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Wastewater and Public Health: Project Outline

Who we are

The National Engineering Policy Centre brings engineering thinking to the heart of policymaking, creating positive impacts for society. We are a partnership of 42 professional engineering organisations that cover the breadth and depth of our profession, led by the Royal Academy of Engineering. Together we provide insights, advice, and practical policy recommendations on complex national and global challenges. Our latest project on wastewater and public health brings together partners from across the engineering profession and beyond to consider interventions to reduce the risk to public health.

Public health definition: Organised measures (whether public or private), taken to reduce risk to tolerable levels to prevent disease, promote health, and prolong life among the population as a whole.

Context

Members of the public using natural bodies of water such as lakes, rivers and coastal waters in the UK are potentially at risk from the presence of human faecal pathogens from both raw sewage and the continuous discharge of treated wastewater. Furthermore, the spread of antibiotic-resistant bacteria and their genes from the wastewater system into the environment also presents a longer term, potential public health risk.

The UK Environment Act of 2021 set new wastewater targets and assigned new duties to water companies to reduce environmental and public health harms from the use of storm overflows. This has resulted in a range of policies,

pledges of investment and innovations from government, industry and civil society. Our ageing infrastructure makes this a complex problem to address effectively, and any individual interventions need to be considered as part of a wider system that must achieve multiple goals.

This project will consider and assess the viability of a range of interventions to mitigate the public health risks posed by wastewater pollution of the rivers, in-land and coastal waters used for recreation across the UK. It will highlight some of the choices that government, regulators and industry will need to address.



The approach

In assessing potential intervention points to reduce public health risks, we will consider how wastewater infrastructure fits into the wider UK water system. For each intervention, the challenges and potential for co-benefits will be considered against the delivery of other systemic goals:

- resilience of water supply
- drive to net zero operational emissions for water companies
- improving the ecological health of water bodies
- securing financial stability
- demand for urban development and housing
- flood mitigation and prevention.

Our intention is to provide a balanced review of suites of interventions which mitigate public health risks so that informed decisions can be made. We will also consider their relative costs and effectiveness, the systemic impacts and the policy and regulatory interventions that may enable the suites of interventions to be delivered. This will be developed and evaluated in collaboration with public health specialists, engineers in the water industry, academics and civil society organisations.

Given our specific focus on mitigating the public health risks from human faecal pathogens, the following topics will be explicitly outside of the scope of this work:

- a. A detailed assessment of the applicability of different interventions across different catchments and geographies, or within different administrations.
- b. Supply and treatment of drinking water.
- c. Animal waste and diffuse pollution sources such as agricultural run-off, except for those that enter the sewerage network, such as road run-off, or those that are products of it, such as sewage sludge and its disposal.
- d. Measures to reduce/prevent pollutants, including antimicrobial prescribing and usage.
- e. Discussion of specific products, eg, treatment products. We will focus on the high-level mechanisms and technologies.
- f. Assessment of current industry structure (such as public versus private ownership).

Working group

The project scope was developed in discussion with the Chief Medical Officer (CMO) for England, Fellows of the Royal Academy of Engineering, National Engineering Policy Centre partners, policymakers, and other experts through input gathered at a scoping workshop held in June 2023. Further evidence gathering is planned throughout autumn and winter of 2023, with a final report expected for publication in spring 2024.

This project will be delivered by a National Engineering Policy Centre Working Group made up of the following experts:

Professor David Butler FREng FICE FCIWEM (Chair)
Professor of Water Engineering, University of Exeter

Professor Luiza Campos FICE
Professor of Environmental Engineering, UCL

Philip Clisham FICE
Technical Director, PClisham Consulting

Professor Barbara Evans MCIWEM
Professor of Public Health Engineering, University of Leeds

Darren Hollins FIMechE
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Professor Dragan Savić FREng FICE FCIWEM
CEO, KWR Water Research Institute

Dr Andrew Singer
Principal Scientist, UK Centre for Ecology and Hydrology

Dr Heather Smith
Senior Lecturer in Water Governance, Cranfield University

Dr Andrew Thompson FICHEM
Water Domain Lead, AtkinsRéalis

Further information

For further information about this project, or to share evidence on the issue of wastewater and public health, please contact the Royal Academy of Engineering at: healthpolicy@raeng.org.uk or visit our webpage at nepc.raeng.org.uk/wastewater-public-health