

POLLUTION INCIDENT REDUCTION PLAN

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EXECUTIVE SUMMARY

This Pollution Incident Reduction Plan (PIRP) sets out our plan for 2020-25 (revised in February 2022) for reducing pollutions to help us meet our ambitious goal to have zero pollutions as a result of our assets and operations.

At Northumbrian Water Group (NWG), we have developed a culture focused on all aspects of pollution risk. This approach has led a transformation in pollution performance, particularly from 2017 onwards, resulting in industry-leading performance as a frontier company, supporting our 4* Environmental Performance Assessment (EPA) rating in 2018 and again in 2020.

In developing our plan, we have taken into account the expectations of government, our regulators (Ofwat, Environment Agency (EA) and Natural England), customers, environmental NGOs and our Customer Challenge Group (CCG), The Water Forum. Our objectives are to maintain our industry-leading pollution performance, and to continue to reduce the number of pollution incidents from our wastewater and water operations.

Our focus is on continuous improvement in performance across our water and wastewater networks and assets, including 25,000 km of water main and 55 water treatment works (WTWs), and 30,000 km of sewers, 1,250 storm overflows (SOs), 1,000 sewage pumping stations (SPSs) and 430 sewage treatment works (STWs). The water improvements identified here also apply to our Essex and Suffolk water assets.

Our Board and Executive Leadership Team (ELT) are committed to the delivery of this PIRP alongside existing monitoring and governance arrangements, including reporting on the delivery of our Pollution Management Programme (PMP). These activities contribute towards our vision of becoming the national leader in the provision of sustainable water and wastewater services to our customers.

In our plan, we describe our current performance and our approach to pollution, including how we have made considerable improvements in our wastewater pollution performance over the past six years, and the water supply activities we undertake across our operating areas to reduce pollution incidents.

We developed our pollution plan for 2020-25 through undertaking further analysis of the root cause of incidents and identifying additional control measures and interventions. Our plan includes proven business-as-usual activities and interventions which show results, and innovative and transformative programmes designed to maintain and improve our performance further as we become more efficient, resilient and effective.

Ensuring that we protect and enhance the environment in everything we do is part of our culture as a company. Our purpose is caring for the essential needs of our communities and environment, now and for generations to come. We do this by providing reliable and affordable water and wastewater services for our customers. We make a positive difference by operating efficiently and investing prudently, to maintain a sustainable and resilient business.

We will continue to have a zero-tolerance approach to pollution and are committed to working with others in partnership to deliver this plan.

INTRODUCTION

This document is NWG's Pollution Incident Reduction Plan (PIRP) 2020-2025, update in February 2022. It was developed in-line with the requirements set out by the EA.

What we do

As a water and wastewater undertaker serving 2.7 million customers in the northeast of England as Northumbrian Water (NW), and 1.8 million water-only customers in the east of England as Essex & Suffolk Water (ESW), NWG's activities impact significantly on rivers and coastal waters. NWG is proud to be an ethical company, and we take our responsibility towards the environment very seriously. Ensuring that we protect and enhance the environment in everything we do is a key part of our vision to be the national leader in the provision of sustainable water and wastewater services. We aim to manage our assets and operations to avoid environmental effects and to benefit the environment wherever possible.

Our purpose is caring for the essential needs of our communities and the environment, now and for generations to come. We do this by providing reliable and affordable water and wastewater services for our customers. We make a positive difference by operating efficiently and investing prudently, to maintain a sustainable and resilient business.

The importance of the environment to NWG is also reflected in the Improving the Environment theme in *Living Water*, our 2020-2025 business plan. In this theme, we committed to create a step change in our environmental activities, building on our role as stewards of the environment to demonstrate leadership, and to protect and improve the environment within our regions.

To work towards our environment outcome of 'we help to improve the quality of rivers and coastal waters for the benefit of people, the environment and wildlife', we have ambitious goals to have zero pollution incidents as a result of our assets and operations, and to have the best rivers and beaches in the country. Other business outcomes are also impacted by excellent pollution performance, including our wastewater service deals with sewage and heavy rainfall effectively and we are resilient and provide clean drinking water and effective wastewater services; now, and for future generations.

Pollution incidents

Pollution incidents can occur as a result of both water and wastewater operations, from a variety of network and built asset types. Water incidents can occur for example from the supply network from burst water mains, or as discharges from WTWs. Wastewater incidents can occur from STWs, SPSs and sewers, including from polluted surface water outfalls (PSWOs) as a result of misconnected pipes.

Incidents are categorised as: Category 1 (major, serious, persistent and/or extensive impact); Category 2 (significant impact); Category 3 (minor or minimal impact); or Category 4 (no impact).

Once identified, incidents are managed and recorded on the National Incident Reporting Scheme, a list jointly owned by the EA and NWG.

Our pollution position

In 2015 we started our internal Pollution Best Practice Group (PBPG) and PMP as transformative actions to significantly reduce pollution incidents. We aim to develop a culture focused on all aspects of pollution risk. This approach has led to considerable improvements in pollution performance, particularly from 2017 onwards, resulting in industry-leading performance as a frontier company, supporting our 4* EPA rating in 2018 and 2020. Hence, we have already achieved the reduction in pollution numbers that the WA are expecting of the industry, as set-out and shown in our PIRP.

Our aim is to continue to lead the industry on pollution performance. This PIRP builds on our past successes to drive continuous improvement in the reduction of pollution incidents. Improvements will be achieved across our water and wastewater network and assets, including 25,000km of water main, 55 WTWs, 30,000km of sewers, 1,250 CSOs, 1,000 SPSs and 430 STWs.

Stakeholder expectations

Our **customers** consider reducing pollution to be one of the most important indicators of our wastewater performance, and continued pollution reduction received the largest support of any service area through our PR19 customer evaluation work. Overall customer satisfaction with our wastewater service is high, and very few contacts or complaints relate to pollution, because few customers ever experience it. Most customers only become aware of pollution through our performance measures, communications from our regulators and the media.

Ofwat's common measure for pollution requires that we meet our performance commitment, maintain our upper-quartile position and also reduce pollution incidents by at least 22% to 19.5 pollution incidents per 10,000km of the wastewater sewer by 2024/25 (Ofwat FD, 2019).

The EA and Natural England set out environmental performance requirements in their jointly published Water Industry Strategic Environment Requirements (WISER) document (October 2017):

- Serious pollution incidents (category 1 and 2) must continue to trend towards zero (statutory)
- Trend to minimise all pollution incidents (category 1 to 3) by 2025. There should be at least a 40% reduction compared to numbers of incidents recorded in 2016 (statutory)
- Effective management of transferred private sewers and SPSs with low levels of pollution incidents (statutory)

- High levels of self-reporting of pollution incidents with at least 80 per cent of incidents self-reported by 2025. More than 90% of incidents self-reported for STWs and SPSs (non-statutory).

The WISER guidance also states 'Where you are not achieving zero serious pollution incidents or 100% compliance with permits, we expect you to have established the reasons for this and have plans in place to improve performance. These plans should be shared with customers, Customer Challenge Groups and Ofwat.'

Defra requires Ofwat to challenge companies to improve planning and investment to meet the wastewater needs of current and future customers, specifying pollution risk and flooding (Defra SPS, 2017).

The government's 25 Year Environment Plan (2018) sets out goals for clean and plentiful water and to reduce the risk of harm from environmental hazards. It states that all forms of pollution (air, land and water) must be significantly cut to ease pressure on the environment.

CCW consider it important that consumers trust their water company is able to manage and operate sewer networks and STWs responsibly and efficiently, minimising environmental impacts. They believe it is important that wastewater systems are resilient and that pollution incidents caused by water companies are avoided.

The Water Forum, our CCG, provides independent and robust challenge to NWG as we endeavour to keep customers at the heart of our plans and operations. During development of our 2020-25 business plan, this group challenged us to go further to progress our environmental ambitions, including for pollution.

Blueprint for Water, the water environment charities coalition, set out their requirements in Blueprint for PR19. They called for water companies to stop pollution of our waters, and to set strategic long-term wastewater plans to ensure wastewater and treatment systems are sufficient to prevent pollution, storm overflows and flooding, in the context of population growth and climate change. They also call for targeting zero pollution incidents, 100% monitoring of storm overflows and 100% self-reporting of incidents.

Catchment partners expect NWG to minimise pollution incidents, to allow partners to support us in identifying pollutions on the ground, and to address misconnections at polluted surface water outfalls, which are suspected to have a chronic impact on river water quality throughout urban areas.

CURRENT PERFORMANCE

Wastewater pollution

Our PMP has transformed our wastewater pollution incident performance. Pollution incident numbers have decreased significantly since 2015 with our lowest ever levels of category three incidents recorded consistently in the past four years (Figure 1).

In 2018 and again in 2020, we recorded just one serious incident towards attaining zero category one or two incidents. Our best performing year was 2018.

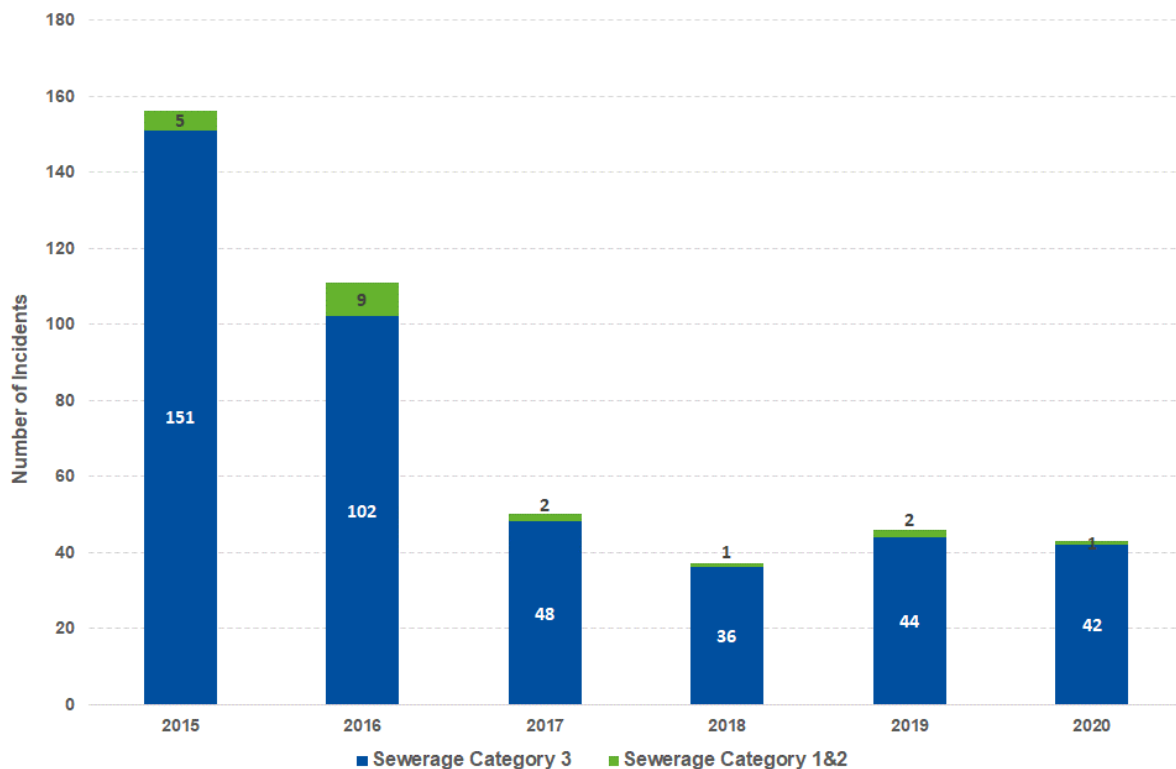


Figure 1. Wastewater pollution incidents (category 1-3), 2015-2020

This improvement has resulted in NWG becoming the frontier company for pollution performance within the industry, consecutively ranked 1st place in 2017, 2018, 2019 and 2020 for the pollution EPA measure (wastewater category 1-3 incidents per 10,000km of sewer). Our forecast position for 2021 remains on target to maintain this leading position into AMP7 (Table 1).

Year	WATER AND SEWERAGE COMPANIES (WASCs) Rank - Pollution Incidents (Sewerage 1-3) per 10,000 km sewer									
	1	2	3	4	5	6	7	8	9	10
2015	35 (56) Anglian	38 (61) Thames	40 (64) United Utilities	47 (75) Severn Trent	48 (77) Wessex	58.79 (94) Dwr Cymru	72 (116) Yorkshire	75 (120) Southern	97 (157) NWG	171 (275) South West
2016	22 (63) United Utilities / Wessex		30 (86) Severn Trent	32 (91) Anglian Water	33 (94) Thames	35 (100) Southern	38 (109) NWG	46 Yorkshire	115 South West	No data Dwr Cymru
2017	17 (50) NWG	23 (80 / 169) Wessex / United Utilities		28 (303) Thames	30 (228 / 280) Anglian Water / Severn Trent		31 (123) Southern	43 (225) Yorkshire	109 (169) South West	No data Dwr Cymru
2018	12 (37) NWG	24 (82 / 181) Wessex / United Utilities		25 (191) Anglian Water	27 (297) Thames	31 (287) Severn Trent	39 (151) Southern	44 (229) Yorkshire	98 (168) South West	No data Dwr Cymru
2019	15 (46) NWG	22 (76) Wessex	26 (243 / 94) Severn Trent / Dwr Cymru		28 (205) United Utilities	30 (325) Thames	35 (266 / 181) Anglian / Yorkshire		105 (180) South West	110 (430) Southern
2020	14 (43) NWG	19 (143) United Utilities	21 (190 / 77) Severn Trent / Dwr Cymru		24 (125) Yorkshire	25 (87) Wessex	27 (294) Thames	28 (210) Anglian	102 (400) Southern	131 (226) South West

* Note: Figures do not include pollutions from transferred assets and from water assets (water treatment and water distribution system).

Table 1. Industry comparison of wastewater pollution incidents (category 1-3) per 10,000 km sewer, 2012-2020.

Water pollution

We have seen an increase from 2017 onwards in the amount of pollution incidents from our water distribution system and WTWs assets (Figure 2) due to changes in reporting, with 21 incidents recorded in 2018 from WTWs and the water distribution system.

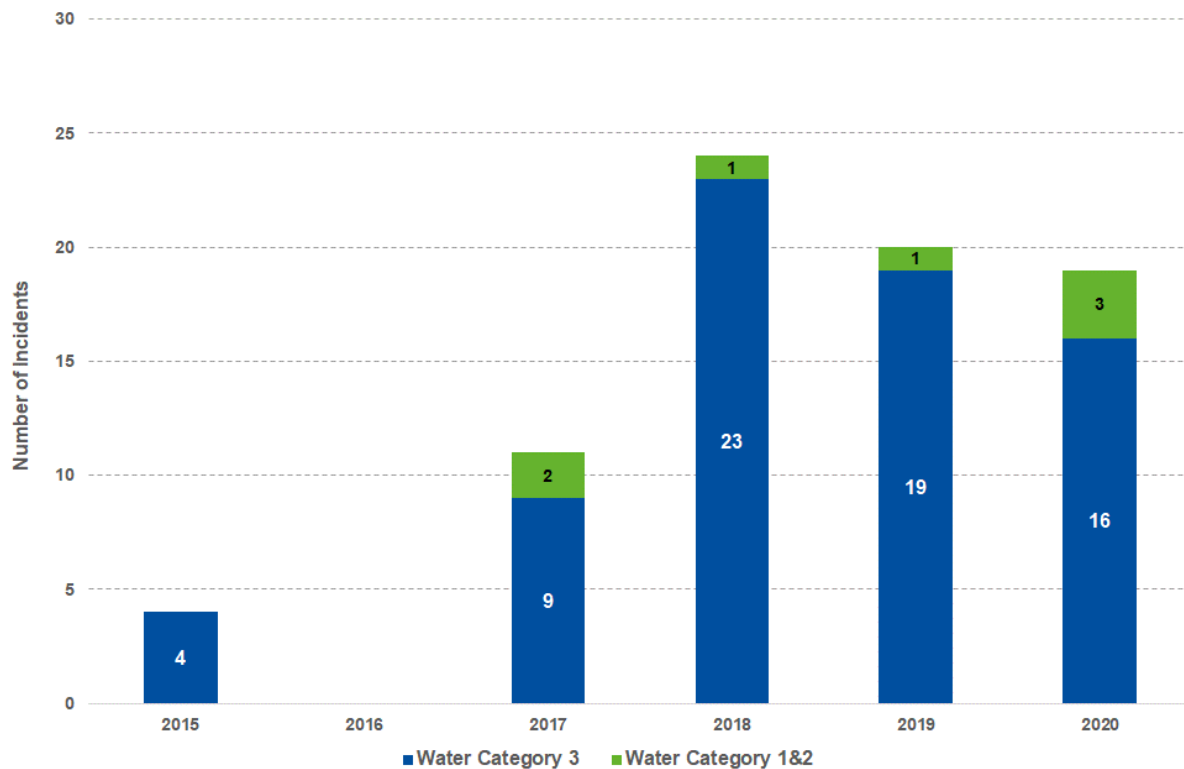


Figure 2. Water only pollution incidents (category 1-3), 2015-2020

Self-reporting

We follow the EA's operation guidance and follow best practices in reporting pollution incidents that are then recorded on the National Incident Reporting System (NIRS). Our performance in this area is measured by the percentage of incidents that we have reported to the EA.

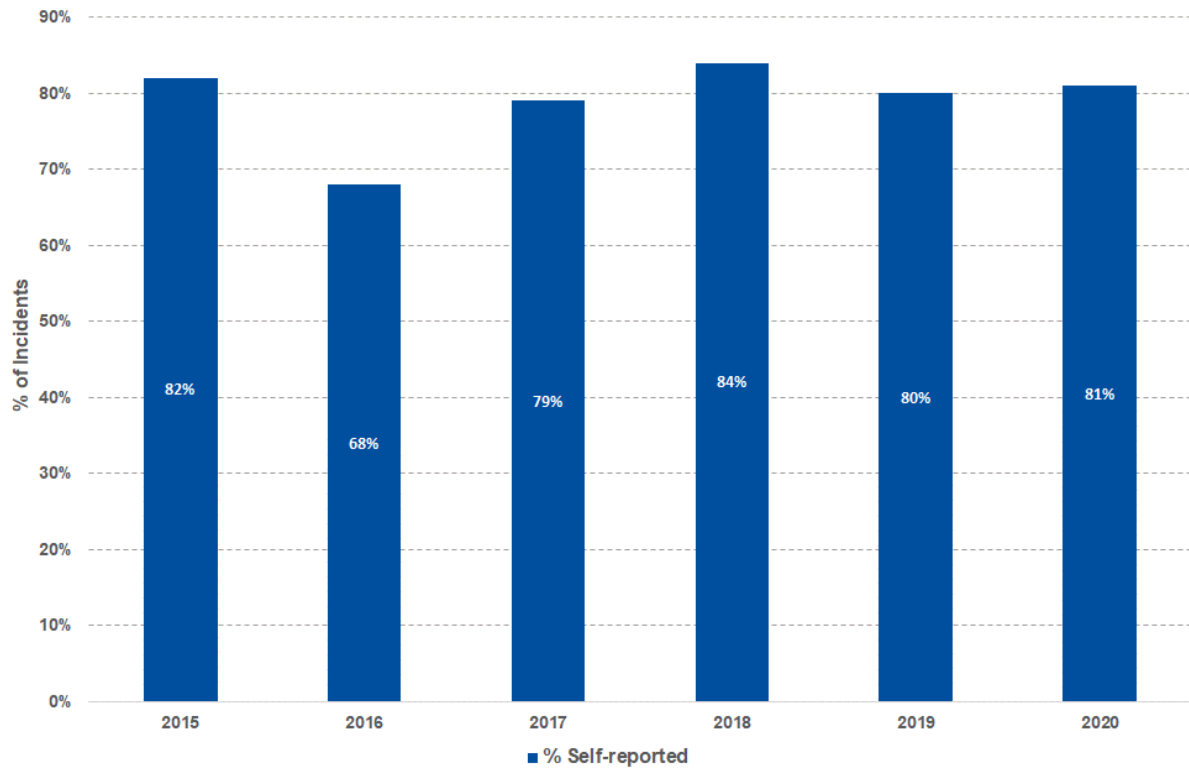


Figure 3. Percentage self-reported incidents (all category 1-3), 2015-2020

We have attained high levels of self-reporting and have been consistently at 80% or above since 2018.

OUR APPROACH TO POLLUTION

Wastewater pollution

Our current strategy for preventing pollution incidents stems from a series of interventions incorporated in our PMP, led and developed by our internal PBPG.

Transforming our approach

In 2015, NWG's pollution performance for wastewater incidents was ranked one of the lowest within the industry (Table 1). NWG considered this to be unacceptable, given our environmental aspirations and customer outcomes.

We created a special project team as part of a zero-tolerance approach to pollution. The project team was focused on developing and then implementing ideas to improve pollution performance across our whole wastewater network and assets. The teams introduced regular review meetings and a new escalation protocol. We also increased our use of data to promote proactive asset maintenance.

Several workshops were held to investigate the root cause of poor performance and identify a number of wastewater activities (interventions). Interventions were ranked according to ease or cost of implementation and their likely impact on pollution numbers. A prioritisation exercise resulted in around 26 activities being taken forward for implementation in an initial trial improvement programme.

Pollution Management Programme (PMP)

Following the trial of the initial programme, a multifaceted PMP with more activities was initiated in 2016 (Figure 3). This focuses on incremental improvements across all wastewater asset types and specific aspects of pollution management. Engagement, innovation, data intelligence and analytics also play a strong part.

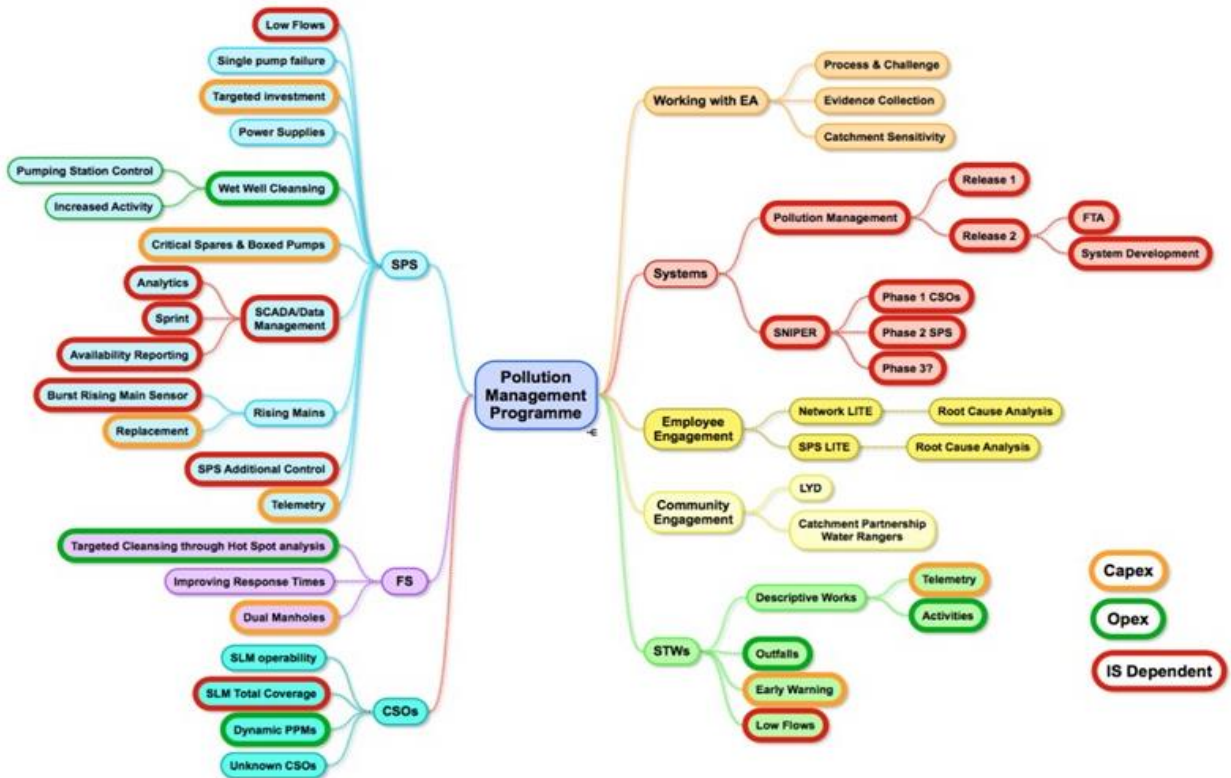


Figure 4. Initial Pollution Management Programme (2016)

Within our programme, we keep track of the interventions, business as usual activities and new or novel ideas for development and monitor whether they have been implemented or completed. Our PMP has grown significantly since 2016 with many more activities added.

Root cause analysis and interventions - wastewater

We have implemented a diverse range of interventions over the past six years, each having an incremental benefit in reducing our pollution numbers, and together these have had a transformative effect on our performance.

To maintain performance and deliver further reductions in pollution numbers, we will look for continued improvements in pollution detection, maintenance, response and systems through the PMP. For greatest impact, we target interventions to address the cause of pollution at key asset groups. Figure 5 illustrates the numbers of wastewater pollution incidents by asset type across the wastewater system, while Figure 6 compares these incidents for asset groups; in 2020 almost 40% of incidents were recorded from foul sewers with SPSs (28%) and STWs (19%) being the next largest groups.

OUR SEWERAGE SYSTEM AND SOURCES OF POLLUTION 2017/20

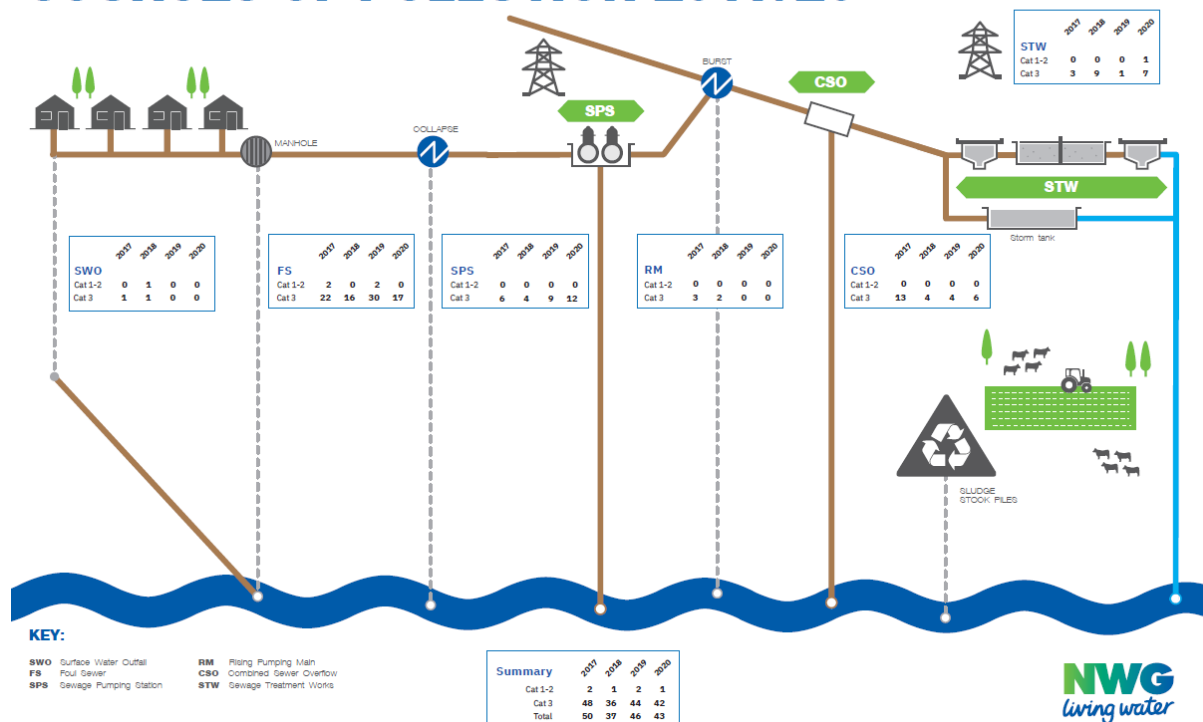


Figure 5. Wastewater pollution incidents by asset type across the sewerage system, 2017-20

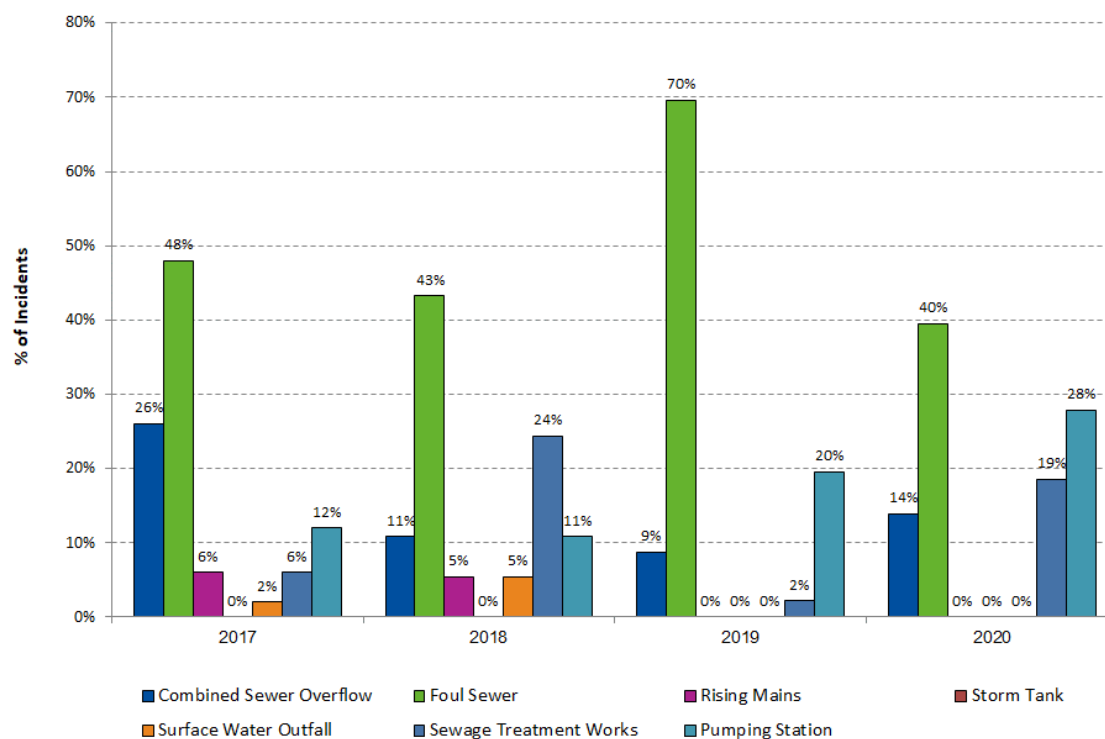


Figure 6. Wastewater category 1-3 pollution incidents by asset type, 2017-2020

We investigate the root cause of pollution for each incident as part of our pollution process including a senior manager review, and record this in our Pollution Management Information System (PMIS). Industry standard root cause analysis (RCA) techniques such as 5Whys (Figure 7) are used to understand the underlying reasons for incidents and implement countermeasures to prevent them from happening again.

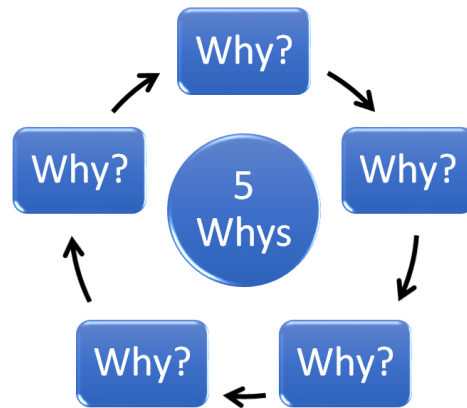


Figure 7 - Root Cause Analysis Methodology

Analysis of data shows that the main cause of pollution incidents in our sewerage network for foul sewers, CSOs and SPSs is blockages (Figure 8). These blockages, which may be partial or full, mainly form from non-flushable material disposed of from households, businesses and development sites. With the exception of a number of identified hot spot areas, pollutions caused by blockages occur randomly throughout the network.

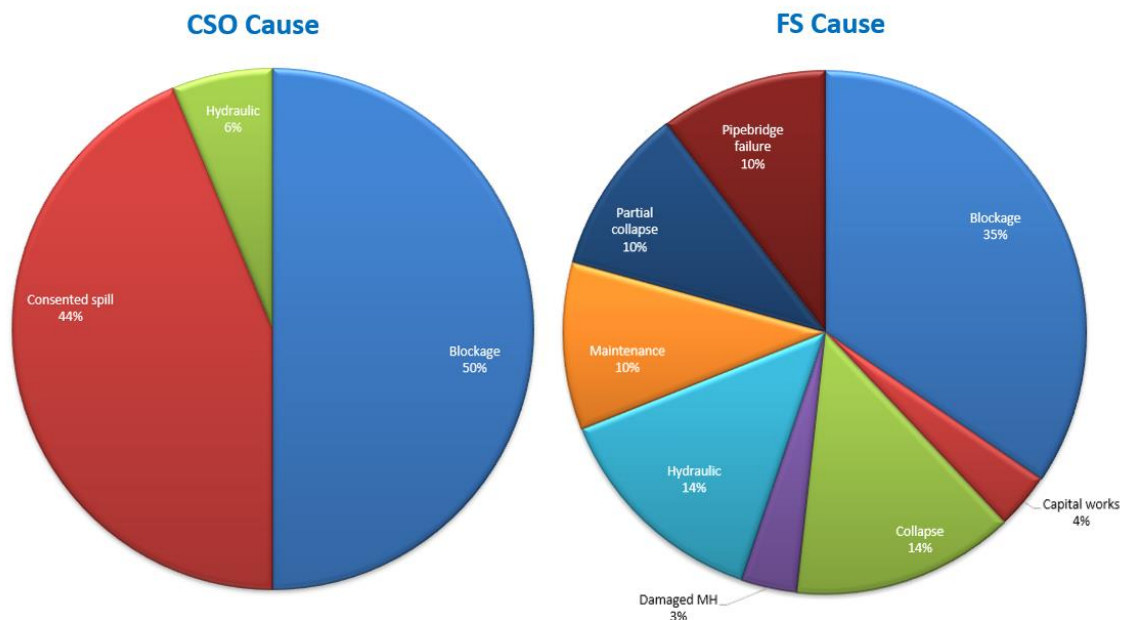


Figure 8. Root cause analysis results at Combined Sewer Overflows (CSO) and Foul Sewer (FS) (2021)

At SPSs and STWs, root cause analysis illustrates that the principal causes of pollution incidents are power supply related issues (e.g., black/brownouts or faults) and blockages.

There are also a range of issues across mechanical, third-party and weather aspects (Figure 9).

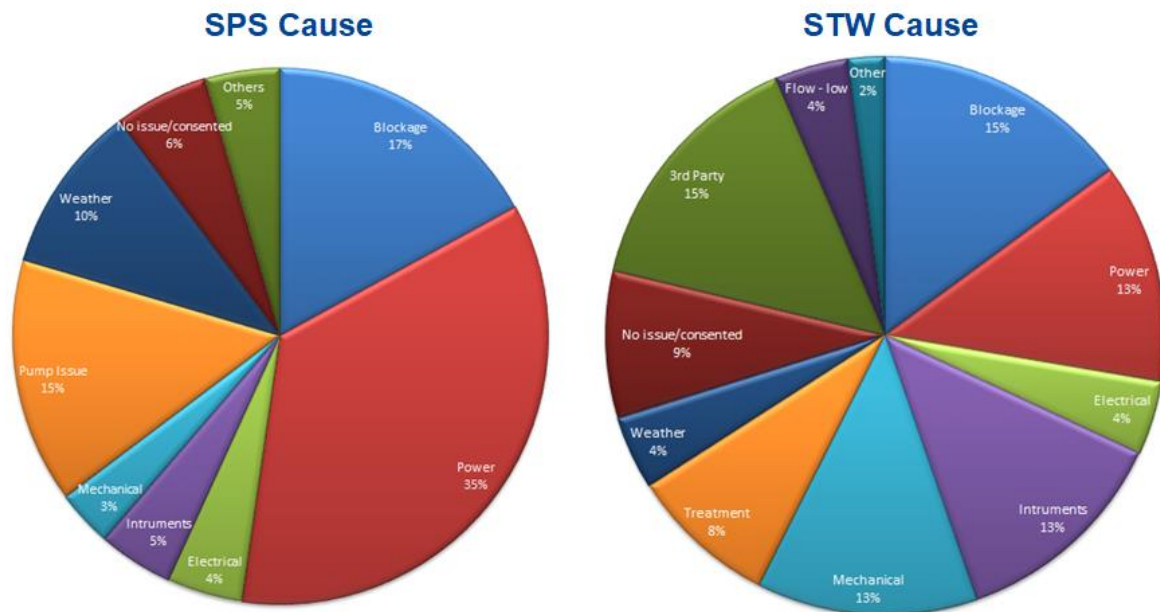


Figure 9. Root cause analysis results at sewage pumping stations (SPS) and sewage treatment works (STW) (2019 to 2021)

After undertaking root cause analysis, we established a range of control measures and developed options to manage the cause of pollution, categorised into previously undertaken interventions and current interventions within the PMP, new interventions, and innovative ideas. Workshops involving stakeholders from across the business were then held to identify the most appropriate interventions for AMP7 based on impact and ease of implementation.

Interventions included in the PMP can be broadly summarised into the following categories: detection; maintenance; response; and systems and processes.

Detection

Constant use and development of our extensive telemetry eSCADA system, covering over three million data points with associated alarms and early warnings. This control and monitoring capability has allowed substantial numbers of potential incidents to be avoided through provision of timely responses and supports our business processes and procedures.

Continued deployment of monitoring and early warning capability across our sewerage networks has also increased our ability to prevent or contain pollutions through battery operated sewer level monitoring (SLM), currently 99% coverage of CSOs against our target of 100% by 2022 with high levels of reliability.

Implementation of low flow software with associated eSCADA telemetry alarms across flow-monitored wastewater assets. Algorithms developed for the early warning of issues at SPS

are used in the Sewer Network Information Performance Reporting (SNIPeR) system together with rainfall data to identify potential problems.

Ongoing extension of telemetry coverage, such as low-cost/low-power outstations, which allows process issues to be alarmed and responded to appropriately. Adding to our industry leading coverage of monitoring across our entire wastewater system.

We also use partnership approaches to aid detection of incidents in the environment. Our long-standing Water Rangers initiative consists of trained customer volunteers who act as our 'eyes and ears' on the ground in the community and raise awareness of any issues spotted on regular patrols along our waterways. River Guardians and catchment partners also report any issues they see when working in the water environment.

Signage has been installed at all our SPSs and at CSOs in sensitive locations that allow our customers to alert us of any issues with our sites.

Maintenance

Asset health, resilience and pollution risk continues to be addressed through targeted capital maintenance programmes, for example, refurbishment of SPSs, sewer lining/refurbs and a programme for CSO maintenance. Focus is also on investment in descriptive STWs due to their condition, compliance with environmental permits (under Environmental Permitting Regulations), and pollution risk.

Building resilience into many of the adopted private SPSs that are reliant on single pump operation.

Operational maintenance activities cover both reactive and proactive interventions, particularly focused on more vulnerable parts of our wastewater system.

Our Trigger Management (TriM) and Dynamic Risk Index Visit Effectiveness (DRIVE) approaches allow us to prioritise activities in order to uphold permit compliance, maintain pump availability and avoid potential pollution incidents. Intelligent use of monitoring data allows us to move from static schedules to more dynamic planning. This puts focus on efficient and proactive operational interventions to maintain asset performance.

Other maintenance activities include:

- Increased wet well cleaning to reduce the risk of blockages at SPSs.
- Ongoing dual manhole monitoring and permanent fixes.
- CCTV, cleansing and resolution of issues undertaken on modelled high-risk sewers near to watercourses.
- Identification and rectification of vulnerable manholes on farmland near to watercourses.
- Provision of critical spares pumps, boxed pumps, and adaptors (where immediate standby cannot be achieved).
- Hire-in contracts for generators for responding to power issues; and
- Trade effluent and FOG (fats, oils and grease) adviser support.

Response

Our response to pollution incidents is governed chiefly by the early notification or detection of an issue. Once we are aware of issues, our people perform a 'blue-light' pollution response to all potential incidents and aim to minimise any impacts immediately. We aim to ensure our response to pollution is consistent and correct every time.

Wastewater operations mainly use eSCADA telemetry generated alarms that have been rationalised over the past few years. These may require an immediate response or further investigation containing some advisory information. Daily SNIPeR notifications are triaged, investigated and responded to appropriately. Telemetry systems are continually monitored by specialist operatives in a dedicated 24hr Regional Control Room.

The investment in SLM at CSOs has increased our capability to respond to problems at an 80% warning level, allowing our Sewer Maintenance Operative crews to be able to resolve a problem before a polluting overflow has occurred or provide containment. These responses and outcomes have been recorded since 2012, resulting in many hundreds of incidents being avoided, such as 272 instances in 2020 alone.

Changes to our wastewater network team structure were initiated in 2017, producing increased management focus with dedicated pollution front-line teams and additional resources, alongside reactive start-to-finish ownership for evidence collection, incident proforma (IP) completion, weekly pow-wows and reporting.

Proactive activities, such as investigating top blocking/spilling CSOs and pre/post bathing season checks, have also been targeted at particular asset types to prevent incidents occurring.

Our campaigns that target customer behaviour to reduce the number of blockages caused by incorrect material being disposed of from households does also benefit pollution risk. Our 'Bin the Wipe' approach was launched in 2020 to reduce sewer blockages by focusing on the problem's number one cause ... wipes. In 2019, 64% of the 15,600 blockages we cleared from our network contained wipes, which do not break up and can snag or settle in pipes and cause build-ups. The campaign uses innovative tools to track wrongly flushed items back to the homes they came from and helps customers to understand that flushing wipes can cause sewer flooding in homes and damage to the environment, such as rivers and beaches.

Initially Bin the Wipe focused on areas of Teesside, where flushing wipes was a known problem. This has reduced the number wipes found in the sewer network by more than 60%, without the need for us to charge or take further actions with customers. By the end of 2021, the campaign had reached 72,503 households in the northeast and we have set ourselves a target to engage with a further 100,000 households in 2022.

Misconnections

Wrongly connected drains from customers' properties can allow wastewater to flow directly into rivers and the sea through PSWOs. A small number of PSWOs may contribute to our annual pollution numbers each year.

Once contamination at an outfall is identified, it is reported to the EA and recorded as a pollution incident on the NIRS. When operational sources of pollution have been ruled out and our investigations confirm the presence of misconnections, the EA allocate the incident to a 'third party' and the outfall is recorded as a PSWO in the pollution management system. We then investigate PSWOs, carrying out an average of 4,000 detailed property surveys a year. Once a property has been identified as having wrongly connected drainage, we work with our customers to help them correct it, providing advice and undertaking re-inspection visits. We also hold community education/engagement activities in key catchments.

We expanded our Misconnections Team at the end of 2015, in response to greater numbers of PSWO notifications received and an increased focus on misconnections.

Systems and Processes

Our culture in NWG is to continuously learn and improve. We use weekly pollution 'pow-wows', monthly incident review meetings involving senior managers to learn from all incidents and improve our pollution management processes.

We have invested in two information systems since 2016:

- SNIPeR to aid early detection.
- PMIS for managing the pollution process internally and with the EA, including misconnections. Also to have epidemiological view of all pollution events in order to deep dive into their occurrence and ways to avoid them.

We work with our local EA to gain joint understanding of many aspects of pollution incidents, such as notifications, reporting, the classification of incidents, and allocation of incidents (including misconnections) to third parties. High quality and consistent evidence collection aids the review process with our EA colleagues.

We actively benchmark pollution performance, management processes and interventions, such as through hosting or visits with other water companies. This allows for new ideas to be shared and best practices to be adopted. We are committed to continuing to work collaboratively across the industry and to develop consistency in conjunction with the EA.

Water supply pollution

We have recently seen an increase in the number of pollution incidents from our WTWs and water distribution system assets (Figure 10).

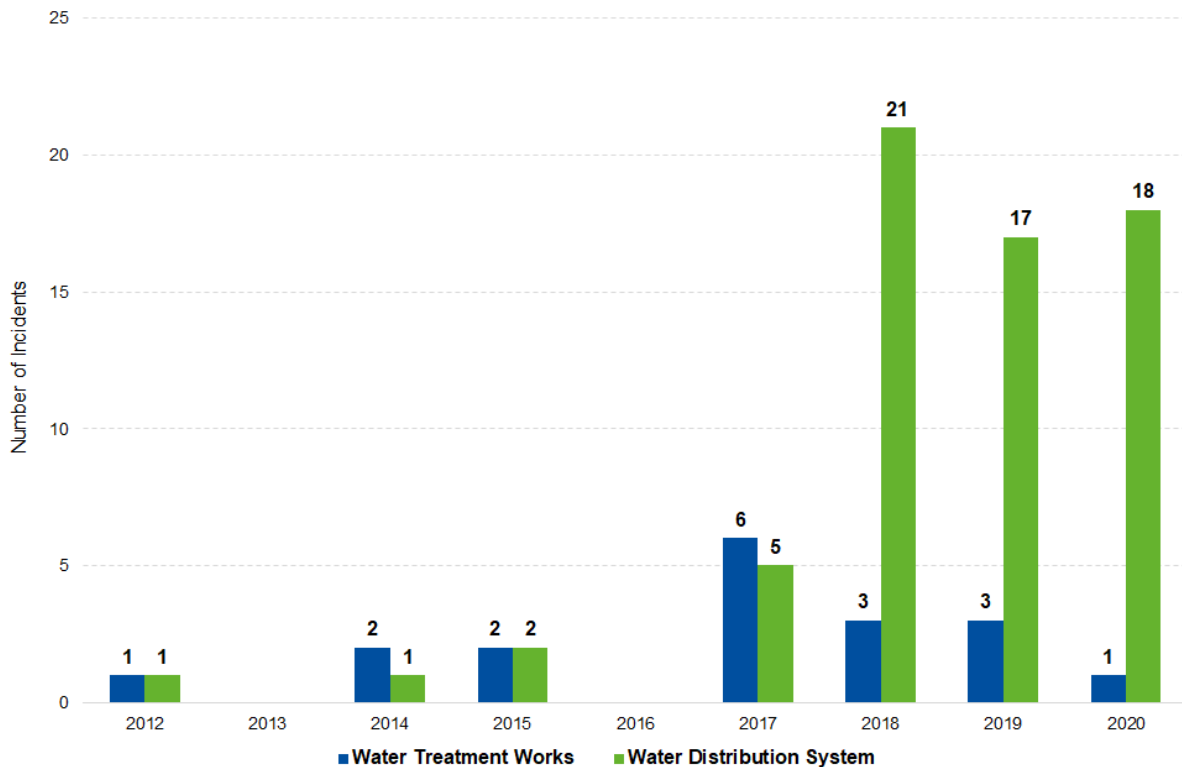


Figure 10. Water category 3 pollution incidents by asset type, 2012-2020

In response to this, we developed a water pollution management and reduction plan. We conducted detailed site risk audits, developed consistent processes and implemented an ongoing risk and environmental impact assessment process.

We have identified and implemented interventions to either resolve or mitigate risks, such as through enhanced operational responses or undertaking capital maintenance. An example is agreeing a change to our burst water main repair methodology, so it now incorporates a range of containment measures.

A significant programme of training has taken place across our Water Directorate to ensure that all operational staff consistently apply processes and procedures, avoid incidents if at all possible, and can effectively manage any incidents. This includes training on pollution risk assessments, understanding connectivity to drainage infrastructure, data gathering and timely deployment of mitigation (e.g., silt mats, silt socks, sandbags, and de-chlorination devices).

Alongside this, we have reviewed our standard documentation to ensure it is fit for purpose. This includes:

- Co-ordination Planner – used to risk score and share planned work with all stakeholders who can be affected by our works, revised to include environmental impact in greater detail.
- Work and task related procedures where the discharge of water is a requirement of the detailed procedure. Examples of these are:
 - Planned and reactive flushing;
 - Service reservoir outage and cleaning procedures;
 - Discharge from excavations.

- Method statements, commissioning plans and outage plans – reviewed with our external and internal contract partners.

We continue to focus on a range of activities and interventions in our water pollution management and reduction plan to develop a zero-tolerance approach to pollution, implementing best practice in our response, and driving a culture of continuous improvement.

Collaboration

We are committed to our collaborative approach, and work in partnership with our stakeholders to reduce pollution incidents from our assets and operations and respond and manage any incidents in an exemplary manner.

Environment Agency

We have a very strong relationship with our local EA teams, and work closely with EA colleagues to manage all aspects of pollution. This includes an excellent record of self-reporting since 2015, monthly pollution review meetings to discuss incidents, issues and incident classification, and strategic level review of our approach. Improvements to joint evidence collation now provide high quality and consistent supporting information to enable effective joint management and review processes.

Industry

We actively benchmark pollution performance, management processes and interventions across the industry to benefit from new ideas and allow best practices to be adopted and share our learning with others. This includes hosting visits or visits to other water companies and contributing to Water UK groups and UK Water Industry Research projects.

We are committed to continuing to work collaboratively across the industry and to develop consistency in conjunction with the EA who have asked us to present on our best practise approach to other companies.

Water Rangers

Our Water Rangers initiative was initiated in 2014 to enlist community support to help identify potential pollution incidents in the environment at the earliest opportunity – in order to help protect the environment. There are now 64 volunteers who monitor 55 public access routes alongside covering over 70 kilometres of streams, rivers, and bathing waters across the North East. Water Rangers patrol waterways every week or fortnight and report any issues so that these can be dealt with quickly.

Volunteers also spot water leaks on the distribution network, operational issues including blocked outfalls and missing or broken covers, and report on partner issues such as fly tipping, fallen trees and missing life buoys which are passed on as appropriate. They also receive awareness training about what to look out for on their routes and have also received awareness training on flood risk to support the work of the EA Flood Warden Service.

With approximately over 12,000 patrols completed by our volunteers - this approach has significantly brought about a focus and heightened awareness of pollutions in the communities we serve, so that any issues are reported promptly, and an appropriate response can be performed.

Environmental stakeholders

Catchment partners are keen to work with us to reduce and manage pollution. In addition to involvement in the River Guardian scheme, partners regularly report in issues they spot in the water environment and have identified a number of misconnections at polluted surface water outfalls. There is great potential to collaborate further in this area, and we plan to incorporate this in our plans to grow our Water Rangers scheme.

OUR AMP7 BUSINESS PLAN

Our pollution management approach through the PBPG and PMP has driven a transformation in pollution performance since 2015. Our aim is to continue to improve our performance across every aspect of pollution management and across our entire asset base towards zero pollutions from our assets and operations.

Future performance targets

We currently lead the industry on pollution performance. Our aim is to maintain our current industry-leading position as a frontier company and to continue to reduce numbers of pollution incidents from our wastewater operations towards meeting our ‘zero pollutions as a result of our assets and operations’ ambitious goal.

In its WISER guidance, the EA set out an expectation that companies will reduce their 2016/17 reporting year pollution levels by 40% by 2024/25. NWG has already exceeded this target and is committed to reducing incidents further as part of our zero-tolerance approach to pollution.

Our regulatory performance commitment for pollution incidents for the common EPA measure (sewerage category 1-3 per 10,000km of sewer) has been set by Ofwat to ensure we achieve industry upper quartile (UQ) performance for each year of the investment period to 2025. Overall, Ofwat expects a 22% reduction in pollutions to reach 57 by the end of period (Table 2).

	2020	2021	2022	2023	2024
Incidents per 10,000 km	24.51	23.74	23.00	22.40	19.50
Performance Target	72	70	68	66	57

Table 2. AMP7 regulatory targets for pollution incidents

Planned interventions – wastewater

For 2020-25, we will maintain the activities that have brought about the robust reduction in pollution prior to this PIRP. In addition, we have identified a number of interventions as follows (updated February 2022):

Detection

- Increase our SLM (Event Duration Monitoring) coverage of SOs currently at 99% towards our aim for 100% coverage and maintain high levels of operability, response, and pollution avoidance. On track to attain full coverage of all overflows in 2022.
- Deploy further monitoring, innovative early warning capability and increased business intelligence across our wastewater system with increased coverage of sites on eSCADA telemetry with appropriate alarm generation. Programme underway to install innovative telemetry to over 150 descriptively permitted STWs by 2025.

- Implement an Operational Technology programme phased by priority to replace telemetry equipment with new start-of-the-art technology with increased functionality and data availability. Ongoing investment programme (2020-2025) across different workstreams including SCADA systems, communications, instrumentation, and process control.
- Continue to utilise our successful SNIPeR system for detection of potential pollution issues for investigation. Ongoing project to enhance our SNIPeR system including improved wet weather predictive trend analysis and asset fault detection.
- Develop innovative new sensors and monitors, such as a rising main burst sensor. Continuing to develop, trial and utilise innovative sensor and monitors, for example, smart air valve monitors on rising mains and low-cost monitors on sewers near to watercourses, to increase our visibility of the wastewater system.

Maintenance

- Use and continued improvement of our Trigger Management (TriM) and Dynamic Risk Index Visit Effectiveness (DRIVE) approaches in prioritising operational activities and avoidance of pollutions. Continued improvements to our approach with extension to other assets groups for planned maintenance activities.
- Target capital maintenance programmes to maintain asset health, such as refurbishment of SPSs and STWs, sewer lining, dual manhole risk reduction and CSO ancillary programmes. Investment programmes ongoing that are targeted and prioritised to reduce pollution risk and increase resilience, such as known high risk assets.
- Maintain and prioritise high levels of wet well cleaning to reduce the risk of blockages at SPSs. Operational expenditure maintained and approach reviewed.
- Undertake a programme of CCTV and cleansing of sewers near watercourses (foul sewers) at high-risk locations identified through our detailed risk model. Programme of find (CCTV) and fix (root cutting and lining) launched in 2021 targeting around 25km of high-risk sewers initially and continuing in 2022.
- Continue to repair vulnerable manholes on farmland near to watercourses according to risk. Ongoing investment to survey, repair and install warning bollards to high-risk manholes on agricultural land.
- Maintain our provision of critical spares pumps and boxed pumps for high levels of pump availability. Ongoing with our maintenance teams that includes the provision of adaptors so spare, or hired-in pumps can be installed quickly.

Response

- Maintain our operational response to all alarms and early warning notifications with our zero-tolerance approach to pollutions. Maintaining and building on our operational response from lessons learned and cause analysis deep dives.
- Maintain and improve our reactive and proactive measures with dedicated front-line pollution teams. Continued focus on all aspects of our pollution response together with a range of preventative measures.
- Continue to work with the industry and EA to develop best practice and consistency. Active member of the National Pollution Reduction Task Force sharing our approach with water companies in England, Wales, and Scotland.

- Target our customer behaviour change campaigns with the launch of 'Bin the Wipe' programme, FOG work with food outlets and Trade Effluent response in order to reduce pollution risk. Ongoing campaigns to reduce blockages that cause pollutions and flooding in our networks, SPSs and STWs.
- Continue to work with housing developers in raising the awareness of pollution incidents as a consequence of construction activities. Action plan developed and delivered to inform developers, nationally and regionally, of the measures required to mitigate against pollutions occurring in our wastewater system.

Systems

- Maintain and where required invest in our pollution related systems, such as SNIPeR and the PMIS. Review of our PMIS to include additional cause analysis information and the launch of a new pollution app initially in our network operations teams.
- Continue to work jointly with our local EA to develop shared learning and implement best practice. Continue to review the progress being made with the EA in implementing our pollution plan.
- Benchmark pollution performance, management processes and interventions. Ongoing collaboration with the industry, such as through the Pollution Reduction Task Force and our annual Innovation Festival.

Managing Misconnections

Our objective is to reduce the number of polluted surface water outfalls (PSWOs) by reducing the number of properties with misconnected drainage. We currently receive around 60 new PSWO notifications each year, and a small number of these contribute to our annual pollution incident numbers.

From 2020-25, we will maintain our level of activity, but our plan is to concentrate our investigations into at least four high-priority catchments where there is evidence that misconnections present a serious water quality issue linked to a reason for not achieving Good status under the Water Framework Directive. As our current approach is resource intensive and can rely on customers providing access to their properties, we will continue to explore the use of new techniques including aerial surveys.

We will also link misconnections issues into our Rainwise initiative and work closely with our partners to address PSWOs. This will include continuing our support of the Connect Right campaign, supporting the Yellow Fish initiative where appropriate, and undertaking joint activity to raise customers' awareness of misconnections and help resolve issues.

Planned Interventions – water supply

We will continue to develop and implement a range of interventions across our water directorate. We have identified the following as part of our plan:

- Improve our response and awareness of mitigation tools, such as in their deployment to avoid or contain potential incidents. Successfully trialed and implemented a more accurate mobile instrument for chlorine analysis.
- Continued training, front-line pollution event learning, and implement proven best practice with regular feedback to field teams and contract partners. On target to train over 190 water distribution employees and contractors (due early 2022).
- Improve water discharge management, such as from trench water or scour, and embed updated processes in field teams. Procedures reviewed and included in environmental training across water distribution teams.
- Review and develop further the impact escalation process. Implemented through our Instant-6 pollution notification and Environmental Impact Assessment that includes lessons learned, escalation required, and implementation of improvements identified.
- Review and revise flushing mitigation risk management procedures. Ongoing through our coordination planning process that embeds environmental risk assessment and working methods to avoid pollution.
- Continue to conduct regular performance review meeting and review against current practice towards refinement of business process. Actively collaborating with the national Pollution Reduction Task Force, such as in a specific session on water supply related pollutions.

Monitoring and assessment of our plan

Our Pollution Best Practice Group will monitor the implementation of this plan through our Pollution Management Programme alongside our tactical planning function. This will involve tracking the progress of implementation against current performance and against our aim of leading pollution performance.

Our Water management team will track delivery of the improvements being made within the Water Directorate against planned interventions.

We will refine our planned interventions iteratively and update our 'live' plan accordingly to make sure we maintain our industry leading position and meet and exceed our targets.

Wastewater planning for the future

To prepare for AMP7, NWG formed a new Service Planning function comprising strategic planning, tactical planning, quality and performance teams under both water and wastewater operational directorates through the implementation of a new target operating model. We are now implementing our vision for a new service planning framework (SPF), which will initiate transformational change through integrated planning. In the SPF, optimal Whole-Life Cost interventions will be considered and balanced across our asset base to deliver outcomes for customers through more effective decision-making. As part of the SPF, we will move from risk-based prioritisation to value-based optimisation to determine priorities for capital investment and operational expenditure.

Our pollution plan will be iterative and responsive, and informed by the implementation of the SPF. Pollution performance will also be supported by Drainage and Wastewater Management Plans (DWMPs) and their development process. This aims to improve the consistency of

approaches taken by wastewater undertakers to long-term planning, with a view to providing greater transparency, robustness and line-of-sight to investment decisions that lead to costs to customers.

The production of DWMPs includes risk-based catchment screening to assess and quantify the risk and vulnerabilities of our current and future drainage infrastructure. A range of factors are taken into account in doing this, including flooding, growth, resilience, pollution incidents, intermittent storm discharges, and river and coastal water quality. Integrated solutions will be developed with our drainage partners to deliver required outcomes for customers, communities and the environment.

An agreed industry framework and timescale has been developed for DWMPs, which will see plans produced by the summer of 2022. NWG is committed to this process and is working closely with industry implementation groups through each stage of the process. We see this work building upon our existing approaches to wastewater planning, and partnership working. The proposal is that DWMPs will be produced on a five-year cycle, to fit with AMP investment. We recognise that the DWMP process has the opportunity to further improve pollution performance through planned integrated strategic investment in the wastewater network. We anticipate that as we develop the first cycle of plans, we will be able to identify opportunities to integrate DWMPs into wastewater strategic planning through the SPF.

Environment Act

The Environment Act 2021 sets out legislation to ensure the country can deliver on the goals in the government's 25 Year Environment Plan, which includes adopting Drainage and 'Sewerage' Management Planning into UK law.

The Act also includes several new provisions concerning storm overflows. Our strategy for storm overflows (SOs) is to continue our significant investment to improve SOs and reduce spills whilst also working with the Defra-led Storm Overflow Task Force, the industry and regulators towards future improvement plans and implementing the new duties in the Act.

We began extensively monitoring our SOs more than 15 years ago for operational control, detection, and response purposes. We already publish SO spill and duration data, known as Event Duration Monitoring (EDM), on our website and this has also been made available on gov.uk.

MANAGEMENT SYSTEMS AND PROCEDURES

We follow the EA's operational instruction 16_02 Guidance for recording and categorising water industry self-reported pollution incidents. This entails reporting every discharge according to the guidance and summarised in the Pollution Incident Matrix. Through this approach, we have a good relationship with our local EA colleagues with monthly meetings to review incidents, their classification and evidence collected, such as for no-case reports.

Our PMIS is used as part of our pollution process and procedures to record information on all pollutions in the company. This was developed in-house so that it can be modified or updated as and when required.

The PMIS provides a chain of custody for incidents with owners logged and incident pro-forma (IP) documents completed. E-mail alerts are also generated so that incident owners and managers can monitor the timely completion of IPs.

Our ongoing company-wide accreditation to ISO 14001 Environment Management standard, provides the assurance that our systems and procedures are fit-for purpose. To make sure we comply with all environment regulations whilst continuously improving in reducing our impact on the environment.

Intelligent asset management

We already have company-wide accreditation to ISO 55001 Asset Management, demonstrating that we follow best practice in the long-term management of our assets. Building on this approach, we are also currently delivering our transformative Intelligent Asset Management (iam) programme towards our vision of becoming a leading water company in terms of asset management. This will allow us to be innovative and resilient while also providing an affordable and excellent service for our customers and the environment. Efficient and effective management of our asset base is also an even greater priority to 2025 and beyond.

The iam programme will deliver a change in our approach to asset management and significantly enhance our capability in this area. Our enhanced target operating model covers all the people, process, information and technology aspects required to support the entire asset management lifecycle.

We are giving specific consideration to data integrity, process integrity, governance, and information system requirements as our reliance on data and information continues to grow and we become an increasingly digital business. Better data and information will allow us to make more intelligent decisions and ultimately provide a better service.

The improvement in asset management plays a significant role in the achievement of many of our performance commitments, including pollution incidents. It includes the introduction of our work and asset management system called Maximo, through to digital twins, data science, and predictive maintenance and enhanced condition monitoring.

Governance

The NWG Board has a long-term vision for the company to become the national leader in the provision of sustainable water and wastewater services. This requires us to provide outstanding service to customers across our water and wastewater operations whilst maintaining the highest levels of environmental performance. The Board has oversight of our pollution plan and receives regular updates from our ELT.

Our ELT monitors performance towards achieving our long-term vision through mechanisms such as the Company Scorecard. They also set challenging internal targets linked to improvement projects sponsored at director level. A detailed pollution performance report, which includes the activities being undertaken through our PMP, is reported quarterly to the

ELT by the Wastewater Director and Head of Wastewater Treatment and Bioresources. These leaders also have overall responsibility for delivering against company targets.

NWG actively engages with colleagues in the local EA teams to provide updates and liaison on our environmental performance, including pollution. The EA/NWG Pollution Review Meetings occur monthly and will have oversight of and receive regular reporting on the PIRP. At a strategic level, our Wastewater Director and the EA's North East Area Director meet quarterly, along with other senior leads from both organisations. Written progress updates will be provided to these meetings setting out progress in delivering this PIRP.

The Water Forum, our CCG, provides independent and robust challenge to NWG as we endeavour to keep customers at the heart of our plans and operations. The Water Forum has an Environment Sub-Group which focuses on our environmental ambitions and progress. Among other responsibilities, this group is charged by members to:

- Understand and support strategic delivery of our environmental responsibilities for the benefit of customers and the environment;
- Understand and challenge our environmental performance and delivery against 2020-25 and long-term plans; and
- Provide expertise and steer to the group on key environmental aspects.

Members of the Water Forum Environment Subgroup include representatives from the EA, CCW, Natural England, National Farmers Union and NGOs including Groundwork. This group has contributed to our pollution management approach and is able to provide external assurance on the PIRP through regular review of progress at meetings.