

WATER INDUSTRY INSIGHTS



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The roadmap to zero pollution



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THE ROADMAP TO ZERO POLLUTION

A river pollution scandal

Earlier this year, the Panorama 'River Pollution Scandal' episode aired which painted a pretty drastic picture of how our sewerage systems impact on watercourses from Wastewater Treatment Works (WwTW) and Combined Sewer Overflows (CSO). And yes, at those specific locations, for those specific incidents, the performance of those assets did not meet those companies targets, nor their obligations as custodians of the local environment. However, is this the complete picture, or indeed one that we see occurring commonly across the UK?

Wild swimming and paddle boarding - the way we use our waterways has shifted

It's becoming clear that the way we use our waterways is evolving. Covid lockdown has encouraged us to look to our local environment for exercise, and with the emergence of additional water based activities such as stand up paddle boarding and wild swimming, which has increased in popularity over recent years with nearly [600 sites accessed by swimmers](#) across the UK and Ireland, the public use of our watercourses has increased.

2020 also saw the first river swimming spot to receive 'bathing water status' on the River Wharfe in Ilkley, all of which adds more pressure to Yorkshire Water, and other water companies, to carefully manage their local sewerage networks. In fact, the recent announcement of the Green Recovery Fund has seen Severn Trent Water secure £78 million investment to trial the creation of two stretches of bathing river.

So as the population increases and more urban areas are paved over, climate change results in more extreme summer storms and wetter winters, and the way we use our waterways continues to evolve, CSO spills will remain in the spotlight.

Overflows are bad, right?

Is it as simple as "overflows are bad, and we need to eradicate them"?

Our sewerage networks were/are designed with the primary purpose of removing domestic and commercial wastewater. And when it rains, storm water is also collected and transported within these systems, sometimes in the same sewer (a combined system) or in separate stormwater sewers. However, sewerage networks have a finite capacity, and when systems are stressed, for example during heavy rainfall, there is a risk that this capacity is exceeded which ultimately results in flooding, and potentially sewage inside people's homes causing a public health issue.

The role of a combined sewer overflow (CSO)

CSOs provide a relief point where heavily diluted storm overflow can be discharged into watercourses to prevent flooding. As such, network operators are always trying to find the balance between investment and impact, managing the network between our two biggest serviceability issues of flooding and pollution, whilst keeping bills affordable for customers.

But CSOs have changed a lot since privatisation. With an infrastructure investment of over £30 billion guided by Environment Agency UK regulation in the last 30 years across 15,000 overflows in England alone, the permitting body for those assets sets the discharge limits. Ever tightening environmental regulation linked to the [Water Framework Directive](#) and the Urban [Wastewater Treatment Directive](#) has led to improved control over discharge and tightening annual spill performance.

['https://environmentagency.blog.gov.uk/2021/03/31/event-duration-monitoring-lifting-the-lid-on-storm-overflows/](https://environmentagency.blog.gov.uk/2021/03/31/event-duration-monitoring-lifting-the-lid-on-storm-overflows/)

CSO performance monitoring, AMP6

The need for increased monitoring of CSO performance was set out by the Government in 2013 when Richard Benyon, then the Minister for Natural Environment and Fisheries, wrote to the Chief Executives of Water Companies and the regulators stating an expectation that most CSO's will be monitored by 2020 to manage the reputational issue of discharges as well as the future impact of growth, creep and climate change.

Working with the Environment Agency, water companies classified both overflows and receiving water bodies to target 'greater significance' overflows for the installation of Event Duration Monitors (EDM) to allow spill performance to be assessed annually. The subsequent water industry investment cycle saw these monitors installed between 2015-2020.

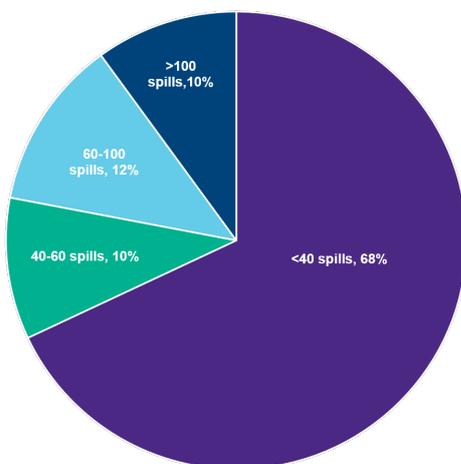
For those overflows with EDM, the trigger of 40 spills a year was identified as the threshold above which a CSO needed investigating. The Storm Overflow Assessment Framework (SOAF) provides the process and structure for this investigation and enables the identification of interventions to improve performance

Data transparency - the public is informed

So what happened in 2020? Across the water companies of England and Wales, EDM performance data was placed into the public domain.

Over 13,000 overflow assets delivered a total annual spill count. Of these assets, 68% of overflows did not meet the investigation threshold for SOAF, spilling less than 40 times. However, 10% of overflows spilt more than 100 times, with the most frequent spillers suggesting potential daily incidents.

It should be stated here that a high percentage of these overflows are already being investigated and upgraded as part of SOAF programmes.



EDMs confirm a spill, not its impact

When you look at the CSOs that spilt once in 2020, they range in duration from two minutes to over 11 hours - which potentially represents a significant difference in volume entering the watercourse. However, EDM data will not tell you if those spill rates were <1 l/s or 2000 l/s - where spill rate and duration indicates the volume of discharge.

This also does not account for the impact that a spill event has on the receiving water body. Is 1m³ being discharged into the River Thames in London, or is 1000m³ being discharged into a small ditch behind a housing estate? Understanding the impact on water quality and aquatic life within the receiving water becomes much more critical to the significance of an overflow spill than merely its occurrence, and this will become more critical to the management of pollution events moving further into the 2020s. Whilst the closure of all overflows would result in an eradication of spills, the investment required makes this unfeasible. So how can we strike the right balance between investment in our networks and our environment?

A Zero pollution future?

With each of these growing pressures - from government, climate change, an ageing asset base and a growing population and their use of our waterways - will we ever be in a position where zero spills, and therefore zero pollution is an actuality, and will this deliver the environmental improvements the public demands?

This is the first in a series of articles as part of the RPS Pollution Series that we'll share over the coming weeks. We'll discuss the challenges in managing discharges into our water bodies across the UK, while taking a deep dive to explore this further as we determine how confident we can actually be with EDM data, and where sewerage modelling comes into its own when used to support data assessment.

About RPS

At RPS, we work with urban drainage catchments across the UK every day analysing the performance of networks as they are now, and how they'll be in the future. This includes assessing the performance priority assets, including CSOs, against their consents issued by the environmental regulators² so we can appreciate the stresses that these networks are put under daily, but also the impacts that discharges can have on receiving waters.