range of additional complementary interventions should also be considered, to tackle pollution from treated wastewater, combined sewer overflows, and diffuse sources. In all these actions, Chalk streams should be prioritised for early action, in view of their global significance.

- The Environment Agency should be supported in prioritising the development of effective water quality monitoring networks for Chalk streams. These should embrace pollution from both point and diffuse sources (e.g. monitoring soil, nutrient and pesticide losses to water at a field level throughout a river corridor). All monitoring data should be readily accessible to the public.

The Cam Valley Forum

1. The *Cam Valley Forum* is an association of local individuals with diverse environmental, recreational, academic and business interests, concerned directly or indirectly with the River Cam, in Cambridgeshire. Our interests embrace not only the main river within the City of Cambridge - its 'beating heart' and one of the most intensively-used stretches of water in Europe - but also the smaller rivers and streams throughout the Cam catchment. We work with a large number of river groups and charities that share our concerns, locally, regionally and nationally.

The global importance of UK Chalk streams

2. The starting point for this submission is that Chalk streams are internationally-rare habitats for which the UK, as host to some 224 (85%) of the world total, has a special global responsibility. Chalk streams should not be treated as 'just another type of watercourse'. Under *natural* conditions, the water from Chalk aquifers that feeds Chalk springs and headwaters has a constant year-round temperature and stable chemistry. It supports rare plant and invertebrate communities. Where there is sufficient winter recharge, Chalk aquifers provide a constant supply of water that enables Chalk streams to flow steadily through periods of dry weather.

3. The significance of Chalk streams is recognised by the EU Habitats Directive, which identifies their characteristic vegetation communities as habitats 'whose conservation requires the designation of Special Areas of Conservation'. However, only four Chalk streams, 1.8% of the UK total, equivalent to 1.5% of the global total, have been so designated. All Cam Valley Chalk streams, and others nation-wide, have no more protection than any other type of river. We view this as a failure of the UK to honour its international responsibilities to conserve biodiversity.

4. Parliament, the Government, OFWAT, the Environment Agency, water companies and land managers should all recognise the international importance of UK Chalk streams. Even if they are not specifically designated as Special Areas of Conservation, Chalk streams should be given an equivalent level of protection, as a matter of Government policy. They should then receive a greater priority in the policies, funding and actions of both the public and the private sectors, in tackling all the problems that Chalk streams face, including those related to water quality.

An integrated set of problems

5. The Chalk streams of the Cam Valley have been substantially degraded over many decades by a combination of groundwater abstraction, pollution, and habitat modification[1]:

    - **Groundwater abstraction, especially for public water supplies, deprives the Cam of about half its average natural flow**. Water companies abstract daily some 100 megalitres of water (40 Olympic swimming pools) from the Cam Chalk aquifer. Too often, summer flows are greatly reduced and, after successive winters of below-average rainfall, daily abstraction for public supplies can exceed river flows. If abstraction lowers the water table under stream beds, water flows back down into the ground below them and they dry out. Some of this reverse flow will be of polluted water because it derives from sewage treatment works.

    - **The impacts of low flows are exacerbated by pollution**. Sources of pollutants include: farmland (e.g. phosphate, nitrate, pesticides, sediment, animal waste); rural septic tanks (e.g. nutrients); urban highways and surface water run-off (e.g. silt, hydrocarbons); and sewage treatment works (e.g. nutrients, microplastics, endocrine disruptors). Inputs from sewage works are constant year-round but their impact on aquatic ecology, especially in the upper river stretches, is magnified when there is less flow available to dilute them. Many plant species cannot tolerate eutrophication and have consequently been lost from the local flora. For example, Long-stalked Pondweed, *Potamogeton praelongus*, '*once a feature of the Cam, both above and below Cambridge ... was last confirmed from the Cam ... in 1959*'[2]. The Burbot, *Lota lota*, is thought to have been extinct in the Cam since 1969[3]. Cam fisheries are now dominated by coarse fish that have less demanding ecological needs.

    - **The impacts of low flows are exacerbated by habitat modifications**. River modifications, such as over-deepening, culverting, straightening, levee construction and field drainage have disconnected rivers from their floodplains and reduced habitat quality. River bed gravels, essential for spawning fish, have been removed by dredging or buried by sediment. Weirs interfere with flows and obstruct fish. Watercourses are often over-shaded.

6. Action to tackle pollution of Chalk streams from the water industry and urban diffuse sources, the focus of this inquiry, needs to be viewed within this wider context. In particular, flows need to be restored to Chalk springs and headwaters by reducing abstraction from public water supply boreholes and taking water instead from the rivers downstream. Chalk streams should then enjoy adequate flows that sustain their ecology all year, every year. The Environment Agency have advised us that '*Our groundwater model suggests reductions in overall abstraction in the Cam catchment of 60-70% would be necessary to meet environmental flow targets, and hence contribute towards achieving good ecological status under the Water Framework Directive*.'[4]

Actions to tackle pollution from the water industry

7. Year-round inputs of phosphate to Chalk streams from the discharges of sewage treatment works and septic tanks are a continuing concern. The EU Urban Wastewater Treatment Directive of 21 May 1991 led to significant investment in improving the quality of major discharges. Now, almost 30 years on, a further step change is needed in treating and purifying wastewater. This is particularly important for Chalk stream catchments, where flows from sewage works can account for all, or nearly all, the flow during periods of dry weather. Sewage works discharging into these catchments should be prioritised for action to upgrade their treatment facilities.

8. In particular, we recommend that:

   (a) The Government should set tighter limits for discharges of phosphate in treated wastewater from sewage treatment works. The threshold at which phosphate has to be stripped applies only to works that serve more than 10,000 people; this should be lowered, say, to 1,000 people. Sewage works discharging into Chalk streams should be prioritised for such action.

   (b) The Government should require water companies to adopt treatment processes that produce wastewater of near drinking water standards, as at the Langford Recycling Scheme in Essex, at works serving, say, more than 10,000 people, prioritising those that discharge to Chalk streams. Up to 40 megalitres per day of treated sewage effluent that would otherwise be discharged to the sea is diverted to the Langford Scheme and treated to high standards (including nutrient removal and ultraviolet disinfection)[5][6]. The water is then released into the River Chelmer and abstracted, stored and treated downstream to feed public supplies.

   (c) Where phosphate stripping is impractical, and/or where feasible, the Government should require water companies to add reedbed attenuation schemes to sewage treatment works to further cleanse discharges before they reach the rivers. Such projects also create significant new habitats for wildlife, and are appreciated and valued by local people[7]. Again, sewage works discharging into Chalk streams should be prioritised for such action.

   (d) The Government should assess the impact of rural septic tanks on water quality on Chalk stream catchments and promote good practice in their management. A study undertaken in the Welland Valley indicated that there may be 10 times as much phosphorus in discharges from septic tanks compared with arable field drains[8]. Where necessary, septic tanks should be replaced by small-scale treatment plants or mains connections. Septic tanks discharging into Chalk streams should be prioritised for replacement or upgrading.

   (e) The Government should encourage research and investment by water companies in developing new technologies to be deployed at sewage treatment works to disinfect water and remove nutrients, pesticides, microplastics, endocrine disruptors and hydrocarbons.

9. Combined sewer overflows have been a recent focus of public concern and Government action. Several combined sewer overflows from sewage works exist in the Cam Valley. If they operate

after intense storms in the summer, following a dry period, Chalk stream flows could consist largely of untreated sewage. At other times of the year they will still impair water quality. This risk underlines the need for a new approach to water abstraction from Chalk aquifers, so that they can continue to provide a steady supply of water to Chalk streams throughout the summer.

10. Examples of discharges from combined sewer overflows operated by Anglian Water in the Cam Valley are set out below[9]. These are the discharges from sites where storm overflows are monitored (they are not monitored at many others). In 2019, there were in total some 146 overflows, over a total period of 1,088 hours. The reported overflows were:
    - Haslingfield (River Rhee): Spilled 88 times for a total of 1,009 hours.
    - Arrington (River Rhee): Spilled 7 times for a total of 3 hours.
    - Melbourn (River Mel): Spilled 21 times for a total of 46 hours.
    - Barrington (River Rhee): Spilled 3 times for a total of 1 hour.
    - Linton (River Granta): Spilled 22 times for a total of 23 hours.
    - Cambridge - Riverside (River Cam) Spilled 5 times for a total of 6 hours.

    The Cam tributaries, the Rivers Rhee, Mel and Granta, are amongst our best Chalk streams.

11. To reduce the ecological damage caused by combined sewer overflows:

    (a) The Government and OFWAT should ensure that water companies prioritise sewage treatment works that discharge into Chalk streams, as distinct from other surface waters, for investment to reduce, and where possible avoid entirely, the use of combined sewer overflows. Within Chalk stream catchments, overflows that operate close to Chalk stream headwaters should be prioritised over those that operate further downstream.

    (b) The Government should require smaller storm overflows to be monitored and action to be taken progressively to reduce and, where possible avoid entirely, their continued use.

    (c) The Government should require new development, wherever possible, to incorporate sustainable drainage systems to encourage infiltration rather than run-off, create new wetland features, and attenuate storm flows. This will reduce the load placed on public sewers by surface water during heavy rainfall and hence the discharge of raw sewage through combined sewer overflows, while these still remain in place.

Actions to tackle pollution from urban diffuse sources

12. To reduce pollution from towns and cities:

    (a) The Government and local authorities should define the riparian corridor that extends 50 metres either side of major watercourses, in both urban and rural areas, as 'Riverscape Opportunity Areas' and target these for interventions to reduce run-off and pollution.

    - Within these Areas in towns, developers, homeowners and land managers should be encouraged to maximise green cover, avoid sealing surfaces, replace sealed surfaces with porous surfaces, restore wildlife habitats and encourage natural river processes.

    - Outside towns, Environmental Land Management incentives should be targeted on these Areas to support action to reduce the intensity of land use and protect watercourses from run-off and field drainage water containing sediment, nutrients and pesticides.

    (b) The Government and local authorities should take action through planning policies, building regulations, and in the management of highways, to encourage infiltration rather than run-

off. Sealing of surfaces should be minimised in new development and, when due for renewal, existing sealed surfaces should be replaced with porous surfaces wherever possible.

(c) The Highways Agency and local authorities should equip all major roads with silt traps to capture run-off to reduce inputs of silt, hydrocarbons and other pollutants. Run-off from bridges over rivers should be diverted well away from the watercourses below.

(d) The Government and local authorities should do more to facilitate safe travel by walking, cycling, and public transport, in place of the use of private cars.

Monitoring of pollution

13. High-quality data sets, ideally gathered at the same locations over long periods of time on a consistent basis, are essential in understanding pollutant loads and prioritising action to reduce them. We are concerned at the reduction in the monitoring of the water environment. For example, between 2014 and 2019, the number of sites visited by Environment Agency officers fell by a fifth and the number of samples taken for river quality monitoring fell by a quarter[10].

14. Without good data on the sources and intensity of pollution it is difficult to develop effective counter-strategies and actions. This is particularly the case in dealing with diffuse pollution from both urban and rural sources. Developments in instrumentation and remote monitoring technology may facilitate more extensive yet still cost-effective programmes of monitoring.

15. The Government should support the Environment Agency in prioritising the development of effective water quality monitoring networks for Chalk streams. These should embrace pollution from point sources, such as licensed discharges, and diffuse sources, such as run off from land and urban surfaces. In rural areas, for example, this should include monitoring of soil, nutrient and pesticide losses to water at a field level throughout a river corridor. The data thereby gained should be readily accessible to the public. The water companies should also publish their monitoring data; this should not be treated as being protected by commercial confidentiality.

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[1] Cam Valley Forum 2020. *Let it Flow! Proposals from the Cam Valley Forum for an Integrated Water Resource Management Plan for the Cam Valley*. Cambridge. 37pp.
[2] Leslie, A C 2019. Flora of Cambridgeshire. Royal Horticultural Society, London. 912pp.
[3] Angling Times. July 9 2010. 'Extinct' Burbot Spotted in River Eden and Great Ouse.
[4] Environment Agency email sent to Cam Valley Forum, 23 October 2020.
[5] House of Lords 2006. *Water management*. Eighth Report of the Select Committee on Science and Technology Session 2005-06. *Appendix 9*.
[6] Lunn M 2013. *Langford Recycling Scheme*. Cited in Tortajada C & Ong C N 2018. *Water Reuse Policies for Potable Use*. Routledge.
[7] Kovacs C 2019. Ingoldisthorpe Water Recycling Centre (2019). Water Projects Online.
[8] Withers P J A, Jarvie H P & Stoate C 2011. Quantifying the impact of septic tank systems on eutrophication risk in rural headwaters. *Environment International* 37: 644-653.
[9] The Rivers Trust 2020. Is my river fit to play in? Interactive map of sewer overflows.
[10] Plimmer G 2020. England's waterways as polluted as they were 4 years ago. *Financial Times* 17 September 2020.