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The Rt. Hon Philip Dunne MP
Chair of the Environmental Audit Committee
House of Commons
London
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Dear Mr Dunne,

Environmental Audit Committee's water quality in rivers inquiry

Thank you for the opportunity to give evidence to the Environmental Audit Committee's inquiry into water quality in rivers on 23 June 2021. I hope my testimony was helpful to your consideration of this important subject.

At the session I agreed to write to the Committee on several issues, please find this information overleaf.

If the Committee would like further information on any of these points raised in this letter or any associated issues, please do get in touch.

I look forward to the Committee's report and recommendations.

Yours sincerely

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Follow up to the Oral Evidence Session

The Strategic Road Network (SRN) comprises of over 4500 miles of motorway and major A-roads, representing around 3% of the total roads across England. Highways England is the government-owned company responsible for operating, maintaining and improving the SRN.

Highways England continues to work closely with the Environment Agency to understand the risk of pollution from highway discharges and the potential scale of the impact as it may relate to the management of the SRN.

All road schemes designed and built since 2009 on the SRN have been subject to robust assessments, which include mitigation measures for known pollution risks, developed in partnership with the Environment Agency. Where these schemes are upgrades of the existing network, the application of this assessment process is designed to drive an improvement in the quality of runoff and/or reduction in impacts on receiving waterbodies.

However, the SRN has been developed over 60 years to road design standards that were current at the time. Highways England has an ongoing programme of work to record its asset inventory and to identify and mitigate locations verified as posing a potential pollution risk.

In our recent Annual Report 2020/2021[1], we re-iterated our commitment to improving the water environment, reducing flood risk and improving water quality for those using or living next to our network. The report states that during 2020–21 we mitigated flood risk at 33 locations vulnerable to flooding, and delivered 25 water quality initiatives (mitigation to 23 outfalls and a further two water interventions - a fish pass and a river enhancement project), improving 17km of watercourse.

Our microplastic research

In December 2020 we published phase one [2] of our microplastics research and development project. This was a literature review to understand current knowledge of microplastics as they might relate to the Strategic Road Network (SRN).

In April 2021, we commissioned the second phase, which will include field monitoring to establish the scale of the impact from the SRN and the effectiveness of treatment systems we routinely deploy. Microplastics is a rapidly developing technical area, so the first element of the second phase included a refresh of the literature review[3] which we have published.

Key themes identified in this recent literature review refresh were:

- The dominant source of microplastic pollution from roads is tyre and road wear particles (TRWP). Quantifying the sources with standardised analytical techniques is a challenging and evolving area.
- Information on microplastics when they enter the environment is limited, with further research into the role of rivers in transport and degradation of TRWPs needed.
- Current techniques used for capturing and retaining sediment are suitable for TRWP associated microplastics, and should be retrofitted where possible, with regular maintenance for drainage systems.

[1] Highways England's Annual Report 2020/2021 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1002845/Highways_AR21_Interactive.pdf

[2] Investigation of 'microplastics' from brake and tyre wear in road runoff: https://s3.eu-west-2.amazonaws.com/assets.highwaysengland.co.uk/Knowledge+Compendium/Investigation+of+microplastics+from+brake+and+tyre+wear+in+road+runoff.pdf

[3] Microplastics Phase 2 – literature review supplement https://assets.highwaysengland.co.uk/Knowledge+Compendium/Microplastics+Phase+2+-+Literature+Review+Supplement.pdf

- The impact of microplastics on ecosystems and human health are not clear and further research is needed.

These themes will be used to inform the field monitoring programme which is due to begin later this year, and will last for a period of six to 12 months. The field work will be undertaken by Plymouth University who are currently finalising the field sampling methodology and site identification. We expect to publish our findings from these investigations in 2023.

Highway England's Key Performance and Performance Indicators

During the oral evidence session, we discussed performance indicators and I want to take this opportunity to set out some more detail and context.

Highways England's performance framework brings together all our delivery aims for the next five years, including those from the Government's second road investment strategy (RIS2 – 2020-2025)[4]. It provides the basis for monitoring by the Office of Rail and Road (ORR), along with our five year delivery plan[5]. We have built this framework based on research, insight and consultation, as well as from observing best practice in other sectors. As agreed with Department for Transport, Transport Focus and ORR; our framework reflects how we will deliver the following six outcomes:

- improving safety for all;
- providing fast and reliable journeys;
- operating a well-maintained and resilient network;
- delivering better environmental outcomes;
- meeting the needs of all users; and
- achieving efficient delivery.

We have both "Key Performance Indicators" and "Performance Indicators".[6]

Key Performance Indicators (KPI) focus on activities or outcomes which are most important, either for road users or communities that live near to the SRN, or which support wider government objectives. This ensures that we can focus performance through our investment plans, and our operational priorities for the network. KPIs have targets attached to them, against which the ORR will monitor our performance. Our environmental KPIs are:

Delivering better environmental outcomes

- No net loss of biodiversity across all Highways England activities by the end of RIS 2.
- Road noise mitigation for 7,500 households in 'noise important areas' funded through our designated funds.
- Bring agreed sections of the SRN into compliance with legal NO2 limit values as soon as possible.
- Reduce carbon emissions resulting from Highways England's electricity consumption, fuel use and other day-today operational activities during RIS 2.

[4] Government's Second Road Investment Strategy: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951100/road-investment-strategy-2-2020-2025.pdf

[5] Highways England's Delivery Plan (2020-2025): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910866/5-year_Delivery_Plan_2020-2025_FINAL.pdf

[6] Highway England's performance metrics are set out in our Operational Metrics Manual (OMM). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/775149/Operational_Metrics_Manual.pdf

KPIs by themselves do not, and cannot, fully reflect how we and the SRN are performing. *Performance Indicators* (PIs) offer trend-based measures to customers and stakeholders. They provide additional context to KPIs, or cover areas of specific focus within an outcome area to inform ORR's monitoring.

We have a number of PIs on environmental performance, including one on water quality:

- "*The length (km) of watercourse enhanced through the mitigation of medium, high, and very high-risk outfalls*[7] *as well as through other enhancements such as river retraining/rewilding".*

The purpose of the metric is to monitor how effectively Highways England is improving the environment by reducing adverse effects on watercourses.

We have robust assessment tools for determining water quality impacts of runoff from the SRN based on extensive research which was, in part, funded by the Environment Agency. The thresholds agreed with the Environment Agency, and adopted by us, to determine if the runoff quality is acceptable or unacceptable, are much more stringent than annual average Environmental Quality Standards (EQS). The thresholds relate to short lived peaks in concentration more characteristic of highway runoff rather than annual averages. Intermittent highway runoff rarely causes a failure of the annual average EQS threshold because outfalls discharge for a relatively short period during and after rain while the river flows continually.

The initial risk category assigned to outfalls and soakaway assets is precautionary, with our experience to date indicating that only around 10% of unverified category A & B assets remain high risk once verification is complete. There are many reasons why this can be the case including: incorrect data assumptions about catchment size; data duplication; and unrecorded drainage mitigations in-situ.

The number of upgrades to outfalls and soakaways mitigated/upgraded each year

Tables 1 and 2 provide summary statistics on known outfalls and soakaways on the SRN at the end of June 2021. The tables provide details of those considered to be a potential high risk of pollution, as well as those classed as having either been mitigated, or assessed and verified as having no risk.

Table 1: Summary statistics for Outfalls on the SRN

Total no. of Outfalls	18,432
Total no. of Risk Addressed Outfalls	2515 (13.6%)
Total no. of High Risk Outfalls (Category A&B)	1194 (6.5%)

Table 2: Summary statistics for soakaways on the SRN

Total no. of Soakaways	7969
Total no. of Risk Addressed Soakaways	1476 (18.52%)
Total no. of High Risk Soakaways(Category A &B)	132 (1.66%)

[7] Our risk category definitions are:
Category A – Very high risk. Where an assessment identifies a risk of pollution from an accidental spillage and/or a predicted failure of the Water Framework Directive Environmental Quality Standards for the receiving waterbody.
Category B – High risk. Where an assessment process has identified a risk of soluble AND sediment pollution for short term highway runoff-specific thresholds.

Table 3 provides the number of outfalls and soakaways mitigated each year since the start of RIS 1 (from 2015) – it includes only those locations that have been formally technically assured.

Table 3: No of outfalls/soakaways mitigated since 2015

Year	Number of outfalls & soakaways mitigated
2015/16	N/A (Year 1 (2015/16) recorded no mitigations as this year was focused on development of the metric and implementation within Highways England, rather than collating the information.)
2016/17	4*
2017/18	5*
2018/19	6*
2019/20	14*
2020/21	23*

** Please note that this table does not include all mitigation measures undertaken prior to the establishment of a performance metric in 2019. Prior to this date, we did not routinely report on outfalls and soakaways mitigated.*

In March 2019 we introduced a "Contract Performance Framework Water Environment Metric" to ensure all of our future road infrastructure improvement schemes (Major Projects) would report improvements made to the water environment in line with the Water Quality Performance Indicator. This metric tracks the number of outfalls and soakaways a major project will mitigate through the design and then construction phases. It also incentivises contractors to seek opportunities to deliver wider water environment benefits beyond core scheme requirements.

The planning lifecycle of major projects means that although schemes are now adopting the implementing the metric, only a few of those schemes have been completed and opened to traffic. It is only when schemes are opened to traffic that these mitigations are reported and contribute to the performance indicator.

Our programme to mitigate the 1,194 high risk outfalls and soakaways

Highway England's priority is to address its 'very high' and 'high risk' locations.

- Around 6.5% (1,194) of outfalls on the SRN could potentially be high risk (category A&B).
- Around 1.6% (132) of soakaways on the SRN could potentially be high risk (category A&B).

The total number of potentially 'high risk' outfall or soakaway assets is therefore *1,326*.[8] The initial risk category assigned to outfalls and soakaway assets is precautionary, with our experience to date indicating that only around 10% of unverified category A & B assets remain high risk once verification is complete.

We will deliver improvements to these potentially 'high risk' outfalls and soakaways through our:

1. **Major Projects Programme**: Existing outfalls/soakaways within a major project scheme's boundary that are identified as posing a risk will be addressed as part of the core scheme. Additional opportunities can be taken to deliver wider water environment benefits through accessing Highways England's ring-fenced Environment and Wellbeing Fund[9] (Environment and Wellbeing Fund).

[8] Please refer to reference 7 for the risk category definitions.

[9] Information on our Environment and Wellbeing Fund: https://highwaysengland.co.uk/designated-funds/

The forward programme of major projects being developed and starting construction during in RIS 2 (2020-2025) and into RIS 3 (2025-2030) is forecast to address approximately 248 of the total 1,326 high risk assets. (A number of schemes in development in RIS2 will complete construction and open to traffic during RIS 3. The details of the RIS3 forward programme and the number of assets to be addressed in RIS3 is likely to increase as more details emerge of the schemes. Further forecasts beyond 2030 are not possible at this stage as potential schemes are in early stages of identification and are unconfirmed.)

2. **Operational Improvements**: For all outfalls/soakaways that are not addressed within the Major Projects Programme, a rolling programme of improvements is being developed by each of Highways England's six regional operational teams to address their highest risk locations first i.e. Category A or B outfalls/soakaways. This activity is currently funded from our Environment and Wellbeing Fund.

   Outside of the Major Projects Programme, this leaves approximately 1,078 category A & B assets to be addressed. To note, most of the 1,078 assets have not had their risk 'verified'. Using the value of 10% prediction that unverified category A and B assets will remain in these categories, it is estimated that there will be a residual 108 high risk outfalls and soakaways which require mitigation outside of the major road enhancement programme.

   Over 2021/2022 we plan that the remaining unverified high-risk locations are 'verified', to confirm their risk status and identify a pipeline of projects to address all verified locations. This will be an operational target and funded through our Environment and Wellbeing Fund. We have set a target to mitigate 35 of these highest risk outfalls in RIS2, subject to feasibility and value for money. This target has been based on an understanding of our supply chain capacity to develop a pipeline of schemes with available funds and to build on our progress in RIS1. Regional targets will be identified to support this and future years' delivery.

   Assuming this is met, and the same level of funding continues beyond RIS 2, the mitigation of the outstanding 108 high risk assets will therefore be complete in three road periods (by 2036).

There are a range of factors that could influence the number and rate at which outfalls/soakaways can be mitigated. These include:

- Any changes to the current RIS2 & RIS3 Major Projects Programme;
- The cost of mitigation & availability of funds for the Operations Directorate. Mitigation of an outfall can range from £150k to >£3m depending on the risks and conditions on the ground. Certainty of funding through our Environment and Wellbeing Fund has been assumed but cannot be guaranteed for future road periods; and/or
- Feasibility of identified mitigation. In some locations space is constrained and the ability to retrofit and construct a viable solution within the existing landscape can be limited or would have a detrimental effect on another environmental aspect e.g. biodiversity through loss of high quality habitat.

Particulate matter from road runoff

The final question posed by the Chair of the Committee to Highways England on the 23 June 2021 oral evidence session centred around particulate matter. The transcript will note I responded specifically on microplastics and would like to provide a fuller response here.

Suspended solids within road runoff are a recognised form of pollution, not just as inert sediment which can cause smothering of the river bed. They also, due to the adsorption of pollutants such as polycyclic aromatic hydrocarbons (PAHs), can be ingested by aquatic fauna with negative consequences.

Our current assessment practices, developed in partnership with the Environment Agency, model the risk of pollution from particulate matter in road runoff against identified threshold values within the receiving environment. Where threshold values are exceeded, sediment removal techniques are incorporated into the drainage design e.g. drainage ponds, wetlands or vortex grip separators.

[ends]