PR24

NORTHUMBRIAN WATER *living water* | **ESSEX & SUFFOLK WATER** *living water*

OUTCOMES

APPENDIX A4
NES05

EXECUTIVE SUMMARY

This document sets out the service levels, or Performance Commitment Levels (PCLs), that we propose to meet by 2030 in our business plan (BP) for the 2024 Price Review (PR24) and the associated incentives that should be attached to those. This includes our proposals for the 'common' service performance areas that all companies are being required to meet as well as how we are handling existing 'bespoke' PCLs where we are not proposing any for PR24 with financial incentives. Finally, it also sets out the proposed rates for the financial incentives that will be applied. An annex to this document provides greater detail on each of the service metrics and the associated PCLs. This includes information on the definition of the service level, historical and forecast performance information and summary plans for delivering the proposed improvements, including through new innovations that we are exploring.

We have adopted the 'common' PCs that Ofwat has identified in its methodology for our plan. Our plan focuses on the common PCs that Ofwat is requiring companies to meet. In determining our PCL for operational greenhouse gases we have made adjustments to the proposed baseline year to account for the current mechanism (AMP7) which funds our green energy certificates that are included in our 2021/22 performance.

We do not propose any further 'bespoke' PCs with financial incentives as none of these met Ofwat's criteria. However, will continue to set reputational incentives for some existing bespoke PCs and will increase our service offering and commitments to customers in relation to repeat sewer flooding. Ofwat have discouraged companies from developing bespoke PCs in their PR24 methodology. We have reviewed the existing bespoke PCs we have in place and tested them against customer feedback and other criteria that Ofwat set out in the PR24 methodology. None of these existing bespoke PCLs met the criteria that Ofwat set out. However, following challenge from the Water Forum, we propose changes that would allow us to continue to set targets and monitor progress against some of these PCs without financial incentives and we set out a new package of commitments and improvements in our service performance for customers in relation to repeat sewer flooding.

We have tried to set ambitious PCLs for the 2025-30 period which meet our 'National Leader' vision of being the best performing water and wastewater company in England and Wales but also reflect customer priorities and are consistent with our long-term goals. In setting the proposed PCLs for our business plan we have considered a range of different factors including:

- Our current performance – we want to try to maintain performance in areas where we perform well and improve in those areas where our performance is weaker.
- The priority service areas for our customers – to make sure that we target improvements in the areas that are the biggest priority for our customers. We have considered evidence of customer priorities when setting our service performance targets including whether we believe customers are willing to pay for improvements or not.
- The scale of improvements that we consider would in aggregate be consistent with our vision of being the national leading water and wastewater company. This uses historical performance information to forecast rates of

improvement into the future and where the sector average and upper-quartile performance levels might be which provides potential ranges to target. We have not chosen to follow Ofwat's benchmarks of delivering upper-quartile service on a very wide range of metrics (coupled with upper quartile cost efficiency) because no company in the sector is currently delivering this and we do not consider that the benchmark is credible.

- The alignment with the long-term targets that we have set out in our **long-term delivery strategy** (NES_LTDS). We want our plan for 2025-30 to set us on the right trajectory to hitting the long-term targets that we have for 2050 and where we are going faster or slower than we need to to hit those targets, we need to have evidence of why that isn't the case. Across the wide range of targets in our LTDS this plan helps us to make progress in hitting those targets.

- The above considerations of customer priorities and relative performance lead us to the proposed changes in performance over 2025/26 to 2029/30.

FIGURE 1: CUSTOMER PRIORITIES, CURRENT PERFORMANCE (2022/23) AND PROJECTED PERFORMANCE (2029/30)
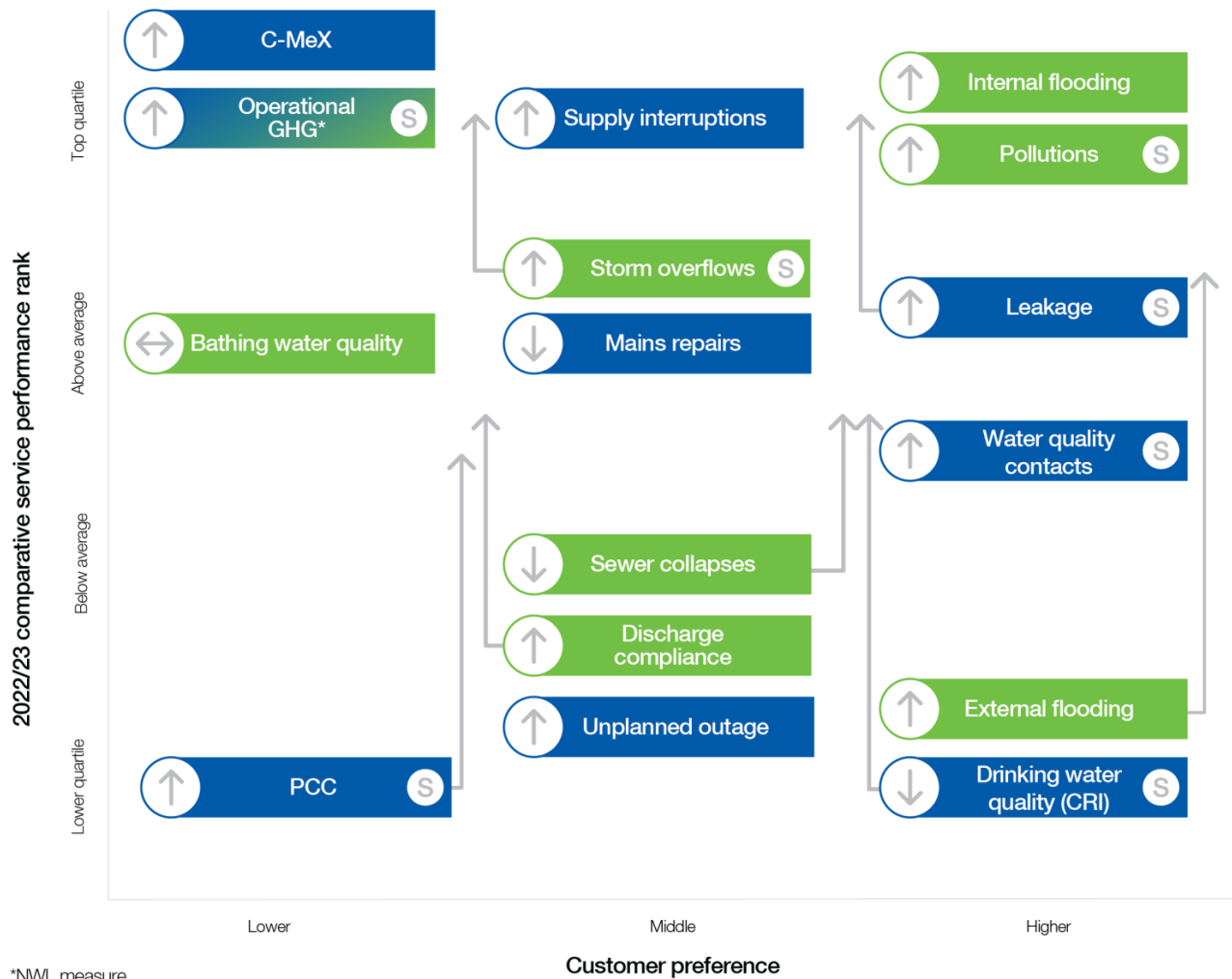
*NWL measure

| (S) Statutory requirement | Change in performance between 2021/22 and 2022/23 | Performance aims for 2025-30 | Water | Watewater |

Source: NWL. Small arrows in boxes indicate the change in performance between 2021/22 and 2022/23, while 'S' indicate those measures with statutory requirements. Larger arrows show the trajectory of relative performance under the plan to 2030.

Wherever possible we aim to deliver these improvements from within our base funding without driving additional rises in customer bills. Where improvements are incremental / innovation driven, or can be funded by re-prioritisation of base funding, we aim to deliver these improvements without impacting customer bills. However, as set out below, we are at the upper quartile for efficiency and on many of the service metrics across the 'common' PCLs. So we do propose some additional investment to improve leakage, demand management and pollutions where our performance is close to the

industry frontier already and/or where legal requirements mean that to improve we need to invest more than we do currently. There are also some areas of investment in our enhancement cases which will also drive service improvements (or mitigate increasing risks which would otherwise result in a deterioration in performance) we explain in those cases **Demand management** (NES15), **Climate change resilience** (NES24), **Storm overflows** (NES27), **Power resilience** (NES32), **NHH Demand** (NES36), and **Pollutions** (NES37), this is after having to find a further £400m of efficiencies in the plan (see **A3 - Costs**, NES04).

FIGURE 2: OUR RELATIVE COST EFFICIENCY AND SERVICE PERFORMANCE PLACES US IN THE TOP QUARTILE OF COMPANIES
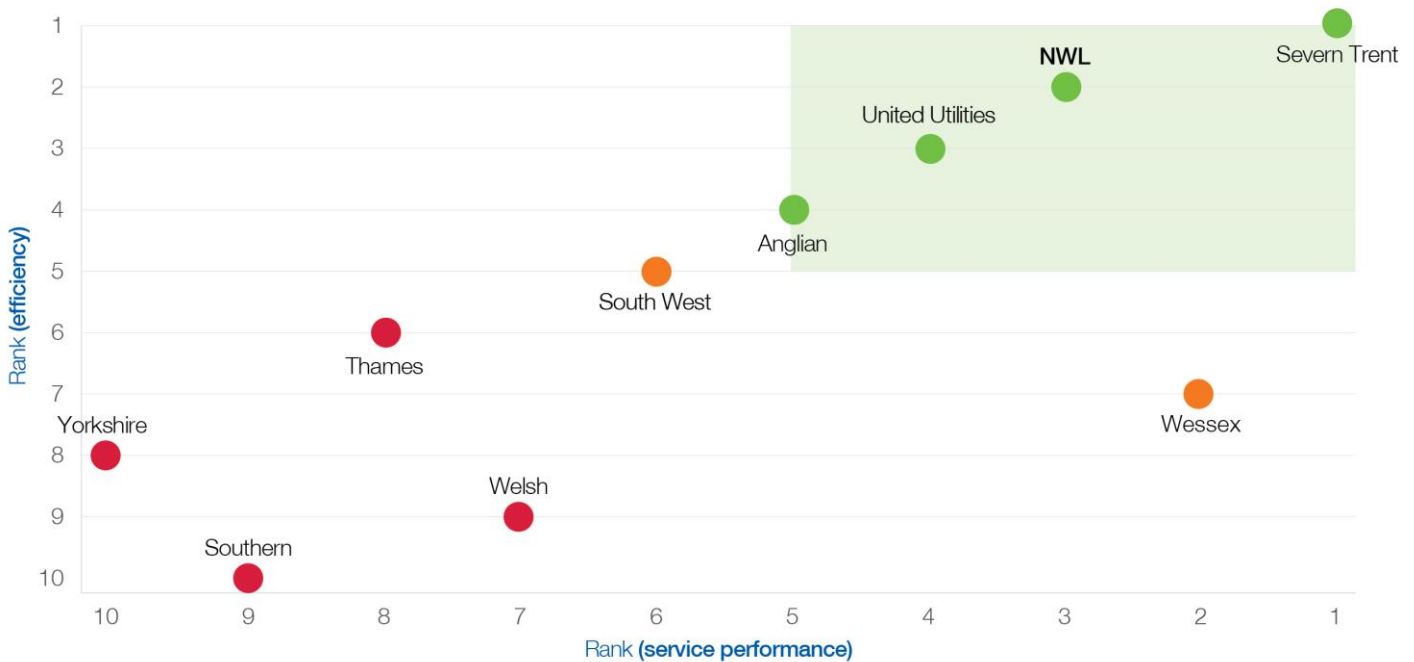
Source: NWL analysis using 2021-23 service performance data and historical industry cost data. Efficiency ranks based on Ofwat's PR24 cost models with weighted efficiency scores across all services/models using five year efficiency score/rank. Service performance ranks use 2021-23 data for Ofwat's PR24 'common' PCLs and give each PC an equal weighting, but data excludes biodiversity, BRMex and river water quality where comparative information is not yet available.

Our plan uses the common incentive rates that have been put forward through the Ofwat and CC Water central research. Ofwat required companies to use incentive rates that they centrally developed, failing to do so could lead to companies facing a 30 basis point penalty on their allowed cost of equity. We have benchmarked the incentive rates against current and historical incentive rates for NWL and other companies, based on previous customer research, and against our own valuation research evidence for PR24. That comparison shows those rates to be very high-powered in comparison to other evidence of customer stated and revealed preference research but generally within the wide ranges of those research outcomes. We have therefore used the incentive rates proposed but we are concerned that a small

number of the incentive rates may overstate customers' willingness to pay for service improvements and we highlight these in the document.

Most of the service incentives do not have dead-bands or caps and collars but we propose three targeted dead-bands for compliance-based metrics or those where there is asymmetric risk including the Compliance Risk Index (CRI), Discharge Permit Compliance of our treatment works and serious pollutions. These dead-bands will be set at the levels currently supported by the quality regulators that set those targets and lower than the levels Ofwat set at PR19. This recognises the inherent difficulty of achieving 100% compliance which is understood by both regulators. All targets are penalty only (it is not possible to achieve less thana score of 0 for CRI, 0 serious pollutions or more than 100% permit compliance at treatment works) and so introducing dead-bands also helps improve the symmetry of the package overall in terms of the balance of risk and reward.

Overall simulations of performance across the 2025-30 period suggest a more risky package with more likely underperformance than outperformance. Finally, we carry out some monte-carlo simulations of where the package could outturn across the 2025-30 period based on historical NWL and sector performance. This shows a wide range of outcomes that is much wider than in previous price reviews, reflecting the power of the incentive rates that Ofwat is proposing. But the risk/return balance is still skewed considerably to the downside, which we consider separately in the balance of risk and return section (**A5- Risk and Return**, NES06).

1. INTRODUCTION

This document outlines our approach to developing the package of service levels (Performance Commitments or PCs) and the associated reputational and financial incentives (Outcome Delivery Incentives). Our approach is designed to make sure that:

- Our plan sets stretching service levels (PCLs) for the 2025-30 period offering levels of service that are consistent with our purpose and our vision of being the 'National Leading' water company.

- Those PCLs are consistent with our long-term strategy (LTS), making sure that the targets we propose set us on the right trajectory towards our long-term goals unless customers support a different trajectory in the next five-year period.

- Our plan focuses on providing service improvements that reflect the preferences of our customers and that the associated incentives, including financial and non-financial incentives, are consistent with robust valuations of customer preferences that will drive service improvements.

Our proposed package of service levels and incentives for the 2025-30 period includes a range of service level targets including all the 'common' 'performance commitments' that Ofwat requires us to put forward under its methodology for the 2024 Price Review (PR24) but also a series of wider commitments that we consider are important for our customers and stakeholders.

For the common PCs we set out proposed financial incentives based on Ofwat and CCW's 'top down' research[1]. We have used these values because in its methodology Ofwat proposes that if companies do not use these values then they will be subject to a 30bps downward adjustment to the cost of equity[2]. We have triangulated those incentive rates against other valuation evidence, including the values from the current PR19 settlement, our own valuation research evidence[3] and a comparative study of the PR19 values across companies[4]. We have also considered those values against our marginal costs of improvement, where those are available to assess whether the incentive rate is likely to be sufficient to deliver improved performance.

We do not propose to include any bespoke PCs with financial incentives, consistent with Ofwat's methodology for PR24[5].

The document has a detailed annex setting out for each of the common Ofwat PCs:

- The definition of the PC.

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[1] Applied by Ofwat – Methodology, **Research into threshold of acceptability - August 2013 - CCW.**
[2] Ofwat Final Methodology – Quality and Ambition pp158,161 - **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_main_document.pdf.**
[3] NWL Service Valuation – **Customer and Stakeholder engagement**, Appendix 7.
[4] PJM Economics – Comparative review of PR19 WTP Results – June 2018.
[5]**https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_7_Performance_commitments.pdf**, page 8-9.

- A summary of customer views on the measure based on our research evidence, which can be traced back to our line of sight report[6].

- Our current and recent historical performance on the PC and a comparison to other companies in the sector and, where possible, other benchmarks.

- A forecast including:

  - our proposed PCLs for the 2025-30 period;

  - where the industry average and upper quartile performance may be by 2030 based on forecasts using historical industry information; and

  - a view on the long-term performance trend needed to meet the objectives of our **long-term strategy** (NES_LTDS).

- A description of how we expect to meet the PCL over the period is also provided including the key interventions we expect to make, any important innovations from which we expect to help us generate improvements and any additional costs we expect to incur beyond our base cost allowances (which are also set out in separate enhancement cases which are referenced).

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[6] **Customer and Stakeholder Engagement** – Appendix 7 (NES08).

1.1. BUSINESS PLAN NAVIGATION

This appendix supports Ofwat in the assessment of the 'outcomes, performance commitments and outcome delivery incentive' tests in the Quality and Ambition Assessment, as set out in **the PR24 methodology**. **Error! Reference source not found.**3 below sets out Ofwat's 'minimum expectations'[7] in this area and outlines where this is covered in this document.

FIGURE 3: MINIMUM EXPECTATIONS FOR OUTCOMES, PERFORMANCE COMMITMENTS AND OUTCOME DELIVERY INCENTIVES

Minimum expectations (from Ofwat methodology)	Where is this covered?
For common PCs, the company's plan contains incentive rates that we propose based on marginal benefit estimates from the collaborative customer research and indicative benefit sharing factors. Where a company provides a different view, it provides compelling evidence, consistent with any relevant guidance. Company's plans should include stretching PCLs from base costs.	See Section **4** on **Error! Reference source not found.**. We adopt Ofwat's proposed common incentive rates but highlight concerns in three instances.
If the company's business plan includes bespoke performance commitments, the company sufficiently demonstrates how it has responded to any feedback we have provided on its definition, or any new proposals meet the expectations we have set out in the methodology. For incentive rates for bespoke performance commitments, the company demonstrates how its proposals are consistent with our draft methodology and any relevant guidance.	We are not proposing any bespoke performance commitments. See Section **3.1.4** of this document which describes our approach to bespoke PCs.

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[7] Ofwat Final Methodology, page 158 **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_main_document.pdf**.

2. OUR APPROACH TO SETTING SERVICE LEVELS FOR 2025-30

This section outlines our approach to developing the package of service levels (Performance Commitments or 'PCLs') that we propose to deliver for customers and stakeholders over 2025-30. This includes service levels that should be subject to financial incentives as well as those which we expect to be subject to reputational incentives only. We can make commitments to service levels for customers outside of the Price Review process itself where they are reputational anyway, we don't need to do this through the Ofwat process. Once we have developed this, we then seek to set the PCL targets for each service level over the 2025-30 (AMP 8) period.

2.1. SETTING THE PACKAGE OF PCLS FOR 2025-30

Figure 4 below sets out the process we have followed to set PCLs for the 2025-30 period. We describe each of these steps in this section.

FIGURE 4: OUR APPROACH TO DEVELOPING THE PACKAGE OF PCLS FOR 2025-30
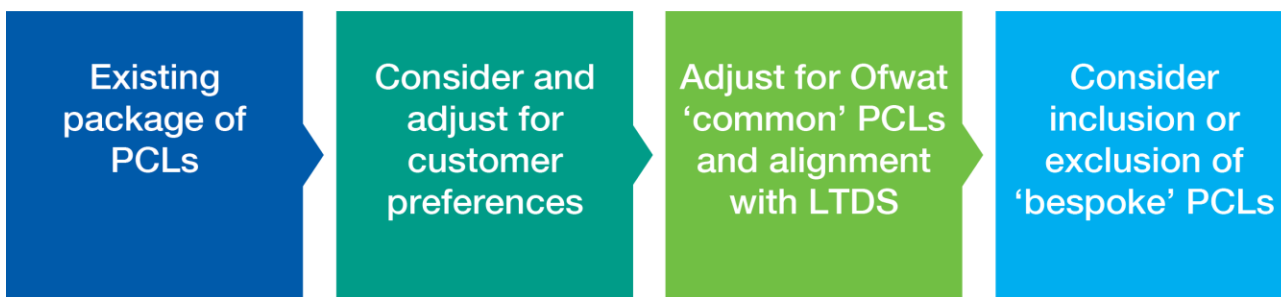
2.1.1. Existing package of PCLs

We develop the package of PCLs for AMP8 starting in the first instance with the package that we have in place for the current regulatory period. This package includes a range of service levels that we have committed to for customers and stakeholders with different incentives, some reputational and some financial. The package also includes some targets where we have set out commitments beyond the 2020-25 period, for example in relation to water poverty and net zero operational emissions.

Figure 5 shows the package of existing Performance Commitment (PC) metrics from the current 2020-25 business plan including those which were common to all companies and those which were bespoke to us. It also shows where there are new measures being introduced as 'common' PCs for the 2025-30 period and those instances where these new measures are similar to some bespoke measures that we have in our current plan for the 2020-25 period. This helps to highlight where new metrics are actually or largely a continuation of our existing plan. Finally, the diagram highlights where certain metrics or targets in our current PR19 plans go beyond 2025 and therefore reflect existing commitments that we have made to customers and stakeholders that should form part of the consideration and development of the 2025-30 business plan.

FIGURE 5: OUR CURRENT PACKAGE OF PCS

Common Measures at PR19

C-MeX
D-MeX
Water Supply Interruptions 3 hrs
CRI
Leakage (NW and ESW)
Per Capita Consumption
Unplanned Outage
Mains Repairs
Risk of severe restrictions in a drought
Internal sewer flooding
External sewer flooding
Pollutions
Treatment works compliance
Sewer collapses
Risk of sewer flooding in a storm
PSR

Bespoke Measures at PR19

Discoloured water contacts
Taste and smell contacts
Event risk index
Water supply interruptions 1-3, 12 hours
Visible leak repair time
Sewer blockages
Repeat sewer flooding
Bioresources
Abstraction incentive mechanism
Bathing water compliance
WINEP
Greenhouse gases
Water environment improvements
Voids
Percentage of households in water poverty

PR24 Measures

C-MeX
D-MeX
BR-MeX
Water Supply Interruptions 3 hrs
CRI
Leakage
Per Capita Consumption
Unplanned Outage
Mains Repairs

Internal sewer flooding
External sewer flooding
Pollutions (all and serious)
Discharge compliance
Sewer collapses

Water Quality contacts

Bathing water compliance
WINEP
Greenhouse gases

Storm Overflows
River water quality
Biodiversity
Business demand

PR19 Ambition beyond 2025

Deliver world class customer service

Have the lowest levels of leakage in the country in our water stressed ESW operating areas.
Have a PCC for water use of 118 litres per person per day by 2040.

Eradicate sewer flooding the home as a result of our assets and operations.
Have zero pollutions as a result of our assets and operations.

Promote confidence in our drinking water so that nine out of ten of our customers choose tap water over bottled water.

Being carbon neutral by 2027 (operational emissions).

Eradicate water poverty in our operating areas by 2030.

* Measure shown in blue text are those with our long-term ambitions are PR19 – with some brought forward to PR24 into common measures (Discoloured Water and Taste and Smell are combined to one Water Quality Contact measure).
Sources: NWL's PR19 Business Plan and Final Determination from Ofwat, **https://www.ofwat.gov.uk/wp-content/uploads/2019/12/PR19-final-determinations-Northumbrian-Water-Outcomes-performance-commitment-appendix.pdf** and Ofwat's PR24 methodology **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_7_Performance_commitments.pdf.**

2.1.2. Adjust for Ofwat 'common' PCs and alignment with LTDS

Adjusting for Ofwat's 'common' PCs

Ofwat has set out a prescriptive approach to setting PCLs for AMP8. This approach sets standard PC definitions, which cover for instance the reporting of the PC to aid consistency of approach across companies as well as any exclusions, for example, and also limit explicitly the service level areas that companies can put in their plans. We have separately highlighted how we do not support this approach[8], which effectively assumes that all customers have homogenous preferences in relation to their water and wastewater services. This approach is not consistent with what would be observed in a competitive market which is in theory what price regulation should seek to mimic. In its methodology for PR24, Ofwat highlights that companies must use their proposed common PCs and can only propose alternatives in very rare circumstances[9]. We therefore include these 'common' PCLs in our proposed package in the first instance.

We have also used Ofwat's common PC definitions in the first instance[10]. One area of concern that we have highlighted to Ofwat before is that these definitions leave all extreme weather and third-party risk with the company with few if any exclusions. We, alongside other companies, have highlighted that this approach is not in the best interests of customers[11] because it will drive uneconomic investment and increase risk in the price control package that will need to be compensated by a higher return to make sure that the price control represents a 'fair bet'. Moreover, because of these reasons Ofwat is an outlier in contrast to other economic regulators operating in similar legal and economic contexts. By adopting these common PC definitions, we therefore increase the need for the business to be more resilient to extreme weather events. As part of our business plan submission, we have separately set out a business case for additional enhancement funding to provide greater protection of our assets to the growing risk of climate change and extreme weather events (see our **enhancement case for power and flooding resilience**, NES32).

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[8] See our ICS report in Ofwat's 'Future ideas lab', **https://www.ofwat.gov.uk/wp-content/uploads/2022/06/Northumbrian_Water_Evolving_the_directions_for_customer_engagement_in_the_water_industry.pdf.**
[9] Ofwat Final Methodology, **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_main_document.pdf**, section 5, also Appendix 7 performance commitments.
[10] Ofwat Performance Commitment Definitions, **https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/final-methodology/pr24-performance-commitment-definitions/.**
[11] See **Frontier Economics work.**

Ensuring alignment with our long-term strategy (LTS)

Our long term strategy (LTS)[12] details our vision and ambitions to improve services to customers as well as our local environment now and into the future. It proposes six long-term goals supported by long-term targets that specify stretching ambitions around key metrics that need to be met by 2050 or earlier. We have tested those targets and the level of ambition within them with customers through our People Panels initially and with customers at our Innovation Festival 2023[13]. Following consultation with stakeholders and customers[14] we made some amendments to our long-term targets, including:

- Introducing a long-term target to remove lead from customer side supply pipes by 2050 in line with our and Water UK's ambition to eliminate the impact of lead on customers by 2050.
- Introducing a long-term target to improve discharge permit compliance.
- Introducing a long-term target to improve our bathing waters.
- Introducing a long-term target to reduce the duration of interruptions to supply.
- Updating our long-term target for asset health to reflect our ambition to develop more robust measures of asset health.
- Revising our target to reduce chemicals usage to enable it be robustly measured and reported against.
- Setting a target to eliminate water poverty by ensuring no customers spend more than 5% of their disposable income on water and wastewater services after housing costs.
- Updating our long-term target for biodiversity to reflect customer preferences.

- We consider that our revised long-term targets are well aligned with – and set a stretching long-term ambition for – the PCs we include in our business plan for 2025-30. While water quality contacts is not strictly aligned with a long term measure, we determined that it broadly aligns with our strategy of 'consistently delivering high quality water' linked to CRI.

Figure 6 maps our long-term targets to our PCs for 2025-30.

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[12] Northumbrian Water - **Long Term Delivery Strategy** (NES_LTDS).
[13] **Customer and Stakeholder Engagement** Appendix 7 (NES08).
[14] See '**Shaping our future: Developing our long term strategy 2025-50**', Northumbrian Water, June 2023.

FIGURE 6: MAPPING OF COMMON MEASURES TO OUR LONG-TERM STRATEGY

Long-term targets[15]	PC for 2025-30
Water	
Reduce household water per capita consumption – to 122 l/p/d by 2038 and 110 l/p/d by 2050.	Per capita consumption- aligned to achieve the long term target
Reduce non-household water demand – by 9% by 2038, excluding growth (from 2019/20 levels).	Business demand – Ofwat methodology is to include growth.
Halve leakage – achieve a 55% reduction in leakage in our North East levels by 2050 (61.1 Ml/d) and a 40% reduction in leakage in our Essex and Suffolk regions by 2050 (40.1 Ml/d), to achieve the national target of 50% companywide (from 2017/18 baseline).	Leakage NW and ESW - aligned to achieve the long term target
Consistently deliver high quality water – Compliance Risk Index (CRI) of zero.	CRI (water quality compliance) (water quality contacts also broadly aligns with consistently delivering high quality water).
Resilient water supplies – household customers continue to have a sufficient and secure supply of water by planning to be resilient to 1 in 500-year drought.	No PC
Leading asset management practices – achieve AMMA assessment of leading or optimising for all measures of asset management maturity by 2030 and leading by 2035.	Mains repairs Unplanned outage (AMMA will replace these metrics)
Reliable water supplies – reduce interruptions to supply greater than three hours to less than two minutes/customer/year on average by 2050.	Interruptions to supply (three hours)
Eliminate the impact of lead on customers – replace all lead customer supply pipes by 2050.	No PC
Wastewater	
Reduce internal sewer flooding – by 60% (from our 2025 performance) to 2050.	Internal sewer flooding
Reduce external sewer flooding – by 60% (from our 2025 performance) to 2050.	External sewer flooding
Leading levels of pollution incidents – zero serious pollutions now and always, zero pollutions as a result of our assets and operations and reduce the number of category 1 – 3 pollutions by 50% by 2040 (from 2022 baseline).	Pollutions Serious Pollutions
Leading asset management practices – achieve AMMA assessment of leading or optimising for all measures of asset management maturity by 2030 and leading by 2035.	Sewer collapses (AMMA will replace this metric)
Protect water environments – target 100% discharge permit compliance and maintain at least 99%.	Discharge permit compliance

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[15] **https://www.nwg.co.uk/globalassets/corporate/about-us-pdfs/long-term-delivery-strategy-final.pdf.**

Leading levels of water quality – eliminate the detrimental impacts of our operations and assets on waterbodies as soon as is practical. Work with partners so that, where possible, waterbodies in our regions can achieve good ecological status.	River water quality
Eliminate harm from storm overflow discharges – year on year reductions in number of storm overflows operating more than ten times a year on average, and none doing so by 2050.	Storm overflows
Enhance biodiversity – all our construction activities, including those that do not require planning permission, will result in a net gain in biodiversity of 10% or the local requirement where higher.	Biodiversity
Deliver net zero – achieve net zero Scope 1, 2 and 3 emissions by 2050. Halve carbon impact of new assets – reduce embodied carbon by 50% for new assets by 2040 (compared to 2026 baseline). Increase renewable generation – 100% of our electricity will come from additional* renewable generation by 2040.	Greenhouse gas emissions
Reduce chemical and energy use – by 20% for all new assets by 2035 (from 2019/20 baseline).	No PC
Excellent bathing waters – all bathing waters at good or excellent status by 2030.	Bathing water quality
Customer	
Leading levels of customer service – as defined by current metrics (C-MeX, D-MeX and BR-MeX).	C-MeX D-MeX BR-MeX
Eliminate Water Poverty – by 2030 no customer will spend more than 5% of their disposable income after housing costs on water and wastewater services and we will maintain this.	No PC
Other	
Leading levels of efficiency – be the most efficient company in the sector in the round by 2030 and maintain that position.	No PC
Leading in innovation – have an innovation pipeline of at least £100m (including Ofwat innovation fund competition) by 2030 and maintain it.	No PC
Support our local economies – maintain spending at least 60p in every £ with suppliers in our region	No PC
Give time back to the community – at least 50% of our employees to spend time volunteering every year.	No PC

*Additional = renewable generation that would not have existed if we were not buying the power. This includes Power Purchase Agreements (PPA) with new generation that we guarantee the take-off for, and renewable generation behind the meter.
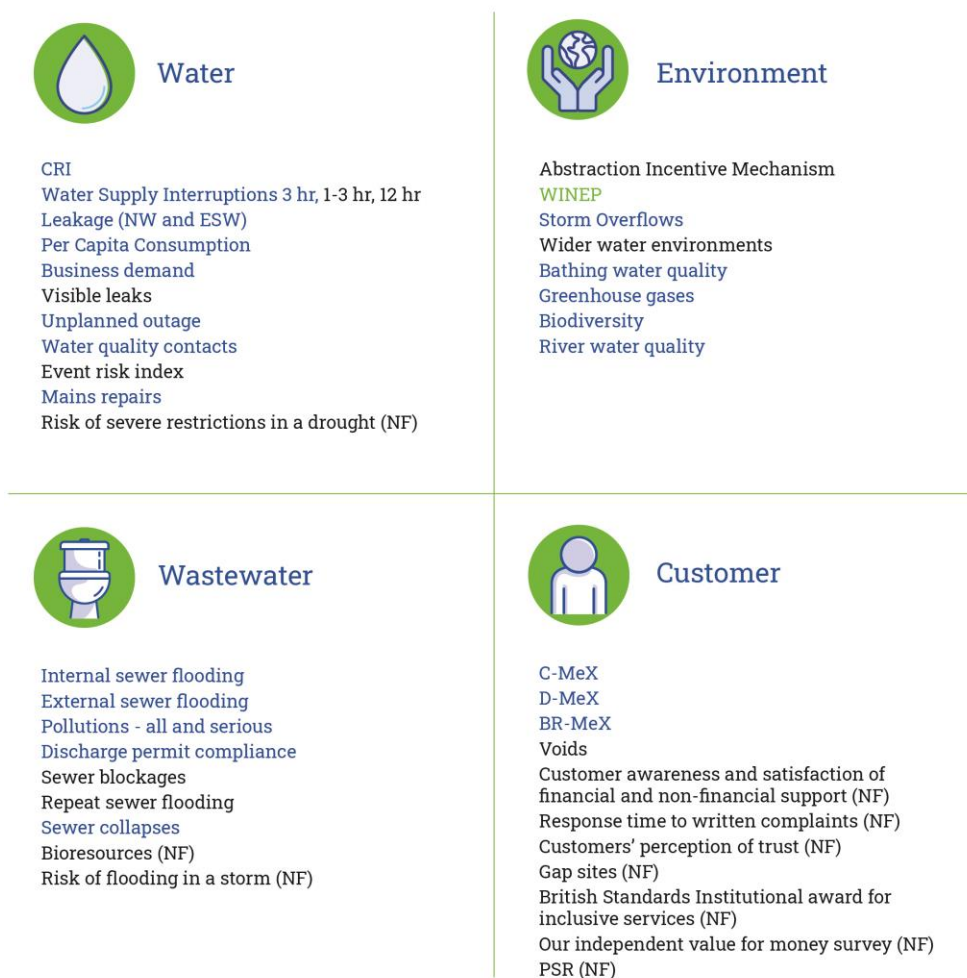
Source: PR24 long term delivery strategy NWL / Ofwat PR24 Common Measures.

Some of our long-term goals do not have associated PCs. We consider this to be a natural result of Ofwat's intention to simplify the outcome framework while we continue to target a broader range of metrics that are important to our customers and the environment in the long term.

2.1.3. Consider and adjust for customer preferences

Below we show the initial package of PR24 PCs which consists of our PR19 measures and the new common PR24 measures. We also note that Ofwat has removed three common measures from PR19, all of these were non-financial: risk of severe restrictions in a drought, risk of flooding in a storm and the priority service register (PSR). The PSR has moved to a licence condition. However, at this stage we kept these measures in our package ahead of testing the measures individually with our customers.

FIGURE 7: OUR INITIAL PACKAGE OF AMP8 PCS

Water

CRI
Water Supply Interruptions 3 hr, 1-3 hr, 12 hr
Leakage (NW and ESW)
Per Capita Consumption
Business demand
Visible leaks
Unplanned outage
Water quality contacts
Event risk index
Mains repairs
Risk of severe restrictions in a drought (NF)

Environment

Abstraction Incentive Mechanism
WINEP
Storm Overflows
Wider water environments
Bathing water quality
Greenhouse gases
Biodiversity
River water quality

Wastewater

Internal sewer flooding
External sewer flooding
Pollutions - all and serious
Discharge permit compliance
Sewer blockages
Repeat sewer flooding
Sewer collapses
Bioresources (NF)
Risk of flooding in a storm (NF)

Customer

C-MeX
D-MeX
BR-MeX
Voids
Customer awareness and satisfaction of financial and non-financial support (NF)
Response time to written complaints (NF)
Customers' perception of trust (NF)
Gap sites (NF)
British Standards Institutional award for inclusive services (NF)
Our independent value for money survey (NF)
PSR (NF)

Notes: Measures in blue text are PR24 Common measures proposed by Ofwat. (NF) – Non-financial incentive against measure at PR19. (Does not include performance commitments related to enhancement delivery at PR19).
Source: Analysis of PR19 and new common PR24 measures.

Our customers' needs and priorities are essential to the direction we take with all our services for both our Northumbrian Water and Essex and Suffolk Water regions. We conduct ongoing research with customers to make sure we have a continuous flow of insight, including our customers' priorities for the future, and their views on potential improvements.

We wanted to make sure that all available qualitative and quantitative evidence could feed into decision making in a rigorous way. We commissioned SIA Partners to set out a triangulation framework and scoring methodology[16], taking account of good practice across other sectors. We have applied this framework to help us understand whether our proposed package reflects our customers' priorities.

We began by collating results from all customer research we had conducted or commissioned since the submission of our previous (PR19) business plan, that included a priority ranking exercise.

In total we identified 12 NWG sources. We also considered priority ranking exercises from three external sources.

FIGURE 8: SOURCES OF RESEARCH EVIDENCE FOR TRIANGUALTION

NWL research evidence	Other research evidence
• NWL Domestic Tracking Research Quarters 1, 2, 3 and 4 (2022)	• Customer spotlight: People's views and experiences of water - Savanta Report
• Brand Values Annual Research (2019, 2020, 2021 and 2022)	• Ofwat and CCW Preferences research - Full Yonder report
• Defining the Future (2021)	• CCW (2021) Public Views on the water environment
• Customer Valuations for Service Improvements (2023)	
• People Panels #3: Aims and Measures (May, 2022)	
• PR24 Pre-Acceptability Research (Phase 1)	

Source: NWL

The 15 research sources included 23 ranking exercises as some sources included more than one ranking exercise. The individual results of each ranking exercise were entered into a separate line in Excel and coded against a common PC or service area. In total, we collected 248 lines of data which represented the views of over 6,800 NWG customers and over 3,100 nationally representative water customers.

This provided a wealth of information, from which we could gain a robust understand our customers' priorities.

Weighting and assessing the evidence

We followed an approach to weighting the evidence adapted from the model set out by the consultancy Sia Partners. Sia's model recommends scoring each source against a series of criteria to calculate an overall robust score. These scores are then used to weight the evidence.

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[16] We adapted this scoring methodology – detail in **Prioritisation of Common PCs** (NES44).

We discussed Sia's methodology with our Customer Engagement Panel (CEP) and agreed to include an additional quality parameter around how recently the research was undertaken.

Once sources were assessed, they were assigned a weighting based on their overall category, which was multiplied by the overall ranking in each exercise. This then allowed us to obtain an average overall weighted ranking for each outcome.

For an in-depth review of how we conducted our triangulation of customer evidence, please see A7 **- Customer and Stakeholder Engagement** (NES08) and **PR24 Customer Research – Prioritisation of Common PCs** (NES44).

Validating and presenting outputs

Our approach was shared with our Customer Engagement Panel for assurance purposes in July 2023 who also influenced the design of that approach. The results were also shared and debated with the Price Review Steering group and our Board Sub-Group.

On completion of this assessment, we then sought to understand how this aligned with Ofwat's assessment which included the industry collaboration exercise, which included our customers and two other pieces of research, Yonder's Importance Score (April 2022) and Savanta's Customer Spotlight (April 2022).

FIGURE 9: MEASURE PRIORITISATION INCLUDING OFWAT RESEARCH

PC	Our ranking*	Ofwat Ranking	Triangulated Ranking
Pollutions (serious and all)	High	Medium	High
Internal sewer flooding	High	High	High
Leakage	High	Medium	High
External sewer flooding	High	High	High
CRI	High	High	High
Discharge compliance	Medium	Medium	Medium
PCC	Medium	Low	Low
Storm overflows	Medium	Medium	Medium
Biodiversity net gain	Medium	Medium	Medium
Water quality contacts	Medium	High	High

Business demand	Low	Low	Low
Asset health (including mains repair, sewer collapses and unplanned outage)	Low	Medium	Medium
River water quality	Low	Medium	Low
Greenhouse gases	Low	Low	Low
Reducing water supply interruptions that last over three hours	Low	High	Medium
Bathing water quality	Low	Low	Low
C-MeX	Low	-	Low

*NWL triangulation of research bank. NWL research bank includes sources used by Ofwat which include Yonder importance score, April 2022 and Savanta customer spotlight, April 2022.

**Interruptions to supply over three hours based on a single strand of research which included the whole package of measures.

Source: NWL Research triangulation, Ofwat Outcomes Working Group May 2023.

2.1.4. Consider exclusion or inclusion of 'bespoke' PCs

Our existing PCLs include a range of 'bespoke' service levels that other companies do not have in place with financial incentives attached to them. In its PR24 methodology, Ofwat suggested that there would be a 'high bar' for the inclusion of bespoke PCs at PR24[17]. Ofwat has separately highlighted that bespoke PCs have been a source of significant outperformance for some companies raising questions around whether some companies may have 'gamed' the regulatory framework. We agree with Ofwat that some companies appear to have bespoke PCLs that are a significant source of outperformance during the current AMP and appear to have been set both insufficiently stretching targets and generous incentive rates. This approach can damage trust and confidence in the regulatory framework when rewards for service performance are not earned through sector leading performance, so we support greater challenge in this area. However, we still consider that the regulatory framework needs to provide space to reflect different customer preferences - this is consistent with how markets would work which the regulatory framework should seek to mimic.

We emphasise that we are not one of these companies, we set challenging bespoke PCLs at PR19, following challenge from our Water Forum. We set 14 bespoke PCLs with financial incentives during PR19, and these were in relation to:

- External sewer flooding, which Ofwat has now considered to be a common measure for all companies, and reducing incidence of repeat sewer flooding events, one of the worst service failures a customer can experience.

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[17] Ofwat Final methodology – Appendix 7 Performance Commitments, page 9.
https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_7_Performance_commitments.pdf.

- Setting more stretching targets to reduce supply interruptions with a more stretching 1-3 hour target and a further target at greater than 12 hours. Which reflected a desire to drive improvements in sector performance at the frontier given our leading position on ITS in 2015-20.

- Targets to reduce sewer blockages, an asset health measure that several companies adopted.

- Reducing the number of visible leaks, reflecting the strong customer preferences to reduce the number of visible leaks in addition to leakage.

- Discoloured water, taste and odour contacts, which has been re-assessed as a common measure for the industry by Ofwat for PR24.

- We also included a number of environmental targets which included abstraction incentive mechanism which only applied if we triggered it, bathing water compliance at 97% of beaches at excellent or good, water environment improvements, greenhouse gases.

- A measure for voids was included to incentivse the reduction of void properties, reducing the impact of these on the customer base.

- Finally we also included a measure for event risk index.

Throughout 2020-25 we have generally found these PCLs difficult to deliver and we have not earned significant rewards on these bespoke PCLs. At the same time our performance on the 'common' comparative PCLs has generally been good in comparison to other water and sewerage companies, placing us in the top half of WaSCs, albeit that the targets appear to have been set at too challenging levels across the whole sector, with only one WaSC achieving net outperformance on its common PCLs in the 2020-23 period.

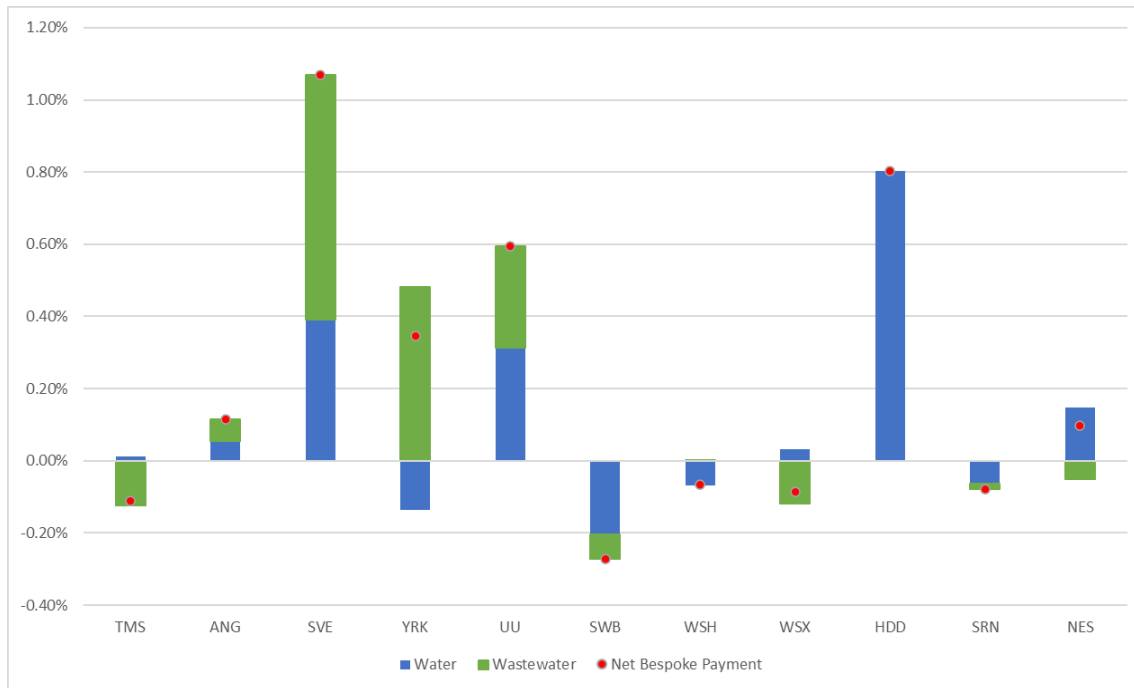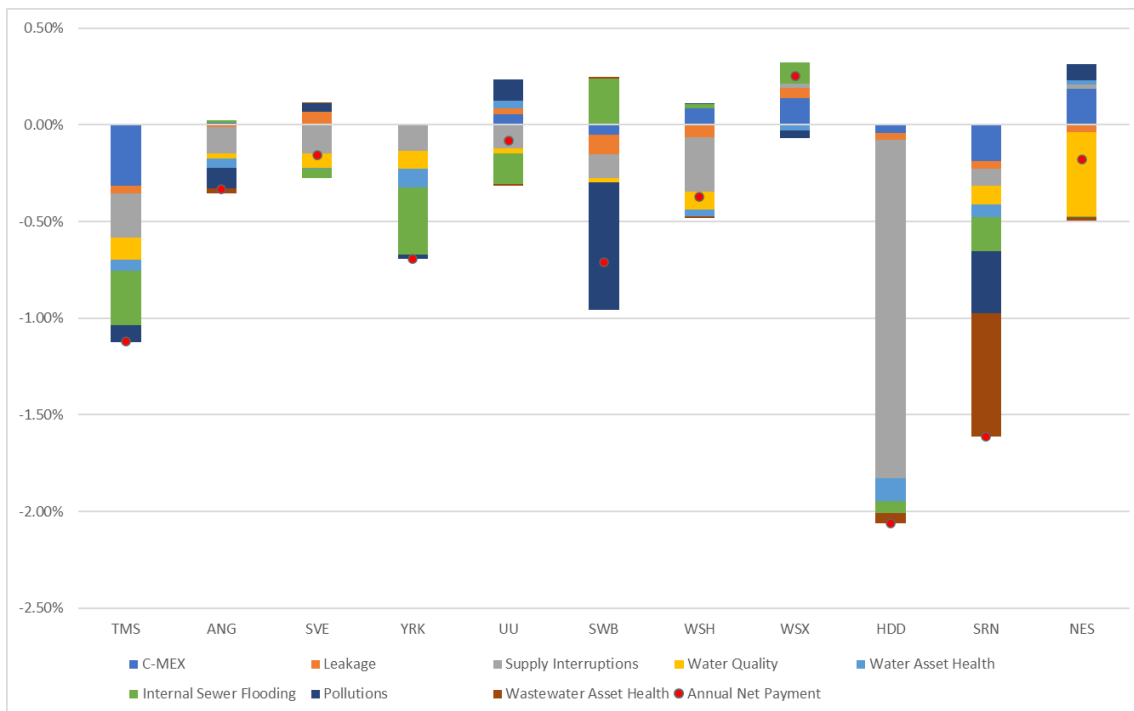## FIGURE 10: WASC RORE PERFORMANCE ON 'BESPOKE' PCLS 2020-23

FIGURE 11: WASC RORE PERFORMANCE ON 'COMMON' PCLS 2020-23

Source: NWL analysis of Ofwat service and delivery report 2021/22 (excludes the impact of Storm Arwen in 2022) and company APR data tables 2022/23.

Given Ofwat's very clear policy position, we took a decision with our board in December 2022 not to carry out further work to develop new bespoke PCLs. However, we have conducted a review of these existing measures, along with a wider review of any gaps that common measures may leave against our customer priorities.

In assessing the suitability of our current bespoke measures for continuation at PR24, we have considered the following factors:

- *Is the PC consistent with Ofwat's methodology guidance?* Ofwat's methodology only considers that bespoke PCLs would be appropriate in instances where:

    o the company has a local circumstance that does not apply to most companies, which requires a PCL to provide appropriate incentives; and

    o a company provides poor service on a common issue where other companies' performance is such that it is not a priority for their customers, it uses the example of low water pressure in one company area.

- *Is the inclusion or exclusion of the bespoke PC consistent with customer priorities?* We reviewed the measure against our triangulated evidence base of customer priorities to understand customers' level of support for its continuation. We were also able to review any potential gaps between their priorities and the common / bespoke measures.

    We also conducted specific customer research on all of our existing bespoke measures (and a small number of common measures) to understand the level of support for each. We show the results of that research in this section, but further information can be found in **A7 - Customer Engagement Appendix** (NES08)[18]. We applied a 70% acceptability threshold to continue any measure, as used in the PR19 acceptability research[19].

- *What form of incentive is appropriate, and would this overlap with other PC incentives?* We asked customers whether the existing measure should continue as a reputational incentive and whether we should include a financial reward and penalty. We also consider as part of this whether there is any overlap or double counting with other incentives.

- *Can a stretching PCL be set and measured with confidence?* We consider practical issues around whether a PCL be set to reflect a stretching performance for an efficient company, with reasonable confidence. We also consider whether we have reasonable influence over the measure and whether it can be measured robustly over time.

We review each of the existing PR19 bespoke measures against the above criteria for its suitability at PR24.

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[18] PR24 Reserch Library – bespoke commitments 2022 and 2023. **PR24 Research and Engagement Activities (nwg.co.uk)**
[19] Applied by Ofwat – Draft Methodology, **Research into threshold of acceptability - August 2013 - CCW**

EXISTING NON-FINANCIAL BESPOKE PCS

The first batch of measures we review are those that are non-financial / reputationally incentivised. Ofwat's final methodology outlined that these measures in their current form would not meet the criteria for PR24, which includes the requirement that all measures need to be financially rewarded and penalised. The group of measures includes:

- Satisfaction of customers who receive additional financial or non-financial support.

- Awareness of additional financial or non-financial support.

- Response time to written complaints.

- Customers' perception of trust.

- Percentage of households in water poverty.

- Gap sites.

- Bioresources.

- British Standards Institution Award for Inclusive Services.

- Independent value for money survey.

While the Ofwat methodology indicated that non-financial measures such as above should be removed from any proposed list of bespoke measures, we wanted to understand if our customers wanted us to keep the measure and attach a reward and penalty to it. We also added a number of extra measures to the research to understand our customers views, these included:

- Ofwat Common measures from PR19, which were reputational only, risk of severe restrictions in a drought and risk of flooding in a storm.

- Ofwat Common measures from PR19, which for PR24 Ofwat has outlined their expectation would not be included as common at PR24, these included Voids and ERI.

- Finally, we also added our renamed water environment improvement measure, now BlueSpaces to the list[20].

We conducted research with a representative sample of our customers across both our Northumbrian Water and Essex & Suffolk Water regions, and the results showed that there was not enough support (all below 70%) from customers to

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[20] **WINEP – 25Y Environment Plan** (NES29).

continue these measures into PR24 by the inclusion of a reward and penalty. The 70% target was applied from CCW's PR14 research, which recommended a threshold of 70-75%[21].

FIGURE 12: RESULTS FROM ONLINE CUSTOMER RESEARCH REGARDING PR19 NON-FINANCIAL MEASURES AND VOIDS / ERI.[22]

	Customer support for bespoke measure with ODI attached	Responses
Bluespaces	66%	572
Satisfaction of customers who receive additional financial support	58%	525
Risk of flooding in a severe storm	54%	414
ERI	54%	557
Voids	53%	582
Awareness of additional financial support	53%	522
Response time to written complaints	52%	623
Gap Sites	52%	597
British Standards Institution Award for Inclusive Services	51%	552
Perception of trust	50%	633
Satisfaction of customers who receive additional non-financial support	50%	547
Awareness of additional non-financial support	47%	545
Percentage of households in water poverty	46%	609
Independent value for money survey	46%	543
Risk of severe restrictions in a drought	42%	602

Source: NWL Research

We applied a 70% target for a measure to be considered as a priority by customers and retained. The 70% target was applied from CCW's PR14 research, which recommended a threshold of 70-75%[23]. As customer support did not reach the 70% threshold for any measure tested, we do not propose to include any of the above measures as bespoke for PR24[24]. The biodiversity aspects of the Bluespaces outcome are now covered by the new biodiversity PC. Instead of including a bespoke PC for other aspects of the Bluespaces outcome, we have included actions in the WINEP under the 25-year Environment Plan driver as we consider this new environmental driver is the best place to include this activity in our business plan.

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[21] Applied by Ofwat – Draft Methodology, **Research into threshold of acceptability - August 2013 - CCW.**
[22] Customer Research Appendix 7 – Bespoke Measures and PR24 Research Library, Bespoke Measures 2022 and 2023 **PR24 Research and Engagement Activities (nwg.co.uk).**
[23] Applied by Ofwat – Draft Methodology, **Research into threshold of acceptability - August 2013 - CCW.**
[24] Applied by Ofwat – Draft Methodology, **Research into threshold of acceptability - August 2013 - CCW.**

Existing financial 'bespoke' PCLs

Removing the measures above left a much smaller subset of measures to review against the criteria we set out all of which were subject to financial incentives.

We conducted various research with customers to understand their views of these PCLs for the future. We applied the Ofwat methodology for the inclusion of bespoke measures within the plan, for example all measures must have ODIs attached. To do this, we carried out our bespoke measures research[25]. In this, we asked our customers if they thought we should continue to report performance against these measures, and if we should apply a financial incentive to performance. Our customer research took two forms, a large quantitative survey which was online, and a smaller set of qualitative People Panels[26]. In line with Ofwat's guidance that all measures should have financial incentives, we used the results from our customer survey that reflected support for the measure and an ODI and applied a similar 70% target for a measure to be considered as a priority by customers. The research looked at visible leak repairs, interruptions to supply over 12 hours and between one and three hours, sewer blockages and repeat sewer flooding incidents.

From the research it became clear that's while customers expected us to continue to monitor our performance against our existing bespoke measures, they were less supportive on the inclusion of financial incentives on existing bespoke measures. Repeat sewer flooding was most important to customers just meeting the 70% threshold for customer support, while visible leak repair time was second, but below the threshold, at 66% support.

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[25] Bespoke Measures Research – Appendix 7 – **A7- Customer and Stakeholder Engagement** (NES08).
[26] Full details of the customer research can be found in Appendix **A7 – Customer and Stakeholder Engagement** (NES08).

FIGURE 13: RESULTS FROM ONLINE AND PEOPLE PANEL CUSTOMER RESEARCH REGARDING BESPOKE MEASURES.[27]

	Household customer support for continued monitoring (after seeing performance information)					Household customer support for financial incentives					Overall priority ranking	
	Online Survey (quantitative)	People Panels (quantitative)				Online Survey (quantitative)	People Panels (quantitative)				Online Survey (quantitative)	People Panels (quantitative)
	Combined NW and ESW results	NW (13)	E (14)	S (10)	YP (9)	Combined NW and ESW results	NW (13)	E (14)	S (10)	YP (9)	Combined NW and ESW results	Combined People Panel results (46)
Repeat Sewer flooding	80% (1,016)	✓	✓	✓	✓	70% (962)	✓	✓	✓	✓	1st	1st
Sewer blockages	82% (994)	?	✓	?	✓	64% (946)	X	?	X	✓	3rd	4th
Visible leak repair time	83% (943)	✓	✓	✓	✓	66% (894)	-	✓	✓	?	2nd	3rd
Interruptions to supply 1-3 hours	69% (975)	X	✓	X	X	59% (921)	-	✓	X	X	5th	5th
Interruptions to supply greater than 12 hours	75% (963)	?	✓	✓	✓	61% (914)	X	✓	✓	✓	4th	2nd

Source: NWL Research.

We reviewed these PCLs against the criteria previously set out and the table overleaf summarises this assessment.

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[27] Customer Research Appendix 7 – Bespoke Measures.

FIGURE 14: ASSESSMENT AGAINST CRITERIA

Measure	Is the PCL consistent with Ofwat's methodology guidance?	*Is the inclusion or exclusion of the bespoke PCL consistent with customer priorities?*	*Can a stretching PCL be set and measured with confidence?*	*What form of incentive is appropriate, and would this overlap with other PCL incentives?*
Repeat Sewer Flooding	Does not meet Ofwat criteria.	Customers support the inclusion of this as a measure with a financial incentive – 70% support.	Existing measure in place so reporting is possible and stretching target can be set based on historical trend but no comparative data.	Financial ODI, partial overlap with internal sewer flooding.
Visible Leak Repair Time	Does not meet Ofwat criteria.	Customer support at 66% below the 70% threshold for inclusion.	Existing measure in place so reporting is possible and stretching target can be set based on historical trend but limited comparative data. Some other companies have had visible leak PCLs.	Financial ODI. Overlaps with leakage.
Sewer Blockages	Does not meet Ofwat criteria	Customer support approx. 64%, below the 70% threshold for supporting ODIs on measures	Existing measure in place, long established and comparative data available.	Financial ODI, some overlap with sewer flooding as cause of flooding.
Interruptions to Supply over 12 hours	Does not meet Ofwat criteria	Customer support lower at 59%. Lowest support from all measures tested.	Definition clear and well established some historical data available.	Financial ODI. Overlaps with ITS over three hours (common measure).
Interruptions to supply between 1 and 3 hours	Does not meet Ofwat criteria.	Customer support at 61%, below the support threshold for inclusion.	Definition clear and well established some historical data available. Comparative data not currently publicly available.	Financial ODI. Overlaps with three hours. Improving performance against three hours raises the performance against this measure.

Source: NWL Data.

Independent challenge

These results were briefed to our independent Water Forum group, who noted the nature of sewer flooding, and the impact on the customer of repeats. They challenged us to look at how we could best resolve the issue and support the customers.

"Of particular note is 'repeat sewer flooding' and the need to prevent this awful experience from happening more than once – we would like the Company to find a way of ensuring that all customers who regularly experience sewer flooding have their problems resolved. At this stage, our minds are open about how this could be achieved; by a financial incentive/penalty PC, delivery of a specific package of works or another method – preferably one that has the least financial impact on customers, and for which there is a compelling, well-supported (by customers) case."[28]

Our response to repeat sewer flooding

The existing measure is defined as the number of repeat internal flooding events occur over a five-year period. This measure partially overlaps with the common internal sewer flooding measure, as this is a count of incidents in any given year.

We have improved our performance since the introduction of repeat sewer flooding since 2015, and in the current AMP, we are ahead of a stretching target. In 2022/23 we had 20 repeat flooders against a target of 42 (while our target in 2024/25 is 37).

While this measure does not meet Ofwat's criteria, there is challenge from both our customers and water forum to resolve repeat flooding and to support our customers if it does happen.

We acknowledge that internal sewer flooding is one of the worst service failures that can occur to a customer, and to have this happen more than once is likely to cause our customers' significant distress. However, we feel that we can better serve those customers who experience this issue outside the bespoke measures process. Under the current bespoke measure where we exceed our target we obtain a reward from our customers, while a worse service can incur a penalty. This penalty is returned to all customers in the form of a bill reduction.

We will continue to help all customers who experience sewer flooding and will replace our current bespoke repeat sewer flooding measure with an enhanced level of service to those small number of worst affected customers. This enhanced level of customer service will become business as usual and will not be subject to a performance measure where we could receive a reward opportunity. The enhanced service level has emerged from CC Water's review of internal flooding

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[28] Water Forum December 2022.

arrangements across companies where we already appear to offer a good level of service in comparison.[29] Our enhanced service will include:

- We will be responsible for cleaning areas affected by internal sewer flooding where a customer asks us to do this, regardless of whether this is a first time or a repeat incident. We already do this for external flooding.
- We will pay our customers insurance excess where cleaning has taken place but customers have identified a need to claim on their home insurance following an internal sewer flooding incident, regardless of whether this is first time or a repeat incident.
- We will consider paying the increase in insurance premiums to those properties identified as being at risk of sewer flooding against the following criteria:
    - Properties recorded as being at active risk of flooding internally due to hydraulic overload in the two-in-ten-year risk category (expected probability that sewer flooding will occur two or more times in ten years) and have suffered internal sewer flooding in the past.
    - Properties recorded as being at active risk of serious external flooding due to hydraulic overload in the two-in ten-year risk category and have suffered external flooding in the past.
    - Properties which have flooded internally more than once in the ten years before 31 March in the reporting year due to 'other causes'.
    - Properties which have suffered, on average, more than one serious external flooding due to 'other causes' in the three years prior to 31 March in the reporting year.
- We will waive the annual wastewater charges for those properties identified as being at risk of internal sewer flooding.
- We will carry out a Director Review of all repeat internal sewer flooding incidents. This review may lead to additional compensation being paid by ourselves directly to the customer affected.

We believe this activity is a much better way of dealing with the small number of customers worst affected by repeat internal sewer flooding, rather than the penalty and reward mechanism of rewards and penalties across the whole customer base.

Abstraction mechanism (AIM)

The AIM measure is dependent on the identification of sites that require the reduction of abstraction of water at environmentally sensitive sites when flow or levels are below an agreed point. As such we have no new sites identified that would require this measure. We therefore remove this from our PR24 bespoke measures.

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[29] **https://www.ofwat.gov.uk/wp-content/uploads/2022/05/customer-experiences-of-sewer-flooding-a-joint-report-by-ccw-and-ofwat.pdf.**

Outcome

We are not proposing any new bespoke measures for PR24. Our final package of measures is below:

FIGURE 15: OUR ADJUSTED PACKAGE OF AMP8 PCLS

Water

CRI
Water Supply Interruptions 3 hr
Leakage (NW and ESW)
Per Capita Consumption
Business demand
Unplanned outage
Water quality contacts
Mains repairs

Environment

WINEP
Storm Overflows
Bathing water quality
Greenhouse gases
Biodiversity
River water quality

Wastewater

Internal sewer flooding
External sewer flooding
Pollutions - all and serious
Discharge permit compliance
Sewer collapses

Customer

C-MeX
D-MeX
BR-MeX

*New common measures. Blue text shows those measures which are part of our long-term strategy.

We propose a new way to support our customers who have been the victim of repeat sewer flooding incidents, making sure they are supported more significantly through financial help than presently available to help tackle any loses and insurance.

2.2. SETTING STRETCHING PCLS

Once we have defined the package of service-level areas that we want to move forward into AMP8 we need to define the target service levels that we expect to deliver over that period. To define these PCL targets, we take four broad steps as set out in the figure below.

FIGURE 16: SETTING STRETCHING PCLS

In the first instance we want to set PCL levels that are stretching, not only is this Ofwat's ambition but it is also our own in line with our vision to be the national leader in the provision of water and wastewater services. This drives a level of stretch in relation to the various service level targets we set by considering where the industry performance could be in 2030 based on a forecast of historical information.

We also seek to consider and reflect customer preferences and ambitions for service improvement in order to agree a package of PCL targets that aligns with customer priorities and ambitions. As part of this we also engaged with customers to understand their appetite to fund additional service improvement in some instances.

Finally, we check alignment with the LTS targets. This represents a cross-check to the trajectory needed to deliver the long-term targets and ambitions that we have to ensure the AMP8 plan places us on a reasonable path to those long-term targets. This does not necessarily mean that targets need to be aligned exactly to a linear trajectory of progress towards the 2050 targets in the LTS but consistent with that strategy.

2.2.1. Alignment with Our Purpose and Vision to be a National Leader

We want the service level targets that we set in the business plan to be ambitious and stretching. To do so we first seek to forecast where service performance across the industry could be by 2030 to provide a guide to inform the level of ambition in the business plan and provide a range within which to set the target. We also seek to consider the position across both costs and service levels to ensure a challenging package in the round.

We forecast service improvement across the sector to 2030 based on the available historical information[30]. This analysis was useful in order to inform where the range from best to worst across the sector could be in 2030 based on the trends in historical performance data. These trends are set out in the annex to this document and provide a useful guide to inform forecast targets but they require some judgement and interpretation. For some of the PCs there is limited or no historical performance information making forecasting very difficult[31], in some instances forecasts trend in the wrong direction[32] or could unreasonably suggest a rapid trend towards zero events which is implausible[33]. Moreover, forecast improvement rates may not be linear as it is likely that for most service performance areas it will become more challenging to improve performance as service performance increases, so we complete a range of different forecasts (including linear and log forecasts). Consequently, we use the forecasts to assign ranges within which the industry performance may be from best to worst and seek to make sure that our targets sit within those ranges of forecasts against an overall level of ambition for customers, reflecting their preferences for service improvement and based on deliverable plans for interventions we would need to make to improve service performance. The setting of targets therefore requires some judgement because we cannot know where service performance will be by 2030 in advance across the sector.

We attempt to set a challenging package in the round considering both costs and service levels holistically. Ofwat at PR19 chose to set 'base' cost allowances and service improvement targets independently from each other and proposes to do the same at PR24[34]. We do not support this approach and have highlighted that in our responses to its various consultations[35]. There is a risk that targets become too stretching and unachievable where cost efficiency and service improvement targets are set at very stretching levels individually and separately according to a 'perfect company' in the round so no company is able to deliver them. Indeed, it was on this basis that four companies chose to appeal their determinations to the CMA at PR19 and the CMA accepted this argument[36] providing additional cost allowances for service improvement, like leakage for example, for some companies and additional cost allowances for all companies in their final determinations. From that experience the CMA panel's decisions have been vindicated through the lived experience of the 2020-23 period to date, where no company is currently delivering all of the performance commitments that it was required to meet from the determination and spending within its allowances. Indeed, at a sector level there is both overspending significantly at the average and net performance penalties, this is despite companies facing very strong incentives to drive efficiency and improve service and the UK water sector being one of the better water and

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[30] Forecasts based on the industry data set shared by Ofwat July 2023.
[31] Biodiversity, River Water Quality and Business Demand.
[32] Per Capita Consumption, External Flooding Upper Quartile – see **Annex** for each measure.
[33] Unplanned Outage – see **Annex** for measure.
[34] Ofwat, 2022, Creating tomorrow, together: our final methodology for PR24, **https://www.ofwat.gov.uk/publication/creating-tomorrow-together-our-final-methodology-for-pr24/**.
[35] NES Response to assessing base costs at PR24.
[36] CMA Final Report - 7.81 onwards, including 7.98 'The approach taken by Ofwat is likely to mean that not all companies can achieve all targets without additional investment', **Final report (publishing.service.gov.uk).**

wastewater sectors in the world[37]. Effectively the settlement has been set at a level that is too stretching for any company in the sector to deliver.

FIGURE 17: REVIEW OF WATER AND SEWERAGE COMPANY PERFORMANCE AGAINST COST AND SERVICE LEVELS 2020-23 (WATER AND WASTEWATER) – NO COMPANY IS MEETING OFWAT'S PR19 DETERMINATION

Water

	Cost efficiency		ITS	Leakage	PCC	CRI	Mains repairs	Unplan. outage
					End of Amp Targets			
	Ranked UQ?	Spending in line with allowances?	05:00	15% reduction	Targets vary	1.5	Targets vary	2.34
ANH	Y	N	N	N	N	N	N	Y
WSH	Y	N	N	N	N	N	N	Y
HDD	N	N	N	N	N	Y	N	Y
NES	N	N	N	N	N	N	N	Y
SVE	N	N	N	Y	N	N	N	Y
SWB	N	N	N	Y	N	N	Y	Y
SRN	N	N	N	N	N	N	N	Y
TMS	N	N	N	N	N	N	N	Y
UUW	N	N	N	Y	N	N	Y	Y
WSX	Y	N	Y	Y	N	Y	N	Y
YKY	N	N	N	Y	N	N	N	Y

Wastewater

	Cost efficiency		Internal sewer flooding	Pollutions	Sewer collapses	Treatment works compliance
				End of Amp Targets		
	Ranked UQ?	Spending in line with allowances?	1.34	19.5	Targets vary	99%
ANH	N	Y	N	N	Y	N
WSH	N	Y	Y	N	Y	N
HDD	N	N	Y	Y	N	N
NES	Y	Y	Y	Y	Y	N
SVE	Y	Y	N	Y	Y	Y
SWB	N	N	Y	N	Y	Y
SRN	N	N	N	N	N	N
TMS	N	N	N	N	Y	Y
UUW	N	N	N	Y	Y	N
WSX	N	Y	Y	N	Y	Y
YKY	Y	Y	N	Y	Y	Y

Sources: NWL analysis replicating Ofwat's 2021/22 Service and Performance report: **https://www.ofwat.gov.uk/publication/water-company-performance-report-2021-22-data/** for the APR year 2022/23.

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[37] International Comparisons of Water Sector Performance, Global Water Intelligence, 2018, **https://epi.yale.edu/**.

FIGURE 18: TOTEX VARIANCE AND ODI RORE INC C-MEX AND D-MEX, FOR BOTH NWL AND WASCS

Adjusting for timing
Appointed Totex 20-23 to date

RORE 2020-23 to date
ODIs including CMEX & DMEX
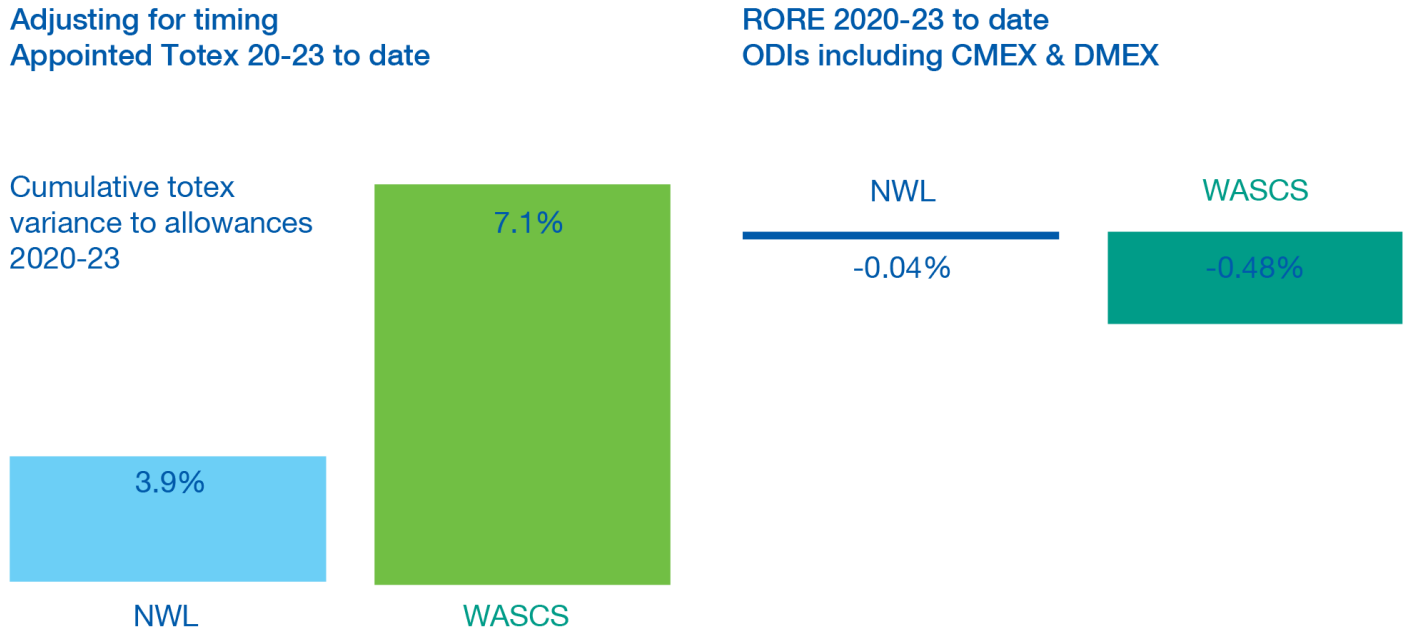
Source: Data from APR 2020-23, Table 1F Note: Actual returns and notional regulatory equity.

The industry has clearly overspent against totex allowed by Ofwat in the first three years of this AMP, with a steady increase year on year. Alongside this overspend the industry has not been able to meet the PCL targets set and failed to achieve a positive return of regulatory equity on ODI payments related to common measures set by Ofwat.

In light of this experience, we look for a different benchmark against which to set our performance ambitions that remains very stretching but which is clearly achievable. We already benchmark our performance as a water company internally against our vision to be the 'national leader' in the provision of water and wastewater services, we define that vision using some key criteria:

- To have a top two position across the sector for customer experience (for which we use Ofwat's current comparative C-MeX measure)[38].
- To have the most service measures at or above the upper quartile level of the sector[39].
- To have all measures above the sector average.

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[38] We recognise that our approach places additional weight on customer service improvements over other service improvements. We note that Ofwat has itself proposed to double the strength of the incentives around CMex.

[39] The measures used are consistent with the outcome performance commitments set by Ofwat at PR19, and comprise: C-MeX; D-MeX; Priority Services; PCC; CRI; ERI; appearance contacts; taste and odour contacts; bursts; leakage; interruptions to supply; unplanned outage; risk of severe restrictions in drought; sewer blockages; collapses; internal flooding; external flooding; risk of sewer flooding in storms; treatment works compliance; pollution; and bathing waters.

The framework for national leader is designed to drive the business towards being the best performing water company in England and Wales. We use this vision to set performance targets and objectives within the business to drive improvements and regularly report on our progress against this vision to leaders and our people across the business, for example through our Team Talk and Townhall sessions with employees. We have been reviewing company performance since we established the national leader assessment in 2016 and over this time it shows that no company has ever been able to claim they have achieved upper-quartile performance against all the measures set out above in any single given year.

At the same time, we always seek to benchmark ourselves against other comparators wherever available. On water and wastewater service metrics we can benchmark our performance against other international comparators in several areas and in the area of customer service we can also benchmark our performance against other utility companies.

The performance of the UK Water sector is already strong internationally across a range of indicators. The Environmental Performance Index, prepared by Yale and Columbia University ranks the UK as second internationally on environmental performance and sixth in relation to wastewater treatment and water resources out of 180 countries[40]. In comparison to European countries the UK offers some of the highest levels of drinking water quality and customer service[41]. The UK also invests more than most European countries in these services but the cost of water services remains close to the European average. Leakage or 'non-revenue water' percentage losses are better than the European average[42]. This evidence suggests that the UK Water sector, and us within it, provides some of the best levels of service compared to other European and international benchmarks.

In 2022/23, we ranked second across the WASCs against our national leader assessment. While we achieved our goal of top two in C-MEX, we need to improve the number of measures where we achieve better comparative performance.

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[40] See: **https://epi.yale.edu/epi-results/2022/component/epi.**
[41] See: **global_water_intelligence_report.pdf (severntrent.com).**
[42] See: **file (eureau.org).**

FIGURE 19: OUR 2022/23 ASSESSMENT OF NATIONAL LEADER

WASC	Customer Service - top 2 in industry	Most Upper Quartile Positions		All Measures above Average		National Leader	
		National Leader Assessment 2022/23 *"Our vision is to be the national leader in the provision of sustainable water and waste water services"*					
	C-Mex (Rank WASCs)	Total Upper Quartile Positions (estimate Appearance & Taste & Odour contacts used)	Upper Quartile Positions (Rank WASCs)	Total Average or above Positions (estimate Appearance & Taste & Odour contacts used)	Average Positions (Rank WASCs)	Overall Rank (Based on sum of C-MEX, Upper Quartile and Average WASC Ranked positions)	Average rank across C-MEX, Number of Upper Quartiles and above average
Wessex	2	6	4	16	1	1	2.3
NWG	1	9	2	13	5	2	2.7
Anglian	6	8	3	16	1	3	3.3
Severn Trent	5	6	4	16	1	3	3.3
South West	8	10	1	14	4	5	4.3
United Utilities	4	6	4	11	6	6	4.7
Welsh	3	3	9	8	10	7	7.3
Yorkshire	7	4	8	9	9	8	8.0
Southern	9	3	9	11	6	8	8.0
Thames	10	5	7	10	8	10	8.3

Source: NWL Analysis

Our national leader assessment is extremely challenging. This represented by no company achieving all the criteria to be considered a national leader within this AMP to date but in practise the company at the top of the rankings would reasonably be considered the 'national leader'. Wessex Water was ranked 1st in 2022/23, with the best average rank across the criteria, but still did not meet all the criteria to meet the national leader. NWL achieved 2nd position in 2022/23 overall, but similarly failed to achieve the criterion of most measures with a performance at upper quartile and above average.

Our national leader assessment encourages us to increase service performance to above average for all measures and above the upper quartile for 'most' measures. The assessment requires us to have 'most' measures in the UQ for the sector, noting that no company achieves UQ performance in all areas and UK Water's comparatively strong position against international benchmarks. We therefore propose to identify some PCLs where we want to move or retain performance in that UQ position. However, this needs to be informed by customer preferences and support. We consider that our business plan and the service levels we are offering, alongside cost efficiencies, will reasonably place us at or close to the 'national leader' based on the comparative performance of other companies historically.

2.2.2. Reflecting customer preferences

Our customers' needs and priorities are essential to the direction we take with all our services for both our Northumbrian Water and Essex and Suffolk Water regions. We conduct ongoing research with customers to make sure we have a

continuous flow of information of what our customers think about our services and about improvements that could be made to services or the priorities that customers may have for the services they receive.

All this research provides a wealth of information, from which we can triangulate and understand the levels of priorities customers have for our services. We have mapped our customers preferences alongside our relative performance and our customer trajectory of performance (2021/22 to 2022/23).

FIGURE 20: CUSTOMER PRIORITIES AND CURRENT PERFORMANCE (2022/23)
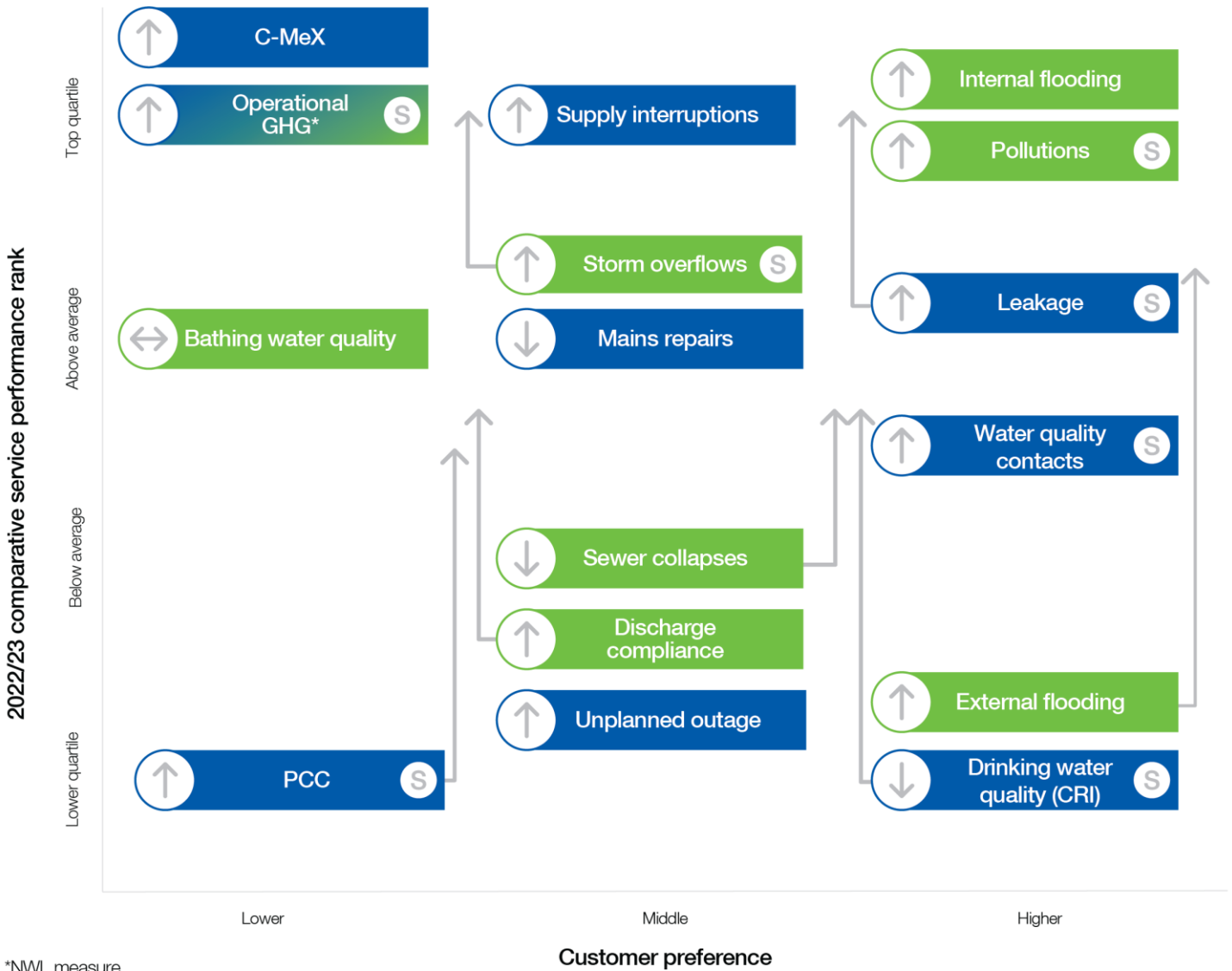
*NWL measure

Arrows indicate the change in performance between 2021/22 and 2022/23, while 'S' indicate those measures with statutory requirements.
Source: NWL.

It is clear from our triangulation of research that our customers place a high importance on a number of services that we perform well against, these include pollutions, internal sewer flooding, leakage and water quality contacts. However they also prioritise a number of areas where we know we need to improve, we detail these further below.

- Water quality compliance (CRI)

  Customers expect a good quality supply of water, with this as one of the most important priorities. The target in the current AMP is 0, with a deadband of 2 that moved to 1.5 in 2022/23 for a small number of companies including ourselves. Our performance has not met this deadband, achieving 7.62 in 2022 and does not correspond with the level of performance customers expect. We know this needs to improve and we are investing significantly and have plans in place already and continue to work with the DWI to achieve their goals for the removal of our notices. We want to achieve performance that is in line with the better performers in the industry. We detail our plans for improvements for CRI in the annex to this document. In 2023/24 we are also seeing a marked improvement in our drinking water quality performance following the additional investment we are making. In July our CRI score was 1.4 having been as high as 5.7 at the same point in the previous year.

- External sewer flooding

  Our customers have indicated that next to internal sewer flooding, they see external sewer flooding as a high importance. While we have seen good reductions against internal sewer due to our action plan, we continue to have a lower quartile performance for external sewer flooding. We have seen gradual improvements in the number of external flooding incidents in this AMP. However, we continue to perform around the lower quartile level. We missed our target of 3,018 by 9 incidents in 2022/23. We propose to expand on the tactics we have utilised for internal sewer flooding to reduce our external sewer flooding over the next AMP, further detail of our proposals is in the annex to this document, from page 73. We propose a significant improvement in performance. However, we know we cannot become an upper quartile performer overnight, and we have significant work to do. We note that more recent performance suggests a flat or deteriorating performance at a sector level which influences the future forecasts.

- Leakage

  Our customers told us that leakage was a high priority for them and our performance in our Essex and Suffolk region is upper quartile and overall as a company we are above average withing the industry. As our customers place a high importance on leakage, we are committed to reducing leakage in our northern region by 55% and 40% in our southern region by 2050. We have failed our leakage targets in AMP7 but started to see improvements in the levels of leakage across both regions since 2020/21, and in our ESW region we achieved our PCL in 2022/23. Our plans aim to meet out targets by 2024/25.

- Discharge compliance

  Our customers told us the discharge compliance was a medium priority, while our performance was below the average within the industry for 2021/22 (Ofwat definition). We improved in 2022/23, from 98.03% to 98.52%, but crucially remain below the 99% deadband threshold. We have proposed a plan to improve our performance in the annex to this document.

- Asset health

  Customer triangulation indicated that our customers felt asset health metrics were a medium priority. However, our performance is mixed across the measures, with our unplanned outage in the lower quartile in 2021/22. We have continued to improve our performance this AMP, down to 3.51 in 2022/23. (This measure however will see a worsening of performance at the start of the next AMP due to a definition change.) Both mains repairs and sewer collapses we performed better than the average industry performance for 2021/22 and we will continue to seek further improvements. We detail our plans to improve our asset health metrics in the annex to this document. We have separately highlighted that we do not consider these metrics to represent a robust or appropriate view of our asset health[43] and are committed to working with Ofwat to improve the asset health metrics that the sector uses ahead of PR29.

2.2.3. Setting PCLs

We set out by measure our PCLs between 2025 and 2030 in the table below. We have set out to determine future PCLs by applying the following principles:

1. To satisfy our national leader aspirations, we aim to have performance that would place us amongst the best in the sector in terms of the number of measures above average or at the upper quartile relative to others and focus improvement on those aspects of service performance that are most important to customers.

2. To propose targets that are consistent with our long-term plans, including DWMP and WRMP, and which present credible pathways to the long-term targets set out in our LTS and the various statutory/regulatory expectations contained therein.

3. To achieve maximum performance on PCLs which reflect statutory standards for compliance.

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[43] In particular because they represent a small subset of the asset base we manage are lagging and take no account of issues like asset criticality (see: https://www.ofwat.gov.uk/wp-content/uploads/2022/06/Northumbrian_Water_Resilient_efficient_services_require_healthy_assets.pdf).

4. To make sure that customers do not pay any more for service improvement than they should we generally seek to fund improvements from base allowances where our performance does not currently place us as the 'national leader' company.

5. If we fail to meet service level targets then this can damage customer trust so it is important that targets are deliverable. To maintain deliverability and make sure that the activities required to deliver any significant step changes in performance we seek enhancement funding in a small number of instances. Enhancement funding may also be required to protect against any material increasing risks to performance which could otherwise result in a deterioration in service levels.

With regards to the last point, while we target these improvements to align with customer priorities, we are mindful of our service valuation research for our optimisation tool[44] results which showed large numbers of customers (more than 50%) did not want to pay for improved service, across all the measures we tested. We therefore only propose additional investment to improve service where there is a clear legal requirement to improve to invest (for example, leakage, CSO spills and pollutions) aligned to the long-term statutory planning frameworks (including the WRMP and DWMP).

This is particularly pertinent in relation to asset health metrics – while customers value stable asset health there is little support for paying for improvement in these metrics for their own sake, especially when the current level of asset health can be seen not to be having a detrimental impact on customer facing service metrics. In any case we do not consider that the proposed asset health metrics are an appropriate way of assessing health – they are lagging indicators with only a partial coverage of the asset base, however we have included them in our proposals in order to remain compliance with Ofwat's methodology.

The table below summarises our proposals, and where applicable separates the PCL that can be achieved with base funding (the 'base PCL') and the additional improvement that can be delivered with enhancement funding (The 'enhanced PCL').

In the annex to this section we outline by measure, how we derived our PCL, the split between base and enhancement funding with links to the relevant enhancement cases, what we are doing this AMP with regards to performance and how we plan to achieve our 2030 target.

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[44] NWL Service Valuation Research 2022 – **Customer and Stakeholder Engagement**, Appendix A7 (NES08).

FIGURE 21: PCLS BY MEASURE

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
Internal sewer flooding	Base PCL (per 10,000 connections)	1.23	1.22	1.26	1.27	1.26	1.24
	Forecasted comparative	UQ					UQ
	A 'high' priority for customers. Substantial improvements in AMP7 are forecast to deliver UQ performance by 2024/25, with further incremental improvements in AMP8 to maintain comparative performance. This will enable some re-allocation of base funding from internal to external flooding						
	Enhanced PCL		1.22	1.20	1.20	1.19	1.17
	Forecasted comparative	UQ					UQ
External sewer flooding	Base PCL (per 10,000 connections)	21.43	20.28	19.22	18.32	17.34	16.43
	Forecasted comparative	LQ					UQ
	A 'high' priority for customers. Having delivered substantial improvements in AMP7 on Internal Flooding, this will enable reallocation of resources and some base funding to tackle external flooding. This aims to deliver a 25% reduction across AMP8 - a significant step change to achieve performance with the range of potential forecasts for the upper quartile. Further improvements beyond this level are not affordable from within base funding (considering we are the frontier company for wastewater efficiency and in the top quartile on broader wastewater service performance) and while this measure is a high priority for customers overall, our customers are not supportive of additional enhancement funding to improve service given broader affordability constraints.						
	Enhanced PCL		20.28	19.18	18.14	17.16	16.25
	Forecasted comparative	LQ					UQ

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
Pollutions (all)	Base PCL (per 10,000kms)	19.32	18.98	19.81	18.48	16.81	15.48
	Forecasted comparative	UQ					13.5-18
	A 'high' priority for customers. We propose to maintain our current UQ performance but deliver a 30% improvement, moving forward the current frontier for the sector. However, this requires enhancement investment to mitigate the impact of climate change on performance, in the form of increased frequency and severity of severe weather events which disrupt power supplies (**Power Resilience**, NES32) and our proposed pollutions investment (**Pollutions**, NES37) to deliver a step change in regulatory expectations as set out in WISER guidance which requires a 30% reduction to the EA's AMP7 EPA target in the face of wider regulatory reforms which are expected to increase the number of reported pollutions across the sector. This ambition is reflected in the Enhanced PCL below. In the absence of this investment, we would expect increasing risks.. We are also aware that the EA is considering a change in the treatment of Category 4 incidents and should this result in a material impact on reported Category 1-3 pollution then we would expect PCLs and baselines for pollution to be reset accordingly.						
	Enhanced PCL		18.98	17.65	16.32	14.65	13.32
	Forecasted comparative						Frontier
Serious pollutions	Base PCL (number)	(0 in 2022)	0	0	0	0	0
	Deadband		1	1	1	1	1
	Forecasted comparative	UQ/ Frontier					Maximum Compliance
	A 'high priority for customers. We have proposed to sustain the current frontier performance with a PCL of zero, which is also consistent with Government SPS for Ofwat as well as our own LTDS. No additional enhancement funding is requested for this measure. We propose a deadband of 1 serious pollution which addresses some of the asymmetric risk within the package, whilst we also note that we are unable to obtain "green" in the EA EPA or enhanced performance rewards if we do not achieve maximum compliance.						

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
Sewer collapses	Base PCL (per 1,000kms)	8.12	7.92	7.71	7.5	7.3	7.12
	Forecasted comparative	LQ					Average
	Asset Health measures are a 'medium' priority for customers. Despite outperforming our AMP7 PCL this still leaves us at LQ comparatively. In line with our national leader vision we are proposing to improve performance to above average and more broadly support stable asset health. We do not consider that further improvement is justified – see comments preceding the table in relation to Asset Health metrics. In particular collapses are not a material driver of flooding or pollution performance.							
Discharge compliance	Base PCL (%)	99.0	100	100	100	100	100
	Deadband		99	99	99	99	99
	Forecasted comparative	Below average					Maximum compliance
	A 'medium' priority for customers. We have proposed a PCL of 100% reflecting that these are statutory standards, along with a deadband consistent with levels currently supported by the quality regulator. As a minimum we are intending to improve performance to 99.4% (1 failure across both water and wastewater) to achieve average performance and be within the proposed 99% penalty deadband which is consistent with a Green EPA assessment.							
Storm overflows	Base PCL (average number)	20	20	20	20	20	20
	Forecasted comparative	UQ					Average
	A 'medium' priority for customers. Our base PCL proposes to maintain our current pledge which aims to achieve average spills of 25 by 2025. Assuming WINEP enhancement funding in relation to SOAF (Storm Overflow Assessment Framework) and SO-DRP (Discharge Reduction Plan) is endorsed, we will be able to deliver greater reductions, and would propose a more stretching PCL as set out below. The trajectory of this reduction							

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	is consistent with achieving our objective of <10 av spills by 2035.						
	Enhanced PCL		19.53	18.80	18.07	17.34	16.61
	Forecasted comparative						Above Average / UQ
CRI	Performance under base	4.35	4.24	4.14	4.03	3.93	3.82
	Performance under enhanced		4.24	4.14	4.03	3.93	3.72
	PCL		0	0	0	0	0
	Deadband		1.5	1.5	1.5	1.5	1.5
	Forecasted comparative	LQ					Maximum compliance
	A 'high' priority for customers. We have proposed a PCL of 0 reflecting that these are statutory standards along with a deadband consistent with levels currently supported by the quality regulator. We have an agreed transformation programme with the DWI which aims to improve performance however anticipate it will be early in AMP9 before our CRI score reduces to within the deadband.						
Water quality contacts	Base PCL (per 1,000 population)	1.10	1.07	1.06	1.06	1.05	1.02
	Forecasted comparative	Average					Average
	A 'high' priority for customers. We propose ongoing incremental improvements to maintain at least average performance. We also gain a benefit from our enhancement cases, **Climate change resilience** (NES24) and **Power resilience** (NES32), detailed below in our enhanced PCL. These figures include an assessment of an expected increase of 11% in contact due to the DWI notice 04/2022.						

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	Enhanced PCL (per 1,000 population.	1.10	1.06	0.98	0.98	0.97	0.94
	Estimated comparative	Average					Average
Interruptions to supply (three hours)	Base PCL (mm:ss)	00:05:00	00:04:58	00:05:04	00:04:52	00:04:40	00:04:28
	Forecasted comparative	UQ					UQ
	A 'medium' priority for customers. We have historically performed at the UQ and underlying performance remains strong but extreme/severe weather events have impacted more recent performance. We are proposing an UQ target with an inclusion of one severe storm impact every five years. We obtain some benefit from our our enhancement cases, **Climate change resilience** (NES24) and **Power resilience** (NES32). This benefit it represented by our enhanced PCL.						
	Enhanced PCL (mm:ss)		00:04:51	00:04:39	00:04:27	00:04:15	00:04:03
	Forecasted comparative	UQ					UQ
Mains repairs	Base PCL (number per 10,000kms)	123.4	123.4	123.4	123.4	123.4	123.4
	Forecasted Comparative	Above average					Above average
	Asset Health measures are a 'medium' priority for customers. See comments preceding this table in relation to asset health metrics. We are proposing a PCL maintaining a flat level of repairs across the AMP under base which is consistent with maintaining above average performance. Our business plan includes additional enhancement case for a greater level of mains renewal. However the benefit of this enhancement is not realise until AMP9 (2030 onwards) per table CW15.						
Leakage NW	Base PCL (MLD – three-	117.3	116.8	115.7	115.5	114.0	112.5

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	year average)						
	% reduction from 2019/20 baseline	13.0%	13.4%	14.1%	14.3%	15.4%	16.5%
	Forecasted comparative	Above average					Above average
	A 'high' priority for customers. Our enhanced PCL (below) proposes reductions consistent with our WRMP24 and also our long term objective to reduce leakage by 55%. We consider that improvements beyond the 1.4% reduction pa delivered currently require enhancement funding, with the 1.4% reduction pa reflected in the base PCL above.						
	Enhanced PCL (MLD – three-year average)		115.3	112.7	110.8	109.0	107.1
	% reduction from 2019/20 baseline		14.5%	16.4%	17.8%	19.2%	20.5%
	Forecasted comparative						Close to UQ
Leakage ESW	Base PCL (MLD – three-year average)	55.2	55.1	54.6	54.6	53.9	53.2
	% reduction from 2019/20 baseline	15.4%	15.6%	16.3%	16.3%	17.4%	18.5%
	Forecasted comparative	Frontier					Close to frontier
	A 'high' priority for customers. Our enhanced PCL (below) proposes reductions consistent with our WRMP24 and also our long term objective to reduce leakage by 40%. We consider that improvements beyond the 1.4% reduction pa delivered currently require enhancement funding, with the						

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	1.4% reduction pa reflected in the base PCL above. This reflects our position as one of the frontier leakage performers in the sector.						
	Enhanced PCL (MLD – three-year average)		54.4	53.2	52.7	52.2	51.6
	% reduction from 2019/20 baseline		16.7%	18.4%	19.2%	20.0%	20.8%
	Forecasted comparative						Close to frontier
Unplanned outage	Base PCL (%)	4.41	4.31	4.24	3.83	3.77	3.70
	Forecasted comparative	LQ					LQ
	Asset Health measures are a 'medium' priority for customers. See comments preceding this table in relation to asset health metrics. The vast majority of outages have no impact on continuity or quality of supply to customers. We hence do not propose a significant step change in performance, simply a gradual improvement. We obtain a small improvement from our **Climate change resilience** (NES24) and **Power resilience** (NES32) enhancement cases.						
	Enhanced PCL (%)		4.31	4.23	3.82	3.76	3.69
	Forecasted comparative						Lower Quartile
Per capita consumption	Base PCL (L/p/d – three-year average)	151.6	149.1	146.4	143.9	141.9	140.2
	% reduction from 2019/20 baseline	-0.6%	1.0%	2.9%	4.5%	5.8%	6.9%
	Forecasted comparative	LQ					LQ

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	A 'low' priority for customers. We are proposing PCLs consistent with WRMP requirements to maintain supply demand and our long-term target to reduce to 110 l/p/d by 2050. This degree of change is supported by enhancement funding for smart meter installation in both regions and additional water efficiency in ESW. We are not proposing further improvement as this is a low customer priority and customers will not support additional expenditure.						
	Enhanced PCL (L/p/d – three-year average)		148.3	144.8	141.4	138.5	136.0
	% reduction from 2019/20 baseline		1.6%	3.9%	6.2%	8.1%	9.7%
	Forecasted comparative						Average
Business demand	Base PCL (MLD) reduction from 2019/20	215.0 MLD	232.7 MLD	248.6 MLD	261.5 MLD	270.2 MLD	276.7 MLD
	% Reduction from 2019/20	1.3%	-6.8%	-14.1%	-20.0%	-24.0%	-27.0%
	Forecasted Comparative	n/a					n/a
	A 'low' priority for customers. Our PCLs are consistent with the WRMP requirements, and include growth estimates. From our existing customers base, and excluding growth we are proposing to reduce consumption by 1.8% by 2029/30. However, applying Ofwat's definition[45], we expect a 22.4% increase on our three year average NHH consumption by 2029/30, from a three year average base of 2017/18 to 2019/20. We include an						

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[45] Ofwat indicate growth should be included in forecasts – PR24 Query log 19 September page 68-69, Query no 257. 'Companies will need to incorporate into the forecasts in their business plans any expected new premises, premises that will close and other changes in demand by businesses'. **PR24-query-log-updated-19-September-2023.pdf (ofwat.gov.uk).**

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	enhancement investment related to our water efficiency programme.						
	PCL (MLD) reduction from base Figures are increase Enhanced PCL % reduction from 2019/20		228.1 MLD -4.7%	243.2 MLD -11.6%	254.5 MLD -16.8%	261.6 MLD -20.1%	266.6 MLD -22.3%
	Forecasted Comparative						n/a
River water quality (P load reduction)	Base (2020) 757,143 P emitted in 2020 from treatment works with a P limit – 211,230	3.13%	3.13%	3.13%	3.13%	3.13%	3.13%
	No comparative data						
	A 'low' priority for customers. A new metric so comparable data not yet available. We have linked improvements to our WINEP programme, and specifically quantified the reduction in phosphorus load that will result from the introduction of new or more stringent consents in AMP8. We operate with considerable headroom against our current consents and hence the level of reduction in actual load (as per Ofwat's metric definition) is materially less than the reduction in consented load which we expect the EA to track. As a low priority for customers and given frontier position on wastewater efficiency which precludes the allocation of base funding to this topic, we have linked improvements solely to WINEP enhancements and hence propose no improvement from base funding.						
	Enhanced PCL		4.93%	5.11%	7.45%	7.49%	7.52%
	No comparative data						

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
Bathing water quality	Base PCL (%)	80.1%	80.1%	80.1%	80.1%	80.1%	80.1%
	Estimated Comparative	Below Average		Below Average			
	A 'low' priority for customers. This metric is changing for AMP8 and the apparent reduction in performance is simply due to measurement change. While the majority of our beaches already achieve good or excellent status, we do have a small number of dedicated WINEP schemes (at two waters) as well as expected improvements from WINEP SO-DRP schemes, which are expected to result in improvements and achievement of average performance by end of AMP8.						
	Enhanced PCL (%)		80.1%	80.1%	81.1%	82.1%	87.1%
	Forecasted comparative		Average				
Biodiversity	Base PCL (biodiversity units per 100km2)	New metric	0	0	0	0	0
	No comparative data						
	A 'medium' priority for customers. Given that overall relative efficiency and service performance leaves little headroom to allocate base funding to improvements, and customers are not supportive of additional funding for improvements, our approach has been to identify opportunities associated with WINEP schemes to deliver biodiversity improvement. This is reflected in the enhanced PC and accordingly no improvement is envisaged from base beyond maintaining existing conservation objectives. There is a significant time lag between making an intervention (for example planting a tree) and that intervention becoming sufficiently mature to deliver a biodiversity improvement against the metric. This is why improvements are only forecast in year five despite interventions being planned much earlier in the AMP.						
	Enhanced PCL (biodiversity units per 100km2)		0	0	0	0.08	0.25

Measure	Units	2024/25 Forecast	Proposed Performance Commitment Levels				
			2025/26	2026/27	2027/28	2028/29	2029/30
	No comparative data						
Carbon emissions (water)	Base PCL (Tonnes CO2e)	2021/22 Base 118,072.22	113,974.23	112,909.78	110,521.95	108,496.05	106,840.00
	A 'low' priority for customers. Our baseline for 2021/22 is adjusted to reflect the removal of performance associated with the retention of green certificates. We have both a base PCL and enhancement PCL to reflect the benefits we obtain across our enhancement cases documented in CW15.						
	Enhanced PCL (Tonnes CO2e)		113,920.09	112,697.76	110,335.75	108,345.00	106,711.73
Carbon emissions (waste)	Base PCL (Tonnes CO2e)	2021/22 Base 132,671.82	108,372.22	107,350.72	106,048.00	104,752.81	103,416.16
	A 'low' priority for customers. Our baseline for 2021/22 is adjusted to reflect the removal of performance associated with the retention of green certificates. We have both a base PCL and enhancement PCL to reflect the benefits we obtain across our enhancement cases documented in CWW15.						
	Enhanced PCL (Tonnes CO2e)		108,011.16	105,978.44	104,719.03	103,203.91	101,226.38

2.2.4. Alignment with LTS

We need to consider the trajectory of performance, both now and over future price reviews, to make sure we remain on track to achieve our stretching long-term targets.

Having previously made sure that the PCs are consistent with the **long-term strategy** (NES_LTDS) in Section 3.1.2 we also need to make sure that the targets proposed are also consistent with those outlined in our LTS. Over the 25-year time period of our LTS we do not consider that it is essential for us to have targets over the 2025-30 period for those PCs on a simple linear trajectory to 2050. Indeed, this would in some cases be inconsistent with customers' preferences and may not be efficient, for example if new technologies or changes might allow more rapid and cheaper progress to be made in the future. Instead, we may choose to go slightly slower or slightly faster depending on other considerations such as customer preferences and affordability, financeability and deliverability. Across many of the service performance metrics that we are seeking to meet, we would expect to see increasing marginal cost or difficulty of improving service,[46] so we may want to move faster than the long-term trajectory. As we get closer to our long-term targets progress may become more difficult or expensive. However, where we are expecting to be far behind that linear trajectory over the next five years, we might have concerns that we are putting the eventual delivery of that long-term target at risk.

The table below maps each of the long-term targets from the LTS to the near-term targets that we are proposing for the 2025-30 period. In the table we show a 'RAG' status highlighting in 'green' where the target for 2030 is in line with or better than the linear trajectory of the LTS 2050 target, 'amber' where the 2030 target is very close to the linear long-term trajectory of the LTS and 'red' where the target seems very far behind that linear trajectory.

FIGURE 22: ALIGNMENT OF OUR LONG-TERM STRATEGY AND OUR 2030 PCL

Long-term target	Measure	Alignment between long-term target and 2030 Performance Commitment Level	RAG
Water			
Reduce household water per capita consumption – to 122 l/p/d by 2038 and 110 l/p/d by 2050.	Per capita consumption	Our WRMP / PCL of 136 litres (three-year average) by 2030 aligns with reaching the 110 litres by 2050.	GREEN
Reduce non-household (NHH) water demand – by 9% by 2038, excluding growth (from 2019/20 levels).	Business use	Our target is to reduce NHH demand by 1.8% (three-year average) over the period 2025-2030, excluding growth, increasing the pace of improvement from 2030. A linear trajectory would to 2038 would be approximately 3.2%.	AMBER

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[46] **WRMP Demand Management Plan** (NES15) section 2.3, CMA Final report PR19 **Final report (publishing.service.gov.uk).**

Halve leakage – achieve a 55% reduction in leakage in our North East levels by 2050 (61.1 Ml/d) and a 40% reduction in leakage in our Essex and Suffolk regions by 2050 (40.1 Ml/d), to achieve the national target of 50% companywide (from 2017/18 baseline).	Leakage NW Leakage ESW Mains repairs	Our WRMP targets for 2025-2030 align with our long-term target of 55% NW and 40% ESW reductions by 2050.	GREEN
Consistently deliver high quality water – Compliance Risk Index (CRI) of zero.	CRI (water quality compliance) Water quality contacts	Our PCL for CRI is 0, which aligns to our long-term ambition. We acknowledge our current performance and that it will take tie to achieve our PCL. We also set a challenging water quality contact PCL to support our vision of delivering high quality water.	GREEN
Leading asset management practices – achieve AMMA assessment of leading or optimising for all measures of asset management maturity by 2030 and leading by 2035.	Mains repairs Unplanned outage	In the long-term we consider a mature asset management approach is a more appropriate measure than existing asset health measures. We consider our proposed PCLs are consistent with a mature approach to asset health management.	N/A
Reliable water supplies – reduce interruptions to supply greater than three hours to less than two minutes/customer/year on average by 2050.	Interruptions to supply (three hours)	Our proposed target for AMP8 aligns with our ambition to achieve less than two minutes by 2050. However any ambition maybe restricted by severe weather year to year.	GREEN
Wastewater			
Reduce internal sewer flooding – by 60% (from our 2024/25 performance commitment levels).	Internal sewer flooding Sewer collapses	Our proposed target of 1.17 per 10,000 connections by 2030 aligns with our long-term target.	GREEN
Reduce external sewer flooding – by 60% (from our 2024/25 performance commitment levels).	External sewer flooding Sewer collapses	16.25 per 10,000 connections by 2030 puts us ahead of our linear trend to the 60% reduction on 2024/25 performance by 2050. (18.94 per 10,000 required by 2030.)	GREEN

Leading levels of pollution incidents – zero serious pollutions now and always, zero pollutions as a result of our assets and operations and reduce the number of category 1 – 3 pollutions by 50% by 2040 (from 2022 baseline).	Pollutions Serious pollution incidents.	Our PCL follows the assessment from WISER, which is a 30% reduction on the 2024-25 PCL, this targets 13.3 per 10,000 km, ahead of the 15.87 we need to target on a linear trend to our 2040 target. We set a PCL of 0 for serious pollutions which aligns with our long-term strategy.	GREEN GREEN
Protect water environments – target 100% discharge permit compliance and maintain at least 99%.	Discharge permit compliance	Our PCL is consistent with our long-term target as our ambition is to maintain current level of service in the long term.	GREEN
Environment			
Leading levels of water quality – eliminate the detrimental impacts of our operations and assets on waterbodies as soon as is practical. Work with partners so that, where possible, waterbodies in our regions can achieve good ecological status.	River water quality	Our PCL reduces the level of phosphours by 7.52% by 2030, including the impact of growth on our treatment works.	GREEN
Eliminate harm from storm overflow discharges – year on year reductions in number of storm overflows operating more than ten times a year on average, and none doing so by 2050.	Storm overflows	Our PCL of 16.61 average storm overflows aligns to achieving less the ten average spills by 2035.	GREEN
Enhance biodiversity – all our construction activities, including those that do not require planning permission, will result in a net gain in biodiversity of 10% or the local requirement where higher.	Biodiversity	Our PCL proposed is to increase the level of biodiversity units by 29.67 by 2030.	GREEN

Deliver net zero – achieve net zero Scope 1, 2 and 3 emissions by 2050. Halve carbon impact of new assets – reduce embodied carbon by 50% for new assets by 2040 (from 2025/26 baseline). Increase renewable generation – 100% of our electricity will come from additional* renewable generation by 2040.	Greenhouse gas emissions	Ofwat's proposed PCL does not align with our long term target. In response to Ofwat's proposed commitment, we have set a PCL to reduce our emissions from a 2021/22 basline for water by 9.6% and by 23.7% for wastewater (including enhancements)	N/A
Excellent bathing waters – all bathing waters at good or excellent status by 2030.	Bathing water quality	Our forecasted PCL is set to achieve all bathing waters as good or excellent in 2030. (with the final poor classified bathing water being removed in 2030).	GREEN

Source: NWL

*Additional = renewable generation that would not have existed if we were not buying the power. This includes Power Purchase Agreements (PPA) with new generation that we guarantee the take-off for, and renewable generation behind the meter.

2.2.5. Deadbands

In the current price review period companies are subject to a range of 'deadbands' for service performance. Where performance falls within these bands companies are not subject to either a reward or a penalty for performance. For PR24 Ofwat has proposed that companies generally should not be subject to dead-bands but has accepted that some dead-bands may be suitable for some compliance-based measures like the CRI.

We do not propose that deadbands will apply for most of the service metrics we will set. However we propose that dead-bands will continue to be set for three compliance-based measures including CRI and Discharge permit compliance and serious pollutions.

For CRI we propose to set a deadband at 1.5, a deadband in this area is justified because:

- The DWI accepts that achieving 0 CRI risk is not possible and while we are investing heavily and seeking to improve performance and reduce CRI risk achieving a score of 0 is not feasible. In 2022 no company achieved a CRI score of 0 with an average industry CRI score of over 5[47].

- A dead-band set at this level is less than the dead-band set by Ofwat at PR19 (which was set at 2) and is consistent with the lower level set by the CMA[48].

- The CRI is a penalty-only incentive and without a deadband the incentive will introduce greater asymmetry into the risk reward balance which would need to be corrected either by offering a less stretching package of service targets or by raising the allowed return.

For discharge permit compliance we propose to set a deadband at 99%, a deadband in this area is justified because:

- The EA accepts that achieving 100% compliance across all treatment works is not possible and currently sets a deadband on this measure of 99% as part of its Environmental Performance Assessment (EPA) and only one company was able to achieve 100% compliance in 2021/22 with the sector average being 98.65% compliance[49].

- This is a penalty-only incentive and without a deadband the incentive will introduce greater asymmetry into the risk reward balance which would need to be corrected either by offering a less stretching package of service targets or by raising the allowed return.

For serious pollutions we propose setting a deadband at 1, a deadband in this area is justified because:

- Serious pollution is a penalty-only incentive and without a deadband the incentive will introduce greater asymmetry into the risk reward balance which would need to be corrected either by offering a less stretching package of service targets or by raising the allowed return.

- Companies must achieve no serious pollutions in order to enable access to enhanced outperformance incentives against the pollutions (all Category 1 – 3) measure – so there remains a strong incentive to achieve 0.

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[47] See: **https://www.dwi.gov.uk/water-companies/compliance-risk-index-england-and-wales/.**
[48] CMA Final Report page 1208, **https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf.**
[49] See: **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Wit had fffCPR_2021-22.pdf** pp.25.

3.   OUR APPROACH TO SETTING OUTCOME DELIVERY INCENTIVES

3.1.1. Ofwat Methodology

In its PR24 methodology Ofwat sets out a requirement for companies to use the centrally developed incentive rates that they have set[50]. Failure to do so would result in companies receiving a 30 basis point reduction in their allowed return to equity investors. We have concerns about Ofwat's approach to setting incentive rates but have used these centrally developed incentive rates in our business plan to comply with the methodology and avoid the penalty for non-compliance.

However, we have also sought to cross-check those incentive rates against existing incentive rates and other evidence including from our own service valuation research.

We have communicated our concerns about the proposed approach to Ofwat. Specifically we have raised a number of methodological concerns in our response to Ofwat's PR24 ODI Research[51] which included[52]:

- The focus on willingness to accept (WTA) rather than willingness to pay (WTP) risks generating estimates that are too high, could for instance over-compensate companies for service improvements resulting in service levels beyond what customers are willing to pay.
- The use of a single piece of research which is being used to determine ODI rates for common performance commitments. At PR19 companies were praised by Ofwat for using multiple rounds of valuations. Furthermore, recent CCW commissioned report, Triangulation - A review of its use at PR19 and good practice[53], - makes sensible recommendations for good practice triangulation for PR24. In our view Ofwat's approach places to much reliance on a single value.
- The valuations obtained are sensitive to the performance ranges which were used in the research – against which customers value improvements. These did not always align with the performance ranges in companies long term delivery strategies, potentially bringing into question the applicability of the valuations obtained to the performance ranges expected in practice.

While we had our reservations, we continued to support Ofwat's centralised research. Unfortunately, this research has been beset by delays. The initial PR24 programme indicated that a full set of ODI rates would be made available to companies in December 2022. This was postponed to January/February 2023 and subsequently the first batch of results was first made available in March 2023[54]. When the first results were released, PJM Economics observed and error, and Ofwat had to re-issue new values. However, a number of companies including ourselves then highlighted concerns with

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[50] Ofwat Final Methodology – Quality and Ambition pp158,161 - **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_main_document.pdf.**
[51] PR24 ODI Research – Ofwat Queries – February 2022.
[52] Further commentary with our response: PR24 ODI Research – Ofwat Queries – February 2022.
[53] Triangulation – A review of its use at PR19 and good practice.
[54] PR24 Collaborative Customer Research Steering Group 14 November 2022. **PowerPoint Presentation (ofwat.gov.uk).**

the values provided, in particular with the valuation for internal and external sewer flooding, and the relative valuations associated with different metrics which seemed counter-intuitive. At this time, the collaborative research and mapping suggesting the ODI rate for an incident of internal sewer flooding circa £3,200. We highlighted in our response[55] to this, that had this ODI rate existed at PR19 we would not have been able to invest in the step-change reduction of internal sewer flooding incidents.

As a result, Ofwat changed its methodology from the problematic bottom-up approach using customer valuations to a 'top-down' approach which simply apportioned the total RoRE range to be associated with ODI penalties and rewards across the metrics based on relative customer priority. As such the central collaborative research has now been used only as a priority matrix for measures, alongside two other strands of research.

Final results from the revised methodology were received in June 2023, albeit some gaps remained.

This was too late to use Ofwat's ODI values to underpin our own customer acceptability research which began in May, so to support this process we had to rely on our own service valuation research.

3.1.2. NWL Service Valuation Exercise

Ahead of Ofwat's work to set ODI rates for the industry, we conducted a review of our service valuation information collected at PR19[56]. We did this, to understand what our customers had already told us about their priorities and associated valuations against the package of measures being proposed at the time.

To support PR24, we then created a paper version of our PR19 online service valuation tool to ask customers to value different service improvements, across the whole package of measures – including the common measures and a small selection of possible bespoke measures. This was important as we wanted customers to have as full picture as possible against the service measure package. Using a paper version allowed the research to be conducted face to face; allowing the use of actual denominations of plastic money and providing the opportunity for respondents to easily adjust their choices. To make sure we had a representative sample we conducted 2,000 tests across the North East (1,000), Essex (648) and Suffolk (352). Full details of how this research was conducted is available in **A7 - Customer and Stakeholder Engagement** Appendix (NES08).

The output of this research provided customer valuations for a set level of performance improvement. The responses by measure generally followed the same pattern with a large number of customers not wanting an improvement, by associated no value with the improvement (£0), with a reducing number of customers allocating higher valuations. This

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[55] NWL Letter to Ofwat re ODIs, 18/05/2023.
[56] NES PR24 Copperleaf Service Valuation – Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

essentially provided us with a downward curve of value against performance. Those respondents placing the highest value for the improvement were low in numbers.

The data provided by respondents allowed the calculation of the marginal benefit per respondent (and per property due to the representative sample) for each measure tested. To obtain the full benefit per measure, we took the marginal benefit per property and multiplied it by the forecasted number of connections for either water or wastewater in 2027/28 (midway in the period 2025-2030).

To better understand the impact of the respondent data we ran a number of methodologies against the data, including a. by using the full data set, b. removing outliers beyond a number of standard deviations (two and three), c. constraining total valuations to a maximum of 10% of the bill.

We also noted there were a proportion of respondents who answered £0 for every measure, therefore indicating they did not want to pay for any improved service. Approximately 30% of respondents in NW and 20% in ESW that indicated £0 overall potentially reflects the current affordability crisis within the country at the time of survey.

To achieve our marginal benefit data, we utilised the method of using data within two standard deviations of the mean. This gave the following advantages:

- It included all the £0 valuations from customers who did not want to pay for improvements. These were legitimate responses by customers, especially at the time of the ongoing affordability crisis.
- It removed the upper valuations from each measure, where it could be considered the customer had not either understood the exercise or had not potentially read the whole instructions. The range of maximum valuations by measure moved to between £5 and £30 (only one measure at £30).
- This moved the mean valuation for measures below the upper quartile. This was previously above the upper quartile value due to the skew from high upper end values.

Once we had the marginal benefit data, we converted it to an ODI rate using Ofwat's final methodology formula of ODI = Marginal benefit x sharing rate (70%).

We compare our rates from our service valuation research with the Ofwat Final Determinations at PR19 and the comparative willingness to pay review conducted by PJM Economics[57] after PR19.

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[57] PJM Economics – Comparative Review of PR19 WTP results, June 2018.
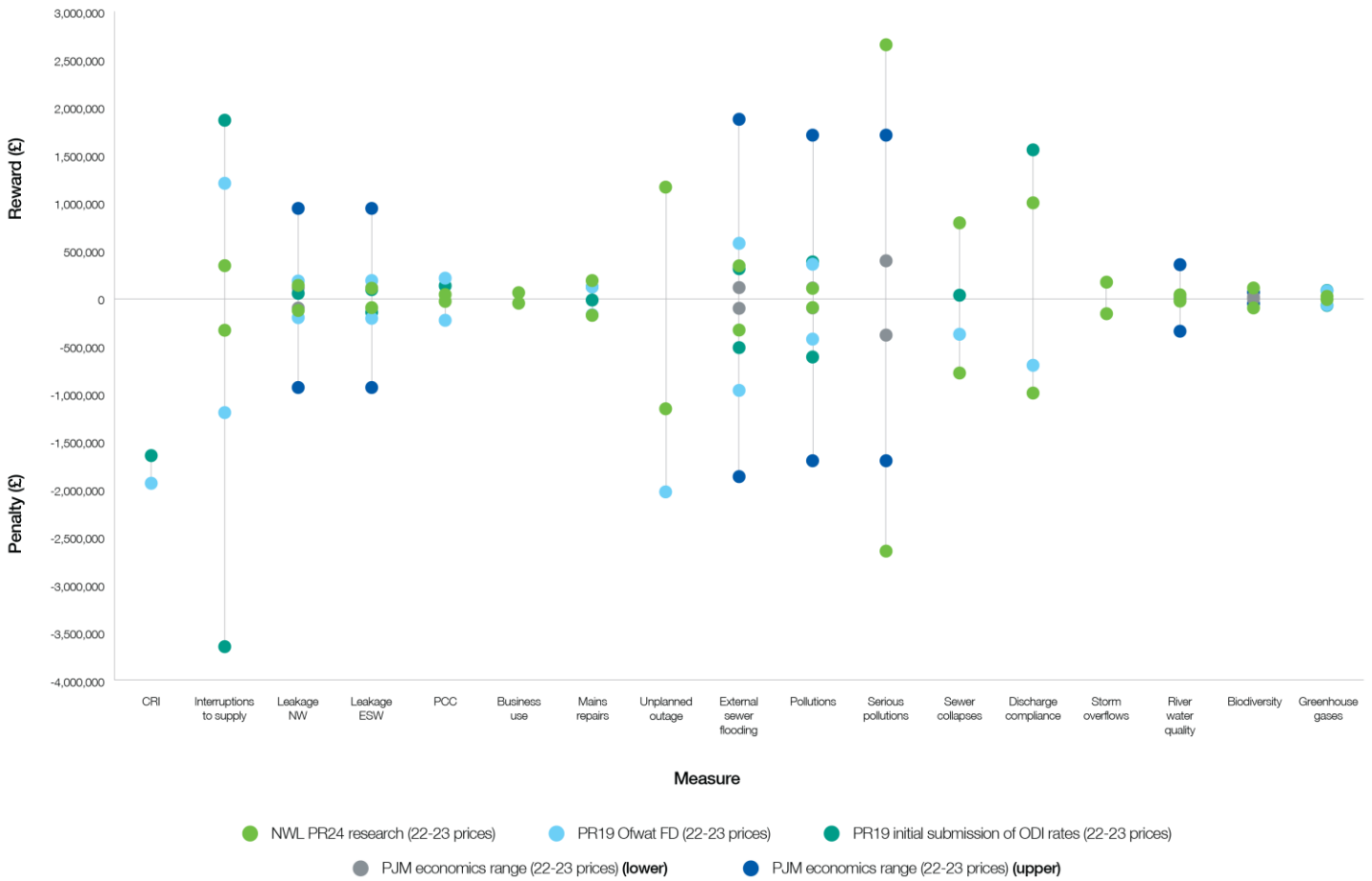
FIGURE 23: VALUATION RESEARCH DATA POINTS
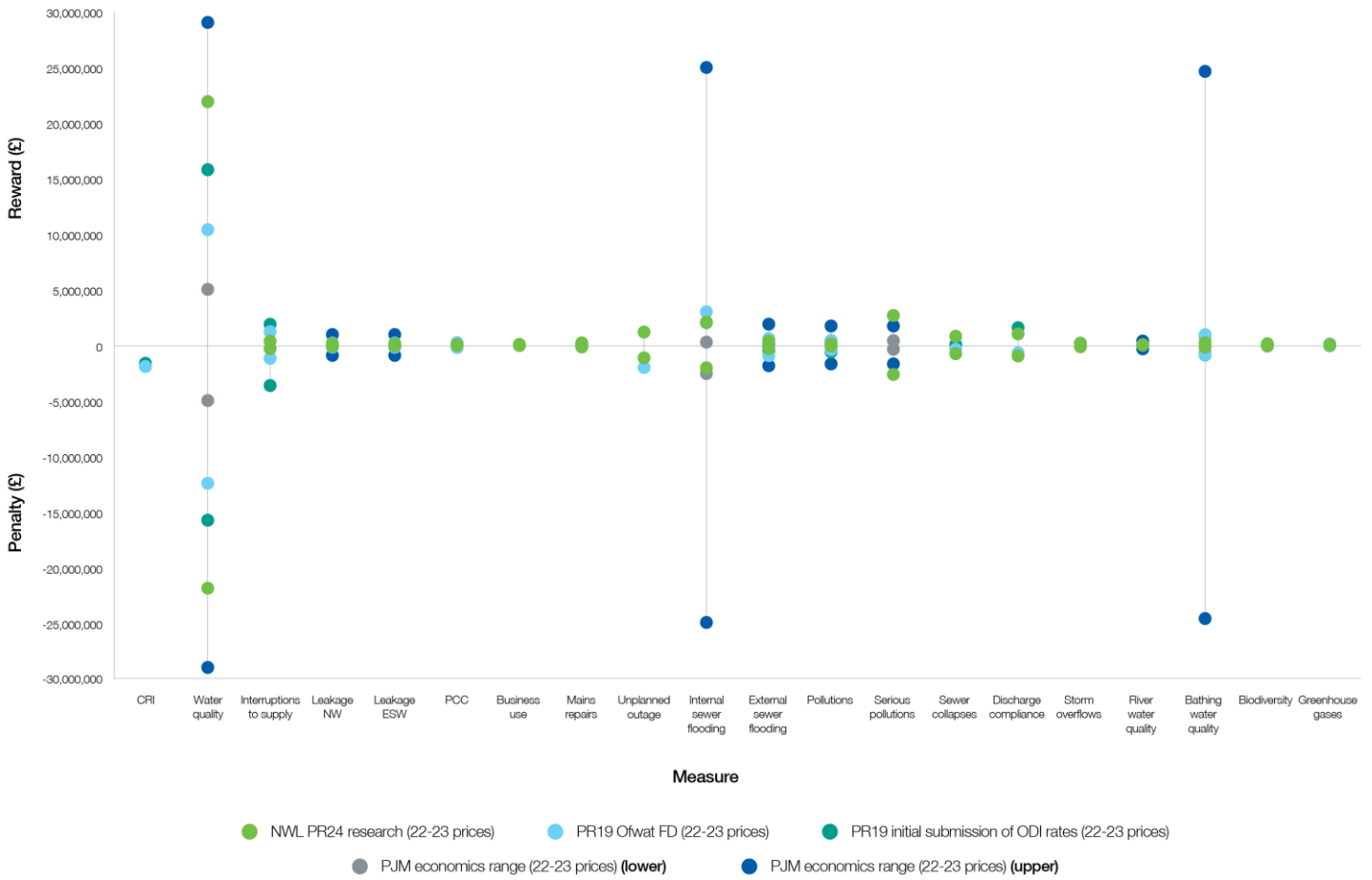
Source: NWL Analysis – ranges developed on analysis of PJM Economics, PR19 FD, PR19 and PR24 NWL Service Valuation Research.

The chart below removes the three large ranges for water quality, internal sewer flooding and bathing water quality so that some of the smaller ranges are more visible.

FIGURE 24: VALUATION RESEARCH DATA POINTS EXCLUDING INTERNAL SEWER FLOODING, BATHING WATERS AND WATER QUALITY


Source: NWL Analysis – ranges developed on analysis of PJM Economics, PR19 FD, PR19 and PR24 NWL Service Valuation Research.

3.1.3. ODI evaluation

We then used the above analysis to create min and max data ranges for each measure, against which we reviewed the proposed Ofwat ODI rates once we had received them.

FIGURE 25: HOW DO OFWAT'S PROPOSED ODIS SIT IN THE MIN AND MAX RANGE
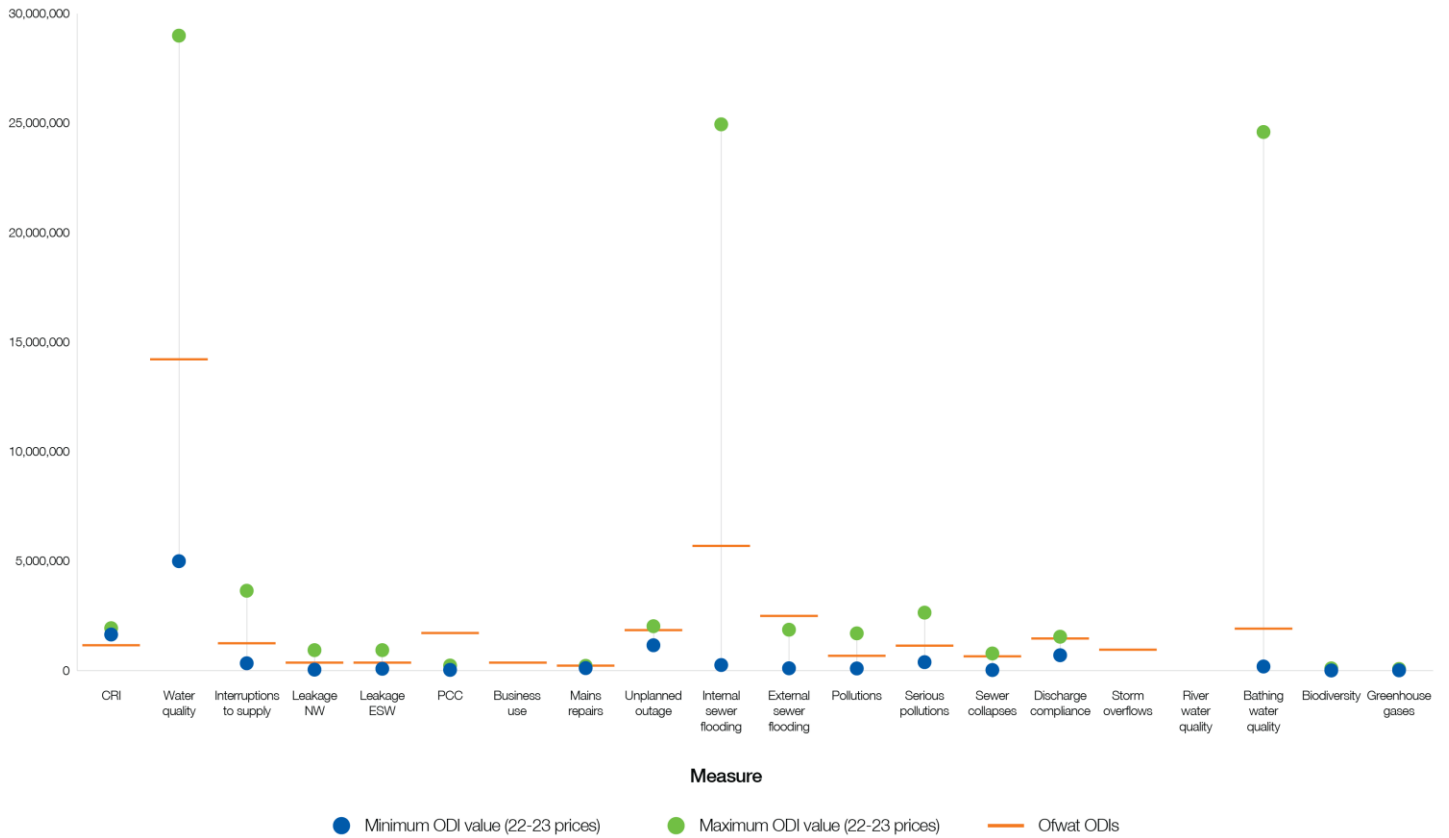
Source: NWL Analysis

From this comparison we note some of Ofwat's ODI rates that sit outside the ranges we have been able to deduce from our own analysis. This suggests that some of Ofwat's proposed ODI rates are outside the customers' willingness to pay. These are highlighted in the charts above; CRI, per capita consumption and external sewer flooding.

As we indicated earlier in this section, despite a small number of Ofwat's proposed ODI rates being outside the range, we have accepted their use, to ensure we are not penalised in thw quality and ambition assessment.

3.1.4. Package evaluation

Ofwat outlines within its methodology that it expects the value at stake across the whole ODI package to be between plus or minus 1% to 3% of regulated equity[58] (RORE).

However, as the value at stake is largely a function of the ODI rates (provided by Ofwat) and the likely performance range for each metric, the scope to make adjustments to the range is limited.

To determine the likely RoRE range associated with our package of common measures, targets (note where applicable enhanced targets were used as opposed to base) and proposed ODI rates, we modelled maximum upside and downside (ODI) performance and the probability of different financial outcomes (ODI RORE) from our package using a scenario analysis, in this instance a Monte Carlo analysis. In determining our expected P10 and P90 performance, we undertook an assessment across the business to understand the levels of performance at the 10th and 90th percentile including considering historical performance but also how we have improved, we reviewed these against the expect PCLs. Whilst this approach involves a greater degree of judgement we consider it is likely to deliver a more reasonable range than a simple observation of historical NWL performance (and for example assuming the worst ever performance was p0 and the best ever p100). For example, this approach allows us to reflect improving performance in the recent past in areas like sewer flooding where we assume that we wont revert back to the levels we were seeing 4-5 years ago. Indeed, if anything we consider our analysis to be optimistic.

These values were then applied in a Monte Carlo simulation model. The full range of our assessed P10 and P90 performance and the trimmed range from our Monte Carlo analysis can be found in simulation four.

In our assessment, we included the core common measures within the package. However, given time constraints, the timing of methodological guidance and availability of data such as ODI rates from Ofwat, we were unable to include a small number of measures within the Monte Carlo; these included: biodiversity (no ODI rate), operational greenhouse gases (no ODI rate), business demand and river water quality.

Also note that individual simulations below are individual runs of the model which although build on top of each other in relation to adding or removing data from the models, are re-run using another set of performance scenarios by the models.

Simulation 1 – RORE related to PCLs set and applying Ofwat's proposed ODIs.

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[58] Ofwat Methodology – Appendix 8 Outcome Delivery Incentives, page 57. **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf.**

We used 10,000 scenarios within the Monte Carlo analysis, using the targets and deadlands proposed in Section **3.2.3** and Ofwat's proposed ODI rates. We do not include any caps or collars within this simulation, except for the natural cap where performance achieves a mathematical maximum (for example 100% compliance).

Using this simulation, across the AMP indicates a full AMP range from -3.2% (-£474m) to +2.6% (£384m), showing a skew towards penalties.

FIGURE 26: MONTE CARLO RANGE FOR SIMULATION 1

	AMP £m	AMP % RORE
Min £m	-473.98	-3.23%
1st percentile	-270.80	-1.85%
2nd Percentile	-236.30	-1.61%
3rd Percentile	-217.06	-1.48%
4th Percentile	-203.70	-1.39%
5th Percentile	-192.40	-1.31%
50th Percentile	-3.95	-0.03%
95th Percentile	184.06	1.25%
96th Percentile	195.14	1.33%
97th Percentile	209.49	1.43%
98th Percentile	228.45	1.56%
99th Percentile	256.34	1.75%
Max £m	383.77	2.62%

Source: NWL Monte Carlo Analysis

Simulation 2: RORE related PCLs set, removes all deadbands and applying Ofwat's proposed ODIs

This scenario replicates the above simulation, with the except that we remove deadbands associated with CRI, discharge compliance and serious pollutions. We note that removing these deadbands indicates pushes the P50 further negative. However they have a relatively low impact on the extremes of the scenario.

FIGURE 27: MONTE CARLO RANGE FOR SIMULATION 2

	AMP £m	AMP % RORE
Min £m	-471.99	-3.22%
1st percentile	-278.03	-1.90%
2nd Percentile	-243.22	-1.66%
3rd Percentile	-224.54	-1.53%
4th Percentile	-210.35	-1.43%
5th Percentile	-198.92	-1.36%
50th Percentile	-11.41	-0.08%
95th Percentile	175.19	1.19%
96th Percentile	187.63	1.28%
97th Percentile	203.21	1.39%

98th Percentile	221.88	1.51%
99th Percentile	248.89	1.70%
Max £m	398.74	2.72%

Source: NWL Monte Carlo Analysis

Simulation 3 – RORE related to PCLs set and applying Ofwat's proposed ODIs with caps and collars

Ofwat has indicated that even though the primary method to manage ODI risk is at the aggregate level[59], they may make targeted use of caps and collars on a small number of performance commitments[60], where:

- Commitments are new or bespoke.
- Benefits from high outperformance are uncertain, to protect customers and avoid over-incentivising companies.
- Have the potential to be a significant source of skew in the outcomes package.

Under this methodology, Ofwat has proposed to include the following caps and collars on common commitments[61]:

- Water supply interruptions (collar only) – a collar of 0.5% RORE as a minimum (we applied a 0.5% RORE collar in the model).
- Biodiversity – expected range -0.5% to 0.5% RORE.
- Operational greenhouse gas emissions – expected range -0.5% to 0.5% RORE.
- Bathing water quality – expected range -0.5% to 0.5% RORE.
- River water quality – expected range -0.5% to 0.5% RORE.
- Storm overflows – expected range -0.5% to 0.5% RORE.
- Asset Health measure – mains repairs, sewer collapses and unplanned outage – per measure 0.25% RORE cap and a collar of -0.5%.

In simulation 3, we applied the caps and collars to those measures included in our model (detailed earlier in this section).

We did not include river water quality, biodiversity, business demand or greenhouse gases caps or collars as indicated in Ofwat's methodology due to the lack of information available at the time.

Using this simulation, across the AMP indicates a full AMP range from -2.9% (-£425m) to +2.7% (£397m), showing a skew towards penalties.

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[59] Ofwat Appendix 8 Outcome Delivery Incentives – page 61, **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf.**
[60] Ofwat Appendix 8 Outcome Delivery Incentives – page 62, **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf.**
[61] Ofwat Appendix 8 Outcome Delivery Incentives – page 63-66, **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf.**

FIGURE 28: MONTE CARLO RANGE FOR SIMULATION 3

	AMP £m	AMP % RORE
Min £m	-424.75	-2.90%
1st percentile	-275.73	-1.88%
2nd Percentile	-242.55	-1.65%
3rd Percentile	-222.81	-1.52%
4th Percentile	-207.60	-1.42%
5th Percentile	-195.29	-1.33%
50th Percentile	-6.52	-0.04%
95th Percentile	179.21	1.22%
96th Percentile	191.84	1.31%
97th Percentile	205.96	1.40%
98th Percentile	223.03	1.52%
99th Percentile	257.19	1.75%
Max £m	397.11	2.71%

Source: NWL Monte Carlo Analysis

Simulation 4 – NWL targets, NWL expected P10 and P90 scenarios and applying Ofwat's proposed PCLs

In this simulation we apply our performance expectations of P10 and P90 to scenario 1. In determining our expected P10 and P90 performance, we undertook an assessment across the business to understand the levels of performance at the 10th and 90th percentile, reviewed these against the expect PCLs. We also include the relevant deadbands against our CRI, discharge compliance and serious pollutions measure. As noted earlier, given the time constraints and availability of data, we were unable to include the following measures; biodiversity (no ODI rate), operational greenhouse gases (no ODI rate), business demand and river water quality. We indicate the P10 and P90 performance scenarios:

FIGURE 29: P10 AND P90 PERFORMANCE SCENARIOS

	Performance									
	P10					P90				
Measure	2025/26	2026/27	2027/28	2028/29	2029/30	2025/26	2026/27	2027/28	2028/29	2029/30
Internal sewer flooding	1.89	1.89	1.89	1.89	1.89	1.22	1.2	1.18	1.17	1.15
External sewer flooding	22.72	23.97	25.3	26.7	28.19	20.15	18.85	17.64	16.51	15.46
Pollutions (all)	20.88	22.06	24.48	27.11	29.97	12.22	11.44	10.66	9.88	9.1
Serious pollutions	3	3	3	4	4	0	0	0	0	0
Sewer collapses	8.36	8.6	8.85	9.1	9.36	7.87	7.63	7.39	7.16	6.94
Discharge compliance	96	96	96	96	96	99	99	99	99	99
CRI	6.29	6.18	6.07	5.96	5.85	2.19	2.08	1.97	1.86	1.75
Water Quality Contacts	1.1	1.09	1.08	1.08	1.04	0.9	0.89	0.88	0.88	0.85

Interruptions to Supply	10	10	10	10	10	3	3	3	3	3
Mains Repairs	135.74	135.74	135.74	135.74	135.74	111.06	111.06	111.06	111.06	111.06
Leakage NW	126.8	124	121.9	119.9	117.8	103.8	101.4	99.7	98.1	96.4
Leakage ESW	59.8	58.5	58	57.4	56.8	49	47.9	47.4	47	46.4
Unplanned Outage	5.52	5.52	5.24	5.19	5.19	3.74	3.74	3.46	3.41	3.41
Per Capita Consumption	149	146.8	144.2	142.3	140.6	148	144	140.3	137.1	134.2
Storm Overflows	25	24.06	23.13	22.2	21.26	19	18.5	18	17	16
Bathing Water Quality	74.51	74.51	75.41	76.32	85.51	82.55	82.55	83.55	84.58	89.7

Source: NWL analysis

Applying the ODI rates defined by Ofwat, we obtained the following expected range of P10 and P90 financial penalties and rewards. (please note due to the timing of analysis there may have been some very small changes to the PCLs that will have a very small adjustment to these figures).

FIGURE 30: FINANCIAL ODIS APPLIED TO THE P10 AND P90 PERFORMANCE SCENARIOS.

Measure	ODI £m										P10 Total	P90 Total
	P10					P90						
	2025/26	2026/27	2027/28	2028/29	2029/30	2025/26	2026/27	2027/28	2028/29	2029/30		
Internal sewer flooding	-3.820	-3.934	-3.934	-3.991	-4.048	0.000	0.000	0.114	0.114	0.171	-19.725	0.399
External sewer flooding	-6.227	-12.224	-18.272	-24.321	-30.471	0.332	0.842	1.276	1.684	2.016	-91.515	6.150
Pollutions (all)	-1.292	-2.999	-5.549	-8.473	-11.322	4.597	4.223	3.849	3.244	2.870	-29.634	18.782
Serious pollutions	-3.414	-3.414	-3.414	-4.552	-4.552	0.000	0.000	0.000	0.000	0.000	-19.346	0.000
Sewer collapses	-0.288	-0.582	-0.883	-1.177	-1.465	0.033	0.052	0.072	0.092	0.118	-4.395	0.366
Discharge compliance	-4.437	-4.437	-4.437	-4.437	-4.437	0.000	0.000	0.000	0.000	0.000	-22.185	0.000
CRI	-5.561	-5.433	-5.306	-5.178	-5.050	-0.801	-0.673	-0.546	-0.418	-0.290	-26.529	-2.728
Water Quality Contacts	-0.467	-0.467	-0.467	-0.583	-0.583	1.867	1.867	1.867	1.750	1.633	-2.567	8.983
Interruptions to Supply	-6.396	-6.645	-6.955	-7.142	-7.390	2.298	2.049	1.739	1.553	1.304	-34.528	8.942
Mains Repairs	-2.851	-2.851	-2.851	-2.851	-2.851	2.851	2.851	2.851	2.851	2.851	-14.253	14.253
Leakage NW	-4.198	-4.125	-4.052	-3.979	-3.906	4.198	4.125	4.052	3.979	3.906	-20.258	20.258
Leakage ESW	-1.971	-1.935	-1.935	-1.898	-1.898	1.971	1.935	1.935	1.898	1.898	-9.636	9.636
Unplanned Outage	-1.655	-1.655	-1.655	-1.655	-1.655	1.655	1.655	1.655	1.655	1.655	-8.273	8.273
Per Capita Consumption	-1.203	-3.436	-4.810	-6.528	-7.903	0.515	1.374	1.890	2.405	3.092	-23.880	9.277
Storm Overflows	-5.251	-5.050	-4.858	-4.666	-4.464	0.509	0.288	0.067	0.326	0.586	-24.288	1.776
Bathing Water Quality	-10.777	-10.777	-10.911	-11.084	-2.978	4.668	4.668	4.726	4.783	5.071	-46.527	23.916
Total	-59.806	-69.961	-80.287	-92.513	-94.971	24.690	25.254	25.544	25.914	26.880	-397.537	128.283

Source: NWL Analysis.

We apply the caps and collars at the P10 and P90 positions. We compare this value to the full value of ODIs that would be earned if the performance against each measure reached the full P10 or P90 position. (note values below do not account for tax – and therefore differ to the values in our risk and return appendix).

FIGURE 31: MONTE CARLO RANGE FOR SIMULATION 4

	NWL assessed P10	Monte Carlo	Trim rate	P50	NWL assessed P90	Monte Carlo	Trim rate
Value	-£397.53m	-£125.62m	68.4%	-£40.851m	£128.29m	£31.30m	75.6%
% RORE	-2.71%	-0.86%		-0.28%	0.87%	0.21%	

Source: NWL Monte Carlo Analysis.

In all cases of the Monte Carlo, there was a greater downside risk of penalties than the upside rewards. This is more clearly shown in the expected P10 and P90s built by us which show a realistic range of performance across the next AMP.

3.1.5. ODI Outcomes

At this stage we will apply the Ofwat ODI rates to our measures for PR24 primarily due to the requirement in Ofwat's Methodology which outlines the potential for receiving a 30-basis point reduction in their allowed return to equity investors[62]. However, we may need to review our assessment at the Draft Determination, when we are able to review the updated rates from Ofwat[63].

3.1.6. Caps and Collars

We agree with the CMA[64] that caps, collars can serve a useful function as part of the design of effective ODIs: (a) Caps provide protection for customers from increased bills, and also mitigate the risk that a company's objectives could be distorted by the opportunity to outperform on particular ODIs. (b) Collars mitigate the risk that underperformance on one PC (which could arise for various reasons, potentially including ones outside the control of the company) could lead to extreme penalty levels for firms.

We agree with Ofwat's methodology to apply caps and collars where measures are:

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[62] Ofwat Final Methodology – Quality and Ambition pp158,161 - **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_main_document.pdf.**

[63] Ofwat Outcomes Working Group 29 June 2023 – ODIs will be updated once new RCV figures etc available.

[64] See: **https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf** pp.631-

- That are new or bespoke and therefore more uncertain.

- Where the benefits from high outperformance are uncertain, to protect customers and avoid over-incentivising companies.

- That have the potential to be a significant source of skew in the outcomes package[65].

These principles indicate we would expect to see caps and collars on the following measures, as per Ofwat's guidance[66]:

- Water supply interruptions (collar only).

- Biodiversity.

- Business demand.

- Operational greenhouse gases.

- Bathing water quality.

- River water quality.

- Storm overflows.

- Asset health measures including mains repairs, unplanned outage and sewer collapses.

We would suggest applying the values of RORE that take account of the overall customer prioritisation for each measure.

3.1.7. Enhanced Incentives

Ofwat operates a comparative regulatory regime where 'catch-up' challenge can have a material benefit to the generality of customers across England and Wales. For example NWL was the benchmark company for wastewater at PR19, because we were efficient and able to deliver the PR19 settlement for less than the allowed costs Ofwat was able to apply NWL as the efficiency benchmark to other companies across the sector saving customers more than £400m[67]. This demonstrates the enormous benefit that can arise from pushing forward the frontier levels of performance and this is similarly true for service levels. We have therefore always supported the role for enhanced incentives which can provide additional benefits to companies that are able to improve the benchmark for service performance across the sector.

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[65]**https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf**, page 62.
[66]**https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf**, page 63.
[67]See: **https://assets.publishing.service.gov.uk/media/5e8dc5f886650c18d05f7f30/NWL_PR19_Statement_of_Case_2.4.2020_PDF.pdf section 2.6.3**, pp22-23.

For PR24 Ofwat has proposed that enhanced incentive rates should be available for companies where those companies deliver performance that is at least as good as the best levels of performance ever achieved in the past. They have also proposed that incentive rates should be set at double the levels of the general incentive rates, which are already high-powered. Ofwat has been clear that companies need to use their centrally set incentive package or face the potential for a 30 basis point penalty on the allowed cost of equity. Given this policy position, we reviewed the best in industry performance to consider enhanced performance thresholds and include the thresholds set out in Figure 32 below in our business plan.

FIGURE 32: BEST PERFORMANCE ACROSS THE INDUSTRY

Measure	Unit	Performance	Year
Water supply interruptions	HH:MM:SS	00:01:23	2019/20 (SES)
Internal sewer flooding	Per 10,000 connections	0.76	2021/22 (SWB)
External sewer flooding	Per 10,000 connections	7.03	2018/19 (TMS)
Leakage	Per litre / property / day	65.6	2021/22 (BRL)
Per capita consumption	Litres/ person / day	126.2	2017/18 (SRN)
Total pollution incidents	Per 10,000km of wastewater network	12.32	2018/19 (NES)

Source: Ofwat Historical Data set updated 4 April 2023, and our analysis for leakage conversion

While we have used these enhanced incentive rates in the business plan, we do not consider that they will provide much of an incentive for companies to drive improvements in performance. On reviewing the historical data, any company achieving these frontier performance positions have been unable to maintain the performance year-on-year.

- SES water achieved 1 minute 23 for interruptions to supply over three hours in 2019/20, however in the years surround this achievement, performance was 16 mins 59 and 7 minutes 22.

- Thames Water achieved 7.03 external flooding incidents per 10,000 connections in 2018/19, however since this time it has risen to 9.21 in 2019/20 (12.32 in 2020/21 and 9.45 in 2021/22)

- Likewise, our pollution performance, went from our best in 2018/19 or 12.32 to 15.32 in 2019/20.

These examples highlight how service performance can be impacted significantly by a range of factors that are entirely outside of the control of companies. Suggesting that the best levels of service performance ever achieved are likely to be too stretching a benchmark against which to set incentives. We note in this context that:

- Ofwat, the CMA and other regulators do not set cost efficiency benchmarks at the level of the 'frontier' company. Instead they recognise that any comparative benchmarking data is imperfect and it is difficult to isolate completely inefficiency from other factors outside of management control. Instead that PR19 the CMA set the 'catch-up' efficiency challenge at the level of the upper quartile company recognise this.

- Ofwat and the CMA have in the past provided 'enhancement' funding to deliver service improvements for some companies whose performance was in the top quartile of companies across the sector. This recognised that those companies were already operating close to the sector frontier in service performance and hence additional investment would likely be required to deliver service improvements. Again, Ofwat and the CMA did not set the benchmark at the frontier company recognising how these comparisons can be imperfect and driven by other factors.

We also recognise that Ofwat has proposed that enhanced incentives could be set at double the levels of the general incentive rates. As we highlight elsewhere in this document (see Figure 24) these general incentives are already high powered and in some cases above what we consider customers would likely be willing to pay for improvements. While we totally agree that the incentive rates should be higher than the general incentive rates to reflect the higher marginal costs of improvement at the frontier they do appear to us to be very high. We have also previously highlighted to Ofwat the risk that incentive rates are set higher than customers' willingness to pay for improvement, incentivising inefficient behaviour.

Whilst we have therefore used these enhanced incentive rates at these levels we remain of the view that as set out they will provide little practical and relevant incentive even for a company like NWL which could reasonably push the service performance frontier out in some areas. This is because the levels at which they will apply are so high that there is no reasonable prospect of targeting that level of performance in any of our service delivery strategies or tactical plans. At the same time the incentive rates don't need to be so high and could reasonably be lower. We remain of the view that a recalibration of these enhanced incentives would make them far more effective and have instead proposed a small and targeted list of enhancement cases to improve service performance in certain areas.

Incentive Sharing Rates

Our plan assumes that the aggregate caps and collars apply to ODI incentives beyond 3% +/- RoRE with sharing rates as per the PR24 methodology.

ANNEX: DETAILED MEASURE BY MEASURE REPRESENTATION
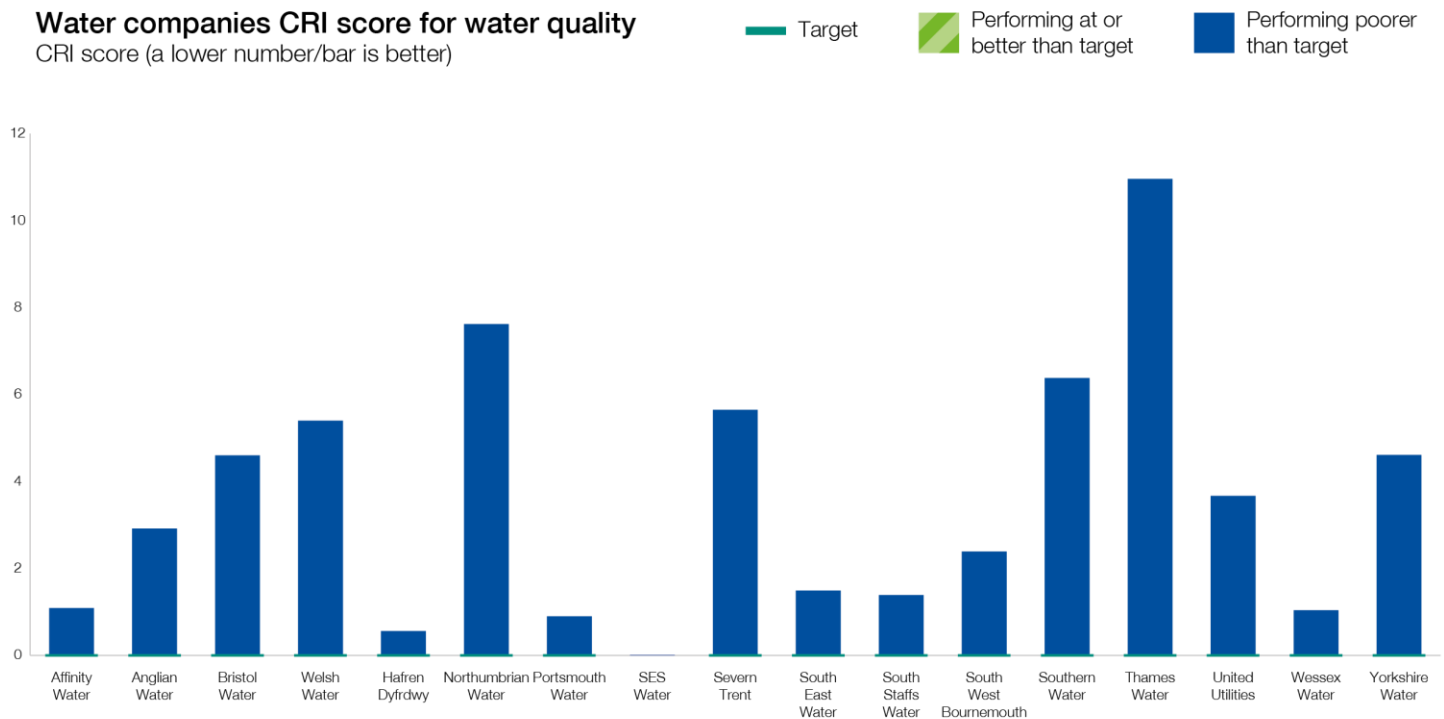
CRI (WATER QUALITY Compliance)

DEFINITION

As per the Ofwat[68] and DWI definition[69].

CURRENT PERFORMANCE ASSESSMENT

The commitment for all companies is set at 0, with a deadband set a 2. Four companies appealed their final determinations to the CMA, including ourselves, and the CMA reduced the deadband to 1.5 by 2024/25. In 2022/23 we achieved a performance of 7.62, which is the worst performance of this AMP to date We acknowledge have a long way to go to achieve the deadband of 1.5 by the end of the AMP. We currently rank sixteenth in the industry and incurred at £8.5m penalty as a result of our performance in 2022/23.

FIGURE 33: 2022/23 CRI SCORES ACROSS THE INDUSTRY

Water companies CRI score for water quality
CRI score (a lower number/bar is better)

— Target | Performing at or better than target | Performing poorer than target

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[68] https://www.ofwat.gov.uk/publication/cri-pc-definition/.
[69] https://www.ofwat.gov.uk/publication/dwi-compliance-risk-index-cri-definition/.

Source: Industry APR data for 2022/23.

The 'Compliance Risk Index' (CRI) score stands out as an area of poor performance for the company and has attracted a large financial penalty. The large transformation programme that we are working on with the Drinking Water Inspectorate (DWI) to improve the CRI scores is a long-term one.

For 2022 most of our CRI score is derived from compliance failures in our North East operational area while in 2021 it was primarily the Essex and Suffolk area. When a failure occurs at an asset or in a supply area that is subject to an agreed programme of work with the Drinking Water Inspectorate (DWI), the DWI's compliance assessment will increase the associated CRI score. In 2022, this effect increased the CRI total by 2.27 units.

The biggest impact on CRI for 2022 was a bacteriological failure from a water treatment works in the Teesside area, which accounted for 1.431 units. This represents more than 15% of the final figure. No definitive cause could be identified however, the condition of the superstructure which houses the filter gallery, contact tanks and flash mixer is known to be in very poor condition. Some parts of the asset cannot be accessed to carry out inspection.

A sampling campaign at the time of the failure demonstrated that the result was confined to the treatment works and had no impact on customer supplies or public health.

There have been fifteen service reservoir (SR) failures in 2022. These were all in the North East region apart from one failure in Essex and Suffolk. This is a deterioration in performance compared to 2021. In the last 12 months, we have completed the full replacement of a treatment site in Wooler, which will provide more reliable supplies and meet future drinking water standards. Following on from this is the new treatment works at Horsley which (alongside the existing site) supplies a large proportion of Tyneside. This new works is partially in supply, and we expect completion in 2024.

CURRENT AMP ACTIONS

Our ongoing and future actions are linked to the DWI transformation programme. This followed a detailed hazard review to identify a series of actions and associated timescales which we are meeting and following in line with our DWI commitments.

The replacement of three sites in Northumberland was completed in 2022 along with the completion of the installation of UV treatment at two works supplying the Durham and Wearside areas. We are continuing with the enhanced programme of treated water storage tank inspections to mitigate some of the risks identified at these sites, alongside a risk review of treatment processes.

We are continuing to prioritise our efforts around water treatment where CRI risk is highest, and areas of focus include filter media refurbishment, carbon regeneration, and water quality minor works activities such as on-line monitoring capability to increase resilience and control of the treatment processes.

The journey of water from treatment through to customer tap is important, and in our networks, we are continuing with the enhanced service reservoir maintenance programme, inspecting and (where applicable) repairing a higher number of tanks per annum to maintain the integrity of these assets and minimise any water quality risks. We are using a combination of physical assessment and technologies such as Remote Operating Vehicles (ROVs).

We are continuing with smart network innovation to allow real time operational decisions to be made on the quality of water being supplied through our networks and so improve the customer experience.

FIGURE 34: ONGOING ACTIONS TO TACKLE WATER QUALITY COMPLIANCE

Action	Description	Target Date
Deliver five-year tactical plan for CRI	• Five treatment sites in Northumberland were replaced in 2022 along with UV treatment being installed at two water treatment works (WTWs) supplying the Durham and Wearside areas. • An extensive programme of inspections and work at treated water storage tanks is preventing some of the risks identified at these sites, alongside a thorough risk and hazard review (HazRev) of all treatment processes to improve condition, capability and resilience. • As we prioritise our efforts around water treatment our areas of focus include filtration, carbon regeneration, and water quality activities such as on-line monitoring to control the treatment processes. We are also trialling an innovative smart network in the Tees area of supply, which we believe will be the largest implementation of a water quality sensor network in Europe. Monitors are being installed at both service reservoirs and District Metered Areas to help create insight in how the network influences water quality and the CRI measure, and to signpost positive interventions around operational management, asset maintenance and cost efficiency, all with the aim of improving the customer experience. • We will continue to work with customers on tap hygiene and cross contamination in the home, and the replacement of lead pipes where necessary.	31/03/2025
Deliver enhancement schemes at Layer and Mosswood WTWs	• We are investing in new treatment equipment at these sites to respond to changes in the quality of the raw water (from rivers and reservoirs) that these sites have to treat.	Layer March 2025, Mosswood March 2024

Source: NWL (Our) Performance Action Plans 27 January 2023 / APR 2022/23.

Our CRI response is investment intensive, and performance will take time to respond during the AMP.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

Regulatory target

Ofwat's PR24 methodology sets out the requirement for 100% compliance against this measure.

Customer research

A triangulation of our customer research bank indicated that CRI was considered a high priority. Ofwat's own research triangulation agrees with our assessment.

We also noted in our Service Valuation research that our customers were telling us in the majority that they did not want to pay for improvements to service[70].

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight and prioritisation of common PCs documents, see Appendix A7 - **Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

We have reviewed the historic performance, both for ourselves and the industry from the Ofwat and industry collaborative dataset to extrapolate performance into the future and mapped this against our proposed long-term target.

However, the limited information we have against the CRI measure provides very little ability to predict future performance. The historic UQ since 2017/18, shown below has been volatile to date, all be it at level lower than the current deadband of 2 for most companies (between 0.52 and 1.78).

Based on DWI and PR19, the target for CRI is 0. Currently most companies have a deadband of 2 to 2024/25, with a small number of companies including ourselves, set at 1.5 for the rest of the AMP (from 2022/23).

The chart below shows the upper quartile company performance has breached our current deadband of 1.5 twice in the last five years.

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[70] Our Copperleaf Research Results – see PR24 Resaearch Library. **Research library (nwg.co.uk).**

FIGURE 35: CRI HISTORIC UQ PERFORMANCE AND AMP7 DEADBAND (FOR NWL)

Water Quality Compliance - Industry Score (Lower number better)
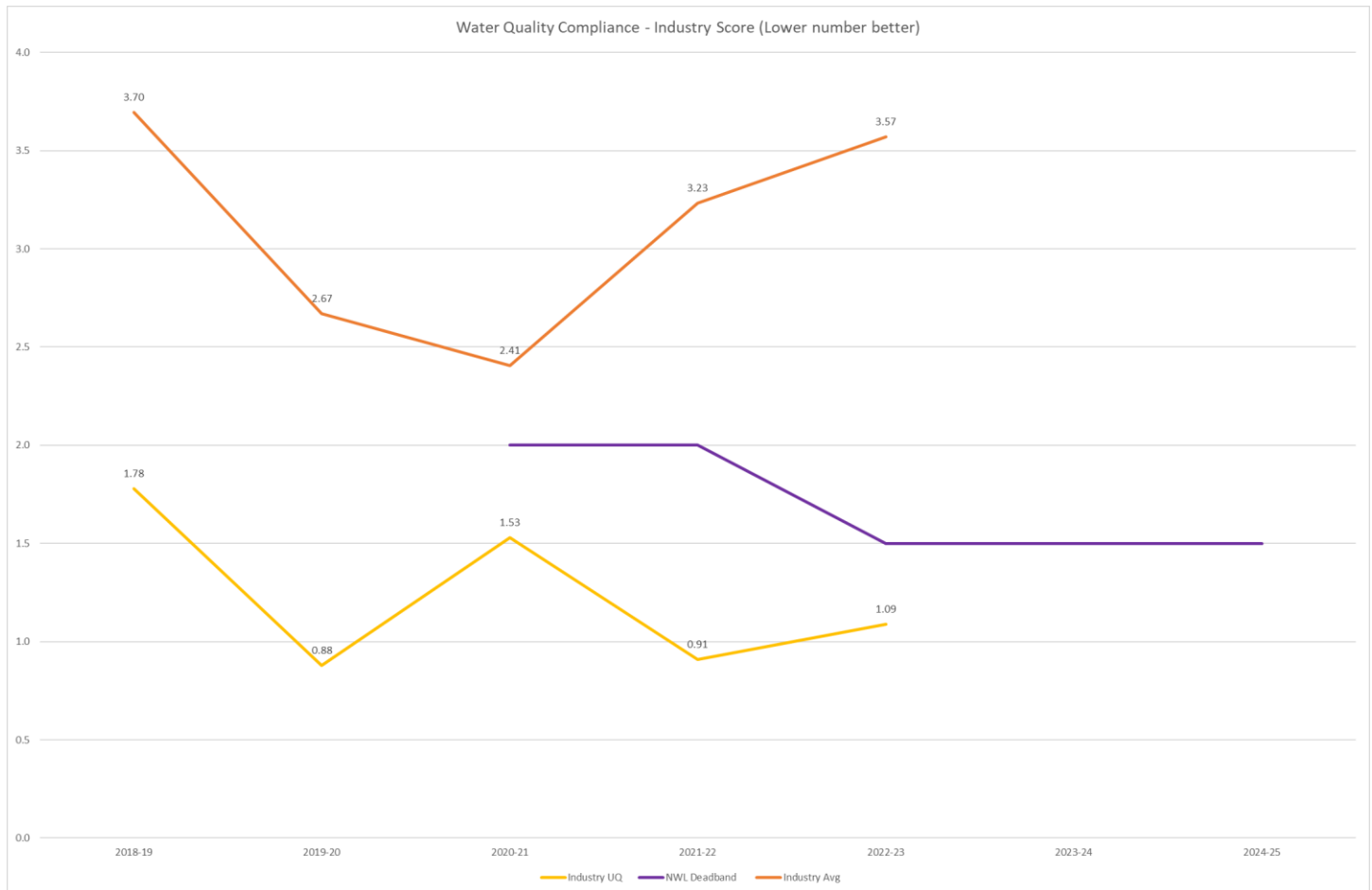
Source: NWL Analysis

An average UQ performance over the last five years is 1.12 (average at 2.98).

The PR19 deadband was set around likely performance of 2.0 CRI Units and then reviewed down to 1.5 CRI units by the CMA process. For PR24, the Ofwat PR24 Final Methodology – Appendix 8 states:

'We will set a deadband on the compliance risk index that reflects the historic level of failures caused by customers' internal fittings. We will work with the Drinking Water Inspectorate and set the level of the deadband in our draft and final determinations based on the latest available data. We would expect to see an improving profile over the 2025-30 period.

This helps to mitigate the risk that the deadband could embed the current level of failures caused by customer-side failures, even if they reduce over time.'[71]

We have looked at national figures for 2020 and 2021 and estimated a potential lower deadband of 0.2 CRI Units. There is a potential upper deadband figure of 1.2 CRI units depending upon the parameters seen as failing due to customer plumbing issues. These figures will alter as new results become available to the draft and final determination process.

For CRI we propose to set a deadband at 1.5, a deadband in this area is justified because:

- The DWI accepts that achieving 0 CRI risk is not possible and while we are investing heavily and seeking to improve performance and reduce CRI risk achieving a score of 0 is not feasible. In 2022 no company achieved a CRI score of 0 with an average industry CRI score of over 5[72].

- A dead-band set at this level is less than the dead-band set by Ofwat at PR19 (which was set at 2) [and consistent with the deadband that the DWI consider is appropriate].

- The CRI is a penalty-only incentive and without a dead-band the incentive will certainly introduce downward asymmetry into the risk reward balance which would need to be corrected either by offering a less stretching package of service targets or by raising the allowed return.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

Assessment

We propose to set our target based on Ofwat's and the DWI's requirement of a score of 0 annually. As we have already set out above, we propose a deadband of 1.5.

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[71] Page 71 - **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf**.

[72] See: **https://www.dwi.gov.uk/water-companies/compliance-risk-index-england-and-wales/.**

While we set this target of 0, in reality we are aware of our current situation and as we outline we are working hard to remove our DWI notices and reduce our CRI score. However, this will take time. We have outlined below the performance we expect forecast to achieve across AMP8 from our base totex and that of our enhancement programme (Hazrev).

FIGURE 36: CRI PCL TARGETS

Targets for reducing the CRI score for water quality
CRI score (a lower number/bar is better)
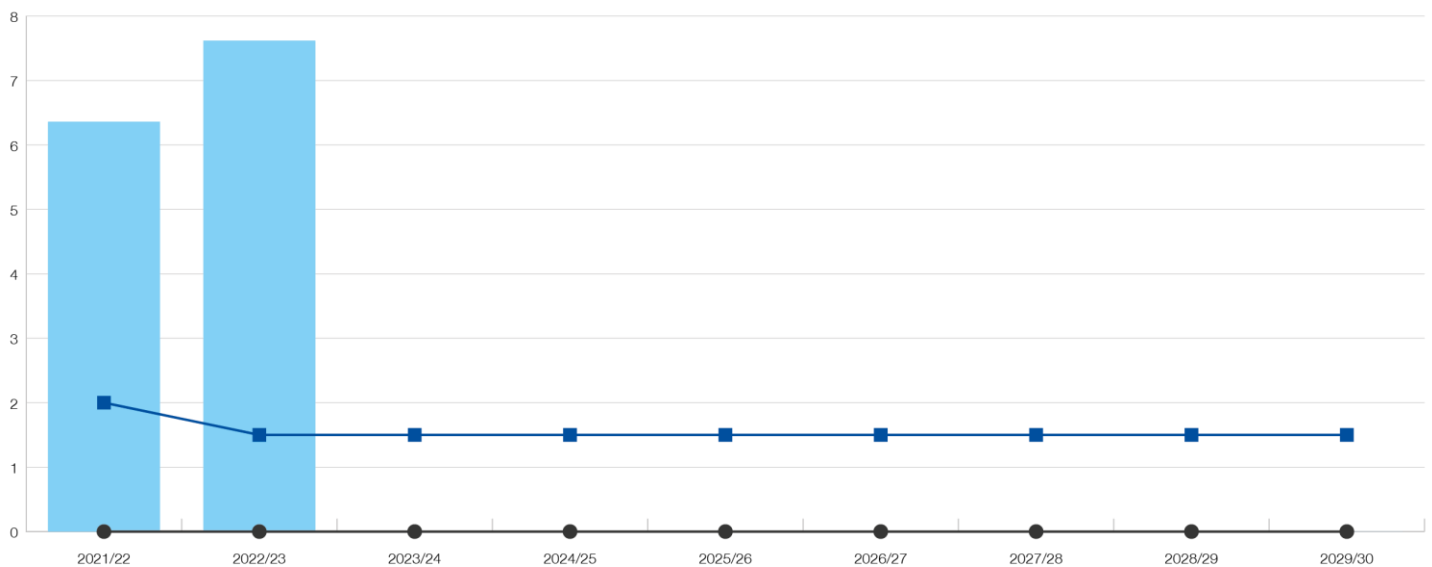
	2025/26	2026/27	2027/28	2028/29	2029/30
Expected performance (base)	4.24	4.14	4.03	3.93	3.82
PCL (enhancement)	4.24	4.14	4.03	3.93	3.72
PCL	0	0	0	0	0
Deadband	1.5	1.5	1.5	1.5	1.5

We know improving our performance against CRI will take time, but we are committed to improving our performance through to 2029/30.

WHAT IS OUR PLAN TO ACHIEVE THE PCL

We are working across our whole water business to improve our CRI scores. However, there are particular areas where we are focusing work:

- WTWs bacteriological failures – Prioritised work under the DWI notice at all high risk final water and chlorine contact tanks.
- New WTWs – New WTWs at Fowberry, Murton, Byrness, Rochester and Otterburn have all come online since PR19.
- WTWs Hazard Reviews (HAZREVs) – A detailed investigation of all of our WTWs to highlight and manage risks to water quality better.
- WTWs documentation review – The processes and procedure that improve routine maintenance and the event management of unexpected events better and smoother.
- Strategic network replacement – We are replacing many kilometres of larger diameter mains within one of our highest risk, for customer contact, water systems, Teesside.
- Water supply network flushing – We continue to refine and extend our distribution system flushing, targeting some CRI risks as well as customer contact reduction.
- Investigation of a smarter water network – We are working with Siemens on an industry leading project to develop insights into what a smarter, water quality monitored network brings us. This is funded under the Ofwat innovation fund.
- We also obtain a small improvement in year five of the AMP from our resilience enhancement business case.

Emerging risk variability

The measure continues to be volatile with one or two sample failures having the capability to consume the deadband and push companies into penalty, this was the case for six water companies in 2021. The sector average performance in 2021 was more than three units. The number of sites that are tested as part of the regulations and over a wide range of parameters means there is wide variability in this measure. We do accept the need to control our failure risks better and as such are working with the DWI under their transformation programme. In particular the Hazrev notice aims to tackle a number of risks at our WTWs that have lead to some of our higher CRI scores in recent years. All sites that have caused significant deterioration are having work carried out to reduce risks of repeat failures and we expect to see overall CRI scores drop and variability between years also reduce.

We regard this as a multi AMP process and although we will make significant progress within AMP8 we do not envisage being able to drop below the existing AMP7 deadband of 1.5 CRI units within AMP8. The above predictions for an AMP8 deadband far below that of AMP7, also means that despite improvements we are still likely to exceed the deadband in AMP8.

Innovation

There is no single innovation that will bring about a step change in CRI scores, for us or any UK water Company. We do believe in the power and potential of innovations and as such pursue them across all or field of our activities. Engineering or water system management innovations generally involve small tweaks to existing assets or ways of managing them. There are significant innovations starting to come online within water treatment processes, but overall costs mean any new water treatment processes will have to be phased in gradually for management of costs alongside making sure they remain as resilient, capable and sustainable as required.

We continue to pursue a smarter water distribution network to better understand our existing network and the way we currently manager it so we can isolate improvements that can have a largest impact. We work to optimise and refine existing treatment processes within the structures and along with all UK water companies are committed to adopting best asset management practice.

DWI notices and transformation

We are in a transformation process set out by the DWI. We understand the reasons for this and have accepted that there are areas for improvement. One of the impacts of two of our most significant notices is that any failure at sites named within the notice are automatically scored higher the if we were outside of the transformation process and while we understand and accept the reason for this sanction it is worth pointing out that recovery of poor CRI score can take longer because of this regulatory scoring impact.

Work set out in the Notices is progressing in line with our expectations and we regularly review progress with the DWI. There have already been some significant elements completed and we believe we are already significantly less at risk of poor CRI scores than the early part of AMP7.

The work set out within our **Surface Reservoir Notice** will be substantially complete by end of March 2025. As a result, if our CRI scores and failure performance within this area then deemed to be satisfactory to the DWI, we would expect to be released from the Notice shortly after this date. However, any subsequent failure for coliforms or E.coli, will still be covered by the HazRev notice. It's estimated that between 2020 and 2022, this CRI score increase is responsible for an average of 1.45 CRI Units.

The **HAZREV notice** in place at WTWs, means that any failure of a CRI parameter at a WTWs results in the higher notice related scores. Because of the scope of the work and the length of time needed to put all the measures in place its likely this notice will remain in place throughout AMP8 and into the first part of AMP9.

We are working hard to remove all the notices, but for the purposes of CRI impact, it's likely that there will be a Notice multiplier in place for the common parameters at all WTWs throughout AMP8 and the start of AMP9. WTWs have been the highest contributing element of the CRI score in five out of the nine years since 2014 and are responsible for the bulk of the score in any year we have scored over 4.0 CRI Units.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We propose to apply Ofwat's ODI rate of £1.161m per CRI point of underperformance beyond the deadband.

LEAKAGE NW

DEFINITION

As per the Ofwat definition[73].

CURRENT PERFORMANCE ASSESSMENT

Despite recent improvements in the levels of leakage, we remain behind our three-year average target for NW. In NW we reduced the annual leakage in 2022/23 from 130.5 MLD to 118.8 MLD, this gave a three-year average of 129.8 MLD against a target of 126.7 MLD.

During the year we achieved some of the lowest levels of leakage ever recorded in the North East and headed into the summer months in a strong position. The first four months of the reporting year saw leakage remain under the performance commitment target profile. The hot and dry summer with record breaking hot temperatures in mid July started to create significant numbers of burst mains and other asset failures which created a very challenging operational environment. Just before Christmas we entered a period of freeze and thaw. This freeze/thaw event saw leakage increase rapidly. In comparison to our expected daily leakage in December, we saw a 72% rise in our North East operating area.

During these peak times, we have responded quickly to the sources of leakage by bringing in additional operational resources to fix leaks. We have also increased the number of people that were looking for leaks to enhance our detected leaks to support recovery of our position.

Increasing our operational resources is just one of the ways we are tackling leakage. During the year we implemented several new and exciting technologies and techniques to help us achieve our leakage goals. We collaborated with industry experts to develop Digital Twins for four of our District Metered Areas, which gave us a new digital tool to identify leaks on our network. We have implemented new AI sensor technology that makes our leakage detection surveys more efficient. We use our annual Innovation Festival to explore new concepts, such as 'no-dig' repair techniques, and emerging sources of data that can enrich the insights we have now. Finally, we are leading on industry collaboration, as we develop the new National Leakage Research and Test Centre. This will be a 5km buried water pipe network purpose built for developing and testing leakage interventions without disrupting customers' supplies or affecting water quality. We continue to evaluate and optimise how we use Smart Meter data, as we build on the penetration of meters already deployed.

Despite all the above improvement, we recognise that we remain off track against our performance commitment and are implementing solutions to deliver a step change in performance. We are continuing to fund innovations and trials of

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[73]**https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/final-methodology/pr24-performance-commitment-definitions/.**

emerging technologies, alongside identifying what we need to take forward in terms of the level of resources we deploy across the year. Our final leakage position for the year is confirmed by an annual review of our water balance, this reconciles the total volume of water input into our supply network at our treatment works with the water that is consumed by our metered and non-metered customers, along with the water used for various other purposes, and the volume lost due to leakage. We are continually improving the quality off all datasets to make sure we present the most accurate picture of use and leakage across our network and these elements all change annually.

FIGURE 37: CURRENT INDUSTRY PERFORMANCE FOR LEAKAGE (2022/23 THREE-YEAR AVERAGE)
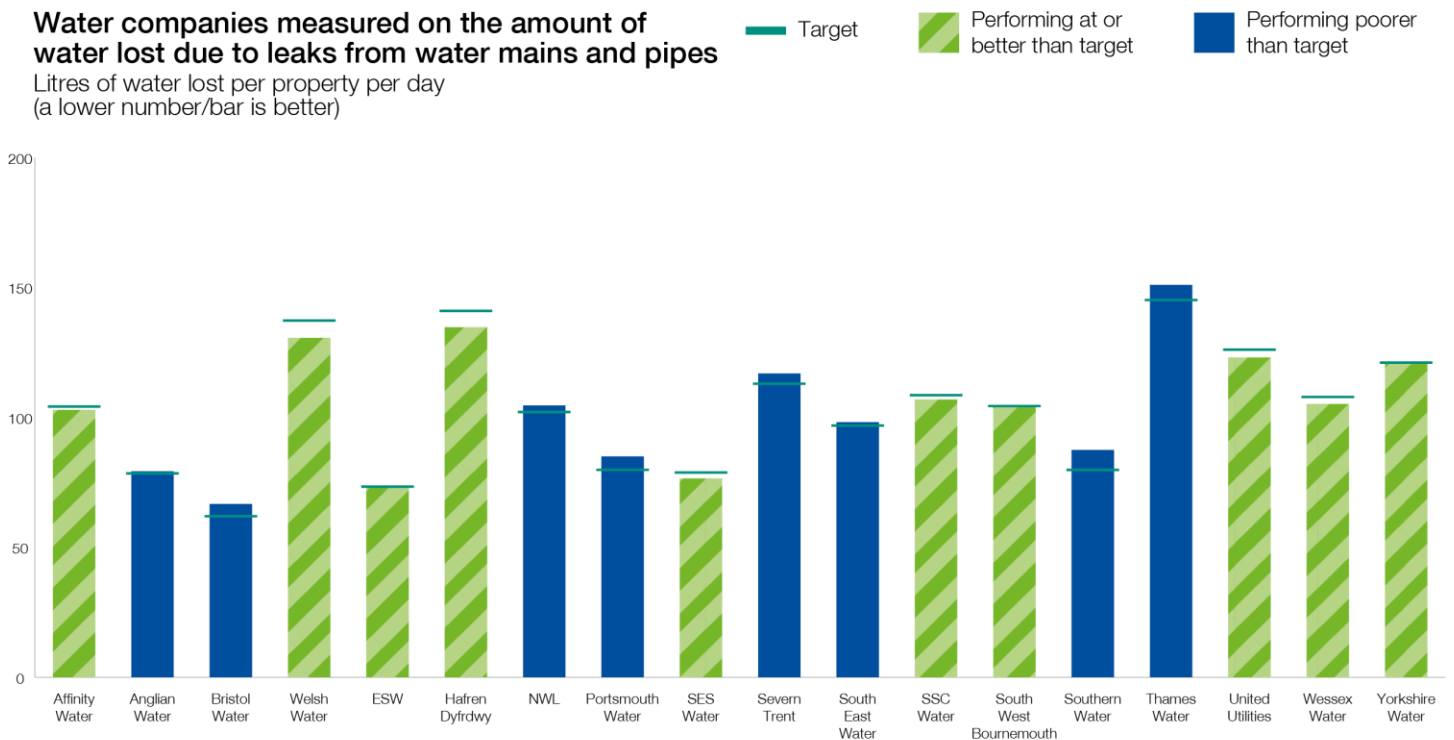
Source: NWL chart from Industry APR data 2022/23

CURRENT AMP ACTIONS

There have been several innovative interventions employed alongside the standard Active Leakage Control processes throughout the year as well. Some 6,000km of mains have been surveyed using satellite to highlight potential points of interest; digital twins of the network have been developed to tackle problematic District Metered Areas by identifying specific areas of focus for our leakage technicians; acoustic logging trials have been carried out with multiple suppliers and further studies have been done to review our plumbing losses value.

We have made a good reduction in 2021/22 in annual performance but recognise it wasn't enough to achieve the three-year average target. We are providing additional investment in the NW region to help us get back on track with meeting our targets by 2025. This includes additional Leakage Technicians, scaling up the digital twin project, continuing to

improve data quality for all water balance components and maximising the benefit of existing pressure management schemes.

FIGURE 38: ONGOING ACTIONS TO IMPROVE LEAKAGE PERFORMANCE

Action	Description	Target Date
Minimise leakage repair times	We have recruited extra 'find and fix' technicians to help minimise leak repair times in the future.	Ongoing
Improve pressure management	We're also working to identify new ways to manage water pressure using special valves.	31/03/2024
Allocation of leakage detection resources	We're also working to identify new ways to manage water pressure using special valves.	31/03/2024
Better understand link between consumption and leakage	We're now carrying out studies to better understand customer consumption. A big part of calculating leakage is understanding how much water our customers use at night. The more accurate our estimates are then the more confidence we have in what is leakage on our network, which we need to find and repair, and what is actually being used by customers.	31/03/2024
Improve logging of NHH customers and variable use	A project is underway to add extra data loggers to business customers' meters to help us improve accuracy when tracking and measuring consumption and leaks for businesses.	31/03/2024
Improved monitoring of trunk mains leakage	Trunk mains are our large water pipes that deliver high volumes of water, and we are investing money to improve the way we monitor these for leakage.	2025-2030
Innovation to improve efficiency	We already use innovative and clever ways to track leakage, such as surveying 8,000km of pipes by satellite. We've been trailing small listening devices, more sensitive than the human ear, at points around the water network, where we can monitor the noise levels on the pipes to help find tiny leaks that we wouldn't be able to spot otherwise. We're even creating 'digital twins' – virtual models of our water pipe network that allow us to run simulations, study problems and generate new solutions.	Ongoing
Innovation –no dig technology	We're trialling a gel and mineral-based solution that allows leaking pipes to 'self-heal' without the need for excavation (digging).	Ongoing

Source: NWL APR July 2023.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED REWARD THRESHOLD

We considered a number of sources when setting our PCL, including.

- to those set out in our WRMP; and

- our long-term strategy for leakage (50% reduction in NWL by 2050, which includes a 55% reduction in NW).

Customer research

A triangulation of our customer research bank indicated that leakage was ranked as a high priority for our customers, whilst Ofwat's own review indicated medium. We have assessed this as a high priority for our customers overall[74]. However, we also note within our Service Valuation Research[75] that the majority of customers did not want to pay more to improve the level of service.

We also considered the raft of responses from our customers across a number of pieces of research, the highlights of which are shown by measure in our customer engagement line of sight and prioritisation of common PCs documents, see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

Base funding is forecast to deliver a 1.4% reduction in leakage per year following the average trend over the last five years. We submit a leakage enhancement business case[76] to further reduce leakage from the base case to the levels we have set out in our Water Resources Management Plan 2024.

Assessment

Considering the above evidence, linked to our WRMP and the prioritisation of our customers we propose targeting 105.2 MLD annually by 2029/30, which achieves 107.1 MLD as a three-year average for the same year.

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[74] NWL – PR24 Customer Research – **Prioritisation of Common PCs** (NES44).
[75] Appendix **A7 – Customer and Stakeholder Engagement** (NES08).
[76] Leakage Enhancement Business Case (**A3 – Costs**, NES04).

We note achieving this 107.1 MLD (three-year average) in 2029/30 requires the agreement of our leakage enhancement, detailed in our Appendix **A3 - Costs** (NES04).

FIGURE 39: PCLS FOR LEAKAGE NW

Targets for reducing the amount of water lost due to leaks from water mains and pipes
Number of mega-litres (a million litres) lost a day (a lower number/bar is better)
Northumbrian Water
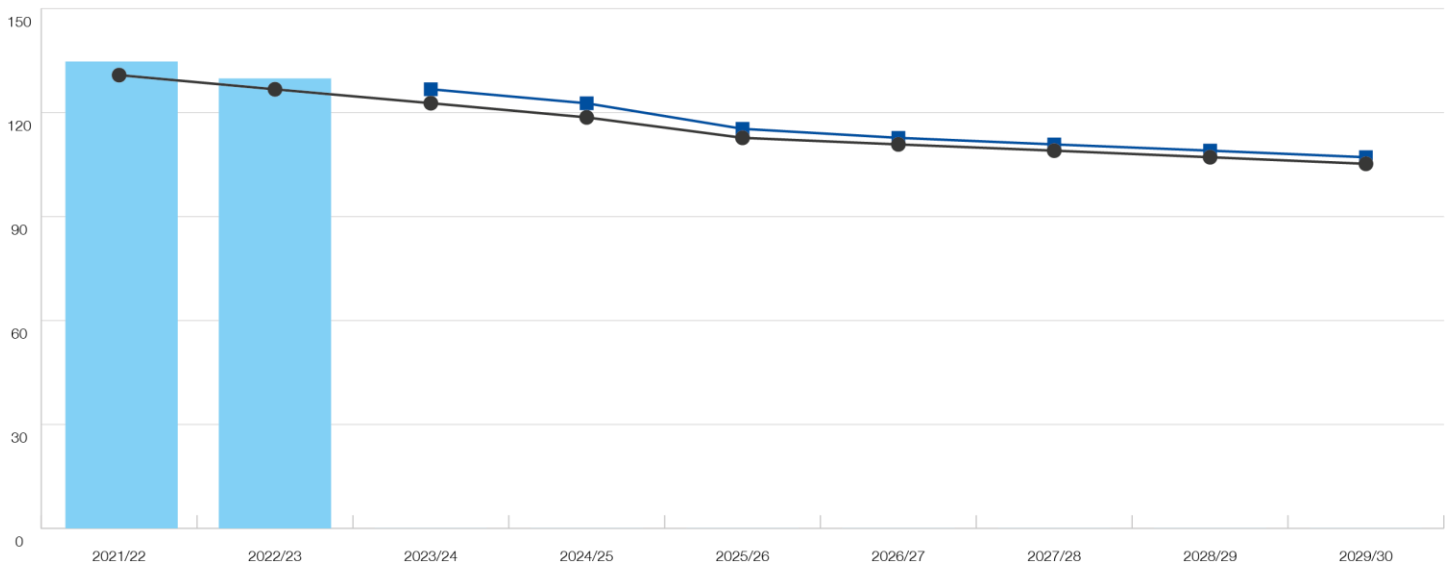
Our PCL includes both base and enhancement expenditure. For context on our demand management enhancement cases (**NES15** and **NES36**).

	2025/26	2026/27	2027/28	2028/29	2029/30
PCL (annual) MLD	112.7	110.8	109.0	107.1	105.2
PCL (three-year average) MLD	115.3	112.7	110.8	109.0	107.1
% reduction from 2019-20 baseline	14.5%	16.4%	17.8%	19.2%	20.5%

Source: NWL

Below shows the performance associated with base totex only.

Three-year average	2025/26	2026/27	2027/28	2028/29	2029/30
Base (annual)	117.1	115.5	114	112.5	111.1

Base (three-year average)	116.8	115.7	115.5	114.0	112.5

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

We plan to build on our successful interventions from AMP7 and further scale up our activities to deliver the required reductions in leakage. The key activities include:

Additional find and fix resources

Increase our capacity to find a fix smaller volume leaks. Additional leakage technicians will be required to pinpoint these leaks and more maintenance teams will be needed to carry out the repairs.

Investment in smart networks / innovation

Technology is always evolving to help support these activities. Satellites, digital twins, and acoustic loggers all aim to reduce the time spent locating leaks to maximise the output from our leakage technicians. We are also working in partnership to develop a 'no dig' repair solution which will enable pipe repairs to be undertaken without any excavation.

Deployment of smart meters

Smart meters are a key tool in the battle against leakage. Not only do they identify customer side leaks very quickly, but they also improve our understanding of customer consumption and customer side leakage which will improve the accuracy of our calculations. This in turn improves the efficiency of our targeting process and influences our future strategy for reducing leakage in the most cost-effective way.

Creation of upstream flow balances

Like the benefit of smart meters on customer side leakage, upstream flow balances will help us to better understand leakage on the strategic network. Firstly, it is about quantifying the amount of leakage we have on our trunk mains and then we can prioritise the areas that need leak detection activities to be carried out.

Mains renewal

As the network gets older and the condition of pipes deteriorate then more failures will occur. The highest risk pipes, according to our deterioration models, need to be replaced at an appropriate rate to maintain performance. Consideration also needs to be taken to severe weather events, like hot dry summers or a freeze/thaw winter, that can significantly affect certain pipes in certain soils.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat proposed an ODI rate of £360,000 per MLD of out or under performance.

FIGURE 40: LEAKAGE NW VALUATIONS

Measure	Unit	Ofwat PR24 ODI Rate	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission (2022/23 prices)	PJM Range (2022/23 prices)
Leakage three-year average	**MLD**	**£365,000**	£131,022	Penalty £0.206m Reward £0.177m	£47,500	£106,062 - £937,390

Source: NWL triangulation of Service Valuation research.

We apply the Ofwat ODI formula to the national marginal benefit rate provided by Ofwat's customer research and mapping.

LEAKAGE ESW

DEFINITION

As per the Ofwat definition[77].

CURRENT PERFORMANCE ASSESSMENT

We achieved our PCL for 2022/23 leakage in our ESW region. In ESW we reduced the annual leakage in 2022/23 from 59.3 MLD to 55.6 MLD, this gave a three-year average of 60.3 MLD against a target of 60.5 MLD.

During the year we achieved some of the lowest levels of leakage ever recorded in Essex and Suffolk. By July we had driven down the visible leak repair time in Essex and Suffolk to an average of 4.3 days in comparison to 7.9 days during the corresponding period in 2022, achieved in part through increasing our operational resources.

Increasing our operational resources is just one of the ways we have tackled leakage. During the year we implemented several new and exciting technologies and techniques to help us achieve our leakage goals. We collaborated with industry experts to develop digital twins for four of our District Metered Areas, which gave us a new digital tool to identify leaks on our network. We have implemented new AI sensor technology that makes our leakage detection surveys more efficient. We use our annual Innovation Festival to explore new concepts, such as 'no-dig' repair techniques, and emerging sources of data that can enrich the insights we have now. Finally, we are leading on industry collaboration, as we develop the new National Leakage Research and Test Centre. This will be a 5km buried water pipe network purpose built for developing and testing leakage interventions without disrupting customers' supplies or affecting water quality. We continue to evaluate and optimise how we use Smart Meter data, as we build on the penetration of meters already deployed.

These improvements have been offset by an increase in water mains bursts caused by the dry soil conditions during the 2022 summer heatwave, where temperatures hit more than 400C in our Essex region. We repaired more than 1,000 additional visible leaks than we did in the summer of 2021, and overall, the number of repairs that were needed during the summer was double that of an average year. We saw leakage increased to 133% of our forecasted daily level during the freeze/thaw event which took place in December. We were able to recover quickly from this winter peak as we had planned and prepared for this event and could quickly deploy additional resources.

Our final leakage position for the year is confirmed by an annual review of our water balance, this reconciles the total volume of water input into our supply network at our treatment works with the water that is consumed by our metered and non-metered customers, along with the water used for various other purposes, and the volume lost due to leakage. We

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[77]https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/final-methodology/pr24-performance-commitment-definitions/.

are continually improving the quality off all datasets to make sure we present the most accurate picture of use and leakage across our network. These elements all change annually.

FIGURE 41: CURRENT INDUSTRY PERFORMANCE FOR LEAKAGE (2022/23 THREE-YEAR AVERAGE)
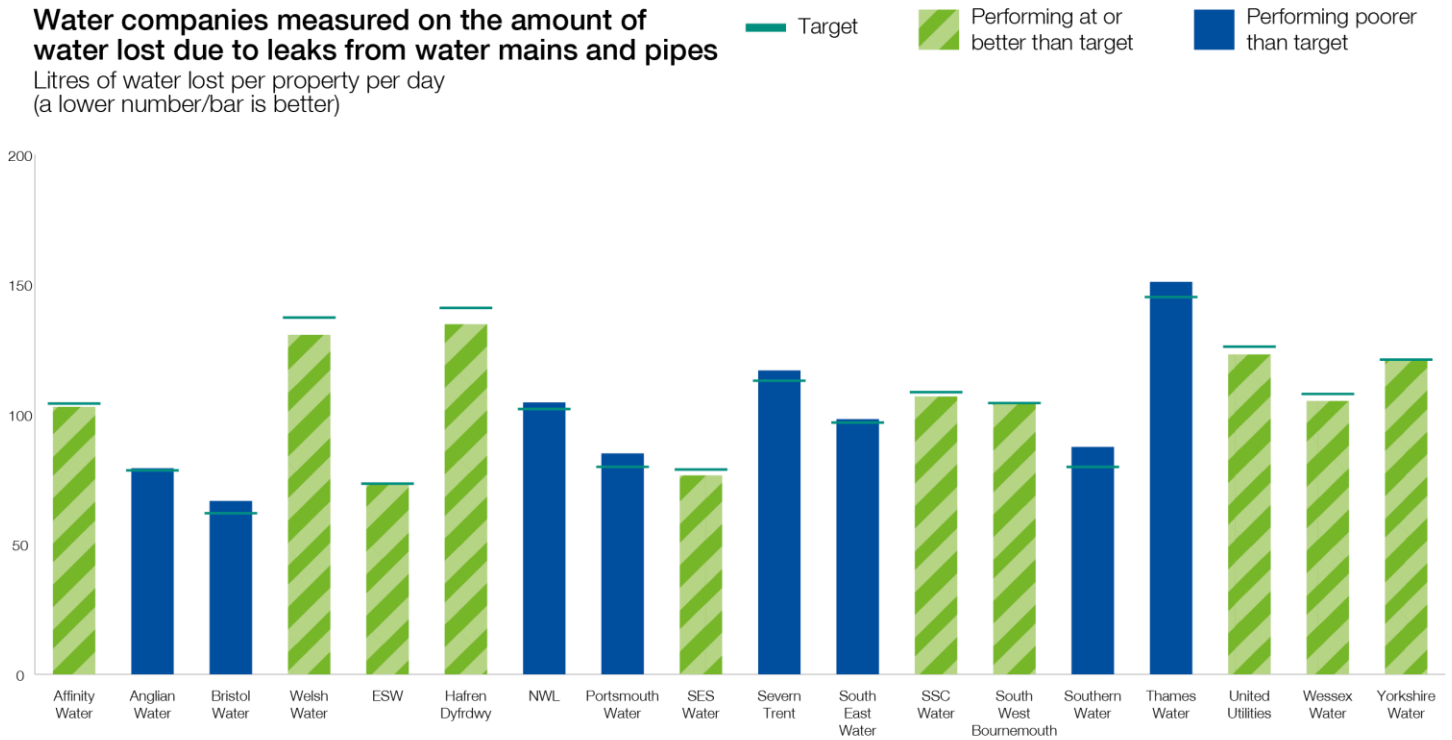
Source: NWL chart from Industry APR data 2022/23.

CURRENT AMP ACTIONS

There have been several innovative interventions employed alongside the standard Active Leakage Control processes throughout the year as well. Some 2,000km of mains in Suffolk have been surveyed using satellite to highlight potential points of interest; digital twins of the network have been developed to tackle problematic District Metered Areas by identifying specific areas of focus for our leakage technicians; acoustic logging trials have been carried out with multiple suppliers and further studies have been done to review our plumbing losses value.

Our focus is now on delivering the interventions that will get us back on track for next year. These include scaling up the digital twin project, continuing to improve data quality for all water balance components and maximising the efficiency of our existing Leakage Technicians.

Ongoing actions to improve our leakage performance are as per the leakage NW measure above.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED REWARD THRESHOLD

We considered several sources when setting our PCL, including.

- to those set out in our WRMP; and

- our long-term strategy for leakage (55% reduction in NWL by 2050, which includes a 40% reduction in ESW).

Customer research

A triangulation of our customer research bank indicated that leakage was ranked as a high priority in a triangulation of Ofwat's and our research. However, we also note within our Service Valuation Research[78] that the majority of customers did not want to pay more to improve the level of service.

We also considered the raft of responses from our customers across a number of pieces of research, the highlights of which are shown by measure in our customer engagement line of sight and prioritisation of common PCs documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

Finally, we propose an enhancement case[79] for leakage to further reduce the levels in our water stressed region of Essex and Suffolk. While we are already an upper quartile company for leakage in this area, our customers continue to indicate that the reduction of leakage is a high priority for them.

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[78] Appendix **A7 - Customer and Stakeholder Engagement** (NES08).
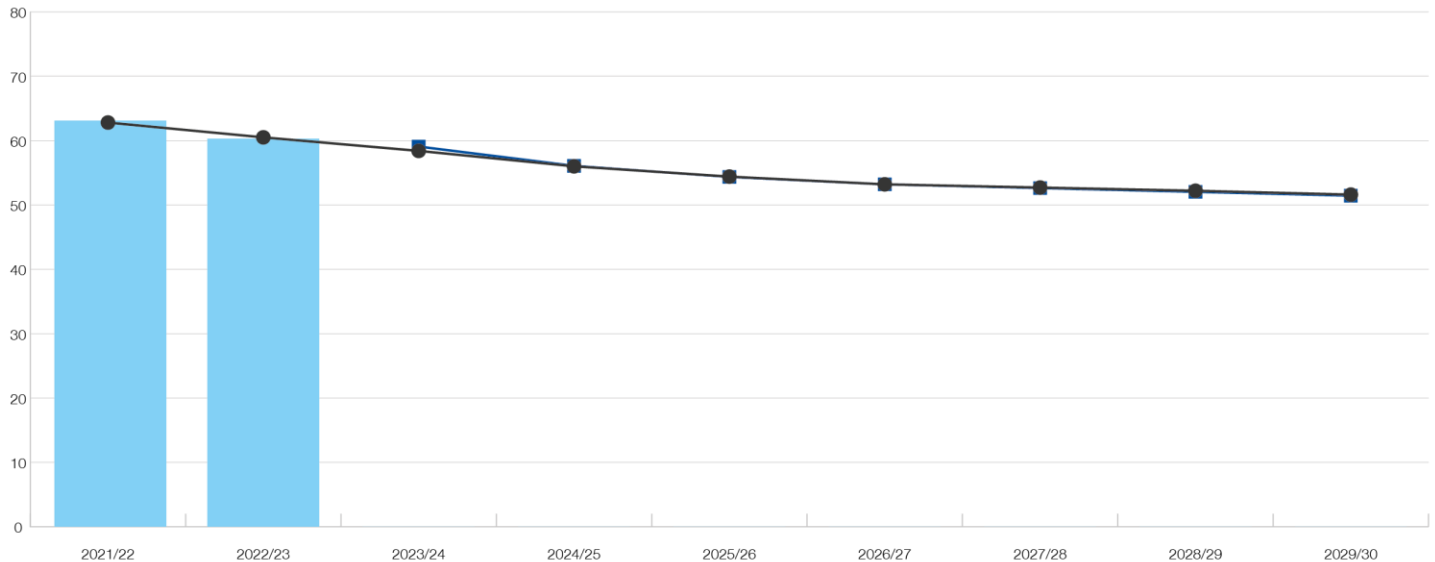[79] Appendix **A3 - Costs** (NES04).

FIGURE 42: PCLS FOR LEAKAGE ESW

Targets for reducing the amount of water lost due to leaks from water mains and pipes
Number of mega-litres (a million litres) lost a day (a lower number/bar is better)
Essex & Suffolk Water

Our PCL includes both base and enhancement expenditure. For context on our leakage enhancement, see Appendix **A3 - Costs** (NES04).

	2025/26	2026/27	2027/28	2028/29	2029/30
PCL (annual) MLD	53.2	52.7	52.2	51.6	51.1
PCL (three-year average) MLD	54.4	53.2	52.7	52.2	51.6
% reduction from 2019-20 baseline	16.7%	18.4%	19.2%	20.0%	20.8%

Source: NWL.

Below shows the performance associated with base totex only.

Three-year average	2025/26	2026/27	2027/28	2028/29	2029/30
Base (annual)	55.3	54.6	53.9	53.2	52.5
Base (three-year average)	55.1	54.6	54.6	53.9	53.2

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

We plan to build on our successful interventions from AMP7 and further scale up our activities to deliver the required reductions in leakage. The key activities include:

Additional find and fix resources

Increase our capacity to find a fix smaller volume leaks. Additional leakage technicians will be required to pinpoint these leaks and more maintenance teams will be needed to carry out the repairs.

Investment in smart networks / innovation

Technology is always evolving to help support these activities. Satellites, digital twins, and acoustic loggers all aim to reduce the time spent locating leaks to maximise the output from our leakage technicians. We are also working in partnership to develop a 'no dig' repair solution which will allow pipe repairs to be carried out without any excavation.

Deployment of smart meters

Smart meters are a key tool in the battle against leakage. Not only do they identify customer side leaks very quickly, but they also improve our understanding of customer consumption and customer side leakage which will improve the accuracy of our calculations. This in turn improves the efficiency of our targeting process and influences our future strategy for reducing leakage in the most cost-effective way.

Creation of upstream flow balances

Like the benefit of smart meters on customer side leakage, upstream flow balances will help us to better understand leakage on the strategic network. Firstly, it is about quantifying the amount of leakage we have on our trunk mains and then we can prioritise the areas that need leak detection activities to be carried out.

Mains renewal

As the network gets older and the condition of pipes deteriorate then more failures will occur. The highest risk pipes, according to our deterioration models, need to be replaced at an appropriate rate to maintain performance. Consideration also needs to be taken to severe weather events, like hot dry summers or a freeze/thaw winter, that can significantly affect certain pipes in certain soils.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We apply the proposed Ofwat value of £360,000 per MLD of our and underperformance. Below we compare the Ofwat's value with other available data points.

FIGURE 43: LEAKAGE ESW VALUATIONS

Measure	Unit	Ofwat PR24 ODI Rate	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission (2022/23 prices)	PJM Range (2022/23 prices)
Leakage three-year average	**MLD**	**£365,000**	£101,474	Penalty £0.213m Reward £0.182m	Penalty £0.150m Reward £0.087m	£106,062 - £937,390

Source: NWL triangulation of service valuation research inc PJM PR19 evaluation.

PER CAPITA CONSUMPTION

DEFINITION

As per the Ofwat definition[80].

CURRENT PERFORMANCE ASSESSMENT

Our PC requires us to deliver a reduction of 5.3% by 2024/25 against a baseline taken in 2019/20, on a three-year rolling average basis.

FIGURE 44: PCC 2022/23 INDUSTRY PERFORMANCE AGAINST TARGET

Water companies measured on the volume of water used per person
Litres of water used per person per day
(a lower number/bar is better)
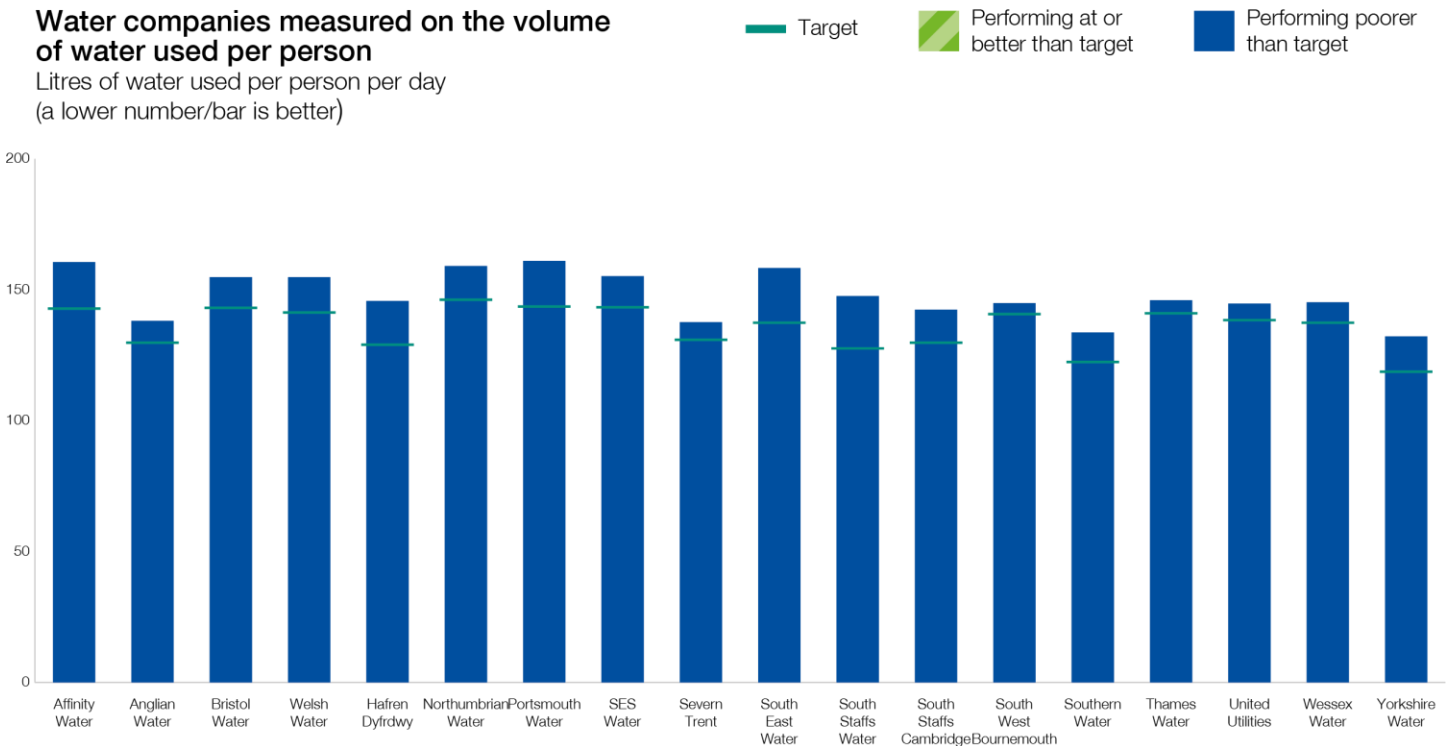
Source: Industry APR 2022/23.

The Covid-19 pandemic has had a pronounced effect on PCC (which reflects household water consumption only, as opposed to business use), through increased water use for hygiene requirements and a substantive shift to home

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[80] https://www.ofwat.gov.uk/publication/per-capita-consumption-pc-definition/.

working. Social distancing restrictions have also limited our ability to implement water efficiency measures in customer homes.

As a result, PCC has increased by 5.6% by the end of 2022/23 against the 2019/20 baseline. 2023/24 should see a fall in PCC as the worst performing year during Covid-19 drops out of the three-year average.

The aim for our programme of activities was to deliver a 1% reduction in PCC, as well as addressing the shortfall from 2020/21.

We continued to monitor the impact of Covid-19 on household consumption and have sought to disaggregate the impact of Covid from other variables that influence PCC. We have worked with the Met Office to model demand within our regions in two phases, showing that:

- PCC for our operating areas overall increased by 5% between April and August 2020. 63% of this was due to an increase in base demand from normal, and 37% was due to an increase in weather dependent demand from normal.

- Between April and September 2021, demand in all three of our operating regions stayed higher than 2019 (pre Covid-19). The weather dependent demand seen from people being at home using water in the garden has significantly reduced in this period compared to 2020/21. From this it can be concluded that Covid-19 alone impacted total demand and PCC over and above the effects of the weather.

CURRENT AMP ACTIONS

Background

Water efficiency has remained a key strand of our demand management undertakings throughout AMP7 having initiated the first water efficiency retrofit programme in 1997, we are able to demonstrate the successful delivery of industry-leading projects, schemes and initiatives spanning over twenty years. These activities have resulted in quantifiable water savings, unrivalled customer experiences and a significant contribution to the water efficiency evidence base.

The strategy has, and continues to be, designed to create water efficiency programmes that make sustainable long-term savings in water, as cost effectively as possible.

A critical part of the programme is the monitoring of results to find out what the actual savings in water are and how sustainable they are, while using customer surveys to gauge the effectiveness of the engagement approach. This benefits our water efficiency planning and ultimately the high levels of demonstrable water savings achieved, it has and will continue to contribute significantly to the industry's water efficiency evidence base, in turn aiding others in developing demand management and water efficiency strategies.

Partnership working

Working in partnership is key to driving deeper and sustainable water efficiency impact. Indeed, taking a collaborative approach with various partners and stakeholders will be key to reducing both per capita consumption and Business Demand to 2050.

We currently work with a range of organisations to deliver our household water efficiency strategy. Examples of working in partnership in PR19 include:

- We are a supporter of Waterwise, the leading independent voice in the UK for using water wisely. We've collaborated with Waterwise in many guises over the years. Recent examples include:

    o Playing a leading role in instigating Water's Worth Saving - the first national water efficiency campaign - through WaterUK and Waterwise in 2020.

    o Co-delivery of the annual pledge campaign with the most recent being Pledge23 whereby we challenge the public to make New Year's Resolutions and pledge to make water saving behaviour changes.

    o A seat on the steering group for both the initial national five-year Water Efficiency Strategy and the subsequent Water Efficiency Strategy 2030.

    o Working with Waterwise to take forwards the concept of Water Literacy, with a successful bid application through Ofwat's third Water Breakthrough Challenge.

- We also work with consultants and contractors to deliver our key water efficiency programmes. Examples of include Aqualogic for our home water and energy saving retrofit programme and Hopscotch for our primary school education programme.

- We also partner with academia to make sure we leverage the benefit of behavioural science and behavioural economics through our water efficiency programmes and behaviour change campaigns. Recently worked with independent academics, the likes of University of Oxford, University of Chicago, University of Denver and University of Manchester on various pieces of research.

- We have strong relationships with our regulators and key stakeholders.

We recognise that we need to keep working with others and to push further the partnerships we currently have in place. We need water users to hear and engage with the water efficiency message from a variety of places, through various channels and through a range of key trusted partners. We'll seek to drive further benefit throughout PR24.

Covid-19 impact

The first half of 2021/22 saw the continuation of lockdowns and meant our people continued to review, adapt, and develop innovative approaches and a new water efficiency strategy for the remainder of the 2020-25 period. As we moved into the second half of the year and out of Covid-19 related restrictions, we were able to initiate various new approaches alongside returning to our tried and tested interventions.

Highlights of our new water efficiency strategy include:

• Our new home water and energy saving retrofit programme, effectively targeting the highest users of water.

• Video calls to survey customer's homes and offer a continuation of our home water and energy saving retrofit programme.

• An online water and energy calculator allowing customers to produce personalised reports with tailored water and energy saving solutions.

• A highly engaging online school education programme providing teachers with interactive, curriculum linked resources for KS2 children.

• Gold Sponsorship of the 2022 Waterwise Conference.

• Active and leading involvement in two national water efficiency behaviour change campaigns - Water's Worth Saving and Pledge21.

• Integrating water efficiency as a core customer journey in our smart metering programme.

In addition, we have completed several phases of customer research to understand changes in work location, staycations, water use now and in the future. Customers told us that working from home has increased and they were using more or much more water.

Frequent surveys have allowed us to understand the trends and changes over time. We will continue to carry out research and data analysis throughout 2020-25 to make sure we have a clear picture of what's changing and how the pandemic continues to impact PCC.

The Covid-19 pandemic and associated lockdown restrictions initially hindered the delivery of these programmes, and we are working hard to catch up.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED THRESHOLD

Government and regulatory targets

The UK Water Efficiency Strategy to 2030[81] highlighted that climate change is changing rainfall patterns and increasing the frequency and severity of high temperature events and drought, putting more stress on our water supplies. As set out in the Government's Environmental Improvement Plan[82], Defra emphasises that an additional 4,000 megalitres (Ml) of water a day will be needed in England by 2050 to meet future pressures on public water supply. Around a third of this needs to be met through concerted demand management action (smart meters and water efficiency activity)[83].

The Government has a long-term target to reduce the use of public water supply in England per head of population by 20% from the 2019/20 baseline reporting year figures, by 31 March 2038. To achieve the statutory water demand target, it plans to 'reduce household water use to 122 litres per person per day (l/p/d), reduce leakage by 37% and reduce non-household (for example, business) water use by 9% by 31 March 2038. This is part of the trajectory to achieving 110 l/p/d household water use, a 50% reduction in leakage and a 15% reduction in non-household water use by 2050. The interim targets are based on the progressive reductions needed to meet the long-term target and the supply-demand challenge'. These Government targets/aspirations have largely been translated into wholesale water company Performance Commitments.

Strategic Objective 7 of the national Water Efficiency Strategy 2030[84] is that 'water efficiency measures are included in building retrofit programmes, including to achieve net zero'. We lead the Task and Finish Group progressing this objective.

We know that around 6% of the UKs total greenhouse gas emissions are from household water supply and use and that this equates to over 2.6 kg CO_2e per home per day[85]. Approximately 90% of these water-related emissions are from how we use water in the home. The rest are emissions from water companies supplying water and removing and treating wastewater. This emphasises the important role that household water efficiency interventions play in reducing carbon emissions.

Long-term strategy

Our long-term strategy is to achieve 110 litres per person per day in 2050.

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[81] J37880-Waterwise_Water_Efficiency_Strategy_Inners_Landscape_WEB.pdf.
[82] Environmental Improvement Plan (publishing.service.gov.uk).
[83] Preparing for a drier future (nic.org.uk).
[84] J37880-Waterwise_Water_Efficiency_Strategy_Inners_Landscape_WEB.pdf.
[85] Net Zero and the Role of Water Efficiency – Waterwise (2021) – Database WW.

Customer research

A triangulation of our customer research bank indicated that PCC was ranked as a medium priority by our customer research triangulation, and low in Ofwat's. We have considered this an overall low rank across both our research and Ofwat.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents - see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative data

Forecasting future trends for PCC using historic data is problematic due to the Covid-19 pandemic, which has had a large impact on the industry performance since 2020.

FIGURE 45: PCC HISTORIC NWL AND INDUSTRY PERFORMANCE, INCLUDING LONG TERM TARGET PROJECTIONS 110 L/P/D 2050.
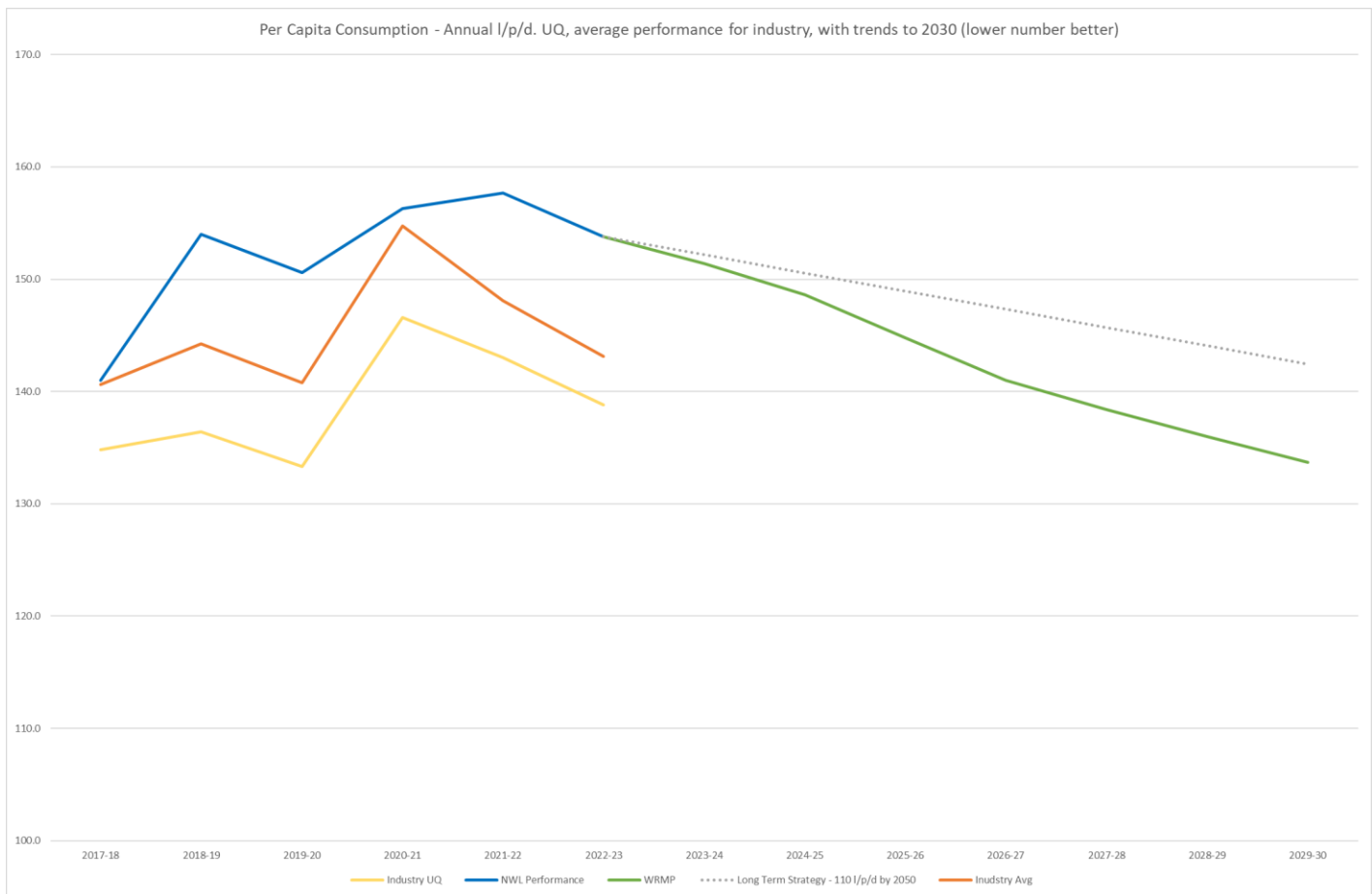
Per Capita Consumption - Annual l/p/d. UQ, average performance for industry, with trends to 2030 (lower number better)

Source: NWL Analysis.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

Assessment

We align our PCC PCL with that of the trajectory in our Long-term strategy and the levels set out in our WRMP, to achieve 110 litres per person per day in 2050. To do so, we set our three-year average at 136.0 by 2029/30.

FIGURE 46: PCC TARGETS 2025-2030

Targets for reducing the amount of used water by customers
Number of litres consumed per person per day (a lower number/bar is better))
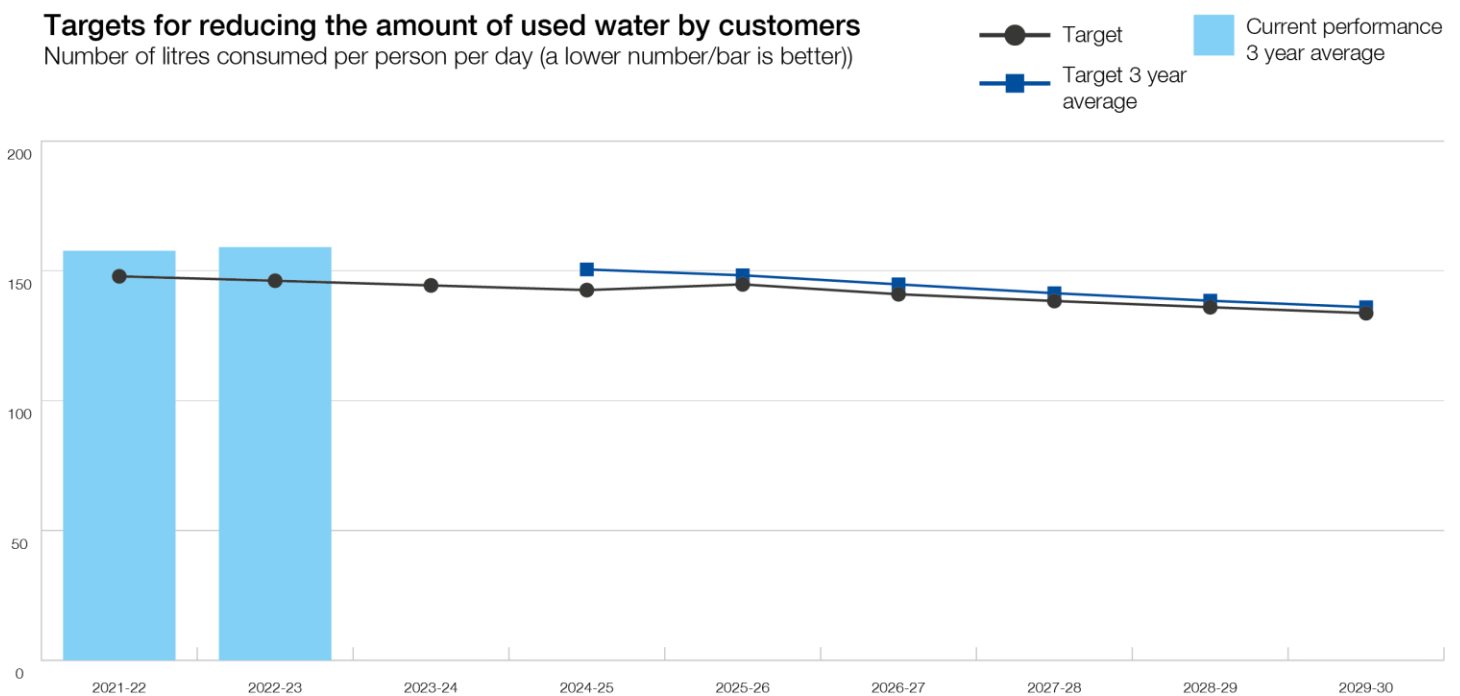
	2025/26	2026/27	2027/28	2028/29	2029/30
PCL annual (l/p/d)	144.8	141.0	138.4	136.0	133.7
PCL three-year average (l/p/d)	148.3	144.8	141.4	138.5	136.0

Source: NWL.

This PCL includes both our planned base totex and enhancement business case, which can be found in Appendix **A3 - Costs** (NES04).

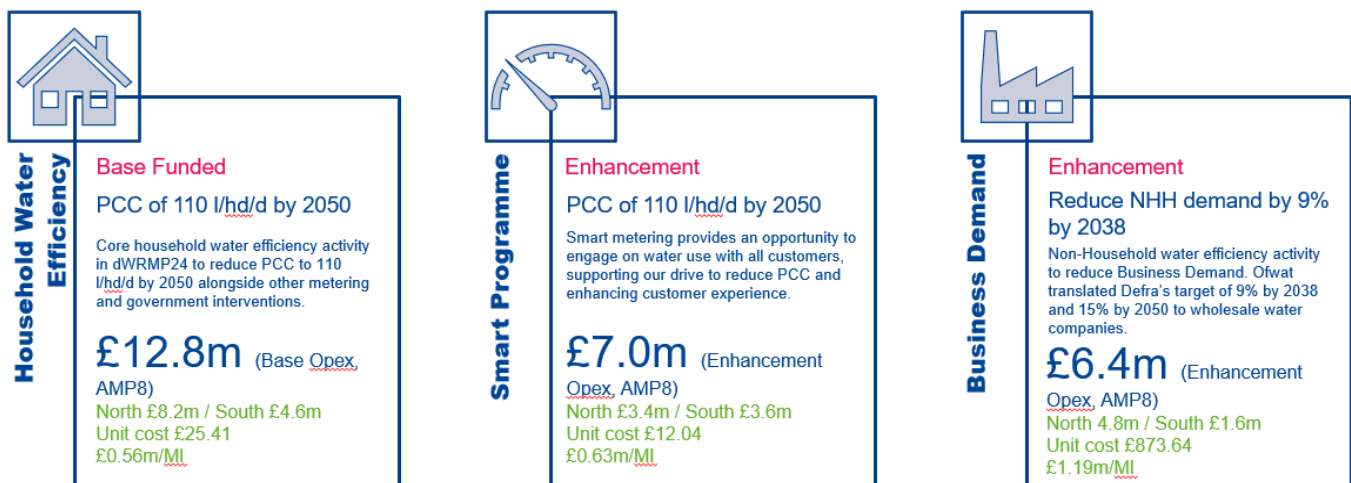| Three-year average (MLD)	2025/26	2026/27	2027/28	2028/29	2029/30
Base performance	149.1	146.4	143.9	141.9	140.2
Enhancement performance	148.3	144.8	141.4	138.5	136.0
% reduction from 2019/20 including enhancement	1.58%	3.89%	6.14%	8.08%	9.70%

Source: NWL.

WHAT IS OUR PLAN TO ACHIEVE THE PCL

We aim to achieve our PCL by building on our existing programmes, scale up our industry leading water efficiency work, integrating water efficiency interventions into the smart metering programme and delivering a new non-household water efficiency strategy.

FIGURE 47: WATER EFFICIENCY STRATEGY

Household Water Efficiency

Base Funded
PCC of 110 l/hd/d by 2050

Core household water efficiency activity in dWRMP24 to reduce PCC to 110 l/hd/d by 2050 alongside other metering and government interventions.

£12.8m (Base Opex, AMP8)
North £8.2m / South £4.6m
Unit cost £25.41
£0.56m/Ml

Smart Programme

Enhancement
PCC of 110 l/hd/d by 2050

Smart metering provides an opportunity to engage on water use with all customers, supporting our drive to reduce PCC and enhancing customer experience.

£7.0m (Enhancement Opex, AMP8)
North £3.4m / South £3.6m
Unit cost £12.04
£0.63m/Ml

Business Demand

Enhancement
Reduce NHH demand by 9% by 2038

Non-Household water efficiency activity to reduce Business Demand. Ofwat translated Defra's target of 9% by 2038 and 15% by 2050 to wholesale water companies.

£6.4m (Enhancement Opex, AMP8)
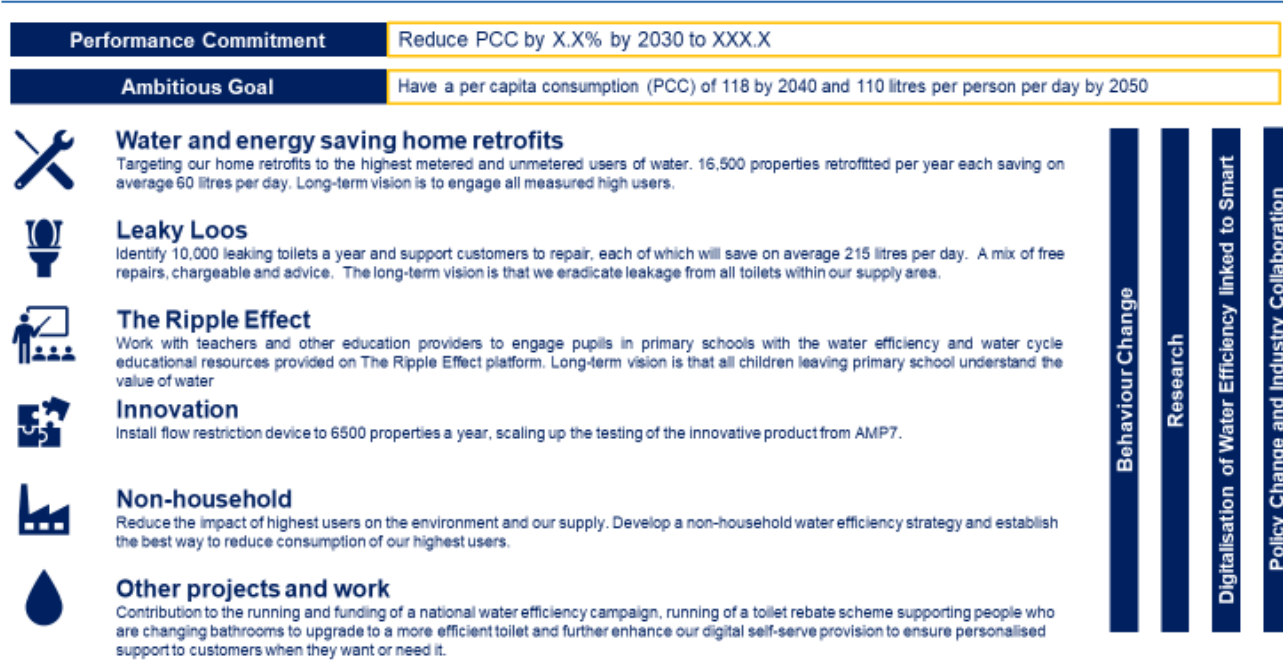North 4.8m / South £1.6m
Unit cost £873.64
£1.19m/Ml

Source: Our Water Efficiency Strategy 2023.

We outline our strategy to achieve our PCL below, with an initial overview of the plan on a single page, before providing more detail for both our base expenditure and enhancement funding.

FIGURE 48: WATER EFFICIENCY STRATEGY ON PAGE

Source: Our Water Efficiency Strategy 2023.

Base expenditure activities.

- **Home water and energy saving retrofit visits**

In recent years, we have focused our household customer water saving visits on the provision of free water saving products and advice. For this option, we are focusing on the Top 5% highest users to enable us to achieve high water savings, we expect each visit to achieve approximately 60 litres per property per day. This assumption is based on calculations carried out using historical data from past home visit projects. This approach will see us offer customers personalised products and tailored information to enhance the opportunity of changing high users' behaviour.

Studies show that most households are using much less than average PCC indicates. We believe this is due to our data being skewed by the Top 5% highest water using customers. Therefore, if we focus on our highest water using customers, we are assuming that the amount of water we can save increases and reducing the amount of water used occurs sooner.

This option will have close synergies with our water efficient digital engagement strategy to support the engagement of the Top 5% group. The cost associated with this activity including engagement and recruitment is £100 per visit. This figure is based off recent delivery costs for water saving home visits with contractors. Our calculations predict this option will save

2.89 Mld/day over the AMP, based on 9,648 visits taking place each year across the AMP achieving 60 litres per property per day.

In 2022, we launched the first visits to Top 5% highest water using customers. We are currently working on this approach to understand our highest water using customers behaviour and to evaluate how to deliver this effectively in time for AMP8. We will continue to work with academic experts to enhance our engagement with customers and delve deeper into the psychology of behaviours and understand human habits to create positive interventions for water savings.

- **Unmeasured property engagement - retrofits**

Previously, we have offered water saving visits on an area-by-area basis known as Every Drop Counts which was our Whole Town Approach. This water saving visit approach has granted us with many successes other the years and allowed us to make average savings of 24 litres per property per day. Covid-19 allowed us to have the opportunity to think differently about how we do things to maximise our water savings. The Top 5% project allows us to do this, trialling new interventions, methods of engagement and allowing us to achieve three times more water with this approach. We know that PCC is relatively higher in the unmeasured customer base and believe the savings potential will reflect this.

Due to the lack of measurement within unmetered properties we believe that the savings potential to be like that of the measured Top 5% highest users visits. By 2025, we predict that around 52% of customers in the NW operating area will be unmetered which allows us to have the opportunity to engage with around 80,800, customers with this approach. This will save up to 2.06 Mld during AMP8. This Mld calculation is based on our preferred option scenario, whereby we will aim for 60 litres per property per day for 6,852 properties per year over the AMP.

There will be synergies with the digital engagement offering as this will be a route to engage with customers. There is uncertainty around customer take up from customers who are living in unmeasured properties. A 15% take up rate has been assumed when working with the Top 5% of unmeasured customers. However, this may vary, and we will be able to make a more informed decision from AMP7 learnings.

- **Leaky loos**

We will continue to offer our free leaking toilet visits as we know from studies that between 200-400 litres of water per day can be saved from repairing just one. The studies also state that that up to 8% of all toilets in homes across our operating area are leaking and this grants us with huge opportunity to repair the toilets, promote how to repair the toilets and educate customers on the amount of water that is being wasted in this way, every day. Assuming each one of our customers has one toilet in their home, we estimate that there are over 19,000 leaking toilets per year which gives us the opportunity to potentially save 8.06 Mld/day during AMP8. We have set out to repair 37,500 over the AMP based on a 215-litre saving. There is some uncertainty around the take up rates of this offer from customers, we have assumed 10% based off previous programmes of work.

For internal leakage repair there are subcategories to what we offer and who we offer it to:

o We aim to promote how to identify leaks and the importance of repairing leaking toilets, taps and overflows for customers, this will be operating area wide engagement. We will also promote a solution for customers and support identification of Water Safe plumbers to make sure that repairs are being made.

o For customers who have identified leaks through the education (above), we will offer a free visit to repair the leaks but only for those customers who are currently on an affordability tariff. This allows us to support customers who need it most.

o For customers who are not on an affordability tariff and have identified a leak, we will offer a visit to repair the leaks at a cost to the customer. We are uncertain about the take up rate of this and are keen to hear customers thoughts on this part of the option. We expect to hear customer opinion through support of the Strategic Research team and the customer research studies they are working on as part of WRMP24.

There are synergies with smart metering options as this will be a way to identify any internal plumbing losses which can be highlighted for repair, therefore water savings.

- **Leaky loos – bulk supply**

We have had previous success when it comes to finding leaking toilets in bulk within accommodation blocks or properties which are on a bulk meter. A dedicated team of leak finders and fixers for bulk meters/blocks of flats/accommodation blocks/owners of multiple properties will go and find internal leaks and repair them. These repairs would be free to the customer. The repairs could contribute to a saving of 2.69 Mld over the AMP based on a calculation of 12,500 over the AMP with a saving of 215 litres per property per day.

- **Education**

As part of our commitment from PR19, we are continuing to offer Key Stage 2 educational resources. There has since been a shift whereby this engagement is held as part of an online education tool (known as The Ripple Effect) to change water using behaviours for the future and for future generations to engage with us at scale. From 2025, we will develop an offering for all Key Stages (1-3) and introduce water efficiency into the curriculum through support of the Department for Education. We hope to bring a digital education offering to college and university aged people, to engage with our future bill payers around their water wasting behaviours. Based on a 20% take up rate by schools, we have assumed this programme of work could save 1.88 Mld in AMP8, using a saving of 15 litres per property per day (evidenced by our UKWIR behaviour change tool) and targeting 125,000 young people. The Behaviour Change Tool created by Artesia Consulting for UKWIR Project WR25: Cost Benefit of Baseline Water Efficiency Activities has been used to calculate the saving from The Ripple Effect interactions. The tool was created and designed to estimate assumed savings from soft measures, it also shares draft guidelines for determining the level of engagement for school-based activities. The method is detailed in Section 7 of the UKWIR Project WR25: Cost Benefit of Baseline Water Efficiency Activities Report.

- **Digital engagement**

A one stop online digital engagement platform for water efficiency will provide customised advice, services, information, and guidance to change behaviour on a large scale. This platform will be accessible whenever a customer wants to engage with us with incentives to ensure a continued dialogue. It allows us to check in with customers at moments of change in their lives whereby their water consumption may change - whether that be moving home or having a baby – the platforms allow us to check in about their water use and how that will impact our supply-demand balance on micro scale to support our wider plans. The digital engagement platform will allow us to engage across generations and cover the lifespan of a customer from the point where they register for the first time.

To understand the potential saving which could be associated with this option we used current total number of online accounts and customers who will be digitally engaged (60% according to the Digital Index). There is a target for 80% of customer based to be online by 2030. We have assumed that 19% of those with an online account will be actively using the digital platform for water efficiency, saving 0.3 Mld per year, using a saving of eight litres per property per day (evidenced by previous work of a 5% PCC reduction and Watersmart) and targeting 40,000 customers a year.

- **National campaign**

A nationwide campaign to support and increase awareness of water saving with support from Waterwise and all water companies, following the success of the Water's Worth Saving campaign.

A campaign will support change across the industry as the programme will need participation from a wider audience at national level. This will involve strategically providing the public with information that can help lead to more water efficient lifestyles and more transparency about water resources in their area. This campaign will encourage behavioural changes and seek to educate the public on how they can save water, energy, and money. We believe the campaign will have minimal affect in terms of water savings however, we believe this will be an enabler for other water saving activity and options listed here, saving 521 litres per day across the operating areas of those involved.

- **Toilet rebates**

Based on micro component questionnaires around 70% of toilets in customers' homes were installed pre 2001 as either single or dual flush with flushes of up to nine litres or more. Providing a rebate to replace with dual flush 4/2 litre toilets that do not leak identified on the water label should provide an expected saving of 52 litres a property a day. An estimated total cost of £55 per rebate is expected. This option has not been explored before in the UK water sector before now and will enable us to provide a case study for the rest of the industry to use in any future options.

We have assumed a 5% take up rate for the toilet rebate offering which means that we can deliver 2,500 rebates across the operating areas with a saving of 0.65 Mld in total for AMP8. Through research about the potential saving the rebates can offer, we believe based on evidence and what is currently available on the market a saving of 52 litres per property can be achieved.

- **Home flow restrictions**

Throughout AMP7 we will test the benefit of flow restriction for a range of properties including new builds. We assumed based off initial research that flow restriction grant us the opportunity to save around 34 litres per property per day. The whole home flow restriction allows water consumption to be reduced at a property level. The restrictor limits the water flow to around 14 litres per minute. We are currently trialling a device in AMP7 which has the capability of regulating flow to ten litres per minute. However, our current trial is looking at the potential savings and customer opinion of the 14 litre per minute device. This level is beneficial and regulates the amount of water into the home without compromising the appliance function within the property. A take up rate of 4% has been assumed in calculations based on a trial project with a flow restriction device in 2019 as well as savings from this trial of 34 litres per property per day.

Enhancement expenditure linked to smart meters

Below are enhancement options that we will be utilising through our Smart Meter installation rollout across the AMP that will deliver benefits for household water consumption and in turn the Per Capita Consumption Performance Commitment.

This activity is built into the WRMP24 as base operational activity.

- **Home flow restrictors**

Based on research and testing during AMP7 we believe that flow restriction will grant us the opportunity to save an average of 34 litres per property per day for every restrictor installed. The whole home flow restriction allows water consumption to be reduced at a property level. The restrictor limits the water flow to around 14 litres per minute which is a level beneficial to regulating the amount of water into the home without compromising the appliance function within the property. We plan to target properties based on water use levels, water pressure and geographical considerations to install 36,370 flow restrictors on a customer opt out basis, while on site installing a smart meter. This will maximise efficiencies and customer satisfaction with a single visit, and we estimate will provide water saving of 1.24 Ml/day over AMP8.

- **Education and support on the doorstep**

The rollout of smart meters throughout our operational areas provides us with unparalleled opportunity to engage with our customers in person and at their homes. Alongside a best-in-class customer experience, our technicians will provide a tiered engagement and education offering which will be determined by the customer during the meter installation to make sure they receive the best level of service suited to them while also receiving relevant education on water saving methods. What follows are the tiered offerings with volumes and savings based on expected meter installation types and customer uptake.

  o Water saving information / education leaflet. We are committing to a provide every customer that has a Smart Meter installed with a document that provides water saving ideas and links to online sources for more information and support that we as a business can offer our customers. These will either be handed to

customers by our technicians or posted through a letter box should the customer not be available which we will believe will encourage a change in the behaviour of some customers realising a saving in water. Based on our smart meter rollout plan we expect c.650,000 documents to be provided to our customers over AMP8. When factoring expected savings and customer engagement with the documents, we expect water saving of 0.32 Ml/day over AMP8.

- o Doorstep engagement and education. To maximise the customer experience and support for our customer to help save water and energy, our technicians will where appropriate attempt one to one engagement with our customers while at their homes installing their meters. Our technicians, as well as providing the information/education leaflet will offer the customer advice on methods of saving water appropriate to them and signpost information on the leaflet. This will encourage a behaviour change in the way some of customers use water and realise a saving in water. When considering opportunity and customer take up of this activity, we plan to engage with c.194,000 customers in AMP8 with an expected water saving of 0.15 Ml/day.

- o Water saving product installation with engagement. As an additional enhancement to doorstep behaviour change engagement by our technicians at the time of smart meter install as detailed above, our technicians where appropriate will provide and fit a range of water saving devices in customers' homes should they agree to this. These water saving products when utilised with a change in customers water using behaviour will maximise water savings. When considering opportunity and customer take up of this activity, we plan to engage with c.145,000 customers in AMP8 with an expected water saving of 0.73 Ml/day.

- **Leak check and repair**

We will continue to offer our free leaking toilet visits as we know from studies that between 200-400 litres of water per day can be saved from repairing just one. The studies also state that that up to 8% of all toilets in homes across our operating area are leaking. Through the smart meter rollout, we will be visiting customers' homes which grants us a huge opportunity to efficiently identify and make every effort to repair the toilets, along with leaking taps while educating customers on the amount of water being wasted in this way every day.

For internal leakage identification and repair we will adhere to the following:

- o During the smart meter installation process, we will support the customer in the identification of a potential leak through engagement with the customer during any smart meter installation job booking process, doorstep conversation or meter advancement while appliances are not in use.

- o Should a leak be identified, and the customer is engaging on the doorstep, we will offer to check for potential leaking toilets and taps. Should the customer not engage for any reason we will leave behind a supportive leaflet, highlighting the possibility of a leak and referring the customer to our HH leaky loo process.

- o   If the customer engages, agreeing for us to complete the check and repair we will make every effort to repair any leak while in the customer's home. Any leaks that can be repaired in line with the equipment and expertise of the technician will be completed during the meter installation appointment.

- o   Should the work required be complex, such as non-standard taps or concealed toilet cisterns the customer will be referred to our household leaky loo process.

Based on data shared from industry partners, we believe that of the smart meters that we install, around 5.9% will evidence a leaking toilet and 1.6% a leaking tap. Combining the identification and where possible repair, we expect to save 4.6 Ml/day in AMP8.

- **Home water and energy saving visits.**

In recent years, we have focused our household customer water saving visits on the provision of free water saving products and advice to the highest water users. For this option, we are focusing on the Top 5% highest users to enable us to achieve high water savings, we expect each visit to achieve approximately 60 litres per property per day. This assumption is based on calculations carried out using historical data from past home visit projects. This approach will see us offer customers personalised products and tailored information to enhance the opportunity of changing high users' behaviour.

Studies show that most households are using much less than average PCC indicates. We believe this is due to our data being skewed by the Top 5% highest water using customers. Therefore, if we focus on our highest water using customers, we are assuming that the amount of water we can save increases and reducing the amount of water used occurs sooner.

This option will have close synergies with our water efficient digital engagement strategy to support the engagement of the Top 5% group.

To maximise efficiencies and provide the best level of service for our customers we plan to recruit Top 5% water users to receive this service at the point that their meter is replaced with a smart meter (analogue reads will be used to determine water use prior to replacement).

It is anticipated that this option will save 0.66 Ml/day over AMP8, based on c.11,000 visits taking place over the AMP8.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat has proposed a significant increase on the PR19 rate of ODI for PCC, from approximately £200k (2022/23 prices) to £1.72m.

FIGURE 49: PER CAPITA CONSUMPTION VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission ODI (2022/23 prices)
PCC	l/p/d	£1.718m	£35,725	Penalty £234,000 Reward £207,000	£127,500

Source: NWL triangulation of Service Valuation research.

BUSINESS DEMAND

DEFINITION

As per the Ofwat definition[86] which includes business demand linked to growth.

This performance commitment is designed to incentivise the company to promote water efficiency of business customers. Benefits: The benefit of reduced business demand is to improve long term water resources supply/demand balance and reduce the need for water abstraction[87].

CURRENT PERFORMANCE ASSESSMENT

As part of our PC we agree to deliver a reduction of 9% by 2037/38 (three-year average) against a baseline taken in 2019/20, on a three-year rolling average basis (this is excluding growth and applies to the existing customer base). This contributes to Defra's water demand target and associated Environmental Improvement Plan, which seeks a 9% reduction of non-household water consumption by 2037 to 2038, from a 2019 to 2020 baseline, as part of the delivery of the distribution input per person reduction.

We have committed to a relative target (9% reduction excluding growth) instead of an absolute target (9% reduction of overall NHH demand). This equates at 19 Ml/d demand reduction from water efficiency interventions delivered to non-household customers.

Our NHH demand growth forecasts are among the highest in the industry and therefore we have devised a programme of NHH interventions that will deliver a 9% reduction against a baseline excluding growth. We have not committed to anything beyond 2037/38 currently. We believe we will learn a lot of this period and will consider increasing our commitment post 2038 in future resource plans.

CURRENT AMP ACTIONS

This performance requirement was first shared by Ofwat as part of PR24 methodology at the end of 2022. No action to impact the target has been taken in AMP7 due to this. Plans have been created for delivery against target from 2025 onwards.

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[86] **https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/final-methodology/pr24-performance-commitment-definitions/**.
[87] **Business_demand_PC_definition.pdf (ofwat.gov.uk).**

Stakeholder engagement

We have engaged a range of organisations to develop our non-household water efficiency strategy. These include WRE, MOSL, water retailers, wholesale water companies and consultants. We will continue to build on these relationships, with a concerted effort on driving long-term and impactful relationships with water retailers.

We have shared our plans as they have developed with our two largest retailers, Wave and Everflow, who make up c.90% of our NHH connections. Up to and after 2025 we will continue to interact to identify the best ways of delivering together. Discussion focused on the relationships retailers have with their customers could lead to a higher level of engagement, with funding required for retailers to take this on over and above their current level of engagement.

Decisions of how to best to manage this will be agreed ahead of delivery from April 2025 with retailers involvement. We will continue to build on these relationships, with a concerted effort on driving long-term and impactful relationships with water retailers.

Retailer and non-household research

We engaged with Water Resource East specifically to deliver collaborative customer research with retailers and non-households.

We believe that NHH water efficiency options will allow us to improve the supply-demand balance, but we are aware that there are issues and challenges to overcome prior to developing a well-established plan of action in this space. Potential barriers to water efficiency option implementation are listed within the table below.

FIGURE 50: BARRIERS TO WATER EFFICIENCY OPTION IMPLEMENTATION FOR NHHS

TYPE OF BARRIER	BARRIER
Capability	Lack of accessible and accurate consumption data
	No sense of how to be (more) water efficient
Opportunity	No sense of when to be (more) water efficient
	No cost benefit or inadequate cost benefit to save water
Motivation	Lack of awareness of water scarcity content and/or need
	Water restrictions/bans not seen as a business threat
	Deferred responsibility: looking to the industry and government to promote and implement water efficiency.
	Lack of incentives to save (or disincentives not to)
	Limited consequences if NHH do nothing (for example, customer not demanding this)

To overcome these barriers, we have recently completed a piece of research with the industry group, Water Resource East (WRE) and social market research company, Blue Marble. The aim of the research was to understand what is needed by retailers and NHHs to deliver effective water savings, this work addressed Ofwat's research principles to deliver high quality outcomes.

A series of interviews and surveys were conducted with retailers and NHHs to explore understanding of retailers' perspective on improving water efficiency, and specific barriers to more effective collaboration. Increasing our knowledge on the NHH customer perspective building on the primary capability, opportunity, and motivation barriers to greater water efficiency within their organisations (Table 14) and finally to explore the opportunity to work with retailers to 'solve' the water efficiency challenges that wholesalers face in the context of the NHH market.

These challenges include:

- Working within the retail/wholesale framework.

- The provision of meaningful data for retailers and non-household customers.

- Characterising the multiple sectors and business concerns involved.

- Understanding the different behaviours and water usage of the multiple sectors involved.

- Making sure that business customers understand the overarching need for reductions in demand as part of our environmental destination.

- Keeping business customers engaged and supporting them to sustain their level of reduction in demand.

Prior to the research starting NHH customer segmentation was identified through research conducted by the Retail Wholesale Group and Market Operator of England's Non-Household Water Market working group, this segmentation was considered and used as part of the research (Figure 51).

FIGURE 51: A VISUALISATION OF MOSL'S SEGMENTATION OF NHH CUSTOMERS
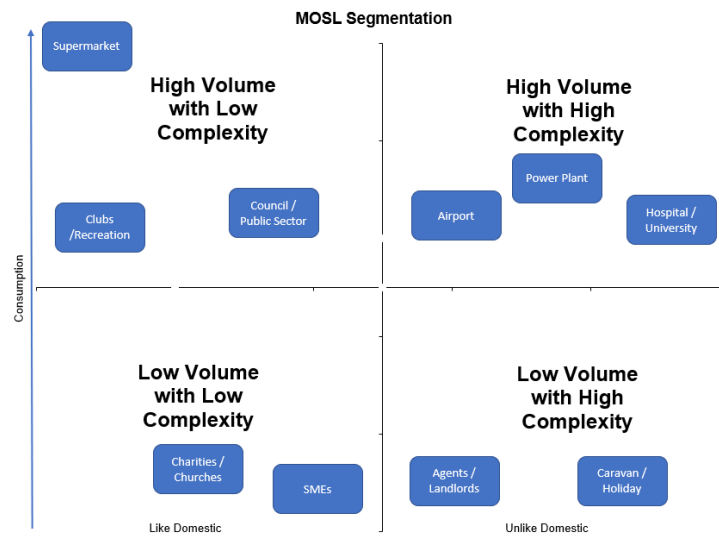
Source: Blue Marble, Promoting Water Efficiency among Non-Household customers, 12 August 2022. (page 8).

This segmentation allows us to determine how we should be engaging with retailers and their customers based on their consumption and how like domestic use their business is. As always, we are keen to develop bespoke offerings to maximise our potential water savings.

Retailers were presented with example propositions to consider and express their thoughts, share highlights and concerns for each. The following propositions were put forward:

- To reduce leakage from business premises (internal plumbing loss and supply pipe leaks).

- In person audits to allow business to understand where savings can be made.

- Adoption of water recycling.

- Incentives, web resources and accreditation.

The research will be shared with MOSL and Ofwat to share the understanding and explore the barriers and requirements identified. It will also be shared with the Retail Wholesale Group on Water Efficiency to make sure all water companies can share in the benefit. We will review the research and evaluate what is possible from the findings and then create scenarios from the NHH water efficiency options before our final submission for WRMP24. This was completed in collaboration with the other WRE water companies to align our action in the resource zones covered.

Within the research, improvements for each proposition were suggested by the retailers and NHHs, to support our most cost effective and efficient plans. The WRE water companies will continue to improve the detail of the options together sharing industry data, align policy where possible and find evidence for costs where not already available. This will ensure one plan for the WRE area and align partly in the North East. These will be carefully reviewed and actioned as part of the NHH Water Efficiency Option creation. It is suggested that further work takes place to understand the water saving potential each of the suggested measures during this option appraisal process.

Quantitative research and further qualitative research may be required to enhance the understanding of the NHH options when scaling up for an even larger audience and to develop the detail surrounding said options. We are committed to complete this as needed.

Ongoing action

September 2023 to March 2025 will see continued learning and collaboration with retailers, water companies, non-household customers, and technical consultants to look at how best to deliver the plan with all partners so we are ready for successful deliver from the start of AMP8.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

We considered several sources when setting our PCL, including:

Customer Research

A triangulation of our customer research bank indicated that business demand was a low priority to our customers. Ofwat's triangulation of research agreed with our assessment of low.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

WRMP / long-term strategy

Our WRMP indicates we will reduce business demand exluding growth by 9% by 2037/38 when comparing annual figures.

NWL National Leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

We have worked from the bottom up using interventions and costs to forecast performance through to 2030.

We ensure our PCL fators in our proposal to reduce non-household demand of 9% by 2037/38 (excluding growth) against a baseline taken in 2019/20.

Our PCL aligns with those to be proposed in our updated WRMP and considers the impact of growth, completed 2023.

FIGURE 52: PCLS FOR BUSINESS DEMAND

	2019/20 base	2025/26	2026/27	2027/28	2028/29	2029/30
Base costs	217.9					
PCL – three-year average (MLD)		232.7	248.6	261.5	270.2	276.7
PCL - % from base		-6.8%	-14.1%	-20.0%	-24.0%	-27.0%
Enhancement and base	217.9					
PCL annual		244.3	258.5	260.7	265.7	273.5
PCL – three-year average (MLD)		228.1	243.2	254.5	261.6	266.6
PCL - % from base		-4.7%	-11.6%	-16.8	-20.1%	-22.4%

Source: NWL.

The enhancement figures above include our proposed 1.8% reduction in relation to consumption of our existing business customer base.

FIGURE 53: REDUCTION IN BUSINESS USE OF EXISTING NHH CUSTOMER BASE

	2025/26	2026/27	2027/28	2028/29	2029/30
PCL – three-year average	0.2%	0.5%	0.9%	1.4%	1.8%
Annual l/p/d	0.5%	1.0%	1.4%	1.9%	2.4%

Source: NWL

OUR PLAN TO ACHIEVE THE PCL

Our WRMP plan outlines the the activites we plan to take in relation to business demand[88]. While below we outline the work we intend to carry out to achieve our 1.8% reduction of demand in relation to the existing business customer base (excluding increase of business customers).

A thorough options appraisal was carried out through our WRMP24 process, starting with an unconstrained list of 91 original options scored according to the following criteria:

• Impact on water savings.

• Impact on changing customer behaviour.

• Research value.

• Innovation value.

• Dependence on others.

• Potential to measure water savings.

• The risk involved in technology and/or products.

These scores were based on previous research and data, which formed the first screening out of options to form the 'constrained' list of options. These constrained options were approximately costed and evaluated for potential water saving, then scored again based on the below criteria:

• Is it cost effective? (L/M/H)

• Is it technically possible? (Y/N)

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[88] WRMP – Northumbrian Water.

- What is the risk of not achieving the deliverable? (L/M/H)

- Does the option deliver a timely water saving? (Y/N)

- Will the option deliver a sustainable saving? (Y/N)

- Is it the same as a household visit? (Y/N)

From the 47 NHH options initially scored, 23 options for NHH were taken forward to the costing process as well as the secondary screening phase outlined below. As they scored 60% or higher. These options formed our non-household scenario.

Costs and savings have been determined based on our own experience with recent household projects and industry evidence provided by other water companies and industry contractors currently delivering activity.

This activity is built into the PR24 as part of <u>Non-Household Demand Enhancement Case</u> (NES36). The total cost of the interventions listed in the table below is £6.4m in AMP8, which equates to an annual cost of £1.3m per year from enhancement funding.

FIGURE 54: ACTIVITY TO REDUCE NHH DEMAND

Intervention	Quantity in AMP	Saving in AMP (Ml/d)
5.2 Information Provision	1,455	0.1
5.3 Infrastructure and Leak Investigation	3,305	0.9
5.4 Water Efficiency Solutions for Domestic-type Use	4,269	1.8
5.5 Water Efficiency Solutions for Mixed-type Use	396	0.4
5.6 Consultancy for Industry	42	1.8

Source: NWL.

A description of the options that make up each intervention category are below:

Information provision

- **Customer side leakage education** – promoting how to find leaks and the importance of checking/ repairing leaking toilets, taps and overflows.

- **Customer specific alerts** - alerts for NHH customers 'we have noticed your use is higher than normal' based on a three-month average. The alert could make customers consider other actions they could do to prevent their consumption increasing, 'do you have a leak?' and to also encourage them to tell us if circumstances have changed, bettering the data we hold. 'There is high demand in your area, please consider reducing your water use'. The alert could make customers consider other actions they could do to prevent consumption increasing.

- **Free water efficiency assessment** - visiting the NHH property to understand and look at ways water can be reduced. A report will be produced from the assessment determining next steps and actions for the NHH. This could include reviewing processes, engaging with employees about water use, as well as leaving a selection of water saving devices from the water saving kit. The assessment will be free to boost take up rate and this channel would be a route to offer NHH's visits from the report findings.

Infrastructure and leak investigation

- **Leak investigation** - NHHs could request a specialist to visit to find a suspected leak or to identify areas where a leak is likely to occur.

- **Rain/greywater re-use** - where possible, installing alternative water use infrastructure in NHHs.

- **Find and fix leaky loos** - supporting NHHs to check for leaking toilets and encouraging them to get repaired. Places such as retail areas, shopping centres/public toilets, supermarkets where there are a large number of toilets will be checked regularly. Depending on type, if a leak is found we either complete the repair, or not complete the repair but the retailer and we should be informed of its find and fix.

- **Toilet replacements** - replacing older toilets with lower capacity, dual-flush toilets.

- **Landscaping redesign** - using low water and drought resistant plants, landscape designs such as rock gardens, and rainwater harvesting, to reduce the need for water use.

Water efficiency solutions for domestic-type use

- **Domestic use self-serve** - water and energy saving products provided for free to companies using domestic type water use (taps, toilets, showers).

- **Individual, tailored audits** - identifying and repairing any leaks (internal like taps and toilets, and external pipes), retrofitting water saving devices within and behaviour change regarding washing, food preparation, and so on. for hairdressers, hotels, leisure centres, multi-business sites, offices, pubs, restaurants, schools, shops, and residential care homes.

Water efficiency solutions for mixed-type use

- **Free water efficiency visit** - similar to the assessment above, this would involve visiting the NHH property to understand and look at ways water can be reduced. A report will be produced from the assessment determining next steps and actions for the NHH, which would include installing water saving devices into employee spaces and repairing leaks.

Water efficiency consultancy for industry

This option will start with the highest water users and work downward to better understand water use in industry, identify areas where water is not being used efficiently, and provide suggestions and solutions to reduce water waste. An external contractor will be used to ensure the correct level of expertise is available, and each visit will be thorough and tailored. Solutions could include reusing greywater, harvesting rainwater, reducing use of potable water, installing devices to regulate water use, and many more.

Golf course water efficiency

Supporting golf courses to use water more efficiently. Golf courses use approximately 70,000m3 annually for irrigation and 10,000m3 for hospitality purposes. This would include working with golf courses to introduce rainwater harvesting and other smart irrigation solutions to reduce this consumption of potable use. This option could look at supplying golf courses with an irrigation audit where options are explored to reduce their consumption as well as a water saving visit for their clubs and hospitality venues to check for any leaks/repair them and install water saving devices.

Other forms of reduction

Reduction of domestic type use (showers, taps, toilets, garden watering) in non-households, for example, leisure centres, hotels, offices, multi-site businesses, retail.

Reduction of medium size water users, for example, types of manufacturing, farms etc through a mix of domestic type use and leakage identification and resolution.

Reduction of the largest water users, for example, manufacture of chemicals/meat and mining services through leak identification and resolution plus assessing process water changes, such as rain/grey water systems.

Identification and resolution of plumbing losses (leaking toilets, taps, overflows, boilers).

Identification and resolution of customer side leakage (supply pipes).

Usage alerts from smart meters and personalised customer engagement (where installed).

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We have limited data points to assess the overall ODI rate Ofwat has proposed. Our own research indicated our customers were prepared to pay the value of £55,000 per MLD of water saved through business demand. Ofwat's research ash indicated a higher value of £365,000 per MLD. We propose to use Ofwat's ODI valuation.

INTERRUPTIONS TO SUPPLY OVER THREE HOURS

DEFINITION

As per the Ofwat definition.
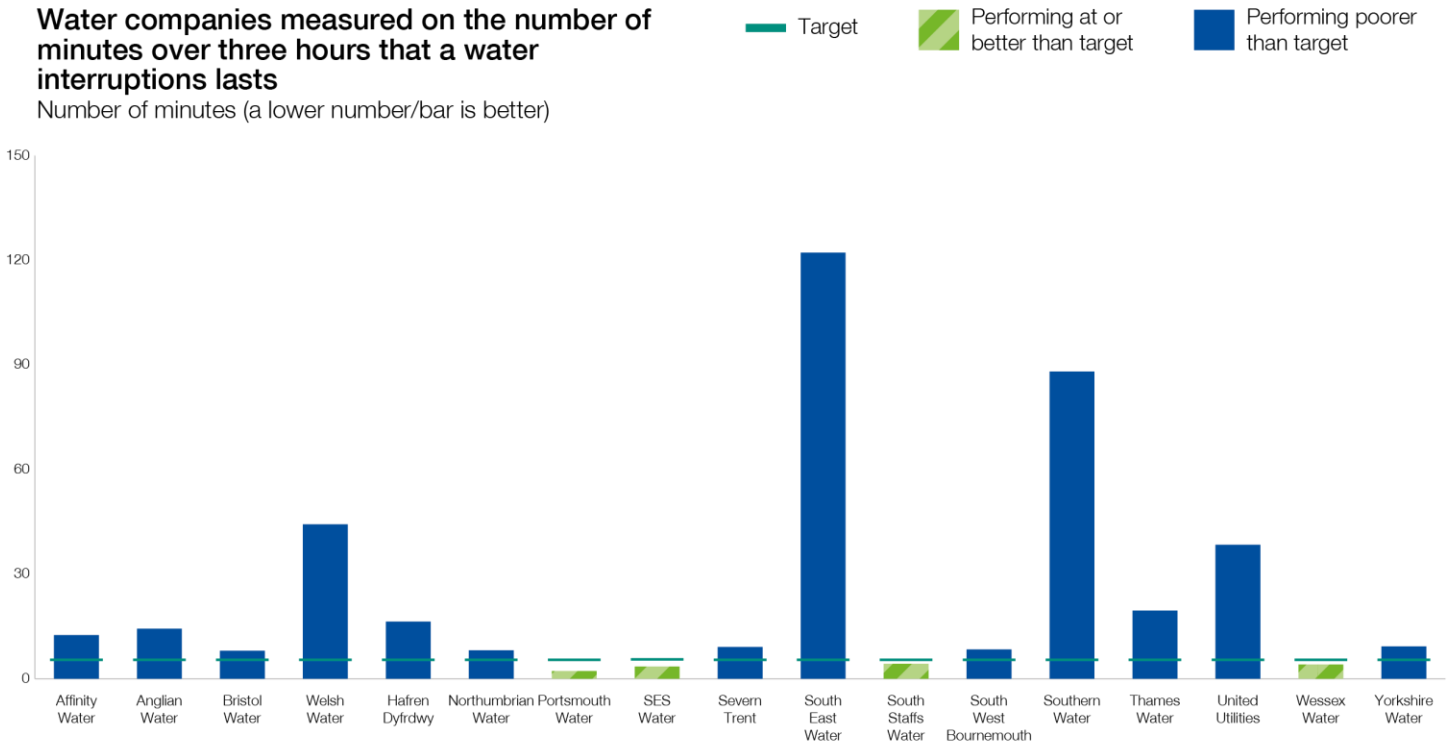
CURRENT PERFORMANCE ASSESSMENT

Performance against this measure as per the definition presented in our FD had been better than target for both years of the AMP to date (excluding the impact of Storm Arwen which was a civil contingency). However, we performed below target for 2022/23, at 8 minutes 17, although this was only 14 seconds away from the upper quartile performance across the industry.

Supply interruptions remain a key area of focus for us, and underlying performance has been stable when compared to 2021/22. Our performance of 8 minutes 16 seconds is due to the uplift in repair activity caused by the dry soil conditions during the summer heatwave, where temperatures hit 40 degrees in our Essex region. Moreover, supply interruptions were also caused by the freeze-thaw event which occurred in both of our operating areas during December 2022 when temperatures dropped to a low of -7 degrees Celsius recorded on 13 and 16 December to a high of 13 degrees on 19 December. Our response was to recruit additional resources to help find and fix leaks.

We are disappointed that one of our largest events was caused by a third party who damaged three of our mains while working in Middlesborough. It is incidents such as these which drive our passion to see the National Underground Asset Register (NUAR) deployed across the UK. Developed at our 2017 Innovation Festival, it sees existing data on underground pipes and cables brought together in one single, digital map to display where electricity and phone cables, and water and gas pipes are buried.

NUAR has been live in our North East operational area since April 2023. Once fully operational across England, Wales and Northern Ireland, NUAR will help improve efficiencies in construction and development, reduce disruption to the public and businesses (from extended road closures and congestion), improve workers' safety and is envisaged to deliver at least £350 million economic growth per year.

FIGURE 55: CURRENT INDUSTRY PERFORMANCE FOR INTERRUPTIONS TO SUPPLY (2022/23)

Water companies measured on the number of minutes over three hours that a water interruptions lasts
Number of minutes (a lower number/bar is better)

Legend: ── Target | Performing at or better than target | Performing poorer than target

Source: NWL analysis of Ofwat Industry Historic dataset

CURRENT AMP ACTIONS

We continue to learn from the events we have had by holding weekly reviews to share what went well and where we could have done things differently, sometimes changing processes to prevent similar occurrences. We endeavour to improve our response times to all reports of nil supply, understand when to escalate an event, and acknowledge our forward thinking, such as when restoring supplies through alternative methods (before the repair is completed). Our focused approach means that all teams involved know to keep supply interruptions as short as possible.

We continue to carry out Post Interruption Reviews for events over three hours that affected more than 100 properties. The aim of these meetings is to understand and record what we could do better and share any learning to reduce the likelihood of a similar event occurring again and allow others to gain knowledge from other's experiences.

We have also begun developing a MOWBI, which is a mobile pumped water storage unit that enables some properties restored temporarily. These are particularly useful in those events where a property requires a more complicated repair or there is a health and safety reason. We anticipate this will mean some customers may experience a shorter interruption in the future, even while the permanent solution is still ongoing.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED THRESHOLD

In setting our PCL, we considered:

Regulatory methodology

Ofwat has indicated they intend to remove all exceptions such as severe weather, which pushes more risk on to companies from events such as Storm Arwen. We outlined the impact that this had on our performance in 2021/22, moving us from just over four minutes, and ahead of our target to 11 minutes 45 seconds and well below the set PCL. An increase in stormy weather is likely to impact on this measure moving forward. There is various information that can be found to suggest an increase in stormy weather. The met office has provided evidence to indicate that summers are getting wetter[89]. The government flood forecasting centre noted that in February 2022, the UK experienced three named storms in one week for the first time ever (since naming began in 2015-16)[90].

Long-term strategy

Our long-term strategy ambition is to make sure interruptions to supply over three hours are no longer than two minutes by 2050.

Customer research

A triangulation of our customer research bank indicated that interruptions to supply was ranked as a low priority across our list of measures proposed for PR24. Once we reviewed this against Ofwat's bank of evidence, we determined that interruptions to supply was a medium priority.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix **A7 – Customer and Stakeholder Engagement** (NES08).

Historic and comparative data

Historic and comparative data extrapolated to 2030 using both linear and logarithmic curves. We recognise that Ofwat provided an industry historical dataset, with the most recent set in April 2023. We have analysed the data which is relevant to the current AMP7 definition as it is closest to the proposed definition at PR24. However, data for this is only available from 2016/17 onwards. We show the upper quartile performance, extrapolated to 2030, with our forecasted performance. The expected upper quartile for 2030 sits between 5 minutes 20 second and 5 minutes 45 seconds. This level of performance is expected given the removal of the civil contingency exception from the definition.

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[89] **https://www.metoffice.gov.uk/research/news/2021/recent-trends-and-future-projections-of-uk-storm-activity#:~:text=Annual%20trends%20are%20small%20relative,and%20winters%20are%20assessed%20separately.**
[90] **https://www.gov.uk/government/publications/flood-forecasting-centre-annual-review-2021-to-2022/flood-forecasting-centre-annual-review-2021-to-2022.**

FIGURE 56: FORECASTING FUTURE ITS THREE HOURS PERFORMANCE USING OFWAT HISTORIC INDUSTRY TRENDS.
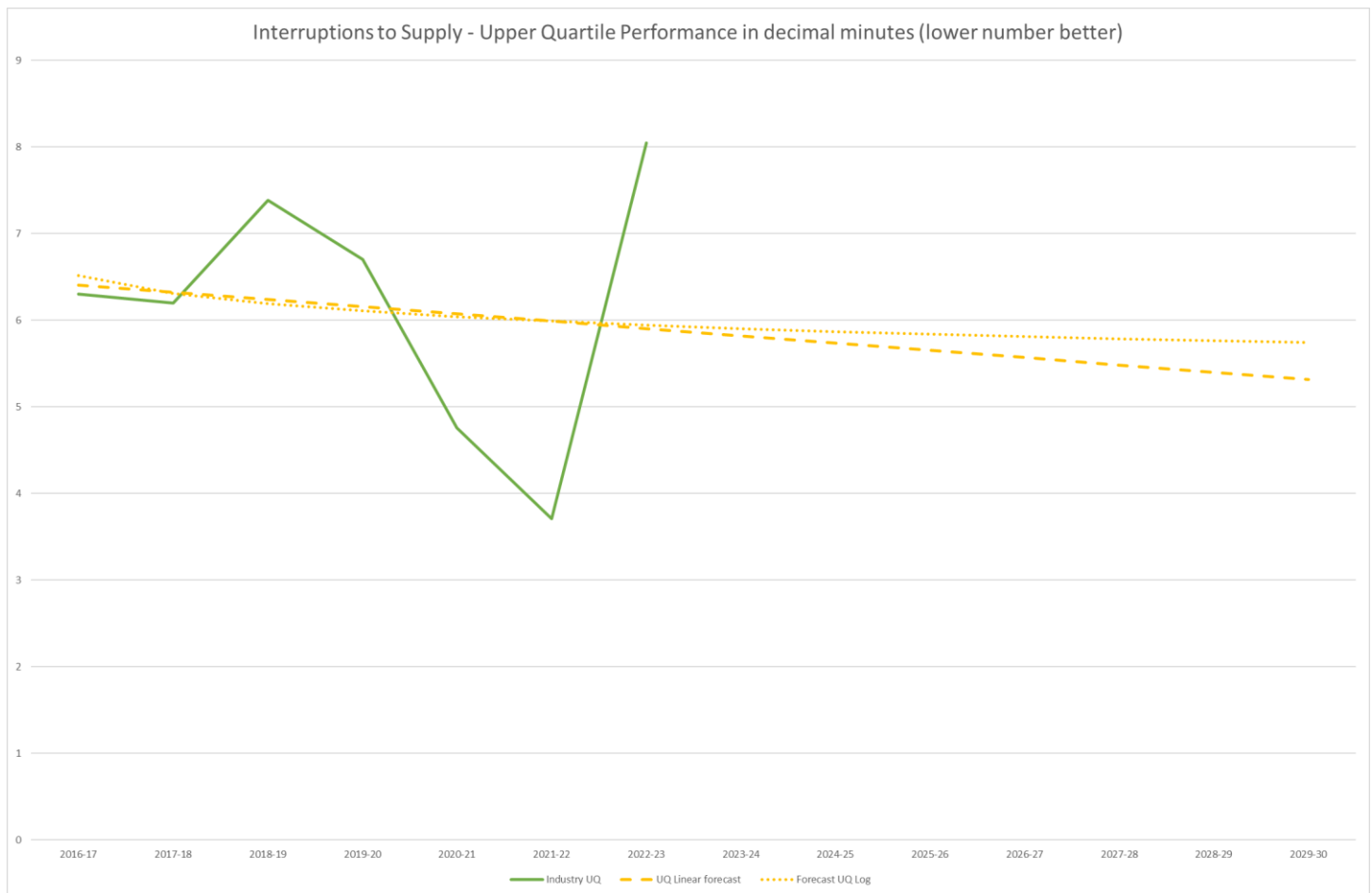
Source: Our analysis using Ofwat Historic Dataset April 2023 and Industry APR performance for 2022/23.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational data

We have worked from the bottom up using interventions and costs to forecast performance.

FIGURE 57: PCLS FOR ITS THREE HOURS

Targets for reducing the length of time properties are without water
Duration without water for more than 3 hours by minutes per property
(a lower bar/number is better)

●— Target   █ Current performance
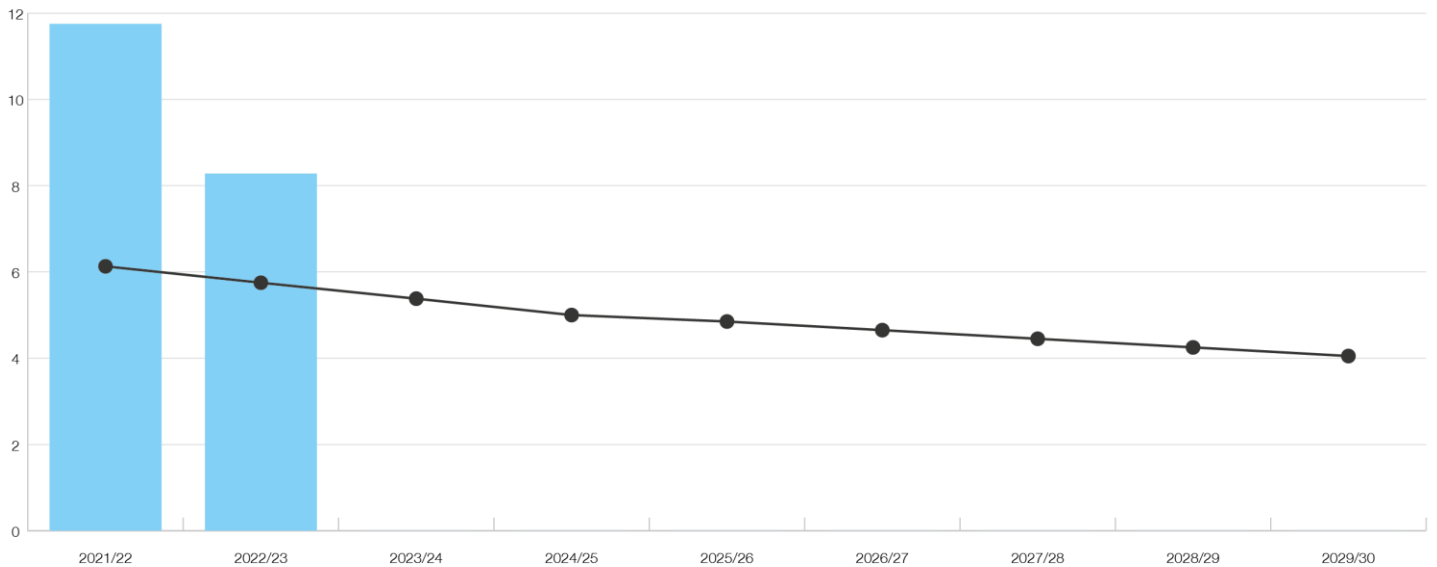
	2025/26	2026/27	2027/28	2028/29	2029/30
Base PCL	00:04:58	00:05:04	00:04:52	00:04:40	00:04:28
Enhanced PCL	00:04:51	00:04:39	00:04:24	00:04:15	00:04:03

This measure also attracts enhanced rewards for frontier performance. The current frontier level of performance is 00:01:23, which was achieved by SES Water in 2019/20 (the only company to get below two minutes). We note earlier in our methodology that companies delivering frontier performance have been unable to maintain this level year to year. Since this achievement, SES has achieved 00:02:58 as its next lowest time. This will be exceptionally challenging for companies to achieve.

FIGURE 58: PROPOSED ENHANCED PCLS

	2025/26	2026/27	2027/28	2028/29	2029/30
Enhanced reward threshold	**00:01:23**	**00:01:23**	**00:01:23**	**00:01:23**	**00:01:23**

OUR PLAN TO ACHIEVE THE PCL

Performance associated with interruptions to supply is dependent on weather. In the current price review period 2020-2025 we have already seen first hand the impact of civil contingency level storm can have on overall performance. The measure for 2025 onwards removes the exception of civil contingencies from performance. We therefore propose a two-pronged approach to improving our performance.

Firstly we will continue to build upon the interventions we have used previously to reduce ITS; activities include:

Root cause analysis

Additional resources to assist in the analysis of an interruption event and to review the root cause of failure. This will allow us to better understand the key issues on our network and to prioritise the best interventions for future delivery of targets.

Improve our DMA alarm process

Quicker responses and appropriate actions to failures at any time of the day by incorporating DMA logger data directly into our Regional Control Centre. Alongside this we will have intelligent alarm profiles will give us more reliable notifications and 24/7 monitoring.

Calm networks

We continue to train our employees through our Water Shed facilities to make people aware of pressure transients and the damage they can cause. We will also look to instigate proactive pressure transient surveys to identify and locate the source of any issues on our network. We believe if these can be resolved at source, then there should be a reduction the number of mains failures and therefore interruptions to supply.

Mains renewal

As the network gets older and the condition of pipes deteriorate then more failures will occur. The highest risk pipes, according to our deterioration models, need to be replaced at an appropriate rate to maintain performance. Consideration also needs to be taken to severe weather events, like hot dry summers or a freeze/thaw winter, that can significantly affect certain pipes in certain soils.

Our second approach considers how we can reduce the impact of severe storms have on our network. We have included an enhancement business case[91] to improve our overall resilience to power failures, such as those seen in Storm Arwen. This increased power resilience seeks to reduce the peaks in performance associated with when the power networks are unable to provide sufficient power to our treatment works.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We propose to apply Ofwat's value of £1.24m per minute of under or out performance.

FIGURE 59: ITS THREE HOURS (ALL) VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission ODI (2022/23 prices)
Interruptions to supply	**Time HH:MM:SS**	**£1.242m**	£338,000	£1.2m	Penalty £3.65m Reward £1.86m

Source: Our triangulation of Service Valuation research.

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[91] Appendix **A3 - Costs** (NES04), Power Resilience.

MAINS REPAIRS

DEFINITION

As per the Ofwat definition[92].

CURRENT PERFORMANCE ASSESSMENT

Our performance has deteriorated in 2022/23 to 154.9 repairs per 1,000km against a target of 132.4. As a result, we remain better than average in the industry.

FIGURE 60: CURRENT INDUSTRY PERFORMANCE FOR MAINS REPAIRS (2022/23)

Water companies measured on the number of mains repairs
per 1,000km of water network (a lower number/bar is better)

Legend: Target | Performing at or better than target | Performing poorer than target
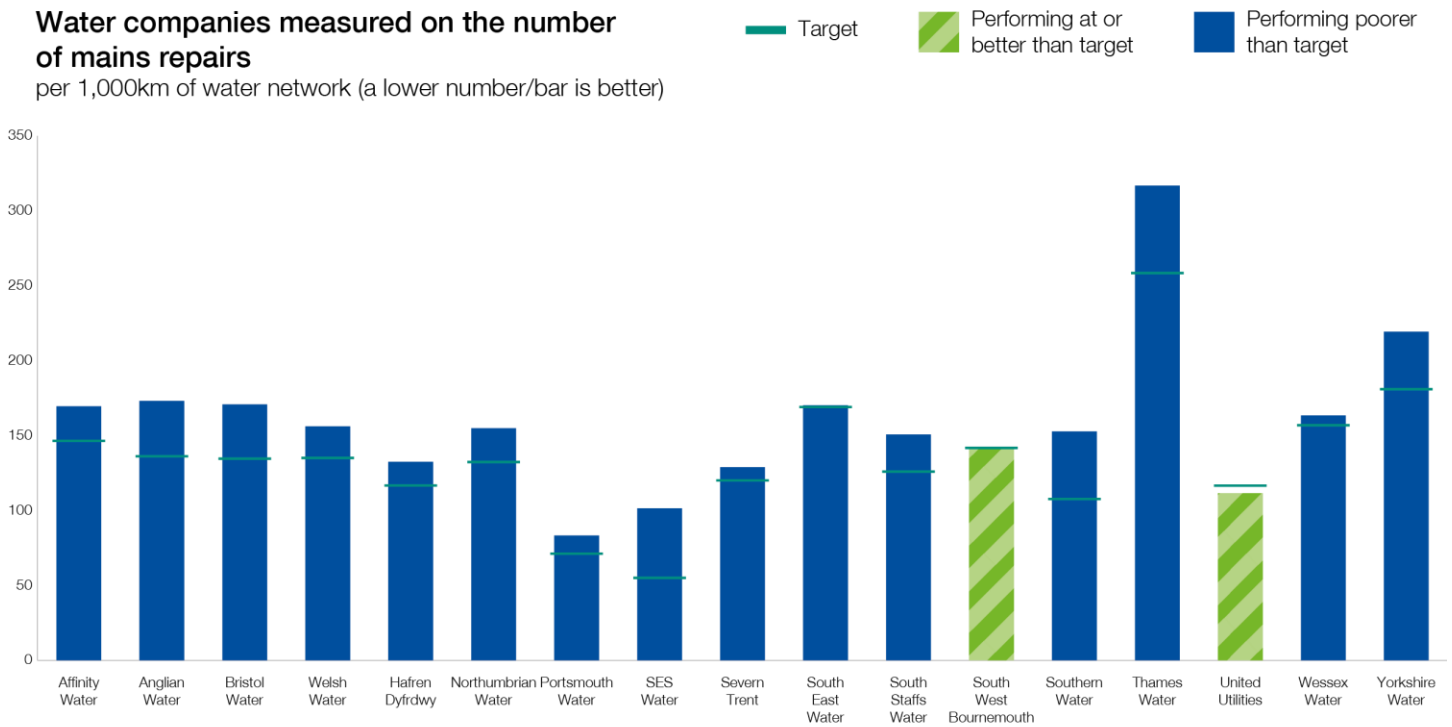
Source: NWL analysis of Ofwat Industry Historic dataset.

Our performance for mains bursts has been impacted by the dry soil conditions during the summer heatwave, where temperatures exceed 40 °C for the first time ever in the UK. As well as the freeze/thaw event, which occurred in both of our operating areas during December 2022. During this time temperatures dropped to a low of -7 degrees Celsius recorded on 13 and 16 December to a high of 13 degrees on 19 December. While we are not able to fully weatherproof

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[92] https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Mains_repairs_PC_definition.pdf.

our network, we can make sure our response to these events is our top priority. We did have some freeze/thaw events where there was a high risk of properties experiencing a long interruption and one such event saw 18,723 properties experience an interruption of at least one hour. However, our focused response meant that only two customers went on to experience a supply interruption greater than 12 hours.

It is the significant uplift in mains bursts during the winter and summer months that have markedly impacted our overall performance. For example, we had close to double our forecasted mains bursts in August compared to our recent performance based on a three-year average. Our underlying burst rate continued to be in line with previous years outside of July through to September and December and January this year.

CURRENT AMP ACTIONS

Looking ahead we continue to refine our modelling capability for identifying areas at a higher risk of bursts. We will feed these into our analysis as we prioritise areas for investment. We continue with staff training calm network operations, and investing technology, which can help us identify activity on the network that can cause a mains burst.

We continue to focus efforts on ways in which we can mitigate the impact of demanding weather scenarios on our performance. Outside of July, August, December and January our run rate for bursts has been in line with previous years indicating a strong underlying performance consistent with our performance commitment.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

In setting our PCL for main repairs we have used have considered:

Customer research

A triangulation of our customer research bank indicated that customers consider asset health measures were a low importance across the list of measures proposed for PR24. However, Ofwat's assessment indicates this to be a medium priority. Reviewing this information, we believe that asset health measures are consider a medium priority.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

The industry data set to forecast the upper quartile position. We have used linear and log assessments to provide a range of estimates for UQ in 2030 and 2050.

FIGURE 61: TRENDING MAINS REPAIR PERFORMANCE TO 2029/30 USING HISTORIC DATA
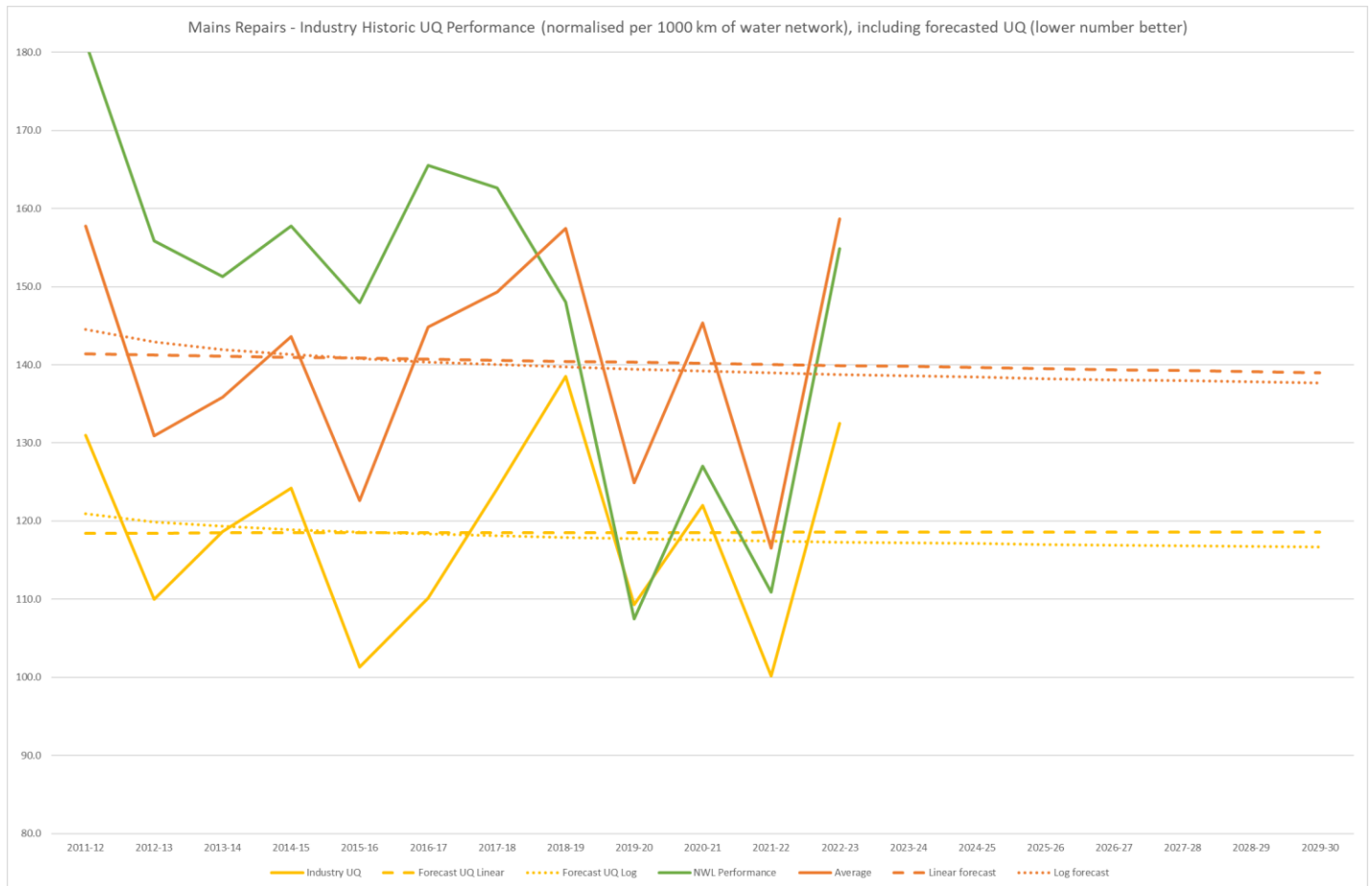
Source: NWL Analysis of Ofwat Historic Data Set and 2022/23 APRs for the industry.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational data and analysis

We have worked from the bottom up using interventions and costs to forecast performance.

Assessment

We propose to set our performance target for mains repairs as per below.

FIGURE 62: PCLS FOR MAINS REPAIRS

Targets for reducing the number of mains repairs
Number of mains repairs, per 10,000 km of water mains (a lower bar/number is better)

● Target   ▮ Current performance
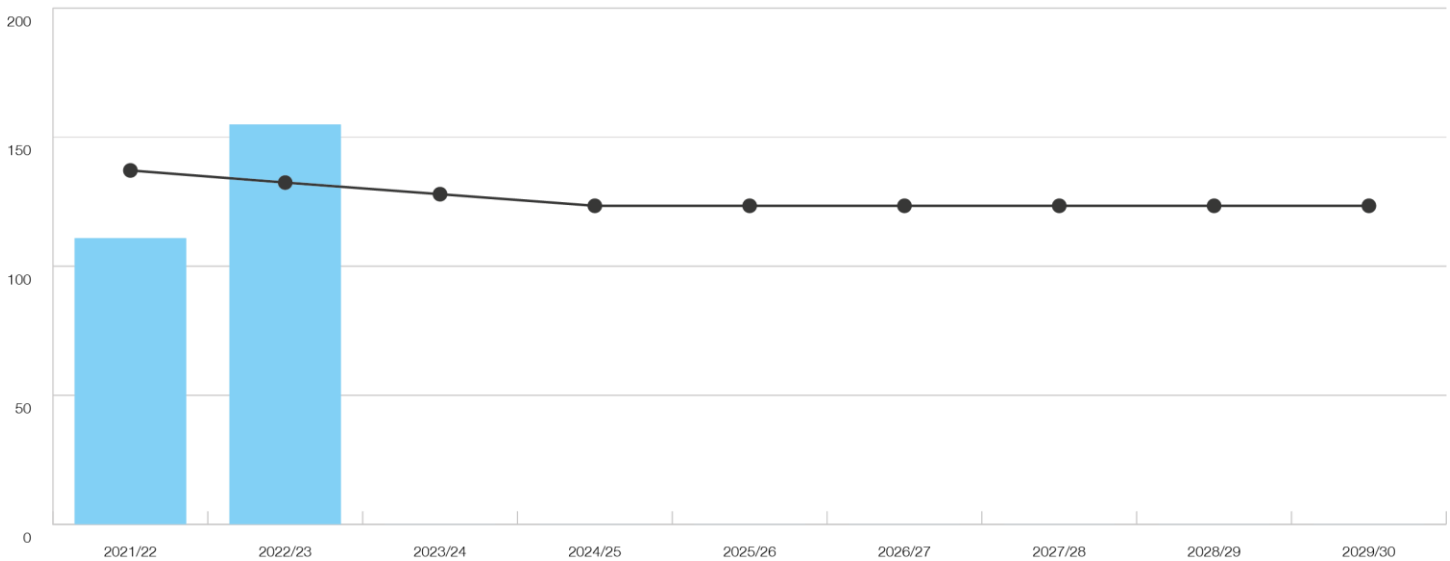
	2025/26	2026/27	2027/28	2028/29	2029/30
Base PCL	123.4	123.4	123.4	123.4	123.4

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

In line with our plan to deliver the Interruptions PCL, we outline the key activities we will utilise to reduce the number of failures on our network. However, we also note that the additional activities we will carry out to reduce leakage, including the proactive find and repair of mains bursts, we will see an increase in the number of mains repairs overall.

Calm networks

We continue to train our employees through our Water Shed facilities to make people aware of pressure transients and the damage they can cause. We will also look to instigate proactive pressure transient surveys to identify and locate the source of any issues on our network. We believe if these can be resolved at source, then there should be a reduction the number of mains failures and therefore interruptions to supply.

Mains renewal

As the network gets older and the condition of pipes deteriorate then more failures will occur. The highest risk pipes, according to our deterioration models, need to be replaced at an appropriate rate to maintain performance. Consideration

also needs to be taken to severe weather events, like hot dry summers or a freeze/thaw winter, that can significantly affect certain pipes in certain soils.

We include a mains renewal enhancement, however as noted in table CW15, the benefits of this case are not realised until AMP9, so no enhancement PCL is included in our business plan for AMP8.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat has proposed a symmetrical ODI rate of £230,000 per repair in 1,000 kms. We reviewed our data for ODIs based on per repair below.

FIGURE 63: MAINS REPAIRS (ALL) VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate (2022/23 prices)	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission ODI (2022/23 prices)
Mains repairs	**Per repair per 1,000 km**	**£231,000**	£182,000	Penalty £175,900 Reward £115,700	Penalty £220,000 Reward £115,800

Source: Our triangulation of Service Valuation research.

We propose to apply Ofwat's symmetrical penalty and reward.

UNPLANNED OUTAGE

DEFINITION

As per the Ofwat definition[93].

CURRENT PERFORMANCE ASSESSMENT

This is common, penalty-only measure, which is used to assess the health of our assets for our water abstraction and water treatment activities. It is designed to make sure water companies appropriately maintain and improve the asset health of their non-infrastructure or above-ground water assets for the benefit of current and future generations and demonstrate their commitment to asset stewardship responsibilities.

Ofwat set us the very ambitious target of having only 2.34% of unplanned outages by the end of 2025. Every day our workers discuss how best to look after the treatment of water and the control of its distribution around our network, they look to minimise the time of any unplanned, or planned treatment issue and over the last year we've been tested by the weather.

We have once again improved performance reporting 3.51% across the company beating our 2022/23 target of 4.36%. However, our performance remains in the lower quartile.

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[93] **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Unplanned outage_PC_definition.pdf.**

FIGURE 64: CURRENT INDUSTRY PERFORMANCE FOR UNPLANNED OUTAGE (2022/23)

Water companies measured on the loss of peak week production capacity
Percentage of loss against the overall company peak week capacity (a lower number/bar is better)

Legend: Target | Performing at or better than target | Performing poorer than target
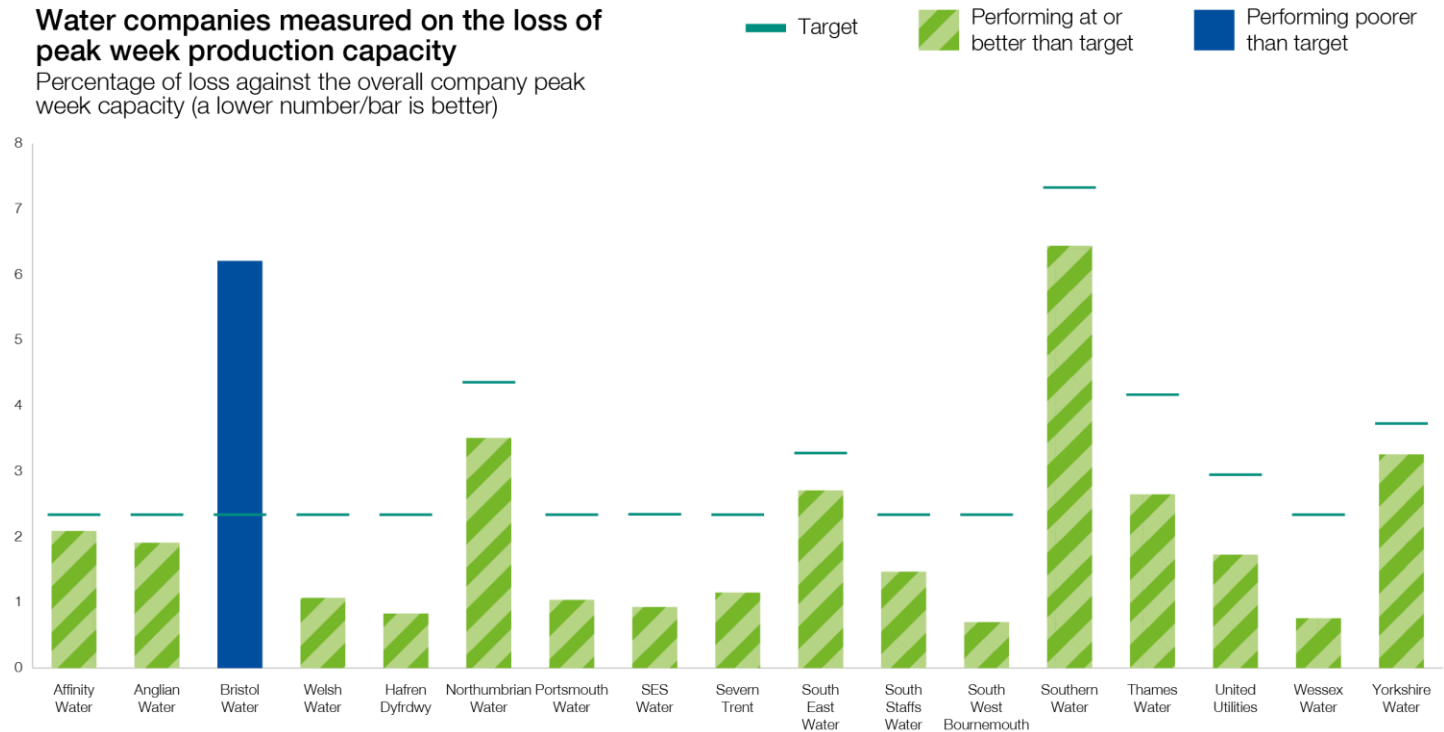
Note: Performance shown is for the current PR19 definition of unplanned outage which includes the raw water exceptions.

Source: NWL analysis of Ofwat Industry Historic dataset.

CURRENT AMP ACTIONS

We continue to inform Ofwat of any unplanned or planned situations when we're unable to meet Peak Week Production Capacity (PWPC) because of any asset failures or the inability to treat water to required standards. In addition, we continue to improve our processes and simplify the data entry process for operations. Internal engagement through regular meetings and outage reviews means our people have a clear awareness of the need to accurately record outages. Our internal and external audit teams ensure the number we provide is as rigorous as it can be.

Our improvement plans remain centred on proactive maintenance regimes, continued operator asset care and delivery of future investment to our water treatment assets.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

In setting our PCL for main repairs we have used have considered:

Customer research

A triangulation of our customer research bank indicated that customers consider asset health measures were a low importance across the list of measures proposed for PR24. However, Ofwat's assessment indicates this to be a medium priority. Reviewing this information, we believe that asset health measures are consider a medium priority.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

In setting our PCL, we recognise that we are a lower quartile performer. However, we have consistently improved our score since the AMP began, to 3.51 in 2022/23 (under the PR19 reporting definition), while under the PR24 definition with the removal further exclusions our performance is at 6.5 for 2021/22 (v 4.57% for our PR19 definition), slightly up on the previous year.

Reviewing Ofwat's data set for historic performance indicates the industry UQ has risen from just under 1 in 2020/21 to 1.36 in 2021/22. (we do not have comparative industry data for the PR24 defintion of unplaned outage for 2022/23).

FIGURE 65: TRENDING UNPLANNED OUTAGE PERFORMANCE TO 2029/30 USING HISTORIC DATA
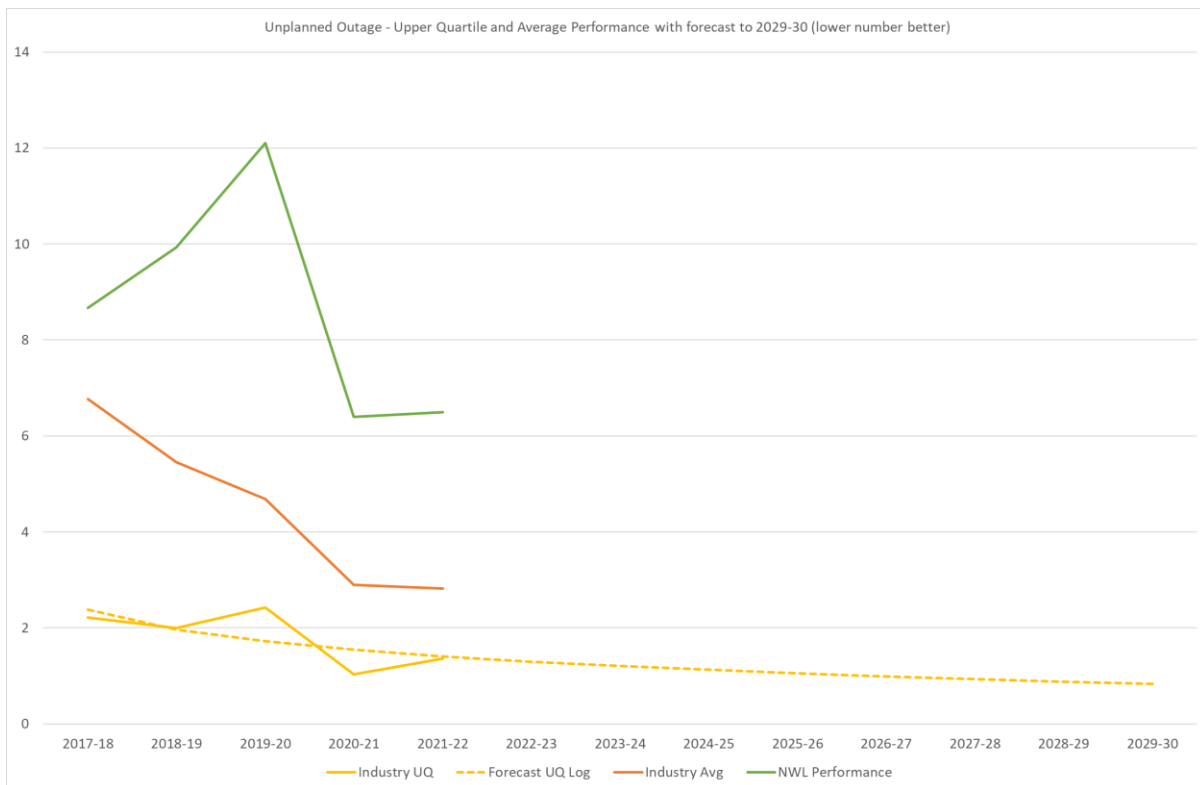
Source: NWL analysis of Ofwat Performance data set.

Further review of the historic dataset indicates some large variations between reported company performance for the PR19 measures and the PR24 definition removing the raw water exceptions.

Over the past three years 2019/20 to 2021/22 companies have reported uplifts due to the removal of exceptions between 0% and 710%. We are concerned about the overall reliability of such data due to the variations.

FIGURE 66: COMPANY VARIATION OF PERFORMANCE BETWEEN PR19 AND PR24 DEFINITIONS OF UNPLANNED OUTAGE

Company	2019/20	2020/21	2021/22	Average variation
ANH	57.79%	83.33%	31.98%	57.70%
WSH	0.00%	0.00%	0.00%	0.00%
HDD	0.00%	0.00%	0.00%	0.00%
NES	23.22%	12.48%	42.23%	25.98%
SVE	3.15%	21.90%	37.80%	20.95%
SWB	123.61%	83.17%	2.08%	69.62%
SRN	1.02%	2.50%	2.09%	1.87%
TMS	15.63%	42.05%	2.68%	20.12%
UU	76.20%	115.96%	91.30%	94.49%
WSX	250.00%	710.53%	212.58%	391.03%
YKY	43.24%	43.41%	20.42%	35.69%
AFW	43.86%	31.52%	56.30%	43.89%
BRL	316.67%	200.00%	9.20%	175.29%
PRT	0.00%	0.00%	0.00%	0.00%
SEW	2.72%	19.74%	5.81%	9.43%
SSC	177.36%	70.18%	223.33%	156.96%
SES	0.00%	0.00%	0.00%	0.00%

Source: NWL analysis of the Ofwat Historic Performance Data set.

Given this information, we believe there needs to be careful consideration given to forecasts from historic data.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry. We recognise that our proposed targets will not move us above the forecast average for the sector. We were mindful that customers did not want to pay for service improvement and also consider that the measures in place to track and monitor asset health in the future will need to change in order to become more comprehensive. We also note that no company has met our national leader assessment criteria.

Operational data and analysis

We have worked from the bottom up using interventions and costs to forecast performance through to 2030. We have utilised the three-year average raw water quality exclusion value and our best performance in 2022/23 to identify the base performance for years one to five. Work at Horsley WTW is forecast to be complete in 2026 with a positive influence from year three. We are also investing in nitrate removal technology through WRMP at two sites in Essex and one site Suffolk, we have estimated the benefit of this raw water quality outage will be delivered by year three and the benefit can be seen in years four and five.

We also note an average uplift of 25% between our PR19 reporting and re-evaluate values for PR24 removing the raw water exceptions from the measure.

FIGURE 67: PCLS FOR UNPLANNED OUTAGE

Targets for reducing unplanned outage
(a lower number/bar is better)
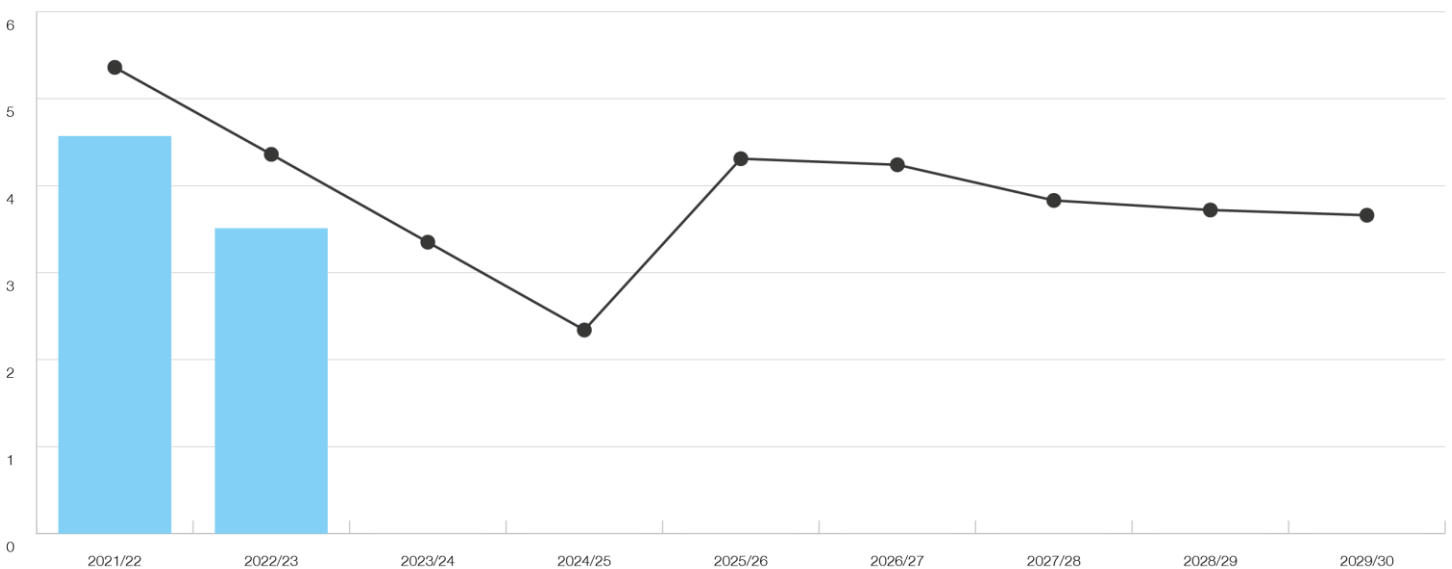
Note: target from 2025 includes the DWI notice

	2025/26	2026/27	2027/28	2028/29	2029/30
PCL base (%)	4.31%	4.24%	3.83%	3.77%	3.70%
PCL enhanced (%)	4.31%	4.23%	3.82%	3.76%	3.69%

Source: NWL.

Note, the overall PCL between 2024/25 and 2025/26 increases due to the change in definition at PR24.

OUR PLAN TO ACHIEVE THE PCL

We manage our unplanned outage performance through a number of channels. There is routine daily contact between our operational teams and our performance analysts to make sure that all outages, both planned and unplanned, are accurately recorded. Asset maintenance work is carefully planned in to make sure that there is always an adequate supply of water to our customers. Reactive maintenance work is carried out in priority order with the highest priority given to health and safety and water supply issues.

We have a monthly review forum made up of stakeholder departments including performance, planning and operations. Performance is reviewed, causes of unplanned outage are discussed, remedial actions and learning is documented and disseminated. Through this forum and by working with our maintenance teams we have improved our stock of critical spares to reduce outages. In response to unplanned outages, reviews are carried out. These reviews are to identify the root cause of the outage and to make sure that our people have a clear awareness of the accuracy required when recording outages. The outputs from these reviews are then shared in the monthly forum. In addition, we continue to improve our processes and simplify the data capture and entry process for our operations teams.

We experience raw water quality outage, primarily in Essex & Suffolk Water, with raw water being periodically unsuitable for water treatment due to the levels of turbidity, algae, cryptosporidium and nitrate. Our WRMP for Essex and Suffolk includes nitrate treatment at three sites to mitigate some of this outage. The other sources of outage were reviewed for raw water deterioration enhancement funding but we felt the cases were not yet compelling. We will continue to monitor this and include enhancement schemes in future business plans as required.

Our improvement plans are centred on proactive maintenance regimes, continued operator asset care and delivery of future investment to our water treatment assets.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat has proposed an ODI rate of £1.859m per %. Below we review this against other available data points.

FIGURE 68: UNPLANNED OUTAGE VALUATIONS

Measure	Unit	Ofwat PR24 ODI Rate (2022/23 prices)	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL Submission ODI (2022/23 prices)
Unplanned outage	**Per %**	**£1.859m**	£1.16m	£2.03m	n/a

Source: Our triangulation of Service Valuation research.

We propose to apply Ofwat's ODI rate.

WATER QUALITY CONTACTS

DEFINITION

As per the Ofwat definition[94] and includes the DWI information letter 04/2022.

CURRENT PERFORMANCE ASSESSMENT

For 2020 to 2025 our water quality contacts measure was split between taste and smell, and appearance. We have performed better than our target for both measures in the AMP to date. Combining performance, in 2022/23 we achieved 0.96 contacts per 1,000 population. This performance puts us ahead of average (1.04 in 2022/23) but not yet at upper quartile in the industry (0.65). However, we do note that our performance among those companies that treat highly coloured peatland waters is at upper quartile.

FIGURE 69: CURRENT INDUSTRY PERFORMANCE FOR WATER QUALITY CONTACTS (2022/23)
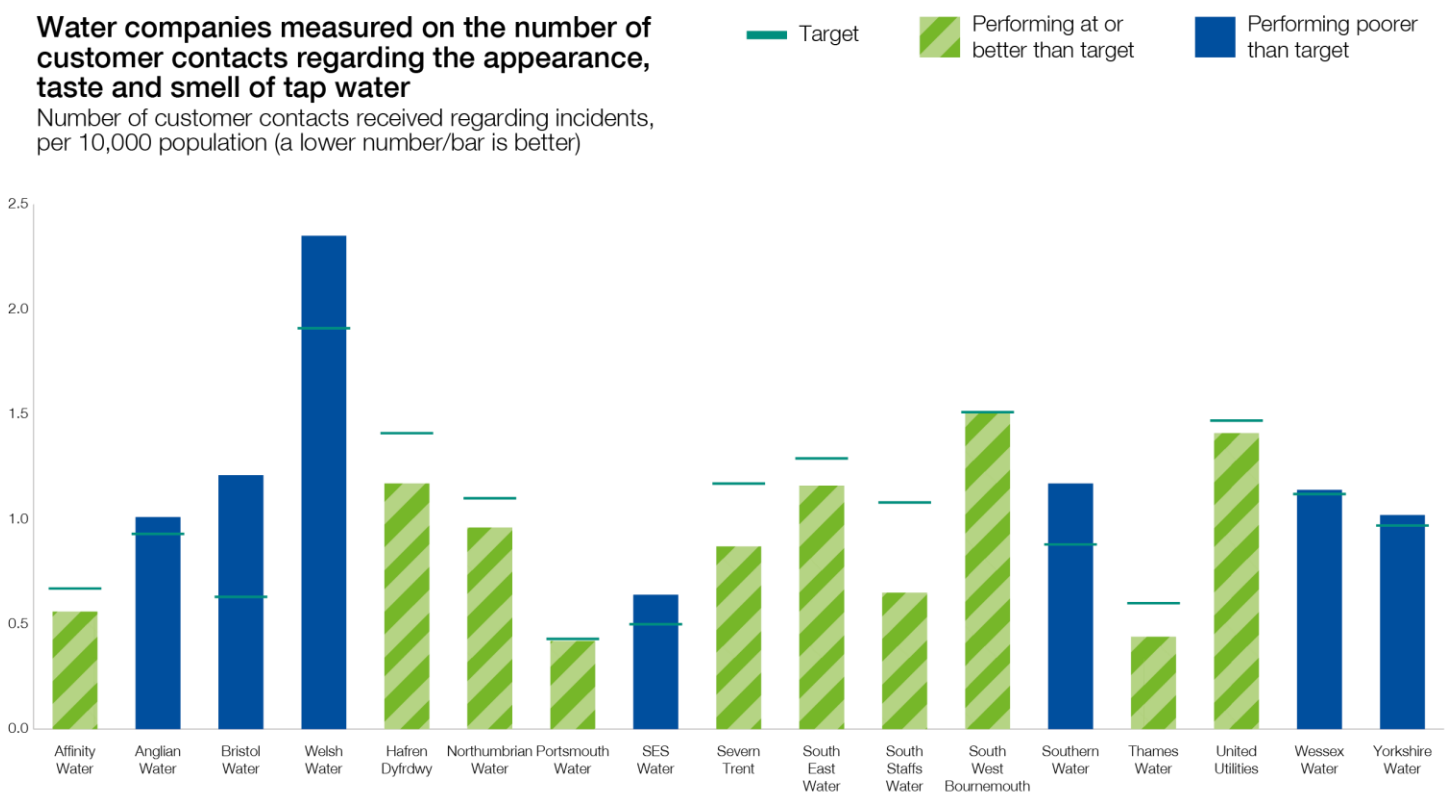
Source: NWL analysis of Ofwat Industry Historic dataset.

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[94] https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Customer_contacts_about_water_quality_PC_definition.pdf.

CURRENT AMP ACTIONS

Around 40% of customer taste and smell contacts are recorded as chlorine based. We have been carefully controlling the level of chlorine in the water, balancing the needs of water safety and water acceptability. Customer engagement has also identified that change causes concern for customers and can therefore trigger contact. Water supplies for most areas routinely come from the same source. However, to carry out asset maintenance, or in response to reactive issues like a burst pipe, water to an area can be re-zoned through a different route or come from a different source treatment works. It may also be necessary for us to change the source of supply in drier weather to protect resources and preserve stocks.

Our plan also continues to focus on appearance: discoloured water – brown, orange, or black, which is our major contributor of contacts to this measure. Very occasionally, and for a short time, customers' tap water may appear discoloured. This is caused by the disturbance of harmless material in our water supply network, possibly caused by a burst, leak or third-party activity. We are continuing to progress with our programmes of work agreed with the DWI to improve the number of trunk mains in which flow can be automatically raised with less risk of disturbing mains material and causing discolouration in downstream supply areas. Continuing to flush smaller sized pipes closer to customers is happening on a prioritised basis as well as investigations into how to improve the other contact types such as water coloured white due to aeration. We'll also look for innovations that can cleanse parts of the network which cannot be managed with our current techniques.

We've increased the number of text messaging alerts to inform customers that we are aware of an issue and are investigating the potential cause. We've also continued with employee training, to make sure we are using the correct operational techniques, which we know helps to manage the number of contacts we receive while we work on the network.

There is an ongoing project with Siemens in the Tees system where there are a higher-than-average number of contacts for both discolouration and taste and odour (T&O), and also records a steady number of CRI-related fails each year. Borne out of the Innovation Festival, we installed online water quality monitors in the distribution network to identify changes in water quality parameters. This information is then being used to support investigations into water quality changes which may influence taste and smell of the water. The project also incorporates leakage data to understand synergies with water quality and includes customer behavioural research to understand how the future customer wants to interact with water quality information.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

In setting our PCL we considered the following information:

Customer research

A triangulation of our customer research bank indicated that water quality was considered a medium priority out of the list of measures proposed for PR24. Once we reviewed this against Ofwat's bank of evidence, which indicated a ranking of high, we determined that water quality contacts were a high priority for customers.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix A7 - Customer and Stakeholder Engagement.

Historic and comparative data

We have reviewed both industry data sets for water quality – the first as per the PR19 measure of water quality with all data back to 2011/12, and the updated set from 2017/18, whereby companies had been asked to account for the new DWI information letter 04/2022 to be included in contact counts.

On analysis of the data set including the DWI information letter 04/2022, we do not believe this is complete or mature enough to base future trends on. Across the 17 companies in the industry, the data set does not include data for six companies, while the data report by companies shows a large range of impact by the DWI information letter. Of the 11 companies that provided data including the DWI information letter 04/2022, 5 companies suggested there was no impact since 2017-18 or at least one year of no impact. Two companies showed an actual reduction in some years of reporting. Whilst other companies indicated an increase of anywhere between 2% and 55% change in any given year. As a result, there is very low confidence in this data set supplied to us. We expect that some shadow reporting across the rest of the AMP would better show the impact of the DWI information letter 04/2022.

Analysing the historic data set of the current definition back to 2011/12 and applying both linear and log curves to 2030, shows a continued improvement of performance over the period. Upper quartile is estimated to sit between 0.2 and 0.73 per 1,000 population by the end of 2030. However the tightest end of performance would seem unlikely. Average performance looks to sit between 0.26 and 0.99 per 1,000 population.

Adding the DWI information letter 04/2022 to contact data will increase the number of contacts included in the assessment of the measure. However as we note at this time, the industry requires more time to make that assessment of uplift. At the current time we expect approximately a 15% increase in the level of contacts.

FIGURE 70: WATER QUALITY CONTACTS TREND ANALYSIS TO 2030 (WHOLE INDUSTRY)
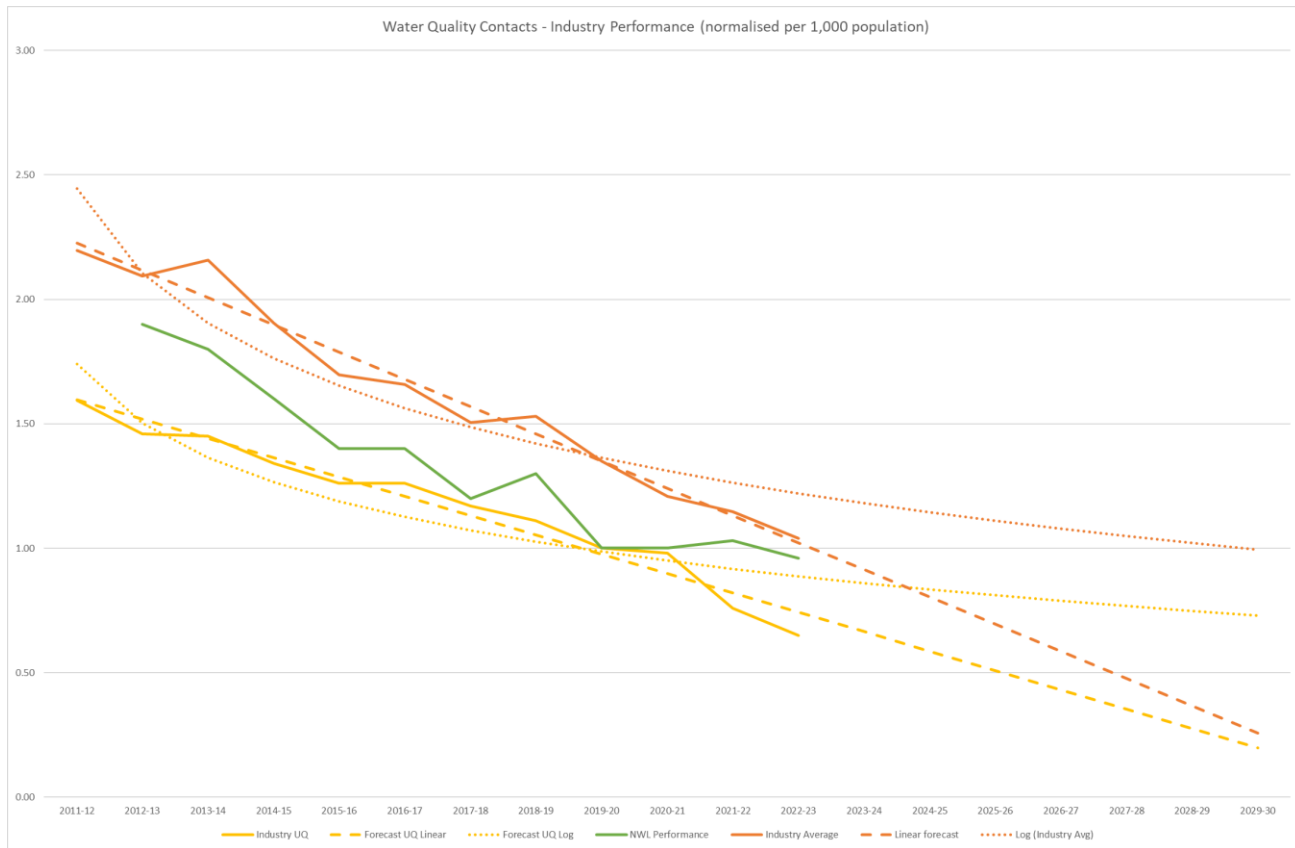
Source: NWL analysis on Ofwat historic dataset

FIGURE 71: ASSESSMENT OF UPPER QUARTILE AND AVERAGE

	Upper quartile 2029/30	Average 2029/30
Water quality contacts	0.2 (linear) – 0.73 (log)	0.26 (linear) – 0.99 (log)

Source: NWL Analysis of Ofwat Industry Data set and APRs

Peatland waters

Each company has a defined geographic area from which their water resources come. The nature of the water changes with geology and land use and this has implications for the final water quality that the customer experiences. Companies to the north and west of England have softer more highly coloured water influenced by peat. Companies to the South have harder waters which are lower in colour. There is also a peatland influence in Suffolk from the peat cuttings that form The Broads.

The influence of these different source waters can be seen in customer contact data. Companies in the South East have proportionally lower numbers of discoloured water contacts. As two of our three regions are impacted by peat sources it is

expected that companies such as ourselves and those based in the North and West will have proportionally more discoloured water contacts.

While we are not a frontier performer against the whole industry we are very much a frontier performer within those companies who treat peatland waters (analysis includes those companies that treat peatland waters,South West Bournemouth, United Utilties, Welsh Water and Hafren).

FIGURE 72: PERFORMANCE OF COMPANIES TREATING PEATLAND WATERS VERSUS THE REST OF THE INDUSTRY

Water companies treating peatland waters	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Upper Quartile	2.92	2.21	2.03	1.92	1.73	1.76	2.05	1.97	1.85	1.53	1.55	1.17
Frontier	2.30	1.90	1.80	1.60	1.40	1.40	1.20	1.30	1.00	1.00	1.03	0.96
UQ of Peatland companies without NES	2.92	2.94	2.83	3.02	2.47	2.47	2.09	2.31	2.03	1.62	1.68	1.35

Source: NWL analysis of Ofwat Historic dataset

Using the same method of extrapolation to 2029/30, using linear and log curves, shows higher levels of performance for UQ than the rest of the industy.

FIGURE 73: UPPER QUARTILE RANGE COMPARISON FOR PEATLAND WATER COMPANIES

	Upper quartile 2029/30
Whole industry	0.2 (linear) – 0.73 (log)
Peatland water treating companies inc NES	0.67 (linear) – 1.26 (log)
Peatland water treating companies exc NES	0.44 (linear) – 1.50 (log)

Source: NWL analysis of Ofwat Historic dataset

At PR19, our water strategy was clear that we wanted to achieve the best performance for discolouration contacts of those threating uplands waters[95]. To date we are achieving this leader position amongst this sub group of companies.

Setting a common upper quartile target across the industry against this measure tries to categorise the treatment process of differing types of water the same, when there is a clear likelihood that companies treating peatland waters will have greater contacts (in relation to discolouration).

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[95] **https://www.nwg.co.uk/globalassets/corporate/about-us-pdfs/2.6_long_term_water_quality_plan.pdf**

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational data and analysis

We have worked from the bottom up using interventions and costs to forecast performance through to 2030.

Based on this evidence, we determined the need to continue to improve our performance against this measure. However, we also note the uplift in the number of contacts that are received due to the DWI information 04/2022. Below we provide the proposed PCL for water quality contacts in terms of actual and normalised per 1,000 population.

FIGURE 74: PCLS FOR WATER QUALITY CONTACTS

Targets for reducing the number of incidents of discoloured water (e.g. brown tinge); or a strange taste or smell occurring
Number of customer contacts received regarding incidents, per 1,000 population
(a lower number/bar is better)
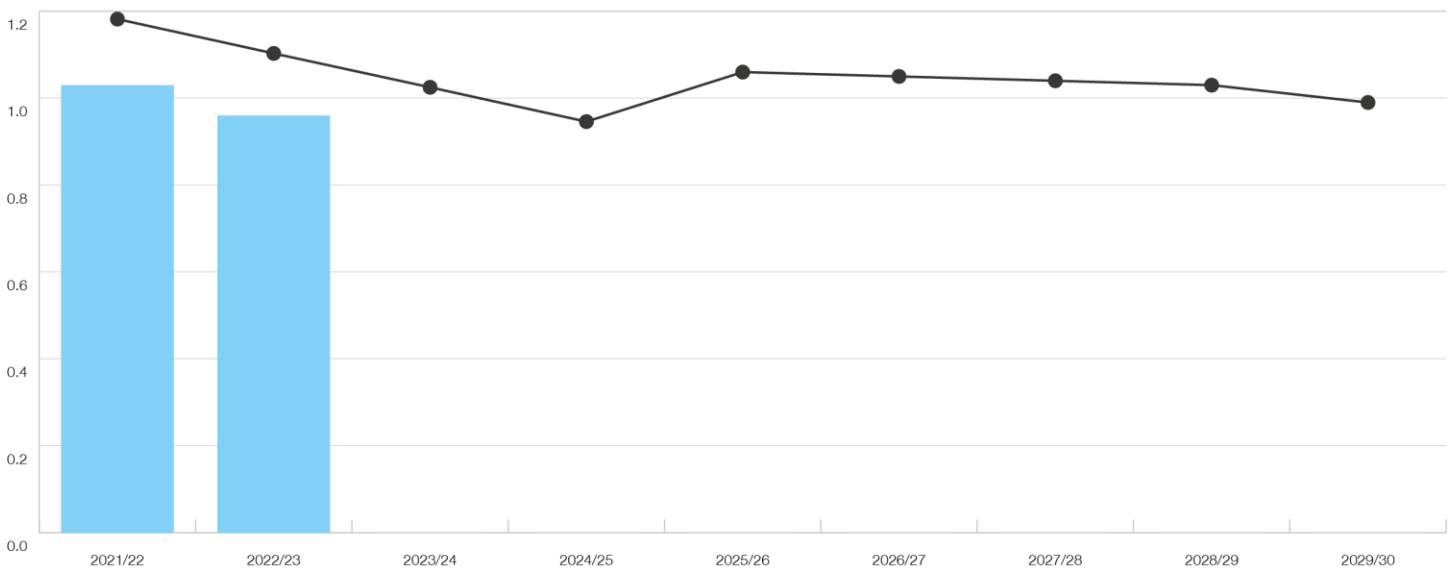
Note: target from 2025 includes the DWI notice

	2025/26	2026/27	2027/28	2028/29	2029/30
Base PCL (normalised)	1.07	1.06	1.06	1.05	1.02
Enhanced PC (normalised)	1.06	0.98	0.98	0.97	0.94

Source: NWL

OUR PLAN TO ACHIEVE THE PCL

Our plan to achieve the PCL is a continuation of our water quality contacts strategy which has been in place for some time. There are no major schemes planned to achieve a step change in performance and we continue to iterate and refine our strategy.

The primary causes of taste/odour perception contacts are recorded as; chlorine; earthy musty; metallic and a collective 'other' category. The primary causes of appearance contacts are; appearance – discoloured water - brown/orange/black; appearance – white – air; appearance – general conditions; appearance – particles.

The largest number of contacts by volume comes from the north east operating area regarding appearance – discoloured water – brown/orange/black. The number of contacts has significantly improved over time from around 15,000 contacts per year in the mid 2000's to around 2,000 contacts per year now. Water companies with upland peaty raw water sources to the north and west are prone to this contact type (Scottish, United Utilities, Welsh, Hafren Dyfrdwy, South West). This issue does not happen in the same way to companies to the east and south[96].

The appearance – general conditions contact type is specifically for water quality problems caused by the customer's property and not by the water company. Increases in this contact type, should not be the basis of penalty incentives.

The main elements of the water quality contacts strategy are:

- Control the water quality leaving the water treatment works by applying site specific water quality targets.

- Manage the strategic network through conditioning to reduce accumulation of discolouration causing material.

- Clean service reservoirs to prevent accumulation of discolouration causing material.

- Flush local networks to remove accumulated material.

- Train and refresh training with operational colleagues to practice calm networks to prevent causing discolouration when isolating or returning mains to supply.

- Support customers with good quality information and messages to inform them of changes and any service issues.

- Continue to investigate the opportunity for smart networks and network management from quality sensors.

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[96] See analysis on previous page

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We set the ODI rate based on Ofwat's proposed rate of £14.22m per contact per 1,000 population. This rate is within the recent ranges of values provided in customer valuations.

The ODI at PR19 created performance improvements, and while the DWI notice adds further contacts to our performance, the proposed ODI rate will continue to create improvements in our performance which is consider a high priority by customers.

FIGURE 75: WATER QUALITY CONTACT VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate (2022/23)	NWL PR24 research (2022/23)	PR19 Ofwat FD (2022/23)	PR19 NWL submission ODI (2022/23)	PJM Economics (2022/23)
Water quality contact	**Per contact per 1,000 population**	**£14.22m per 1 in 1,000 population** **Approx £3,170 per contact**	£21.875m	£10.3m - £12.4m	£12.9m – £15.76m	£5m - £29m

Source: Our triangulation of Service Valuation research

We will apply Ofwat's ODI rate of £14.22m per one contact in 1,000 population

INTERNAL SEWER FLOODING

DEFINITION

As per the Ofwat definition[97].

CURRENT PERFORMANCE ASSESSMENT

Internal sewer flooding is one of the worst performance failures our customers can experience. Historically we have been a poor performer in terms of the number of internal sewer flooding incidents year on year. Performance of 4.07 per 10,000 connections in 2018/19 has us tenth in the industry (WASCs) at that time. However, we have invested heavily in this area over the past few years to improve our performance.

This investment has enabled us to significantly improve our performance to 1.21 incidents per 10,000 connections in 2022/23. This ensures we have become an upper quartile company in the industry and meeting our target of 1.58 for the year.

Our performance has improved by over 30% compared with the performance we reported last year with our success resulting from the continuing maturity of our sewer flooding tactical plan we started in 2019.

Highlights this year include visiting over 500 high risk properties and investigating, clearing blockages, and fixing sewer defects where we find them. We also significantly boosted the engagement we have had with customers from our Bin the Wipe campaign by sending an additional 100,000 information letters to customers in hotspot areas. This is on top of the 170,000 properties we have engaged with directly on the ground.

Our tactical plan is reviewed monthly to make sure we are doing everything we possibly can to help reduce the risk of sewer flooding to customers, as well as providing the right level of support and standards when this does happen.

We are also working to implement several additional recommendations recently identified in Ofwat's and CCW's joint sewer flooding research and hope to have these embedded as business as usual for 2023/24. This will include how we can provide an enhanced standard of care for customers who experience internal and repeat internal sewer flooding.

Our performance this year means we are one of the top performing companies in relation to internal sewer flooding, with our performance above the industry upper quartile. Further initiatives planned for 2023, including CCTV of all first-time blockages will help further reduce the risk of sewer flooding to customers in the North East.

We are continuing to seek performance improvements to achieve our future targets and our aspiration is to have zero internal sewer flooding incidents as a result of our assets and operations as it is one of the worst service failures a

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[97] **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Internal_sewer_flooding_PC_definition.pdf**.

customer can have. In our long-term strategy we propose to further reduce flooding to properties by 60% by 2050, from our PCL in 2024/25. This reduction would see performance reduce from 1.34 incidents per 10,000 connections to 1.18 in 2029/30 and 0.54 in 2049/50. In terms of 2022/23 connection numbers this would see actual incident numbers drop from 175 to approximately 70 incidents.

FIGURE 76: INDUSTRY PERFORMANCE ON INCIDENTS OF INTERNAL FLOODING 2022/23
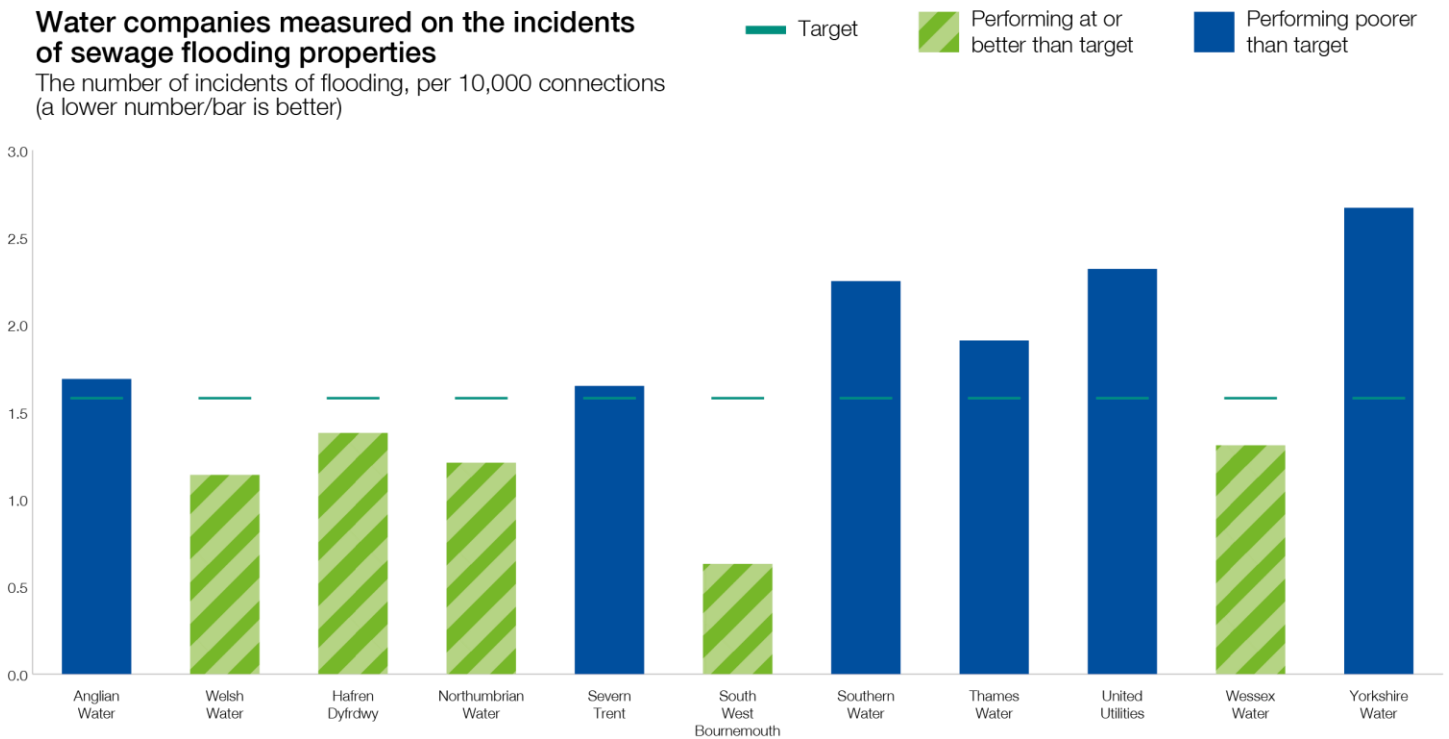
Source: NWL analysis of Ofwat Industry Historic dataset

CURRENT AMP ACTIONS

We have worked hard to mitigate the damage by clearing blockages as quickly as possible, or by repairing the pipe/defect if it is relatively straightforward and cost effective to do so - particularly where there is a risk of repeat flooding. For hydraulic incapacity (of the sewer network) we will carry out investigations to confirm the cause and identify a solution. This is then prioritised along with all our investments. We have paid affected customers Guaranteed Standards Scheme (GSS) payments in line with our statutory obligations.

We're working to make sure this is minimised in future, and that we can cope with increasingly wet weather conditions. We are continuing our monthly review of our tactical plans to identify the initiatives that are working well and those we could improve. This has already helped us plan our approach for 2022/23 and will inform the decisions we need to make for the next three years so that we can achieve our future targets. While we already perform relatively well against the

recommendations recently laid out in Ofwat and CCW's joint sewer flooding research report, we recognise that areas for improvement exist.

FIGURE 77: ONGOING ACTIONS TO TACKLE INTERNAL SEWER FLOODING

Action	Description	Target date
Operational activity	• Make sure technical support advisors attend flooding events out of hours. • Analytics to proactively address high risk blockages prior to flooding impact. • Additional resources to respond to incidents, investigate and resolve root causes, and proactively review repeat incidents. • Review of CCTV for first-time flooding on transferred network.	All in place and ongoing
Customer behaviour change	• Continued focus on our Bin the Wipe campaign – especially expansion to blockage hotspots.	Ongoing
Investment	• Enhanced CCTV and repair to address all grade 4 and 5 defects. • Deliver property level mitigation, for example, flood doors and air bricks. • Additional CCTV to investigate root cause of first-time blockages. • Enhanced sewer rehab programme focused on high priority areas of network. • Additional studies to understand root cause of chronic repeats – focused on external flooding. • Delivery of two specific hydraulic incapacity schemes. • Increased expenditure on sub-programme for reactive repairs.	Ongoing

Source: Our Performance Action Plans 27 January 2023

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED THRESHOLD

In setting our PCL, we considered the following:

Long-term strategy

We want to be consistent with our long-term strategy of reducing internal sewer flooding incidents due to our assets and operations by 60% between our PCL in 2024/25 and 2050[98].

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[98] **Our responsibilities and plans (nwg.co.uk)**

Customer research

A triangulation of our customer research bank indicated that internal sewer flooding was ranked as a high priority. Ofwat's own research triangulation agrees with our assessment.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative performance

In terms of performance, we recognise that our performance in recent years has been behind the industry upper quartile, as recent as 2021/22 and we are working hard to achieve this performance going forward.

We reviewed the industry data set from companies / Ofwat data to understand our ranking and performance in the industry. This data was then extrapolated to under the possible range of industry performance by 2030 and 2050 using both linear and logarithmic curves.

FIGURE 78: FORECASTING FUTURE INTERNAL SEWER FLOODING PERFORMANCE USING HISTORIC INDUSTRY TRENDS AND REVIEWING AGAINST NWL PERFORMANCE AND LONG-TERM STRATEGY.

Source: NWL analysis

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

FIGURE 79: ASSESSMENT OF PERFORMANCE RANGES

Customer ranking	Upper quartile range (linear – log)	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory (linear)
High	0.66 – 1.21 per 10,000 connections	0.32 – 1.53 per 10,000 connections	60% reduction on our 2024-25 target by 2050 is 1.18 in 2029-30.

Source: NWL Analysis

Our proposed AMP8 PCL will sit us in the range of the likely UQ for 2029/30. It will also keep us close to the required linear trajectory to meet our long-term target. Our trajectory will not be linear, this is due to the marginal rate and cost of improvement, with performance gains becoming increasingly difficult to achieve as close in on our target for 2050.

In line with above we set our target (per 10,000 connections) for the next price period, 2025-2030 to achieve our calculated forecast industry upper quartile position.

FIGURE 80: PCLS FOR INTERNAL SEWER FLOODING

Targets for reducing the incidents of sewer flooding properties
Number of incidents per 10,000 connections (a lower number/bar is better)

—●— Target   ▮ Current performance
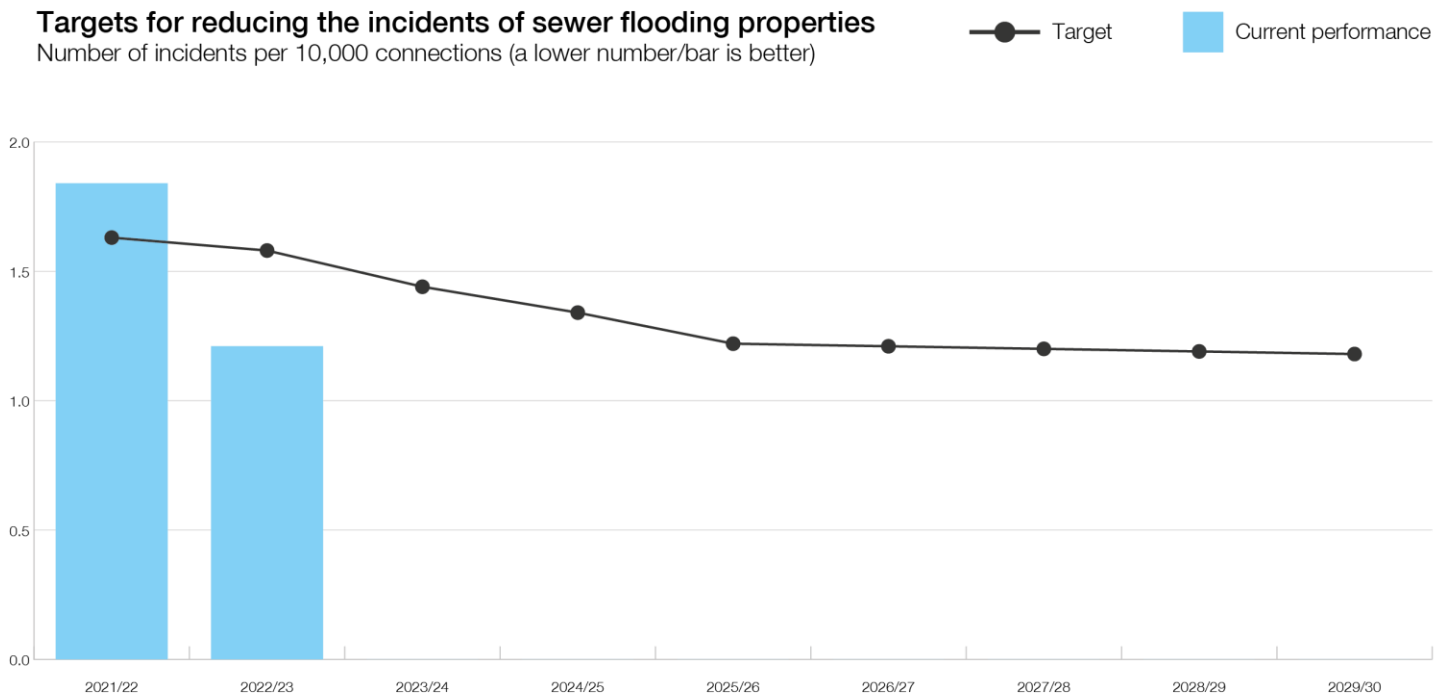
	2025/26	2026/27	2027/28	2028/29	2029/30
Base PCL	1.22	1.26	1.27	1.26	1.24
Enhancement PCL	1.22	1.20	1.20	1.19	1.17

Source: NWL

We include an enhanced PCL to reflect the small benefit we obtain with regards to our resilience and storm overflows enhancement cases in table CWW15.This measure also attracts enhanced rewards for frontier performance. The current frontier level of performance is 0.76 per 10,000 connections, which South West Bournemouth achieved in 2021/22. We noted earlier in our methodology that companies delivering frontier performance have been unable to maintain this level year to year. As such we indicate the 0.76 would be a relevant starting point for enhanced rewards in 2025/26. We also then trend this level down over the AMP, aligned to our PCL.

FIGURE 81: PROPOSED ENHANCED THRESHOLD

	2025/26	2026/27	2027/28	2028/29	2029/30
Enhanced reward threshold	0.76	0.74	0.74	0.72	0.71

Source: NWL analysis

OUR PLAN TO ACHIEVE THE PCL

For AMP8 we will continue to invest in the initiatives identified in our sewer flooding tactical plan as shown in Figure 82 from our base totex.

We also obtain some addition benefits in the reduction of approximately seven incidents by the end of the AMP due to links with our enhancement cases attributed to resilience and storm overflows. Appendix **A3 – Costs** (NES04), provides details of the enhancement cases.

Note: These BCR rates are based on benefit data from PR19.

FIGURE 82: SEWER FLOODING TACTICAL PLAN

Intervention	Description	Internal benefit (incidents)	External benefit (incidents)	BCR
First time TDS	Dedicate resource investigating and validating root cause of external first-time flooding located on our Transferred Drains and Sewer network.	0	64	1.6
Resource plan A	Increased resources associated with three key areas: • Network protection (fats, oil and grease – FOG). • Flooding other cause (FOC) – non hydraulic flooding root cause. • Investigation teams associated with our industry leading Service Level Agreements for attending flooding events (two hours internal, four hours external).	37	313	8.0
Repeat blockage	Dedicated team of Technical Support Advisors investigating and validating repeat blockages	7	53	5.0

Intervention	Description	Internal benefit (incidents)	External benefit (incidents)	BCR
	occurring within a two-year risk window.			
High risk properties	Proactive CCTV, root cause analysis and fixing of defects associated with flooding at over 550 properties a year.	20	100	1.7
Bin the Wipe	Team of 16 leading our award-winning Bin the Wipe campaign educating, investigating, and taking action to reduce the number of wipes being disposed of within our sewer network. The Bin the Wipe campaign targets over 150,000 high risk properties a year.	10	93	4.9
Enhanced FOC	Increased length (km) of proactive CCTV and network rehabilitation on public and TDS network.	14	108	0.8
Property level protection	Installation of PLP measures, including flood doors, air brick covers and flood barriers.	8	0	1.33
Flooding volunteers	Team of company personal ready to help assist and help record evidence of flooding during busy and incident periods.	0	8	N/A
Out of hours attendance	Increasing resourcing support to make sure Technical Support Advisors can attend all out of hours external flooding events to validate and investigate root cause.	0	10	0.63
CCTV first time blockages	CCTV off all blockage events regardless of service impacts (that is, even if no flooding has occurred) to investigate root cause and fix any associated network defects.	51	193	1.56
Hydraulic flooding investment	Increased level of funding provided a year to reduce the risk of flooding caused by hydraulic overloading of our sewers. This will include investing in chronic repeat external flooding.	Between 20 and 1	Between 42 and 2	<0.5

Source: NWL

We will continue to monitor and success of these interventions at our Sewer Flooding Group and benchmark our performance with other water companies.

We will also continue to adopt innovative solutions to further improve our sewer flooding performance. We are currently undertaking a pilot project within our Tyneside catchment exploring the potential benefits and scoping the requirements for a smart network. A smart network on Tyneside will give us the ability to operate and maintain our sewerage assets and network but managing and controlling flows proactively to make timely decisions when managing performance and protecting the environment.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We apply the Ofwat proposed rate of £40,000 per internal sewer flooding incident.

FIGURE 83: INTERNAL SEWER FLOODING VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate (2022/23 prices)	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission ODI (2022/23 prices)	PJM economics range (2022/23 prices)
Internal sewer flooding	**Per flood incident per 10,000 connections**	**£5.7m** **(£40,000 per incident)**	£2.06m	£2.98m	£2.02m	£257,300 - £24.95m

Source: Our triangulation of Service Valuation research.

Ofwat's valuation is significantly higher than at PR19, although remains inside the very large range suggested shown by PJM's results of PR19 (these figures have been adjusted for inflation to 2022/23).

We will apply Ofwat's ODI rate for internal sewer flooding incidents.

EXTERNAL SEWER FLOODING

DEFINITION

As per the Ofwat definition[99].

CURRENT PERFORMANCE ASSESSMENT

While we continue to improve our external sewer flooding performance, reducing our reported numbers by a further 12% compared to last year's performance (we have reduced our overall number of incidents by 37% since we first implemented our sewer flooding reduction plan in 2019/20), we are still not achieving our PCL for the current AMP, missing it by nine incidents in 2022/23.

We have the right initiatives in place within our sewer flooding tactical plan to meet our future targets, including several specific initiatives helping us to reduce external sewer flooding. These initiatives are now starting to outperform our initial benefit assessment, with a great example of this being the investigations and technical rigour we are undertaking on first time external flooding events occurring on the Transferred Drains and Sewer Network (TDS), which is delivering a measured reduction in external flood risk of 10% more than we originally had estimated.

We continue to support affected customers with Guaranteed Standards Scheme (GSS) payments, as well as providing support and cleaning services post flood events. Our response time for attending external flooding incidents (four hrs) is already amongst the best in the industry. We are also investigating how we can now provide longer term solutions to those properties with chronic repeat hydraulic flooding, following on from the sewer flooding studies we carried out and reported on in our last annual performance report.

Our performance this year shows that our overall reduction in external sewer flooding incidents since the start of the regulatory reporting period on average continues to be among the best of those other companies that are also improving. Despite this, we are still one of the worst performing companies at present for external sewer flooding. We are confident in our planning and that our performance will improve in the near future, however, we will also be using the outputs from our Drainage and Wastewater Management Plan (DWMP) to identify future hotpot areas for investment, as well as using this programme to identify how we can best use new technology to proactively manage risk through 'smart networks'.

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[99] **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/External_sewer_flooding_PC_definition.pdf.**

FIGURE 84: CURRENT INDUSTRY PERFORMANCE ON INCIDENTS OF EXTERNAL FLOODING (2022/23)

Water companies measured on the incidents of sewage flooding outside properties
The number of incidents of flooding, per 10,000 connections
(a lower number/bar is better)

Legend:
- Target
- Performing at or better than target
- Performing poorer than target
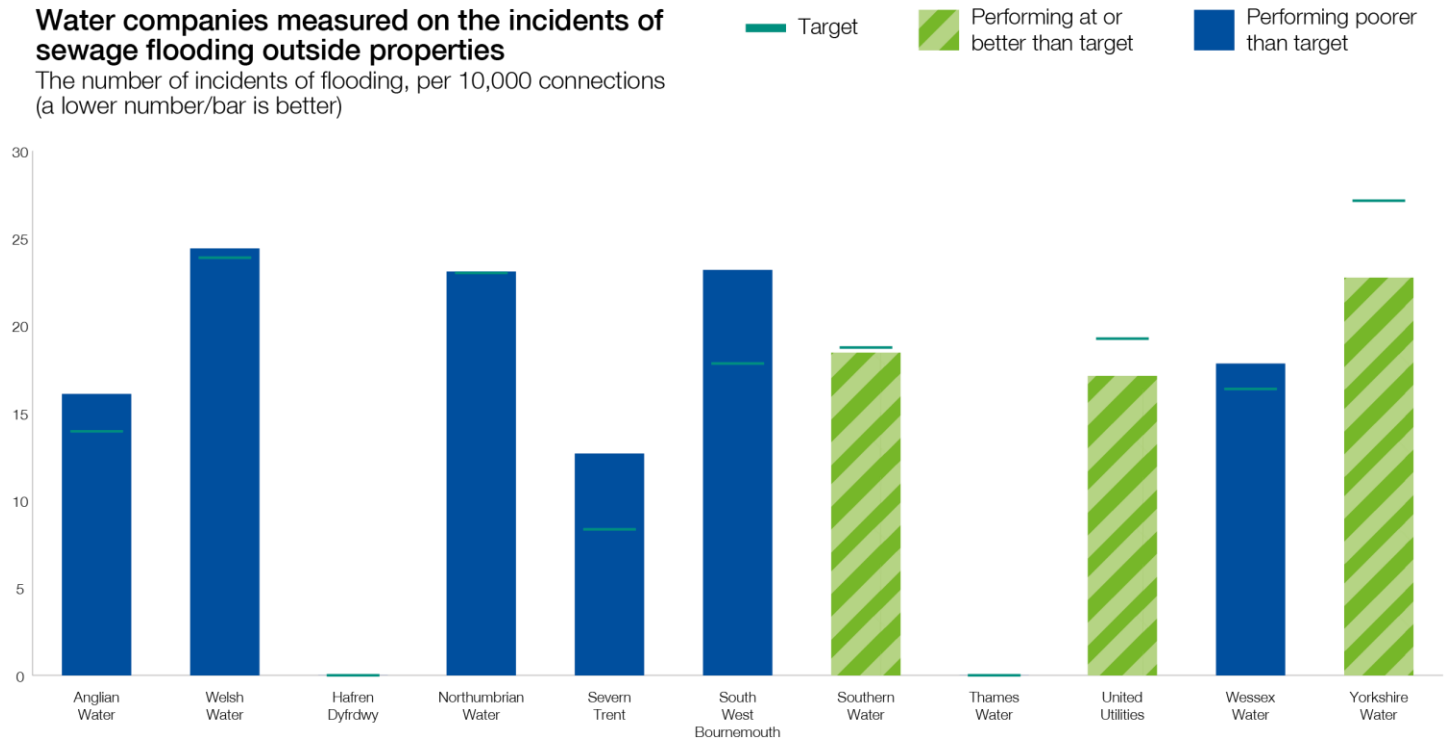
Source: NWL analysis of Ofwat Industry Historic dataset

CURRENT AMP ACTIONS

Our actions align with the flooding plan outlined in the internal sewer flooding section above.

In response to the increased number of external flooding incidents associated with wet weather, we have expanded our sewer flooding studies to investigate chronic repeat external incidents, as well as reviewing appropriate measures that we could provide for properties through our existing Property Level Protection programme. We have paid affected customers Guaranteed Standards Scheme (GSS) payments in line with our statutory obligations.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED THRESHOLD

In setting our PCL, we considered the following:

Long-term strategy

We want to be consistent with our long-term strategy of reducing internal sewer flooding incidents due to our assets and operations by 60% between our PCL in 2024/25 and 2050[100]. Our proposed AMP8 PCLs will keep us close to the required linear trajectory to meet our long-term target and in line the industry upper quartile. In reality our trajectory will not be linear, this is due to the marginal rate and cost of improvement, with performance gains becoming increasingly difficult to achieve as close in on our target for 2050.

Customer research

A triangulation of our customer research bank indicated that external sewer flooding was ranked as a high priority. Ofwat's own research triangulation agrees with our assessment.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative performance

In setting our PCL, we recognise we must make a step change in performance to move from our current position to the industry upper quartile. This cannot be made overnight, and we expect that it will take use into AMP9 to reach the UQ. However, we are seeking to make a serious improvement in relation to performance.

We have also used historic and comparative data to review trends to 2030 for both upper quartile and industry average using both the linear and logarithmic curves. Forecasting the industry upper quartile over the period shown, indicates a rising trend.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

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[100] **Our responsibilities and plans (nwg.co.uk).**

Operational information and analysis

We created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

FIGURE 85: FORECASTING FUTURE EXTERNAL SEWER FLOODING PERFORMANCE USING HISTORIC INDUSTRY TRENDS AND REVIEWING AGAINST NWL PERFORMANCE AND LONG-TERM STRATEGY.
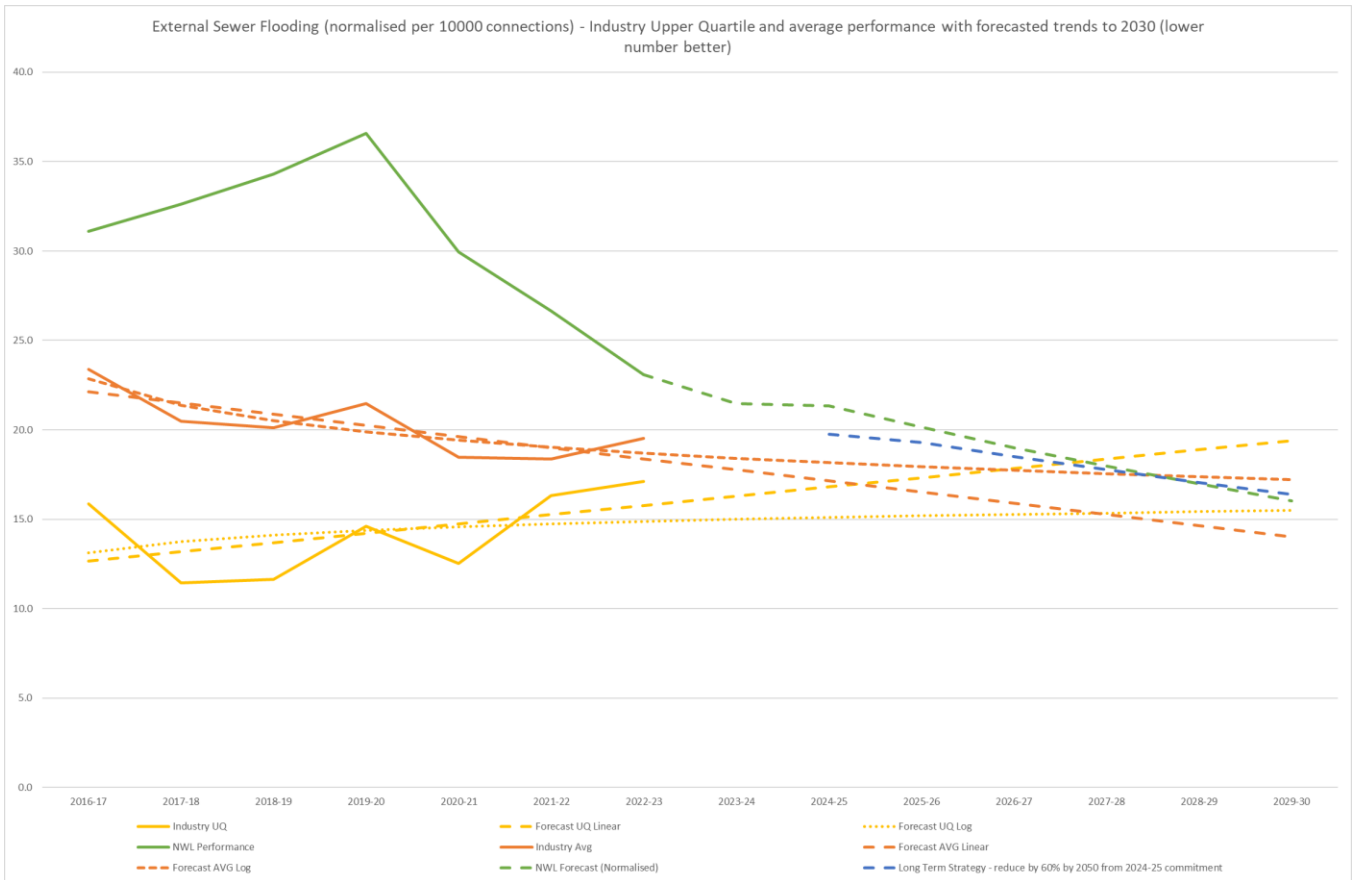
Source: NWL.

FIGURE 86: PERFORMANCE RANGE ASSESSMENT

Customer ranking	Upper quartile range (linear – log)	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory (linear)
High	15.49 – 19.4 (both rates increasing).	14.02 – 17.21 per 10,000 connections	60% reduction on our 2024-25 target by 2050 is 16.38 in 2029-30.

Source: NWL Analysis.

Our proposed AMP8 PCL will sit us in the average and upper quartile ranges for external sewer flooding. It is difficult to determine just how close we are to upper quartile give the forecasts are increasing over time. It will also keep us close to the required linear trajectory to meet our long-term target. Our trajectory will not be linear, this is due to the marginal rate and cost of improvement, with performance gains becoming increasingly difficult to achieve as close in on our target for 2050.

In line with above we set our target (per 10,000 connections) for the next price period, 2025-2030 to achieve our calculated forecast industry upper quartile position.

FIGURE 87: PCLS FOR EXTERNAL SEWER FLOODING

Targets for reducing the incidents of sewer flooding outside properties
Number of incidents per 10,000 connections (a lower number/bar is better)
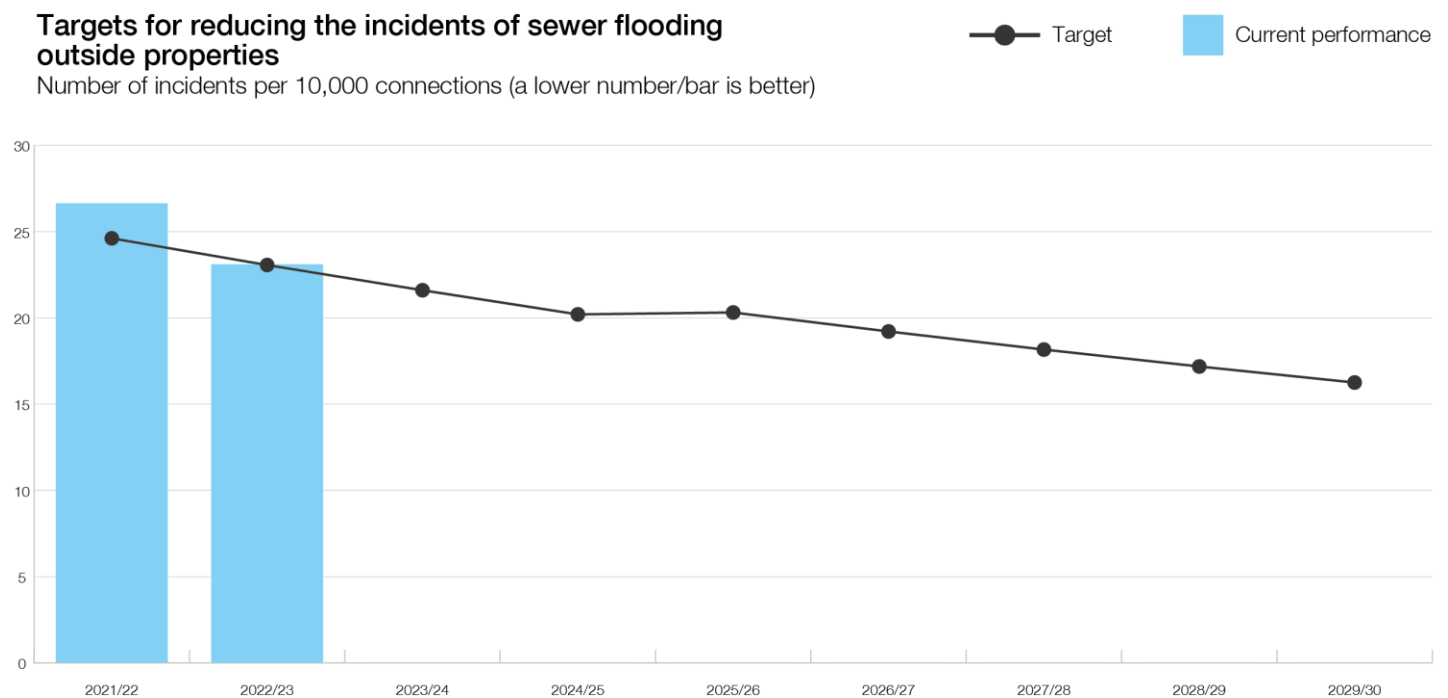
	2025/26	2026/27	2027/28	2028/29	2029/30
Base PCL	20.28	19.22	18.32	17.34	16.43
Enhancement PCL	20.28	19.18	18.14	17.16	16.25

Source: NWL.

We include an enhanced PCL to reflect the small benefit we obtain with regards to our resilience and storm overflows enhancement cases in table CWW15. This measure also attracts enhanced rewards for frontier performance. The current frontier level of performance is 7.03 per 10,000 connections, which was achieved by Thames Water in 2018/19. We noted

earlier in our methodology that companies delivering frontier performance have been unable to maintain this level year to year. After Thames Water achieved 7.03 in 2018/19, performance increased to 9.21. Thames remains the closest to this frontier with 9.45 in 2021/22, with no other company below ten. As such we indicate the 7.03 would be a relevant starting point for enhanced rewards in 2025/26. With the upper quartile rising within the current AMP it is difficult to assess how this frontier should trend from 2025/26, and suggest it may be stretching for the industry over the current AMP.

FIGURE 88: PROPOSED ENHANCEMENT ODI PCLS

	2025/26	2026/27	2027/28	2028/29	2029/30
Enhanced reward threshold	7.03	7.03	7.03	7.03	7.03

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

For AMP8 we will continue to invest in the initiatives identified in our sewer flooding tactical plan as previously shown in Figure 89, from our base totex funding.

As per our internal sewer flooding case, we obtain some addition benefits in the reduction of approx. 7 incidents by the end of the AMP due to links with our enhancement cases attributed to resilience and storm overflows. Appendix 3: Costs, provides details of the enhancement cases.

Note: These BCR rates are based on benefit data from PR19.

FIGURE 89: SEWER FLOODING TACTICAL PLAN

Intervention	Description	Internal benefit (incidents)	External benefit (incidents)	BCR
First-time TDS	Dedicate resource investigating and validating root cause of external first-time flooding located on our Transferred Drains and Sewer network	0	64	1.6
Resource plan A	Increased resources associated with three key areas: • Network protection (fats, oil and grease – FOG). • Flooding other cause (FOC) – non hydraulic flooding root cause. • Investigation teams associated with our industry leading Service Level Agreements for attending flooding events (two hours internal, four hours external).	37	313	8.0
Repeat blockage	Dedicated team of Technical Support Advisors investigating and validating repeat blockages occurring within a two-year risk window.	7	53	5.0
High risk	Proactive CCTV, root cause analysis and fixing of	20	100	1.7

Intervention	Description	Internal benefit (incidents)	External benefit (incidents)	BCR
properties	defects associated with flooding at over 550 properties a year.			
Bin the Wipe	Team of 16 leading our award-winning Bin the Wipe campaign educating, investigating, and taking action to reduce the number of wipes being disposed of within our sewer network. The Bin the Wipe campaign targets over 150,000 high risk properties a year.	10	93	4.9
Enhanced FOC	Increased length (km) of proactive CCTV and network rehabilitation on public and TDS network.	14	108	0.8
Property level protection	Installation of PLP measures, including flood doors, air brick covers and flood barriers.	8	0	1.33
Flooding volunteers	Team of company personal ready to help assist and help record evidence of flooding during busy and incident periods.	0	8	N/A
Out of hours attendance	Increasing resourcing support to make sure Technical Support Advisors can attend all out of hours external flooding events to validate and investigate root cause.	0	10	0.63
CCTV first-time Blockages	CCTV off all blockage events regardless of service impacts (that is even if no flooding has occurred) to investigate root cause and fix any associated network defects.	51	193	1.56
Hydraulic flooding investment	Increased level of funding provided per annum to reduce the risk of flooding caused by hydraulic overloading of our sewers. This will include investing in chronic repeat external flooding.	Between 20 and 1	Between 42 and 2	<0.5

Source: NWL

Achieving our proposed PCL targets requires an additional 17.5% improvement of our external sewer flooding performance for the period 2025-2030 and would place us at the industry average position for external sewer flooding incidents. This stretching forecast can be achieved within our existing base funding allowance (that is without additional investment) and without impacting the performance of other service levels/PCLs.

We believe additional external sewer benefits can be achieved through:

- Prioritising external flooding over internal flooding in some circumstances to make sure we can collect robust evidence quickly to enable a thorough root cause investigation.

- Investment in capital schemes to address chronic repeat external hydraulic flooding.

- Maturity and improvement in benefits from existing our tactical plan.

- Benchmarking from other companies yielding further operational improvements.

- Applying innovative solutions to our sewer flooding tactical plan. This includes the smart network pilot in our Tyneside catchment and using AI for defect recognition of CCTV footage of our sewer network.

We will continue to monitor and success of these interventions at our Sewer Flooding Group.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat's has proposed an increased rate of £20,000 per incident of external sewer flooding. This rate is significantly higher than values seen in Ofwat's PR19 Ofwat Final Determinations, and our values from our PR24 customer research.

FIGURE 90: EXTERNAL SEWER FLOODING VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate (2022/23 prices)	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission ODI (2022/23 prices)	PJM economics range (2022/23 prices)
External sewer flooding	**Per flood incident**	**£2.55m** **Approximately £20k per incident**	£335,900	Penalty £967,400 Reward £571,700	Penalty £520,00 Reward £306,000	£108,600 - £1.87m

Source: NWL triangulation of Service Valuation research.

We will apply the Ofwat proposed ODI rate.

POLLUTIONS (ALL)

DEFINITION

As per the Ofwat definition[101], and is the total pollution incidents (Categories 1 to 3) from sewerage assets as normalised per 10,000km of sewer served to two decimal places following the EA's EPA methodology[102].

CURRENT PERFORMANCE ASSESSMENT

We aim to avoid all pollution and our PC for all wastewater Category 1, 2 and 3 incidents. It is a common measure for pollution using the EA's EPA methodology.

The EA's PR19 WISER required a 40% reduction in incidents by 2024/25 compared to those recorded in 2016. Ofwat determined upper quartile performance for this common measure as 19.5 normalised by 2025 with a 22% reduction in pollutions in our final determination. This has been used by the EA in setting the glidepath thresholds for EPA green performance between 2021 and 2025.

FIGURE 91: AMP7 OFWAT PC (TWO DECIMAL PLACES)

	2020/21	2021/22	2022/23	2023/24	2024/25
AMP7 PCL	24.51	23.74	23.00	22.40	19.50

Source: Ofwat PR19 FD.

FIGURE 92: EA EPA GREEN THRESHOLD GLIDEPATH

	2020/21	2021/22	2022/23	2023/24	2024/25
EA EPA Green Threshold	<=23	<=22	<=21	<=20	<=19

Source: EA EPA.

The total length of sewer served used in the EPA methodology for AMP7 is 30,026km. This increased from 16,060km prior to 2016 when the calculated transferred network length was added and was 29,848km up until 2020.

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[101] **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Total_pollution_incidents_PC_definition.pdf**
[102] **Environment Agency water and sewerage company Environmental Performance Assessment (EPA) methodology (version 9) for 2021 to 2025 - Ofwat**

Our focus is on continuous improvement in pollution performance through our company-wide zero-tolerance approach as set out in our published Pollution Incident Reduction Plan (PIRP). We constantly examine all aspects of pollution to target our efforts in effectively reducing the number of incidents.

Our best performance for this measure was in 2018 with 37 incidents (12.4 normalised). The transformation in our wastewater pollution performance came from base expenditure (opex/capex) and interventions through our pollution management programme that started in 2015. Typically, this consisted of targeted improvements in detection, response, evidence collection and EA case reviews.

FIGURE 93: NWL HISTORIC PERFORMANCE CATEGORY 1, 2 AND 3 POLLUTIONS
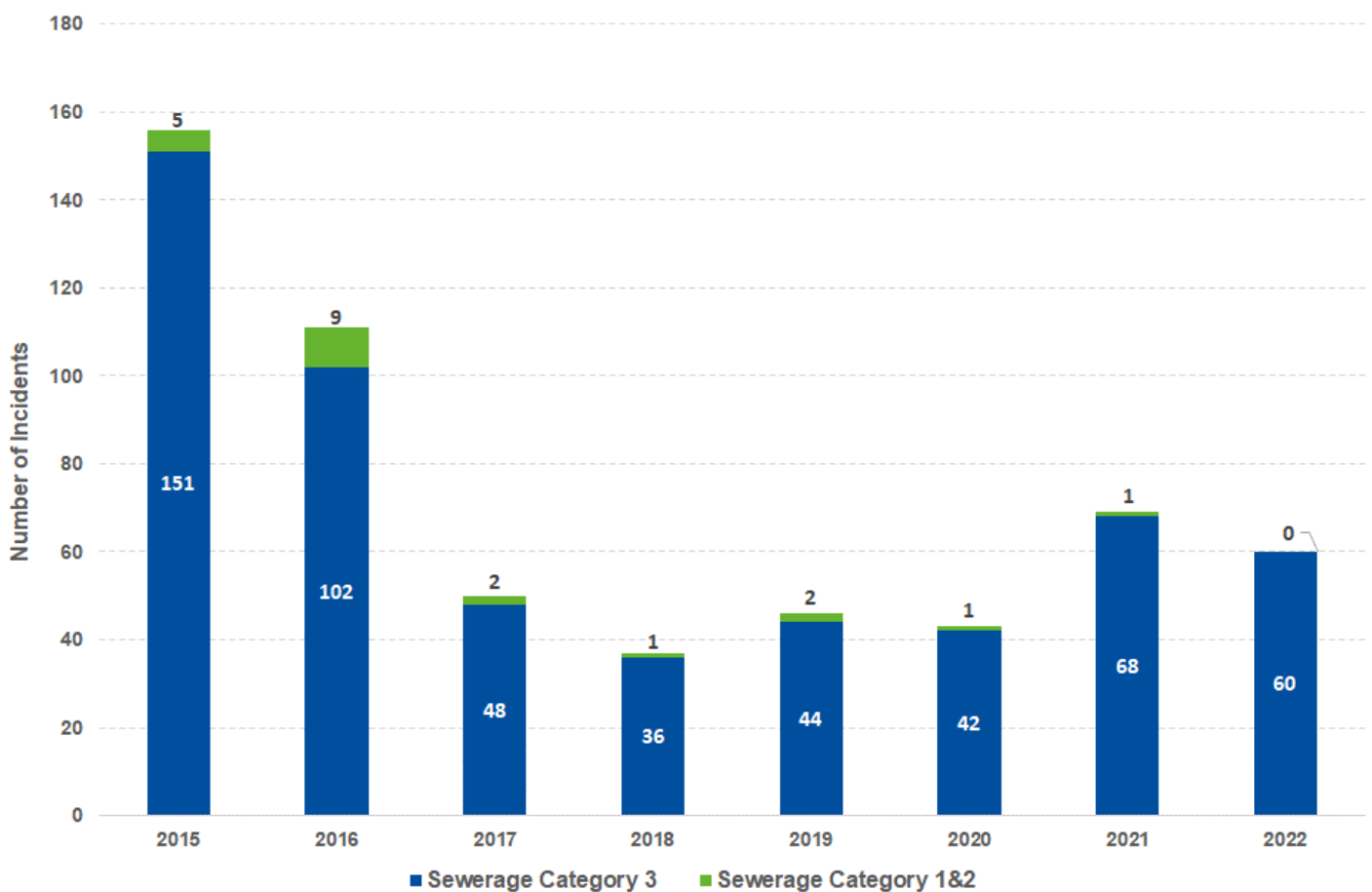
Source: NWL analysis.

So far this AMP we have achieved our PC for this measure and have earned outperformance reward.

FIGURE 94: ODI PERFORMANCE FOR POLLUTIONS

	2020	2021	2022
Actuals	43	69	60
Normalised	14.61	22.98	19.98
PCL	24.51	23.74	23.00
ODI reward	£2.960m	£0.227m	£0.902m

Source: NWL APR Submissions.

Pollution performance in 2021 and 2022 has been impacted by an increase in incidents associated with sewage pumping stations (SPSs).

Power issues remains one of the main reasons behind this increase in wastewater category 3 incidents that particularly impacts sewage pumping stations (SPS). These are connected to incoming power supplies where power cuts or very small interruptions or 'brown outs' can cause significant issues to our powered sites. Internal power issues can also affect our service.

The EA's assessment of our performance has excluded a number of incidents that were attributable to Storm Arwen (November 2021) Storm Malik (January 2022). These events caused damage throughout our region with severe winds and multiple power outages. The decisions taken reflects that these incidents were deemed to be outside of our control.

We remain an upper quartile company for pollution incident performance in this measure having previously held Frontier Company status between 2017 and 2020.

FIGURE 95: CURRENT INDUSTRY PERFORMANCE FOR POLLUTION INCIDENTS (2022/23)

Water companies measures on the number of incidents of pollutions of rivers and streams
Number of incidents per 10,000km of sewer
(a lower number/bar is better)

— Target
Performing at or better than target
Performing poorer than target
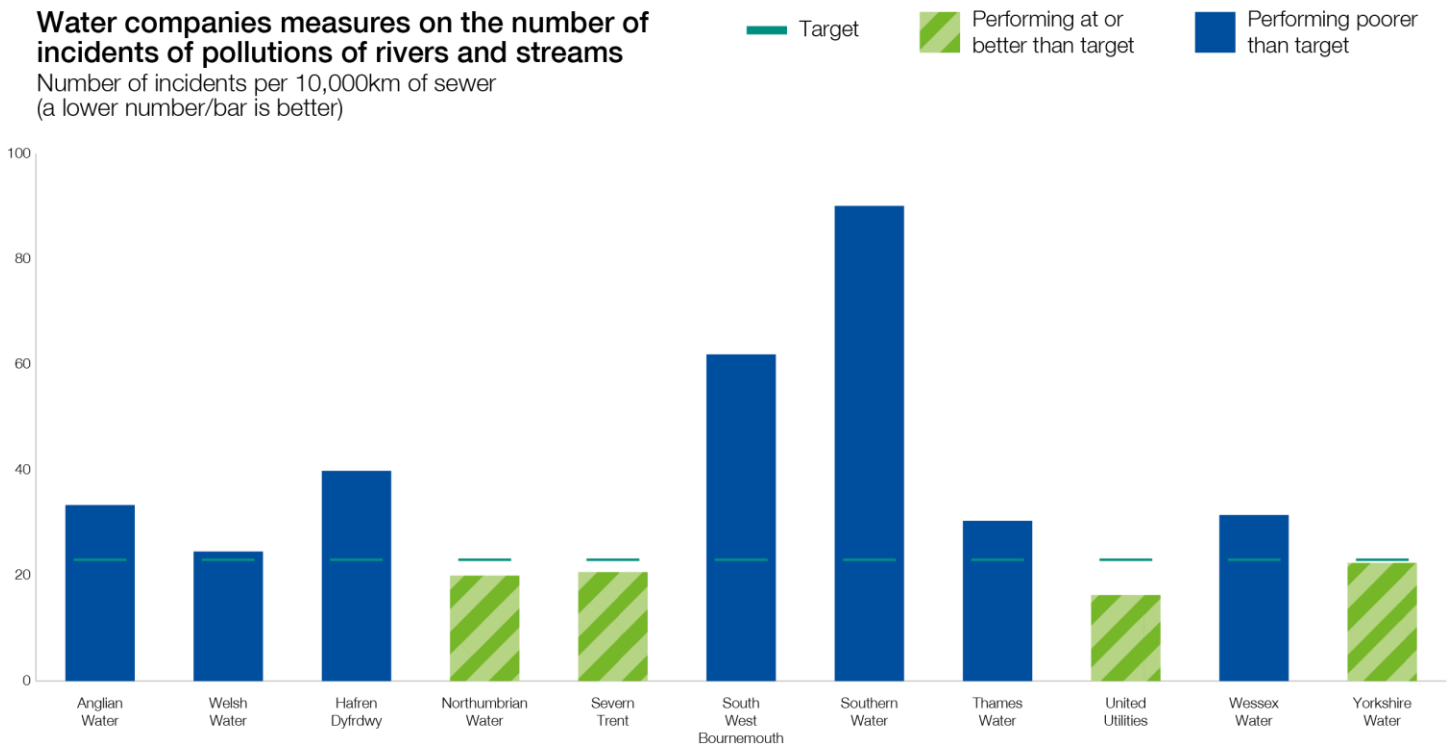
Source: NWL analysis of Ofwat Industry Historic dataset.

Alongside ourselves, United Utilities and Severn Trent are strong performers with all WaSCs required to make significant reductions in pollutions through their PC targets (19.5), EA EPA thresholds and PIRPs.

FIGURE 96: INDUSTRY HISTORIC PERFORMANCE COMPARISON

WASC	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Anglian	35	32	30	25	35	28	34	33.36
NWG	97	38	17	12	15	14	23	19.98
Severn Trent	47	30	30	31	26	21	22	20.64
Southern	75	35	31	39	110	102	94	90.11
South West	171	115	109	98	105	131	87	61.93
Thames	38	33	28	27	30	27	25	30.37
United Utilities	40	22	23	24	28	19	18	16.29
Wessex	48	22	23	24	22	25	21	31.48
Yorkshire	72	46	43	44	35	24	27	22.39
Average	**69**	**41**	**37**	**36**	**50**	**47**	**43**	**35.54**
Upper	**39**	**26**	**23**	**24**	**25**	**21**	**22**	**21.52**

Source: NWL Analysis.

We are continuing to seek performance improvements to achieve our future targets and our aspiration is to have zero pollution incidents from our assets and operations. In our long-term strategy, we propose to reduce the number of Category 1-3 pollutions by 50% by 2040 (from a 2022 baseline) and to have zero serious (Category 1) pollution incidents now and always[103].

CURRENT AMP ACTIONS

We continue to work hard to improve our wastewater pollution incidents performance through our approved Strategic Delivery Strategy, Tactical Plan and Pollution Best Practice Group.

Activities this AMP focus on further improvements in pollution detection, maintenance, response, EA review and business intelligence. Interventions are targeted to address pollution risk and root causes of pollution at key asset groups, such as foul sewers, pumping stations and sewage treatment works.

Our agreed AMP7 strategy consists of capex and opex investment. Historically, base opex has achieved the largest reduction in actual pollution numbers, such as successful EA review of incidents from a default Category 3 to a Category 4 (no impact), improved evidence collection and pumping station wet well cleansing. Base capex provides overall pollution risk reduction, such as rehabilitation of assets with pollution history.

Our Pollution Incident Reduction Plan (2022) provides a summary of our AMP7 Plan and includes:

- Increased visibility of our wastewater system through the deployment of low-cost telemetry at descriptive sewage works and level monitoring of high-risk sewers near to watercourses.
- Full deployment of Stormharvester smart network management technology using advanced machine language learning, together with hyperlocal rainfall forecasting, to accurately predict the normal performance of our assets and provide alerts of issues occurring.
- Base maintenance capex programmes to target pollution risk reduction, vulnerable locations and increase resilience.
- Find and fix programme to address sewers near to watercourse risks.

We continue to put in place measures to increase our power resilience, such as improved arrangements for generators and engagement with our power Distribution Network Operator (DNO) to address risks. We also actively share experiences and learn from others, such as through the industry Pollution Reduction Task Force and our innovation networks.

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[103] **Long-term-delivery-strategy_final_1 (2).pdf**

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL) AND ENHANCED THRESHOLD

In setting our PCL, we considered:

Regulatory targets

The EA's Water Industry Strategic Environmental Requirements (WISER) contains the following obligations under regulatory compliance:

- o   At least a **30% reduction** of all pollution incidents (Category 1 to 3) by 2030 on current 2025 targets (statutory).
- o   there might be some variation depending upon WaSC performance during AMP7 to 2025.
- o   at least 90% self-reporting by 2030 with >95% for SPSs and STWs (non-statutory).

Applying the WISER reduction of 30%[104] to the EA's EPA target for 2025[105] of 19.00 would equate to 13.3 by 2030. We believe this will be a stretching target for all companies and we expect that the industry upper quartile performance will not meet this target without significant investment and change.

FIGURE 97: WISER PERFORMANCE PATH

	2025/26	2026/27	2027/28	2028/29	2029/30
Normalised	18.98	17.65	16.32	14.65	13.3

The normalised figures are based on the current 30,026km served as stated in the EPA Methodology and used by Ofwat.

The Government's strategic policy statement (SPS) for Ofwat included a key priority for water companies to significantly reduce all pollution incidents.

Ofwat's indication in their Final Methodology, companies can only earn enhanced rewards for all pollutions if they have no serious pollutions in the same year[106].

Long-term strategy

To be consistent with our long-term strategy ambitions of reducing the number of Category 1 -3 pollutions by 50% by 2040 (from a 2022 baseline) no pollution incidents as the result of our assets and to have zero serious pollution incidents now and always[107]. To achieve our long-term strategy under a linear trend, we need to achieve 15.87 per 10,000 by 2029-30.

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[104]**https://www.gov.uk/government/publications/developing-the-environmental-resilience-and-flood-risk-actions-for-the-price-review-2024/water-industry-strategic-environmental-requirements-wiser.**
[105] EA EPA - **https://www.ofwat.gov.uk/wp-content/uploads/2021/01/EPA-methodology-version-8-October-2020.pdf.**
[106] Ofwat PR24 Final Methodology.
[107] **long-term-delivery-strategy_final_1 (2).pdf.**

Customer research

A triangulation of our customer research bank and Ofwat's analysis indicated that pollutions were considered a high priority.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative performance

Using the industry data set since 2011/12, we note the first three years of the data were significantly higher 2014/15 onwards, which significantly steepens any forecast performance. On this basis we reviewed performance trends using both the full data set and performance from 2014/15 onwards. For both periods we used both linear and logarithmic trends to forecast future performance to 2030. This provided a range of where we believe the industry upper quartile will sit. We provide both charts for the full period and 2014 onwards.

FIGURE 98: FORECASTING FUTURE POLLUTION PERFORMANCE USING HISTORIC INDUSTRY TRENDS AND REVIEWING AGAINST EA WISER AND LONG-TERM STRATEGY (TRENDS EXTRAPOLATED FROM 2011/12).

Pollutions (all) - Industry Performance (normalised by sewer length) including forecast, since 2011-23 (lower number better)

Industry UQ — Forecast UQ Linear ····· Forecast UQ Log — NWL Performance — EA WISER - 30% reduction 2024-25 target — Long Term Strategy 0 by 2040
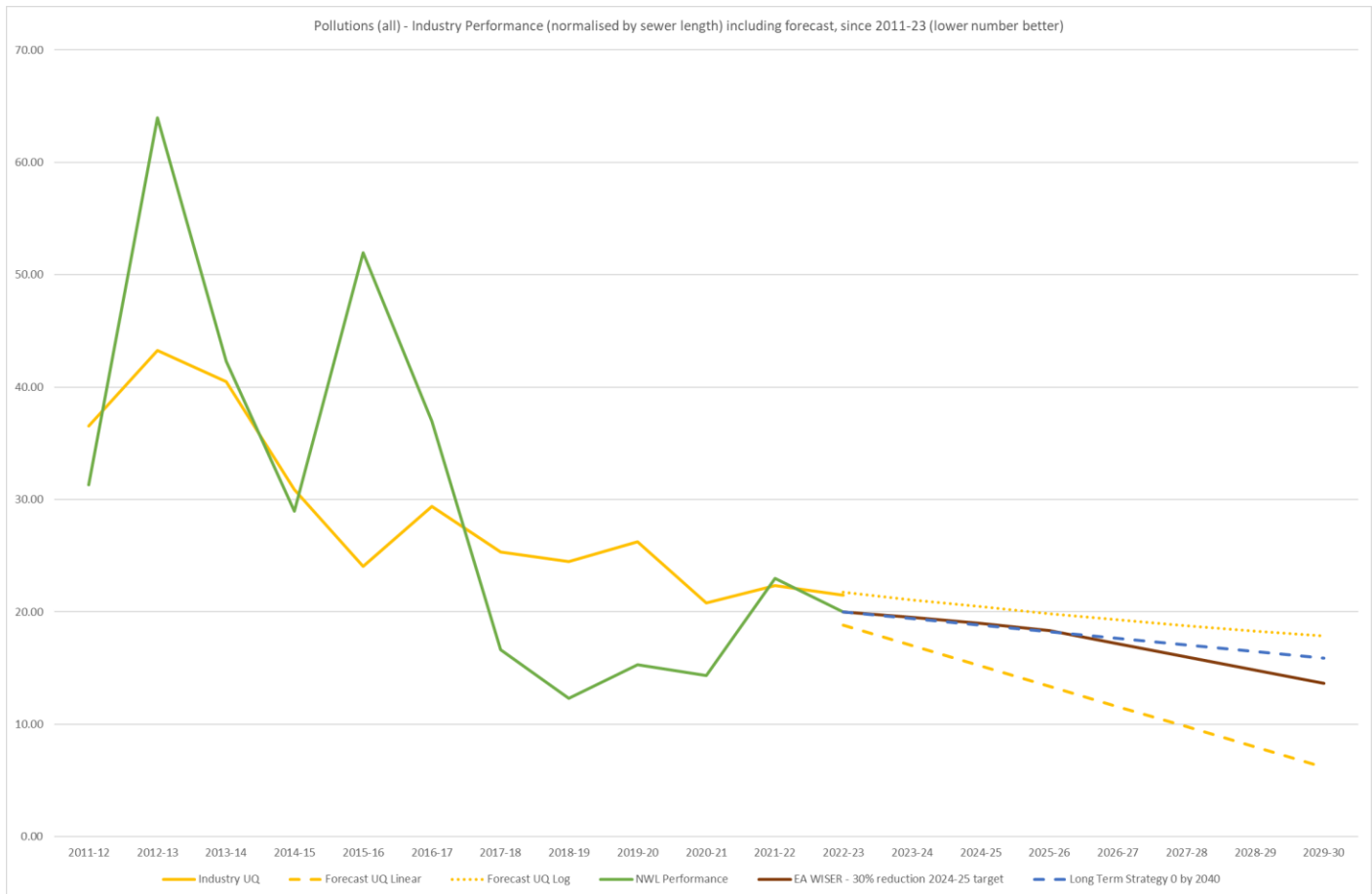
FIGURE 99: FORECASTING FUTURE POLLUTION PERFORMANCE USING HISTORIC INDUSTRY TRENDS AND REVIEWING AGAINST EA WISER AND LONG-TERM STRATEGY (TRENDS EXTRAPOLATED FROM 2014/15).

Pollutions (all) - Industry Performance (normalised by sewer length) including forecast based on data from 2014-15 (lower number better)
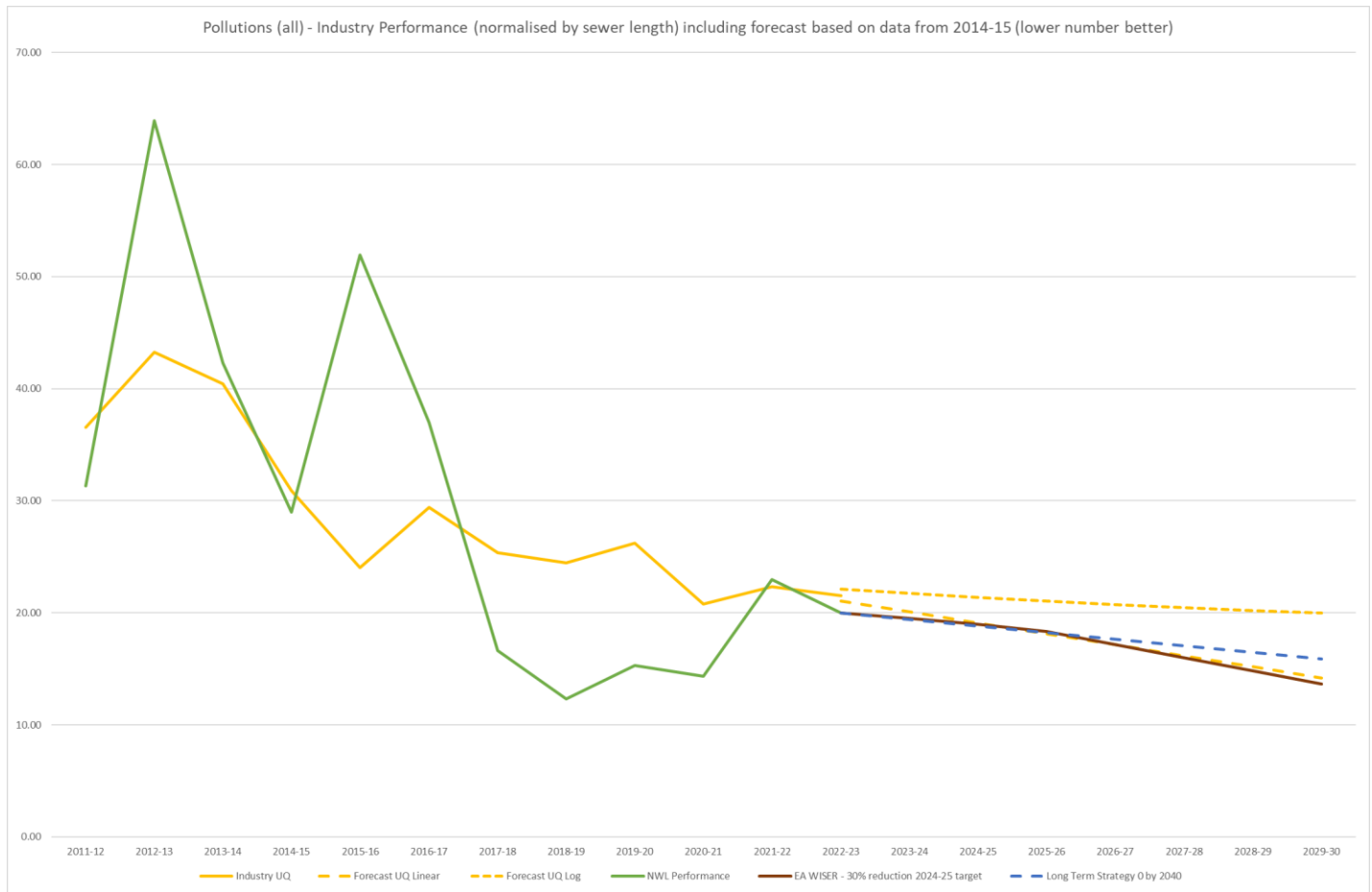
Source: NWL.

National leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry. Forecasted average between the linear and logarithmic extrapolations currently has a wide range between 11.02 and 31.58 per 10,000km of sewer network. While the range for data from 2014 onwards indicates a range between 12.48 and 24.22 per 10,000km. We would indicate the range using data from 2014 onwards would be the more likely scenario for average, although given current industry performance the higher end of the range is more likely to occur.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

FIGURE 100: ASSESSMENT OF PERFORMANCE RANGES

Customer ranking	Upper quartile range (linear – log)	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory (linear)
High	14.19 – 19.97 (2014/15 onwards) 6.16 – 17.84 (2011/12 onwards)	12.48 – 24.22 (2014/15 onwards) 11.02 – 31.58 (2011/12 onwards)	To reduce pollutions by 50% in 2040 from our 2022 performance. By 2029/30 this would require a performance of 15.87.

Source: NWL Analysis

Our proposed AMP8 PCLs will track the EA WISER reduction of 30%, which equates to 13.3 per 10,000 km by 2030. We expect our proposed PCLs for AMP8 will make sure we are an upper quartile company within the industry. However, we note, should the EA revise its classification of pollutions, such as Category 4 incidents, then the proposed PCLs would need to be revisited to reflect the increase in Category 3 incidents, which are included within this measure.

FIGURE 101: PCLS FOR POLLUTION INCIDENTS (ALL)

Targets for reducing the number of incidents of pollutions of rivers and streams
Number of incidents per 10,000 km of sewer (a lower number/bar is better)
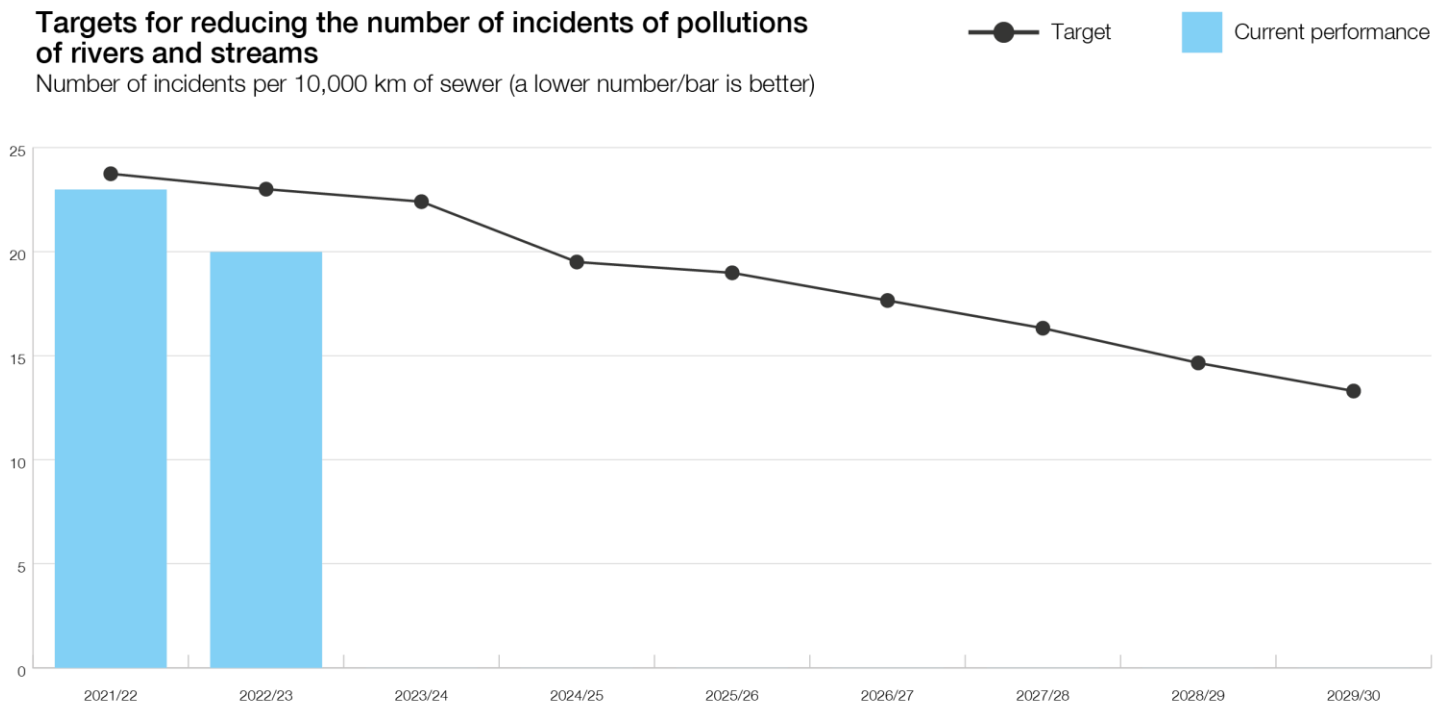
	2025/26	2026/27	2027/28	2028/29	2029/30
PCL (per 10,000 km)	18.98	17.65	16.32	14.65	13.32

Source: NWL.

This PCL includes both our planned base totex and our **Power resilience** (NES32) and **Pollutions** (NES37) enhancement business cases. In particular we would highlight how the regulatory changes to pollutions reporting are likely to push the number of pollutions up.

Per 10,000km	2025/26	2026/27	2027/28	2028/29	2029/30
Base performance	18.98	19.81	18.48	16.81	15.48
Enhancement performance	18.98	17.65	16.32	14.65	13.32

Source: NWL

This measure also attracts enhanced rewards for frontier performance. The current frontier level of performance is 12.32 per 10,000 connections, which was achieved by us in 2018/19. We noted earlier in our methodology that companies delivering frontier performance have been unable to maintain this level year to year. After we achieved the 12.32, we have struggled to maintain this level of performance, with levels rising to 22.98 by 2021/22. Since 2018/19, United Utilities is the only other company to get below 20 pollutions per 10,000km, with 16.29 in 2022/23. As such we indicate the current frontier of 12.32 would be a relevant starting point for enhanced rewards in 2025/26. The WISER target of 13.3 per 10,000km already looks extremely challenging.

FIGURE 102: PROPOSED ENHANCED PERFORMANCE THRESHOLDS

	2025/26	2026/27	2027/28	2028/29	2029/30
Enhanced reward threshold	12.32	12.32	12.32	12.32	12.32

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

In assessing our plan to achieve the PCL, a review of future risks and opportunities has been carried out with business subject matter experts, including wastewater compliance.

The risks associated with pollution performance for the period 2025 to 2030 have been determined as:

- Removal of Category 4s (we are the only industry with this category) as suggested by the EA (Ref: SWQWPG Paper) that will potentially impact our Category 3 classifications. For example, minimal impacts that are challenged from an initial Category 3 to a Category 4 would remain as Category 3 as a default.

- Potentially more pollutions recorded from FFT measurement where we don't pass sufficient flow through the works and discharge more through storm tanks.

- Emergency overflows through our pumping stations that aren't due to rainfall and increased monitoring from U_MON6 MCERTS EDM on EOs and MCERTS flow measurement on EO/SO stations.

- Impact from continuous water quality monitoring of sewage treatment works final effluent and intermittent discharges should this show a significant decrease in water quality downstream following a discharge.

- EA continue to analyse EDM data and retrospectively classify pollutions.

- EA assess data rainfall and determine spills on dry days. Have had 48 CAR forms where EA believes we've discharged on a dry period. The Agency is not considering drain down periods.

- Expectation from Ofwat of clean and well-maintained network in connection with storm spills.

- Potential that a failed sample from a works are classified as pollutions by EA.

- EA also considering continuous monitoring of final effluent on sewage treatment works – difficult to maintain compliance – but also could mean additional pollutions.

- Reducing spills in the network through storage will additional treatment capacity but could also increase non-compliant spills at the works and an increase in potential incidents.

Opportunities that can provide benefit for pollution numbers have been assessed as:

- Effectively monitor and assess all data to report and investigate any issues.

- Need for increased people resources to understand, investigate, and report on all issues, including retrospective reporting of EDM data.

- Increase in resilience for power issues and our response, linked to our PR24 business case.

- Smarter network management (for example, Stormharvester and HydroDigital) and deployment of additional monitors across the network.

Baseline performance is maintained through current levels of targeted base capex by asset group in the AMP to reduce overall pollution risk. Business as usual base operational expenditure is also required to maintain current performance levels through our detection, response, reporting, evidence collection and EA reviews.

Risks and opportunities have been evaluated across the asset groups that are responsible for our current and future pollution performance. Without increased resources and expenditure, it is forecast that we will not be able to meet the required reduction in pollutions in AMP8 to 2030 with a deterioration in numbers to 99 (32.97 normalised).

To achieve the target of 13.3 pollutions per 10,000 km we require the approval of the power resilience enhancement case, which allows are ability to increase resilience to power outages during events such as storms. The detailed enhancement business case can be found in Appendix **A3 - Costs** (NES04) – Resilience Enhancement Business Case.

FIGURE 103: HISTORIC PERFORMANCE, 2030 PCL AND ASSOCIATED RISK OF DETERIORATING PERFORMANCE WITHOUT INVESTMENT

Asset type	Average (2017-2020)	Average (2021/2022)	Target for 2030	All risk
Sewage treatment works	5	10	8	20
Storm tank	0	0	0	0
Combined sewer overflow	7	9	4	18
Foul sewer	22	17	12	17
Pumping station	8	27	15	37
Rising mains	1	3	1	6
Other	0	0	0	0
Surface water outfall	1	0	0	1
Total	44	65	40 (13.35)	99
Normalised	14.65	21.48	13.3	32.97

Source: NWL Analysis.

Risks have been examined across a matrix of applicable asset groups and EA classification of incidents. Interventions have then been produced to mitigate the risks with a cost estimate broken down into opex and capex needs. Overlaps with current investment and PR24 planning have been identified.

In summary, to achieve the PCL we will need to:

- Maintain current levels of base maintenance for asset health and overall pollution risk reduction targeted by asset groups responsible for pollution performance.

- Increase the visibility of our wastewater network to provide early detection of issues and increase our response capability.

- Increase our resilience to power related issues – see our **enhancement case** (NES32).

- Respond to the regulatory changes – see our **enhancement case** (NES37).

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We apply the proposed Ofwat incentive rate, of £680,00 per 1 pollution (Category 1 – 3) in 10,000km of sewer network. We do, however note this is higher than other ranges with the exception of the range of values from companies during PR19 (PJM Analysis of PR19 Willingness to Pay Values).

FIGURE 104: POLLUTION VALUATIONS

Measure	Unit	Ofwat PR24 ODI rate (2022/23 prices)	NWL PR24 research (2022/23 prices)	PR19 Ofwat FD (2022/23 prices)	PR19 NWL submission ODI (2022/23 prices)	PJM economics range (2022/23 prices)
Pollutions	**Per pollution in 10,000 km**	**£680,000**	£100,477	Penalty £430,931 Reward £353,009	Penalty £618,000 Reward £377,000	£104,495 - £1.7m

Source: NWL triangulation of Service Valuation research.

SERIOUS POLLUTIONS

DEFINITION

As per the Ofwat definition[108] and is the number of serious pollution incidents (Categories 1 and 2) from both sewerage and water supply assets following the EA's EPA methodology[109]. This measure is not normalised and is per calendar year with underperformance payment only.

CURRENT PERFORMANCE ASSESSMENT

We have been close to zero serious pollutions for wastewater assets since 2017 with consistently low numbers. The EA's Environmental Performance Assessment (EPA) for AMP7 now includes water supply assets having previously been a normalised measure for sewerage only serious incidents. We are an upper quartile performer most years. We are very pleased that we had zero serious Category 1 and 2 pollution incidents in 2022 from our water and wastewater assets having previously reported very low occurrences at one (category 2) in 2021. Our continued aim is to have zero serious incidents.

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[108] **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Total_pollution_incidents_PC_definition.pdf**
[109] **Environment Agency water and sewerage company Environmental Performance Assessment (EPA) methodology (version 9) for 2021 to 2025 - Ofwat**

FIGURE 105: CURRENT INDUSTRY PERFORMANCE FOR SERIOUS POLLUTION INCIDENTS

Water companies measured on the number of serious pollution incidents in 2022/23
(A lower number/bar is better)

There are no targets for this year.
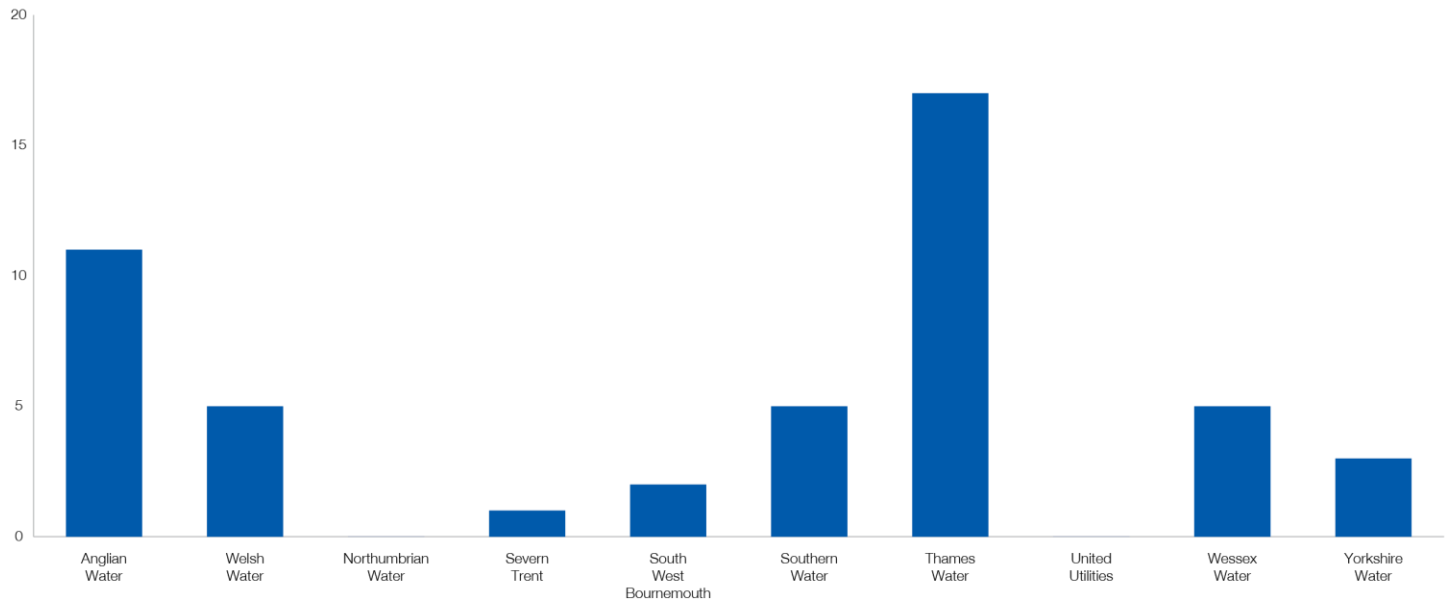
Source: NWL.

The five-year glide path thresholds applied to this measure in the EPA to meet the 'green' (better than target) status is particularly challenging with a requirement for zero in the first year of AMP8 (2025).

FIGURE 106: EA EPA 'GREEN' PERFORMANCE REQUIREMENT

2021	2022	2023	2024	2025
<=1	<=1	<=1	<=1	=0

Source: EA EPA

We successfully recorded zero pollutions for the first time in 2022 (2022/23). The historical average is 2.3 for this measure (2017 to 2022).

Improved performance has been delivered through improvements in detection, response, evidence collection and EA case reviews. Serious incidents can arise due to circumstance where an incident or discharge has occurred without early detection (long durations), major failure of assets or exceptionally low dilution in the receiving waterbody (for example, drought conditions).

FIGURE 107: NWL HISTORIC PERFORMANCE

	2016	2017	2018	2019	2020	2021	2022
Sewerage	9	2	1	2	1	1	0
Water supply	0	2	1	1	3	0	0
Combined	9	4	2	3	4	1	0

Source: NWL.

The only other WASCs to achieve zero serious incidents (across both water and wastewater) for this measure is United Utilities and Hafren Dyfrdwy. The average industry upper quartile (UQ) for WASCs between 2016 and 2023 was 1.9 incidents. We achieved UQ performance in 2018 and 2021-2023.

FIGURE 108: NWL HISTORIC PERFORMANCE

	2016	2017	2018	2019	2020	2021	2022
NWG	9	4	2	3	4	1	0
Industry average	4	3	4	3	3	4	3
Industry average – WASC Only	5	5	6	5	4	6	5
Industry UQ	0	0	0	0	0	0	0
Industry UQ – WASC only	3	2.5	2	1	2.5	2	0.5

Source: NWL.

CURRENT AMP ACTIONS

We continue to work hard to consistently achieve zero serious pollutions incidents across our wastewater and water services. This measure is not currently a separate commitment in this AMP. It is part of our all-pollutions measure, for which we are around an upper quartile performer. The actions we are taking to improve our pollutions performance can be found in the Pollutions section of this annex.

Typically, serious incidents happen when a discharge has either gone on too long or there is a major or catastrophic failure of asset(s) that has an immediate serious impact. Our focus is on continuous improvement in all aspects of pollution performance to target our efforts in effectively reducing the overall number of incidents. There are not any stand-alone actions in our plans to reduce serious incidents. Our continued aim is to have zero serious incidents as achieved in 2022.

Our company-wide zero-tolerance approach is summarised through the actions set out in our published Pollution Incident Reduction Plan (PIRP), Pollution SDS and Tactical Plan. We share our experiences and learn from others, such as through the industry Pollution Reduction Task Force and our innovation networks.

An example of a recent innovation that extends our detection capability is the full deployment of the Stromharvester smart network management technology in 2022/23. This uses advanced machine language learning, together with hyperlocal rainfall forecasting, to accurately predict the normal performance of our assets and provide alerts of issues happening. We are building further intelligence into this system with additional benefit for our pollution performance.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

We considered a number of factors to consider in setting the PCL for serious pollutions, they include:

Regulatory targets

The Government's strategic policy statement (SPS) for Ofwat included a key priority for water companies to achieve zero serious pollution incidents by 2030[110]. This condition is also in the EA's Water Industry Strategic Environmental Requirements (WISER) as a statutory obligation under regulatory compliance.

EA Wiser statutory commitment to set serious pollutions at zero for 2025-2030[111]. The EPA threshold for this measure requiring zero incidents for a green assessment for the calendar year 2025. This also impacts our 4-star company status ambitions.

Ofwat has already indicated in their Final Methodology, companies can only earn enhanced rewards for all pollutions if they have no serious pollutions in the same year[112]. We agree with this gateway on enhanced rewards on all pollutions.

Long-term strategy

To be consistent with our long-term delivery strategy to have zero serious pollution incidents as a result of assets and operations today and always[113].

Customer research

A triangulation of our customer research bank and Ofwat's analysis indicated that pollutions were considered a high priority.

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[110] https://www.gov.uk/government/publications/strategic-policy-statement-to-ofwat-incorporating-social-and-environmental-guidance/february-2022-the-governments-strategic-priorities-for-ofwat.
[111] https://www.gov.uk/government/publications/developing-the-environmental-resilience-and-flood-risk-actions-for-the-price-review-2024/water-industry-strategic-environmental-requirements-wiser.
[112] Ofwat PR24 Final Methodology.
[113] long-term-delivery-strategy_final_1 (2).pdf.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

Our performance over the last five years to 2022/23 we have been at or better than the WASC upper quartile three times. While in the latest reporting year we had no serious pollutions.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry. Average industry performance fluctuates between three and four serious pollutions annual, which are driven by the WASCs.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

Risks

Interventions to meet the total pollution measure (wastewater Category 1 to 3) will benefit in meeting the PCL for this measure. As noted above, there is a requirement to attain zero pollution incidents to earn eligible enhanced outperformance payments for the total pollution incidents measure. The risk here is that our incentive to reduce Category 3 incidents on wastewater assets might be impacted by a serious incident on either water supply or wastewater assets.

The risks that are particular to this measure include:

- The EA's classification of pollution incidents changes to sterner assessments.
- Asset failures increase across water supply and wastewater assets that result in impacting discharges.
- Discharges occur in drought conditions when river flows are very lower with limited dilution thus increasing impacts significantly.
- Future impacts of severe storms and the EA's acceptance of our response and/or resilience to manage major incidents, such as in civil emergencies.

These risks will be considered through the total pollution measure.

FIGURE 109: ASSESSMENT OF PERFORMANCE RANGES

Customer ranking	Upper quartile range (linear – log)	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory
Medium	0 (WASC and WOCs) 1.9 (average over the last seven years for WASC only)	0 (WASC and WOCs) 3 (average over last seven years for whole industry, 5 for WASC only)	To have no serious pollutions pollution incidents as a result of assets and operations today and always

Source: NWL Analysis

Given the regulatory information above, and our current performance, **we set our target as 0 for the period 2025 – 2030.** However, we also propose a **deadband of one**, which is outperforming current upper quartile performance against WASCs and reduces the asymmetry of the ODI against this commitment. We also note that while if we achieve one serious pollution in the year, we will not be able to access any enhanced rewards on our total pollutions measure.

FIGURE 110: PCLS FOR SERIOUS POLLUTIONS

Targets for reducing the number of serious
pollution incidents (cat 1 and 2)
(A lower number/bar is better)
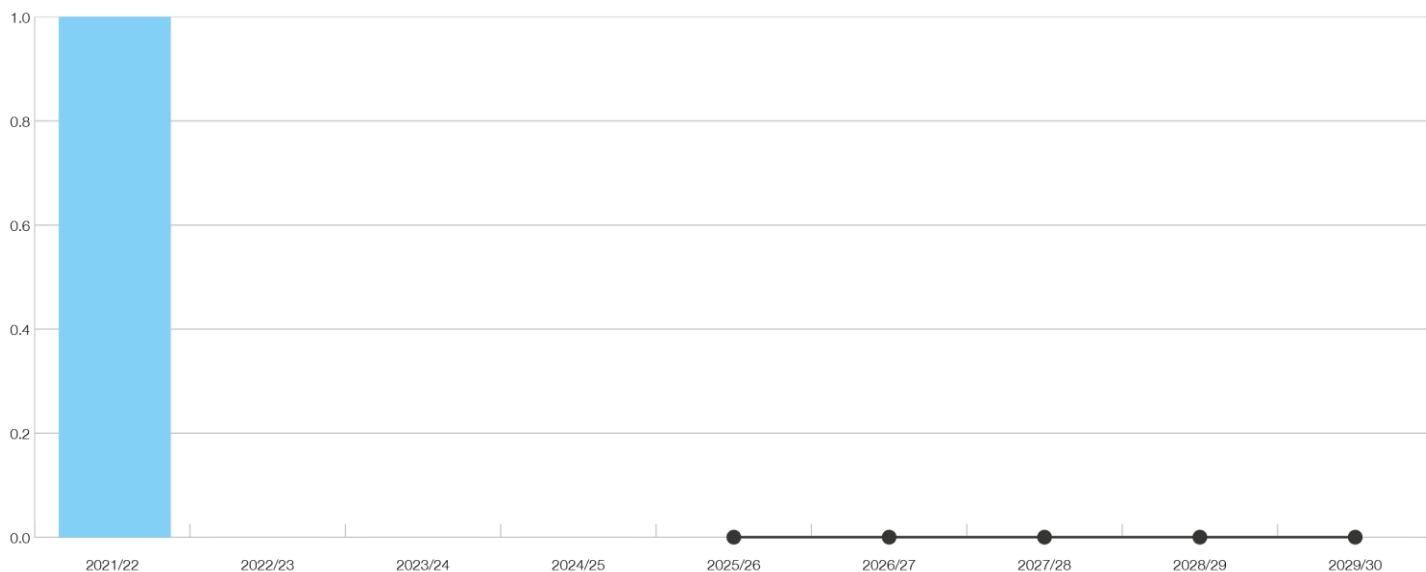
	2025/26	2026/27	2027/28	2028/29	2029/30
PCL	0	0	0	0	0
Deadband	1	1	1	1	1

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

For AMP8, we will continue to deliver upper quartile pollution performance through our PIRP, SDS and Tactical Plan.

Our stated continued aim is to consistently have zero pollutions from our assets and operations.

There are no specific plans for meeting this PCL as all activities are in the total pollution measure plan.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We will apply Ofwat's proposed penalty rate of £1.14m per serious pollution outside of our proposed deadband of 1.

SEWER COLLAPSES

DEFINITION

As per the Ofwat definition[114].

CURRENT PERFORMANCE ASSESSMENT

We continue to outperform our PCL this AMP. For 2022/23 we achieved 9.29 per 1,000km against a target of 9.43. Despite this our performance deteriorated on the previous year when we were at 8.71 per 1,000km. We have also fallen below the industry average of 8.07.

We carried out specific training within our operational teams to embed the learning and best practice we have identified throughout the year. We're also seeing several sewer collapses avoided through proactive investigations, for example those identified as part of our find and fix activities associated with our 'Flooding Other Causes' programme.

We recognise that there is more than we can do in this area and will continue to benchmark our performance and learn from companies who are doing slightly better than us to help us continue to reduce sewer collapses in the future. The work we are trialling using AI for defect recognition from CCTV survey footage is a good example of where we plan to improve the efficient and effective proactive inspection of our sewer network.

Our continuing improving performance in this area has helped reduced the risk of sewer flooding incidents and environmental discharges across our region.

Finally, as one of four asset health metrics, longer term performance is strongly linked to the delivery of appropriate levels of capital maintenance. However, delivery of improved asset health will in turn be dependent on the provision of appropriate levels of funding for capital/asset maintenance activities. We do not consider that the current regulatory approach to setting funding allowances is sustainable in the longer term.

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[114] **https://www.ofwat.gov.uk/wp-content/uploads/2022/12/Sewer_collapses_PC_definition.pdf**

FIGURE 111: CURRENT INDUSTRY PERFORMANCE FOR SEWER COLLAPSES (2022/23)

Water companies measured on the number of sewer collapses

Number of sewer collapses, per 1,000 km of sewer network (a lower number/bar is better)

Source: NWL analysis of Ofwat Industry Historic dataset

CURRENT AMP ACTIONS

We carried out specific training within our operational teams to embed the learning and best practice we have identified throughout the year. We're also seeing several sewer collapses avoided through proactive investigations, for example those identified as part of our find and fix activities associated with our Flooding Other Causes Programme.
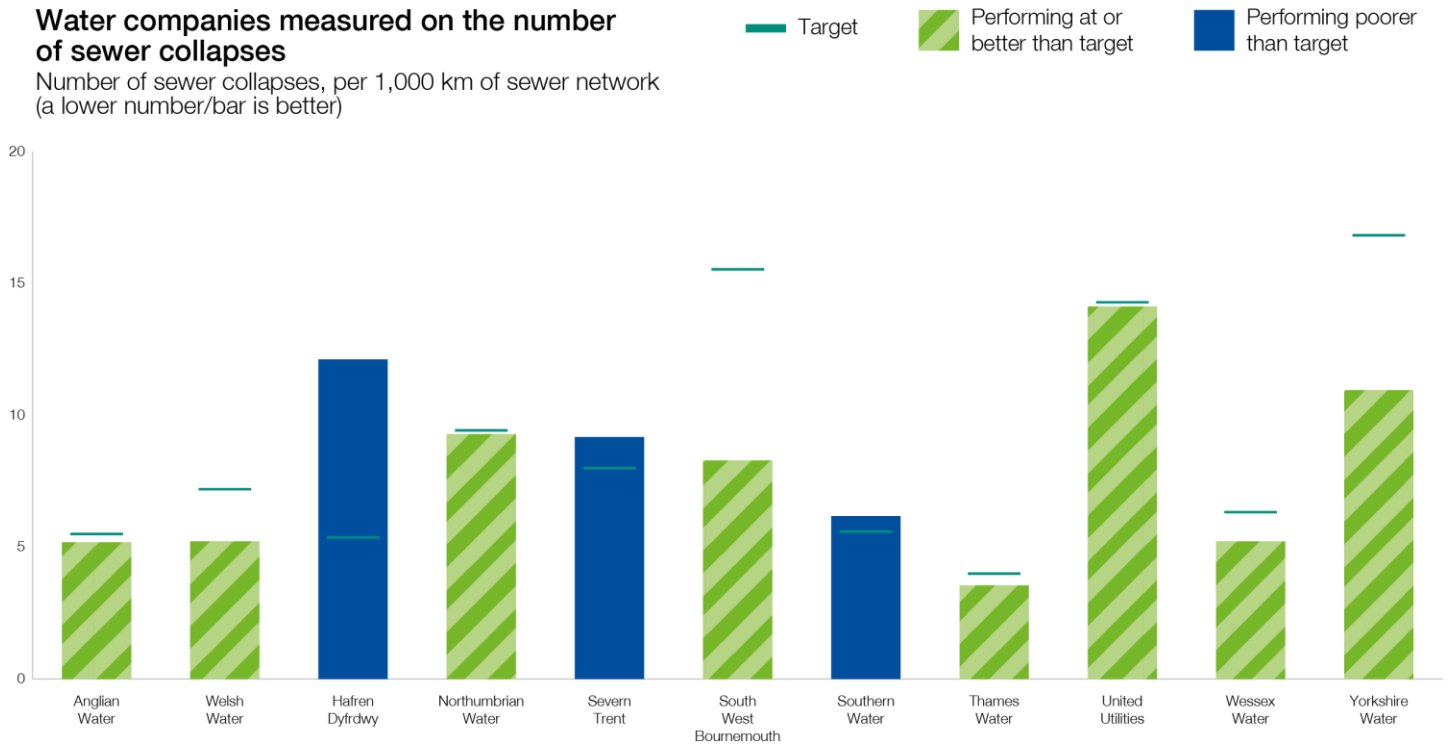
SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

In setting our PCL we considered the following information:

Customer research

A triangulation of our customer research bank indicated that customers consider asset health measures were a low importance across the list of measures proposed for PR24. However, Ofwat's assessment indicates this to be a medium priority. Reviewing this information, we believe that asset health measures are consider a medium priority.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see Appendix **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

Historic and comparative data extrapolated to 2030 using both linear and logarithmic curves. Industry upper quartile does not aid the extrapolation of performance trends as this remains an upward trend since 2017/18. The last two years has started to see reductions in the upper quartile, and if this continues in 2023/24 we are likely to start to see a downward trend. Industry average has seen reductions over the period, 11.33 per 1,000km of sewer, to 8.07 in 2022/23. We have extrapolated out the average position to 2030, which has an upper level of 7.60 using a log curve.

FIGURE 112: FORECASTING FUTURE SEWER COLLAPSE PERFORMANCE USING HISTORIC INDUSTRY TRENDS.

Source: NWL.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry. While the

information from the Ofwat Historic data set shows upper quartile to be upward, the average performance has been reducing, extrapolating this out to 2029/30 suggests a range of 3.81 to 7.60 per 1,000 km of sewer network.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

FIGURE 113: ASSESSMENT OF PERFORMANCE RANGES

Customer ranking	Upper quartile range (linear – log)	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory
Medium (Asset Health)	Rising, trend expected to change direction in next AMP – 5.7 per 1,000 km in 2022/23	Range 3.81 to 7.60	n/a

Source: NWL Analysis.

We propose to continue reductions of sewer collapses over the next AMP, setting a target PCL of 7.12 per 1,000 by 2029/30.

FIGURE 114: PCLS FOR SEWER COLLAPSES

Targets for reducing the incidents of sewers collapsing
Number of sewer collapsing per 1,000 km of sewer network
(a lower number/bar is better)
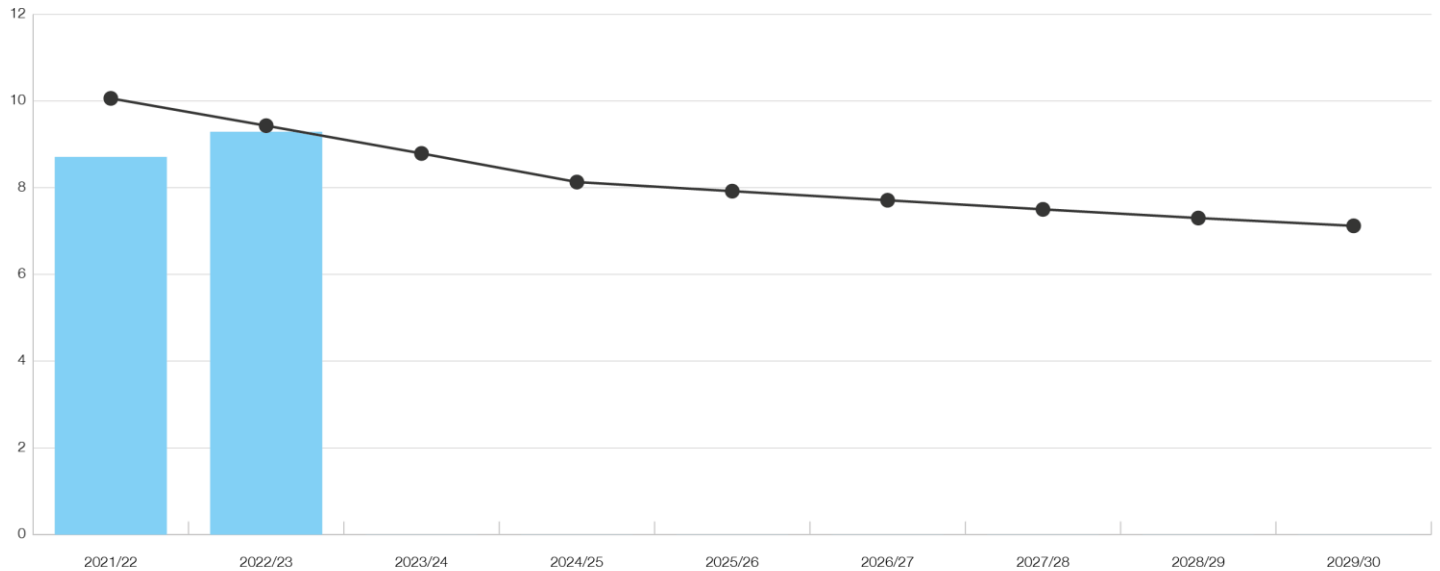
	2025/26	2026/27	2027/28	2028/29	2029/30
PCL (normalised)	7.92	7.71	7.5	7.3	7.12
PCL (actual)	240	234	228	222	217

Source: NWL.

Our proposed PCL will be funded through base totex, with no enhancements attached to this measure.

OUR PLAN TO ACHIEVE THE PCL

For AMP8 we will continue to invest in the initiatives identified in our sewer collapse tactical plan. The key performance initiatives associated with this plan, alongside the benefits we measure and report against are shown in Figure 115.

FIGURE 115: SEWER COLLAPSE INTERVENTIONS

Intervention	Description	Sewer collapse benefit (Nr)	BCR
Enhance FOC	Increased length (km) of proactive CCTV and network rehabilitation on public and TDS network.	10	<1
Training / awareness	This includes improving the data we collect on site to improve root cause assessment and allowing us to raise jobs more efficiently and effectively.	18	>1
Solution hierarchy	This involves ensuring that the solutions we identify are right first time and avoid where possible the need to 'dig down'.	5	<1

Source: NWL.

In addition to this we are investing an additional £49.5m TOTEX for the period 2025/30 to help us reduce sewer collapses in line with our proposed PCL.

This additional invest will include:

- Investment in an enhanced strategy and inspections for wastewater sewerage. This will lead to the following benefits:

  o Effective information and data to help optimise our network performance.

  o Reducing the risk of future failures.

  o Optimised strategy for future investment.

  o Evidence based assessment of asset health.

- Enhanced sewer rehab programmes (above existing levels) – targeting reducing condition grades in high-risk locations. Expected reduction in sewer collapses, five Nr.

- Enhanced proactive inspection and fix programme (above existing levels). Expected reduction in sewer collapses, ten Nr.

- Greater investment for rising main replacement – named schemes. Expected reduction in sewer collapses, three Nr.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We will use Ofwat's proposed incentive rate of £650,000 per sewer collapse in 1,000km of network for out and under performance against our PCL.

DISCHARGE PERMIT COMPLIANCE

DEFINITION

As per Ofwat's definition. The discharge permit compliance metric is reported as the performance of wastewater treatment works (to treat and dispose of sewage) and water treatment works (for the water supply service) in line with their numeric discharge permit conditions. The discharge permit compliance metric is reported as the number of failing sites (as a percentage of the total number of discharges) and not the number of failing discharges. This measure applies to both water only companies and to water and sewerage companies.

CURRENT PERFORMANCE ASSESSMENT

Our performance improved from 2021/22 of 98.03% to 98.52% in 2022/23, however we remain outside the EA deadband of 99%. It differs slightly from that reported by the Environment Agency (EA) in its annual Environmental Performance Assessment (EPA) of water companies in England. This measure is reported as the total number of failing sites (rather than the number of failing discharges) where one or more numeric permitted discharges have been confirmed as failing in a calendar year. This is expressed as a percentage of the total number of discharges on the EA register. For both NW and ESW in 2020-25, this measure now includes both STW and WTW discharges and is subject to penalty for under-performance (EPA does not include ESW sites).

Our target is 100% and we have ranged between 96.00% (tenth in industry) to 99.5% (sixth in industry) over the last six years. It is interesting to note that only two companies have achieved the 100% compliance in the last six years.

FIGURE 116: CURRENT INDUSTRY PERFORMANCE FOR DISCHARGE COMPLIANCE (2022/23)

Water companies measured against the percentage of failing treatment work sites
Percentage of failing sites of the total number of discharges (a higher number/bar is better)

Legend: Target | Performing at or better than target | Performing poorer than target
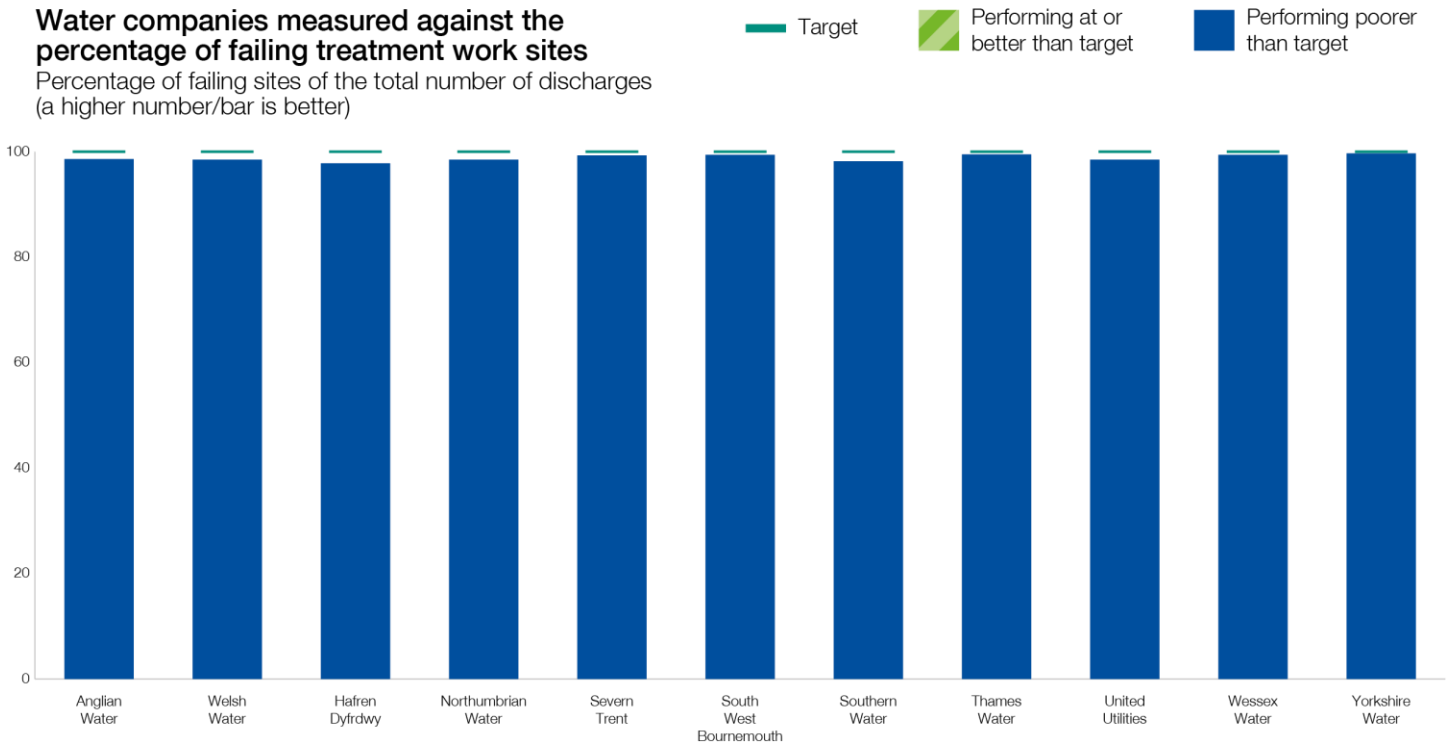
Source: NWL analysis of Ofwat Industry Historic dataset.

This result has been associated with three treatment work sites in our Northumbrian operating region (one STW and two WTW) and one WTW in the Essex and Suffolk area. The STW failing discharge was due to an ammonium failure with the WTW failures being chlorine (one works) and iron (two works) from a total of 204 eligible treatment works.

We have completed extensive investigations to establish the root cause of these events and identified corrective measures to mitigate the likelihood of a reoccurrence. Most of the corrective actions have been fully implemented with the remainder nearing completion. These corrective measures have included additional enhancement to both the sites operating procedures and preventive maintenance schedules along with the installation of additional process infrastructure. Each failure has or continues to undergo a thorough investigation process to identify any further mitigation measures to avoid future failures.

The EPA metric specifically applies to treatment works in the Northern region which have three failing discharges against a total of 177 (one STW and two WTW). Although 2022 has resulted in a penalty for performance below our PC we have achieved a 3-star company status in the Environmental Performance Assessment (EPA) from the EA.

We are continuing to seek performance improvements to achieve our future targets and our aspiration is to have zero discharge compliance failures.

CURRENT AMP ACTIONS

We remain focused and proactive in using leading indicators in monitoring our treatment works taking regular samples that are analysed for compliance, including phosphorous and ammonia, and specific substances that may accumulate to cause a problem in the water environment. We continue to do our best to deliver against the challenging new standards, while also adapting to challenging circumstances, as well as a very stretching settlement from Ofwat. We must also continue to be adaptive and plan to meet future requirements including the challenges of emerging themes while satisfying our continued obligations in contributing to a 'Good' Water Framework Directive (WFD) status in our rivers.

FIGURE 117: ONGOING ACTIONS TO IMPROVE DISCHARGE COMPLIANCE PERFORMANCE

Action	Description	Target Date
Address known risks	Targeted interventions at sites with one or more individual sample fails in rolling 12-month period. (Typically, three sample fails required before an STW site is classed as failing under Look Up Table methodology unless a failure is upper tier, whereas no headroom at WTW sites) This includes: • Billingham STW - capital scheme underway to improve inlet works (to address failure June 2022). • Honey Hill WTW - cleaning of settlement tank (to address failure May 2022). • Ramshaw STW - dosing and filter issues investigated. Dosing adjusted and under close monitoring (to address sample failure August 2021). • Sherburn STW - capital project scheduled for completion December 2024 to address ammonia issues (to address sample failure March). • Embleton STW - ammonia challenge addressed by site upgrade (to address sample failure May 2022). • Lanchester STW - capital project to address P consent and to improve nitrification performance. Scheduled for completion in 2025.	As per bullets
Continuous improvement of compliance controls including visibility and scrutiny of compliance data	To include: • Continued use of TRIM and DRIVE tools – ONGOING. • New Compliance Hub – End 2023. • Improved data, including from retailers, to facilitate trade effluent management – Scheduled for end 2024.	As per bullets

Source: Our Performance Action Plans 27 January 2023.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

We considered a number of factors to consider in setting the PCL for serious pollutions, they include:

Regulatory targets

The EA, has indicated the following requirements within WISER:

- 100% compliance for all licences and permits (not statutory).

- 100% compliance at wastewater treatment works and water treatment works with numeric limits and for storm overflows (statutory).

- 100% compliance with environmental impact and operational performance permit conditions at wastewater treatment works and water treatment works with descriptive not numeric limits (statutory).

- To achieve 'Green' under the current EPA guidance requires a minimum performance of 99%.

Customer research

Discharge compliance was considered a medium priority by customers from both our own customers and the research undertaken by Ofwat.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

Historic and comparative data, reviewing the upper quartile and average performance for the industry. We note that industry upper quartile peaked in 2020/21 with 99.70%, however performance has usually been between 99% and 99.4%. Average industry performance between 2017/18 and 2022/23 has generally been between 98.2% and 98.9%, however peaked at 99.25% in 2020/21. Generally, one company a year since 2019/20 has achieved 100% compliance (two in 2018/19).

Extrapolating these trends out, using both linear and log trends, suggests an upper quartile of between 99.46% and 99.61% by 2030. An average position in the industry sits between 99.16% and 99.53%.

FIGURE 118: FORECASTING FUTURE DISCHARGE COMPLIANCE PERFORMANCE USING HISTORIC INDUSTRY TRENDS
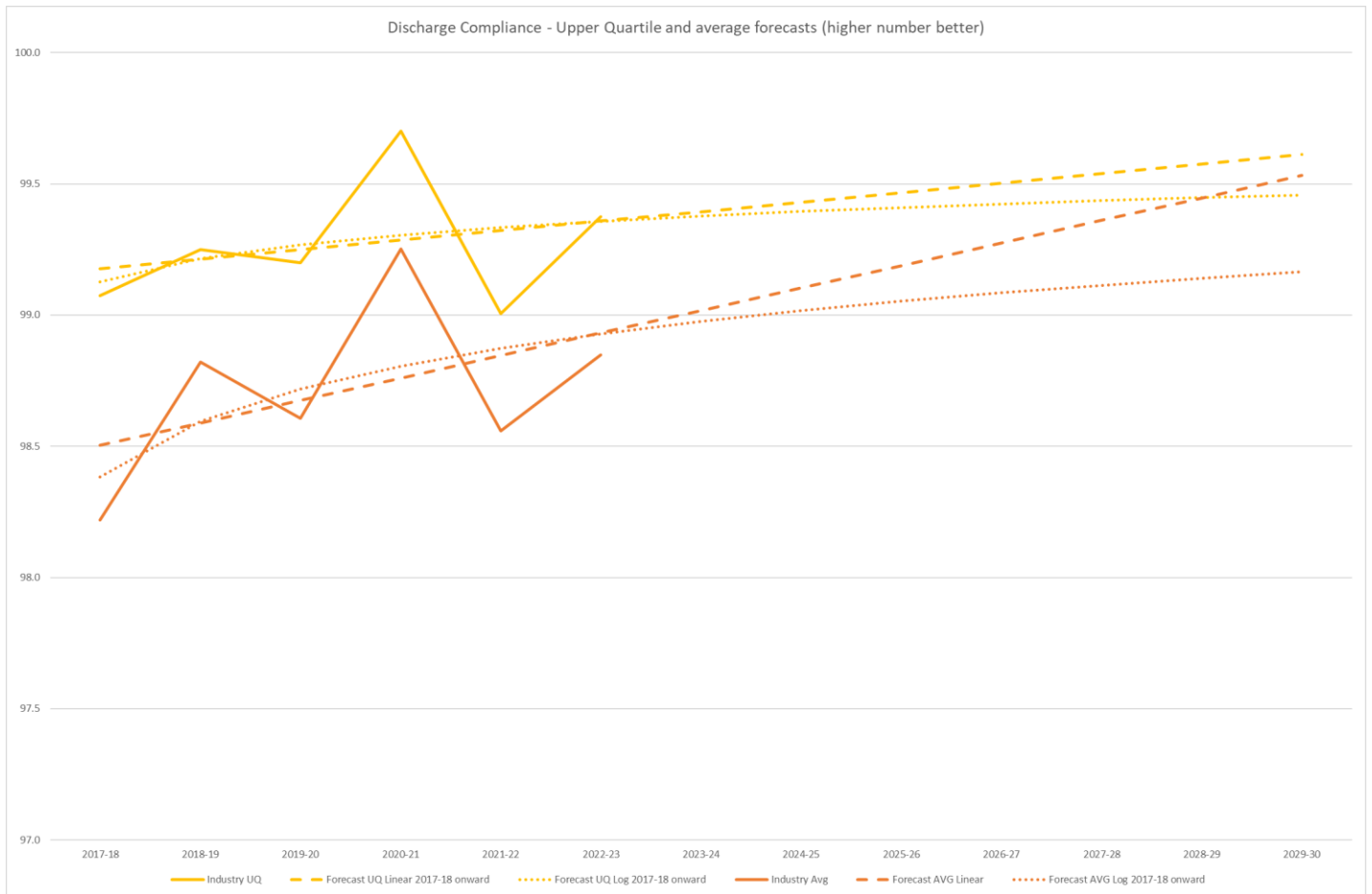
Discharge Compliance - Upper Quartile and average forecasts (higher number better)

Source: NWL.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry. Extrapolating industry average performance from Ofwat's Historic data set indicates average performance to be between 99.16% and 99.53% in 2029/30.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

FIGURE 119: ASSESSMENT OF PERFORMANCE RANGES

Customer ranking	Upper quartile range (linear – log)	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory
Medium	99.46 – 99.61%	99.16 – 99.53% - however the UQ range would suggest average will be at the lower end of the range.	n/a

Source: NWL Analysis.

FIGURE 120: PCLS FOR DISCHARGE COMPLIANCE

Targets for improving treatment works compliance
Percentage of compliance against permits (a higher number/bar is better)

Legend: Target, Deadband, Current performance
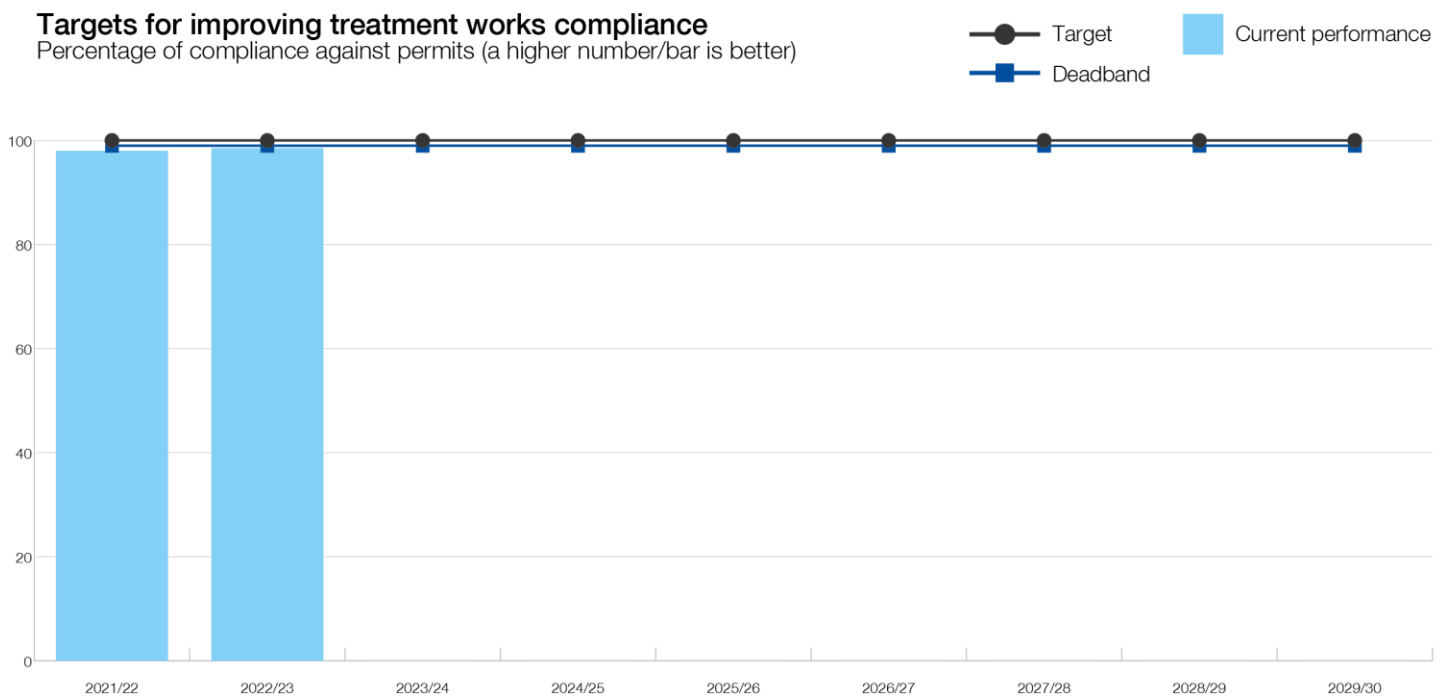
	2025/26	2026/27	2027/28	2028/29	2029/30
PCL	100%	100%	100%	100%	100%

Source: NWL.

Based on the current Environment Agency, EPA ratings, which indicates a rating of green for a 99% compliance we add a 99% deadband to performance.

	2025/26	2026/27	2027/28	2028/29	2029/30
Deadband	**99%**	**99%**	**99%**	**99%**	**99%**

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

A tactical plan to improve performance is currently in development and will aim to see us reach over 99% compliance by year three and four of AMP8. The tactical plan will be based on enhancement funding in AMP8 together with continued base maintenance funding and operational interventions.

The tactical plan will address three key areas in both water and wastewater directorates.

1. Known risks.

2. Continuous improvements.

3. Trend analysis / data analytics and knowledge sharing/ operator interventions procedural changes.

Examples of intervention activities are shown in the table below. This is not comprehensive and will evolve as the tactical plan develops.

FIGURE 121: DISCHARGE COMPLIANCE ACTION PLAN

ACTION	Wastewater	Water
Known risks	• Root cause analysis. • Site specific interventions including extra infrastructure. • Improving operating procedures. • Preventive maintenance schedules. • Regular sampling.	• Root cause analysis. • Site specific interventions including extra infrastructure. • Improving operating procedures. • Preventive maintenance schedules. • Regular sampling.
Continuous improvement	• Investigation and intervention at first failure. • Investing in cleaning, filtration and investigating ammonia issues. • Optimisation of dosing equipment. • New programme of compliance controls including further improving visibility and scrutiny of compliance data, through a new 'compliance hub', including data from retailers to facilitate trade	• Reporting requirements. • Increased focus on discharge compliance. • Review cleaning/SOP.

	effluent management.	
Performance data analytics	• Ensuring the quality of the data (Mcert and other quality audit requirements). • Making sure the data is correctly interpreted and meets reporting obligation. • Ensuring that any necessary actions as a result of the data are adequately programmed and resourced to allow delivery to avoid non-compliance.	• Further development of DRIVE or to carry out specific feasibility studies.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We apply Ofwat's proposed incentive rate of £1.48m per percentage point we are below the deadband of 99%.

BATHING WATER QUALITY

DEFINITION

As per the Ofwat definition[115] and is a single average 'score' for each company using weightings for each classification (Excellent, Good, Sufficient and Poor).

It covers all eligible designated coastal and inland bathing waters using the EA's Planning Class that considers underlying risk (all samples). Specific exclusion applies to bathing waters that cannot be impacted by water company assets as provided by the EA and set out in PR24 final determinations.

Closed or de-designated sites in the reporting period are included with most recent classification but newly designated sites are not included in this measure.

CURRENT PERFORMANCE ASSESSMENT

Our current AMP7 bespoke measure for bathing waters targets the number of good and excellent bathing waters, as reported by the Environment Agency and DEFRA, as a percentage of all bathing waters. This PC is subject to both penalty and reward Outcome Delivery Incentive (ODI) for under or over performance with no caps or deadbands.

There is no Environment Agency (EA) Environmental Performance Assessment (EPA) measure for bathing water quality.

Our PC target is linear for AMP7 at 97.06% that is equivalent to 33 out of 34 designated bathing beaches being classified as Good or Excellent[116].

The incentive rates (standard only) are equivalent to £0.733m per bathing water with no cap on under performance. The definition for this PC includes a specific exemption where it can be proven that our assets are not contributing to any deterioration in classification.

Performance in this measure has mainly been brought about through enhancement quality driven schemes to meet the Bathing Water Regulations and the Urban Wastewater Treatment Regulations. These investments included the installation of full secondary treatment at coastal STWs, construction of long sea outfalls (LSOs), interception of storm overflows (SOs), storm storage systems and ultraviolet (UV) disinfection treatment.

Improvement at individual bathing waters has also been achieved through the undertaking of specific quality driven projects that sought to understand and improve BWQ. Examples include Spittal Beach, where diffuse agricultural sources

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[115] **https://www.ofwat.gov.uk/publication/bathing-water-quality-pc-definition/.**
[116] **https://www.ofwat.gov.uk/wp-content/uploads/2019/12/PR19-final-determinations-Northumbrian-Water-Outcomes-performance-commitment-appendix.pdf.**

of pollution were managed by working with farmers and SEPA through a Priority Catchment Investigation, and Saltburn, which has also seen steady improvement to reach 'Excellent' standard following significant investment in 2015/16.

Our best performance in this measure was 97.06% which was achieved in 2016 for the first time. In 2018, Cullercoats deteriorated to 'Poor' and has been the focus of continued partnership working together with an AMP7 WINEP investigation. This concluded that contaminated groundwater is the likely cause.

FIGURE 122: CURRENT INDUSTRY PERFORMANCE FOR BATHING WATER QUALITY

	2020	2021	2022	2023	2024
PC (Unit %)	97.06	97.06	97.06	97.06	97.06
Actual classifications	97.06	94.12	94.12	-	-
Exclusions applied	N/A	97.06	97.06	-	-
Actual reward	£0	£0	£0	-	-
Actual penalty	£0	£0	£0	-	-

Source: NWL.

In 2021/22 we reported that we achieve 32 out of 34 beaches at either good or excellent. We had one at poor (Cullercoats) and one at sufficient (Marsden).

Marsden deteriorated to sufficient in 2021 following several high summer storm related samples in 2018 and 2019. From our AMP7 WINEP investigation, we applied the specific exemption. The EA provided written statements to confirm that Marsden meets the exemption criterion for the 2021 bathing season and again for the 2022 season. Therefore, our reported performance is 33/34 (or 97.06%) for these years that comprises of 32 beaches rated as Excellent or Good along with Marsden rated as Satisfactory but with a written exemption confirmed by the EA.

We remain an upper quartile company for coastal bathing water company in comparison with our PC with consistently high-ranking position for percentage good and excellent classifications.

For PR24, Ofwat has proposed a new common measure, to provide a weighted score for bathing waters dependent on the rating of the bathing water. We have reviewed 2021/22 industry performance for bathing waters (inland bathing waters are excluded as at this time the consultation by the EA has not been concluded).

Using Ofwat's datset we obtained a performance of 82% which is just below the industry's upper quartile of 83% and well ahead of the average of 76%. We show our position in the industry against the other companies in the below chart. Note, that not all companies have coastal bathing waters.

FIGURE 123: CURRENT INDUSTRY PERFORMANCE FOR BATHING WATER QUALITY
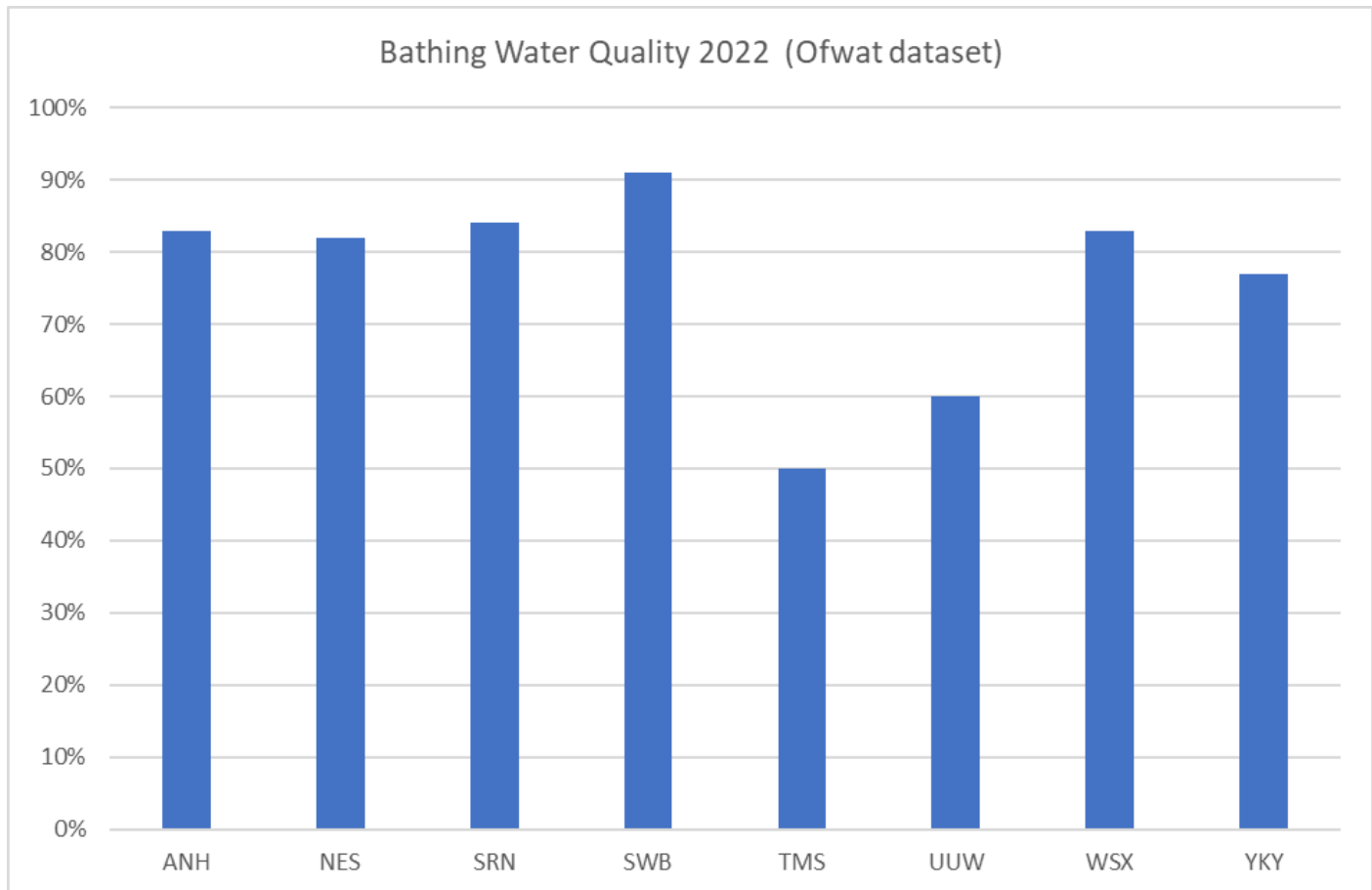
Source: NWL using Ofwat Bathing Water Dataset.

CURRENT AMP ACTIONS

We continue to work in partnership to improve bathing water quality and maintain Good or Excellent bathing water service from our assets. Our strategy is set out in our approved Strategic Delivery Strategy (BWQ SDS, 2022).

Activities this AMP focus on maintaining compliance from base maintenance, WINEP investigations and schemes, and operational interventions.

The specific bathing water quality opex interventions across the AMP include:

- Pre-season bathing water checks – Bathing water assets are inspected, CCTV, cleansed and any issues resolved before the season starts and includes 30km of network.

- Clean up (sewage related debris) – Operational teams carry out clean-ups after storms to remove any sewage related debris along with all investigations to resolve issues with screening controls.

- Seasonal UV disinfection treatment - All but one (Marske) ultraviolet disinfection plants run on a seasonal basis and is the most significant expenditure due to high energy costs.

- Analysis of historical data, high samples and SLM management of live Beach Aware information – Working with EA and Surfers Against Sewage to investigate high results and spill notifications to make sure we have the correct information and correct any erroneous alerts.

- SeaScapes Beach Care Officer (committed contribution) – Partner in a £5m heritage lottery funded seascapes project and hosting a Beach Care Officer who is part of our Wastewater Strategic Planning team.

Capex investment covers ten WINEP investigations to determine reasons for deterioration or options to increase the robustness of existing good or excellent classifications. These were all completed by September 2022. WINEP improvement schemes at Marsden and Redcar Granville have not been required. This has been due to investigations highlighting issues with our network which have been resolved or that other sources of bacteria are the predominate reason for the deterioration.

Base maintenance capex interventions related to bathing water assets (for example, sea outfalls, UV treatment, SOs) are included in other SDSs (Pollution and Discharge Compliance). Existing opex interventions that also benefit bathing water quality are also contained in Pollution and Discharge Compliance SDSs. Ad-hoc expenditure also results from continued opex funded investigations, such as at Cullercoats.

We continue to work closely with the Environment Agency to identify at risk bathing waters and priority sites for in-season investigations, such as through pre-season bathing water meetings, data sharing and site walkovers.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

In setting our performance commitment level we considered a variety of information, including:

Regulatory targets

The Government's strategic policy statement (SPS) for Ofwat doesn't include any specific requirement for bathing water quality but there is priority for companies to make progressive reductions in the adverse impacts of discharges from storm overflows. This is linked to the Government's Storm Overflow Discharge Reduction Plan (SO-DRP) that contains a target for all storm overflows (SOs) associated with designated bathing waters to spill no more than two or three times a bathing season by 2035 to protect human health and significantly reduce harmful pathogens.

The EA's Water Industry Strategic Environmental Requirements (WISER) covers a number of statutory actions to improve bathing water quality to address deterioration and meet the minimum standards under WINEP. There are also non-statutory actions to improve designated and non-designated bathing beaches where there is evidence of customer support that are non-statutory (NS). Lastly, an action to communicate to the public the location and quality of designated bathing waters and actions they can take to support bathing water quality (NS).

Ofwat uses the EA's underlying planning class for this new measure and not the national published classification. The planning class uses all samples in the assessment, even those that have been discounted or disregarded through short-term pollution (72 hours) or pollution risk forecasting (PRFs). This dataset is used to target investment to determine reasons for deterioration and schemes to address deterioration linked with water company assets. There are currently 15 bathing waters in our region that are subject to the EA's PRF system.

The measure covers all eligible designated bathing waters, such as coastal, lakes and river sites. Therefore, all WaSCs in England will be included in this measure. For example, Severn Trent Water currently have only one bathing water, a lake which is Excellent (2021 and 2022) so their average score is 100%.

It is also important to note for eligible bathing waters that if a bathing water is closed and sampling cannot be carried out, the most recent classification will apply for the period. Also, if an eligible bathing water is de-designated during the reporting period it will continue to be included in the average score calculations based on the last classification (for example, Poor for Cullercoats). Any newly designated bathing water for the period will not be eligible for the purpose of calculating performance against this measure.

The specific exclusion for this measure is that bathing waters which cannot be impacted by our assets are excluded by the EA when listing all eligible bathing waters in our PR24 final determination.

Potential exclusions can be beneficial to the weighted average score (such as Cullercoats) where others will have any impact (such as Excellent bathing waters):

- Cullercoats (Poor) - No direct impact from our operations. Contaminated groundwater has been determined to be the issue.
- Low Newton (Excellent) - Remote beach with no direct discharges from our assets.
- Seaton Carew North Gare (Excellent) - Sheltered from River Tees and remote from our assets.
- South Shields (Good) - Not thought to be impacted by Howdon or the River Tyne. No direct discharges.

In setting the PCL for this measure, we have obtained the planning class dataset from the EA so that we can assess the likely upper quartile performance. We have also evaluated this against the published classification.

Customer research

A triangulation of our customer research bank indicated that the improvement of bathing waters was a low priority for customers. Ofwat's own triangulation of sources agreed with our assessment.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

The upper quartile position decreases from the published class to the EA's planning class by around 3% to 4% on average. This is due to the number of bathing waters in each company area being subject to PRF and the number of disregarded samples. Severn Trent and Thames have inland only sites with no difference between datasets with Yorkshire Water showing a slight increase. The rest of WaSCs have an average decrease of between 2.8% and 4.3% with the exception of United Utilities who have the largest decrease of between 12% to 25%.

Applying this measure (all water companies) for 2021 and 2022 we would be a middle ranking company and outside of upper quartile, with Severn Trent and South West leading.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

To forecast AMP8 and AMP9 performance, we have assessed each bathing water individually using previous investigation reports, understanding of bacterial source apportionment, expert judgement, and trends, AMP8 WINEP bathing water investment and spill reduction investment of ~£700m to meet the Government's SO-DRP bathing water targets.

Our forecast position was then used to evaluate the following three scenarios:

- Published classifications (best case) without any discounting samples.
- Planning classifications (likely case) based on current PC definition including all discounted or disregarded samples.
- Worst case is based on planning class dataset with addition of three newly designated bathing at Poor or Sufficient and includes local deterioration due to non-NWL sources.

All scenarios include the SO spill reductions investment specially covering bathing water assets to 2035, AMP8 WINEP no deterioration investigations and non-statutory schemes (for example, Berwick STW UV disinfection).

FIGURE 124: PCL SCENARIOS FOR BATHING WATER QUALITY

Scenario published class	2024	2025	2026	2027	2028	2029
NWG	87.09	88.06	90.06	90.06	90.06	90.06
Industry average	86.55	87.49	88.55	89.41	90.26	90.99
Industry UQ	90.09	91.23	92.39	93.55	94.74	95.94

Scenario planning class (likely)	2024	2025	2026	2027	2028	2029
NWG	79.15	80.12	80.12	81.09	82.09	87.06
Industry average	82.61	83.51	84.31	85.24	86.17	87.56
Industry UQ	87.52	88.62	89.75	90.88	92.03	93.2

Scenario planning class	2024	2025	2026	2027	2028	2029
NWG	73.62	74.51	74.51	75.41	76.32	85.51
Industry average	82.61	83.51	84.31	85.24	86.17	87.56
Industry UQ	87.52	88.62	89.75	90.88	92.03	93.2

Source: NWL Analysis.

These scenarios are dependant on the list of bathing waters included in the EA's list. Any changes to the list upon which this forecast was based would seen changes to our PCL.

The middle likely scenario was considered to be the most plausible as this is based on current PC definition.

FIGURE 125: ASSESSMENT OF PERFORMANCE RANGES

Customer ranking	Upper quartile range	National leader minimum (average range, linear - log)	Long-term strategy (2050 target and 2030 trajectory
Low	93.2 – 95.94	87 - 91	n/a

Source: NWL Analysis.

FIGURE 126: PCLS FOR BATHING WATER QUALITY

	2025/26	2026/27	2027/28	2028/29	2029/30
Base	80.1	80.1	80.1	80.1	80.1
Enhancement	80.1	80.1	81.1	82.1	87.1

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

Our plan to achieve the PCL is based on enhancement funding in AMP8 and AMP9 together with continued base maintenance funding and operational interventions as set out in our bathing water SDS,.

AMP8 WINEP bathing water investigations programme will focus on five designated beaches to understand actions to address deterioration but will also include three further investigations at non-designated recreational waters. This supports our work with The Rivers Trust and the NECH which includes the identification of at least two inland bathing waters for designation applications with Defra.

Our PR24 WINEP plan for 2025-2030 includes investment at Seaton Carew and Marske to address a deterioration in bathing water quality along with schemes at Berwick and Redcar. These improvements are all being delivered under the WINEP storm overflow spill reduction programme and meets the Government's SO-DRP targets. We are going further in some cases by reducing to two spills per bathing season, this being the requirement for excellent seawater quality. We also have included proposed non-statutory investment to install UV disinfection at Berwick STW that required evidence of customer support.

We are currently planning a total enhancement funded investment of ~£700m that will improve 54 storm overflows in meeting the 2035 deadline. From AMP10 onwards (2035), any remaining risk to bathing water quality or deterioration will most likely be from non-water company sources of bacteria.

We will also work in partnership to address other sources of bacteria affecting seawater quality at designated sites as incentivised through the PC/ODI.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We set the ODI rate at £1.92m as per Ofwat's proposed rate per 1% of the new composite measure.

RIVER WATER QUALITY

DEFINITION

As per the Ofwat definition[117].

This measures the amount of phosphorus (P) entering rivers from water company activities. It includes reductions in loads discharged into rivers as a result of P removal through wastewater treatment, and also allows for load reductions to be included through catchment solutions if these can be appropriately measured.

CURRENT PERFORMANCE ASSESSMENT

We do not currently have a measure for river water quality or for P load reductions into rivers.

The river water quality ODI is a new common performance commitment designed to incentivise companies to improve river water quality by being rewarded for reducing the loading of P discharged into watercourses from treated wastewater, over and above regulatory obligations. The measure includes reductions from sewage treatment works (STW) discharges and from any partnership approaches in catchments that water companies support.

Measured total P concentrations, determined through regulatory samples, have been combined with measured average daily flow to calculate a P load baseline in kg per year. For numeric STWs without permits, a concentration of 5 mg/l has been assumed, as specified in the methodology. The baseline load of P discharged into the environment uses the 2020 calendar year. We estimate the baseline load from the 138 STWs in our region discharging into rivers to be 757 tonnes per annum.

CURRENT AMP ACTIONS

We currently have 23 STWs with phosphorus removal in place. We also have 23 AMP7 WINEP P schemes in delivery which will reduce P loading into rivers by the end of AMP7 (2025 calendar year). These consist of 17 STWs where new P removal technology will be added, two STWs where tighter permits will apply (these sites already have P removal under the Urban Wastewater Treatment Directive), and four STW closures (raw effluent will be transferred to other STWs for treatment).

We estimate that our current loading into rivers will reduce to 740 tonnes per annum in 2025 after the 23 AMP7 schemes are complete. At this stage we will have P removal onsite at 40 STWs.

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[117] **https://www.ofwat.gov.uk/publication/river-water-quality-pc-definition/.**

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

In setting the PCL for this measure, we have looked at our current and planned P removal schemes and calculated loadings into rivers from all our numeric STWs for each calendar year, forecasting ahead based on investment plans and the agreed WINEP plan for PR24.

Our forecasts have used measured baseline daily flow, but the calculations for annual loads will use measured daily flows for reporting purposes and some sites may be impacted by projected growth (not yet included in our forecasts).

Our 23 AMP7 WINEP P removal schemes currently in delivery will be operational at the end of AMP7, which will lead to a significant reduction in P loading in the 2025 calendar year. We estimate that the P loading into rivers in our region in 2025 will be 740 tonnes per annum (a reduction of 17 tonnes on the 2020 baseline).

Our PR24 WINEP P removal programme for WFD and Habitats Directive drivers includes end-of-pipe investment at 18 STWs in AMP8 (one closure, three outfall transfers taking P loads out of freshwaters, six new P removal schemes, five schemes to tighten existing P permits requiring further investment at end-of-pipe and three schemes to tighten existing P permits through complete nature based solutions). In addition to the 40 STWs with existing P removal at the end of AMP7, this will take the number of P removal schemes in the region to 46, out of 138 numeric STWs discharging into rivers. Our forecast P loading will reduce to 634 tonnes per year by 2030.

AMP8 schemes may not be delivered until the regulatory deadline of March 2030, and so the benefit of these schemes is only included in the PCL forecast for the 2030 calendar year. This PC will incentivise us to deliver these schemes earlier than 2030. If any of these schemes are deliverable early given the engineering challenge for AMP8, the profiling should consider where the biggest river water quality benefits could be achieved.

Our AMP8 plan also includes catchment nutrient balancing schemes supporting catchment solutions for P in 35 river waterbodies in the Wear, Tees and across the Northumberland coastal area, as alternatives to removing P at 18 STWs (13 would have been new schemes and five would have required investment to meet tighter permits). As these catchment interventions may not come into effect before 2030, we have not included a catchment element in our forecast for this PC. If we have early successes with catchment solutions and measured river water quality benefits are agreed with the Environment Agency, we would include these in this measure. Any P benefits from nutrient neutrality schemes would be similarly included.

The AMP9 plan includes further indicative end-of-pipe P removal schemes which may be required to meet Environment Act targets, if required.

Progress against Environment Act targets: Ofwat intended that this PC clearly demonstrates the contribution to Environment Act Targets, showing how each company contributes to the 80% load reduction in P required nationally from the water sector to meet WFD good status in waterbodies by 2038. We have agreed a plan with the EA to meet our North East regional requirement, which when measured using the EA's methodology is equivalent to a 62% reduction by the end of AMP8 (2030). However Ofwat's methodology uses a different approach, using measured flow and measured

concentrations, rather than the permitted and modelled values the EA use for their calculations. As a result, the reductions as percentage rates appear very low compared to the target. This is in part due to the high level of operational overperformance we have traditionally designed for to reduce permit compliance risk.

Value for customers: Ofwat states in its methodology for this PC that '*For both elements the company must only report reductions in phosphorus that result from plans that represent the best value long-term approach for customers and the environment. This should take into account a wide range of factors including the long term resilience of the supply chain*'. For AMP8, we are confident that our plans represent best value for customers, as we have agreed a number of catchment nutrient balancing schemes with the EA as alternatives to end-of-pipe schemes which will deliver better P benefits for lower costs. However, should we be required by the EA to implement Environment Act (Env Act IMP1) targets at end-of-pipe in AMP9 which go beyond WFD good status in order to meet the national load reduction targets, this will not be the case.

PCLS FOR RIVER WATER QUALITY

The measure will be reported as a percentage reduction in P to two decimal places. Outcome delivery incentives will be applied on a kg of P basis. Measurement timing is based on calendar years.

Table below is updated with agreed numbers after Stantec review and revised methodology to include growth. These numbers have been included in the PR42 Ofwat Data Table OUT5 and include growth forecasting inline with PR24 methodology[118].

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[118] Ofwat indicate growth should be included in forecasts – PR24 Query log 19 September page 68-69, Query no 257. 'Companies will need to incorporate into the forecasts in their business plans any expected new premises, premises that will close and other changes in demand by businesses'. **PR24-query-log-updated-19-September-2023.pdf (ofwat.gov.uk).**

FIGURE 127: PCLS FOR RIVER WATER QUALITY

Phosphorus loading into rivers	2020 (Baseline)	2025 (AMP7 schemes included)	2026	2027	2028	2029	2030 (AMP8 schemes included)	2035 (AMP9 forecasts included)	2040 Long-term strategy	2045
All 138 numeric STWs (kg/year)	757,143									
All 93 STWs with likely P permits by 2035 (kg/year)	211,231	173,920	172,537	154,821	154,556	154,270	60,132	37,521	37,521	37,521
Reduction from Baseline (kg/year)		37,310	38,693	56,409	56,675	56,960	151,099	173,710	173,710	173,710
Reduction from Baseline (%)		4.93	5.11	7.45	7.49	7.52	19.96	22.94	22.94	22.94

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

We intend to achieve the PCL by delivering our AMP7 WINEP WFD P removal schemes and operating within our STW permits issued by the Environment Agency. Outperformance could be achieved by:

- Overperforming against our permits;
- Bringing forward AMP8 P removal schemes from the regulatory deadline; and
- Through catchment solutions which prevent P entering rivers through partnership working.

The majority of investment in this ODI is enhancement funding (AMP7 from 2025-2029 and AMP8 also included from 2030 which could be pulled forward). A very small proportion of this funding to support P removal will be from base investment (AMP8 growth schemes at Morpeth and Willington STWs). Base investment does not impact the reduction in loading as the enhancement drivers require tighter standards of treatment.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat has proposed a rate of £700 per KG of P removed. We propose to use this valuation.

BIODIVERSITY

DEFINITION

As per the Ofwat definition[119]. It measures the net change in the number of biodiversity units on nominated land.

It excludes improvements in biodiversity that arise as a result of conditions or obligations relating to other forms of regulation including planning processes.

CURRENT PERFORMANCE ASSESSMENT

We do not currently have a measure for improvements in biodiversity.

We currently own approximate 8,000ha, of which 4,000ha is open water. We do not have a formal basis by which we regularly review the biodiversity value of the whole landholding. We do have a baseline assessment of terrestrial habitat areas (excluding linear features such as rivers and limited data on hedges) from 2019. In 2022 this data was put through Defra's biodiversity metric v3.0 and provides a baseline of 64,511 habitat biodiversity units.

We also have an ecological survey strategy that is followed to make sure we maintain adequate knowledge on the biodiversity richness of our sites. Currently 37% of our terrestrial landholding is in some form of conservation management.

We work in partnership with eNGOs at our key sites and have management plans in place.

While we have not had a biodiversity measure in AMP7, we have worked in partnership both on and off NWL's landholding to benefit biodiversity and we offer three different grants aiming to increase the resilience of the natural world in our regions. These are our original Branch Out grants that focus on action for wildlife and reconnecting people to nature, Branch Out INNS that supports projects to manage or eradicate invasive non-native species, and Branch Out Priority Habitat that supports projects working at a landscape scale to create or restore priority habitat. Through our original Branch Out grant scheme we have, over ten years, supported 150 projects, investing over £650k which has helped to bring in over £15m investment into the natural world.

CURRENT AMP ACTIONS

In AMP7 we have some specific projects relating to enhancing biodiversity. We have two projects relating to priority habitat, the first is to create or restore 12ha of priority habitat on our land which we are well on target to deliver. The second is to work with partners to create or restore a minimum of 250ha in the catchments in which we operate, we have already hit the 250ha target and are anticipating being closer to helping deliver double that amount by the end of AMP7.

[119] **https://www.ofwat.gov.uk/publication/biodiversity-pc-definition/.**

We carried out a site ranking exercise to investigate if it would be possible to put in place targets to move our sites up through the ranks. The ranking system proved to be too coarse (at a 1-10 scale) to be of much value within an AMP as changes in site management take a while to result in ecological changes. The findings from the site management changes we have implemented as part of this investigation have lead to a scheme being requested for implementation in AMP8.

We work in partnership with eNGOs on our key sites, to ensure we maximise the value of our investments in those sites and share knowledge between our organisations. We are working in partnership in the Upper Tees to restore blanket bog, which will have multiple positive outputs including reduction of colour in the downstream watercourses and improving biodiversity.

We have also been delivering biodiversity enhancements in partnership with others as a key output of our Bluespaces project. We are on track to improve 250km by 2025, through a combination of access, facilities and recreation; wildlife and biodiversity benefits; and water quality improvements.

We have two holistic catchment management projects underway, gathering data, carrying out mapping and either setting up new partnerships or working with existing ones. These projects are focussing on delivering work to improve and stabilise water quality, reduce sedimentation and increasing the quality and extent of priority habitat in the catchments.

In addition to the above projects, we are also delivering a number of schemes focusing on invasive non-native species, eels and fish passage, all of which will be of benefit to biodiversity.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

Regulatory targets

The expectations for the Natural Environment in the EA's Water Industry Strategic Environmental Requirements (WISER) that relate to biodiversity expect:

- Action that contributes to meeting and or maintaining conservation objectives of habitat sites.
- Action that contributes to meeting or maintaining favourable condition targets for Sites of Special Scientific Interest.
- Action that contributes to the restoration and recover of habitats and species under the NERC Act including supporting delivery of the Nature Recovery network.
- Actions for biodiversity should deliver outcomes of the relevant Local Nature Recovery Strategy, Protected Sites Strategies, and Special Conservation Strategies introduced by the Environment Act.
- Contribute to actions under non-statutory initiatives including the England Peat Action Plan, England Tree Action Plan and the National Pollinator Strategy.

The WISER document also references the Government's 25-Year Environment Plan which sets out the government's ambition to improve the environment and people's connection to it within a generation.

Through the measure definition, Ofwat requires that companies provide assurance that overall biodiversity across sites which are not included in the performance commitment is not deteriorating.

Long-term strategy

Our long-term strategy outlines our ambition to play our part in implementing the Environment Act 2021, including local nature recovery strategies and delivering biodiversity net gain. We are targeting, by 2050, that all our activities result in a net gain in biodiversity of 5% above the legal requirement. This would include all work carried out through permitted development, as well as work requiring planning permission (the latter is subject to a minimum of 10% biodiversity net gain).

Customer research

A triangulation of our customer research bank indicated that biodiversity was considered a medium priority by both our customers and those within Ofwat's industry research.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

Operational information and analysis

In setting the PCL for this measure, we have looked at the biodiversity assessments that have been carried out in as part of our WINEP submission.

We propose to target a PCL that reflects the number of biodiversity units we will generate from our WINEP programme over AMP8, where those biodiversity units do not arise from schemes that require planning permission.

Through delivery of the WINEP we will be creating 221 BUs. Of these, we expect 79 will be through projects that are subject to planning permission and as such are excluded from the PCL. This leaves 142 BUs that we have assessed as being deliverable through our WINEP that we do not expect to be subject to planning permission. We are setting our PCL for AMP8 at delivering 30 BUs as due to the time for habitats to reach their target condition, the remaining 112 BUs will not be measurable until future AMPs.

FIGURE 128: PCLS FOR BIODIVERSITY

	2025/26	2026/27	2027/28	2028/29	2029/30
PCL (base)	0	0	0	0	0
PCL (enhancement) **Per 100km2**	0	0	0	0.08	0.25

Source: NWL.

OUR PLAN TO ACHIEVE THE PCL

We intend to achieve the PCL by delivering the associated schemes in the WINEP.

These schemes include enhancing the grassland and hedgerows on some of our operational sites, peatland restoration in partnership with the North Pennines AONB and Northumberland National Park, river restoration schemes, woodland enhancement and creation, and other catchment improvement works.

The delivery of the BUs has been forecast towards the end of the AMP. The schemes will need to identify exactly where the habitat works can take place as they will mainly be on land not owned by us so will require landowner agreement. It will then take a number of years for the works to result in a measurable ecological enhancement.

There is no additional funding associated with this PCL beyond this and the base opex required to maintain the biodiversity value of our whole landholding.

Once Ofwat has derived its incentive rate at the draft determination we will be able to better understand our ability to create further units of biodiversity. We propose that any reward from this measure be re-invested in creating further biodiversity units.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat has outlined it will provide their ODI rate for biodiversity units at the draft determination. We will assess its suitability against our set of principles at that time.

We are committing that any outperformance delivered against this ODI will be reinvested in achieving wider public value.

GREENHOUSE GASES

DEFINITION

We apply the Ofwat definition. However we make adjustments to the baseline year associated with AMP7 funding of green energy certificates that are including in our 2021/22 performance.

CURRENT PERFORMANCE ASSESSMENT

Set out below is NWL's performance under its existing GHG PC. It should be noted that during AMP7 the methodology used with the Carbon Accounting Workbook (CAW) version 13 being replaced with the CAW version 16 and thus the baseline has been updated. The baselines are given in figure 129.

FIGURE 129: AMP7 ODI EMISSIONS BASELINE

	2019/20 Baseline	
	CAW V13	CAW V16
Scope 1		
Direct emissions from burning of fossil fuels (location-based)	28,858	28,870.00
Process and fugitive emissions (incl. refrigerants	21,907	28,762.00
Emissions from vehicle transport (owned or leased)	8,479	8,328.00
Emissions from land	0	0
Scope 2		
Purchased electricity	0	0.00
Purchased heat	0	0.00
Electric vehicles	0	0.00
Removal of electricity to charge electric vehicles	0	0.00
Scope 3		
Business travel on public transport and private vehicles used for company	913	913.18
Outsourced activities	1,710	2,174.50
Purchased electricity: extraction, production, transmission and distribution	0	0.00
Reductions		
Exported renewables (generated onsite and exported)	-217	-421.02
Exported biomethane (generated onsite and exported)	0	0.00
Net Emissions	**61,650**	**68,627**

Source: NWL Analysis.

The baseline set out in Table 1 included REGO certificates that were acquired at low cost. Continued acquisition of these certificates has a material cost that the new PC does not make provision for. Figure 130 gives approximate quantities of green certificates included by ourselves in our AMP7 baseline (that is, those certificates which are unfunded by the existing ODI).

FIGURE 130: GREEN ENERGY CEETIFICATES INCLUDED IN AMP7 BASELINE

Certificate Type	Baseline Quantity
REGO Power Import Bought (GWh)	350
REGO Power Export Retained (GWh)	19
RGGO Gas Import Bought (GWh)	0
RGGO Gas Export Retained (GWh)	0

Source: NWL Analysis.

The cost/value of these certificates has increased significant during the AMP as set out in figure 131 (values estimated based on market information). This demonstrates a likely whole amp cost of maintaining the baseline performance of circa £8.9M.

It should be noted that approximately 30% of the REGOs needed to maintain the baseline performance were purchased before the start of the AMP at low cost, however the remaining 70% are bought each year at the prevailing market rate.

FIGURE 131: COST TO NWL OF MAINTAINING REGOS INCLUDED IN THE AMP7 BASELINE

	2020/21	2021/22	2022/23	2023/24	2024/25
REGO Price (£/MWh)	£0.5	£2.0	£4.5	£7.0	£10.0
Cost to NWL of maintaining baseline (£m)	£0.2	£0.7	£1.7	£2.6	£3.7

Source: NWL Analysis.

Figure 132 gives the actual performance of NWL under the current ODI. As well as the consumable cost of the REGOs set out above, we have used RGGOs to improve its performance. This included buying RGGOs for imported natural gas, and also the opportunity cost of not selling the RGGOs associated with biomethane export at Advanced Anaerobic Digestor (AAD) sites.

FIGURE 132: AMP7 PERFORMANCE

	2020/21	2021/22	2022/23
Workbook used	V13	V16	V16
Scope 1			
Direct emissions from burning of fossil fuels (location-based)	43,871	8,616.72	8,688.33
Process and fugitive emissions (incl. refrigerants	20,724	28,035.17	29,253.17
Emissions from vehicle transport (owned or leased)	8,421	7,999.60	7,568.02
Emissions from land	0	0	0
Scope 2			
Purchased electricity	0	0.00	0.00
Purchased heat	0	0.00	0.00
Electric vehicles	0	0.00	0.00
Removal of electricity to charge electric vehicles	0	0.00	0.00
Scope 3			
Business travel on public transport and private vehicles used for company business	233	300.03	395.96
Outsourced activities	2,089	1,896.71	1,859.19
Purchased electricity: extraction, production, transmission and distribution	0	0.00	0.00
Reductions			
Exported renewables (generated onsite and exported)	-181	-250.02	-272.33
Exported biomethane (generated onsite and exported)	-28,742	-24,680.80	-24,047.09
Net Emissions	46,415	21,917	23,445
Reduction v Baseline	15,235	46,709	45,181
PC Reduction	4,433	5,602	6,771
Outperformance	10,802	41,107	38,410
ODI Payment (£m)	£2.0	£7.7	£7.2

Source: NWL Analysis.

The estimated cost/value of the RGGO certificates is set out in Figure 133.

FIGURE 133: APPROXIMATE VALUE OF RGGO CERTIFICATES

	2020/21	2021/22	2022/23
RGGO gas import bought (GWh)	0	182	162
RGGO gas export retained (GWh)	145	135	131
RGGO import price crop (£/MWh)	£6.00	£9.50	£25.00
RGGO waste export price (£/MWh)	£8.00	£15.00	£30.00
RGGO certificate cost (£m)	£1.2	£3.8	£8.0

Source: NWL Analysis.

When considering all certificate costs, and the ODI payment, the overall financial impact can be understood. The best case scenario (making a very conservative assumption that that the 2022/23 costs are repeated for the remainder of the AMP) would mean the existing ODI has a net impact of £3.5m cost to ourselves – as net zero moves into focus for other market participants it is highly likely that these costs will materially increase.

FIGURE 134: NET FINANCIAL IMPACT OF ODI

Costs/revenue (costs negative)	2020/21	2021/22	2022/23
ODI revenue	£2.0	£7.7	£7.2
Electricity REGO opportunity cost (£m)	-£0.2	-£0.7	-£1.7
Gas RGGO cost/opportunity cost (£m)	-£1.2	-£3.8	-£8.0
Net revenue	£0.7	£3.2	-£2.5

Source: NWL Analysis

While Ofwat has removed some use of certificates in its PC methodology, certificates must still be retained for exports. As such, Ofwat is linking the costs of meeting the PCs to a volatile and illiquid market (particularly for RGGOs).

Additionally, the existing ODI partially mitigates our costs of performance under the current PC. As these costs are not funded through our base costs for AMP8 this performance must be excluded from the baseline PC defined for AMP8.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

Baseline Setting

As set out above the existing performance commitment partially funds our activities regarding green energy certification. As such it cannot be assumed that the 2021/22 performance can be used the baseline as continuing this level of performance comes at significant cost.

Figure 135 gives the unmodified and then adjusted baseline figures to make sure that the PC properly funds net zero. As the performance commitment requires the retention of green certificates for reductions, these reductions are removed for the proposed baseline.

FIGURE 135: PROPOSED AMP8 BASELINE

	Water		Wastewater	
Relevant emissions	**2021/22**	**Adjusted**	**2021/22**	**Adjusted**
Scope 1				
Direct emissions from burning of fossil fuels (location-based)	2,334.28	2,334.28	39,532.14	39,532.14
Process and fugitive emissions (incl. refrigerants	0.00	0.00	30,218.27	30,218.27
Emissions from vehicle transport (owned or leased)	4,621.59	4,621.59	3,378.01	3,378.01
Emissions from land	89.85	89.85	0.00	0.00
Scope 2				
Purchased electricity	46,516.86	46,516.86	24,593.79	24,593.79
Purchased heat	0.00	0.00	0.00	0.00
Electric vehicles	0.00	0.00	0.00	0.00
Removal of electricity to charge electric vehicles	0.00	0.00	0.00	0.00
Scope 3				
Business travel on public transport and private vehicles	150.01	150.01	150.01	150.01
Outsourced activities	763.80	763.80	1,132.91	1,132.91

Purchased electricity: extraction, production, transmission and	17,335.37	17,335.37	9,112.18	9,112.18
Purchased heat: extraction, production, transmission and distribution	0.00	0.00	0.00	0.00
Purchased fuels: extraction, production, transmission and distribution	1,543.28	1,543.28	8,382.94	8,382.94
Chemicals	42,161.74	42,161.74	11,315.25	11,315.25
Disposal of Waste	2,555.43	2,555.43	4,856.33	4,856.33
Reductions				
Exported renewables (generated onsite and exported)	-165.54	0.00	-2.46	0.00
Exported biomethane (generated onsite and exported)	0.00	0.00	-24,680.80	0.00
Insets	0.00	0.00	0.00	0.00
Net emissions	**117,906.68**	**118,072.22**	**107,988.57**	**132,671.82**

Source: NWL Analysis.

Possible interventions

Figure 136 sets out the interventions and risks with the PC design. We note that before the implementation of the PC we intend to commission a full audit of the baseline data (and share this with Ofwat) as the definitions were received sufficiently late that it has not been possible to fully validate the baseline (as such please treat any baseline data that is not included in our existing PC as indicative).

FIGURE 136: INTERVENTIONS AND RISKS

Relevant emissions	Reduction options	Risks
Scope 1		
Direct emissions from burning of fossil fuels (location-based)	Energy efficiency; Sustainable energy vectors.	Energy efficiency already incentivised by energy costs – only significant PC incentive rate likely to impact optimal level.
Process and fugitive emissions (including refrigerants	NA	NA
Emissions from vehicle transport (owned or leased)	Reducing mileage; Efficient conventional vehicles; Sustainable energy vectors.	Fleet has natural replacement rate – only significant PC incentive rate likely to impact optimal level. Limited marketplace (supply) for high mileage/payload vehicles.
Emissions from land	Minimal impact available.	
Scope 2		
Purchased electricity	Energy efficiency; Renewable energy generation.	Energy efficiency already incentivised by energy costs – only significant PC incentive rate likely to impact optimal level. Renewable development heavily constrained by transmission and distribution connections with all new connections delayed until after 2030 (outside NWL control). The definition requires that 2022 emissions factors are used, whereas Ofwat's long term strategy states that companies should assume fully green electricity by 2035, meaning this PC appears to

		over-incentivise green power in the near term.
Purchased heat	NA	NA
Electric vehicles	NA	NA
Removal of electricity to charge electric vehicles	NA	NA
Scope 3		
Business travel on public transport and private vehicles used for company business	Minimising travel; More sustainable options.	Baseline data includes the heavily reduced travel necessitated by the Covid-19 pandemic so unlikely any cost-efficient improvements can be made.
Outsourced activities	Unknown (definition issues).	We aim to make sure that it cannot benefit under its existing GHG ODI by simply sub-contracting work that would normally form part of its operational activity. The Ofwat definition focuses on leased assets, which we do not believe is an appropriate definition.
Purchased electricity: extraction, production, transmission and distribution	As per Scope 2 purchased electricity	As per Scope 2 purchased electricity
Purchased heat: extraction, production, transmission and distribution	NA	
Purchased fuels: extraction, production, transmission and distribution	Energy efficiency; Sustainable energy vectors.	

Chemicals	Reducing quantity used (the emissions factors are set);

Changing the type of chemicals used (to another within the allowed/existing emissions factor data set). | Increasing demand likely to outstrip any efficiencies.

High chemical cost means that only significant PC incentive rate likely to impact optimal level.

Emissions factors proposed are very low quality/confidence, as such switching between chemicals may yield an improvement under the ODI but no real environmental benefit – this is neither in the interests of customers or the environment. |
Disposal of Waste	Limited because of water sludges being disposed to land (natural variation depending on raw water quality/quantity).	
Reductions		
Exported renewables (generated onsite and exported)	Increase onsite renewable generation	Renewable development heavily constrained by transmission and distribution connections with all new connections delayed until after 2030 (outside our control).
Exported biomethane (generated onsite and exported)	NA	NA
Insets	NA	Although the allowable quantity of nature-based insets is limited to 1%. We do not consider it is appropriate to use any without also accounting for any development activity which is outside the scope of this ODI definition, but which would have an adverse effect on natural systems – only the net water-service position should be allowable.

PC adjustments

Before setting the PC level it is necessary to include provision for any increases or decreases in emissions which result from changes to the quantity of 'work done' by ourselves (satisfying growth and meeting new regulatory standards). These are set out in figure 137.

For water, we have made provision for the emissions reductions associated with reduced PCC/leakage – assuming Ofwat set a PC rate within the range of Defra shadow prices, failure to deliver the PCC/leakage targets could create a GHG ODI cost of between £2M and £7M.

FIGURE 137: ADDITIONAL EMISSIONS ADDED TO BASELINE

	2025/26	2026/27	2027/28	2028/29	2029/30
Water (tCO$_2$e)	-2,264.10	-2,646.56	-3,644.03	-4,278.57	-4,544.26
Wastewater (tCO$_2$e)	1,086.19	1,571.07	2,038.96	2,514.36	2,948.31

Source: NWL Analysis.

Water performance commitment

Figure 138 gives the water PC level proposed including the updated baseline. Considering the cost of interventions, the necessary incentive rate for this level of reduction is £42/tCO$_2$e. Ignoring the natural decarbonisation that occurs at no cost due to PCC improvements the average cost is £83/tonne. It is suggested that we propose a minimum ODI rate of the shadow price of carbon (low scenario) which is an average of £134/tonne across the AMP.

FIGURE 138: PC WATER BASE PCL PROPOSAL

Relevant emissions	Planned interventions	Baseline	Forecast tCO2e				
			2025/26	2026/27	2027/28	2028/29	2029/30
Scope 1							
Direct emissions from burning of fossil fuels (location-based)	Displacement of natural gas heating	2,334.28	2,287.31	2,279.38	1,991.16	1,710.46	1,437.42
Process and fugitive emissions (incl. refrigerants	NA	0.00	0.00	0.00	0.00	0.00	0.00
Emissions from vehicle transport (owned or leased)	40% replacement of LCV fleet with EV by 2030	4,621.59	4,621.59	4,159.43	3,697.27	3,235.12	2,772.96
Emissions from land	None planned	89.85	88.04	87.74	86.94	86.44	86.22
Scope 2							
Purchased electricity	All possible renewables (offset uplift EV demand)	46,516.86	44,692.85	44,681.04	44,266.99	44,002.96	43,891.40
Purchased heat	NA	0.00	0.00	0.00	0.00	0.00	0.00
Electric vehicles	NA (captured above)	0.00	0.00	0.00	0.00	0.00	0.00
Removal of electricity to charge electric vehicles	NA (captured above)	0.00	0.00	0.00	0.00	0.00	0.00
Scope 3							
Business travel on public transport and private vehicles used for company business	Status quo = high performance due to pandemic	150.01	150.01	150.01	150.01	150.01	150.01
Outsourced activities	NA	763.80	763.80	763.80	763.80	763.80	763.80
Purchased electricity: extraction, production, transmission and distribution	All possible renewables (offset uplift EV demand)	17,335.37	16,655.62	16,651.22	16,496.92	16,398.52	16,356.95
Purchased heat: extraction, production, transmission and distribution	NA	0.00	0.00	0.00	0.00	0.00	0.00
Purchased fuels: extraction, production, transmission and distribution	Natural gas heating phased out	1,543.28	1,512.23	1,506.98	1,316.43	1,130.85	950.33
Chemicals	Efficiency (reduction of 5% by 2030)	42,161.74	40,891.89	40,326.98	39,531.66	38,872.31	38,351.16
Disposal of waste	NA	2,555.43	2,504.02	2,495.33	2,472.68	2,458.27	2,452.24
Removals							
Exported renewables (generated onsite and exported)	All possible renewables	0.00	-193.14	-193.14	-252.92	-312.70	-372.48
Exported biomethane (generated onsite and exported)	NA	0.00	0.00	0.00	0.00	0.00	0.00
Insets	NA	0.00	0.00	0.00	0.00	0.00	0.00

| Net emissions | 118,072.22 | 113,974.23 | 112,908.78 | 110,520.95 | 108,496.05 | 106,840.00 |

We provide details of a number of lines benefit related to water greenhouse gases in our data table CW15. These enhancements provide a further reduction from our base PCL shown on the previous page.

FIGURE 13939: PC WASTEWATER PC PROPOSAL

	Forecast tCO2e				
	2025/26	**2026/27**	**2027/28**	**2028/29**	**2029/30**
Base PCL (Out 2)					
Enhanced PCL (Out 4)	113,920.09	112,697.76	110,335.75	108,345.00	106,711.73

<u>Wastewater performance commitment</u>

Figure 140 gives the wastewater PC level proposed including the updated baseline. Considering the cost of interventions, the necessary incentive rate for this level of reduction is £217/tCO_2e. This rate is marginally artificially high as the rate is calculated against a baseline which does not account for the upward pressures noted in figure 137. When normalised against only the reduction activities this incentive rate is £202/tCO_2e. It is suggested that the incentive rate is set at the central case of the DEFRA shadow price of £268/ tCO_2e.

FIGURE 14040: PC WASTEWATER PC PROPOSAL

Relevant emissions	Planned interventions	Baseline	Forecast tCO2e				
			2025/26	2026/27	2027/28	2028/29	2029/30
Scope 1							
Direct emissions from burning of fossil fuels (location-based)	AAD gas efficiency improvements of 5%. Natural gas heating phased out.	39,532.14	39,867.57	39,139.28	38,405.73	37,674.51	36,930.49
Process and fugitive emissions (incl. refrigerants	NA	30,218.27	30,474.68	30,589.14	30,699.59	30,811.81	30,914.25
Emissions from vehicle transport (owned or leased)	40% car/van fleet EV deployment	3,378.01	3,378.01	3,204.56	3,031.11	2,857.66	2,684.21
Emissions from land	NA	0.00	0.00	0.00	0.00	0.00	0.00
Scope 2							
Purchased electricity	All possible renewables (offset uplift EV demand)	24,593.79	24,474.19	24,678.95	24,731.28	24,785.05	24,830.86
Purchased heat	NA	0.00	0.00	0.00	0.00	0.00	0.00
Electric vehicles	NA (captured above)	0.00	0.00	0.00	0.00	0.00	0.00
Removal of electricity to charge electric vehicles	NA (captured above)	0.00	0.00	0.00	0.00	0.00	0.00
Scope 3							
Business travel on public transport and private vehicles used for company business	Status quo = high performance due to pandemic	150.01	150.01	150.01	150.01	150.01	150.01
Outsourced activities	NA	1,132.91	1,132.91	1,132.91	1,132.91	1,132.91	1,132.91
Purchased electricity: extraction, production, transmission and distribution	All possible renewables (offset uplift EV demand)	9,112.18	9,067.86	9,143.73	9,163.12	9,183.04	9,200.01
Purchased heat: extraction, production, transmission and distribution	NA	0.00	0.00	0.00	0.00	0.00	0.00
Purchased fuels: extraction, production, transmission and distribution	AAD gas efficiency improvements of 5%. Natural gas heating phased out.	8,382.94	8,454.07	8,299.63	8,144.08	7,989.02	7,831.25
Chemicals	Efficiency (offset by DI and water quality)	11,315.25	11,298.10	11,227.81	11,156.02	11,084.89	11,010.09
Disposal of waste	NA	4,856.33	4,897.54	4,915.93	4,933.68	4,951.72	4,968.18
Removals							
Exported renewables (generated onsite and exported)	All possible renewables	0.00	-141.93	-141.93	-201.71	-261.49	-321.27
Exported biomethane (generated onsite and exported)	Biomethane certificates retained plus 5% improvement	0.00	-24,680.80	-24,989.31	-25,297.82	-25,606.33	-25,914.84

Insets	NA	0.00	0.00	0.00	0.00	0.00	0.00
Net emissions		**132,671.82**	**108,372.22**	**107,350.72**	**106,048.00**	**104,752.81**	**103,416.16**

We provide details of a number of lines benefit related to wastewater greenhouse gases in our data table CWW15. These enhancements provide a further reduction from our base PCL shown on the previous page.

FIGURE 14141: PC WASTEWATER PC PROPOSAL

	Forecast tCO2e				
	2025/26	**2026/27**	**2027/28**	**2028/29**	**2029/30**
Base PCL (Out 2)					
Enhanced PCL (Out 5)	108,011.16	105,978.44	104,719.03	103,203.91	101,226.38

Alternative approach

We believe that there may be an alternative approach that delivers the same environmental benefit but at a lower cost to customers.

We recognise that Ofwat has required the companies retain REGOs and RGGOs in order that any risk of double counting is removed – ensuring that green energy exports truly represent a net zero benefit.

We, however have concerns that the CAW methodology (particularly the emissions factors used in the CAW) render this expensive retention of certificates unnecessary for biomethane.

The emissions factors used in the CAW for green energy are the UK Government standard factors. The methodologies provided with these factors are somewhat limited and complex. Our reading of this limited information is as follows.

The electricity emissions factor (applied inversely in the CAW to any renewable exports) is calculated based on information gained from the power generation industry on its sources of energy. As such, if a company sells its REGOs there is a risk that these REGOs are considered in the calculation of the grid emissions factor – as such the requirement to retain REGOs where a reduction is claimed appears to be valid.

For natural gas, supplied through the grid, the emissions factor is based on the stoichiometry of the combustion of methane in air in the average UK combustion equipment and does not take account of any non-fossil supplies of gas (consideration is given to sources of fossil gas but there appears to be no provision for biogas/biomethane). As such, any export of biomethane into the grid results in an emissions reduction by displacing fossil gas. As such for gas – a generator must retain RGGOs in order to receive a reduction/inset on its net Market-Based emissions inventory, however, because the calculation is based on stoichiometry even where RGGOs are sold the reduction still applies to location-based emissions. As the emissions from grid-supplied natural gas combustion are a Scope 1 emission, any buyer of the Certificates would still be obliged to report their emissions using the natural gas factor in their main location-based inventory (avoiding double counting).

As noted above, the value of these certificates is significant. Even at current rates, if sold, the value of our certificates would be £20M across the AMP – this would contribute to our leading bioresources efficiency – benefiting our customers

and the wider industry due to upper quartile benchmark we would support on efficiency. While we are the leader on biomethane, its likely that the lost value to the industry would be £90M across the amp on the same basis.

Removing the need to retain the RGGOs would also limit the need to amended the baseline for these certificates as set out above.

Enhancement

We acknowledge that the above PCLs appear less ambitions than our AMP7 approach – given the ongoing cost of living crisis our AMP8 plans focus on affordability and play to our strengths.

We will be submitting an Innovation Fund application for a unique approach to net zero. The focus of this application will be flexibility of demand – as UK renewable power increases the variability of emissions associated with electricity will vary significantly creating an opportunity to use energy only when it there is abundant green energy on the system.

We perform well on demand flexibility in comparison to other companies – controlling our water pumping/production assets and our AAD systems in line with live half-hourly energy prices. By extending this functionality to consider the implications of our energy use on the emissions of the UK energy system's emissions will deliver a low/no cost opportunity for the sector to contribute meaningfully to the UK's decarbonisation agenda.

This approach will influence 45% of our water emissions and more than 50% of our wastewater emissions.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

Ofwat has outlined it will provide their ODI rate for greenhouse gas at the draft determination. At this time, we will assess its suitability against our set of principles at that time.

STORM OVERFLOWS

DEFINITION

As per the Ofwat definition[120] and is the average number of spills for each storm overflow (SO) to two decimal places. Covers all SOs across the wastewater system using EDM Data Return figures in 12/24-hour format.

There are no specific exclusions. The measure incentivises reductions to eliminate ecological harm and protect human health. Ofwat has included various reporting and assurance requirements.

CURRENT PERFORMANCE ASSESSMENT

There isn't an AMP7 PC for storm overflows and performance is measured through annual Event Duration Monitoring (EDM) data returns that are a regulatory requirement. The publication of these returns started in 2020 as a commitment by water companies having been in place since 2016 under Environmental Permitting Regulations (EPR) conditions following the installation of EDM devices. The Environment Act 2021 made the publication of EDM data a statutory requirement and for the Environment Agency (EA) to provide an annual report.

There is not a specific measure for storm overflows in the EA's Environmental Performance Assessment (EPA) that is used to provide a star rating for companies. Storm overflow performance is included in the overall EPA reporting under compliance, improving water company performance and progress with environmental improvement schemes. Future measures may include SOs (for example, within flow compliance).

Our coverage of monitoring across all SOs is around 99%. All companies have a commitment to achieve 100% coverage by December 2023 and include EDM permitting conditions under EPR.

Performance in this measure is impacted by the amount of annual rainfall across our region. The average number of spills has varied from a high of 25.34 in 2021 to a low of 20.30 in 2022, a difference of 6,786 spill events or 18.6% reduction.

### FIGURE 1422: OUR HISTORIC SPILL DATA

	2020	2021	2022
Total No. Spills	32,497	36,483	29,697
SOs with data	1,458	1,440	1,463
Average (2dp)	22.29	25.34	20.30

Source: NWL Analysis.

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[120] **https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/final-methodology/pr24-performance-commitment-definitions/.**

The EA's Water Situation Reporting[121] shows that for 2020 and 2021 we experienced normal or above normal rainfall whereas in 2022 it was below normal. From previous years reporting, we can expect to see highly exceptional rainfall once every 10 to 14 years and this will be reflected in a higher average spill number for this measure.

FIGURE 1433: EA ANALYSIS OF RAINFALL LEVELS IN THE REGION
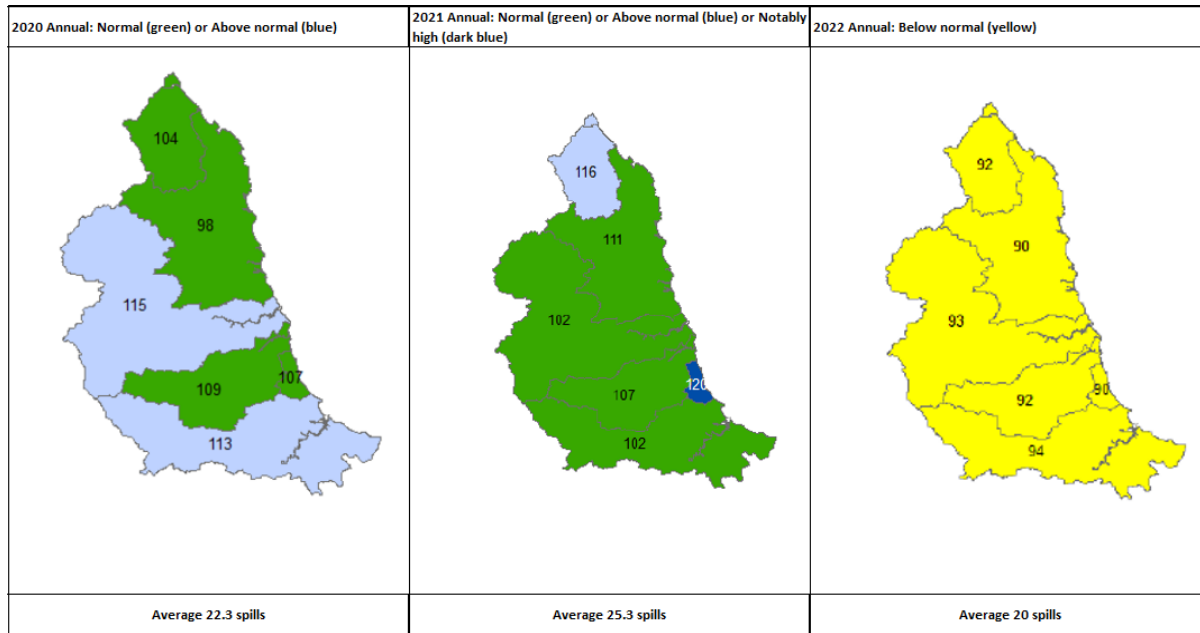
Source: EA Water Situation.

Industry performance in this measure across all companies in England and Wales, shows a wide variance. In comparison, our spill performance is better than the industry average and within or near to upper quartile performance.

FIGURE 1444: OUR PERFORMANCE AGAINST THE INDUSTRY

	2020	2021	2022
NWG	22.29	25.34	20.30
Industry upper quartile	25.1	24.9	17.8
Industry average	33.6	29.4	23.0

Source: NWL Analysis.

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[121] **https://www.gov.uk/government/publications/water-situation-national-monthly-reports-for-england-2022.**
https://www.gov.uk/government/publications/water-situation-local-area-reports.

The 2022 returns showed a 19% reduction in the number of spills compared to 2021 (from 372,533 to 301,091) and was a result of less rainfall rather than water company improvements in general (although for NWL rainfall was actually above average). In England, coverage of EDM for 2022 is at 91% (13,323 of 14,580) with the requirement to monitor 100% by December 2023 under base maintenance.

FIGURE 1455: EA'S INDUSTRY EDM DATA

Table 1: 2022 EDM Headlines	Anglian Water (AWS)	Dwr Cymru Welsh Water (DC/WW) (in England)	Northumbrian Water (NW)	Severn Trent Water (SvT)	South West Water (SWW)	Southern Water (SW)	Thames Water (TW)	United Utilities (UU)	Wessex Water (WSX)	Yorkshire Water (YWS)	Water Company Totals / Average
Total no. storm overflows listed in the annual return in 2022	1,552	126	1,564	2,466	1,342	978	777	2,254	1,300	2,221	14,580
Total no. storm overflows with EDM commissioned	1,058	126	1,542	2,457	1,333	963	480	2,004	1,182	2,178	13,323
% overflows listed with EDM commissioned	68.2%	100%	98.6%	99.6%	99.3%	98.5%	61.8%	88.9%	90.9%	98.1%	91%
Total no. storm overflows with spill data in 2022	1,054	120	1,463	2,438	1,323	939	472	1,971	1,182	2,118	13,080
Average no. spills per storm overflow with spill data in 2022	15.3	23.3	20.3	18.4	28.5	17.8	17.0	35.1	18.5	25.6	23.0
Average duration (hrs) per monitored spill event in 2022	5.6	3.4	3.6	5.6	7.7	8.8	9.3	6.1	5.9	4.3	5.8

Source: EA

CURRENT AMP ACTIONS

Our commitment in AMP7 is to reduce spills to an average of 20 by 2025. This stretching and clear pledge (Pledge 5) was included as part of a package of nine pledges made in our Vision for Coasts and Rivers. The overall aim is to meet the expectations of the public and our customers by enabling our region to benefit from the best rivers and beaches in the country.

Our Pledge 5 action plan is delivering a range of activities to reduce spills in 2023/24 and 2024/25 with an overall investment of c.£7m (totex). It is based on our 2021 EDM data return of 36,483 spills with an average of 25.34 and an aim to reduce this by around 8,000 spills per year to deliver 20 spills by 2025. The activities focus on the SO asset types responsible for the majority of spills – SOs in the sewerage network and at sewage pumping stations (SPSs). The main actions are:

- Network SO Spill Reduction Programme to CCTV, cleanse and fix any issues (for example, remove tree roots and lining) downstream of high spilling overflows.
- Network SO Flow Controls Programme is to inspect every flow control device at SOs to make sure they are calibrated correctly and make any necessary improvements, such as modifications or renewals.
- SPS SOs Flows and Spills Programme to assess the flow pass forward at high spilling overflows and make necessary changes to pumps, such as new impellers or pumps.
- Enhanced SO reporting that is focused on tracking all SO and spill reductions, this includes company scorecard targets and forecast spill performance for every SO.
- Use of Stormhavester smart network management system using advanced machine language learning, together with hyperlocal rainfall forecasting, to predict performance of our assets, provide accurate alerts of issues occurring and relearn performance after spill reduction activities have been implemented.

In our AMP7 WINEP, we have c.£10m investment under the Storm Overflow Assessment Framework (SOAF) where we have investigated 127 high spilling overflows – 97 inland and 30 in estuaries and coastal waters. These studies determine the reasons for frequent spills together with an assessment of environmental impact. Any identified maintenance issues affecting spill performance are programmed for resolution, such as cleansing to remove siltation.

Our WINEP SOAF investment also includes at least five spill reduction schemes that are being delivered by March 2025 and to the new spill standard of no more than ten spills events per year. This is forecast to reduce spills by about 175 per year from our 2021 baseline year.

FIGURE 1466: OUR INTERVENTIONS FOR STORM OVERFLOWS

Programme	Type	Annual (average)	AMP	Comments
Sewer Maintenance	Reactive	£10,443,165	£52,215,827	Annual across AMP
Sewer Rehab Pollution (Fix)	Planned	£1,009,844	£5,049,219	Annual across AMP - SNWC
Sewer Rehab Pollution (Fix)	Planned	£915,458	£3,661,831	Years 2, 3,4 & 5 - SNWC
Sewer Rehab FOC	Planned	£3,736,196	£14,944,785	Years 2, 3,4 & 5
Sewer Rehab Flooding	Planned	£1,022,573	£5,112,866	Annual across AMP
FOC Enhanced Programme	Planned (RBP)	£7,956,811	£7,956,811	Year 1 into Year 2
Network SOs Spill Reduction	Regulatory Expectations	£2,485,682	£4,971,365	Years 4 & 5 - Pledge 5 Action 3
Network Flow Control Programme	Regulatory Expectations	£743,742	£1,487,483	Pledge 5 Action 6
SPS Flow and Spills Pumps Mods	Regulatory Expectations	£125,000	£250,000	Pledge 5 Action 8 (capex element only)
CSO and Ancillary Programme	Planned	£300,000	£1,500,000	Annual across AMP
TOTAL			£97,150,187	

Source: NWL.

Benefits for spill reduction may also be realised from other investment programmes. For the wider WINEP programme we have significant investment to increase the capacity of sewage treatment works (STWs) and the provision of further monitoring. Base maintenance (capex) consists of reactive and planned programmes include the rehabilitation of the network, Pledge 5 activities and maintenance of storm overflows.

SETTING THE PERFORMANCE COMMITMENT LEVEL (PCL)

Regulatory targets

The Government's strategic policy statement (SPS) for Ofwat provides a key priority for water companies to 'significantly reduce the frequency and volume of sewage discharges from storm overflows, so they operate infrequently, and only in cases of unusually heavy rainfall'.

The statutory expectations for urban wastewater and regulatory compliance in the EA's Water Industry Strategic Environmental Requirements (WISER) requires companies to reduce the frequency and volume of sewage discharges from storm overflows in line with the Storm Overflow Discharge Reduction Plan. It also requires 100% compliance at wastewater treatment works and water treatment works with numeric limits and for storm overflows.

In Ofwat's Final PR24 Methodology, they expect water companies to reduce the use of SOs and where appropriate go beyond an annual average of 20 spills per overflow. This is without additional expenditure allowances. Funding will be provided to reduce harm and meet the Government's SO Discharge Reduction Plan (SO-DRP) targets.

Through the measure definition, Ofwat also requires that companies:

- Must keep the spill records required for the 12/24 spill counting method for at least six years from the date the company made the records.

- Will provide external third-party assurance that the company implements appropriate processes to identify EDMs that do not accurately report spills.

- Will also provide a reconciliation of the performance reported under the performance commitment with any publicly available information.

- Shall make sure that its outcome delivery incentive payments only relate to real performance changes and not definitional, methodological or data changes in performance commitments.

- Shall not benefit either because it has not installed event duration monitors (EDM) or because monitors are not working.

Long-term strategy

Our target will be consistent with our long-term ambition of year-on-year reduction in the number of storm overflows operating more than ten times a year on average, and none doing so by 2050.

Customer research

A triangulation of our customer research bank indicated that storm overflow reduction was considered a medium priority by both our customers and those within Ofwat's industry research.

The evidence we used in determining our ranked prioritisation of measures is available within our customer engagement line of sight documents, see **A7 - Customer and Stakeholder Engagement** (NES08).

Historic and comparative information

We have limited data points to forecast storm overflow performance by 2030. The three data points (2020-2022) we do have extrapolated suggest an upper quartile of 0 - 12.5 by 2030. However this is impacted by the latest year 2022 figures

which sees a notable drop, compared to the previous two years. However the notable drop in 2022, has been linked by the Environment Agency (EA) to a dry year rather than particular company improvements[122]. Removing this year and then reviewing the UQ based on the two years of data (2020-2021), suggests a UQ range of 23 (linear) to 24.4 (log). Whilst average under the two years of data sits between 0 and 19.6.

We would suggest that UQ will be lower than the forecasted 23 - 24.4, and that 16.61 would be reflective of a likely UQ position by 2030. To fully understand where upper quartile is likely to sit by 2030 will require at least a further data point.

NWL national leader assessment

Our national leader assessment, which determines that our performance target proposed should be no lower than the average of the industry with the aim of having the most upper quartile performances across the industry.

Operational information and analysis

Finally, we created a bottom-up estimate of performance based on interventions and costs. We utilised this information to determine the PCL.

Risks

The main risks affecting this PCL are the amount, longevity, and intensity of rainfall events, which are the cause of storm overflows operating. This will mean that annual performance in this measure will be challenging as we expect that some years will have above normal or exceptionally high rainfall. Preference would be towards a long-term average where step changes in performance are recognised. Spill reduction will require significant investment to permanently amend hydraulics and resolve the demand on SOs.

The accuracy of EDM spill data is also an area of risk with ~10,000 false readings removed every month when validating the data. WaSCs employ differing technologies, communications, and validation processes.

In setting the PCL for this measure, we have considered the current AMP activities to arrive at a starting position for AMP8 of 20 spills on average form our baseline year of 2021. This comprises of:

- Pledge 5 action plan from base funding (£7.3m) aiming to reduce spills by 8,129 per year equivalent to a 22.3% decrease to meet our commitment of 20 spills on average by 2025.
- WINEP SOAF enhanced funding to investigate 127 frequently spilling overflows and reduce at least five overflows to ten per year with a forecast reduction of 176 spills per year which is a 0.62% reduction from 2021 figures.

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[122] **Water situation report for England December 2022 (publishing.service.gov.uk)** , **Storm overflow spill data shows performance is totally unacceptable - Creating a better place (blog.gov.uk)** , **Environment Agency publishes Event Duration Monitoring data for 2022 - GOV.UK (www.gov.uk).**

We have then forecast our 2030 PCL using our WINEP enhancement funded SO Spills Reductions programme. This comprises of:

*   Spill reductions at 160 priority overflows to meet the Government's SO-DRP targets that comprises of 133 inland SOs to ten spills per year and 27 bathing water overflows to two spills per year.
*   This is forecast to provide a spill reduction of 5,139 spills that equates to a 14.4% decrease compared to 2021 baseline year.

The overall scenario used to set our PCL is a combination of Pledge 5 Action Plan, AMP7 WINEP and AMP8 **WINEP SO-DRP expenditure** (NES27).

FIGURE 1477: STORM OVERFLOW SCENARIOS

Scenario	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
1. PR24 / PR29 WINEP						
2. PLEDGE 5 AMP 7		19.69				
3. SOAF WINEP AMP7		25.18				
OVERALL (1-3) PROFILED	22.00	19.53	18.80	18.07	17.34	16.61

Source: NWL Analysis.

Based on this scenario our proposed PCL is **16.61** by 2030.

FIGURE 1488: OUR STORM OVERFLOWS PCL

	2025/26	2026/27	2027/28	2028/29	2029/30
Base	20	20	20	20	20
PCL	19.53	18.80	18.07	17.34	16.61

Our WINEP SOAF and SO-DRP plans are based on a modelled clean network. Therefore, base maintenance activities will continue to be needed to address siltation and the condition of our wastewater network to deliver the required spill reductions. At the same time NWL is an efficient wastewater company (ranking first on Ofwat's cost models in aggregate) and has spent its capital maintenance allowances in full since 2000. We will continue to expore opportunities to improve performance from base maintenance but we see limited scope to improve.

OUR PLAN TO ACHIEVE THE PCL

Our plan to achieve the PCL is based on current activities in AMP7 focused on SO spill reductions and the significant investment in AMP8 under enhancement funding to meet the Government's SO-DRP targets.

Specifically, this expenditure comprises of the following:

- Pledge 5 Action plan reductions of 8,129 spills in 2023/24 and 2024/25 to meet 20 spills on average by 2025 at c.£7m totex.

- AMP7 WINEP SOAF spill reductions at 5 SOs by 2025 to deliver 176 spill reduction.

- AMP8 WINEP SO-DRP spill reductions programme at 160 priority overflows to remove 5,139 spills and meet ten spills a year (133 SOs) or two spills a bathing season (27 SOs).

Current levels of base maintenance funding of capex are required to maintain baseline performance across the wastewater system and prevent deterioration in performance.

Additional funding is required in AMP8 and beyond to continue to maintain high levels of spill performance. This will focus on continuing targeted interventions (for example, Pledge 5 work) to demonstrate that our wastewater network is operating effectively to maintain capacity downstream of SOs, pass forward the correct flows and therefore maintain spill performance. This is also important for when we have delivered SO spill reduction schemes as they are designed on a modelled clean sewer basis, and they are expected to comply annually with spill frequency trigger permits.

Two scenarios have been considered for additional base maintenance funding in AMP8. Each take forward the principle of visiting every SO at least once every AMP to carry out a full CCTV and cleanse along with rehabilitation programmes. This is in addition to our business as usual planned preventative maintenance activities and reactive works. We have also included revisits for a sub-set of SOs where they require siltation removal more frequently.

The scenarios shown are between £50m and £70m totex. The main difference between them is that the higher value scenario includes a capex find and fix programme versus an opex approach to inspection.

FIGURE 1499: CAPEX / OPEX INTERVENTION SCENARIOS

	Programme	Type	Annual (average)	AMP	Comments
1.	Annual Network SO CCTV/Cleanse	OPEX	£4,500,981	£20,459,003	All SOs once per AMP and silt sites revisited once
4.	Network Flow Control Programme	CAPEX	£743,742	£3,718,710	Continue Pledge 5 Action 6
5.	SPS Flow and Spills Pumps Mods	CAPEX	£125,000	£625,000	Continue Pledge 5 Action 8
6.	SO Rehab Spills	CAPEX	£5,000,000	£25,000,000	Budget costs for planned maintenance from No.1
	TOTAL			**£49,803,613**	

	Programme	Type	Annual (average)	AMP	Comments
2.	Network SO Find + Fix	CAPEX	£11,983,522	£59,917,610	All SOs once per year and fixed (lining)
3.	Network SO CCTV/Cleanse Revisits	OPEX	£1,333,182	£6,665,910	Revisits only (part of No.1)
4.	Network Flow Control Programme	CAPEX	£743,742	£3,718,710	Continue Pledge 5 Action 6
5.	SPS Flow and Spills Pumps Mods	CAPEX	£125,000	£625,000	Continue Pledge 5 Action 8
	TOTAL			**£70,302,855**	

Source: NWL Analysis.

We are developing our plans further. This has also included an assessment using our hydraulic models to determine a non-clean network and likely need for cleansing. This work supports our case.

There is also a requirement to demonstrate the accuracy of our spill data. This can be done by using confidence factors for confirming or reporting spills, such as in near real time in meeting the Environment Act 2021 duty. This is based on verifying spills using additional data and monitoring points.

SETTING THE OUTCOME DELIVERY INCENTIVE (ODI)

We propose to set our ODI aligned to Ofwat's proposed incentive of £960,000 per one average spill.