

# Pollution Incident Reduction Plan (PIRP)

2022–2025

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YorkshireWater

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# Navigating this document

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There are also many other clickable links within this document which we've made easy to spot by underlining and **highlighting** them in blue. If you click on one of these links, but then wish to navigate back to the page you were viewing previously, simply click the 'Back' button at the top of the page.

# Contents

This report is set out into colour-coded sections to help you navigate the report easily. Click on the section you are interested in on the contents page and it will navigate you to that section.

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# 1. What is a PIRP and why do we have one?





# What is a PIRP and why do we have one?

Protecting Yorkshire's rich and diverse environment is key to everything we do. From supplying our customers with clean water, to treating wastewater and returning it safely back to our rivers and our Pollution Incident Reduction Plan outlines just how we plan to continue to do so.

We take our responsibility for protecting the environment seriously, which is why we are investing £637m in AMP7 to improve Yorkshire's rivers.



## 2. What is a pollution incident?





# What is a pollution incident?

A pollution is when a substance or effluent in the case of sewage companies enters a watercourse. Pollutions arise from asset failures such as burst pipes, from the impacts of severe weather such as flooding, or the handling and storage of chemicals used in treatment processes.

One of the main causes of pollution in the Water industry is blockages in the sewer network. In Yorkshire we have 52,000KM of sewer network and respond to circa 38,000 network escapes a year which are typically caused when the wrong things are flushed down the toilet or drained in the sink. 70% of all blockages are caused by wet wipes which is why we've called for a ban on plastics in all single-use sanitary items, as well as an end to 'fine to flush' labelling and the introduction of mandatory 'do not flush' warnings on all packaging. This will help keep the country blockage free, cut customer bills and protect the environment.

Unfortunately, pollution incidents do still occur and where this happens incidents are categorised based on the extent of environmental impact they have using the Environment Agency's Common Incident Classification Scheme (CICS). Category 1 and 2 incidents are deemed as 'serious' incidents. Category 3 are those with 'minor' impact, and finally Category 4 are those with no impact.

# 3. Our pollution reduction goal





# Our pollution reduction goal

The Environment Agency expects all water companies to prevent serious pollution incidents and requires us to have effective pollution reduction plans to minimise category 3 incidents. Using 2016 performance as a baseline, the Environment Agency expects a 40% reduction in total pollution by 2025.

For Yorkshire Water this represents having no more than 150 pollutions per year by 2025, however, we're committed to going further and plan to outperform this target so that we have no more than 103 incidents per year by 2025.

Our PIRP outlines our plans to achieve this goal and has been updated since it was originally published in March 2020. We see the PIRP as a dynamic plan that we will continue to review, and update based on learning and industry best practice.





# 4. Our journey so far

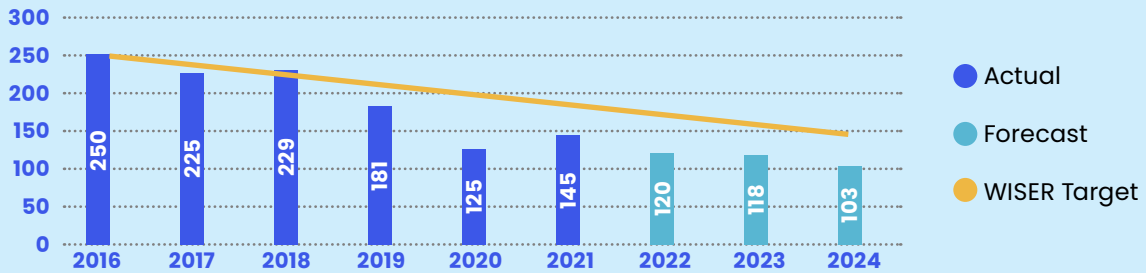




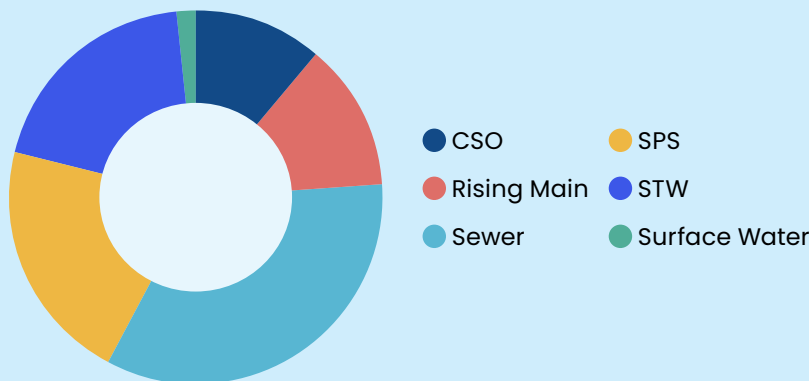
# Our journey so far

In 2018 Yorkshire Water commenced a programme of pollution improvement activity that has led to a downward trend in pollution incidents, and this is a trend that we mean to continue. Despite 2021 being a challenging year we believe our improved and updated PIRP will allow us to continue our long-term trend of pollution reduction.

## Yorkshire Water Pollution Performance



## 2021 Pollution by Asset Type





# 5. What are we planning to do?





# What are we planning to do?

Our PIRP is made up of two key elements; Projects targeted at specific asset types and projects that support enabling themes that cut across all asset types and teams. There are five enabling themes in total:

1. Process improvement & governance
2. Training, competence & culture
3. Data & Technology
4. Maintenance & investment
5. Risk & assurance

The next section will explore some of the asset specific projects we are deploying to reduce pollution.



# 6. Sewer Network





# Sewer Network

Despite reducing sewer network pollution by 50% over the last three years, it remains our primary source of pollution. The sewer network presents a particular challenge given its scale (52,000KM), it's buried and therefore not visible, and the fact that we have little control over what's discharged to it.

Our plan for the network focuses on continuing the good work which has yielded the improved performance seen to date, whilst further improving effectiveness and efficiency of delivery.

## Intelligent Sewer Maintenance

Maintaining an asset base the size of the sewer network is a challenge particularly when it comes to predicting where failure is likely to occur. We take a data-based approach to network maintenance using asset condition, incident history, proximity to water course, job history and weather data to inform our proactive maintenance plans. This means we're able to send out network maintenance teams where they are needed, when they are needed.

## Network Visibility

We have installed 1,000 network monitors at high-risk manholes close to watercourses. This allows us to spot when blockages are forming, so that we can respond and remove them before they cause a pollution incident. We intend to continue to look for low-cost network monitoring solutions that will enable us to spot and respond to failure before it impacts on the environment.



# 7. Sewage Pumping Stations





# Sewage Pumping Stations

We have over 2,500 Sewage pumping Stations (SPS), which play an important role in the collection of sewage and its transfer to our Wastewater Treatment Works. They are used to pump sewage up hill, under pressure via a rising main, when the gravity sewer network would be unable to do so. Pumping stations represent a real opportunity for pollution reduction given their limited size/complexity and level of visibility due to good telemetry coverage. Our goal is to eliminate pollution at this asset type.

## Wet Well Cleaning

Following a successful trial using external contractors we now have a dedicated team of Vactor cleaning vehicles which keep our pumping station wet wells clean on a routine basis. This is an important activity, as blockages are the main cause of pump failure, which can lead to pollution. The team focus on 554 of our highest risk sites with a history of blockages. Site performance is reviewed on a regular basis to ensure that we're targeting the most vulnerable locations.

## Intelligent Pump Reversal

Even with wet well cleaning, pump blockages often occur on wastewater pumping systems due to the inappropriate disposal of wet wipes, sanitary products, and kitchen waste such as fats, oils and grease. When this happens, an Operator is sent to site to unblock the pump to prevent a pollution incident. We're installing equipment to provide automatic recognition of a blockage which will then mean the pump flow can be reversed, thus relieving the blockage prior to any potential pollution. This gives us more time to deploy a colleague to site to fully resolve the cause. We've committed to installing this on all our pumping stations by 2025.

## Electrical Signature Analysis

We're installing technology on our sites that will monitor motor performance of rotating equipment such as pumps. This technology analyses the electrical current to determine if there is a problem developing prior to failure. Upon detection we're able to dispatch an engineer prior to it failing and causing a pollution incident. We will have 1,000 installations of this technology on our assets by 2025.

# 8. Wastewater Treatment Works





# Wastewater Treatment Works

We have over 600 WwTWs that treat and safely return wastewater to the water environment. Many of our treatment works contain pumping assets that will also benefit from the projects outlined in the SPS section. Like pumping stations, our goal is to eliminate pollution from this asset base.

## Intelligent Alarms

'We are providing new alarms on our WwTWs which will alert us to issues relating to treatment flow'. The alarms which are generated within our Regional Operational Control Centre are then passed out to operational colleagues to provide remedial action.

## Power Outage Restarts

One of the problems created by power failures is that when the power is reconnected often the asset will be in a failed mode and require a human intervention to start running again. What we're doing over the next three years is to ensure that our pumps start back up as soon as the power supply is restored. This will minimise downtime and prevent any additional environmental impact.



# 9. Combined Sewer Overflows





# Combined Sewer Overflows

Combined Sewer Overflows (CSOs) provide an important relief valve for the sewer network during periods of intense rainfall, to protect customers and businesses from flooding. If a CSO experiences a blockage, there is a risk that this can lead to a pollution incident if it is not spotted and responded to quickly. 97% of our CSO asset base is telemetered and the remaining 3% will be telemetered by 2023. Our goal is to eliminate pollution from this asset type.

## Dedicated CSO Maintenance Team

Acknowledging the sensitivity of this asset base we formed a team dedicated to their performance. The team ensures the time required to undertake planned maintenance is not compromised and any remedial work is identified and managed through to completion.

## Blockage Predictor

The build-up of fats, oils and greases along with un-flushable wipes and other material not intended for the sewer network build up to create restrictions which in turn lead to sewage escapes. Blockages are the biggest cause of sewer escapes in the industry and that is why this is a key initiative we are growing further.

By monitoring the level within our sewer network, we can understand where restrictions are forming prior to a pollution. We currently monitor the levels at around 3,500 points on the network which our processes constantly analyse to highlight where restrictions are forming so we can intervene proactively.

## Review of Maintenance and Criticality

Our pattern of CSO maintenance had remained static for a number of years – with static visit frequencies. We have now completed a review of all our CSOs, assigning a level of criticality to them based on their impact of failure. This criticality informs an inspection and maintenance plan that is reflective of each asset's risk and bespoke requirements. The inspection and maintenance frequency will be monitored and adjusted based on asset performance to ensure efficiency and effectiveness.

## Meteor Cameras

When our CSOs operate in heavy rainfall, there is a need to inspect and clean up afterwards. We've installed cameras on 58 of our most sensitive CSOs allowing them to be monitored daily to ensure we're acting quickly to clean any debris that may be left as the result of a consented spill.

# 10. Rising Mains





# Rising Mains

Rising mains operate under pressure and are part of the sewage pumping process. We have over 1,250KM of rising main in Yorkshire. Like sewers, rising mains present a challenge due to their number and lack of visibility.

## **Air Valve Maintenance & Technology**

Trapped air within rising mains can cause a wide range of issues from pressure surges and leaks, to contributing to burst pipework in the most extreme cases. To reduce the risk of rising main bursts caused by faulty air valves, we will be trialling Smart Air Valve technology at high-risk locations. These valves provide remote visibility of their performance, detecting potential developing failures and enabling a swift, pre-emptive response to resolve the issue before it results in a failure.

## **Pressure Monitoring**

We've installed pressure monitors on 60 of our highest risk rising mains which will provide us with live performance information. Using pre-set triggers, the system highlights where an asset is drifting outside of its expected operating envelope, which can be an indication of failure or a developing problem. This will enable us to respond quickly to any developing issues and resolve them before they cause a pollution incident.

# 11. Incident Review, Learning & Best Practice





# Incident Review, Learning & Best Practice

Every incident that resulted or had the potential to result in a pollution undergoes Root-Cause Analysis (RCA). This is to identify the learning opportunities and reduce the likelihood of repeat incidents by taking effective, corrective action.

Learning is documented and shared throughout the business to support continuous improvement. This RCA process underpins our PIRP and the identified themes and trends from the RCA process inform where we focus resource to ensure the greatest level of improvement.

Along with our own internal RCA process, the water industry as a collective is committed to sharing best practice through collaborative groups. Yorkshire Water plays an active role in these groups which include the Pollution Reduction Group as well as the Sewer Network Abuse & Prevention Group.





# 12. Governance and Assurance





# Governance and Assurance

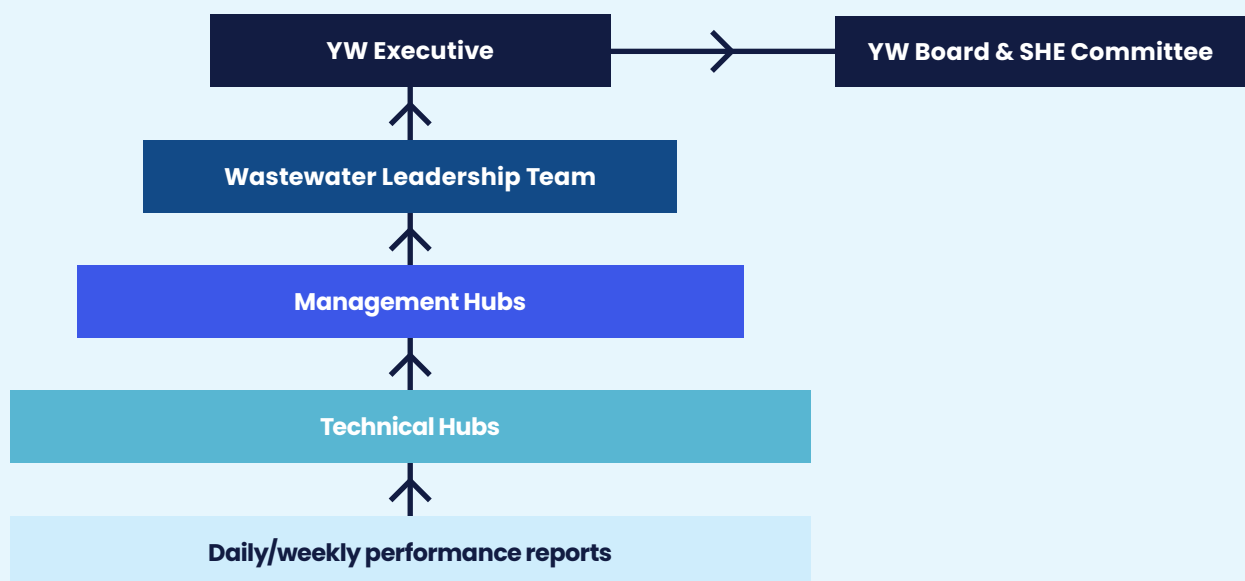
Our PIRP is a diverse and ambitious plan that draws on expertise from across our business. This means it's important that we have strong governance and assurance in place to track delivery and benefit realisation.

We run a tiered hub structure to track performance and identify/manage risks across the business. At the foundation level regular performance reports feed into technical Hubs, that track performance and drive action to resolve developing issues.

There are Hubs covering operational maintenance, asset performance, pollution process, permit compliance and project delivery.

Management oversight is provided through management level Hubs which also track performance and provide a route for dilemma escalation. Senior management oversight is provided by the Wastewater Leadership Team and Board oversight via the Safety Health & Environment (SHE) Committee.

## Information Flow



# 13. Summary





# Summary

We are committed to protecting the environment which is why we've set ourselves an ambitious target which will see us outperform the targets set out by the Environment Agency within their WISER document.

We've learnt a lot over the past two years since we published our first PIRP and have built this into our new plan, as well as broader best practice from across the industry.

Using the governance structure set out in this document we'll monitor our performance closely so we can remain agile and able to adapt our plan to emerging trends. We commit to publishing an annual progress report that will cover pollution performance and an update on PIRP initiative delivery.



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