

Pollution Incident Reduction Plan

June 2023



Foreword

Sarah Bentley, Chief Executive Officer



At Thames Water, we're passionate about our purpose – to deliver life's essential service, so our customers, communities and the environment can thrive. That emphasis on looking after the environment is so important. We are embracing opportunities to be a force for good, both now and in the future, by supporting and enhancing the natural world around us.

Reducing pollutions is a key part of improving river health, we are disappointed we haven't yet realised all the benefits of our initiatives and that we have seen a deterioration in performance in 2022. This updated Pollution Incident Reduction Plan (PIRP) sets out clearly how we will improve our performance. The principles that guide this important work are:

- 1 Targeted initiatives to prevent pollution incidents at the source.
- 2 Improved response to incidents to prevent and minimise any impact.
- 3 Educating, effectively training and motivating employees at all levels across our organisation.

The discharge of untreated sewage is unacceptable, and we are committed to tackling this problem. We are investing record sums in upgrading our sewer systems and treatment works and are striving every day to reduce the discharge of untreated sewage into our rivers. However, there are no quick fixes. Population growth will increase the strain on our sewage network and treatment centres. And because of climate change, the Southeast of England is experiencing heavier downpours, which can overwhelm some sewage treatment works. The scale of the challenge demands urgent and systemic reform with a shared undertaking from all stakeholders. We remain determined to deliver on our mission of at least a 40% reduction from 2016 in category 1 to 3 incidents, and significantly reducing serious pollutions by 2025, with an ultimate aim to have zero serious pollutions.

We are committed to both an 80% reduction in the duration of discharges to the environment in sensitive catchments, and a 50% reduction in the total annual duration of discharges across our area by 2030. Sensitive catchment definition includes a range of factors such as the available watercourse dilution, whether they are a chalk stream, or have a designation such as sites of special scientific interest (SSSI). In January this year, we met our commitment to provide live notifications, within one hour of discharges starting and stopping at all our 468 permitted locations. We are the first company to provide these alerts for inland waters and want to lead the way with this transparent approach. We're determined to 'speak up, open up and clean up' as we drive the way forward.

Sarah Bentley
Chief Executive Officer



Contents

1 Foreword

2 Executive summary

Introduction

Year 3 Pollution Performance Summary

Pollution targets

3 Serious Pollutions

Performance and causes

Initiatives

4 Waste Networks

Pollution causes

Initiatives

5 Waste Treatment

Pollution causes

Initiatives

6 Sewage Pumping Stations

Pollution causes

Initiatives

7 Clean Water

Pollutions performance

Initiatives

8 Case Studies

Infiltration Reduction Success Story:
Lambourn, East Shefford Catchment

Smart Catchment Management at Mogden

9 Governance

10 Appendix

Retired Initiatives

11 Glossary

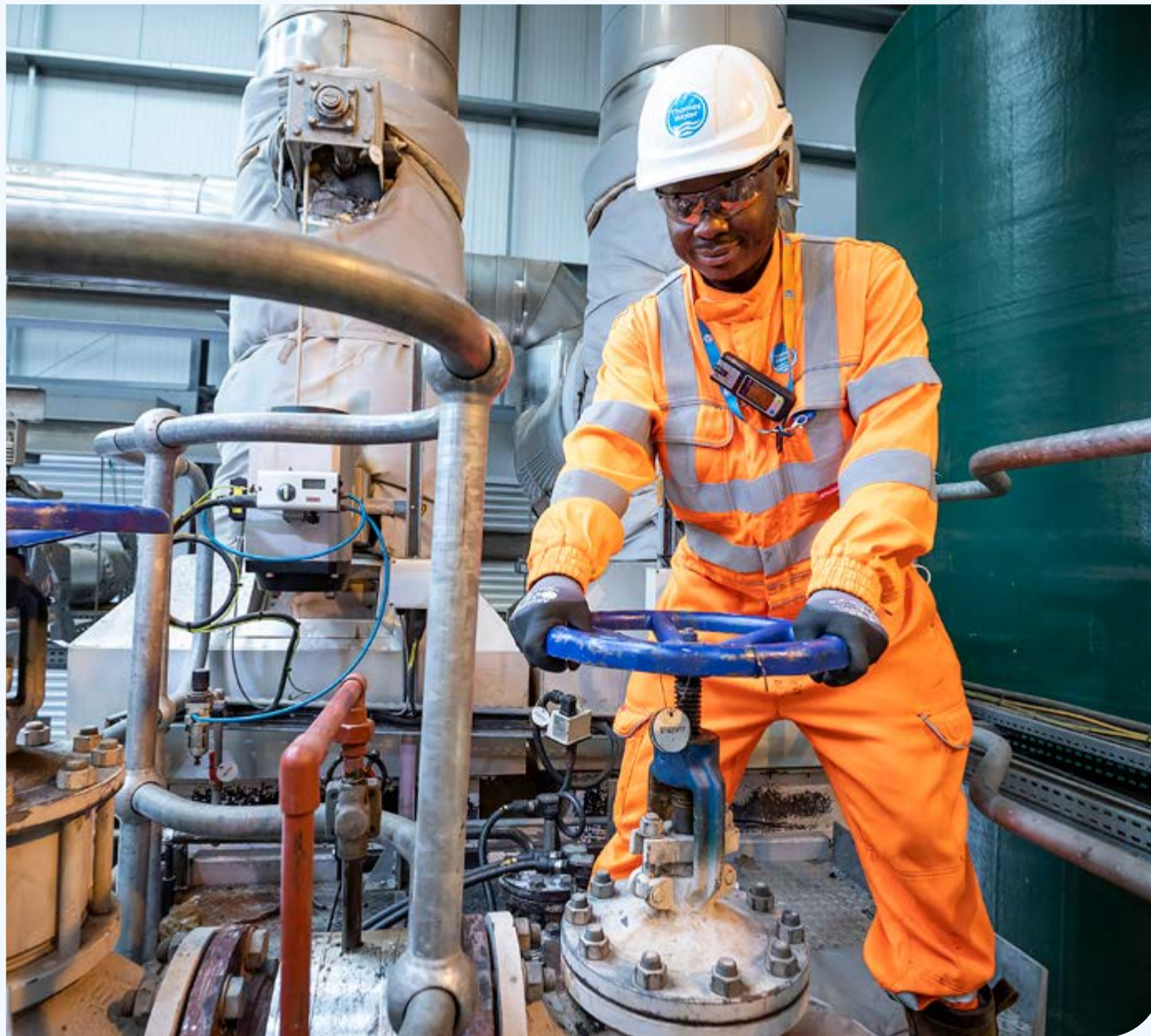


Executive summary

In 2022, we did not achieve the reduction in pollutions that we expected to see. This follows on from not achieving our targets in the two years previously. This document sets out our strategies to systematically manage risk and reduce pollution incidents under a single, overarching framework for AMP7. A review of our Year 3 initiatives and our plans for Years 4 and 5 are included.

Executive summary

Introduction



In 2022, we did not achieve the reduction in pollutions that we expected to see. This follows on from not achieving our targets in the two years previously. This document sets out our strategies to systematically manage risk and reduce pollution incidents under a single, overarching framework for AMP7. A review of our Year 3 initiatives and our plans for Years 4 and 5 are included.

We've evolved our ability to understand the forecasted pollution reduction benefit of our initiatives and taken a more critical review of which will reduce pollution incidents. This was to ensure that we use the pollution incident reduction plan most effectively to deliver the right level, scale, and pace of where we think we can make the biggest impact. This year, we've consolidated the number of initiatives in our plan for Years 4 and 5, and simplified our approach to the document, referring to our Year 1 themes of:

- **Prevention:** Targeted initiatives to reduce the number of operational events that historically are at higher risk of causing a pollution incident, typically through asset investment and changes to our ways of working.
- **Mitigation:** Improve our response to incidents to prevent and minimise any impact on the environment and our communities.
- **Culture and behaviour:** Educate, train, and motivate employees throughout all levels of the organisation to identify risks to the environment and act urgently to prevent impact. Further developing and maintaining a culture of openness and prioritising the best environmental outcome.

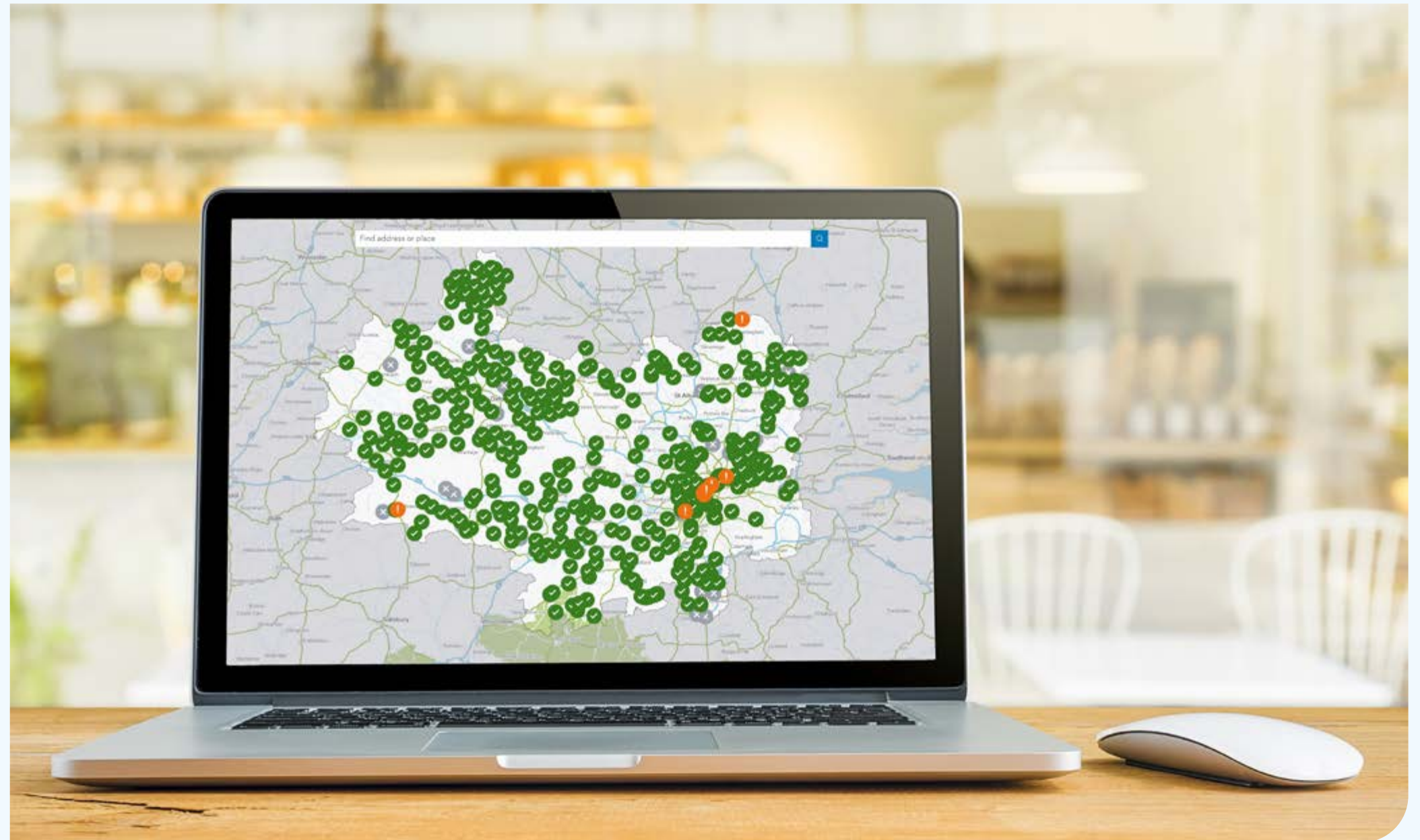
Across all our themes and asset types sits our smart waste digital programme. The vision for Smart Waste is to build an intelligent ecosystem of products that allows us to understand the operational performance of our wastewater assets, so that we can apply the most cost-effective interventions, in the right place, at the right time; helping us move from reactive to proactive. By becoming smarter on blockage detection, identifying the associated risk of pollution and automating work generation 24/7, we aim to prevent and mitigate more pollutions and blockages, building on our successes over the last three years. This work will help meet tightening environmental performance commitments this AMP and set us up to meet the challenge of AMP8, as well as increase customer satisfaction. In June 2022, our board committed significant additional expenditure supported by shareholders aimed at improving performance and outcomes for environmental protection, customers, and leakage. This includes circa £140m to improve river health to enable us to increase our scale and pace of investment in rising mains, infiltration reduction, sewer rehabilitation and sewage treatment works flow compliance.

Executive summary

Introduction

Our river health strategy is aimed at reducing harm to our environment, decreasing both discharges and pollution incidents, and reflects our intention to speak up, open up, and clean up. We're following through on this by making our [Event Duration Monitor \(EDM\)](#) data available to the public and interested parties, marking a conscious change in culture for our organisation. Our plan to reduce discharges to the environment is included in this document as they impact our understanding of river health. This includes the installation of flow and level monitoring equipment across our network and treatment sites, and a storm overflow assessment framework (SOAF). With groundwater still impacting our performance on discharges, we continue to work with the Environment Agency to produce 'groundwater impacted system management plans' across sites and catchments affected. It's a structured approach to investigating and defining the extent of capital investment needed – while some have 'quick win' actions, we'll feed other requirements into our AMP8 business planning process.

A core focus for reducing discharges to the environment in AMP7 is our investment in the Tideway Tunnel. Our 25km tunnel will intercept, store and transfer sewage waste away from the River Thames, protecting it for at least the next 100 years. It will also reduce our sewage discharges into it by 95% in London. Those that happen will be mostly due to surface water runoff after heavy storms. Across our sewage treatment works, additional digital data is available which has renewed our focus on site flow permit compliance, and this can be seen in the delivery of the Waste Asset Assurance Programme within the waste treatment workflow.



Executive summary

Year 3 Pollution performance summary

Category	2016	2019	2020	2021	2022
Cat 1	2	2	2	1	3
Cat 2	8	13	11	11	14
Cat 3	346	310	279	259	314
Total	356	325	292	271	331

Table 1 Pollutions by category 2016-2022

In Year 3, we saw an increase in our category 1-3 pollutions to 331 (from 271 in 2021 – see Table 1). This increase was seen across all asset types and categories, which is not acceptable. After reviewing our performance data, we don't believe that there's a single cause why incidents have increased this year. With blockages from fat and wipes in our network still causing nearly 40% of all pollution incidents, we've continued to deliver the upscaled and hotspot-focused cleaning programme and installed 5,000 more sewer depth monitors and rolled out customer education programmes. The blockage volumes are trending downwards but we're still working hard to realise the pollution reduction benefits from our operational response to the sewer depth monitors. We'll continue to improve the data-led hotspot focus of the sewer cleaning and get the message out to even more customers to 'bin it, don't block it'.

Across the rest of the plan, while two-thirds of our initiatives were delivered, some important pollution reduction activities were not. Details of how we're getting these initiatives back on track are in the sections below, listed by workstream.

2022 has reinforced our need to continue to invest in climate resilience, with intense rainfall putting pressure on capacity in some places. Changes in soil moisture and groundwater levels have impacted the stability of our network assets in the ground. The impact that the drought conditions had on the local environment meant that any discharge entering watercourses with lower flows and associated dissolved oxygen levels had the potential to cause greater harm. Throughout this year, we've continued to provide environmental data as quickly as possible, taking the health and safety of our people and contractors into account, and we'll continue to explore how we can do this even better and share the data in Year 4.

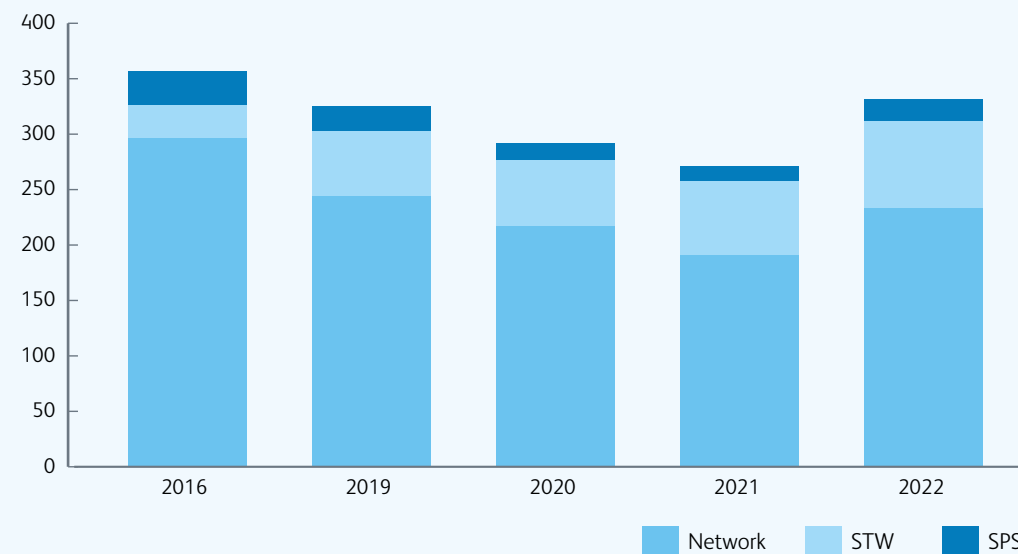
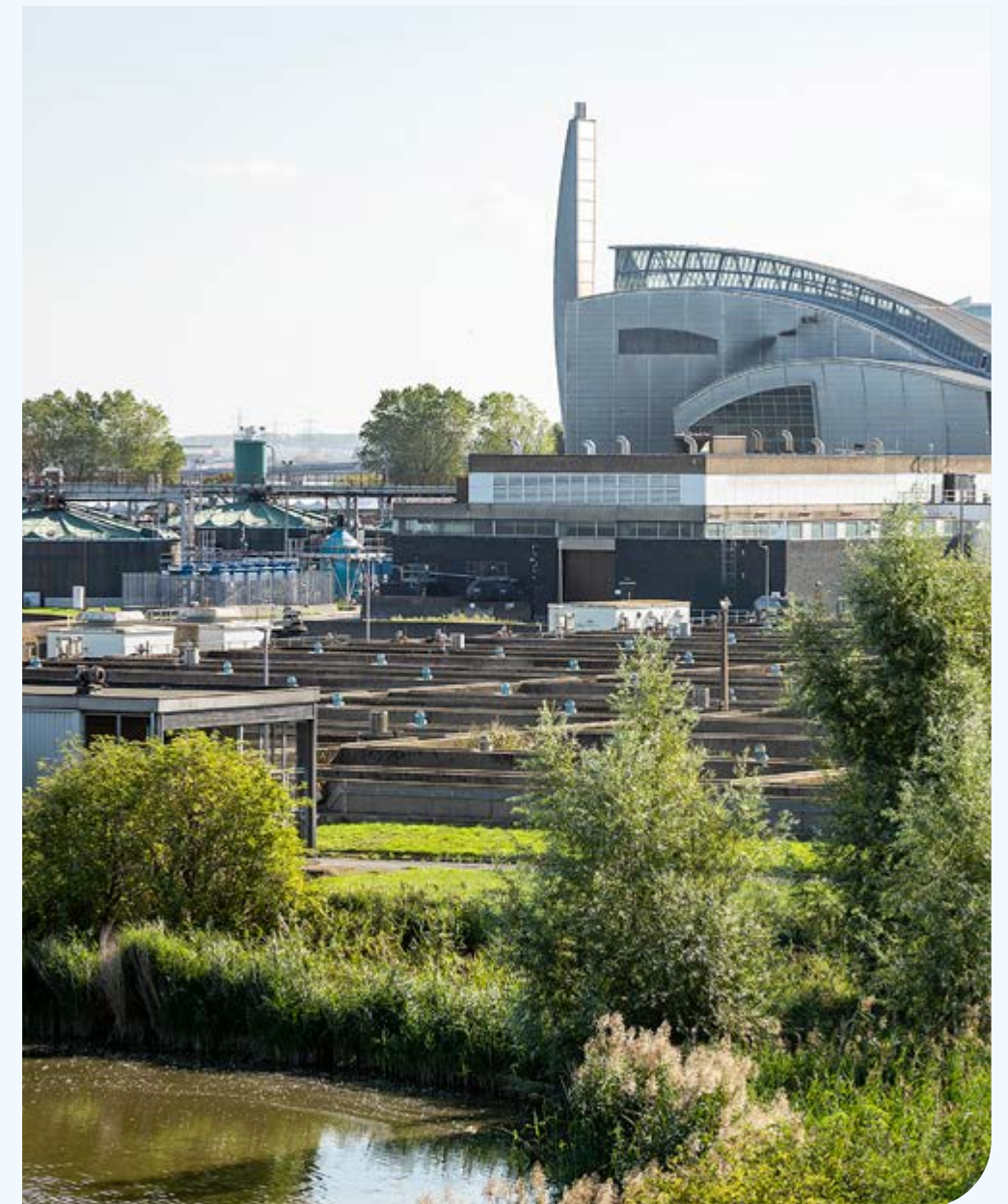


Figure 1 Cat 1-3 pollutions by asset type 2019-2022

We've faced some challenges common across the Water Industry, which have led to delays in the delivery of some parts of our plan; we're still on track to deliver the total commitment by the end of Year 5 for most of our initiatives. These include, inflation driving up the cost of labour, plant, and materials; the availability of people resources following Brexit and competition with other



Executive summary

Year 3 Pollution performance summary



major construction programmes across the water industry and other sectors; and supply chain delays. The additional investment from our shareholders is enabling us to still deliver a significant investment programme, and we continue to work closely with suppliers to secure critical equipment when we need it. We're managing such risks closely and mitigating them where possible to realise the benefits of our baseline plan by Year 5.

We'll continue to build resilience into our asset base committing to high levels of asset investment from drain to river, with a specific focus on rising mains and sewage treatment works (see serious pollution and waste treatment initiatives sections for more detail). Until this investment has been delivered through our construction projects, we're still vulnerable to the impact of extremes in weather so where possible we've deployed temporary equipment and created mitigation plans. We'll start to see the benefit of our large investment programmes on sewage treatment works and rising mains in the last two years of the AMP.

Smart Waste continues to underpin our pollution reduction strategy, building intelligent digital tools to help manage the waste network, from drain to the river. This will allow us to better understand the operational performance of our wastewater assets, so that we can apply interventions, in the right place, at the right time. Our work in Mogden focuses on protecting the Wealdstone Brook, helping us understand the link between our waste network and surface water systems. Learning in Mogden will be applied to other areas and locations where we believe this approach can make a difference. We continue to make progress building new business processes and evolving our ways of working to best respond to this new equipment and the data it provides. We recognise the change needed and we'll have stepped closer to realising the benefits in the next two years. Where it's appropriate, early positive feedback from Mogden will be applied sooner.

In the Summer of 2022, we made changes to our operational team structures, aligning our operational delivery teams to river catchments. The purpose of this was to drive a greater sense of ownership of river health, to get closer to our communities and align better with the way the Environment Agency operates. Our catchment teams are developing tactical plans to focus on pollution reduction which is more specific to the river catchment they work in. Such plans include increasing sewer level alert monitors (SLAM) near sensitive watercourses, improving speed of response, and engaging local stakeholders for early notification. As part of these changes, we've appointed a dedicated senior manager to bring focus to our pollution performance across our entire waste business (network, pumping and treatment) and a dedicated senior delivery manager to focus on pollution incidents from sites not meeting full flow to treatment.

Whilst we recognise that our Year 3 performance has set us off track for our 40% WISER reduction target (from the 2016 baseline shown in Table 1), we remain committed to our pollution reduction initiatives, as we believe delivering the whole plan will bring the associated benefits needed to meet our baseline targets in AMP7. Alongside the formal documented plan, we're also delivering a business improvement plan, which focuses on changes in ways of working and improving our governance processes. The sections below include more detail, line by line, of our in-year performance by initiative, as well as our plans for Years 4 and 5.

Executive summary

Pollution targets

Whilst we recognise it will be challenging, we continue to aim for our baseline Performance Commitment targets in Years 4 & 5. Tables 2 and 3 show our actual performance against the target for Years 1 to 3 and our targets for Years 4 and 5 by asset type for Cat 1-3 and serious pollution incidents.

Although Category 3 clean water pollution incidents don't contribute towards our Performance Commitment targets, we thought it was important to demonstrate the focus on these incidents by sharing our internal targets (Table 4). In Years 4 and 5 we expect to see an increase in the number of self-reported clean water pollutions as we increase training and awareness and we'll continue to explore additional mitigation techniques to reduce the frequency and impact of clean water bursts.

Asset Type	Yr 1 2020 Actuals	Yr 1 2020 Targets	Yr 2 2021 Actuals	Yr 2 2021 Targets	Yr 3 2022 Actuals	Yr 3 2022 Targets	Yr 4 2023 Targets	Yr 5 2024 Targets
Waste Network	217	210	191	189	233	176	175	162
Waste Treatment	59	50	66	50	79	55	55	40
Waste Pumping	16	22	14	20	19	19	14	10
Total	292	282	271	259	331	250	244	212

Table 2 Cat 1-3 pollution actuals & baseline targets for AMP 7 by asset type (Performance Commitment Targets)

Asset Type	Yr 1 2020 Actuals	Yr 1 2020 Targets	Yr 2 2021 Actuals	Yr 2 2021 Targets	Yr 3 2022 Actuals	Yr 3 2022 Targets	Yr 4 2023 Targets	Yr 5 2024 Targets
Waste Network	6	6	6	6	15	6	7	5
Waste Treatment	7	6	6	3	2	5	2	3
Waste Pumping	0	0	0	0	0	0	0	0
Clean Water	0	0	0	0	0	0	0	0
Total	13	12	12	9	17	11	9	8

Table 3 Cat 1-2 pollution actuals & baseline targets for AMP 7 by asset type (internal targets)

Asset Type	Yr 1 2020 Actuals	Yr 2 2021 Actuals	Yr 3 2022 Actuals	Yr 4 2023 Targets	Yr 5 2024 Targets
Water Distribution System	39	33	65	55	50
Water Treatment Works	0	0	1	2	2
Total	39	33	66	57	52

Table 4 Cat 1-3 pollution Actuals & targets for AMP 7 for clean water (internal targets)



Serious Pollutions

Serious pollution incidents have increased to 17 (from 12 in 2021). This performance is unacceptable. In 2022, we delivered a reduction in incidents at sewage treatment works from six in 2021 down to just two. We continue to have no serious incidents from sewage pumping stations or clean water assets. Figure 3 shows a breakdown of serious pollutions by asset type.

Serious Pollutions Performance and causes

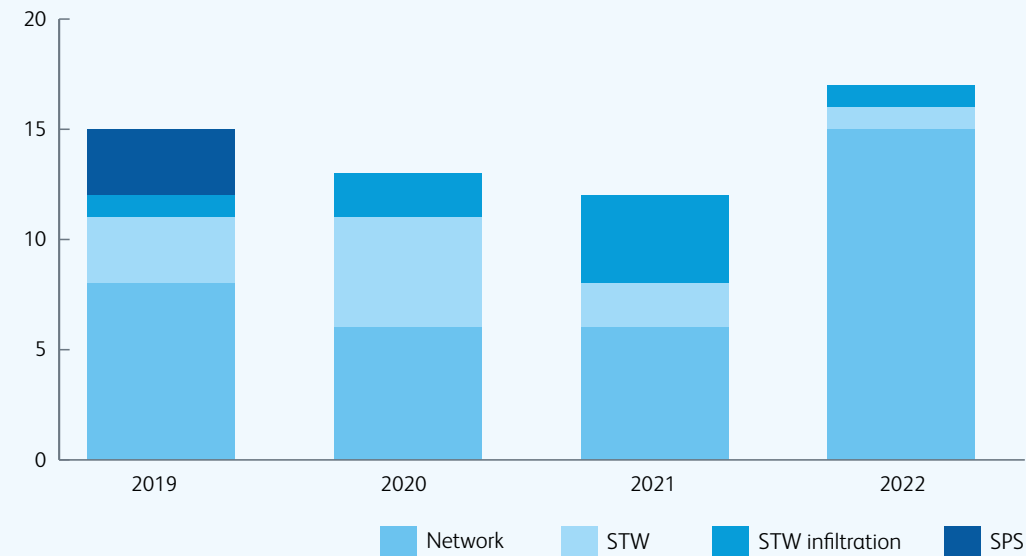


Figure 3 Serious pollutions by asset type 2019-2022

The two serious pollutions on sewage treatment works had separate causes. Clanfield Marsh is a site which continues to have groundwater entering the network, prolonging discharges from the site. We've carried out tactical sealing in the network of this site, and installed treatment capacity on the storm outfall, which is not common practice, to minimise the impact of having a sewage treatment works discharging into such a small, rural ditch. We have further investment planned in Year 4 to continue to reduce the groundwater entering the system. Our Chalgrove site received an untraced trade effluent through the network, which inhibited our biological treatment process. Investigations continue in this catchment to find the substance, but to date, this has not been possible.

Incidents from network assets have increased from six to 15. In part, this is due to continued challenges with blockages caused by unacceptable items in the sewer such as wet wipes and fats (Figure 5). We've increased the scale and specificity of our customer education programme to be focussed on the property where a blockage occurred, sending an information postcard direct to the impacted property which highlights the reason to 'bin it, don't block it'. This is a new approach that we launched in the summer of 2022, and we're assessing the effectiveness as we consider developing new stages. Of the eight structural failures in Table 5 below, 75% were due to a pipe defect and 25% were due to the asset being at the end of life (Figure 6). Six of the eight incidents occurred from rising main bursts, a significant change from previous years (1 in 2020, 0 in 2021).

Asset Type	Primary Cause	2019	2020	2021	2022
Waste Network	Structural Failure	2	2	0	8
	Blockage	2	4	5	5
	No implicated asset	2	0	0	0
	Third-Party	1	0	0	1
	Human factor	1	0	1	1
Sewage Pumping Stations	Equipment failure	2	0	0	0
	Alarm Failure	1	0	0	0
Sewage Treatment Works	Infiltration	1	2	4	1
	Equipment Failure	1	3	2	0
	Site Design	0	1	0	0
	Power failure	2	0	0	0
	Unconfirmed	0	1	0	0
	Third-Party	0	0	0	1
Total	All	15	13	12	17

Table 5 Serious pollution causes by asset type 2019-22

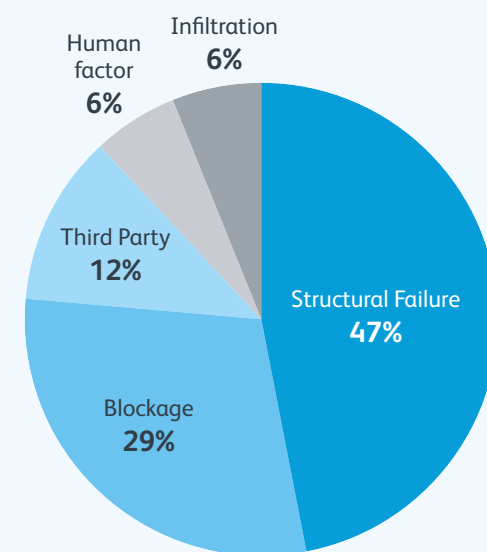


Figure 4 2022 serious pollution causes

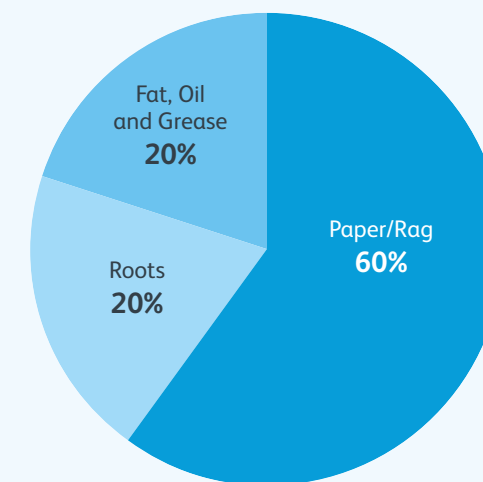


Figure 5 Serious pollution blockage root causes 2022

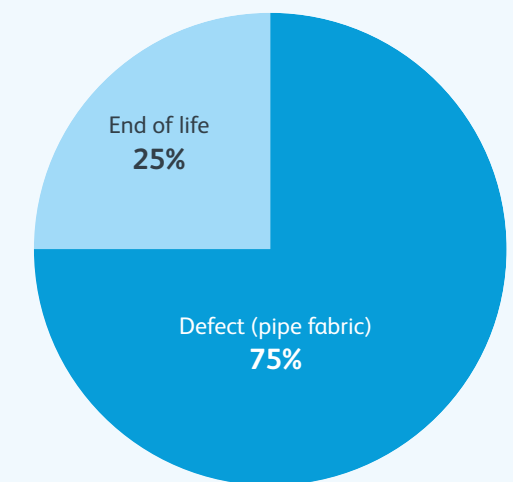


Figure 6 Serious pollution structural failure root causes 2022

Serious Pollutions Initiatives

Our initiatives focus on the root causes of our serious pollutions over the last three years. To reduce structural failures of our pumped sewers (rising mains), we have funded the replacement of four of the most problematic mains in this AMP. In the background, we're building our knowledge and understanding of these assets through an internal asset health working group, bringing a new cross-functional and data-led approach to how we manage them now and in the future. As well as continuing to carry out tactical activities such as analysing broken sections of the main to understand the reason for the failure, we've built our asset health plan for rising mains. We're starting the design work for those assets we wish to replace in the next AMP, to improve the speed of delivery. To progress our response to failures, we've been reviewing and updating flow management plans, as well as creating new ones where needed, so we can mobilise and minimise environmental harm. In 2022, we set up the air valve inspection programme and mobilised a team; they're actively surveying and maintaining existing valves, as well as making recommendations to install additional ones where needed. We continue to engage with our industry colleagues for best practices for monitoring these assets too.

With blockages still being the second-highest cause of serious pollutions, most of the waste network initiatives focus on reducing and removing blockages before they cause environmental harm.

The Smart Waste team is moving the next stage of their programme to focus on a catchment in Mogden, covering Twickenham and Hounslow. They'll use innovative new technology and determine if insights into pumping station behaviour and sewer level data can be used together to detect the risk of asset failure and escapes of sewage (potential pollutions) from the network (see case study). While we deliver this approach, we're taking steps to review

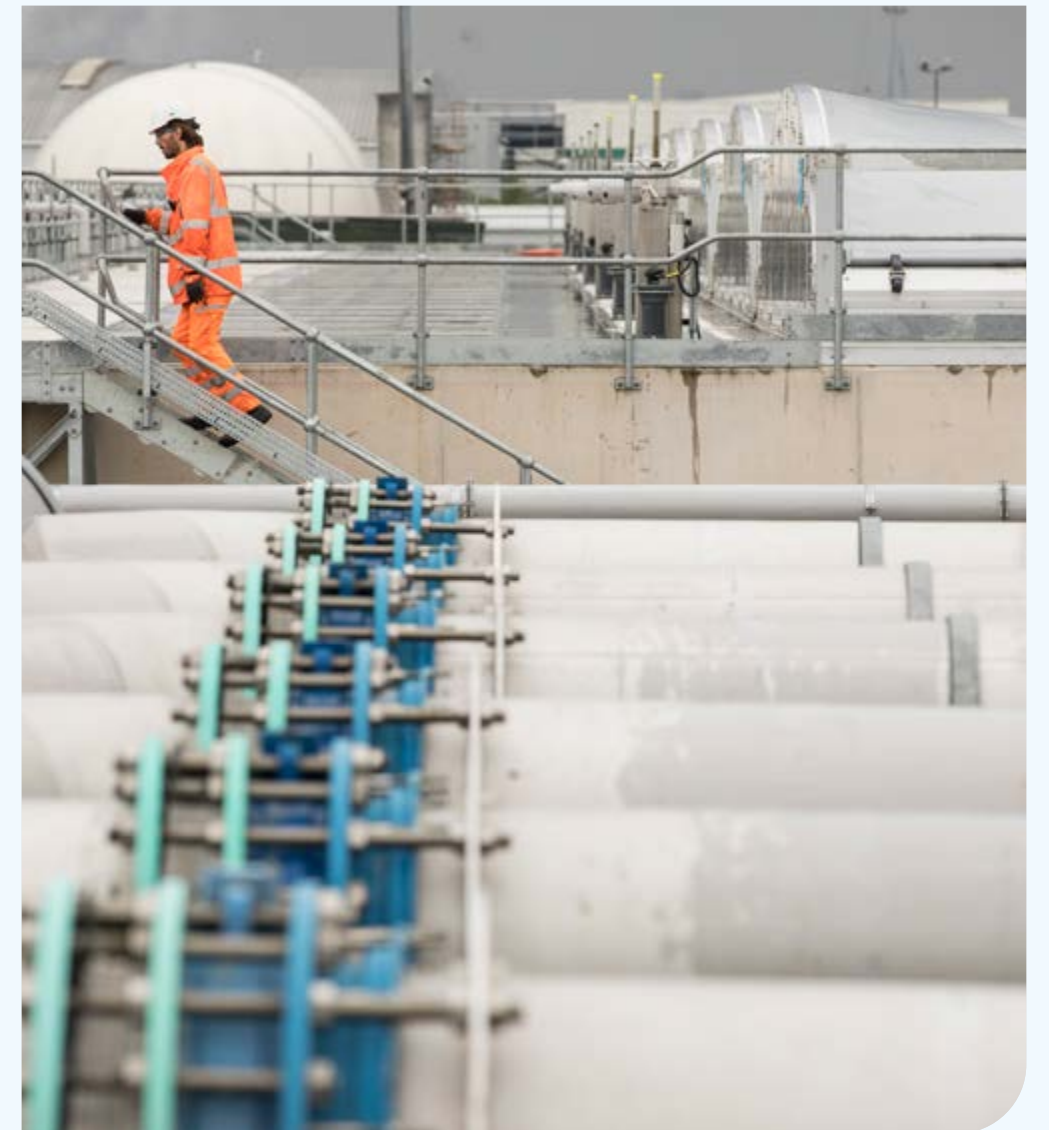
our pollution incident response, to attend quicker and reduce any harm that an escape may cause.

A number of sewage treatment works that have historically polluted, haven't caused serious pollutions in 2022, but a few continue to cause category three pollutions, so we maintain the focus on the delivery of the programme in this section, with nine core sites still on track for pollution mitigation work in this AMP. Other pollution risk sites from earlier studies (previously known as the top 13/top 26) are being assessed through the Waste Asset Assurance Programme (WAAP). We're waiting for the outcome of the site-specific process reviews to confirm the exact scope of work before we add the benefit to the plan. We've accelerated the installations of flow-to-treatment monitoring from 16 to 27 sewage treatment works which provide more accurate data into our digital tool known as discharge alert manager (DAM). With this data, we've seen an increase in category three pollutions, but it's enabled a faster operational response to prevent this from becoming a serious pollution.

Infiltration reduction activity has continued to progress well, reducing groundwater from entering our sewerage system through sewer relining and manhole sealing. This programme continues to roll on through the AMP, with surveys and corrective work as required. We continue to work with the Environment Agency to produce 'groundwater impacted system management plans' across sites affected by groundwater infiltration (as discussed in the introduction).

Our cultural programme is starting to embed, with pollution awareness training in place for our wastewater teams, training our wastewater managers in more detailed sewage treatment process modules. We believe this has contributed to the realisation of our self-reporting target for telemetered

assets. We're moving to a more open culture of reporting potential incidents and escalating problems with our equipment.



Serious Pollutions Initiatives

Initiative	Description	Yr 3 target	Yr 3 actual	Yr 4 target	Yr 5 target	Root cause alignment
Rising main replacement	Proactively rehabilitating/replacing the most problematic rising mains in our asset base.	12.7km of replacement at 8 locations over the next 3 years	0.8km at 3 locations (note target over 3 years)	14.2km in the next 2 years to total 17.7km in total over the AMP		Structural Failure
Mitigation response	Ensure that we have appropriate mitigation responses to environmental incidents within our incident management	n/a (new initiative in Yr 4)	n/a (new initiative in Yr 4)	<ul style="list-style-type: none"> Establish Technical Leads for pollution incidents Develop consistent essential knowledge (including site-specific and scenario-specific playbooks) Increase pollution response reporting and review mechanisms Increase the use of Thames Water assets and resources Centralise management of third-party suppliers 		All
Reduce Infiltration	Rehabilitate sewers and drains with full-length lining, and localised patch repairs to minimise groundwater entering the system.	6km of sewer rehabilitated 181 manholes sealed (remaining AMP target)	5.78km of sewer rehabilitated, 617 manholes sealed (this AMP so far)	Remaining AMP target: <ul style="list-style-type: none"> 7km of sewer sealed 400 manholes sealed/replaced 		Infiltration
Smart Waste Programme: Mogden catchment rollout	Installing additional monitoring, connecting our data & it's use in Mogden catchment, with a focus on protecting Wealdstone Brook – an ongoing hotspot/focus for river health with a high frequency of pollutions caused by blockages.	Mogden catchment rollout to focus on Wealdstone Brook	Rollout has started	Install monitors and integrate into existing smart tools		Blockages
Culture, training & pollution awareness	Expansion of training programmes into all operational areas. Including: <ul style="list-style-type: none"> Pollution identification and prevention Managers to undertake (MoWWT) Improved incident learning and communication. Business-wide pollution awareness campaign. 	Robust review and update of key operational activities, organisational policies & behaviours interventions	Delivered	<ul style="list-style-type: none"> Incident reporting roll-out to waste teams Pollution awareness and response training across all operational teams. Roll out in waste treatment and develop for clean water. Continuation of management of wastewater treatment training MoWWT 		Human Factor
Rising main air valve maintenance programme	Identify and maintain air valves in line with our Asset Management Strategy to reduce the risk of failure and associated environmental impact. Increased scope to high consequence mains (approx. 70) quarterly.	Quarterly visits for top 29 rising mains	Quarterly visits for top 29 rising mains completed	Continue to inspect and maintain air valves on high consequence rising mains		Structural Failure

Table 6 Serious pollution workstream initiatives

Pollution reduction theme key: Culture and behaviour Prevent Mitigate



Waste Networks

Waste Networks Pollution causes

Figure 7, below, outlines detail of the causes of incidents in the previous four years. The most significant cause of wastewater network pollution incidents continues to be blockages, at nearly 40%. This is due to items flushed into the sewer network which it was never designed to manage, including wet wipes and fats, oils, and grease (more details in Figure 9). The second largest cause of incidents was due to third-party behaviours, including misconnections, more significant blockages caused by fats, oils and grease from specific properties, foreign objects and accidental damage (see more in Figure 8).

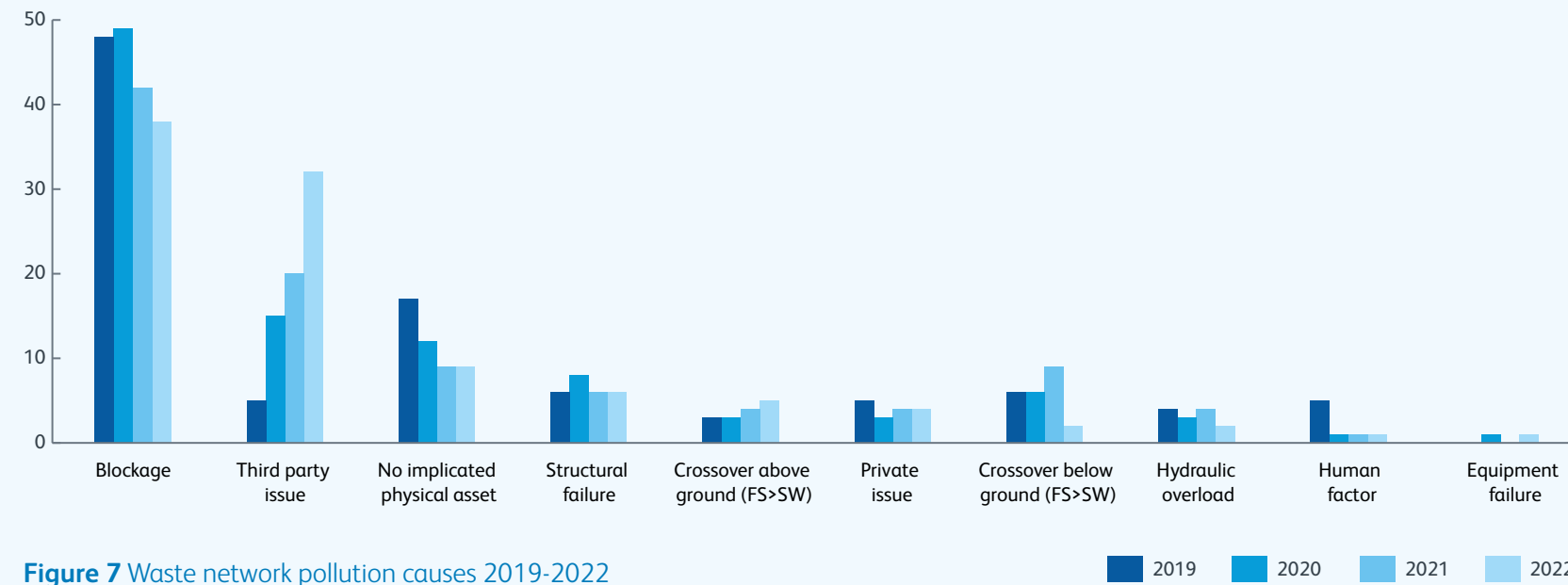


Figure 7 Waste network pollution causes 2019-2022

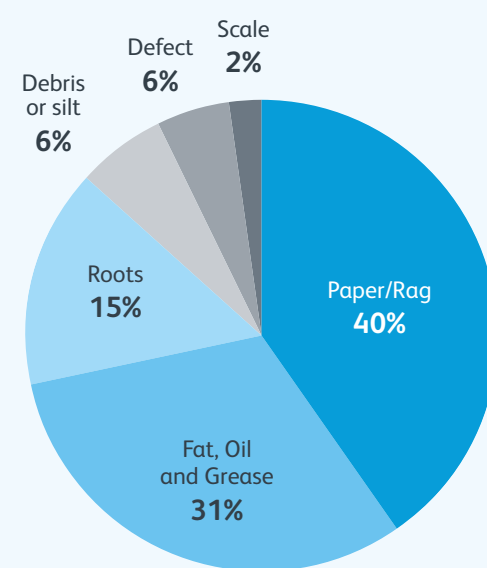


Figure 9 Network pollution blockage root causes 2022

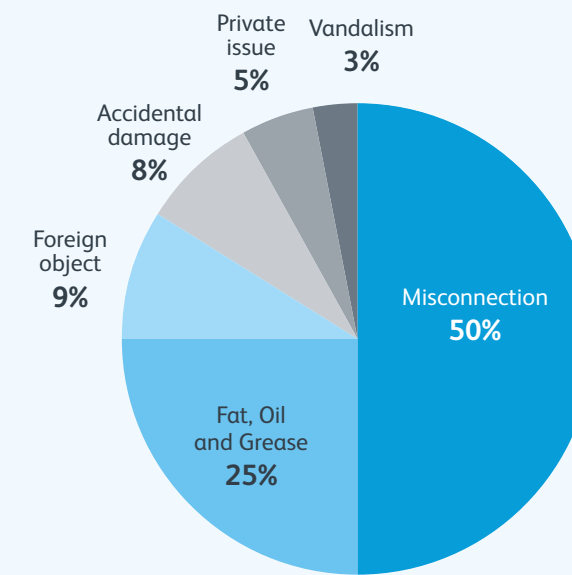


Figure 8 Network pollution third-party root causes 2022

Waste Networks Initiatives

Our initiatives maintain a blockage reduction focus with this continuing to cause most of our pollution incidents on the wastewater network. We continue to assess pollution risk across the network using geospatial hotspot mapping to ensure our proactive interventions are targeting the areas where they will benefit the most. The cause of the blockages remains to be products that we encourage our customers to throw in the bin, namely sanitary products, wet wipes, fats, oil, and grease. We have joined the Water UK 'bin the wipe' campaign and look forward to supporting the initiative as it gains pace. As mentioned above in the serious pollutions section, we've increased the scale and specificity of our customer education programme. We're focussing in on property level and, where a blockage happens, we send an information postcard direct to the impacted property, which highlights the reason to 'bin it, don't block it'. This is a new approach that we launched in the summer of 2022, and we're assessing the effectiveness as we consider developing new stages as we've heard that other companies have had success with this approach.

We've maintained our planned sewer cleaning programme, also known as hotspot cleaning, which has ramped up from 900km in 2019 to 1,500km each year in AMP7. We balance this with the reactive work that's carried out by the same contractors, but still achieved 1,600km in Year 3. In Year 4, we're managing our supply chain more closely to maximise the benefit of this activity. Data-led models continue to be used to identify those areas most at risk of blockage and consider the product causing the blockage as well as the frequency. The models also tell us where to focus our efforts for food service establishments visits, general good practice messaging to the public in social media campaigns, and more recently our household mailing initiative.

We continue to successfully deliver the surface water outfall programme, removing customer misconnected washing machines and sinks from surface water systems which cause deterioration in watercourse quality, as well as having an aesthetic impact on the local community. Misconnections in the surface water sewers are a common problem in urban areas and contribute significantly to overall network pollutions. Identification and tracing of these misconnections is done by the Thames Water Environmental Protection Team (EPT), liaising closely with Environmental Health Officers from local councils and the Environment Agency's local branches. Once traced to a property or properties, we work with the relevant customers to remove the offending misconnection.

In AMP6 this team successfully resolved 200 known polluting surface water outfall's (SWO). So far in AMP7 counting to the end of Year 3, we have resolved a total of 121 polluting outfalls, with 53 in the year, against a target for AMP7 of 200 which we are confident we will exceed. The team has grown during the AMP to match the scale of ambition and investigates innovations to improve tracing, such as more detailed and nuanced riverbank testing, as well as utilising innovative probes to identify and trace pollution. Additionally, with our partners and citizen scientists, Outfall Safaris have been expanded to cover the Thames Valley area as well as Greater London. Outfall Safari teams identify surface water outfalls with signs of pollution in urban areas. Volunteers use a standardised approach and scoring matrix as they walk and assess outfalls along a planned watercourse catchment. Once complete the results are passed to Environmental Protection Team to triage, where outfalls showing signs of misconnections are added to our programme (SWOP). Outfalls scoring higher and showing active pollution are reported right away by the volunteer for immediate investigation. The work of the Environmental Protection Team remains at the heart of the campaign to keep the urban waterways free from sewage-related pollution.

It's still challenging for us to predict exactly where pollutions will occur across the c.110,000km of public sewer that we operate, which is why we continue to expand our smart waste programme with the installation of sewer depth monitors, also known as blockage alarms, to reach our AMP7 target of having 18,500 installed. The intelligent data and learning from these devices, will eventually minimise the need for a customer to call in with a problem and enable us to respond before an incident occurs. Having the event duration monitors installed on sewer overflows will also feed into the smart waste IT platform to alert us to any discharges that should not be occurring and allow us to attend to mitigate any environmental impact. If we see an outfall in alert more than expected, we then add that outfall to the high frequency discharging combined sewer outfall programme, as shown in the table below, which is then assessed, modelled, and mitigated through the framework described as the storm overflow assessment framework.

Waste Networks

Initiatives

Initiative	Description	Yr 3 target	Yr 3 actual	Yr 4 target	Yr 5 target	Root cause alignment
Install blockage alarms (sewer depth monitors)	<ul style="list-style-type: none"> Increasing the estate of monitors from the original AMP7 target of 18,500 to 19,500, focusing on the most vulnerable water courses by mapping historic pollutions and blockages to sewers that are near sensitive water courses. (SLAM). Focus on ensuring the availability of monitors remains high and a better understanding of how we use them more effectively during wet weather. 	5000 monitors installed	5071 monitors installed	3500 monitors installed	3500 monitors installed	Blockages
Sewer cleaning	<ul style="list-style-type: none"> Maintaining the amount of sewer cleaning, surveying and CCTV activity and optimising the delivery to prioritise pollution reduction. Circa 1500km/year for the remainder of AMP7. 	1500km	1600km	1500km	1500km	Blockages
Customer education (household and non-household)	<ul style="list-style-type: none"> Working with food service establishments to install correct grease management. Includes restaurants, pubs, and cafes, care homes, hospitals, and educational facilities. Educating customers in hotspot areas of sewer abuse and encouraging behavioural change – through social media and our new targeted postcard approach. A marketing campaign to encourage behavioural change around the correct disposal of un-flushable items. Measuring customer engagement has changed from a small campaign to social media, hence the change in volumes. 	1500 compliant food service establishments	1539 compliance visits achieved	1500 compliant food service establishments	1500 compliant food service establishments	Blockages
		Engage with >1m customers	13m impressions made via Media Agent (Meta, YouTube) and 70k Impressions from Thames Water platforms of Twitter/Meta. Working with Water UK we have joined the 'bin the wipe' initiative	Continue to use social media to reach more customers Understand the benefit of our targeted customer approach	Continue to use social media to reach more customers	
Resolve misconnections	Surface Water Outfall Programme (SWOP) to resolve misconnections into the surface water sewers in hotspot catchments.	48 outfall signoffs	53 outfall signoffs	48 outfall signoffs	48 outfall signoffs	Third-party
Sewer rehabilitation	Using our data-led approach to identify and rehabilitate additional lengths of high-risk sewer through patch lining.	20km of rehabilitation	26.2km of rehabilitation	20km of rehabilitation	20km of rehabilitation	Structural failure

Investigate high-frequency discharging combined sewer overflows	Using the Storm Overflow Assessment Framework (SOAF): Investigation into high frequency discharging combined sewer overflows (CSOs).	53 sites completed all SOAF stages, 76 sites completed stage 1	115 sites completed all SOAF stages, 33 sites completed stage 1	18 sites complete to all SOAF stages (now absorbed by the Environment Act AMP 8 discharges plan)	n/a (now absorbed by the Environment Act AMP 8 discharges plan)	Prevention
Install & maintain network event duration monitors	Maintaining our event duration monitors within the agreed asset availability levels to ensure continuous data is recorded from these assets. This data will link with our smart tools to provide insight.	Ensure >90% asset availability	Delivered 90% availability	Ensure >90% data availability	Ensure >90% data availability	Blockages

Table 7 Waste network workstream initiatives

Pollution reduction theme key: Culture and behaviour Prevent Mitigate



Waste Treatment

Waste Treatment Pollution causes

In 2022, the largest causes of incidents from our sewage treatment works (STW) was equipment failure and blockages, as shown in Figure 10 below. The equipment failure root causes have been identified as being a mixture of end of life assets, process capacity issues or maintenance not being completed (see Figure 12). The blockages were because of paper, rag, debris, silt, fat, oil, and grease and non-completion of maintenance (see Figure 11). These causes then commonly led to incoming flow not being fully treated through our sites. The installation of additional equipment, such as storm tank alarms and flow-to-treatment flow meters has highlighted potential pollution incidents that we would not have previously seen on our control systems. While this is disappointing, as it has caused an increase in pollution numbers from sewage treatment works, it's the right thing to do for river health and the data is now informing our immediate response and investment plans.

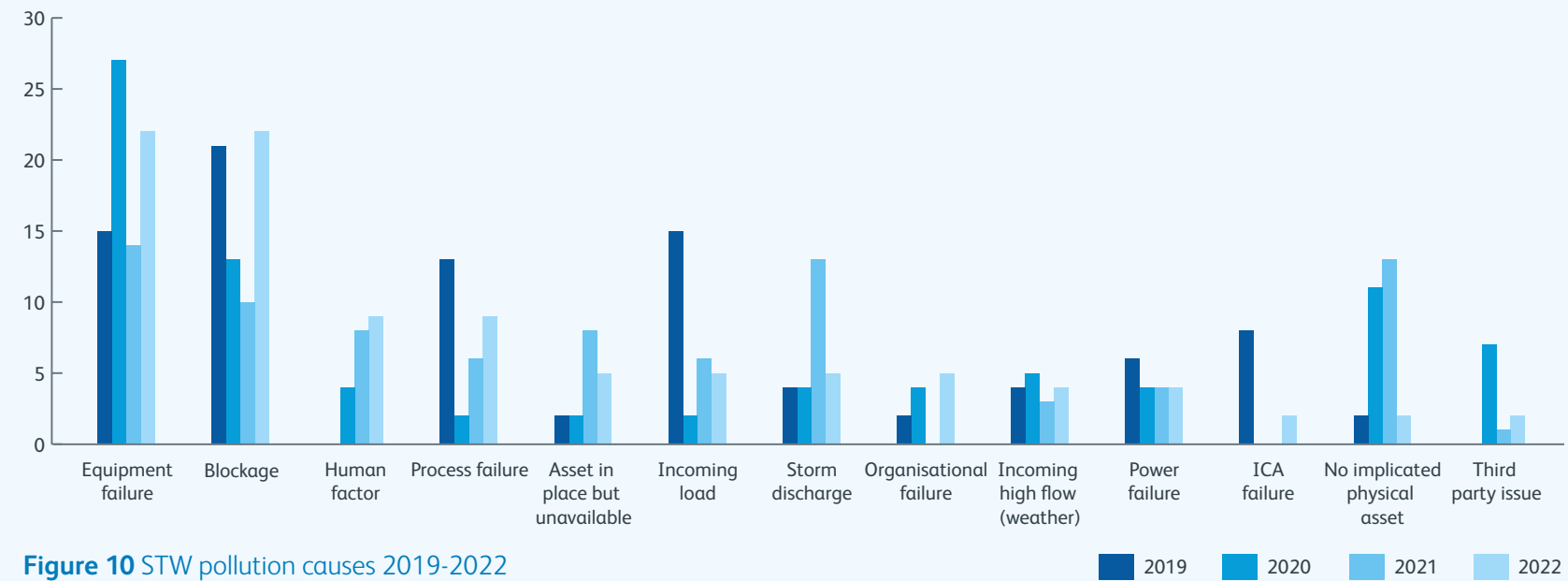


Figure 10 STW pollution causes 2019-2022

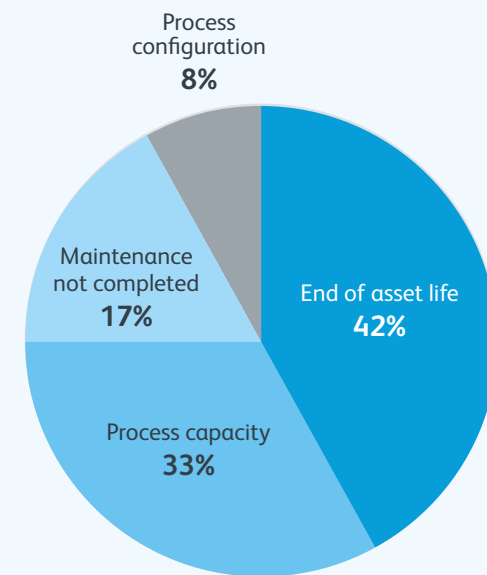


Figure 12 STW pollution equipment failure root causes 2022

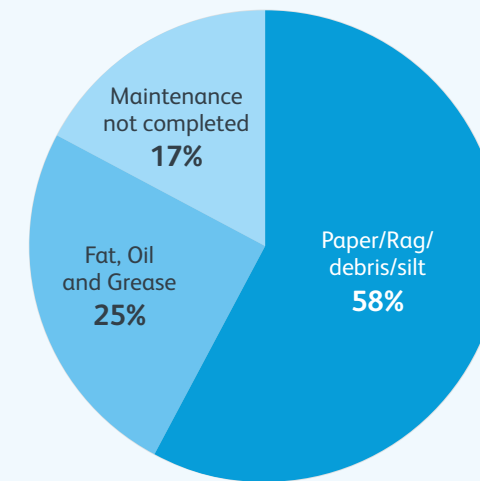


Figure 11 STW pollution blockage root causes 2022

Waste Treatment Initiatives

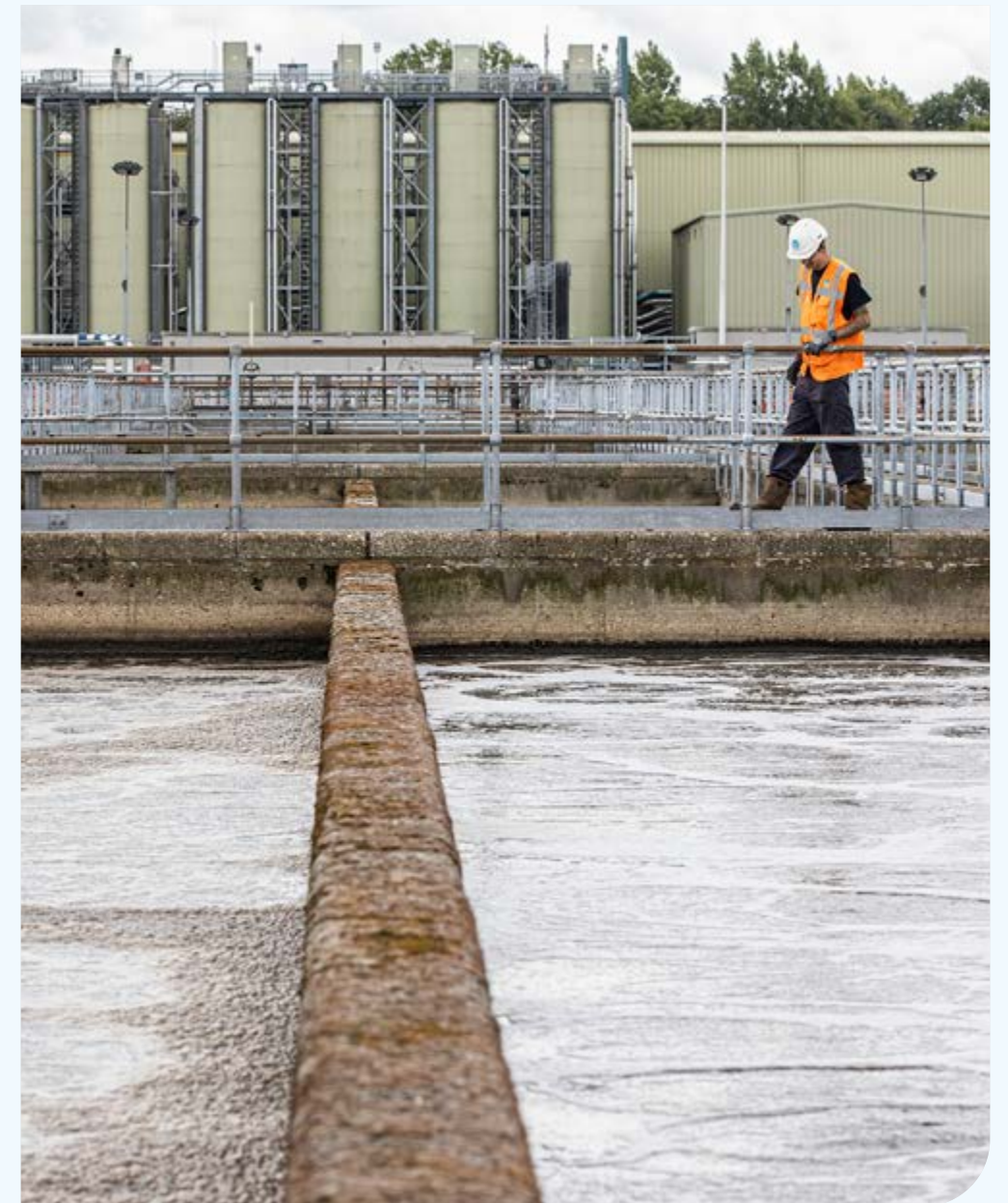
With equipment failure being a primary cause of sewage treatment works pollutions, we 've broken the data down into root cause information, in Figure 12. Further focus is required on the planned maintenance of assets with the new operational catchment teams now in place, to drive better performance of critical asset maintenance. We are reviewing the reporting tool as planned maintenance is hidden amongst reactive work in the current system, to drive an improvement in this area. Surface aeration assets were two of the three cases of assets reaching the end of life, which is again why we want to move to focus on critical equipment maintenance. Within process capacity root cause, one site specifically featured twice which currently has an investment programme in place to upgrade the process capacity by 2025. The other two sites highlighted the need for better critical asset maintenance and the need for a boxed spare of a bespoke pump solution.

Incidents caused by blockages through the sewage treatment process have increased this year, as shown in Figure 11. These are due to unwanted products in our sewers flushing through to the treatment sites. We continue to deliver our inlet screen maintenance programme to remove these products as efficiently as we can. With supply chain cost increases we delivered just under the target to stay within the budget in 2022. The customer education programmes listed above in the waste network section of the document, also work towards a reduction in products in sewage, with the aim that one day we will also see less at our sites as our customers use the bin more, instead of the toilet.

The smart waste programme on our sewage treatment works is directly linked to the installation of storm tank filling monitors. Storm tank installations were targeted at 27 sites, and we've accelerated our AMP7 programme in Year 3 and 58 have been successfully installed. This equipment will aid the speed of

response to potential site incidents related to flow coming into the sites. We continue to bring forward these installations to complete our AMP7 target of 73 early in Year 4. The smart waste programme tool that uses the flow and storm tank data is called the discharge alert monitor, or DAM tool. When we originally wrote the business case for this initiative, as mentioned already, we predicted it would reduce pollutions, but instead, it has alerted us to previously unseen issues on some sewage treatment works. This information is now being used to make changes on sites and create business cases where needed to invest in our sites to prevent repeat incidents.

Investment in our sites continue through the following initiatives to increase asset resilience and process capacity, we did have these broken down into separate sections in last year's PIRP, listed as 'WINEP' output at 28 sites in AMP7 against the original view of 33 and 'go to green' delivering 21 sites in AMP7. With the waste asset assurance programme (WAAP) scope emerging to deliver more flow to treatment compliance, and the net impact of this additional investment positively impacting pollution reduction, we have combined the three initiatives into one line of 'Improve flow compliance'. We have continued to track the progress of our top 26 investment plans separately as this was an initiative from Year 1 in the plan, and we are still aiming to improve nine sites directly through this programme, as well as deliver improvements through other funding lines, such as WAAP above.



Waste Treatment Initiatives

Initiative	Description	Yr 3 target	Yr 3 actual	Yr 4 target	Yr 5 target	Root cause alignment
Improve flow compliance	Waste asset assurance programme: Pathfinder programme to deliver compliance with environmental permits in wastewater, includes go-to green & WINEP	n/a	n/a new in year 4	Targeting improvement at c73 sites (remaining AMP target)		Process design
STW site investment	Programme for capital investment at 13 + 13 STWs identified as most polluting on historical data.	Deliver the top 13 sites (remaining AMP target)	Design and build in progress for 9 sites	Deliver the top 9 sites (remaining AMP target)		Process design
Smart Waste Programme: Install storm tank monitors	Installing flow monitors to our storm tank inlet and outlets to seek better data on their use and respond to early filling events.	Installations at 27 sites	Installations at 60 sites complete	Installations at 13 sites	n/a commitment delivered	Equipment failure/ Process design
Critical asset maintenance of inlet screens	Replacement/refurbishment of inlet screens: a critical asset group, to ensure effective screenings removal and reduce blockages throughout the site.	50 screens	45 screens	31 screens	21 screens	Equipment failure
Routine planned preventative maintenance	Focus on achieving delivery of planned maintenance activities based on equipment criticality.	Asset performance is improved with fewer failures	Not yet delivered benefits	Asset performance is improved with fewer failures		Equipment failure
Smart Waste Programme: Optimise and respond to Discharge alert manager (DAM)	Using certified inlet flow meters and storm tank filling and discharging information to respond to discharges to the environment. This is not a pollution reduction initiative but highlights potential incidents.	Build and trial digital tool	Digital tool built and trialled	Stabilise, optimise and respond		Equipment failure

Table 8 Waste treatment workstream initiatives

Pollution reduction theme key: Culture and behaviour Prevent Mitigate



Sewage Pumping Stations

Sewage Pumping Stations Pollution causes

In 2022, the most significant cause of incidents from sewage pumping stations (SPS) was power failure caused by the grid (41 %) as seen in Figure 13. The second largest cause was equipment failure caused by the root causes of fat blockages, impeller failure and human factors (see Figure 14). Having carried out a deeper review of our data we have found some control system failures in our equipment failure categorisation in our database, so it is a more representative view to combine this data with instrumentation, control, and automation, known as ICA failures. We have provided detail below on how we intend to improve this in the future.

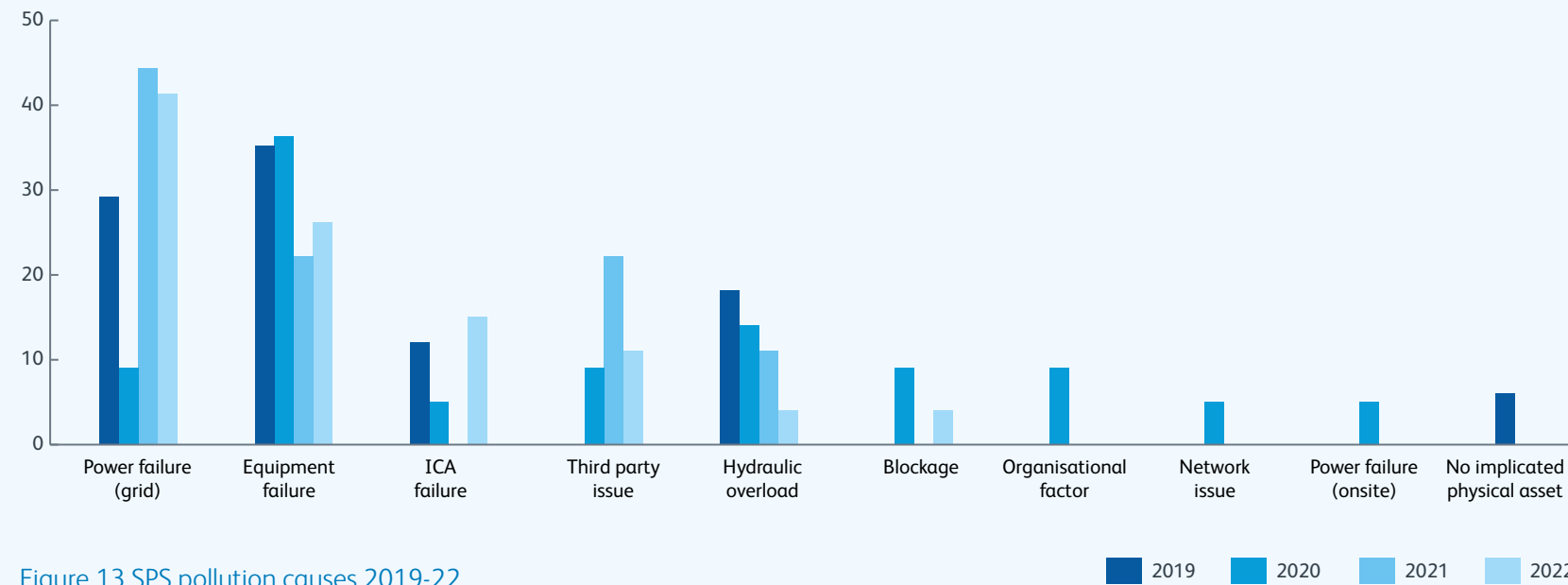


Figure 13 SPS pollution causes 2019-22

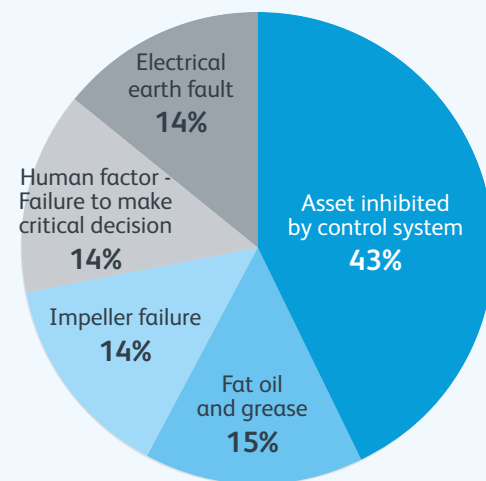


Figure 14 SPS pollution equipment failure root causes 2022

Sewage Pumping Stations Initiatives



Our sewage pumping station interventions remain focused on improving resilience against power and asset failure with these continuing to be the biggest contributors to our pollution incidents for this asset type. We are liaising with the electricity provider to remind them to give us timely notice for planned power interruptions, to allow us to make alternative power provisions, but this is still not a process that works well within their organisation. We monitor sites with higher-than-expected failure rates, as well as their potential impact of failure, to create business cases to install new or replacement standby generators if needed. We've been doing this activity over several years and have fixed standby generators over 200 of our highest-risk sites.

Equipment failure is still a high cause of pollutions from sewage pumping stations with the root cause data showing a mixture of issues, including control systems. The control systems failure could also be classified as an ICA (instrumentation, control, and automation) failure in our database, so we need to do some work to help our teams classify each case consistently as when we add these two causes together, they are in the region of 40% of our failures. We have three initiatives in flight to address these causes and reduce the frequency of equipment and control associated failures: the stressed site reporting tool, the asset improvement programme, and the outstation & controller replacement programme.

The stressed site report is an operational data set that monitors, and records specific conditions about our pumping stations including mains supply failure and excessive pump runtime. This data helps highlight sites that need an operational visit to check that the pumps are operating as they should be. This is a proactive intervention programme, to attend the site before a failure occurs. Building on this, the smart waste programme for sewage pumping stations in Year 3 has focused on creating data models to understand the

performance of our assets, building on our already successful pumping station analytics. This insight can now be used alongside our growing estate of sewer-level monitors, and combined sewer overflows (CSO), allowing a greater understanding into the wider catchment. This is where the Mogden rollout (Case Study 2, below) will pave the way, as our installation plan will place sewer-level monitors on all laterals to pumping stations and CSOs, giving us a fully connected system.

The asset improvement programme has suffered some delays in getting mobilised in year 3, this is because the original business case was designed to employ electricians to complete the activities in-house. We started the recruitment for these roles, and due to the lack of available candidates, the delivery of any in-house work has been very limited. To ensure continued progress, the strategy has been amended and the work is in the process of being contracted out which will take us to 45% completion by the end of Year 4. As this work was intended to be done under the efficiencies of in-house electricians, the project will now run to an extended programme and with additional cost, so we have amended our timeline. We have, however, successfully delivered all the power resilience elements of this programme. The programme that sits alongside the asset improvement programme is the outstation and enhanced controller rollout, which has seen similar delays in securing suppliers through a framework agreement. With this now in place the programme continues to be tendered and delivered in planned phases. This has secured the deliverable scope of this large and complex programme, updating our control systems on sites, so we have full visibility of them at our control rooms, and they can provide the data needed to move forward our smart waste catchment programme too.

Sewage Pumping Stations Initiatives

Initiative	Description	Yr 3 target	Yr 3 actual	Yr 4 target	Yr 5 target	Root cause alignment
SPS Asset Improvement Programme	Backup control, power resilience and wet-well levels. Capital programme to improve the resilience of SPSs to power-related faults, backup controls and auto-restart modifications.	Deliver 30% of the programme	23% of the programme delivered	Deliver 45% of the programme	Deliver 70% of the programme	Power failure
SPS Power Failure Investment	Increased funding for local power resilience (standby generators) at high-risk sites	5 sites	5 sites	5 sites	5 sites	Power failure
SPS Stressed site reporting	Proactive identification of deteriorating site telemetry metrics (energy profile, backup control usage) to identify underlying performance issues and stage an intervention before asset failure.	85% triage completion on stressed sites	97% triage completion on stressed sites	85% triage completion on stressed sites	85% triage completion on stressed sites	Asset failure
SPS Outstation and Enhanced Pump System Controller replacement	Programme to modernise outdated outstation and EPSC units to improve SPS operating control, pump efficiency, station resilience and reliability.	125 enhanced pump system controllers 195 Outstation Replacements (remaining AMP target)	9 enhanced pump system controllers 25 Outstation Replacements	268 enhanced pump system controllers 398 Outstation Replacements (remaining AMP target)		Asset failure

Table 9 Sewage pumping station workstream initiatives

Pollution reduction theme key: Culture and behaviour Prevent Mitigate

Clean Water Pollutions performance



Clean water category 3 incidents have increased to 66 (from 33 in 2021). There were no serious pollution incidents in 2022, a continued trend since the start of AMP 6 (see table 3). The distribution of our incidents by asset type continues to see the majority (98%) occurring from our clean water network as shown in table 10. The biggest cause (86%) of pollutions is pipe failure below ground (see figure 16). We saw more than a 50% increase in burst mains in 2022 compared to 2021 due to prolonged hot weather causing a high soil moisture deficit (highest since 2010) coupled with increased pressure on the network. We believe this coupled with the work done as part of our license to operate coaching programme, which has improved reporting potential environmental impact, explains the increase in our numbers this year.

Asset Type	2019	2022	2021	2022
Water Distribution System	47	39	33	65
Water Treatment Works	1	0	0	1
Total	48	39	33	66

Table 10 Cat 1-3 clean pollution incidents by asset type 2019-2022

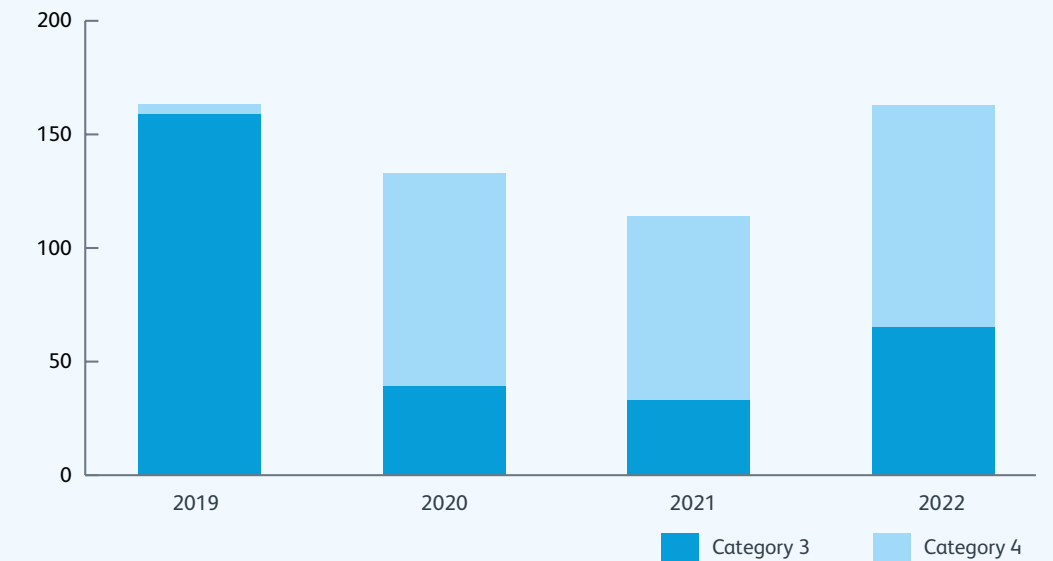


Figure 15 Clean Water Cat 1-4 Pollutions 2019-2022

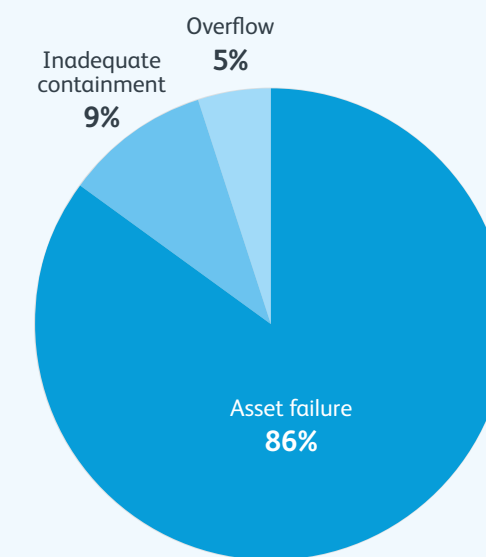


Figure 16 Cat 1-3 clean pollution causes 2022

Clean Water Initiatives

As pipe failure continues to be the biggest cause of our clean pollution incidents our initiatives continue to focus on burst reduction. We also recognise the importance of behaviour when it comes to pollution reduction across all asset types, the roll-out of pollution awareness training across our Water business areas is included in the training and culture initiative in the serious pollutions workstream.

Initiative	Description	Year 3 target	Yr 3 actual	Yr 4 target	Yr 5 target	Root cause alignment
Trunk main leakage (TML) programme	Active leakage control on trunk mains is an essential component of asset maintenance to reduce the likelihood of catastrophic failure and manage water losses from the network.	120 repairs	120 repairs	120 repairs	120 repairs	Asset failure
Calm Systems Strategy	A data-driven approach to deliver calmer water supply operation, focussing on mitigating pressure transients and high-pressure variance with a focus on reducing the number of bursts per year.	75 leaks/ bursts	32 leaks/ bursts	75 leaks/ bursts	75 leaks/ bursts	Asset failure
Trunk Main Valve Check Programme	Valve checks are undertaken on all valves required to isolate and operate the trunk main network. These include isolation, flushing, emptying and hydrant valves and may not necessarily be directly on the trunk main asset itself.	12000 valve checks	12088 valve checks completed	8000 valve checks	8000 valve checks	Asset failure
Air valve maintenance programme	Programme to proactively maintain air valves to reduce burst frequency.	500 air valves	200 completed (recovery in years 4 & 5)	600 air valves	600 air valves	Asset failure
Distribution mains valve repairs	Repair or replacement of distribution valves ensuring rapid isolation when bursts occur.	2500 valve repairs	2473 valve repairs completed	2500 valve repairs	2500 valve repairs	Asset failure
Smart Valve	Consider the roll-out of technology to assist valve operators to ensure valve operations do not harm the network.	Decision on roll-out	Product review underway, final decision due Q1 Yr4	TBC (based on decision)	TBC (based on decision)	Asset failure
Rapid site attendance	Performance management compliance of site attendance time to ensure rapid isolation of bursts	Understand baseline	Baseline understood	Complete trial	TBC (based on trial outcome)	Inadequate containment
Pressure Reducing Valve (PRV) alarm thresholds	Identifying a low-pressure fault indicating a potential burst or an interruption to supply has occurred	695 PMAs	Alarms implemented for 711 PMAs	Test/validate alarms	n/a (initiative complete)	Asset failure

Pollution reduction theme key:



Culture and behaviour



Prevent



Mitigate



Case studies

Case studies

Infiltration reduction success story: Lambourn, East Shefford catchment

Historically the Lambourn Valley area in the East Shefford catchment experienced mass infiltration and inundation causing the waste network to breach amber and red groundwater risk thresholds leading to discharges into a chalk stream within a site of specific scientific interest (SSSI) area. Following the winter of 2019/20, our teams set out to work to understand the route the water was taking to enter our network. We completed lining and sealing improvement activity in the Summer of 2020 which was tested by the wet winter of 2020/21.

Following learning from this period we deployed a filter unit to further mitigate the impact of wet weather and continued to deliver lining and sealing improvements throughout the summer of 2021. The winter of 2021/22 was favourable weather-wise meaning that the filter unit was not required but a welcome contingency for the residents and stakeholders we have engaged with throughout.

We continued to complete further improvement works in the summer of 2022 bringing the total to over 1km of sewers sealed and over 30 manholes sealed. Winter 2022/23 delivered plenty of wet weather with 192% LTA rainfall in November, 111% in December and 113% in January. This caused groundwater levels to rise rapidly in the Lambourn catchment and the threshold was breached in mid-January and has continued to be above amber since then. However, due to the improvement and mitigation put in place, there has been no impact to the watercourse.

A knock-on impact of this work has been that we're also pumping less because of the reduced flows meaning improved efficiency and extending the life of our assets through less wear and tear. The removal of surface water also means that our STWs are receiving less flow minimising the risk of inundation during wet weather.

Underpinning the success in eliminating harm to the water course in the Lambourn Valley has been the approach taken to work with residents and stakeholders to bring about these improvements allowing them to build their trust in Thames Water and help us to take ownership of the problem. Teams from both sides have collaborated to go the extra mile and work together to clear surface water run-offs leading to the village to disperse the water preventing large amounts of silt from reaching the chalk stream. You can read more about this story and see a video of relining in action [here](#).



Case studies

Smart catchment management at Mogden

The Mogden catchment covers Northwest London and treats sewage from some large key sites including Heathrow Airport, Wembley Stadium and Twickenham Stadium. The sewage works serves nearly around 2.3 million people and is one of our largest waste sites. The effluent from the works flows into the river Thames at Isleworth Ait and covers some important ecological sites of interest including Headstone Manor, Bentley Priory SSSI and Osterley Park.

We've been developing a new way of working in the Mogden catchment using smart tools to deliver a digital solution which can combine pumping station analytics, sewer level monitor data and weather data so that we can fully understand how the catchment is performing. Mogden embeds all our waste functional specialisms in teams at a catchment level. This includes treatment, pumping and network assets. It's the showcase area for catchment management and thinking – from our frontline operations through to investment planning and delivering capital investment. Our catchment team has been in place since November when we reshaped our operations into two regional areas of Thames Valley Home Counties, and London. Primarily, it's all about blending our people, our data, and our technology to deliver for our communities and the environment, getting us closer to the customers that we serve.

In March, we started installing 700 smart waste monitoring devices in a small part of the area at Wealdstone Brook. Early indicators show us that the installs are going in the right direction with the discovery of 11 blockages being identified so far allowing for proactive clearance. Along with other smart waste devices, we believe these will make a significant difference in the performance of the Mogden catchment. They provide us with a holistic view and important data on how the network is performing. This will help us become more proactive in our response to blockages, reducing the risk of them turning into something more serious such as pollution or flood. It's a huge step towards being closer to our customers as we develop the ability to get out to them to clear a blockage and let them know about it before they notice an impact in their service.

Further investment into Mogden is being delivered to map the network. This work is pivotal to ensure that our infrastructure is captured and offers more understanding and visibility. The current investment in surveying will mean that there is a dedicated team to spend six months mapping the network.





Governance

The pollution incident reduction plan is a live process where data analysis of the performance of interventions is robustly monitored monthly against the plan. Strategies are continuously reviewed and adjusted to ensure interventions deliver as outlined and progress is communicated regularly. The plan continues to be developed to achieve its overall aims of reducing total pollutions by 41 % and trending toward zero serious pollutions.

Governance

Monitoring and measurement of the progress of the programmes within the PIRP and performance against the targets will take place on a monthly cycle at the PIRP working group level and the Environmental Governance Board. Each quarter an update on the PIRP progress is shared with the board which monitors performance and holds the management team accountable against the identified milestones and targets. Figure 19 shows the full governance process.

Plan development governance

While the PIRP is continually reviewed via the governance laid out above, a more detailed review is carried out annually ensuring that our next iteration of the plan considers broader context and strategy. The governance process for this is:

External review of performance

Overall performance will be monitored at the joint Environment Agency & Thames Water quarterly operational performance and strategic meetings. Progress and effectiveness of the plan will be reported to the Environment Agency Account Manager and Regional Lead Officers on an annual basis. A copy of the plan is published on our external website.

Industry best practice sharing

The performance of the plan, particularly the outcomes of interventions against general targets, is being shared with other Water and Sewerage Companies through the National Pollution Reduction Task Force. This group meets monthly and has been set up to ensure sharing of best practices and knowledge across the industry to reduce pollution incidents.

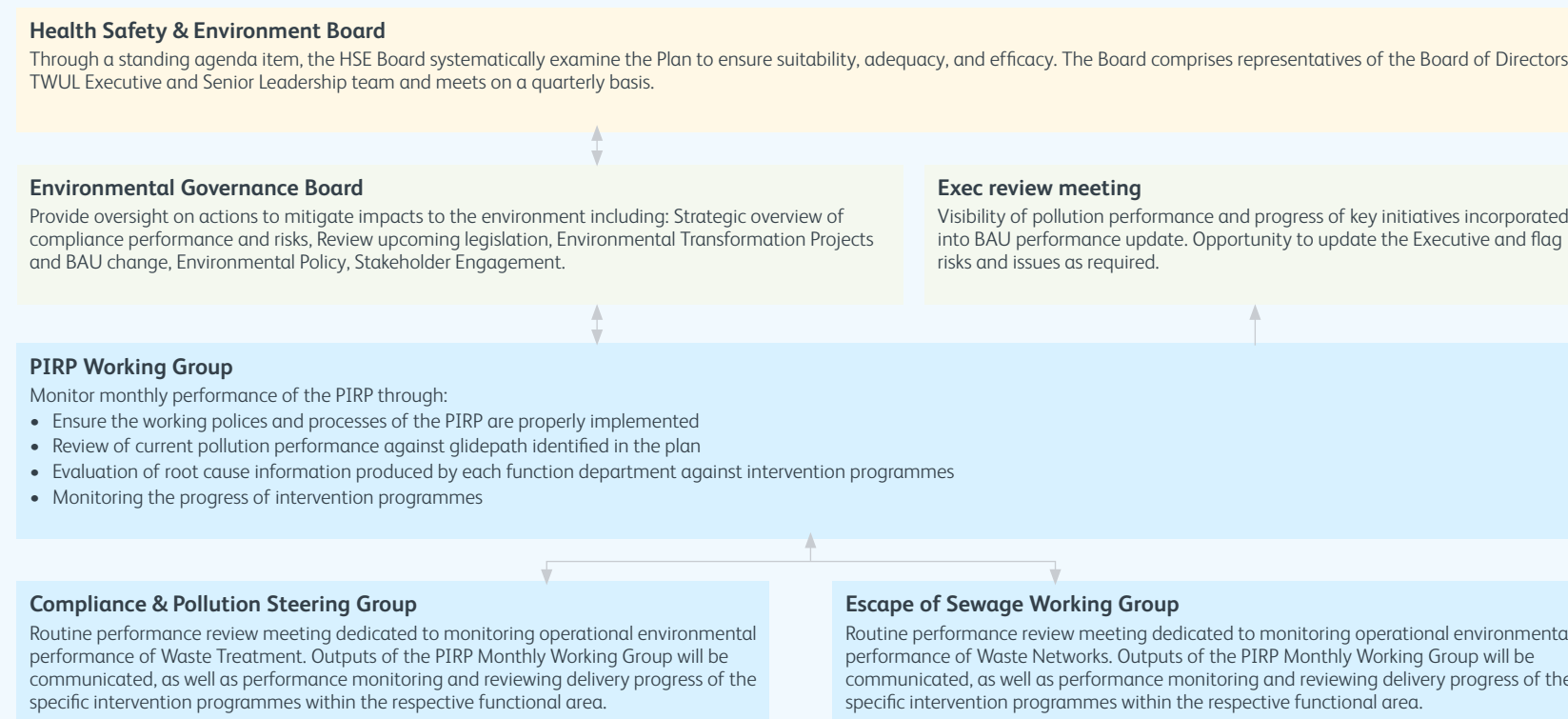


Figure 19 PIRP Governance Structure

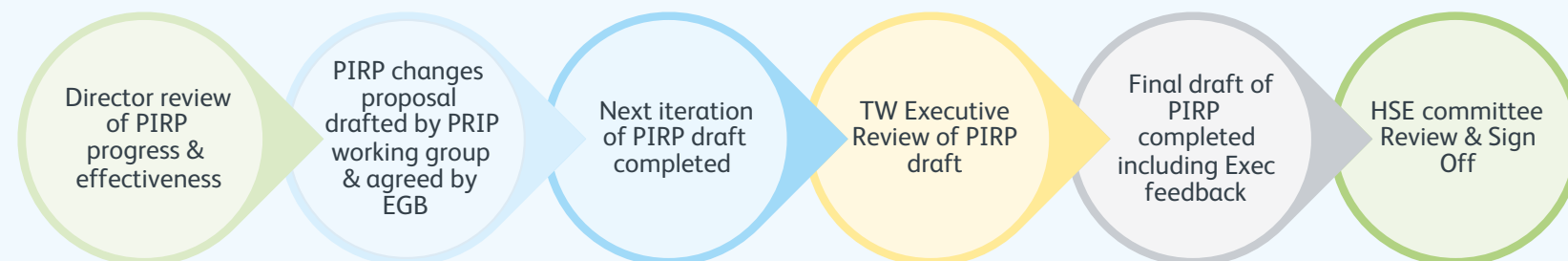


Figure 21 Plan development governance process



Appendix

Appendix

Retired Initiatives

Workstream	Initiative	Description	Yr 3 target	Yr 3 actual	Reason not included in plan for Year 4/5
Serious Pollutions	Flow monitoring	Compliance to flow permit conditions with the installation of MCERT flowmeters to accurately measure flow to full treatment on STWs. The work to ensure sites are compliant is captured in the waste treatment section below under WAAP.	Meeting flow to full treatment 17 sites	Meeting flow to full treatment 27 sites	Initiative complete – brought forward delivery of years 4 and 5 output into Year 3
Waste Network	Interceptor removal	Inspection, cleaning/removal of interceptors that have been causing blockages in our sewer network. (Interceptors contribute to 20% of all blockages).	Trial underway to assess complexity	Trial complete	Having done a deep dive analysis on the benefits of this initiative as part of the trial we're not seeing pollution reduction as expected, the benefit comes to customers impacted by sewer flooding
Waste Treatment	Go to Green	Capital investment for sites requiring asset upgrades to meet flow requirements. Target now 30 in this AMP as some sites superseded.	30 sites (AMP target)	19 sites planned for remainder of AMP	Incorporated into the scope of the Waste Asset Assurance Programme listed as an initiative in the Waste Treatment workstream
Waste Treatment	WINEP storm tank capacity	WINEP storm tank capacity increases to meet the requirements of environmental permits based on incoming flow. Total sites over the AMP = 33.	Increased storm tank capacity at 33 sites (AMP target)	Off track (28 sites planned for remainder of AMP)	Incorporated into the scope of the Waste Asset Assurance Programme listed as an initiative in the Waste Treatment workstream
Waste Treatment	SOM Review Programme	Review of all STW SOMs with updates made to process descriptions and site-specific factors, to ensure the operation is aligned with the manual.	To rolling review programme – 72 per year average	61 issued for review and update	Not found to tangibly reduce pollution incidents
Waste Treatment	Alarm management/reduction	Several workstreams including a new wet weather operating mode suppression, alarm reporting, managing down repeat alarms and alarm testing.	Trend a reduction of repeat alarms with a target of 14,000 as an average in Year 3	Off track (mitigation in place to recover)	Not found to tangibly reduce pollution incidents
Waste Treatment	Black-start generator maintenance plan	Programme of stand-by generator testing to ensure assets operate when a power failure to the site occurs.	Programme of testing at 152 sites	Testing at 155 sites completed	Programme now fully integrated into business as usual, benefits form part of baseline performance
Waste Treatment	Power interruption tests	Power interruption tests on sites with no standby generator to understand the auto-restart functionality of our assets.	Deliver to programme	Delivered (191 completed)	Programme now fully integrated into business as usual, benefits form part of baseline performance

Appendix

Retired Initiatives

Workstream	Initiative	Description	Yr 3 target	Yr 3 actual	Reason not included in plan for Year 4/5
Waste Treatment	EMS site audit programme	Inspection programme for permitted assets to identify environmental risk and generation actions to resolve before an incident occurs.	20 site audits	9 site audits carried out before change in approach. 26 audits carried out in new format	Combined into senior management health, safety, and environment audit (no longer standalone)
Waste Treatment	Root cause analysis	As part of the review of this document, we have identified that we need to make changes to our reporting system to enable clearer mapping of root causes across our estate and consistently carry out Direct-led environmental incident reviews.	Improved root cause analysis and line of sight to the PIRP initiatives	Delivered	Initiative complete
Waste Treatment	Mid process monitoring	Assess the benefit of the equipment	Install 40 monitors	39 monitors installed (23 connected to the control room)	Initiative complete
Waste Pumping	Routine PPM completion	Completion of PPM to ensure optimum equipment reliability and performance and reduced risk of failure.	Deliver >95 % of the plan	Delivered 99.2 % sustained performance	Programme now fully integrated into business as usual, benefits form part of baseline performance
Waste Pumping	Pump availability	Activities of work in place to reduce the number of failures from network pumping stations.	>97.2 %	97.84 %	Programme now fully integrated into business as usual, benefits form part of baseline performance
Clean Water	Licence to operate for Water Production	Inclusion of pollution awareness training into the License to Operate (LTO) framework.	Addition of training content into	Delivered	Future activity in this space is part of the holistic training initiative in the serious pollution workstream



Glossary

AMP7	The seventh asset management period planned by the UK water industry and runs from 2020 to 2025
Category 1 pollution	Major, serious, persistent and/or extensive impact or effect on the environment, people and/or property
Category 2 pollution	Significant impact or effect on the environment, people and/or property
Category 3 pollution	Minor or minimal impact or effect on the environment, people and/or property
Category 4 pollution	No impact on the environment
CSO	Combined sewer overflows are used to prevent sewers flooding our homes, gardens, and streets. They act as a safety valve, diverting some of the rainwater and foul water into watercourses
Discharge	A storm discharge is a mixture of rainwater and untreated sewage, released by storm overflows into watercourses. This happens during heavy or continued rain to prevent sewer flooding.
EDM	Event Duration Monitors use sensors to monitor the level of flow in a tank or sewer. They're installed on storm overflows. The sensor triggers an alert when a certain level is reached, indicating a storm discharge is happening. EDM monitors measure the start and end time of any flow. They don't measure the volume of the flow itself
FOG	Fat, Oil and Grease
GIS	Geographic Information System
Interceptor	A drain interceptor is a tank installed within pipework to collect and hold contaminants, allowing the remaining wastewater to be discharged safely into the main sewerage system
Ofwat	The water services regulation authority
PIRP	Pollution incident reduction plans are a regulatory requirement which all Water Companies must have outlining the actions being undertaken to improve pollution performance
PR24	Ofwat's Price Review 2024
Rising main	A rising main is a sewer which is pressurised using pumps to move sewage uphill
SOAF	Storm Overflow Assessment Framework is an initiative that investigates high frequency discharging combined sewer overflows (CSOs).
SPS	Sewage pumping stations (sometimes referred to as Waste Pumping) pump wastewater from pipes in the network to Sewage Treatment Works
SSSI	Sites of Special Scientific Interest are those areas of land and water that we consider best represent our natural heritage in terms of their: flora, fauna, geology, and geomorphology
STW	Sewage treatment works (sometimes referred to as Waste Treatment) treat wastewater turning back into water acceptable for returning to the river
WINEP	Water Industry National Environment Programme is the programme of actions water companies need to take to meet statutory environmental obligations, non-statutory environmental requirements, or delivery against a water company's statutory functions
WISER	Water industry strategic environmental requirements. A document providing strategic steer to water companies on the environment, resilience, and flood risk for business planning purposes



It's everyone's water