Dŵr Cymru
Welsh Water

# POLLUTION INCIDENT REDUCTION PLAN

2025-2026

JUNE 2025

# CONTENTS

# FOREWORD

As an appointed water company, one of our fundamental duties is to protect the environment from the impact of our society's sewage and wastewater, by treating it and returning it safely to the environment. Whenever pollution incidents linked to our operations occur, this represents a failure to fulfil this duty. We have thousands of miles of sewer and thousands of treatment works and pumping stations, any of which can cause a pollution if equipment fails or something goes wrong. Regardless, our ultimate ambition is to eliminate pollution incidents altogether.

In the meantime, our focus is on reducing the number of pollution incidents, particular the small minority in the most serious category. Our performance in this area has been disappointing and unacceptable in the last few years. The reasons for this are complex – a combination of operational issues and external factors. But we are determined to turn this performance around and return to a clear trend towards zero.

As we begin AMP8, improving performance is the number one priority for me and for the entire Welsh Water leadership team, alongside maintaining the highest standards of health and safety. I know that in this I have the full support of the Board and its new Chair, Jane Hanson. This is therefore the right time to be publishing this Pollution Incident Reduction Plan, which sets out the results of our investigations into the causes of pollutions, and what we are doing to tackle them. Our teams are already working hard to make the necessary changes and deliver the investment that we have promised as part of our AMP8 (2025-30) plan.

I expect the causes and impacts of pollution, particularly in our rivers and bathing waters, to remain high on the political and public agenda through the next period. At a national level it is not a problem we can solve alone. Improving the health of our rivers will take a coordinated joint effort across multiple sectors, with the support and coordination of (Welsh and English) governments and regulators. We are committed to playing our part.

As a not-for-profit company, we do not have shareholders clamouring for a return, enabling us to focus on efficient operations, effective investment, and doing the right thing for our customers and the natural environment.

# INTRODUCTION

- What is a pollution incident?
- Why do pollution incidents occur?
- A review of recent performance
  - Total incidents
  - Root causes
  - Serious incidents
  - Self reporting

# Operating context

Beaches, rivers and watercourses of all kinds are an enormously important part of the natural environment in Wales. Because of the topography in Wales, our operating area is characterised by a high number of small and sensitive rivers. We also have a long coastline and a high number of bathing waters. We therefore take very seriously any damage to these vital natural assets, both for the sake of the environment and local populations and businesses.

In Wales, the situation in terms of river and coastal water quality is different to other parts of the UK. Here, 40% of water bodies achieve 'good' ecological status as defined by the Water Framework Directive compared to 16% in England. Wales has 30% of the UK's Blue Flag beaches, with 15% of the coastline.

But we share the desire of customers, campaigners and regulators to see improvements to river and coastal water quality. Cutting pollution incidents is one way in which we can make a contribution.

In 2024 108 out of the 110 designated bathing waters in Wales met the standards set by the Bathing Water Regulations, and 75 were assessed as Excellent.

We run an extensive investigations and monitoring programme to help Natural Resources Wales and others to understand the causes of poor coastal and river water quality. Partly as a result of this work we know that the diffuse pollution from land management is often the primary reason for poor water quality. That said, where our assets are having a damaging impact we plan to address this. We are targeting the removal of all damaging phosphorous discharges into sensitive (SAC) rivers by 2032.

## We have

**36,000 km** of sewers

**820** wastewater treatment works

**2,500** sewage pumping stations

**2,300** storm overflows

# What are pollution incidents?

A pollution incident occurs when a discharge from a pipe or other asset causes harm to the environment, particularly aquatic life and ecology, or to human health or drinking water abstractions.

The environmental regulators (EA and NRW) record and investigate reports of pollution caused by discharges or escapes of water and contaminants from our assets and equipment.

If after investigation it is concluded that pollution was caused by our activities, then the incident counts towards the assessment of our performance under the Environmental Performance Assessment (EPA), and against performance commitments set by Ofwat.

The impact of an incident depends on the seriousness and persistence of its effects, and the extent of the affected area. Our efforts to reduce pollution incidents are therefore focused on the most serious pollution incidents (Category 1 & 2), while also ensuring that all incidents are properly identified and reported.

Wastewater pollutions can be caused by a discharge from one of our wastewater treatment works or sewage pumping stations as a result of mechanical failure, or from a sewer caused by a blockage or damage to the sewer pipe.

A discharge from a storm overflow on the network during high rainfall may not be categorised as a pollution incident as this may be the network operating normally and within legal permits. The definition of storm overflow pollution incidents is currently under review.

Pollution can also come from a clean water treatment works, or from a burst on a clean water mains that causes ground run-off into a watercourse.

## How are pollution incidents classified?

**After investigation, they classify each incident as one of the following:**

**Category 1:** having a serious extensive or persistent impact on the environment, people or property.

**Category 2:** incidents having a lesser, yet significant impact.

**Category 3:** incidents having a minor or minimal impact on the environment, people or property with only a limited or localised effect on water quality.

The classification of pollution incidents may be changing in 2025. Under new guidance currently under consideration, Category 4 incidents, hitherto considered as 'no impact', may be reclassified under a wider definition of Category 3. If confirmed, this could lead to an increase in the reported number of incidents, without a change in underlying performance. For the purposes of this document we have assumed no changes so that we can look at historical and forecast performance on a 'like for like' basis.

Sewage related debris such as sanitary products and wet-wipes

Filamentous growth (sewage fungus) can be a sign of high nutrient loading linked to sewage contamination.

Miky/grey appearance may indicate a live pollution incident

Grey staining at an outfall is often a sign of sewage contamination.

# What do pollution incidents look like?

## Causes of pollution incidents

**53%** of our wastewater pollution incidents are caused by blockages, with about **24%** of incidents attributed to blockages caused by wet wipes.

Customers can therefore help reduce pollution by only flushing the **three P's – pee, paper, and poo!**

**Fat, oil and grease** poured down kitchen sinks and drains can also build up in sewers and cause blockages and pollution.

**If you spot pollution, please report it by calling our pollution hotline:**

**0800 085 3968**

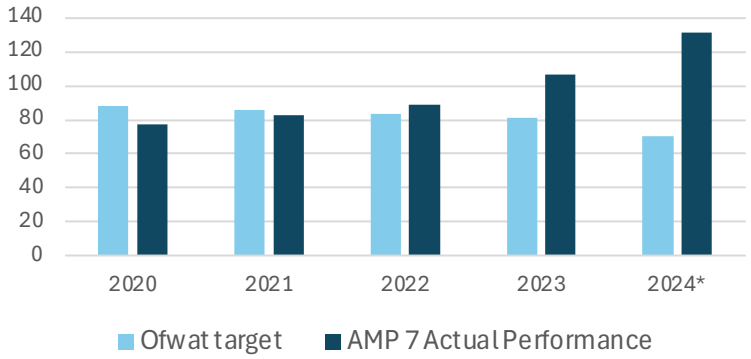
# A review of recent performance

The UK experienced a warmer and wetter than average winter during 2023/24, one of the wettest periods going back to 1836, recording several named storms. This had a significant impact on pollutions events, increasing the number of reportable incidents collectively in 2023 and 2024.

The rise in pollution over recent years, as illustrated, is a significant issue for our Executive team and Board. We are actively seeking to comprehend the factors contributing to this increase, which appears to result from a mix of the performance of our assets, systems, and personnel, as well as external elements beyond our control, such as weather conditions and regulatory changes.

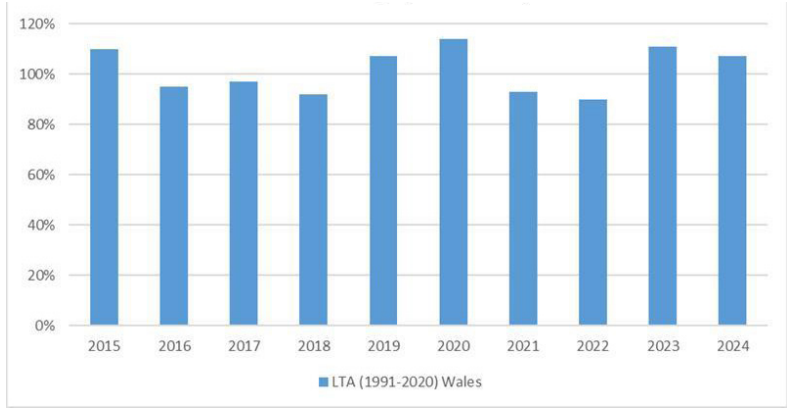
Regardless of the cause, we are committed to Regardless of the cause, we are determined to address these challenges and tackle the challenges and reduce the number of incidents going forward. There are some things we are already doing or can put in place in the short-term; other initiatives will take longer to develop and have an impact. Our ambition is to return to 3-star EPA performance.

## Total pollution incident performance 2020-2024




** Provisional figure not yet finalised with NRW/EA*

## Rainfall in Wales as a percentage against Met Office Long Amount Term Average (1991 - 2020)




# A review of recent performance root causes

We investigate all pollution incidents and attribute them to one primary cause –although in many instances there have been multiple contributing factors. This chart shows the breakdown of primary causes, along with their underlying secondary causes for 2024.

**Other – 11%**

Includes collapses (5%), power failures (4%) and Treatment process failures (2%).

**Targeted reduction in 2025 – 15%**

**Pump failure – 10%**

Pump Blockage – 54%
Pump Air-lock – 38%
Unknown – 8%

**Targeted reduction in 2025 – 42%**

**Burst rising mains– 10%**

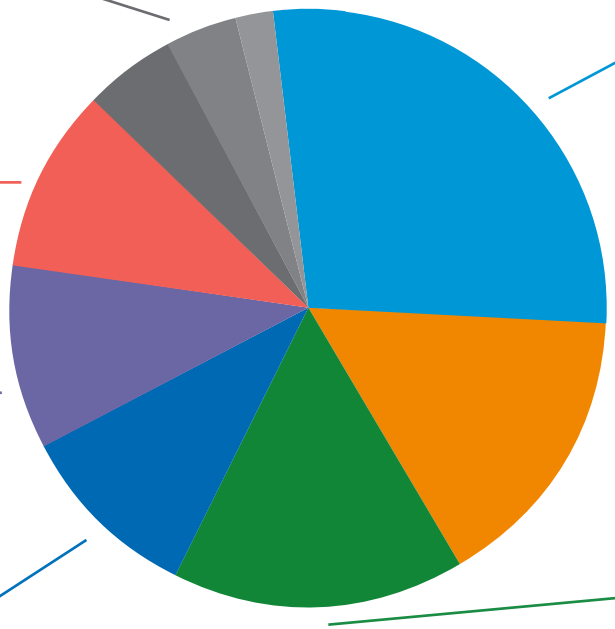
Structural failure – 92%
Third party damage – 8%

**Targeted reduction in 2025 – 0% ***

**Inadequate containment – 10%**

Operational Issue – 38%
Screenings – 23%
Fracture/Joint leaking – 15%
Treatment Process/flow issue – 15%

**Targeted reduction in 2025 – 23%**




**Blockages – 26%**

Fats/Oils/Grease – 32%
Nappies/Wipes/Rags – 32%
Roots – 12%
Silt – 9%
Debris – 6%
Third-party items – 6%
Unknown cause – 3%

**Targeted reduction in 2025 – 38%**

**Hydraulic overload – 16%**

Rainfall induced – 46%
Infiltration induced – 38%
Other – 17%

**Targeted reduction in 2025 – 0%***

**Equipment failure – 16%**

Electrical – 50%
Mechanical – 30%
Instrumentation/control – 20%

**Targeted reduction in 2025 – 10%**

** Work to tackle root causes in these areas will take longer than one year to yield significant results.*

# A review of recent performance: Root cause

The analysis of the underlying causes of our pollution performance in 2024 has guided the focus of our pollution reduction initiatives detailed in this document.

Historically, blockages have posed the greatest challenge regarding pollution, and this trend continued in 2024, with blockages representing 26% of our pollution incidents. This marks a 6% rise in blockage incidents compared to 2023.

Notably, 59% of these blockage incidents were repeated occurrences at the same locations, indicating that further efforts are necessary to address these known blockage 'hotspots'.

Additionally, the data reveals that 72% of our sewer blockages stem from misuse (such as wipes, fats, oils, and greases) while 26% are related to maintenance issues like roots and silt.

A noteworthy change in our pollution incident profile over the past two years has been the rise in Hydraulic Overload incidents.

In 2024, these incidents accounted for 16% of the total, marking the second consecutive year that this primary cause contributed double digits to the overall pollution figures. Before 2023, Hydraulic Overload incidents typically remained in single figures annually. This significant shift was largely driven by the extreme wet weather experienced from July 2023 to March 2024. We recognise the necessity of enhancing the resilience of our assets to adapt to increasingly unpredictable weather patterns, which are likely to become standard due to climate change.

Furthermore, equipment failure significantly impacted overall pollution figures in 2024, constituting 16% of incidents. This represents a 12% increase compared to 2023. It is important to note that part of this increase can be attributed to our enhanced self-reporting capabilities from the 'above ground' asset base rather than a decline in asset performance.

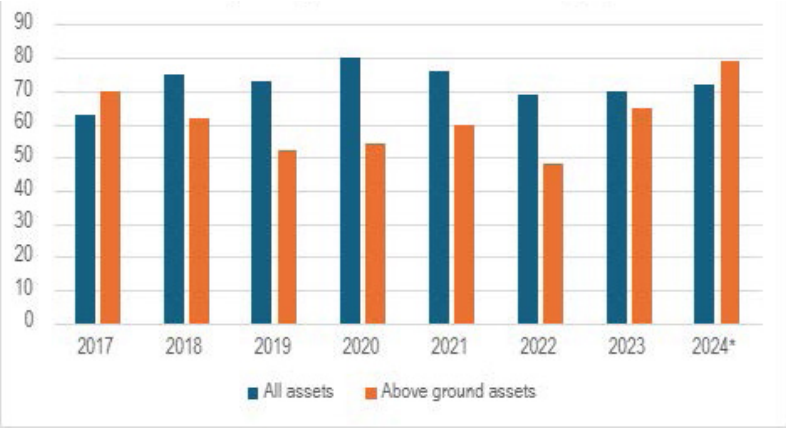
In 2024, we separated pump failures from airlocks and blockages under the 'equipment failure' category to enhance clarity and better target our initiatives. Pump failures accounted for 10% of incidents that year.

Rising mains also represented 10% of the total pollution incident metric, but they disproportionately affected the serious pollution incident metric, with 42% of serious incidents in 2024 resulting from rising main bursts. Notably, 54% of these bursts were linked to assets earmarked for investment in our AMP 8 plans. Inadequate control and containment encompassed various incident types, contributing to 10% of incidents in 2024. Within this category, 38% were due to 'operational issues,' where unintentional mistakes occurred during planned work, leading to incidents. Reviews of these incidents often reveal that the are deemed 'avoidable.' This remains a key area of focus for enhancing training and awareness among operational and support teams.

# A review of recent performance self-reporting

Self-reporting of pollution incidents is an important metric, as it is an indicator of the transparency of our operations and the way that we work co-operatively with our regulators. The percentage, which covers both wastewater and water assets, is reported to NRW and EA, and forms part of the annual Environmental Performance Assessment (EPA). The target consistent with a 'green' EPA is 80% overall, and 90% of all incidents at Pumping Stations and Sewage Treatment Works.

### Self-reporting of pollution incidents (%)




** Provisional figure not yet finalised with NRW/EA*

Since a notable enhancement in AMP6, there has been an overall decline in self-reporting performance since 2020. This trend can be partially attributed to the welcome increased awareness of environmental issues among our customers and the public, particularly during and following the Covid pandemic. When pollution incidents are quickly detected and reported by the public, it enables us and regulators to respond swiftly.

The insights and knowledge of our customers are extremely valuable. We encourage anyone who notices or suspects a pollution incident to contact us directly, allowing us to respond promptly. This also enables us to keep regulators updated on our findings and the measures we have taken to prevent future occurrences. We are committed to acting responsibly based on the information provided to us.

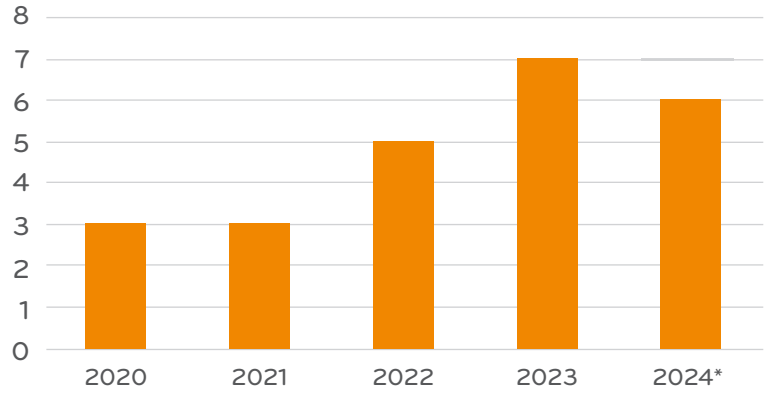
However, we should not solely depend on others to report pollution incidents linked to our assets. We are enhancing our capability to identify issues by installing more monitors that facilitate automated early alerts for blockages and equipment failures. This is reflected in the rising number of self-reported pollution incidents from our telemetered (above ground) assets. Consequently, we are optimistic that our performance in this area will continue to improve in 2025 and beyond.

# A review of recent performance serious incidents

In 2024 there were seven incidents categorised as Category 1 & 2 (serious).

| Location | Cause |
|---|---|
| Pill Farm, Magor | Burst rising main (South East Coastal Main) running overland on Sites of Special Scientific Interest (SSSI) site and entering watercourse. |
| Freeman's Way, Haverfordwest | Pump failure at Picton Place SPS which resulted in a prolonged discharge to the Western Cleddau. |
| Trebanos SWK | Equipment failure of a surface aerator gearbox which ultimately led to a humus sludge blanket carry over event within the sites final effluent. |
| Tenby Salterns | Burst rising main which resulted in a precautionary beach closure of 4 Tenby beaches. |
| Black Oak Rd, Cardiff | Clean water distribution main burst which resulted in siltation of nearby watercourse. |
| Bow St SPS | Prolonged discharge from emergency overflow during complex burst rising main repair. |

**Number of serious pollution incidents**




While Category 1 & 2 (serious) incidents are far fewer in number than Category 3 incidents, their seriousness is such that reducing them is a major priority.

The regulatory target for serious pollutions is zero for 2025-30. Unfortunately, achieving this will require the replacement of long lengths of rising sewer main (see page 22), and will take time. The main reason for the increase in the number of serious pollutions in the last few years is the deterioration in condition of these mains.

# STRATEGY, ORGANISATION AND GOVERNANCE

- 5 Pillars of our Pollution Recovery Strategy
- Organisation and governance
- Reporting

# 5 Pillars of our Pollution Recovery Strategy

We fully accept that we urgently need to improve pollution incident performance. Our aim in the short-term is to achieve parity with other companies that are good performers in this area. In the longer term we aim to eliminate serious pollution incidents and reduce other incidents to a minimal level.

1. **People:** Resources, training, knowledge and upskilling
2. **Smart:** Intelligent monitoring, analysis, detection, prevention
3. **Asset investment:** Investment in our assets that will add value to EPA
4. **Asset maintenance:** Innovative maintenance initiatives beyond business-as-usual.
5. **Process and systems:** Improvements to existing processes and systems

We commit to reducing pollution incidents by 19% from 2024 outturn by 2025, to a figure of 108. This is part of our overall plan to recover our EPA performance from 2-stars to 3-stars by 2027. The five pillars of the EPA recovery plan are summarised opposite. Our full EPA Recovery Strategy can be found **here** and the Pollution Incident Reduction Plan sits under that.

The remainder of this document will describe the Pollution Incident Recovery Plan in more detail, examining each of the types of asset that can be the source of pollution, explaining the root causes, and setting out our actions to tackle them.

### People:

Fund and recruit additional pollution and compliance resources where it is needed most, develop and deliver training and guidance ensuring all new and existing colleagues have the knowledge required to drive performance improvements.

### Smart:

Continue to develop and deliver the sewer monitoring programme, introducing new technologies that will tackle waste from a holistic viewpoint. Implement anomaly detection, preparing a full roll out during AMP8.

### Asset investment:

Additional funding for minor works to accelerate performance improvements where known risks are identified but not previously cost effective. AMP8 schemes to tackle serious pollution incidents from rising mains.

### Asset maintenance:

Air valve maintenance programme targeting highest risk mains, aiming to prevent bursts whilst increase lifespan of ageing mains. Use of innovative technologies to improve quality of maintenance at Storm Overflows. Enhanced central investory for compliance mitigation.

### Process and systems:

Continue to improve our incident review process to reduce avoidable incidents, automation of our operational procedure and reporting systems and delivery of enhanced Operational Technology data transfer project.

# Organisation & governance

In 2024 we undertook a restructure of our wastewater team to bring a clearer focus on environmental performance and impose stronger accountability on the delivery of improvements.

Each EPA performance metric has a responsible owner. For Pollution Incidents this is the Head of Wastewater Networks, bringing together all relevant business areas, including Wastewater Treatment, Wastewater Assets, and Bioresources.

Performance is discussed monthly at the Pollution Incident Steering Group, which scrutinises areas of success and failure, and makes adjustments to optimise the plan. Performance is then reported up monthly to the Wastewater Senior Leadership Team, and quarterly to the Board's Performance and Strategy Committee.

**Wastewater Senior Leadership Team**

Managing Director of Wastewater

**Envisage 2030**

Head of Wastewater Transformation

**Pollution Incident Working Group**

Head of Wastewater Networks

**We will need a laser focus on tackling the root causes of pollution incidents if we are going to be successful in hitting our targets in AMP8.**

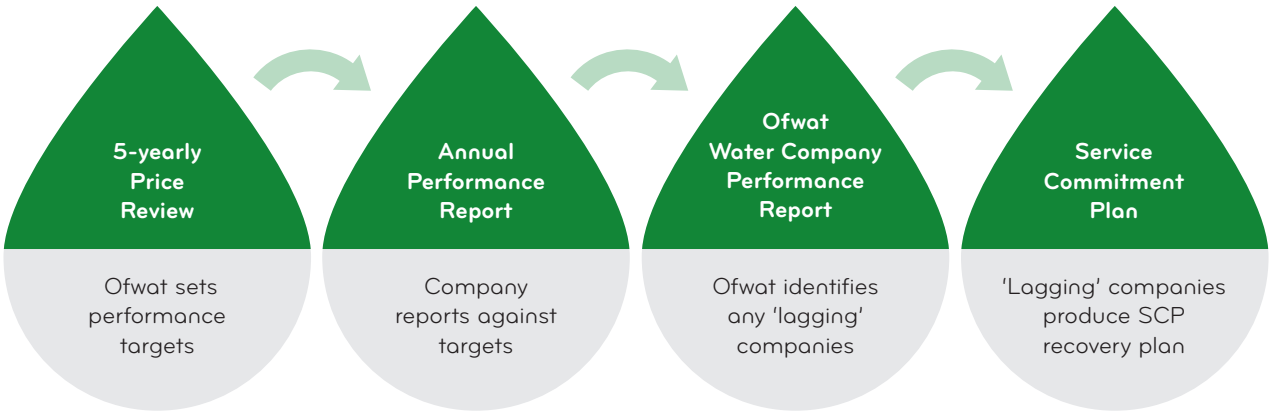
Steve Wilson,
Managing Director of Wastewater

# Reporting

All regulated water companies produce an Annual Performance Report in July of each year. This reports its performance in the preceding year against the performance targets set in the most recent Price Review, along with an explanation of strong or poor performance. The data is subject to rigorous internal and external assurance.

Ofwat compares performance across water companies in its Water Company Performance Report, published in October. Companies deemed to be performing badly against their targets across a range of areas are identified as 'lagging behind' and are required to produce a Service Commitment Plan to explain how they are planning to improve.

**The performance reporting process**




## Service Commitment Plan

Producing a Service Commitment Plan (SCP) is a requirement set by Ofwat for companies identified as 'lagging behind'. In the SCP the company sets out, for each performance area where they are behind, the actions they are taking to close the gap and recover performance. Welsh Water produced a SCP in 2023 and 2024, and the metrics covered included pollution incidents. This Pollution Incident Reduction Plan is consistent with the updated 2025 SCP.

# How we respond to pollution incidents

## Notification

We may receive an alert into our Operational Response Centre (ORC) from telemetry or monitors, or a colleague or member of the public sees what could be a pollution issue. The EA or NRW may also contact us if they have been made aware of an issue.

## Site visit and initial investigation

We send a trained and equipped colleague immediately to visit the site of the alleged pollution and verify the reported issue. If possible the person will take action to stop the incident as quickly as possible, or limit the impact of the pollution.

## Incident reported to regulator

If there is a potential or actual pollution incident, we will inform the NRW or EA as our environmental regulator. We will then investigate further and collect evidence on the cause and severity of the incident.

## Report back to regulator

The evidence and information gathered is sent back to the regulator, who uses it alongside any evidence they have gathered themselves to categorise the incident's seriousness, confirm the source and responsibility.

## Post incident

When an incident is confirmed as having been caused by our assets or activities, we will assess root cause to ensure we minimise the risk of repeat incidents. We complete in-depth reviews for all serious, avoidable and repeat incidents.

## Confirmation of pollution classification

After the end of the calendar year the regulator will confirm the number of pollution incidents in each category, and these will be reported to Ofwat and to the regulators as part of the Environmental Performance Assessment (EPA).

# REDUCTION PLANS BY ASSET CATEGORY

- Wastewater network
- Storm overflows
- Rising mains
- Wastewater treatment works
- Pumping stations
- Clean water treatment and network

# Pollution Incident Reduction Plan

Our Pollution Incident Reduction Plan begins with an examination of the root causes of incidents. This understanding allows us to address the most critical sources of pollution first, enabling swift improvements.

Although we have a basic grasp of these causes, our investigations continue, and we seek to deepen our knowledge about the reasons behind failures and the most effective solutions.

We have developed specific plans tailored to the various classes of assets where pollution incidents occur, as well as the different primary causes. All these plans are integrated into the overarching Pollution Incident Reduction Plan.

The following sections provide a summary of what we have discovered regarding the challenge of minimizing pollution incidents for each asset type, outline our current efforts, and detail our long-term strategies.

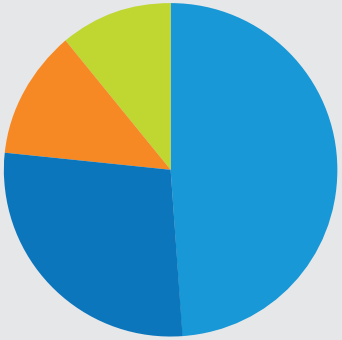
## Asset types and primary causes

| | Blockage /collapses | Equipment failure | Bursts | Hydraulic overload | Inadequate control |
|---|---|---|---|---|---|
| **Sewer networks** | ✓ | | | ✓ | ✓ |
| **Rising sewer mains** | | | ✓ | | |
| **Wastewater treatment works** | ✓ | ✓ | | ✓ | ✓ |
| **Pumping stations** | ✓ | ✓ | | ✓ | ✓ |
| **Clean water assets** | | ✓ | ✓ | | ✓ |

# Sewer Network

Most pollutions emanating from our network of sewer pipes are caused by blockages on sewers. Combined sewers, pollutions are usually caused by hydraulic overload in heavy rainfall, and exacerbated by infiltration which increases flow and puts additional pressure on the system.

**Primary causes (2024)**



- Collapse **11%**
- Blockage **49%**
- Hydraulic overload **28%**
- Inadequate control **12%**

## The challenge

Increasing and maintaining the level of customer awareness about the proper use of sewers and the risk of blockages from wet wipes is a constant challenge. Here governments can help by legislating to ban wet wipes and ensure proper labelling.

Blockages often build up gradually which means sewer monitoring can help alert us to a problem before an escape of sewage occurs from the network. Meanwhile, climate change is increasing the risk of pollutions from hydraulic overload as rainfall patterns change.

## What we are doing

- Continuing efforts to minimise blockages through customer awareness 'Stop the Block' campaign targeted at those areas that see the most blockages.
- We continue to maintain high risk assets to prevent the build up of silt and fats to prevent repeat incident risks.
- We have delivered more than 500 sewer pollution monitors in the last 12 months and are targeting a further 1,000 by December 2025. This will help with early detection of blockages.
- We continue to use blockage data to highlight 'hot spot' high risk areas which impact pollution and target proactive inspections and intervention. An example, we are currently focusing on roots infestation risks.

## Future plans and initiatives

We are targeting installation of 4,000 new monitors over 2025-30 aiming to deliver them as early as possible during the period.

# Storm overflows

Storm Overflows are an important part of the drainage system in Wales. In many areas, we have a combined sewerage system carrying rainwater run-off and wastewater in the same pipes, designed and built in a time of very different expectations in terms of environmental protection. To protect businesses and properties from flooding during and after heavy rain these assets spill heavily diluted sewage, with a high proportion of the content being rainwater.

As long as permit conditions at these assets are being met, these discharges are not designated as 'pollution incidents' as the assets are operating as designed. Occasionally situations (such as blockages) can occur where these assets operate outside of their discharge permits and these may then be considered pollution incidents. We now have monitors in place on 99% of our overflows to be able to identify when storm overflows are operating when they should not be, for example during dry weather, with a much higher risk of causing environmental harm.

Even permitted storm overflow discharges can have a negative effect on the environment. To combat this we have a £1.1 billion investment programme for 2025-30 that will reduce spills from storm overflows, focusing on those spills that are causing the most environmental harm, and that are not covered by permits. This programme is being overseen by Ofwat, and by Natural ResourcesWales, under the National Environment Plan.

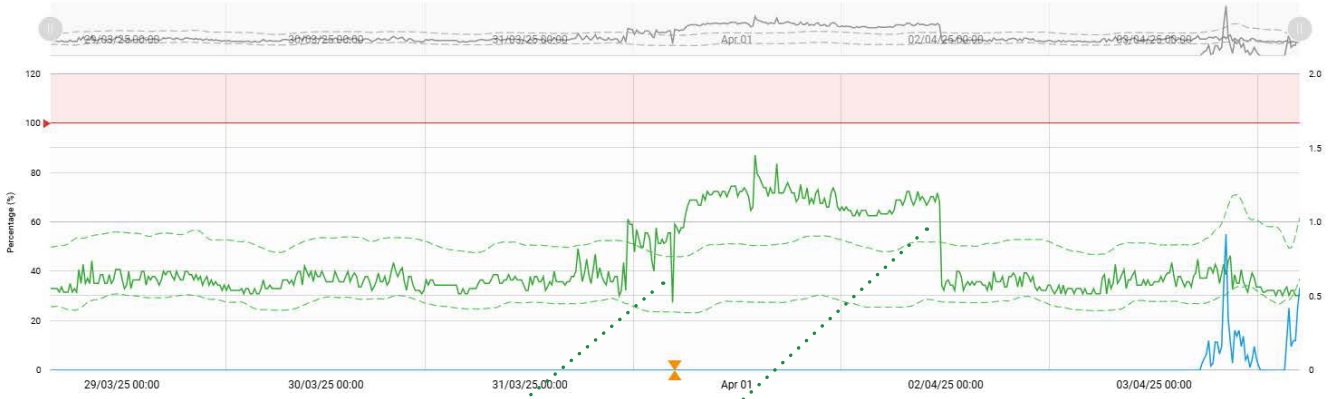
The programme of Storm Overflow assessments (SOAF) is ongoing and there will be a major programme of investment to improve SOs in AMP8, prioritised based on harm caused in line with regulatory guidance. This is not primarily directed at reducing designated pollution incidents, but it will have a positive impact on pollution performance overall.

We are committed to being completely transparent about the operation of our storm overflows and we now have a real-time CSO map in operation that shows which CSOs are spilling, and when the last spill occurred for each CSO. **You can find the map here.**

# **Case study:** Storm Harvester

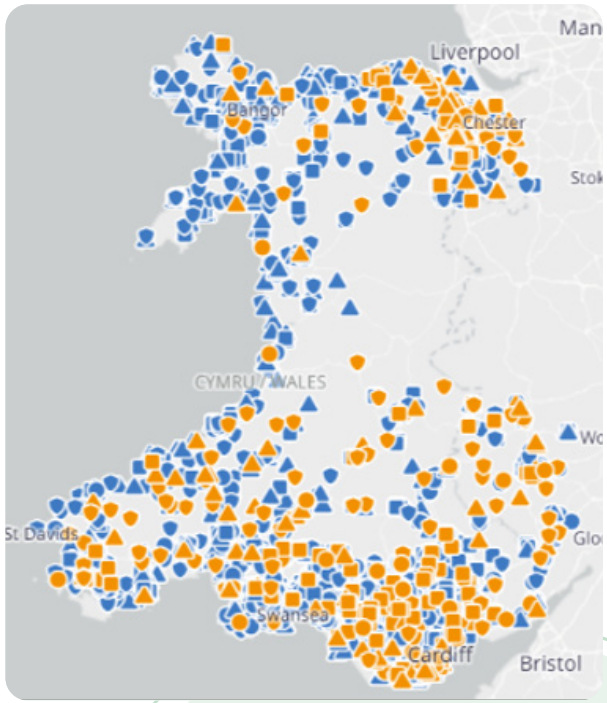
We have now completed an 18 month initial pilot of 'Storm Harvester' technology, which is the industry leader in anomaly detection for sewer networks. The pilot phase is now being rolled out across our operating area, analysing data from 2800 existing monitors. Its capabilities will continue to expand and add value as we install thousands more monitors during AMP8.

StormHarvester uses machine learning and hyperlocal rainfall forecasting to give assets the ability to predict blockages and asset under performance. This then enables operatives to take action to prevent or mitigate problems before they occur. The information provided also helps us to manage the network more efficiently, reducing storm overflow spills and pollution incidents.




**Anomaly Detected:**
Trend outside normal operating parameters

**Blockage cleared:**
dog toy removed




**Locations of level and flow sensors across around 3,000 above and below ground assets across our area.**

# Rising mains

Rising (i.e. pumped) sewer mains form a small minority of our sewer network but are a disproportionate cause of serious pollution incidents. They operate under pressure so if they are damaged or burst due to structural failure they can cause significant environmental harm.

**Primary causes (2024)**

Third party damage **8%**
Structural failure **92%**

## The challenge

Many of the rising mains are in environmentally sensitive areas, meaning the impact of any pollution is greater, while also making them expensive and disruptive to replace. It can be more cost effective to identify and repair weak spots before they cause a problem. Both these strategies are part of our plans.

## What we are doing

- We have identified 11 sites which form the priorities for investment to reduce pollution risk.
- Meanwhile we are focusing on better maintenance of air valves.
- Installing 100 'smart' air valves which help us protect rising mains by increasing awareness of maintenance requirements, protecting the rising main from air entrapment.
- Deploying 50 burst detection monitors to allow us to monitor pressure within rising mains. This will provide early notification of bursts, allowing us to respond more quickly and prevent environmental harm.

## Future plans and initiatives

We are targeting upgrade or replacing 23 kilometres of rising sewer main during AMP8 (2025-30). This includes the long South East Coastal Sewer (see next page) that runs through the environmentally sensitive Gwent Levels.

We will also tackle some of the rising mains that are the biggest causes of serious pollution incidents in areas, including in Tenby and Kenfig.

We are also undertaking much more detailed modelling of the deterioration of the condition of rising mains, which will help us identify where maintenance investment should be prioritised in the future.

# Case study:
# South East Coastal Sewer

The South East Coastal (SEC) sewer main was designed to transfer sewage, via a rising main, to a single treatment works at Nash. It is approximately 33 kilometres in length, with a diameter between 20 and 70cm. It crosses or interacts with the River Wye, the Severn rail tunnel, the M4, and sea wall defences. Importantly, much of its length runs through the Gwent Levels, a Site of Special Scientific Interest (SSSI).

Failures of the pipe have been the cause of serious pollution incidents for some time. Various options have been considered for reducing the risk of further incidents, but for practical and cost-effectiveness reasons these did not featured in our approved investment plans, until PR24. We now have ring-fenced funding to replace 59 kilometres of the sewer that are in poor condition during 2025-30.

Implementing this in the middle of an SSSI will be a major operational challenge and will be one of our most important projects in the next AMP.

# Case study:
## Tenby

The Tenby Salterns rising main is a 375mm glass fibre reinforced plastic (GRP) rising main which transfers sewage from Salterns SPS to the treatment works. It is 2km in length, passing close to Kiln Park, through SSSI land, until discharge into Tenby Treatment works which was built in the 1990's.

Whilst innovative at the time the material has not achieved great success and the most recent failure resulted in significant amenity impact locally.

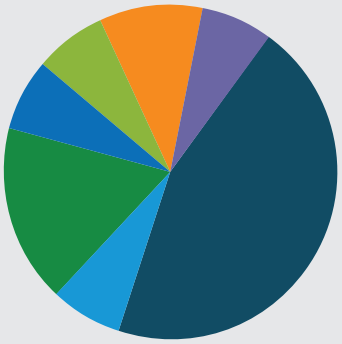
We are now proactively replacing part of the mains to reduce the likelihood of future rising main bursts with the consequent environmental impact, and reduce total and particularly serious pollution incidents.

Replacing the Tenby Salterns rising main is part of this programme. This will be a significant challenge due to the location adjacent to local caravan parks, difficult ground conditions and proximity of sensitive ecological sites. But once complete this replacement will deliver significant pollution risk reduction in this important area for tourism in Wales.

# Wastewater treatment works

Wastewater treatment works use mechanical, biological and chemical processes to clean wastewater and sewage, resulting in a discharge of water to be returned to the environment in line with permits. They have to deal with huge fluctuations in flow depending on rainfall.

**Primary causes (2024)**



- Blockage **7%**
- Equip failure **45%**
- Power failure **7%**
- Inadequate controls **17%**
- Pump failure **7%**
- Hydraulic overload **7%**
- Process failure **10%**

## The challenge

The biggest pollution challenge with wastewater treatment works is maintaining flow levels through the works. When pumps or penstocks (that control flow from one area to the next) fail, this can lead to premature spills into the waterway, causing pollution. Our works vary hugely in size, with a relatively high proportion of the smallest category of works, making maintenance and monitoring an ongoing challenge.

## What we are doing

- As the biggest root cause of pollutions is equipment failure, we are focusing primarily on improving the reliability of treatment works.
- As part of the SMART pillar of the strategy we are deploying 'Concertor' pumps, which are better at adapting to different operating conditions.
- We are improving how we use data on flow to prompt rapid intervention.
- Rotation sensors being installed on 100 prioritised assets to ensure we have better visibility on process failure risks.
- We have completed a review of all telemetry alarms to ensure they are working and feeding through to our Operational Control Centre.

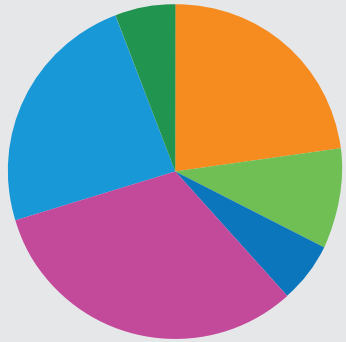
## Future plans and initiatives

As noted elsewhere we have allocated additional resource to reducing inflows into sewers that do not belong there. We expect this to begin to have an impact on pollutions from pumping stations and wastewater treatment works in the medium-term.

# Pumping stations

Pumping stations are a vital part of our network, ensuring that all wastewater reaches treatment works across our topographically diverse operating area. However, pumps are inherently prone to mechanical problems, and rely on steady flows and a constant energy supply.

**Primary causes (2024)**



- Blockage **6%**
- Equipment fail **23%**
- Power outage **9%**
- Inadequate control **6%**
- Hydraulic overload **24%**
- Pump fail **32%**


## The challenge

We have around 2,500 sewage pumping stations on our network and a failure on any one of them can cause a pollution incident. The possibilities include unwanted airlocks, blockages, and hydraulic overload. The challenge is to prioritise alarms and maintenance so we can target correct deployment of the resources we have.

## What we are doing

As with the network in general,

- Artificial Intelligence Is key to early detection of issues and anomalies, using better data about how assets are operating, including energy usage helping to provide early alerts of pump performance.
- We are increasing the efficiency and quality of wet well cleaning. We have found correlation between well condition and pollution occurrence.
- As noted elsewhere we have allocated additional resource to reducing inflows into sewers that do not belong there. We expect this to begin to have an impact on pollutions from pumping stations in the medium-term.

## Future plans and initiatives

As noted elsewhere we have allocated additional resource to reducing inflows into sewers that do not belong there. We expect this to begin to have an impact on pollutions from pumping stations in the medium-term. During AMP 8 we plan to install 'Concertor' pumps across our high-risk asset base.

# Pollutions from clean water treatment and network

While clean water is processed to meet high drinking standards, failures in clean water infrastructure can still negatively impact the environment, often due to inputs of chlorine and siltation.

Clean water incidents have shown progress over the last three years, with a notable decrease in low-impact occurrences.

This improvement has been observed in both treatment and distribution-related incidents. The most significant enhancement has been in the number of incidents at Water Treatment Works, where we have seen a reduction in incidents following the implementation of a permitting programme, resulting in 40 'emergency run to waste' permits being requested in 2023.

In 2024, we did experience one serious incident caused by a major burst in a water main, which led to silt and sediment entering a small stream.

We acknowledge that there is still work to be done and have plans to further reduce the risk of pollution from these assets.

### What we are doing

- Delivery of robust, reliable Ascorbic Acid dosing units for dechlorination at WTWs in order to achieve our compliance aims whilst reducing harm to the receiving environment. This project delivery will support our commitment to maintaining high environmental performance standard.
- Working closely with our operational and capital contractors to ensure any incidents impacting the water environment are reported promptly and sufficient mitigation for Chlorine and Siltation is deployed.
- Developing a network of Pollution Champions within our Clean Water teams to enhance visibility of clean water pollutions and further aid in timely reporting.
- We have set-up and co-chair a National Clean Water Pollution Group to share best practice across the industry.

# **Case study:** Water industry collaboration on pollution incidents

There are 11 water and wastewater companies in England and Wales, all of whom are striving to reduce the number of pollution incidents. There is therefore a lot to be gained by sharing best practice and working together on common problems.

## Water sector collaboration

Our Pollution Performance Manager sits on the National Pollution Group (NPG), which consists of representatives from all water companies and the industry body, Water UK. It meets monthly to share successes, and tackle common problems and challenges.

The Storm Harvester product is an example of where we have benefited from this kind of collaboration. Welsh Water took an interest in this product following presentations from other companies as part of NPG. We undertook a visit to Southern Water to see the system in action and then implemented a successful pilot. Other successful initiatives include collaborative working groups on root-cause analysis and cross-company learning on self-reporting improvements and initiatives.

## Government policy

Since a high proportion of our pollution incidents are caused by blockages, governments can really help by ensuring wet wipes and other 'flushables' are properly labelled. We have consistently lobbied for a total ban on plastic wet wipes in Wales, and the Welsh Government now expects this to come into force in 2026.

We also participate fully in the First Minister's Better River Water Quality Taskforce, which was launched by Mark Drakeford at the first River Pollution Summit in July 2022. This has helped to galvanise all stakeholders in the issue to take action where it can have the biggest impact on river health, notably by reducing phosphorous flows into rivers designated as Special Areas of Conservation.

# SUMMARY AND NEXT STEPS

# Bringing it all together

## Reductions by asset type

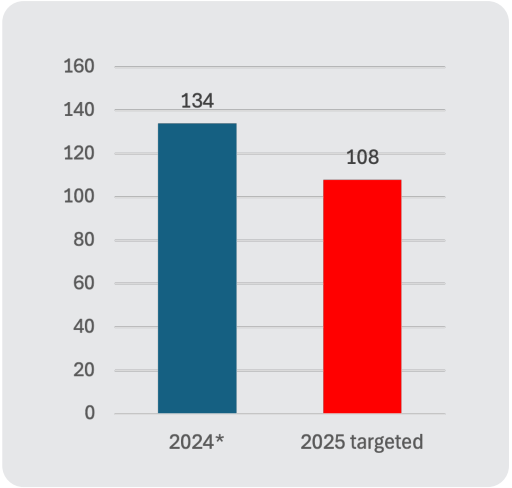
Given the priorities identified in our plan, we are expecting the biggest reduction in pollution incidents to come from the sewer network (foul sewer) and pumping stations, with a reduction of about 22%. There should be a significant reduction also in pollutions from Storm Overflows.

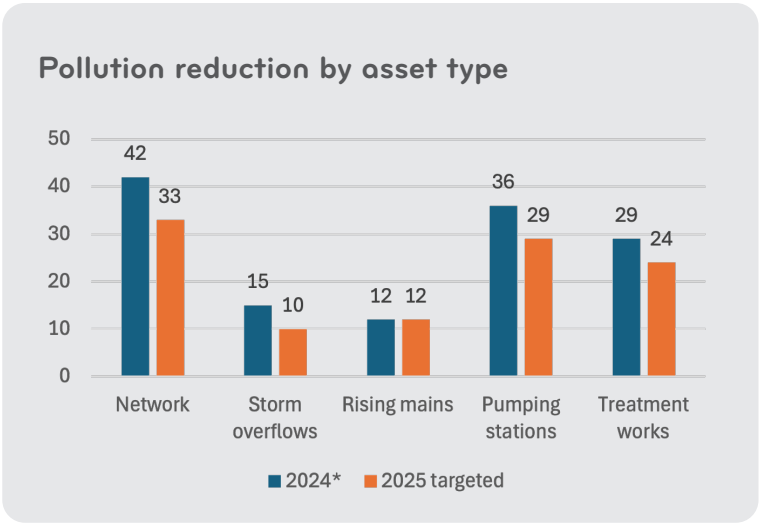
## Reductions by root cause

We are prioritising our efforts on the root causes that are having the biggest impact on pollution incidents. We should see the biggest reductions coming from reducing blockages, through earlier detection of blockages and potential blockages thanks to the installation of sewer monitors and other 'smart' technology.

Further reductions will come from fewer equipment failures of various kinds, as we improve condition monitoring and maintenance, and install 'concertor' pumps.

We do not expect to see a reduction in the number of pollution incidents from burst rising mains in the first year, as it will take longer to prepare and implement the planned repair and replacement of the highest priority rising mains. Similarly, we are not projecting a reduction in hydraulic overload over the next couple of years until our investment plan takes hold.




**2024 performance yet to be finalised with NRW/EA*

# What can we all do?

Alongside our own efforts to minimise pollution incidents, we continue to encourage others to do what they can to help reduce pollution and improve river water quality.

As noted above, we urge **government** to introduce a ban on wet wipes, consider a phosphorous 'credit scheme' for Wales to enable sustainable development, and maintain a policy focus on improving river water quality.

**Local authorities** can promote and deliver sustainable urban drainage schemes, work with us to introduce more wetland and other nature-based solutions and help remove surface water from the wastewater network generally.

**Regulators** can support and introduce regulations to enable 'catchment permitting', incentivise cross-sector collaboration, and help enable sufficient funding to meet investment needs.

**Customers** can avoid using non-flushable wet wipes that cause blockages, and maintain as much green space on their properties as possible. Both business and household customers need to understand the risks caused by pouring fats, oils and grease down the sink. And everyone, particularly builders and developers, can do all they can to avoid misconnections of surface water drains into sewers that add to pressures to the wastewater network.

## Citizen Science

We are conscious of the appetite for Citizen Science, appreciating the commitment and devotion of the public, caring for our natural environment. Whilst the concept has multiple opportunities and benefits, for the action to be worthwhile, there needs to be consideration of many aspects including quality of sampling, consistency of information, involvement of regulators and very importantly, maintaining the safety of the public.

We currently support the Catchment Systems Thinking Cooperative (CaSTCo) that aims to empower local communities to gather robust data which can be shared with decision makers, customers and other stakeholders, allowing evidence-based catchment management decisions. CaSTcO will develop a national framework of standardised tools and training.

We have committed £250,000 to the CaSTCo project and are working with the Wye and Usk Foundation on a trial in the Usk catchment which is demonstrating how the agricultural community can engage in Citizen Science. In the meantime, we are developing a citizen science position statement, that will provide Citizen Science groups with information on how Welsh Water can potentially support and fund certain initiatives whilst maintaining a standard of quality and safety. We will launch this in due course.

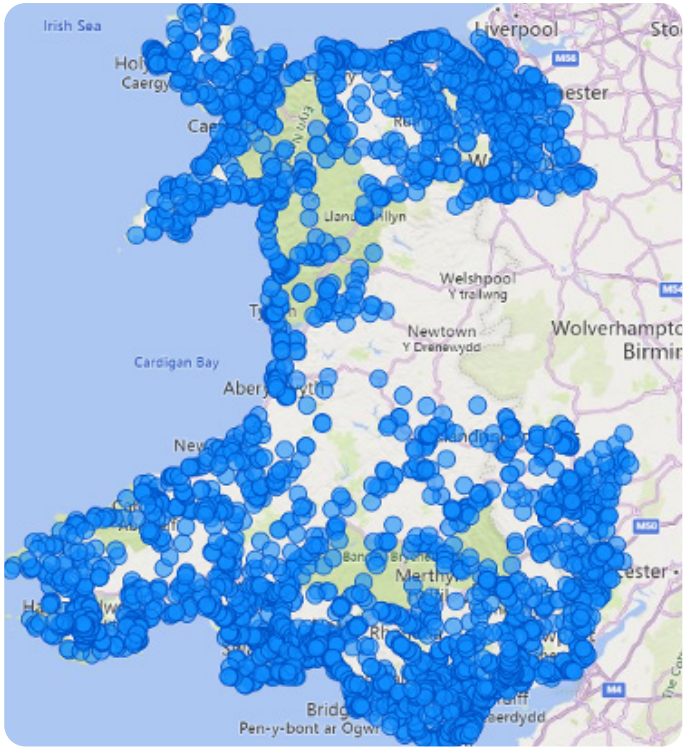
# Glossary

| | |
|---|---|
| **AMP** | Asset management period (5 years) |
| **AMP7** | AMP running from 2020-2025 |
| **AMP8** | AMP running from 2025-2030 |
| **EA** | Environment Agency |
| **Hydraulic overload** | When the capacity of a sewer is insufficient for the volume of wastewater flowing through |
| **NRW** | Natural Resources Wales |
| **Ofwat** | The water service regulation authority |
| **PR24** | The Price Review that concluded in December 2024 covering AMP8 |
| **Rising main** | A sewer pipe that operates under pressure. |
| **SCP** | Service Commitment Plan |
| **SOs** | Storm overflows - A release valve that sends excess wastewater to outfalls during heavy rain |
| **Telemetry** | Automatic monitoring of asset operations. |

FOR REFERENCE ONLY

# Wastewater assets

## Above-ground assets

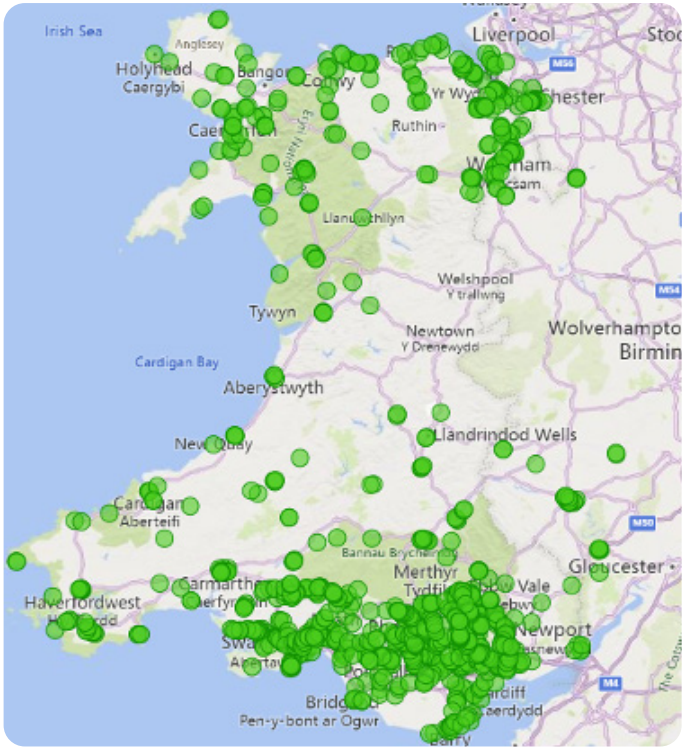



Treatment works: **820**

Bio resources sites: **4**

Sewage pumping stations: **2500**

## Below-ground assets




Network Monitors: **2,500**

Sewers: **36,000 km**

Storm Overflows: **2,300**

# Wastewater assets

| Target Area | Initiatives | YR 1 targeted reduction |
|---|---|---|
| Foul Sewer Blockage Reduction | Foul Sewer Blockage Reduction | Targeted Yr 1 reduction – 28.5% |
| Hydraulic Overload Incidents | Inflow reduction team<br>Focused inflow reduction budget to resolve maintenance issues on Network<br>SO programme to reduce spills from assets | Targeted Yr 1 reduction – 0% (benefits to come later in AMP) |
| Equipment + Pump Failures (SPS/WWTW) | Storm Harvester<br>CSO maintenance budget<br>Concertor pump installs | Targeted Yr 1 reduction – 19% |
| CSO Blockage Reduction | Storm Harvester<br>CSO maintenance budget | Targeted Yr 1 reduction – 35% |
| Rising Main Bursts | Air Valve Maintenance + SMART Air Valves<br>Pressure Monitor installs<br>Rising Main replacement programme | Targeted Yr 1 reduction – 0% (benefits to come later in AMP) |

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