

# Pollution Incident Reduction Plan 2023 - 2025



# Executive Summary

**At Anglian Water, we are determined to deliver on our purpose to bring environmental and social prosperity to the region we serve, through our commitment to Love Every Drop. Central to this ambition is addressing and improving our pollutions performance.**

Pollutions and storm overflow spills have dominated the conversation in the media and with our stakeholders over the past year – and rightly so. We echoed the recent Water UK apology on behalf of the entire industry for not acting on concerns quickly enough, and while we are making great strides in storm overflow spill reduction, we acknowledge our present performance on pollutions is not where we, or our customers, want it to be.

**We are listening and taking action, and this Pollution Incident Reduction Plan demonstrates how seriously we take this matter, outlining the additional steps we are taking between now and 2025 to improve our performance for the region.**

The composition of our region presents a number of specific, additional challenges when it comes to preventing pollutions. Our heavily drained, flat landscape and long, narrow watercourses, combined with our assets spread across rural locations, mean that although our pollution incidents have not caused the environmental impact commonly assumed, we are predisposed to receiving a higher categorisation for pollutions. We recognise the immense value of all aspects of biodiversity however, which is why we treat each incident with the utmost seriousness, as the extent of our plans in this Pollution Incident Reduction Plan (PIRP) demonstrate. To overcome these challenges, we've needed to think radically about how we can address our operations and pollutions performance and we are committed to reaching our goal of zero harm from our assets.

In the same vein, and with a commitment to transparency, we've also been clear to report storm spills on dry days as pollutions. As companies are

reporting differently across the sector, we are aware this means a true comparison across the industry is difficult. While this reporting of dry spills impacts our Environmental Performance Assessment rating, it is very much the right thing to do.

Since the publication of our last PIRP in 2022, we have made significant changes to our business and how we work, including bringing in a new Director of Water Recycling and established a Quality and Environment Directorate.

We've undertaken a root and branch review of our performance, teams and operations, putting steps in place to ensure we have the right operational controls and processes to do the basics brilliantly (page 18). We have been learning; exploring how we can further technology and apply it to different asset types (page 24-35), alongside overhauling our management systems and assurance processes (page 18 and 19) and placing a firm emphasis on the prevention of pollutions and continuous learning and improvement in all that we do.

While our plans are being implemented at pace, we are also realistic that it will take time for these actions to turn into results. This doesn't mean we lack ambition – far from it.

**The changes we are making mean we now have a more comprehensive understanding of our pollutions performance across our network than ever before.**

This in turn is identifying pollutions that in previous decades may have been missed, while at the same time we are preventing others from occurring in the first place. For this reason, we are expecting performance to stabilise in 2023 as we embed our changes, followed by a strong reduction in total pollutions by the end of the Asset Management Plan (AMP). While this trajectory for performance is frustrating, especially for our teams working hard every day to deliver results, I am confident if we maintain the course, we will be able to achieve our goals.



**We can already see progress. For example, our predictive monitoring technology is achieving an 83% positive success rate in correctly identifying issues we need to respond to. In addition, for our telemetered assets we have self-reported our highest number of pollution incidents in 2022, demonstrating our commitment to timely and transparent reporting.**

We're also installing around 22,000 sewer monitors across 11,000km of our high and medium-risk network; this is 10 times the number of storm overflow monitors we are also installing and will provide better visibility of our remote rural network – something that is an acute challenge for us in the Anglian region versus other parts of the UK. Along with embedding predictive analytics and machine learning we will have a much enhanced view of asset health.

We need to work with customers more than ever to address avoidable blockages, by reducing cooking fats and unflushables being disposed of down the sink and toilet, which are the single largest cause of pollutions (41%). To do this, we've widened our partnership with environmental services provider ECAS (Environmental Compliance and Services), taking the successes we've had working with food serving establishments to the wider public.

Supporting our plans is our Water Industry National Environment Programme (WINEP), which will see us make improvements and enhancements worth £811 million in this region. Ours is one of the largest investment programmes in the industry. Through WINEP investment and our Get River Positive commitments (page 36), we have already improved access to inland bathing waters, established a river scrutiny panel to hold us to account and reduced average storm spills to the lowest level in the industry, which has been made possible by adding 11,000 cubic metres of additional storm capacity across 40 sites this past year alone.

**Despite this progress, we are determined to achieve more, and quickly, for our region.**

I am proud of the focus of our teams under intense scrutiny, and how every day they continue to live by our values – to do the right thing, build trust, and always keep exploring. We are confident these values will see us deliver the results we need to reduce pollutions in our region.

**Peter Simpson | CEO**



**We have already made good progress, implementing predictive analytics moving us to a more alert-based, preventative and investigative approach. Highlights include:**

- Prevention of 70,000 events materialising as pollutions over the year
- Significantly improved self-reporting on monitored (telemetered) assets, alongside improved response times
- Enhanced management system with three lines of defence providing ongoing learnings and identifying opportunities to improve
- Quickly established these new technologies as business as usual

**Our interventions are resulting in an 83% positive success rate from our predictive analytics, where these systems are, at these early stages, correctly identifying and enabling us to resolve a flagged issue.**

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## Understanding pollutions in the context of our region

We have the longest sewer network  
in the country, long enough to  
stretch around the world twice, at

**76,437km**

and, we control and maintain

**38,185 km**

of water mains.

# Background on our region: key facts

Anglian Water is the largest water and water recycling company in England and Wales by geographic area. We supply water and water recycling services to almost seven million people in the East of England.

## The scale of our network

**8,000km**

climate vulnerable pressurised mains

**6,500** Pumping Stations

**1,100** Water Recycling Centres

**10** Sludge Treatment Centres

We have one of the longest sewer networks in the country at

**76,437km**



## The challenges we face

**Heavily drained, flat landscape:**

This means we manage more related assets than any other UK water company. These are required to pump water and sewage over vast, flat distances to dispersed communities. A feature of our flat landscape is many long, narrow watercourses – this presents an additional vulnerability to serious pollutions that carry over greater distances.

**89%** of our area is rural

With many of our assets based in rural locations, presenting a monitoring challenge.

Additionally, we are vulnerable to third party damage where our assets run under farmland.



## The environment we operate in

Home to many precious chalk streams:

**85% of the world's chalk streams**

are found in Southern and Eastern England

**Nearly half** of the UK's Grade 1 and 2 agricultural land is in our region, with our infrastructure running directly underneath it.

We manage and maintain **49 designated Sites of Special Scientific Interest** in our region



# What is a pollution?

A pollution is defined as any escape of wastewater or potable water from our assets which could have a detrimental impact to the environment. If our asset is a conduit for a polluting material, we work with the Environment Agency (EA) to trace and resolve it at source.

Most of our interactions with the environment are through the borrowing or return of water to the environment. Because of this, our Pollution Incident Reduction Plan (PIRP) focuses on the prevention of pollution to waterbodies across our region, including rivers, lakes, chalk streams and the sea.



## What is an asset?

An asset is equipment we operate in order to provide water and water recycling services to our region. These are collectively referred to as an 'asset class'. Examples of assets include our water recycling centres, pumping stations, sewers and storm overflows, drinking water mains and drinking water supply pipes. This PIRP focusses on the assets most relevant to preventing pollutions in our region.

## Types of pollutants from the water sector

### Wastewater

Wastewater is a generic term which is used to cover any pollutant that has a component of sewage within it. Some wastewater discharges may be heavily diluted with rainwater (storm sewage). Wastewater can cause unsightly discoloration, odour, sewage debris or unflushables in a waterbody. It also contains ammonia from the breakdown of organic material, at high levels this can be detrimental to aquatic life.

### Potable water

Potable water is treated drinking water heading to customers' taps. The potable water itself is not generally harmful to a waterbody, the small amounts of chlorine quickly dissipate. It is the force and volume of water washing sediment into a waterbody or stirring up the riverbed that causes a negative impact on the environment.

In the past the management of pollution incidents in the water industry was typically responsive rather than preventative. Our new PIRP strategy means we are focusing on identifying and stopping incidents before they occur. If an incident does regrettably occur, we follow a robust response process, see page 38.

## Categorising pollution incidents

<b>Category 1 incident</b>
Major, serious, persistent and/or extensive impact or effect on the environment, people and/or property
<b>Category 2 incident</b>
Significant impact or effect on the environment, people and/or property
<b>Category 3 incident</b>
Minor or minimal impact or effect on the environment, people and/or property
<b>Category 4 incident</b>
Substantiated incident with no impact

### The EA assess impact according to the:

- persistence (time)
- extent (area affected)
- impact on ecology
- amenity value
- proximity to drinking water abstraction
- impact on agriculture and commerce
- impact to human health

[Click here](#) to read more information about how the EA classifies incidents



# A review of our pollutions performance in 2022

We receive around  
**900 million**  
litres of used water  
every day from  
**6.4 million**  
people and businesses,  
and treat it to a high  
standard before  
returning it to  
the environment

# Looking back at 2022



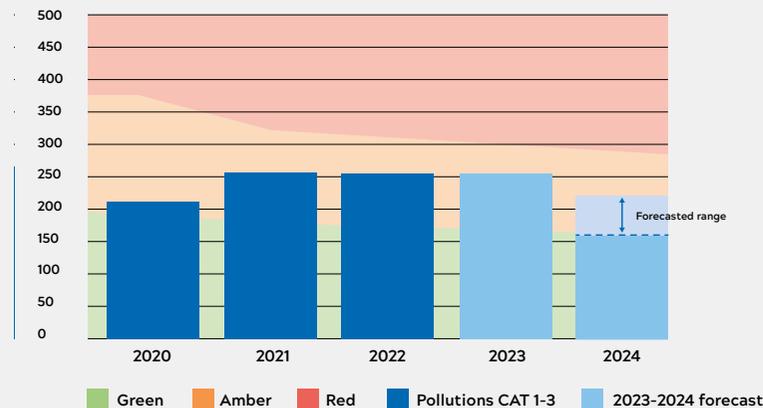
In 2022, the overall total number of pollution incidents for Category 1, 2 and 3 pollutions was 255. This number was similar to that of 2021 at 258 pollution incidents.

We also saw an overall reduction in serious pollutions and a return to zero 'major' Category 1 incidents. The reduction in serious incidents from our waste assets this year (five less than in 2021) was eroded by an increase in two potable water incidents. We acknowledge this performance is not acceptable and we remain absolutely focused on correcting it.

	2020	2021	2022
Category 1	0	1	0
Category 2	11 (1 water)	13	11 (2 water)
Category 3	200	244	246
Total pollutions*	210	258	255
Self-reporting	73%	69%	73%
Star rating	3	2	2

\* Serious water pollutions are excluded from the total pollutions measure which includes wastewater incidents only.

## Environmental Performance Assessment glidepath



We expect to be red in the Environment Agency's Environmental Performance Assessment (EPA) rating in 2023. We are extremely disappointed with this result, but as set out in this plan, we believe the many changes we are making will bring change in the medium and long term.

Our performance glidepath on total pollutions over the next two years is above. We expect 2023 will see us stabilise our position, while 2024 will see a downturn in total pollutions. As many of our planned activities are utilising new technologies, we are unable to forecast precise figures for 2024, and have instead provided an expected range.

## 2022 performance in context

The early part of 2022 saw us recovering from some of the worst rainfall the region has ever seen in the prior winter, which placed extreme pressures on our workloads and operations such as tankering. By mid-2022 we saw our pollution run rates deviate from the expected trajectory – at which point we critically reviewed our approaches and started to simultaneously rebuild our plan to accelerate work already in development, alongside bringing in new thinking. The arrival of our new Director of Water Recycling, Emily Timmins, helped assess our performance with a fresh perspective.

These actions, while not able to immediately impact 2022 performance is the basis for this Pollution Incident Reduction Plan (PIRP) for the next two years.

With the introduction of new monitoring systems, we further identified new challenges which are outlined in the PIRP (such as the factors impacting serious pollutions on page 10 and 11); and as part of our commitment to work transparently with the Environment Agency (EA), we conducted a second line assurance review with our data sets. **This approach, known as retrospective analysis, resulted in us proactively reporting additional potential pollutions to the EA, which in turn added to the total number of pollutions for our end of year position.** While not yet a consistent standard across the industry we are taking a proactive step and are committed to working transparently with our regulator. See page 15 to read more about self-reporting.

# Serious pollutions

## In 2022 we had no category one pollutions and 11 category two pollutions.

This is a reduction from 2021, where we had one Category 1 incident and 13 Category 2 incidents. While this is an improvement we are working to build upon over the next two years, zero is the only acceptable number for serious pollutions and our plan is geared to achieving this.

In 2022 the majority of serious pollutions were associated with water recycling assets (nine incidents), with a further two incidents caused by bursts on clean, drinking water mains. None of the events resulted in any distressed or deceased wildlife. We now understand more about our vulnerabilities and propensity for serious category pollutions (see page 11).

Below summarises our response to these serious pollutions, which is detailed further on pages 20-35.



**Clean water (potable mains)** were responsible for two Category 2 incidents. Both incidents followed the extreme heat and drought during summer 2022, which caused the lowest soil moisture deficit ever recorded in our region, with contracting soils around the pipes causing a high number of water main bursts. While both incidents involved clean water, surface water drains contained a build-up of residue from the dry weather conditions, which in turn carried into the watercourses.

**Our response:** We've expanded our network of asset pressure monitoring on clean water mains and upskilled our field teams, improving their access to pollution mitigation equipment (see page 35). This is taking place alongside an existing programme of activity to prevent bursts and maintain our network as part of our ongoing operational best practice for water networks.

**Sewer Networks** were responsible for two Category 2 incidents, and in both cases these were due to blockages from fats, oils and greases.

**Our response:** Our enhanced sewer cleansing programme is focused on keeping our network clear while our dynamic sewer visualisation programme will better enable us to address network blockages in future (see page 24). Underpinning this is our customer education programme, which is encouraging the behaviour change needed to prevent unwanted materials entering our networks (see page 27).

**Water Recycling Centres (WRCs)** were responsible for three Category 2 pollutions. Two incidents took place at the same WRC within a short period of time, and in both instances sludge management and control were contributing factors. The third incident was a result of a generator failure onsite during an extended power outage.

**Our response:** We are enhancing both our management systems and sludge management, alongside implementing our asset enhancements and reliability plans (see page 31 and 32).

**Pumping stations** were responsible for one Category 2 pollution during the widespread disruption of Storm Eunice. This was due to a combination of factors, including a generator failure during an extended mains power outage (resulting in the pumping station unable to operate). There were also challenging working conditions during a red weather warning (with the Met Office advising 'risk to life' conditions) and a high volume of work needing to be triaged due to the widespread mains power disruption across our region.

**Our response:** We are investing to improve the power resilience of our pumping stations (see page 22). Our Ovarro technology (page 30) is now being applied to our pumping stations to detect abnormalities in performance. We have also enhanced our approach to alarm handling and prioritisation to ensure we can swiftly respond to the highest risks.

**Rising mains** were responsible for three Category 2 pollutions. The first incident was the result of third party damage, the second was due to a burst and the third was as a result of asset failure.

**Our response:** We have invested in new technologies which are helping us to reduce the likelihood of a burst occurring, alongside detecting when a burst has occurred, to ensure faster containment takes place (see page 28), and we have prioritised mains with a history of bursts for monitoring. Our network-wide maintenance review is identifying assets in need of upgrading (see page 20). We are also addressing third party damage and creating a strategy to engage with groups with a high risk of incurring damage.

## Serious pollutions response

When an incident has the potential to become a serious pollution, our response process commands a heightened level of operational management. Triggers for this response include sensitive receptors, (which are the most sensitive water courses in our region, for instance in areas such as SSSIs) as well as impacts to bathing waters and areas of high amenity value.

In addition to our standard impact assessment, which helps to inform our mitigation, we also commission an ecological survey to better understand our impact on the environment. This is repeated as necessary to ensure that there has been no lasting damage.

Our post event process is also enhanced for these incidents. We carry out a detailed and structured investigation using our Sologic system to identify root and contributory causes and learn from it. The outputs are then presented through our assurance and governance processes, which includes the Chief Executive of Anglian Water (see page 18).

### Features of our region

We have **67,433km** of relatively straight water bodies across our region – **86%** of all the water bodies in our region – which are predisposed to serious incidents due to the river morphology.

**9,378kms** of our water bodies have an angularity value of 0, with no kinks or bends whatsoever, which means there are no natural obstructions to stop or slow the spread of pollutions.

A further **10,713km** of more sinuous, narrow water channels with bends.

## Regional features impacting our vulnerability to serious pollutions

Having undertaken a detailed performance review for this Pollution Incident Reduction Plan (PIRP), we have identified factors within our region that have caused or exacerbated serious pollutions incidents. We are addressing these moving forward. These include:

### A long, flat landscape

Geospatial analysis has shown that 44% of serious pollutions take place on unmapped, low flow or dry ditches. The narrow watercourses that are symbolic of our heavily drained region mean pollutions can travel greater distances, creating an increased vulnerability to serious category pollutions. We have a high density of these type of ditches in our region, which are a consideration factor as part of ongoing prevention plans. This includes investment in foul network monitoring close to receiving watercourses, which is a priority for us.

### Rural and remote

The high proportion of rural areas in our region (89% rural versus 11% urban) means we have many unmonitored remote locations across our sewer asset base. The scale of this is broadly a unique issue to us, the risk for which accounts for 50% of serious pollution events.

We have made a step change in asset visibility by installing monitors and predictive analytics. Given the rural geography and the nature of our receiving watercourses we are also rethinking our monitoring approach. We will continue to address how the rural split of our region affects our performance, which will in turn inform our ongoing pollutions strategy.

## Third party damage

Two serious pollution incidents in 2022 were a result of third party activity, where damage caused to an asset has led to an operational incident.

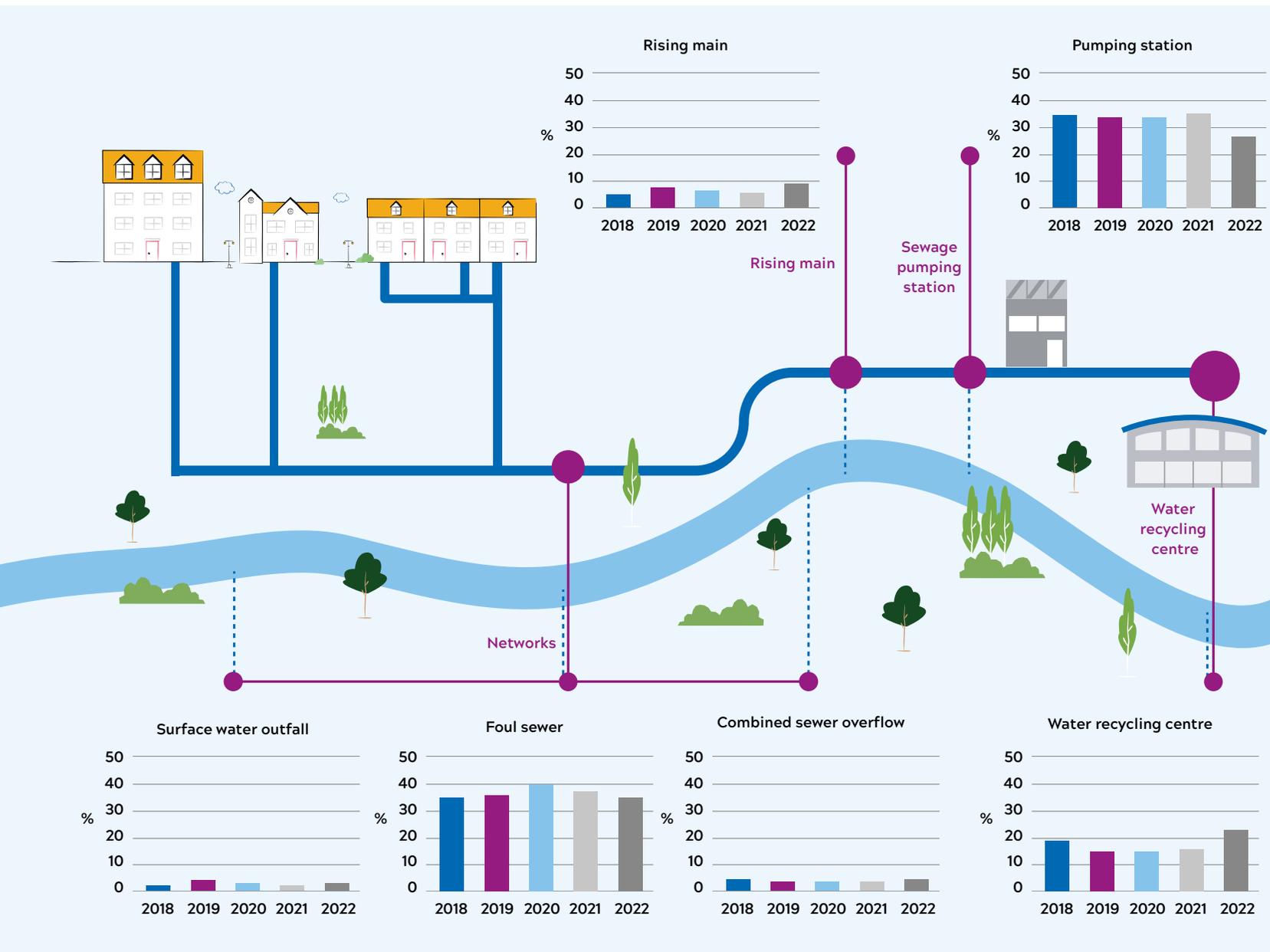
Nearly half of the UK's grade one and two agricultural land is in our region, which makes us vulnerable to ongoing third party damage. As a result, we are prioritising work with local stakeholders to increase awareness of our assets and bring about improvements in ways of working. One such example is our pathfinder project, which is engaging with farmers on the importance of protecting water company assets, and what to do if they observe potential issues.

## Climate change

Our region is on the frontline of climate change in the UK, and our assets are vulnerable to the impacts of this such as heavy rainfall, flooding, ground movement and drought. As a business we continue to build our resilience to climate change and this has been reflected in our PIRP, with elements such as power resilience, improved alarms and monitoring, and collaborative working with the wider utilities sector.



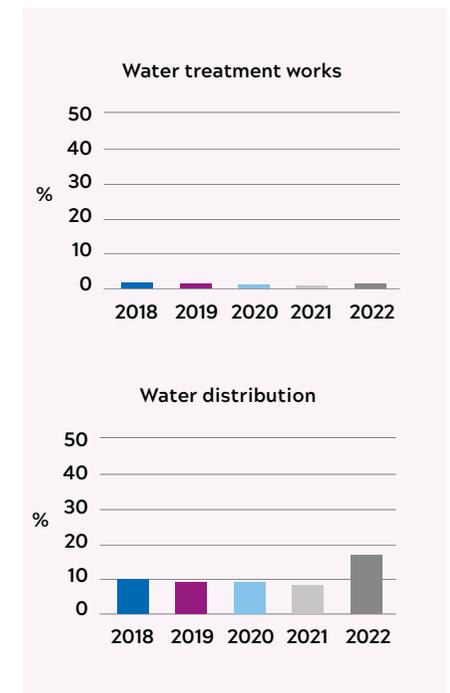
# Pollution incidents by asset class in 2022



The graphs adjacent show the breakdown of pollution incidents by water recycling asset class over a five year period. Pollution events from drinking water assets are shown in the two graphs below owing to their omission from the total pollutions reportable figure.

2022 was an abnormal year for operational water network issues, with more bursts resulting from drought conditions causing ground movement (see the water graphs below).

Root causes of pollution incidents by asset class are explored further on page 13.



# Root causes of pollutions in 2022

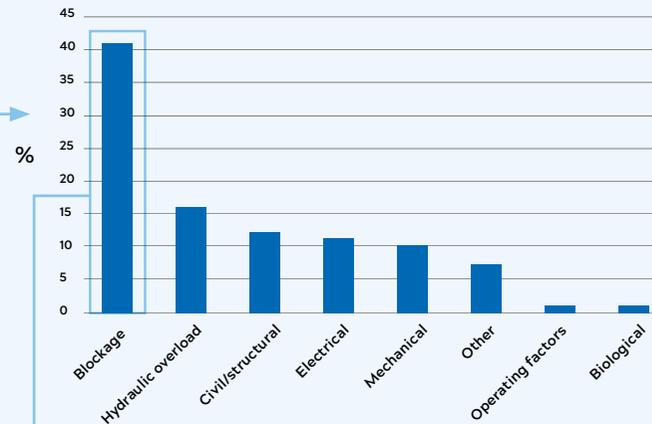
## Root cause of pollution incidents in 2022 (wastewater)

Our root cause breakdown for 2022 reflects a more typical year and aligns with historic trends (see graph adjacent). Our biggest challenge continues to be blockages, which accounted for 41% of pollution incidents in 2022. This is followed by hydraulic overload at 16%, electrical and mechanical, both at 12%, and mechanical at 10%. The remaining 9% is made of other, biological and operating factors.

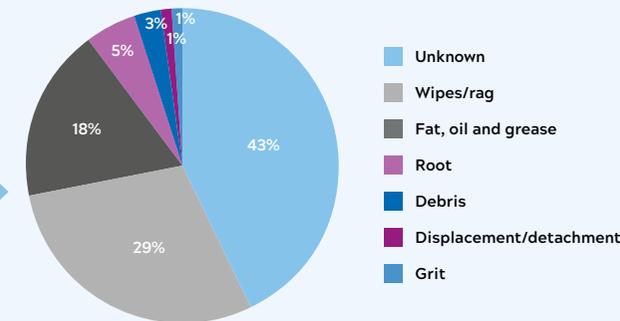
**Last year, 41% of total pollution incidents were due to blockages on our waste sewer network (foul, surface and combined sewers).**

This is a key focus area in our PIRP (see pages 24-27). The majority of our blockages in 2022 (43%) were 'unknown'. Unflushables such as wipes and sanitary items, and fats, oils and greases (FOG) collectively made up almost half of the remaining blockages. We hypothesise a large proportion of the 'unknown' causes are also unflushables and FOG (see pie chart adjacent). Sometimes it is not possible to identify the material of a blockage, this is because the jetting or rodding process to clear the blockage means the blockage material cannot always be retrieved and examined. Only 10% of blockages are caused by natural degradation of the asset such as the intrusion of tree roots, build-up of debris or silt over time, or damage. We recognise in some cases the root cause has not been fully captured in our systems, and we are making improvements to capture evidence across the business in order to report on blockages in more detail going forward.

Root cause breakdown for 2022



Breakdown of blockages



We assess the main root cause for every pollution. In reality there may be many interlinked or contributing causes. For example, an electrical failure may have been caused by a storm, which also caused hydraulic overload. These are reviewed in our post-event investigation and contribute to our wider learning on pollution prevention.

## Water recycling centres make up 23% of pollutions,

with root causes spread across all categories. Hydraulic overload and mechanical are the greatest contributors. Routine sludge movements were impacted as a result of the prolonged wet weather period in 2021 as we prioritised use of our tankers to protect homes and businesses from widespread flooding. This impact was sustained into 2022, and retained sludge in our processes continued to contribute to pollution incidents. Sludge management is a key focus of our PIRP within the WRC asset class (see page 31).

## Pumping stations are our second highest contributor to pollutions at 27%.

Hydraulic overload, where the amount of rainwater exceeds the pump's capacity to move water forward, was the highest root cause for this asset class in 2022. Over half of hydraulic overload issues on pumping stations occurred in the single month of November 2022 as a result of short, intense rainfall. We continue to build on the infiltration reduction plans we set out in 2021 to prevent rainwater entering sewers designed to carry foul waste only. Electrical failures such as power outages and blockages were other significant contributors to pollutions from pumping stations.

## In 2022, 9% of pollution incidents were attributed to rising mains – all due to bursts.

We've purposely separated rising mains from sewer networks as a standalone asset class due to their unique characteristics as a pressurised assets.

Pollutions from water assets are excluded from the total pollutions measure so are not represented here. However there was a significant increase in water pollution incidents in 2022, with 57 incidents compared to 21 in 2021. The root cause of these incidents was almost entirely due to burst water mains, which were heavily impacted by the extreme heat and drought conditions over the summer and the associated soil moisture deficit. This resulted in an increase of burst mains by more than 83% between March and September compared with the same period in 2021.

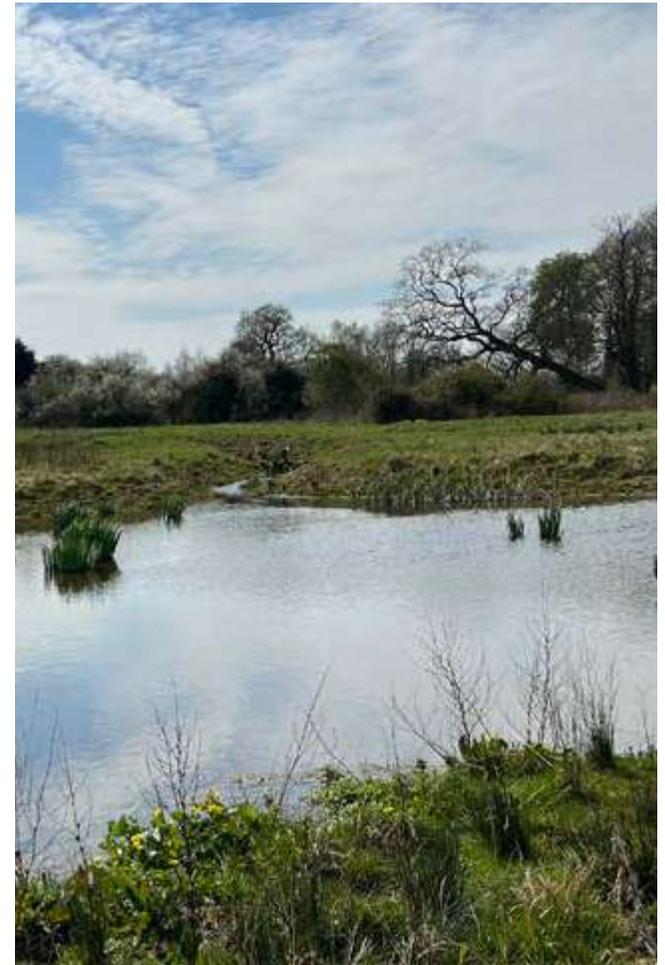
# Key improvements made in 2022

To address pollutions performance we made a number of changes across the business, including:

- **The appointment of our new Director of Water Recycling**, Emily Timmins, who has brought a wealth of knowledge and experience to the business.
- **Setting up a new Environment and Quality Directorate**, which supports the Water and Water Recycling businesses, and is responsible for ‘source to sea’ water quality management.
- **Updating our governance structure** to ensure we have enhanced oversight of pollutions performance across the business (see page 18).
- **Examining the root causes of the biggest issues across our asset classes**, and identifying the actions we need to take in order to resolve them (see pages 13, and 20-23).
- **Undertaking, and completing, an extensive benchmarking exercise** to ensure we are taking leading approaches and best practices from across the industry into each of our new workstreams (supported by our collaborative approach with the wider industry – see page 37).
- **Implementing operational control**, an enhancement to our management system which ensures the effective performance of day-to-day operations into our business as usual activities (see pages 18 and 19).
- **Utilising new technology** to monitor our network and give better visibility of performance, so we can identify potential problems and prevent incidents, placing a greater emphasis on monitoring trends, and prioritising a better visibility of performance to help guide our decision making (see pages 26-30).

These actions are not likely to have impacted our 2022 performance but each is a critical building block to improve performance in future years.

It is also important to note that many of the activities outlined in the PIRP are in addition to our business as usual activities – see pages 20-23 for a breakdown of actions we are taking by asset class.



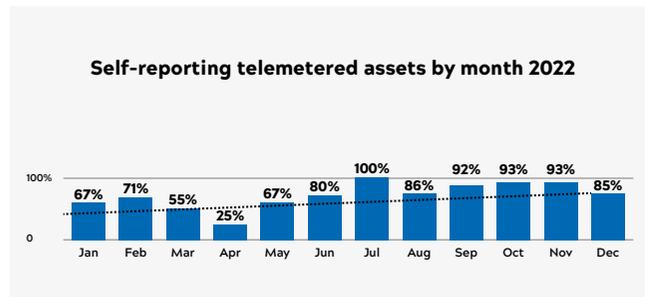
# Self-reporting

## What we did and why

Our self-reporting of incidents has improved this year, a trend that is continuing as a result of major emphasis on this area. We recognise the importance of self-reporting as a reflection of our performance regarding the control and monitoring of our assets. We are committed ongoing improvements to reflect our commitment to transparency, particularly in relation to our environmental impact. We strive to instil a zero pollution mindset and as part of our approach we have reiterated to our frontline teams the importance of timely reporting to our regulator. Self-reporting of issues on our telemetered (monitored) assets has improved and continues to do so. Our greatest challenge for self-reporting is the foul sewer network, and we are increasing monitoring on this asset class.

**We have seen a jump to 90% self-reporting in the second half of the year (June to Dec) compared to 57% in the first half (Jan to May). Self-reporting for telemetered assets specifically has improved 8% on average compared with 2021.**

We have enhanced our approach to alarm systems to improve the information received by alarm handlers, enabling them to make better decisions.



## Self-reporting performance

	2020	2021	2022
Self-reporting (total)	73%	69%	73%
Self-reporting telemetered assets	89%	75%	83%

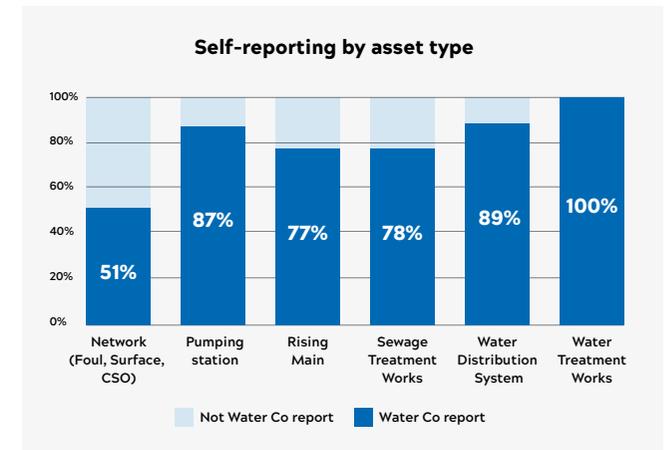
## What we have learned

Our foul network assets continue to have the lowest level of self-reporting at 51%. This has remained static. We do not yet have extensive monitoring of our foul sewer network and we have the added challenge that much of our network passes through rural areas that are less visible.

We saw a significant improvement in self-reporting in 2022, particularly on telemetered assets. We expect this improvement to continue, with our plans for additional monitoring providing us with early visibility of performance issues. Our target for self-reporting across all assets is equal to or greater than 80%, which is green on the EA's EPA metric.

## Planned improvements

Our Dynamic Sewer Visualisation programme (page 26) will give us greater visibility of the performance of our network, and therefore opportunity to act sooner. Where we detect an escape may have already occurred, we will be able to make a proactive self-report.



# Our pollution improvement plan for 2023 - 2025

**“We have made radical changes in our processes, including embedding a shift to predictive analytics with enhanced governance and management systems.”**

Emily Timmins, Director  
of Water Recycling



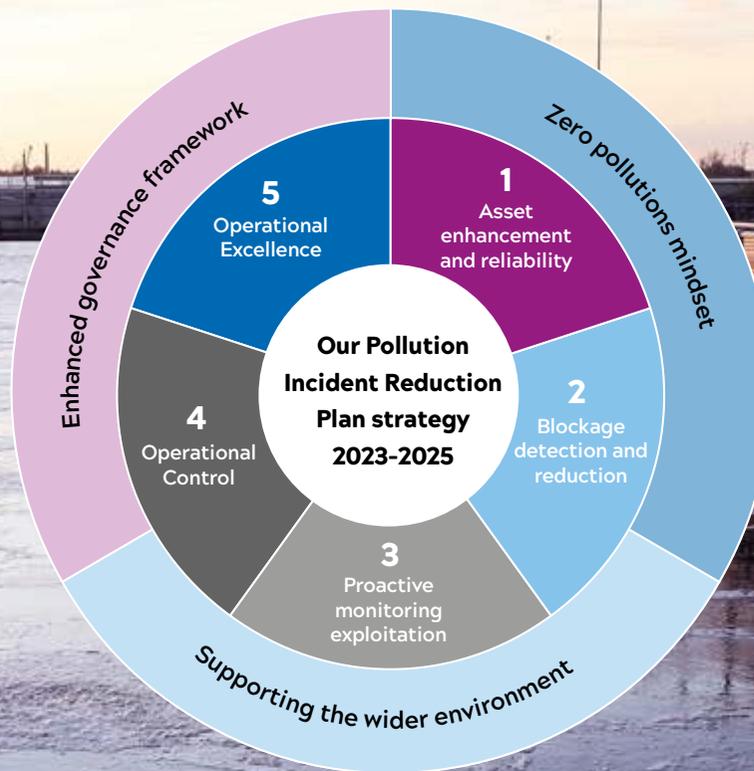
# New Pollution Incident Reduction Plan strategy

We are clear in our ambition to reduce pollutions. In the short term, we want to return to our previous pollution run-rate. In the longer term we intend to eradicate pollution incidents in our region.

To that end, we have developed a new two-year Pollution Incident Reduction Plan strategy that will put us firmly on a path to achieve those ambitions.

## We are focusing on five core areas:

- 1 Enhancing the assets we have**, assessing where improvements can be made and rolling out targeted maintenance and resilience programmes to ensure the entire asset base is reliable
- 2 Bolstering our blockage detection** to help identify potential problems before they happen, to reduce this primary cause of pollutions
- 3 Ensuring the proactive monitoring** we have embedded as business as usual is delivering maximum value; helping us to make informed decisions, alongside implementing new monitoring technologies to further support our efforts
- 4 Delivering consistent operational control standards** and procedures to ensure we remain focused on robust continuous improvement
- 5 Improving operational excellence**, identifying areas we can improve and making changes as a result



## These core areas are supported by:

- **Zero pollutions mindset:** Developing the skills and knowledge of our people so right across the business we adopt a 'zero pollutions mindset'
- **Enhanced governance framework:** Putting additional processes and governance in place as part of our focus on operational control and assurance
- **Supporting the wider environment:** Continuing to take action to support our region's environment through our wider investment activities

## Changing the way we refer to pollutions across the business

We are no longer referring to pollution 'targets' but instead 'limits'. A target is something to aim for whereas a limit is something which cannot be exceeded. We cannot accept a culture that aims for any level of pollution. Changing the language we use is just one of the ways we are enhancing our business culture and ensuring a 'zero pollutions mindset'.

# Governance

In November 2021, we undertook a review of the Water Recycling unit in light of the changing nature of our business and the need to turnaround our performance.

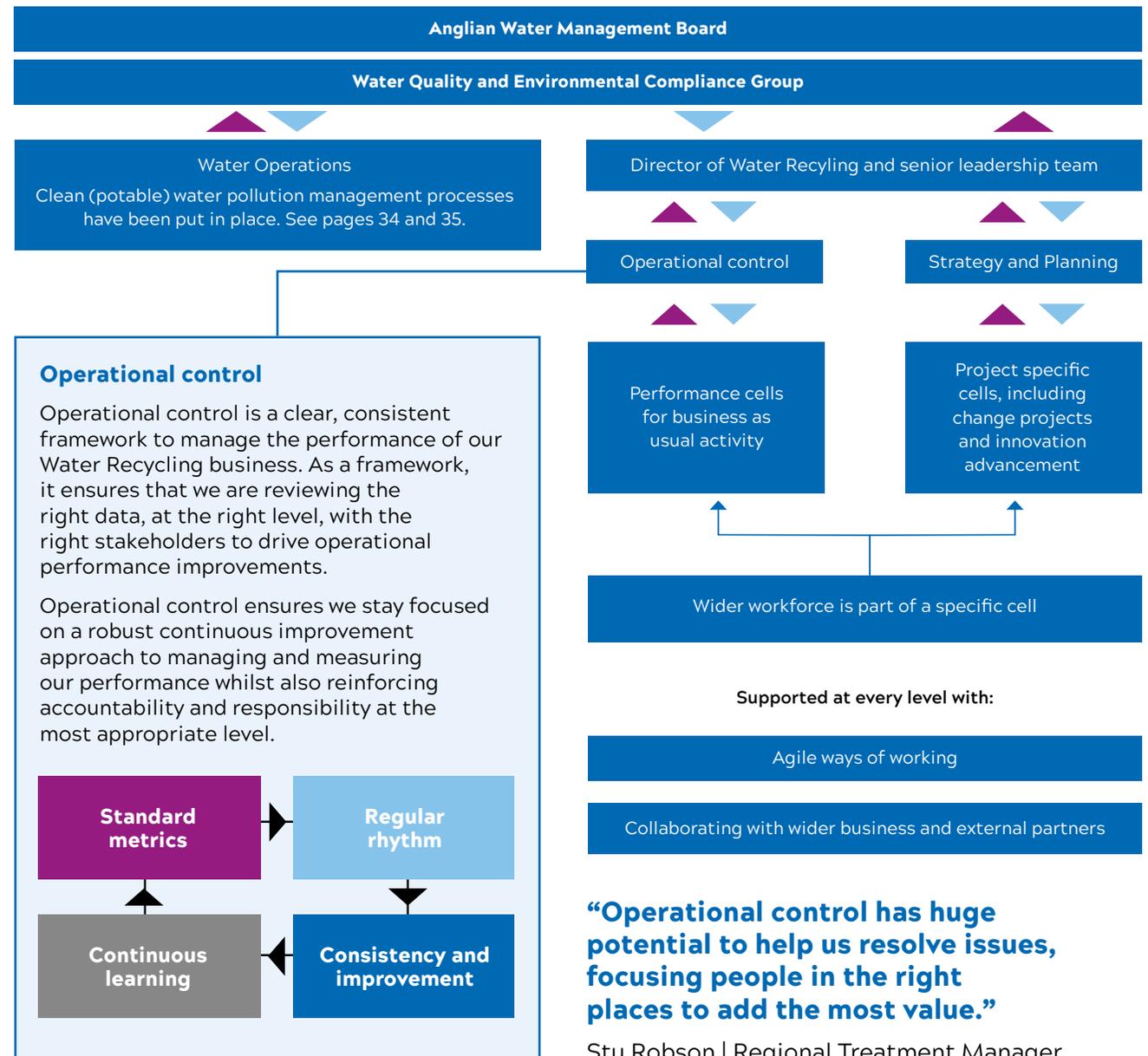
We made the strategic decision to split the business stream into two new units – a newly formed Directorate of Quality and Environment led by Dr Robin Price, and Water Recycling Operations led by newly-appointed Director, Emily Timmins. The former focuses on meeting our requirements for water quality and the wider environment, while the latter is focussed on running an improved, effective and efficient water recycling operation.

As a result we have also refined our governance processes, restructuring these into two workstreams, running in parallel:

- **Operational control:** We've placed renewed focus on 'brilliant basics' including key improvements to day-to-day operations, such as reviewing incident procedures and escalation processes, investing in new headcount and training, and adopting improvement programmes and systems to ensure we are making the right decisions at the right time. This is supported by proactively monitoring our risk position on a daily basis, and introducing a 'gated process' framework to ensure we are consistent in our approach to preventing, reviewing and escalating potential issues, with an appropriate response for high risk situations.
- **Strategy and Planning:** This delivers specific programmes to drive performance such as change programmes introducing innovative new practices to our ways of working. These programmes of work are divided by asset class where key activities are monitored, tracked and regularly discussed with project owners.

Activities across both workstreams are regularly reported back to senior leadership, who can make informed decisions and intervene if activity is off course. We also have a number of steering groups covering the Water EPA key areas.

## The Governance structure for our Pollution Incident Reduction Plan and performance



## Embedding learnings through our management system

The fundamental principle of a management systems is to drive an organisation to continually improve its processes, services and performance and embed learnings into everyday activities.

In line with this we have overhauled our management system across Water Recycling based on five pillars to ensure continuous learning and improvement. Like many others, we follow the Plan, Do, Check, Act (PDCA) model, in line with best practice.

Our management system is built on five pillars:

- **Standards**
- **Performance Framework**
- **Competency Framework**
- **Assurance**
- **Learning Culture**

Together these ensure we have a continuous learning environment in all that we do and it governs how we sustain and embed the improvements we make. It feeds through into every aspect of the business unit, from the targets we set ourselves to informing our training and competency assessments of our people through our Licence to Operate.

These pillars feed our Integrated Management System that unifies our management system processes into a single framework, aligned with our organisational purpose, values and behaviours.

## Developing a zero pollution mindset

We've also developed our zero pollution culture with changes such as referring to thresholds and limits rather than targets to help develop the mindset of all our people every day, in everything we do. It's also about encouraging our people to continue being curious – asking the right questions, taking accountability and ownership in order to reach our goal of zero harm from our assets.

## Assurance and Oversight

We adhere to the 'four lines of defence' model to ensure robust assurance and scrutiny.

1. First line assurance: Through operational control we prioritise the day-to-day management and control of risks. While lacking independence, this level of assurance carries value as it comes from our people who have in-depth knowledge of our business, culture, and daily challenges.
2. Second line assurance: Through active management and our Integrated Management System we ensure effective operation. Assurance in this line is separate from frontline teams and sits with management as a core part of our Integrated Management System
3. Third line assurance: Objective and independent assurance is provided through our internal audit team, offering assurance of the overall effectiveness of governance, risk management, and controls.
4. Fourth line: External independent bodies, such as external auditors and other external entities, provide assurance, as well as fresh and valuable perspective. Through our Get River Positive programme we have established an independent river scrutiny panel to provide challenge and hold us to account in this area. Similarly, our Customer Board was re-established in 2022 where we facilitate an open two-way discussion between customers and our management board on a variety of topics important to customers.

Each line of defence serves a purpose and contributes to robust assurance.

## Working in collaboration with the Environment Agency

We have welcomed the Environment Agency's feedback about our performance and engage with them on a regular basis. Senior management from both the company and the agency meet to review progress and address any emerging issues or topics quarterly, in addition to regular and routine constructive and challenging feedback through the year, and if problems arise. This is a key feature of a productive forward relationship with the Environment Agency.

## Licence To Operate



Having a trained and competent workforce is critical to maintaining the exceptionally high standards we expect and delivering 'brilliant basics'. Our training schemes are developed to ensure all employees are equipped with the knowledge and understanding they need to do their jobs and make the right decisions at all times. This method of certifying individuals sits as part of the Competency pillar of our management system and has become an important way of verifying and providing assurance across our mobile workforce and meets the ISO 17024 global benchmark for personnel certification programmes.

## Table of activity across asset type and class 2023-2025

The below tables summarise the additional actions we are taking between 2023 and 2025 to reduce pollution. More information on each asset class, the work we've carried out in 2022, learnings and planned activity is detailed from 24 to 35. We have an ongoing business as usual programme of activities for both Water Recycling and Water to maintain our assets. This includes asset upgrades or replacement, routine maintenance and management and planned preventative maintenance. This activity is taking place in tandem to the activities outlined in the tables that follow. Where an activity is enhanced this has been signposted.

**In 2023 alone, more than £29.4 million of capital investment has been allocated to support meeting our pollution targets.**

### Networks

Strategy focus area	Headline activity	Description of activity	Root cause (where applicable)	New or enhanced
Asset Enhancement and Reliability	Infiltration Reduction Plans	We have created 26 investigation and mitigation plans which aim to prevent the entry of water into our foul sewers from rainfall, rivers or groundwater. This helps to prevent hydraulic overload of assets in wet weather.	Hydraulic overload	Business as usual
Blockage Detection and Reduction	Repeat blockage standards and process	We're building a process to identify individual repeat blockages and to understand and resolve the root cause to prevent reoccurrence at our foul sewers and pumping stations.	Blockage	Enhanced
Operational Excellence	Targeted proactive sewer cleansing	In addition to our regular sewer cleansing programme, we've instigated a programme of targeted cleansing based on analysis of our highest risk sewer lengths.	Blockage	Enhanced
Operational Control	Sewer Monitors and Storm Harvester	We're installing monitors on 11,000km of our highest risk sewer lengths and applying Storm Harvester technology to help us identify forming blockages early so that we can address them before they cause an escape of sewage.	Blockage	Enhanced
Blockage Detection and Reduction	ECAS and Keep it Clear	We're educating food serving establishments through proactive visits on grease management in kitchens. We're extending these visits to domestic customers to complement our widespread Keep It Clear campaign (case study on p27).	Blockage	Enhanced
Proactive Monitoring	EDM Onboarding	We're creating a system to identify the cause of a storm overflow alarm activation. Where a dry day activation occurs, we can dispatch resource to understand if the alarm is genuine and/or resolve the issue.	N/A	New

### Rising Mains

Strategy focus area	Headline activity	Description of activity	Root cause (where applicable)	New or enhanced
Operational Control	Syrinx	We've already deployed 660 pressure monitors which, with Syrinix technology, can alert us to a burst or abnormal pressure on a rising main which needs further investigation. We're extending this programme and using the outputs to mitigate and prevent future bursts.	Civil/structural	Enhanced
Operational Control	Ovarro Enhancement for rising mains	We're using existing telemetry data through the Ovarro system to help detect burst rising mains. The system can self-learn with feedback enabling us to further refine the success rate of the alerts (currently 70%), alongside our own learning of how to use the insight.	Civil/structural	Enhanced

## Water Recycling Centres

Strategy focus area	Headline activity	Description of activity	Root cause (where applicable)	New or enhanced
Asset Enhancement and Reliability	Enhanced Screen Maintenance	We've added enhanced maintenance to screens at the start of the treatment process to prevent unflushables and large debris getting into other part of the process and causing blockages.	Blockage	Enhanced
Asset Enhancement and Reliability	Power Resilience	We're changing the way we test power resilience on our sites, with emergency generators now on standby in case of an emergency.	Electrical	Enhanced
Asset Enhancement and Reliability	WRC audit programme	As part of our 'plan do check review' approach, we are focussing additional proactive assurance activity on our high risk WRCs through our expert process science team, to provide complete rigour and confidence in our permit compliance and management system.	Assurance	New
Blockage Detection and Reduction	Inlet blockage alarms	We're continually improving the algorithms we add to our telemetry data to flag potential blockages at our site inlets.	Blockage	Enhanced
Operational Excellence	Urgent deployment asset fleet	We have invested in mobile equipment and assets which can be deployed temporarily to support sites with performance issues to prevent them from becoming non-compliant and discharging above permitted limits.	Process improvement	New
Operational Excellence	Action limit standards	We are reviewing and enhancing the operational controls and measures we have for our water recycling centres to ensure sharp focus, visibility and appropriate standardisation to optimise the performance of our sites as part of a continuous improvement approach	Process improvement	Enhanced
Operational Excellence	Sludge base plan review	We are fundamentally changing how we forecast and collect sludge from our Water Recycling Centres. As well as adjustments to our plan to enable better forecasting, our teams will be able to order and track the timings of sludge removed from their sites to maximise the biological treatment capacity and improve the quality of the effluent returned to the watercourse	Biological	New
Operational Excellence	Sludge dry solids programme	This is another activity as part of our sludge management focus. We need to thicken sludge on our sites to ensure optimal removal, storage and transportation. This programme puts significant focus on the thickness of this sludge measured in 'dry solids' as part of our operational control process.	Biological	Enhanced
Proactive Monitoring	Info-Tiles	We're exploring the opportunity to provide early warning of biofilter performance issues using data we already collect through our telemetry system. If the concept works, we will consider how it can be applied across 100 of our sites.	Biological	New
Proactive Monitoring	FE Pod Monitors	We have been exploring the opportunity to utilise mobile monitoring to give us real time visibility of the performance of high risk sites without permanent, continuous final effluent quality monitoring. We're testing eight types of probes across five sites and if successful will expand this.	Biological	New
Proactive Monitoring	Sludge blanket detection review	We need a 'sludge blanket' as a fundamental part of our biological treatment process – like the good bacteria in our own guts. We're re-checking all sludge blanket telemetry control points to ensure they are operating effectively. We've started this activity and found almost a third benefitting from this scrutiny.	Biological	Enhanced
Proactive Monitoring	Sludge tank level monitors	Similar to our sludge blanket detection, our sludge tank level monitors provide another crucial control point. We are committing resource to complete an end-to-end review of these assets to ensure they record accurately to prevent spills from these assets and maximise storage.	Biological	Enhanced

## Pumping Stations

Strategy focus area	Headline activity	Description of activity	Root cause (where applicable)	New or enhanced
Asset Enhancement and Reliability	Power Resilience Phase 1	We're investing £1.2m to increase resilience to power fluctuations and increase our visibility of power status.	Electrical	Enhanced
Operational Excellence	Wet well cleanse enhancement	We're spending £4.8m on the cleaning of pumping station wet wells to help prevent pumps clogging with unflushables and fats, oils and greases.	Blockage	Enhanced
Operational Excellence	Assets out standard	We're improving visibility of assets which are offline for repair or replacement and driving to reduce the time these assets take to be brought back into service. This helps ensure that we have resilience across our asset base.	Process improvement	Enhanced
Operational Control	Pumping Station Ovarro enhancement	We're already using data through Ovarro to identify rising main bursts. This technology can also be applied to pumping stations to detect abnormalities in performance. We're looking to hone the success rate of these alerts to get ahead of potential emerging performance issues. Using Ovarro means we'll have 100% of coverage of our telemetered pumping stations (see case study on p30).	Blockage, electrical, civil/structural	Enhanced

## Clean Water Networks

Strategy focus area	Headline activity	Description of activity	Root cause (where applicable)	New or enhanced
Asset Enhancement and Reliability	Mobile Mitigation	We're bolstering our response to water pollutions by improving our field teams' access to mitigation equipment (see case study on p35).	Operational	New
Operational Excellence	Standby resource	We're implementing specialist standby resource across the region to manage and mitigate pollutions caused by potable water.	Operational	New
Proactive monitoring	Pressure monitoring	Pressure management to reduce burst risk and swifter response to minimise pollution impact	Civil/structural	Enhanced
Operational Excellence	Asset risk models	Development of our asset risk models which increases our understanding of assets most at risk particularly from the effects of climate change.	Civil/structural	Enhanced

## Cross Business

Strategy focus area	Headline activity	Description of activity	Root cause (where applicable)	New or enhanced
Operational Excellence	Enhanced Storyboard	Storyboards are our mechanism for sharing information with the Environment Agency when we have a pollution event. We're enhancing these to improve the quality and detail of information we provide.	Process improvement	Enhanced
Operational Excellence	Improved root cause analysis process	We're extending and improving the depth of our root cause analysis to better understand where we should prioritise investment and resource to drive down pollutions.	Process improvement	Enhanced
Operational Excellence	Enhanced TankR application	We've created an app which helps our teams prioritise and understand availability of tankering resource across our business. We're refining and rolling out its use across the tanker fleet.	Biological	New
Operational Excellence	Maintenance review	We're reviewing the way we carry out maintenance activities across the business. We're looking at condition-based maintenance rather than frequency-based maintenance. We believe this will help us to spend more time and effort on the assets requiring most attention.	Electrical, Civil/ structural	New
Operational Excellence	Flow control standard	We are developing and building on our current flow control standards – the way in which we test and verify that flow is being correctly measured through our treatment sites. This is an important assurance activity for our customers and regulators alike.	Hydraulic	Enhanced
Operational Control	Respond to data	We're helping our expert teams develop the skills and mindset to look for performance issues and pre-empt asset failure. This is part of our shift from a reactive to preventative approach.	N/A	New
Operational Control	Operational control	We're giving all levels of our business visibility of how they are performing against our key objectives and encouraging discussion which enables us to remove barriers, raise risks and action great ideas. We're restoring autonomy and accountability to those who have the power to make a difference through our operational control structure (see page 18).	Assurance	New
Operational Control	Enhanced Alarm Approach	We're continuing work on our alarm estate to enhance what is presented to our alarm handlers and ensure the correct priority is against each alarm. We've already made great progress in moving towards being compliant with the industry standard (EEMUA).	Process improvement	Enhanced
Zero Pollutions Mindset	Zero Pollutions Mindset	We've always had a passion for protecting the environment but our zero pollutions mindset takes this further and ensures that consideration for the environment is woven into everything we do.	Operating factors	Enhanced

# Networks (inc. foul sewers and combined sewer overflows)

## What we did and why

Blockages remain the primary root cause of pollutions on our foul sewer network, as well as triggering sewer overflows, all of which are primarily caused by unflushables and fats, oils and greases (FOG) wrongly disposed of. Focusing on reducing this root cause on a predominantly unmonitored asset base is critical to reducing our pollutions in future.

Our approach to combating unflushables and FOG and the impact on the network has been a two-pronged attack. The first component is customer education and engagement, while the second focuses on asset maintenance.

We created new workstreams in collaboration with environmental compliance experts ECAS (Environmental Compliance and Services), using learnings we took from other leading water companies, to drive Food Serving Establishments (FSEs) to responsibly dispose of their cooking fats, oils and greases. Ensuring compliance among FSEs has been coupled with our continued Keep It Clear campaign for all customers to educate and encourage them to dispose of FOG and wipes and other unflushables responsibly in the home too. Both activities are targeted in known blockage hotspot areas, with us using enhanced data in our mapping tools to identify risks:

- To address avoidable blockages caused by FOG this year **we've visited 8,928 food service establishments preventing 864 tonnes of FOG from entering the network** – the equivalent tonnage of more than four blue whales or 132 elephants clogging the sewers.
- Our Keep It Clear behaviour change programme also continued in 2022, **reaching millions of customers in the region** and educating them about responsible disposal of FOG and unflushables. We'll continue with this work over the next two years. See case study on page 27.

- **We have invested £5.4 million on preventative cleaning programmes** to reduce the risk of blockages across our sewer network. This will reduce the chance of sewage backing up and overflowing into the environment as the result of an avoidable blockage. Selected sewers are cleaned, surveyed using CCTV cameras and then any identified defects or issues are repaired. This programme has been focused on both small diameter, transferred sewers and our larger main sewers using data to predict high-risk areas and focus investment most wisely.
- **Our sewer cleansing programme has covered 799km of sewers**, wet well cleans at 3,037 pumping stations, further surveys of 200km of sewer, and 2,173 inspections of underground assets.
- Improving how we triage issues through our Tactical Operations team has helped enable faster identification of true pollution risks amongst other lower priority work. **In 2022, we triaged 662 possible pollutions, accurately diverting 55% of jobs to another work type.** We'll refine this process further in future.
- We also bolstered our operational teams by **increasing our frontline staff in networks and maintenance**, added Tactical Support roles for technical input and coaching, and provided analytical technicians to support with alarm understanding and management in our move to a more preventative approach.



**Unflushables** is a broad term used for wipes, sanitary pads, tampons and other items that are not designed to be flushed down the toilet. We have worked for many years to help manufacturers develop 'Fine to Flush' products that meet the industry flushable standard. However, the vast majority of blockages we see are avoidable and caused by these items coupled with FOG that are wrongly rinsed down the kitchen sink when they should be disposed of responsibly. Read more about our customer education programme on page 27.

On the foul network, we have seen a decrease in blockages overall in our target areas and expect this to translate to pollution reduction in time. Our data shows an average blockage rate of 20,535 blockages per 1,000km of sewer. Once we apply sewer cleansing the blockage rate reduces by more than 55% to 9,132 blockages per 1,000km of sewer. Combined with our small-diameter sewer cleansing programme, we've seen an impressive 93% reduction in blockages in target areas as a result of these initiatives.

However, our network remains relatively invisible and challenging to predict accurately without real-time information. This has to change in order to deliver our ambition around pollution reduction. The current strategy activities remain sound but represent a slower burn in terms of outcome performance. Current workstreams remain a key feature while we embed near-time predictive analytics. The business case and trials were secured as part of the 2022 accelerated activity.

Extract from our dashboard showing our target high risk small diameter sewer in a hotspot area.

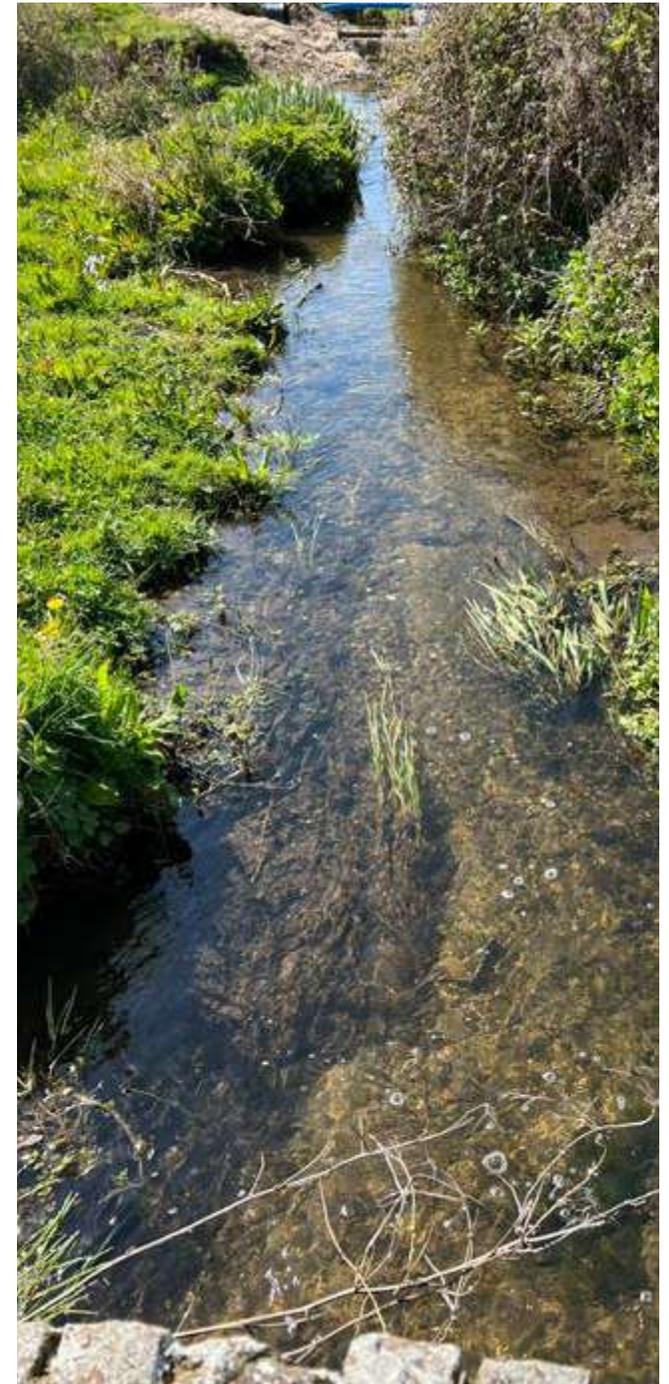


## Planned improvements

The main advance for our foul network will come from monitoring to create a near time visualisation of risk. We are planning an ambitious programme on sewer monitor installation and closely coupled with artificial intelligence to create our Dynamic Sewer Visualisation approach. Both aspects were trialled heavily in 2022 with a fast start of implementation over the next few years.

We will continue with our historical programmes and make continuous improvements to target high risk areas. We have seen success on our programme with Food Serving Establishments using partners ECAS to help inspect and educate those establishments and work with the business owners to improve their fat traps and washing facilities. We are now expanding this approach to domestic customers in localised hotspots, which is an industry leading approach.

Our ECAS domestic programme started in April 2023 and aims to visit over 250,000 customer properties this year. We are working alongside the Dynamic Sewer Visualisation programme to highlight to customers the work we've carried out in their area to improve blockages and the impacts these blockages have. We do this by advising customers on how to dispose of FOG and by promoting our Keep It Clear messaging. We also visit customers our field technicians have identified as contributing to an avoidable blockage, explaining to them how their behaviour has contributed to, or been solely responsible for, the blockage.



# Case study: Dynamic Sewer Visualisation (Storm Harvester)

Blockages typically make up just under half of our root causes of pollutions occurring most commonly on our sewer networks. Installing monitors in our highest risk sewers can help us to detect a blockage forming so that we can clear it before it causes an impact. We've spent time exploring the different types of monitors and building the analytical capability behind the scenes to enable us to translate the data our monitors send into information we can act upon.

**We have plans to install approximately 22,000 monitors by the end of 2023, depending on requirement. These will cover 11,000km of our highest risk sewers.**

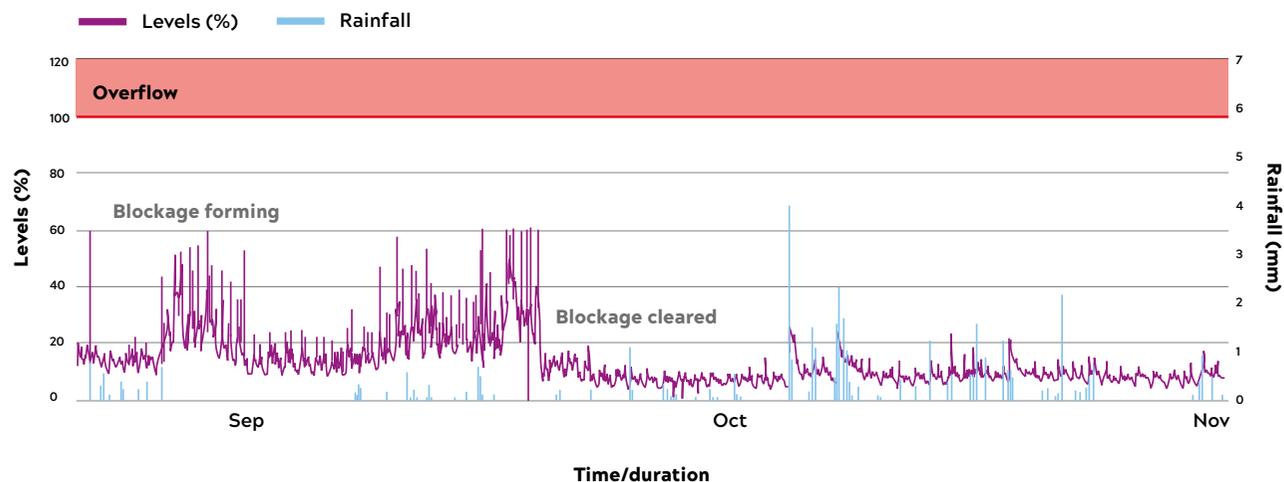
Data is collected from each monitor once a day for a period of three months. During this time Storm Harvester assesses the typical pattern of the sewer level, including the daily changes due to customer activity, and how the level responds during differing intensities of rainfall. When the level in the sewer deviates from what is expected an alert is raised. This is assessed by one of our analysts. They combine the alert with additional data, such as historic alarm data and other connecting assets, to build a picture of the performance of the asset in context and to confirm whether attendance is required. A network technician is dispatched to investigate and clear any building blockage before it leads to a failure.

An example of the data readout is shown below. The purple line is the sewer level and the blue line is rainfall. The red line indicates the position of the monitor, above which there would be an escape of

sewage from the manhole. In September 2022 a blockage had started to build causing the level of sewage behind the blockage to increase, as shown by the purple line on the graph moving upwards. The rainfall (shown in blue) is low and therefore this can be ruled out as the cause. A technician was dispatched, locating and clearing the building blockage. The sewer level reduced and resumed its regular pattern.

Since using this analytical system, we have been able to prevent 44 escapes of sewage. When we tell the system what our investigation found on site, it is able to factor this into future deviations for that specific sewer length. In doing so the system is self-learning, so we expect these results to improve further. We're also exploring other uses of the same analytics to help identify areas of high infiltration.

## Example of Storm Harvester detecting a blockage



## Determining the location of monitors

The location of sewer monitors has been determined using our water recycling networks risk tool. It compiles both static risk information such as proximity to watercourse or high amenity sites, with dynamic risk information such as number of pollutions or floods historically and generates a risk profile for each length of sewer. The highest risk sewers have been selected for monitoring. The profile of each selected length is examined in detail to determine the best possible location for monitors.

# Case study: Preventing blockages through Keep It Clear

## What have we done?

Our award-winning Keep It Clear customer engagement programme continues to be an important tool in our fight against pollutions. We delivered a cohesive regional campaign in 2022, raising awareness of what is appropriate to flush and go down drains.

In 2022 we expanded our efforts to include Food Service Establishments (FSEs), where we help organisations understand whether they have appropriate grease management in place to prevent fats, oils and greases (FOG) entering our sewers. We have launched a hotspot campaign in line with our Keep It Clear initiative and referrals from our field team who encounter blockages within a certain proximity to FSEs. We supplemented this with information on our websites that FSEs can easily access for guidance.

In our communities, we continued with our social, digital and radio campaign, reaching millions of customers, alongside our sewer cleansing programme. Our hotspot programme targeted six areas with a high blockage risk where we rolled out sewer cleansing. Throughout, we engaged with our communities and our teams on the ground supporting customers with helpful information. Our yearly 'Unblocktober' campaign raised awareness of the problems caused by blockages with the wider population.

We've leveraged our partnerships by working with charities and local organisations to help spread the word. They've helped to communicate behaviour change messages using their existing community networks, allowing us to reach specific target audiences which in turn has had a bigger reach. Our toolkits, which support our customers to create more sustainable habits are also promoted by our partners. This is part of our wider strategy to educate, build intent and drive actual behaviour change.

## What have we learned?

FSE inspections and engagement have been essential to changing behaviours. During 2022, we carried out 8,928 inspections and found that approximately 66% of FSEs are compliant with our grease management standards. Continued engagement with these establishments is essential to ensuring the correct action continues. A staggering 864 tonnes of FOG has been removed from our sewers in 2022 through this process, helping to prevent thousands of blockages and damage to the environment.

With our household customers, figures from our campaign demonstrate the success of hyper-local targeting. Our campaign data shows us where to focus our efforts in the future: radio was a very successful tool, reaching over 2.5 million people during the campaign period, and website hits and social interactions reached over 1 million. The use of data to track and manage blockage reporting has enabled us to increase the level of targeting too.

## What have we got planned?

We will build on the success of our FSE programme over the next two years. We will also extend our campaign to target repeat domestic household offenders reporting FOG blockages.

Working alongside ECAS, we are working towards face-to-face interactions in residential areas highlighted as high-density blockage locations. Twelve new direct customer engagement team members will be employed by ECAS and deployed in 2023. By understanding the physical blockers for behaviour change, like the challenge around the recycling of fats, oils and grease, we're exploring partnerships with local authorities to increase rates of waste collection and aim to reduce the amount of FOG that ends up in our network. This innovative partnership process could also add to the circular economy by providing a resource for those businesses looking to recycle FOG into a renewable energy source.

We will also work with ECAS to launch a hyperlocal approach using our monitor installation and jetting programme as a platform to educate customers on the work we've carried out and the future action they can take. We're embedding our work with ECAS across the water recycling business, working with our maintenance, treatment, trade effluent and infrastructure teams to identify further opportunities to spread our message on FOG and unflushables.

Our domestic programme will adapt to the challenges we face from pollutions and flooding to blockages. We will continue to effectively spread our message in the hot spot areas we identify whilst supporting the monitor installation and jetting programme and targeting customers.

**Working together to protect communities**

We're acting now to prevent sewage flooding, reduce the risk of bad smells and help protect the environment for the future.

That's why we're in your neighbourhood to clear, monitor and maintain local sewer networks.

We clear one blockage every 15 minutes, but 80% of these are avoidable.

**3,000 tonnes** of wet wipes, sanitary products and other plastic waste are found in our sewers every year.

**How you can Keep It Clear**

- Only flush the 3Ps: Pee, Poo, Paper
- Use wet wipes and sanitary products
- Once cooled, bin any cooking fat, oil or grease

Explore more Keep It Clear tips here: [seglawater.co.uk/keepitclear](https://seglawater.co.uk/keepitclear)

Scan our QR code

# Rising Mains

## What we did and why

Rising main bursts have contributed significantly to the number of serious pollution incidents this year. As pressurised assets, if a burst occurs a large volume of sewage can escape quickly and can be difficult to contain. We have invested in technology which helps not only to detect that a burst has occurred to allow a faster containment but to reduce the likelihood of a burst occurring in the first place, too.

The Syrinix system involves pressure monitors being installed on our rising mains. These measure pressure levels within the sewer. A sudden loss of pressure can indicate a burst and any changes to the regular pressure pattern suggest a performance issue. Syrinix then sends a live alert to our Tactical Operations team who can dispatch a technician to investigate and mitigate the burst.

We have also put a second system, called Ovarro, in place for rising mains. Ovarro is different to Syrinix in that no physical monitors are installed. Instead, clever algorithms are used on data already collected through our telemetry system. Where a deviation from the typical behaviour occurs an issue can be flagged as an alert for interpretation by one of our analysts.

## What we have learned

We have already seen positive results from Syrinix and Ovarro this year. We are confident these data and insight investments represent an industry-leading approach for predictive operations but also allow us to respond in a heightened way should an issue occur.

As the Ovarro system learns from existing telemetry data and does not require physical monitoring, we have 100% coverage of our rising mains already.

**In 2022 almost 2,000 alerts were generated; we detected 50 bursts and attended 600 performance alerts generated by these systems. The information has assisted in the prevention of many potential pollutions and the rehabilitation of 42 rising mains.**

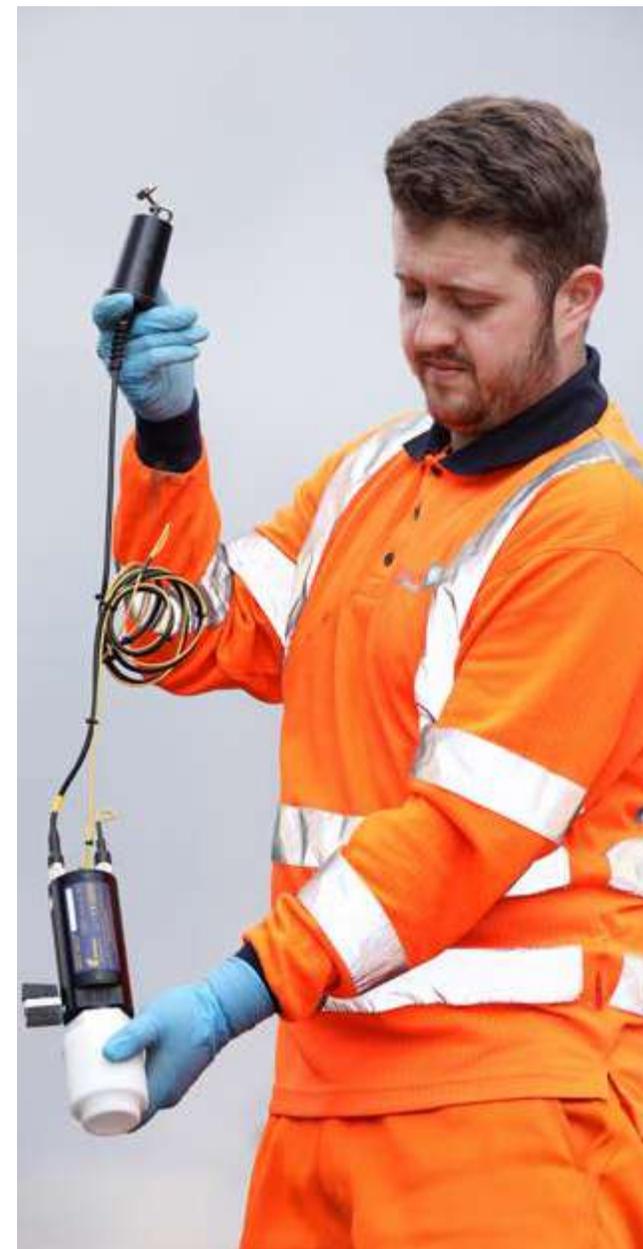
We recognise that moving towards a predictive model, not an alarm-based system, is a journey for our frontline teams – moving from a ‘respond’ to an ‘investigative’ mentality. As a result we added in a second layer of assurance using our Tactical Operations team to make sure we follow up on alerts from our new predictive systems and that every ‘false positive’ alert is rigorously reviewed. Similarly, the Artificial Intelligence system and teams monitoring these tools are on the same learning journey. (See assurance on p19).

We have honed our operational response to large burst rising main events and been able to prevent significant impact as a result of the processes embedded in Tactical Operations. We are pleased with the impact this combined work is starting to have.

## Planned improvements

We will continue to refine the way we interpret the alerts generated from these systems to increase accuracy. Currently they are approximately 70% accurate. In just under a third of cases no fault was found on the rising main. We hope to reduce this percentage going forward with refinement of the technology and our people processes. We will continue to embed this operational activity over the coming year.

We are also exploring other ways to utilise this technology, for example as the system continues to learn we can look to apply the technology to other asset classes such as pumping stations and biofilters on water recycling centres.



# Case study: Syrinix: harnessing technology to prevent rising mains bursts

Rising main bursts contribute significantly to the number of pollution incidents. Alongside our ongoing business as usual asset maintenance, we have invested in two forms of technology which are helping us to prevent bursts, while giving us greater detection capabilities when bursts do occur.

## Training our workforce

To support the implementation of technologies like Syrinix and Ovarro we are continuing to train and support the frontline team using these new technologies. In turn, they are learning how to best harness these technologies and identifying opportunities to leverage the information we're receiving. We expect to realise the full benefits of Syrinix and Ovarro in the next two years.



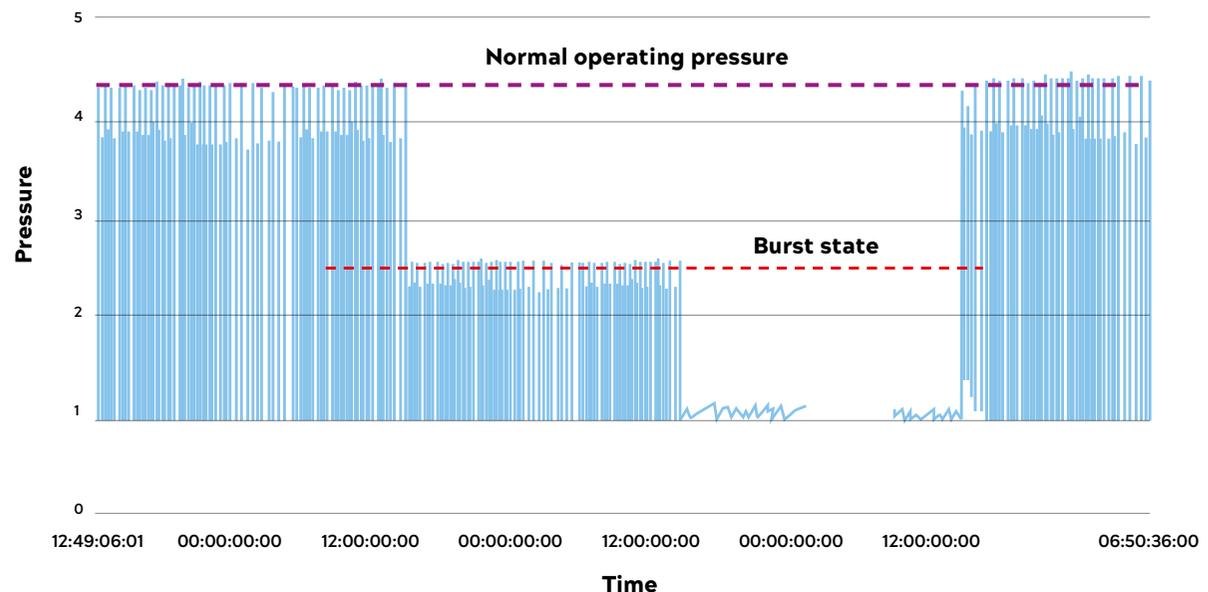
## Syrinix

Syrinix uses pressure monitors on our rising mains to measure the level of pressure within the sewer. The pressure within the rising main should follow a steady pattern in line with the operation of the pumps that push sewage along them. A sudden loss of pressure can indicate a burst. The Syrinix system sends a live alert to our Tactical Operations team who can then investigate and deploy teams to mitigate the burst. Another benefit of this system is the detection of performance issues within the main sewer, with negative pressures or pressure spikes indicative of a burst.

We have installed 495 pressure monitors on our highest risk rising mains. These monitors provide data which using Syrinix can alert us of a burst or a

performance issue. The pressure within the rising main should follow a steady pattern in line with the operation of the pumps that push sewage along them. A sudden loss of pressure can indicate a burst. The Syrinix system sends a live alert to our Tactical Operations control centre who can dispatch resource to investigate or mitigate, helping to reduce the likelihood of a serious pollution event. Where negative pressures or pressure spikes are detected, a proactive investigation takes place to identify the cause of the performance issue. If straightforward, the issue can be rectified by the local team (such as a change in the pump regime) or if more complex can be put forward for rehabilitation through our capital investment team. We estimate that we have detected 50 bursts during 2022 and carried out rehabilitation on 42 mains as a result of performance issues identified.

## Example of a data readout from the Syrinix system



# Case study: Ovarro: providing 100% coverage on our rising mains

## Ovarro

Rather than physical monitors, Ovarro uses algorithms on data that is already collected through our telemetry system. As such we already have 100% coverage of Ovarro on our rising mains. It works by analysing the filling and emptying times of a wet well in relation to the pumps, identifying any deviations from normal behaviour. Where this occurs an alert is raised which is interpreted by our analysts who then dispatch resource to investigate and mitigate. The system is self-learning and as algorithm continues to improve over time, the accuracy of these alerts will too.

Expanding to pumping stations, Ovarro is also being used to detect performance issues, prompting us to act before a failure occurs. To date, more than 2,000 alerts have been generated with an accuracy rate of around 70%. Our most common performance issues

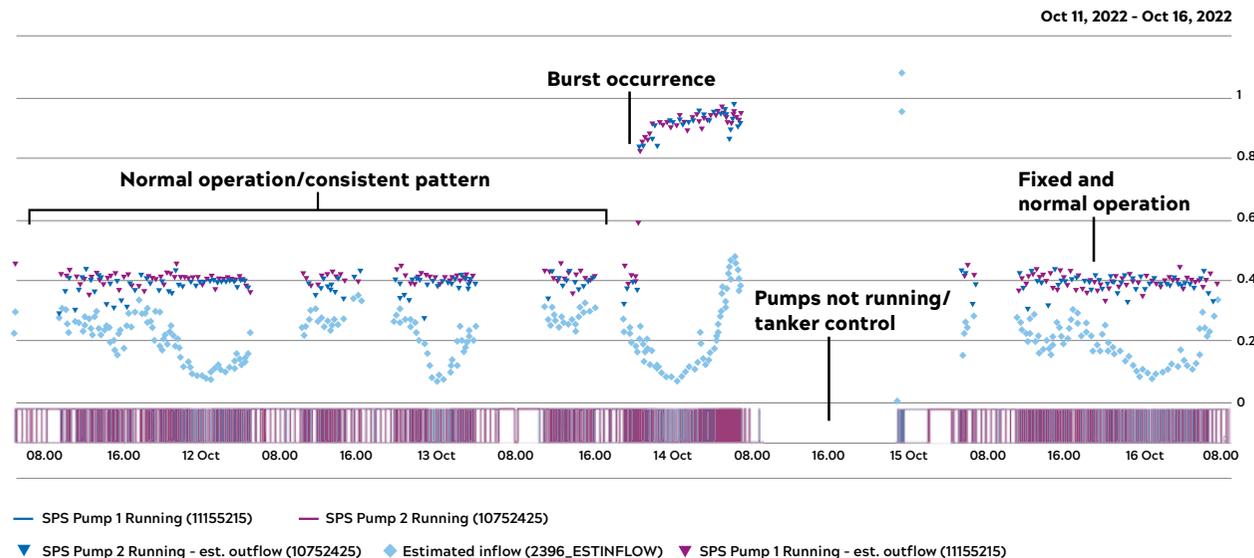
relate to pumping station control mechanisms, non-return valves and pump problems from FOG or mechanical issues. We are exploring how we could apply this system to our maintenance programme, moving away from time-based maintenance and towards performance-based maintenance. This will allow us to target those pumping stations which have the highest risk of failure.

Throughout 2023, we are continuing to hone the way we interpret the alerts within our newly appointed Insights team. Like the algorithms, we are continuously learning how we can best utilise the information produced and find new applications which will give us greater visibility of the health of our assets.

## Ensuring the accuracy of our data from our monitoring systems

When an alarm is raised for an asset from our monitoring systems our Insights team assess all available data, including surrounding assets and the history of the asset site. This helps build a picture of the health and potential issues surrounding an asset. After investigating further, we feed the results back to the system, allowing the monitoring system in question to learn more about the asset in question. This helps build the intelligence of our systems over time, and we expect to benefit from nuanced and accurate alarms in the future as a result. To support this, we undertook a 'sensor to screen' testing programme in 2021/22 to ensure that critical alarms were tested in the field and that the status of the alarm was showing correctly on the screen for our alarm handlers, all of which is building our operational accuracy and resilience.

## Example of a burst rising main from the Ovarro system



# Water Recycling Centres

We have prioritised two key factors to improve the performance of our Water Recycling Centres (WRCs): driving management system enhancements alongside a strong focus on sludge management.

## What we did and why

### Management System Enhancements:

- Our approach has focused on consistency and diligence around the proactive day-to-day running of our WRCs. To do this we've enhanced our frontline operational teams to closely manage risk and ensure we're meeting the highest standard of brilliant basics every day. We have also added tactical support roles to provide technical input and coaching for frontline operators, and analytical technicians to enhance our understanding and management of alarms to adopt a more preventative approach to issues on site.
- Whenever we see a deterioration at one of our WRCs, for example related to weather, we have a process that places that asset into special care measures.



### Sludge Management Enhancements:

- This has been a focus area due to the root cause relationship to our pollution events. Whilst we are proud to reuse our treated sludge as a valuable soil conditioner and renewable fuel, for the treatment process it is important to concentrate on appropriately managing the volume of sludge in our biological processes. We accelerated work including rebalancing our tankering resource to return to routine sludge movements in 2022. This followed the exceptional workloads created by the prolonged wet weather in 2021. This culminated in the introduction of a new tankering support team.
- Our learning from this period led to the development of our TankR app, which enables us to use our tankering fleet more intelligently and efficiently. The app allows greater understanding of tanker locations, how high sludge levels are and the most efficient use of tankers.
- To complement this work, we have introduced new and enhanced procedures to support immediate and unforeseen events where we need to urgently deploy our tankering fleet.



## How Water Recycling Centres work

WRCs clean used water and sewage using biological processes before returning the cleaned water to the environment. The biological treatment processes can be sensitive to external factors like extreme weather. They are also affected by seasonal population fluctuations, power outages, instrument or asset issues and third party misuse of sewers. WRCs require careful and constant balancing and fine-tuning. This requires daily monitoring and considered risk management through our processes and systems.

## What is sludge management?

Sludge is a by-product of the water recycling process. It's a mix of the organic matter from human waste and food waste particles that need removing from the water in order to treat it. Ensuring sludge levels are correct throughout the treatment process is critical to the effectiveness and compliance of our treatment works.

We recognise the significant proportion of our pollutions are attributed to water recycling centres and as a telemetered asset class, we need to drive greater improvements to see the reductions we expect. We must manage and escalate risk on a routine basis and understand when elements can be dealt with and corrected locally while others require escalation and support.

Focussing our teams on getting the basics right every single day has demonstrated the need for an everyday performance framework, as part of our management approach. Throughout 2022, we accelerated the introduction of an industry-leading approach called operational control, which will continue to be embedded in the future. A key feature of operational control is our communication cell (see Governance on page 18). This is affording us a better grip of everyday basics and provides an escalation route through to every layer of the organisation in order to resolve emerging issues.

Alongside this learning, access to asset performance data has provided earlier visibility of an asset deviating from normal trends. This is leading to a better understanding of emerging risk, a higher number of self-reported events and greater transparency of site performance. Visibility of WRC performance is critical, and we need to enhance this where we have identified a vulnerability.

### Planned improvements

There is an important need to demonstrate continuous improvement on these assets and we are driving significant work forward to achieve this.

### Sludge Management

- We are building on our operational excellence and brilliant basics by launching our sludge movement base plan to complement the work of the TankR app. This will enhance our use of data to inform intelligent decision making.
- Our improvement work on sludge dry solids focuses on increasing the thickness of the sludge so we can optimise our treatment processes and ensure the most effective use of tankers.

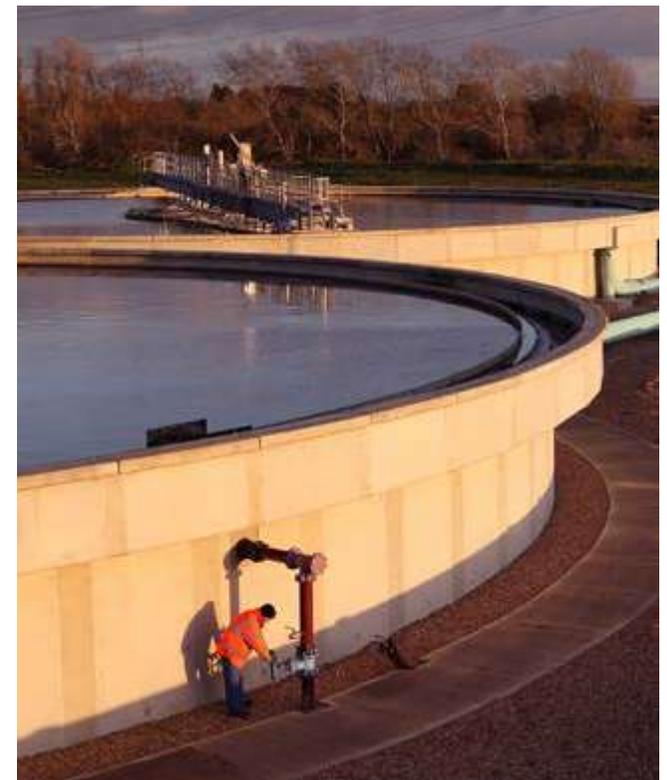
- Our sludge detection blanket is a key tool in controlling levels of sludge on site, but teams were struggling to control the monitors and ensure they are alerting us at a suitable level. Sludge detection blankets are very effective when they are working correctly, and checking the status of these regularly will be embedded into our management process.
- As a result of these changes we are confident we have built resilience into our supply chain, and will continue to enhance our resilience capabilities throughout the PIRP period.

### Risk Management:

- We will continue to embed operational control communications cells to provide line of sight from our frontline teams to directors. This takes the form of focused meetings that scrutinise pollution performance measures through every level of management to drive improvement and capitalise on opportunities. We have made excellent progress in driving this framework into our organisation and we are now embedding it.
- We are pursuing technology and innovation to appropriately support us in our ambition. Proactive monitoring addresses our need for earlier visibility of abnormal asset performance and expected performance of sites. We are trialling the leading Info-Tile technology, which uses our existing data on flow and rotation to understand differing patterns in performance (see Ovarro case study on page 30 and Info-Tiles opposite).
- Developments in technology now allow better portable on-site monitoring of final effluent that is returned to the watercourse. We know that increased monitoring leads to an earlier response and prevention of impact on the environment. We intend to use this technology to support our sites to ensure a robust and effective operational response.
- As part of our management system we provide regular and thorough proactive assurance using our expert Process Science Team.

### Case study: Developing machine learning on Water Recycling Centres

We are exploring smarter ways to proactively identify performance issues and biofilters, a conventional water recycling treatment. We are trialling a brand new data analytics systems called Info-Tiles. Previously, we would have only been able to identify poor biofilter performance during a routine site visit or remotely, through observation of our telemetry estate. Early results from our Info-Tiles trial are showing significant potential. The tech assesses existing data on flow and asset operation to understand normal operational behaviour, alerting control teams when it spots a deviation. We are now in the second phase of live testing, with a view to rolling out Info-Tiles as soon as possible.



# Pumping Stations

## What we did and why

The region we serve has unique features, including a flat landscape and a high number of dispersed rural communities. This means we have more related assets to manage and are therefore prone to more sewage related incidents. As a result, these assets are of great focus and importance in our new PIRP.

Our root cause analysis identified hydraulic overload as our most significant cause of incidents in 2022. This will be addressed through our infiltration reduction plans, which will prevent surface water entering foul systems. A key focus of our new PIRP is the prevention of blockages impacting pump performance alongside resilience to electrical issues (the second highest root causes for this asset).

### Asset Performance:

- We introduced a new approach and zero tolerance mindset to assets that are 'unavailable'. This may be due to a power outage or a technical fault, for example. We rigorously track these cases through our improved performance framework, referred to as operational control. We saw excellent improvement in asset availability through this approach.
- We targeted investment at sites vulnerable to power issues to ensure they can automatically reset and correct themselves following power failures or 'blips' to support the continuous running of our pumps.
- We reviewed our base programme of cleaning wet wells to target blockages and stepped up our behaviour change programme to encourage responsible use of wipes and sanitary items, called unflushables, to ensure these and other pollutants are less likely to cause pump blockages and less likely to reach our natural environment (see page 27).

## What we have learned

We need to hold ourselves to higher standards for this asset class and bring a step-change to our programmes.

We collect a wealth of data and insight from our telemetry on pumping stations which should provide an early warning of deteriorating pump health or asset performance. We are moving towards a predictive state while continuing to drive the basic management system approaches of wet well cleaning and zero unavailable assets to maintain resilience.

Predictive models were trialled using our Ovarro system (see case study on page 30) in the later part of 2022, and its success has provided confidence to roll this out as standard practice.

We know smarter monitoring will utilise different systems and skills sets. We have created teams in our Tactical Operations function to meet this need and continue to improve and build on best practice.

## Planned improvements

Our focus over the next two years is the implementation of new smart technologies and integrating these with our business as usual approaches in our quest to become preventative rather than reactive. This builds on work started in 2022.

- We will embed the capability of our newly-implemented Ovarro system for our pumping stations. This will detect deviating pumping station performance and extend the learnings from the work already completed on rising mains. We've had brilliant success during a trial of this work that gives us confidence in the approach.
- In order to embed the predictive approach and give specific focus to pumping stations, we have reviewed the operating model and moved the asset class to sit within our maintenance remit. This

will ultimately drive our ambition of a 'right first time' approach, ensuring the right people, place, time, skills and tools are in place. This is part of our brilliant basics approach (more on page 18).

- We have committed to delivering an enhanced wet well cleaning programme with an investment of £4.8 million, which will help to reduce these blockages.



# Water network assets

## Potable water pollutions

Potable water is not always considered a pollutant because it is clean and safe for human consumption, however it can have an impact on the environment. The speed and flow of clean water from a pressurised burst can wash additional sediment into watercourses and increase the turbidity. The settling of this sediment can disturb natural processes, scour riverbanks, and disturb important habitats. The chlorine in treated water generally dissipates quickly and is unlikely to be detected at significant levels in a watercourse following a potable pollution event. We routinely test for chlorine and suspended solids when we attend potential potable water pollution incidents to understand any impact we may have had on a watercourse.

## What we did and why

We've focused our efforts on water mains as they present the highest pollution risk. Water treatment works are rarely the cause of pollution incidents (see infographic for asset class breakdown on page 12).

## Asset monitoring

We have expanded our network of asset pressure monitoring on clean water mains, which is predicting areas which may be likely to fail in future. We are proactively targeting these areas to detect minor asset anomalies before they become large-scale failures, limiting the likelihood of impact to the environment. The monitors are also providing valuable data to help us understand which assets would benefit most from capital investment through refurbishment or replacement. We continue to develop our risk models to account for risk to the environment.

## Education and training

Our water technicians have traditionally focused their efforts on reducing interruptions to supply

and impact to customers. We have upskilled our workforce, providing training focused on identifying and responding to a pollution as well as evidence capture and sampling procedures. Environmental protection has always been part of our 'licence to operate' training rolled out to all field teams. This vital education has ensured our teams are more vigilant during water bursts in containing and mitigating where they observe a potential conduit to a watercourse.

## Procedural changes

We have reviewed our operating procedures for key business as usual activities and further incorporated assessment of pollution risk. For example, our online event management platform for interruption to supply events now includes an assessment of pollution risk during a burst, meaning that mitigation and impact assessments are considered earlier in the event.

We have trialled dedicated out of hours pollution support to ensure full coverage of expertise during a possible pollution event. We have also provided teams with better access to pollution mitigation equipment to improve the speed and quality of pollution response.

## What we have learned

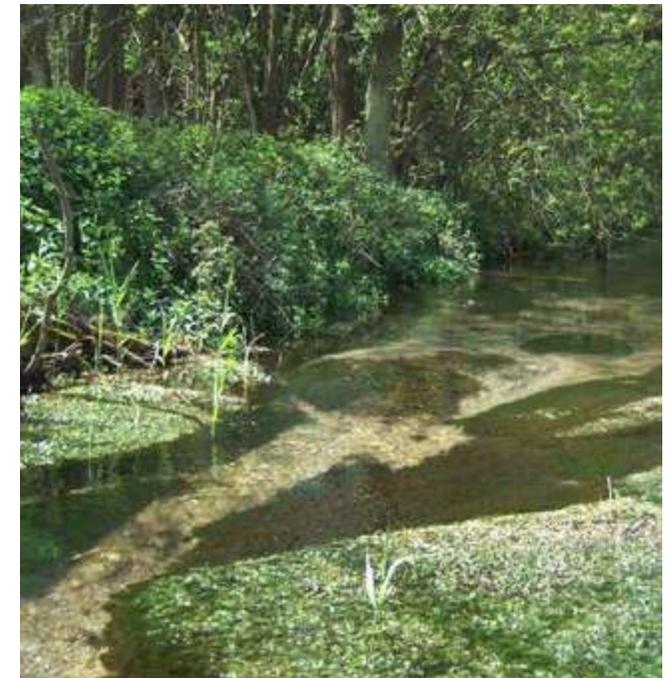
Potable water from pressurised water mains can flow quickly into surface water drains or overland into watercourses, so fast containment and mitigation are vital to avoid significant impact. Some of our mains carry huge volumes of water, which present not only a pollution risk but a health and safety risk too. We consulted with the fire service who routinely manage large volumes of water in a safe way. The learning from this interaction has helped us develop our mitigation equipment. We've already issued our teams with grab bags to manage low level incidents with flows around 5 l/s and are working on equipment to handle larger flows.

Our people are one of our most important resources in driving down pollution. Upskilling our frontline teams to be vigilant of pollution risk alongside interruption

to supply has been important in preventing serious pollution incidents. It is not a one-off exercise and we plan to continually revisit and embed this new learning to see continued benefit.

## Planned improvements

- We'll have out of hours cover to handle pollution risk in all regions to ensure that there is expertise available whenever needed.
- We're building our mitigation and containment equipment and our teams ability to access this. This will help us to minimise any impacts to the environment.
- We're continuing to train and educate our teams on the practical elements of managing a pollution event as well as the regulatory and reporting requirements.



## Case study: Pollution response equipment for potable water incidents

The majority of potable incidents occur due to burst water mains. As pressurised assets, a large volume of potable water can escape quickly and can be difficult to contain. It is imperative that we also consider the potential health and safety risks for our people associated with high volume and high speed water.

Owing to the infrequency of potable water incidents across the water sector, mitigation and containment options are less well developed. We have reached out to other industries with similar challenges, such as the fire service, to explore equipment available and how it can be effectively deployed.

We've developed a tiered response which will enable us to manage flows of up to 15l/s through our grab bags and grab boxes. These contain equipment which can be deployed quickly and easily either to contain flows and prevent entry to a watercourse or to reduce the impact by removing stirred up sediments.

All employees who may be called upon to respond to a pollution carry a 'grab bag', with the contents suitable to deal with a low level incident of around 3-5l/s of flow. The bags contains cone shaped material we refer to as 'witches hats' which can be deployed within a surface water drain to filter out any sediments, as well as booms to prevent the spread of surface pollutants and flood barriers to contain flows.

Grab boxes for higher flows of between 5 and 15l/s are available at strategically placed depots across the region, providing more options for the controlling of flows, such as sandbag provisions.

Our top level of response is a 'pollution trailer', which we are developing through 2023. We're exploring equipment which will allow us to pump, divert or hold back flows. The trailer will be deployed where we have large flows to control of over 15l/s.

Alongside these practical steps, which will help improve our response now, we are looking into opportunities for the future. We are exploring innovative techniques to reduce the impact of Water pollutions, which would give us more time and control on overflows. A portable treatment system which could be used to remove the sediment from flush water is also being investigated.



# Wider environmental work

We are a custodians of the natural environment in the region we operate. To achieve our ambitions for the environment and to do right by the habitats and wildlife, it's vital we work together in partnership with other organisations and volunteer groups throughout our region. Some of these are highlighted below.

## Get River Positive

Working in partnership with Severn Trent we have pledged to Get River Positive by 2030. We have made five commitments:

### Commitment 1



Ensure storm overflows, sewage treatment works and abstraction do not harm rivers

### Commitment 2



Create more opportunities for everyone to enjoy our region's rivers

### Commitment 3



Support others to improve and care for rivers

### Commitment 4



Enhance our rivers and create new habitats so wildlife can thrive

### Commitment 5



Be open and transparent about our performance and our plans

Since launching Get River Positive (GRP) in March 2022, we have progressed many actions, including: establishing the Rivers Trust Strategic Partnership, unlocking funding for a wetland on the River Stiffkey, partnering with global leaders like Microsoft and Avanade, convening an expert scrutiny panel to hold us to account, and launching our interactive storm overflow spill map. Shareholders reinvested £7 million to fund GRP and accelerate river health improvements over two years. More information can be found on our website.



## Catchment partnerships

Catchment partnerships see us work collaboratively at a river catchment level. These partnerships are key to delivering our environmental commitments in our region, through greater community engagement and on the ground delivery to improve water quality.

## Beachcare and RiverCare

We continue to be the sole funders for the RiverCare and BeachCare programme, which we have run in partnership with Keep Britain Tidy for 21 years. Through this programme, we support 50 community groups, comprising over 1,000 volunteers across our region to care for their local environment. Most groups work to remove plastic pollution from their blue spaces, and some also get involved in conservation work such as creating new riverside habitats or removing invasive species.

## Citizen science

River monitoring kits are being rolled out to local river interest groups and we are engaging with local communities to improve our rivers and provide accessible information on bathing waters, river water quality monitoring and health and safety and education. We are also funding citizen science bacterial sampling and sharing results.

## Reducing abstraction

Through the delivery of our Water Resources Management Plan, we've already made industry-leading reductions in the amount of water we take from the environment, despite serving a rapidly growing population. By 2025 we will take 85M/lID less from the environment for drinking water supply, supporting our region's rare and precious chalk-fed streams and rivers.

Further details of how we are working to help protect, restore and enhance the natural environment can be viewed [here](#).

# Case study: How we work with the wider water industry community to drive down pollutions

As one of many monopoly water providers in England and Wales, we feel it is imperative that we form collaborative cross-sector opportunities for sharing good practice, innovative approaches and learnings within the water industry.

## National Pollutions Group

Emily Timmins, our Director of Water Recycling, is the Chair of the National Pollution Group. The group, consisting of representatives from all water companies and Water UK, meets monthly to problem solve, share good practice and discuss common themes.

In March 2023, a face-to-face meeting was hosted by Thames Water aimed at sharing best practices from each of our Pollution Incident Reduction Plans to come up with a 'Pollution Incident Reduction Manual' for the industry. The meeting was an opportunity to work collaboratively, foster connections and relationships and share knowledge.

We are active participants within the group having led sessions on preventing water pollutions, sewer monitoring and rising main burst detection amongst others. These have sparked further break-out conversations and exchanges beyond the National Pollution Group at a local and regional level.

## Sharing knowledge and learning

Working collaboratively with other water companies has had a particular advantage for our sewer monitoring programme. Our approach has focused on developing our systems and analytical capability before rapid deployment of monitors, while other water companies have done the reverse. As a result we have all been able to learn from each other's experiences with different technologies, deployment, monitor reliability and so on. We have hosted visits from several other water companies discussing key topics and showing how our Tactical Operations control room works.

We have attended and hosted many informal knowledge shares between many water companies recognising that these are huge opportunities to fast track learnings into all of our approaches. Our collaborative partnership with Severn Trent on our 'Get River Positive' initiative is a great example of how we can work together to meet shared goals (see page 36).



## Fine to Flush Water industry specification

We welcome the recent government announcement that proposed banning all wipes that contain plastic. Through our Keep it Clear programme, we led on the development of the Fine to Flush water industry specification (WIS). Bringing together 12 UK water and sewerage companies with the wipes manufacturers, a series of tests were developed at WRC's testing facilities in Swindon. The first test to ascertain a wipe's flushability in the sewer network includes a fibre analysis test to determine whether the wipes contains plastic fibres. If the wipes contain plastic fibres, it is an instant fail of the Fine to Flush specification.

Having worked at the forefront of reducing the impact of wipes and campaigned for a ban on plastic wipes for many years, we are pleased with the intention to ban plastic in wipes, laid out by government in its Plan for Water in April 2023.



# How we respond to pollution incidents

In the past the management of pollution incidents in the water industry was typically responsive rather than preventative. Our new PIRP strategy means we are focusing on identifying and stopping incidents before they occur. New technologies such as smart systems (like Ovarro, Syrinix and Storm Harvester), increased asset monitoring and a schedule of planned preventative asset maintenance are just some examples of how we are preventing pollution incidents. If an incident does regrettably occur, our response is as follows:



## 1 Tactical Operations is notified

Our Tactical Operations team is notified of a possible pollution. This can be from within Anglian Water (such as through our extensive alarm system, or via our intelligence system), or externally, such as a call from a local resident or community group.

## 2 A job is raised

A job is raised and a technician attends the site as soon as possible to investigate. Our intelligence system supports us by analysing the possible cause so we can deploy the right resources.

## 3 Incident reported to the Environment Agency

If we believe a potential pollution has occurred we report it immediately to the Environment Agency (EA). We have a dedicated pollution team who manage this, supporting the frontline response, liaising with the EA and providing operational support and logistics.

## 4 The pollution is stopped or mitigated

The pollution is stopped or mitigated as soon as possible. If there is a risk that the incident is a serious pollution, or it has the potential to become one, we have an escalation procedure we follow whereby senior leadership are notified alongside an enhanced incident response.

## 5 We undertake an impact assessment

An impact assessment of the local environment, and evidence of the event, is captured by our teams. Ecological surveys are carried out at sensitive locations.

## 6 Post-incident summary

We draft a post-incident summary and the incident category is confirmed by the EA.

## 7 Post-event investigation

Once resolved, a post-event investigation is carried out and the resulting local or regional actions are agreed with the relevant teams and senior leaders as appropriate. We also carry out ecological surveys to ensure the environment is recovering as it should.

## 8 Learning is shared to avoid a repeat incident

The learning we have identified from the incident is shared across the business and incorporated into future plans wherever possible, to avoid a repeat of the incident.



# Glossary

<b>AMP/AMP7</b>	The seventh asset management period planned by the UK water industry which runs from 2020 to 2025	<b>Pollution Incident</b>	The Environment Agency defines a pollution incident as ‘a specific event or occurrence, brought to our attention, within our areas of responsibility and which may have an environmental and/or operational impact.’
<b>Biofilter</b>	Part of the sewage treatment process, a biofilter uses microorganisms to remove and breakdown contaminants, helping to clean water	<b>Potable Water</b>	Water that has been treated and tested and is safe for human consumption
<b>CSOs</b>	Combined Sewer Overflows, which are also broadly referred to as Storm Overflows, were developed as valves to reduce the risk of sewage backing up into homes and properties during heavy rainfall and are permitted by the Environment Agency. These types of overflows are no longer designed into modern sewerage systems as the foul and surface water sewers are built separately	<b>PR24</b>	Ofwat’s Price Review taking place in 2024, covering the business plan period 2025-2030
<b>EDM</b>	Event Duration Monitor. These monitors have been installed on our storm overflows so we can report the number of times and duration of time they spill to the environment to the Environment Agency	<b>Pumping Station</b>	An asset that moves sewage forward towards a water recycling centre for treatment when gravity cannot be used. We have many pumping stations in our flat region
<b>EA</b>	Environmental Agency. A non-departmental public body responsible for protecting and enhancing the environment	<b>Rising Main</b>	A sewer which is pressurised using pumps to move sewage along the flat landscape or uphill
<b>FOG</b>	Fat, oil and grease. Blockages are the main root cause of serious pollutions, and 80% are completely avoidable – made up of unflushables and FOG	<b>Sludge</b>	The organic waste matter from sewage and used water
<b>GIS</b>	Geographic Information System. A system designed to capture, store, manipulate, analyse, manage, and present geographical or spatial data	<b>Storm overflows</b>	A pressure release valve that sends excess wastewater to outfalls during a heavy rain event
<b>Hydraulic Overload</b>	When the capacity of a sewer is insufficient for the volume of waste water flowing through it	<b>Telemetered assets</b>	Monitoring of our pumping stations and Water Recycling Centres. Because of the monitoring on these assets we are expected to have a higher level (90%) of self-reporting
<b>Main Sewer</b>	The primary pipeline in a sewage system that collects sewage from lateral connections. These lateral pipelines are smaller pipes called drains, connecting homes and businesses to the main sewer line	<b>Transferred Sewer</b>	Small sewers that serve individual or small groups of properties. Until 2011 these were the responsibility of homeowners and as such not all have been well maintained. In 2011 a new law was passed to move these into water company ownership and responsibility
<b>Ofwat</b>	The water services economic regulation authority		
<b>Operating Standard Limits</b>	The numeric parameters we use to understand whether our sites and systems are performing as expected and form part of our management system		
<b>PIRP</b>	Pollution Incident Reduction Plan	<b>WRC</b>	Water recycling centre (formally referred to as Sewage Treatment Works)



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