

Yorkshire Water

DWMP24

May 2023



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Non-Technical Summary

1. Overview

The Drainage and Wastewater Management Plan (DWMP) is a new strategic planning framework. It is a collaborative long-term strategic plan that outlines the needs and requirements of drainage, wastewater and environmental water quality for the next 25 years and beyond. This is the first 5-year cycle of the DWMP (DWMP24).

The DWMP framework was published in 2018 by Water UK and ensures that plans are co-created by water companies and stakeholders with an interest in integrated catchment management. As such, DWMPs will facilitate an increased level of partnership working across relevant stakeholders including Lead Local Flood Authorities (LLFAs) and the Environment Agency (EA) to support and develop long-term plans for drainage, flooding and protection of the environment.

The DWMP is underpinned by the need for consistency, transparency, and collaborative approaches to long-term planning across the industry. We have worked with the national DWMP Implementation Group, and a number of task and finish groups supported by Water UK to finalise framework details. We have worked with our stakeholders and customers to share our progress.

We are proud to play water's role in making Yorkshire a brilliant place to be – now and always. Today, every day and forever it is our job to make sure that everyone in Yorkshire has the water they need for their busy lives. And, when they have used it, it is our job to take it away and return it safely back to Yorkshire's environment. Water is one of life's most basic essentials and we care deeply about taking care of it in the right way for everyone, all of the time.

How we do that really matters; the resources we use and recycle, the way we look after land, our broader support to local communities and the partnerships we develop, will make a considerable difference to getting it right for Yorkshire's people and places.

The 5.4 million people who live in Yorkshire and the millions of people who visit each year rely on our services for their basic health needs and lifestyles. 140,000 businesses use our water to provide goods and services that support the economy, not just of Yorkshire, but the whole of the UK.

Yorkshire, alongside the rest of the UK, faces significant future pressures such as population growth and climate change. The DWMP will help us mitigate the impacts of these pressures on our drainage and wastewater services, ensuring we maintain a robust and resilient drainage and wastewater system for our customers, communities, and environment into the future.

The DWMP will provide Yorkshire Water (YW) with the opportunity to:

- Develop a strategic best value and least cost plan encompassing the next 25 years and beyond to meet the requirements of our long-term ambitions; to reduce sewer flooding and protect and enhance the environment by considering the operation and impact of our storm overflows and wastewater treatment works.
- Facilitate greater collaboration and partnership working with stakeholders such as LLFAs and the EA to ensure targeted investment which benefits our environment and local communities more effectively.
- Understand customer and stakeholder expectations and requirements and how we will work to meet these expectations; particularly around priority areas associated with sewer flooding, sewage escapes, storm overflows and protecting the environment.
- Align with strategies and regulations set out by Government and the EA to achieve a common set of objectives and goals.

- Develop and implement future innovations through the use of technology and the adoption of Sustainable Drainage Systems (SuDS) also known as green/blue infrastructure, wherever possible. This is to provide best value and overall benefits for communities, customers, and the environment over the long term.
- Develop a plan which considers a wide range of options, balancing the needs of customers and communities today and for the future.

We collect and treat around 1 billion litres of wastewater, from homes and businesses, and rainwater, that goes into our 52,000km of sewers every day. To do this we operate over 2000 wastewater pumping stations and 617 wastewater treatment works to safely collect and treat wastewater and rainwater before returning it safely back to the environment.

The DWMP will consider all aspects of our wastewater networks (foul, combined and surface water), our wastewater treatment works (WwTW), the interconnecting drainage systems from other Risk Management Authorities (RMAs), such as local authorities and the EA. It will consider how this impacts our environment, including discharges to rivers, streams, and other waterbodies. We have also incorporated information relating to our business-as-usual activity in terms of asset health, maintenance activities and proactive activities, alongside innovation projects and pilots into our technical document in sections 7 and 8.

Our DWMP will help us understand the potential scale of climate change and the effects that this may have across Yorkshire. Our DWMP considers the latest guidance, scientific understanding, and modelling techniques to identify what risks we may face in the near future. By working now to develop effective partnership and cost-effective solutions, we will be able to minimise the disruption caused by flooding and protect our environmental water quality.

1.1 Requirements of the DWMP

In supporting the business planning process, the framework has been developed such that, through this DWMP, we will:

- Set out the company's assessment of long-term drainage and wastewater capacity and the drivers, risks and scenarios being planned for.
- Assess where (largely drainage) infrastructure managed by other stakeholders may impose additional risks to YW's drainage and wastewater services.
- Identify those options that offer best value to customers and the environment, ensuring robust, resilient, and sustainable drainage and wastewater services in the long-term.
- Incorporate our asset health data into our plan to support solution identification for maximum benefit for our customers and the environment.

The benefits of the framework are that our DWMP will:

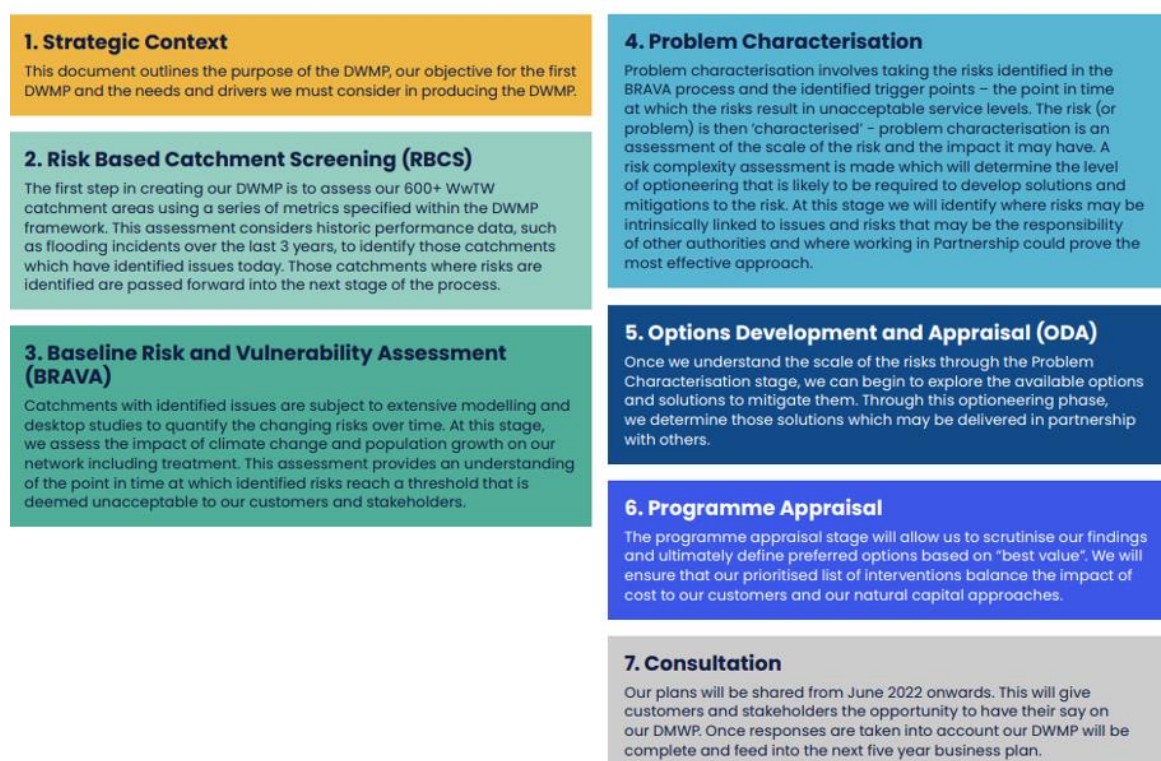
- Show how long-term plans support economic growth, resilient communities and how they protect and enhance the environment in a sustainable way.
- Provide a systematic understanding of service and wastewater system risks and vulnerability.
- Demonstrate a structured and auditable approach to identifying and developing options and presenting a robust best value investment plan.
- Facilitate the integration of partnership working and co-creation of solutions to understand the related works of others and deliver, where possible, integrated solutions. These will provide multiple benefits to achieve best value to the economy, society, and the environment over the long-term.

- Facilitate innovation (by identifying future challenges that will need new approaches to address them) and the development of an affordable, sustainable investment plan.
- Provide a clear, transparent, and consistent planning approach, with sufficient agility and adaptability to respond to long-term drivers for drainage and wastewater services.
- Promote informed debate about acceptability of different levels of risk.
- Provide greater confidence to customers, regulators and stakeholders in strategies identified, and resultant plan.
- Provide the basis for effective engagement with customers and stakeholders on levels of service, environmental performance, and resilience, now and for the future and on the choices and costs to customers in providing that service.

2. Plan development

The Water UK DWMP framework¹ outlines the key steps that must be undertaken in the formation of the DWMP. These are documented in Figure 1 below.

Figure 1: DMWP Process Steps



2.1 Our approach to DWMP

Our DWMP will identify changes in level of risk to the core wastewater services we provide across a range of time horizons. By exploring different time horizons, we will identify and anticipate risks arising from climate change and population growth and the effects these may have on the levels of service we provide. Our baseline will be 2020 and our plan will cover 2025–2050 risks.

Our strategic context document is available to read on our website here:

<https://www.yorkshirewater.com/drainage-and-wastewater-management-plans>

¹ <https://www.water.org.uk/policy-topics/managing-sewage-and-drainage/drainage-and-wastewater-management-plans/>

This sets out the objectives for our first DWMP. It explains the drivers and benefits of a long-term plan and the performance measures we are assessing. It sets out how we intend to work with a wide range of stakeholders to ensure that we play our role in making Yorkshire a brilliant place to be – now and always.

The first cycle of the DWMP for YW is primarily focused on modelled hydraulic capacity of the wastewater system and changing future risk to: sewer flooding; storm overflow operation; and wastewater treatment works compliance, as a result of factors such as population growth and climate change. We have concentrated on these areas but have included data from our established business as usual processes for tackling blockages, collapses, and associated campaigns to address unsuitable materials in the sewer network and inclusion of our innovation programme and pilots for wastewater.

3. PR24 and WINEP

The DWMP is a long-term strategic planning framework for the next 25 years and beyond. The DWMP will inform both YW's long-term delivery strategy and regulatory price review process including water industry business plan submissions. DWMP24 will inform YW's 2024 price review business plan (PR24) and the investment programme for the 2025 – 2030 period.

The price review process seeks to balance multiple long-term plans and priorities including other long term strategic planning frameworks such as the Water Industry National Environment Programme (WINEP). As such, the outputs of the DWMP will be reviewed in context with all other priorities affecting water companies including affordability to customers. Our DWMP long-term strategy aspirations will be reflected in the Long-Term Delivery Strategy (LTDS) tables that accompany the submission of the business plan in autumn 2023.

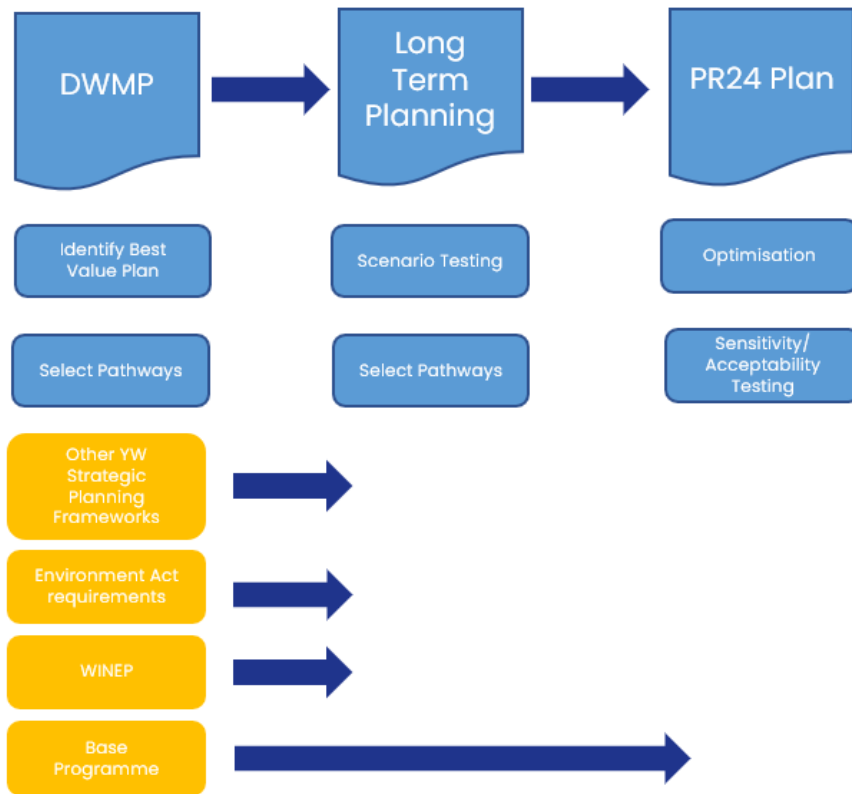
3.1 The price review process

The price review process is a five-year process of setting the price, investment, and service package that customers receive from water companies. This seeks to balance customer interests with the need to finance the delivery of water and sewerage services, including legal obligations, environmental and social duties. The price review process sets the billing or wholesale amount that water companies can charge their customers every 5 years.

We are currently working on the price review for 2024 (PR24) to set the wholesale price controls for the regulatory period 2025 to 2030. Our draft business plan for 2025 – 2030 will be published in autumn 2023 for assessment by the economic regulator, Ofwat. Final price limits will be set by Ofwat in December 2024.

As part of the price review process, we will produce a business plan that sets out how we will serve customers, communities, and the environment in the face of considerable challenge: Addressing climate change, changing societal expectations and affordability of bills alongside many other pressing challenges, will require long-term delivery strategies. The price review will therefore be significantly influenced by the direction established within various Strategic Planning Frameworks. See Figure 2 below.

Figure 2 – Long- Term Planning Schematic



3.2 Strategic Planning Frameworks

There are three main Strategic Planning Frameworks (SPFs) that inform the PR24 methodology, these are:

- Drainage and Wastewater Management Plans (DWMP)
- Water Resources Management Plans (WRMP)
- Water Industry National Environment Programme (WINEP)

The SPFs are standalone regulatory requirements. They will provide key inputs into water companies long-term delivery strategies and price review planning processes.

As the DWMP and WINEP both have a focus on the environment there are elements of interaction between these SPFs, particularly concerning storm overflows and wastewater treatment works compliance. In comparison, there is limited interaction between the DWMP and WRMP. This is because the WRMP focuses on a long-term plan to continue to deliver drinking water to meet future forecast demand. Differences between the two are discussed further throughout our DWMP Technical Summary document.

3.3 Water Industry National Environment Programme (WINEP) and DWMP

The WINEP is a programme of work that water companies in England are required to undertake to meet their obligations with environmental legislation and UK government policy. It is co-developed by the EA and Natural England and the water industry. The work done on the draft and final DWMP24 has been utilised to help compile the data for the submission and within our final DWMP24 we have included the wastewater WINEP as our short-term plan.

The WINEP is the most important and substantial programme of environmental investment in England and Wales. For the regulatory period 2020 to 2025 it consists of a national programme of £5.2 billion of asset improvements, investigations, monitoring and catchment interventions.

The Environment Agency (EA) published the draft water industry national environment programme methodology in July 2021.

<https://www.gov.uk/government/consultations/review-of-the-water-industry-national-environment-programme-winep>

This was followed by the release of the WINEP Options Assessment Guidance (Final version March 2022) and WINEP Options Development Guidance (Final version in July 2022). The driver guidance documents for individual areas of the program were published at regular intervals throughout 2022. The methodology sets out what the EA expected water companies to deliver. The Options Development Guidance set out a six-stage process showing how water companies should assess the risks and issues, propose solutions and how those solutions would be assessed by the EA.

Water companies had to submit optioneering evidence for solutions to address environmental risks and issues identified with the EA by 30 November 2022 for most drivers and the remaining drivers by 23 January 2023. The submission consisted of reports to explain how a final solution and costs had been derived.

Our wastewater WINEP submission for AMP8; 2025–2030, will focus on implementing the Storm Overflow Discharge Reduction Plan including no local ecological harm investigations and the installation of water quality monitors. For our WWTW's the focus is on improvements to inland bathing waters, phosphate, and nutrient removal linked to sanitary determinands, improvements and investigations relating to chemicals. Our schemes will consider blue-green and traditional solutions to address the issues and seek to work in partnership to deliver outcomes where appropriate.

At the time of writing the DWMP the WINEP submission has not been fully agreed with the EA and is subject to change. The final DWMP contains the data from the November 2022 and January 2023 submissions with no alterations after this point. We also do not have an agreed definition of the no local ecological harm standards or details of what our no harm investigations will need to include and to what level these will be carried out by YW. There is also no defined monitor installation requirement at this time. We have submitted costs based on best available information at the time. We have one confirmed inland bathing site and a number of proposed sites and have included these within our AMP8 submission and their associated spill targets. Again, these are subject to agreement with the EA for WINEP delivery and also progression by Defra to become designated inland bathing waters.

4. Draft to Final DWMP24 Journey

4.1 Consultation dDWMP24

Our consultation was launched on the 1 July 2022 on our dDWMP24 and ran for 12 weeks until 23 September 2022. We posed a number of questions to help us understand what our customers, stakeholders and regulators wanted in terms of direction of our plan, how we had built up the plan and also thinking about the scenarios we had proposed, and the costs of plan presented. Below is a selection of the questions asked.

- Thinking about our Drainage and Wastewater Management Plan 24 overall, how supportive or un-supportive are you of our draft plan? And explain why
- Please rank our four scenarios in order of preference with a score of 1 being the most preferred scenario to 4 being the least. And explain why
- The scenarios are with costs to deliver each scenario using our Best Value Plan (BVP) & least Cost plan optimisation. Can you rank them in order and state why you have chosen each scenario based on BVP or least cost plan
- To what extent do you/your organisation believe that Yorkshire Water should be prioritising partnership working to deliver Drainage and Wastewater Management Plan solutions?
- Finally, do you have any further comments about our Draft Drainage and Wastewater Management Plan or anything we should consider for the next iteration of the plan?

The outcomes of this survey were analysed and are discussed below.

4.2 Consultation Feedback dDWMP24

In response to this consultation, we received responses on our dDWMP24 and Strategic Environmental Assessment (SEA). Responses were received from our regulators Ofwat and the Environment Agency and a number of other stakeholders including the Consumer Council for Water (CCW), Natural England and Historic England, a number of Rivers Trusts, five local councils, a catchment-based partnership, a National Park and eleven customers. Ofwat and the Environment Agency provided full written responses to our dDWMP24, with recommendations for improvements in their response. This was also followed up by a multi-agency feedback session facilitated by Defra, which CCW also attended.

There are several key themes included in the responses received. These are:

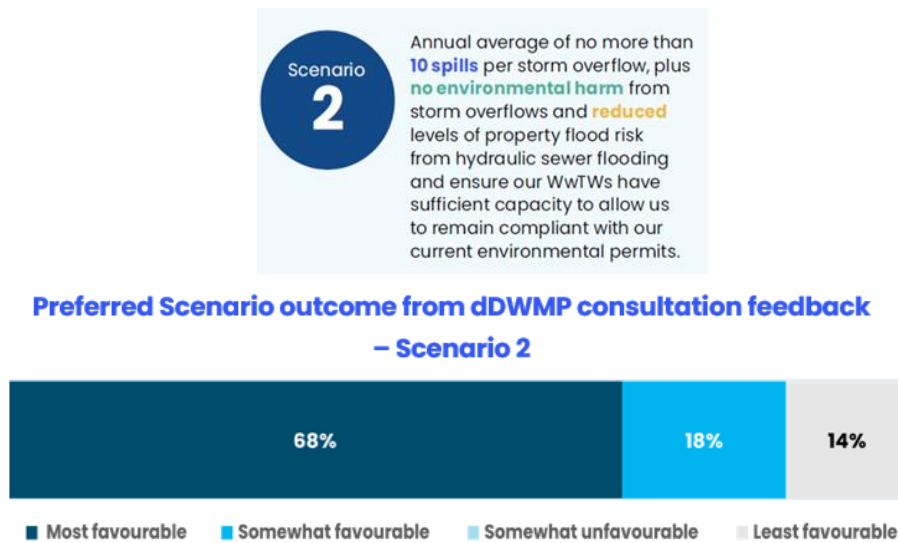
- Importance of partnership working.
- Support for a Best Value Plan (BVP) approach.
- Requirement to demonstrate compliance with all aspects of the Storm Overflows Discharge Reduction Plan (SODRP²).
- Provide increased clarity on the short, medium, and long-term elements of our plan.
- Support for reducing the levels of flood risk at properties.

Figure 3, Figure 4 and Figure 5 show some of the outcomes from our consultation survey.

Figure 3: Consultation Responses Summary

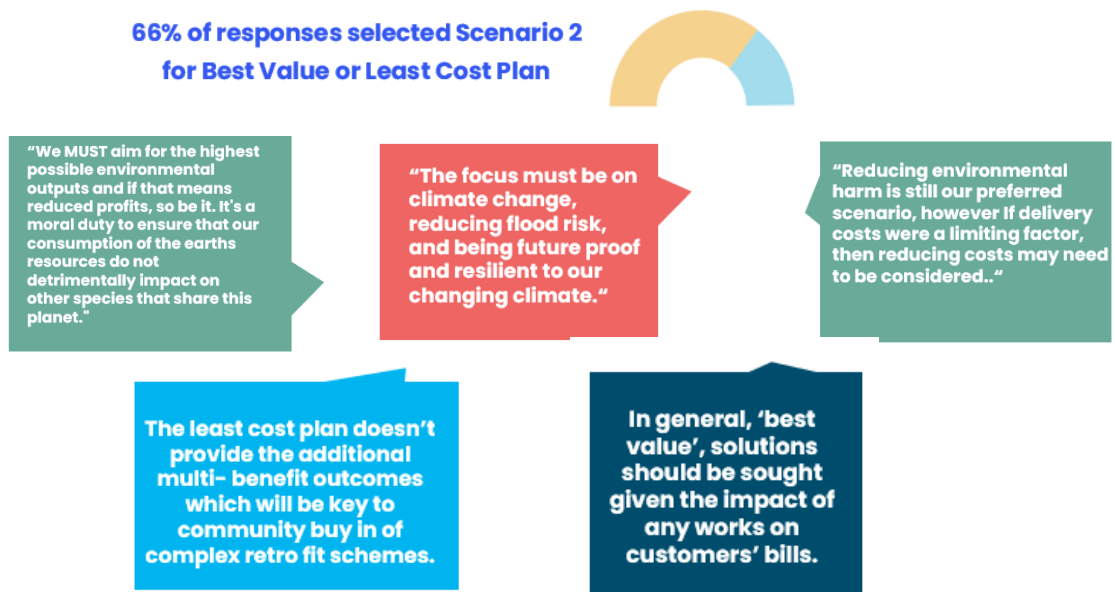


Figure 4: Preferred Scenario Feedback



² <https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan>

Figure 5: Support for Scenario 2 Best Value Plan (BVP) or Least Cost Plan



In addition to the individual response to our draft DWMP consultation received from Ofwat, a letter to all water companies was issued on 11 October 2022 providing Ofwat's industry overview of draft Drainage and Wastewater Management Plans³. A high-level summary of the comments and feedback themes within this industry overview are summarised below:

Ofwat Industry DWMP Comments

- Company plans on storm overflows are lacking. All or part of the UK government's storm overflow targets have not been included in the DWMPs for English water companies.
- There is insufficient evidence to support the investment needs and inadequate development of costs and benefits of solutions, particularly for schemes with multiple benefits.
- There is a lack of ambition in prioritising improvements from base expenditure, and prioritising nature-based solutions or surface water separation options.
- There is a lack of focus and maturity in partnership solutions.

We have taken the comments from the industry overview into consideration in the development of our final DWMP. These are broadly aligned with the individual feedback points we received from Ofwat, outlined below, and we have provided responses to these within our Statement of Response. We have not provided further individual responses to the comments within the industry overview.

Ofwat YW DWMP Bespoke Feedback Themes

- Overall Plan Quality – planning objectives and risk assessment
- Decision Making and Option Appraisal
- Storm overflow reduction plan
- Costs, funding and affordability considerations
- Stakeholder engagement
- Assurance and Governance

³ <https://www.ofwat.gov.uk/publication/letter-to-water-companies-ofwats-industry-overview-of-draft-drainage-and-wastewater-management-plans-2022/>

This feedback requires us to include all aspects of the storm overflow discharge reduction plan within our DWMP for all storm overflow assets. It also asks us to provide more granular detail on costing and bill impacts of our final plan alongside a fully assured plan.

Within their response to our consultation the Environment Agency (EA) provided a covering letter, executive summary and supporting document. We have responded to the detailed comments included within the supporting document as this provided the greatest level of detail. The EA feedback themes were broadly consistent with Ofwat's feedback. There were a few differences within the EA feedback, and this included feedback on groundwater, climate change and enhancing our stakeholder engagement. The EA wanted us to ensure we were including all aspects of impacts to groundwater in our plan, that we considered carbon impacts in our solutions and that we work with the EA closer in cycle 2 to embed a more joined up stakeholder engagement plan.

4.3 Statement of Response

We produced and published our statement of response to our consultation feedback at the end of January 2023. Here is a link to the document.

<https://www.yorkshirewater.com/media/q3eakdvx/yw-statement-of-response-january-2023.pdf>

It outlines feedback to points raised by our regulators, stakeholders and customers. We have answered the query, signposted inclusion in our final draft or will look to incorporate the feedback in cycle 2.

4.4 Changes Draft to Final

Based on the feedback we received we have changed our approach to our DWMP between draft and final predominately to incorporate all the storm overflow assets and to develop flood clusters, linking them to storm overflows where applicable.

We have incorporated sensitivity testing within our plan to allow for alternative climate change rates and also population growth predictions. We have included potential bill impacts for our plan, but this is stand alone and not linked to any bill increases for AMP8 and beyond. This will be subject to our final determination for PR24 from Ofwat.

We have included all relevant wastewater aspects of the WINEP24 within our plan costs and reviewed our approach to short-, medium- and long-term planning. We have included asset health metric and performance commitment information within our final plans to increase the robustness of the plan in the long-term.

We have reworked the Options Development and Appraisal sections to reflect our new approach to solution build up, costing and benefits appraisal.

The focus on the plan has evolved between draft and final, with the significant scale of the SODRP influencing the scale and pace of interventions within the plan. As part of the process, we have carried out a modelled hydraulic flood risk assessment which considers the scale of the risk in 2050. The increase in risk, predominantly from climate change and urbanisation means that we forecast that by 2050, c73,000 properties in Yorkshire are modelled as being at risk from flooding from hydraulic causes. We have sought to maintain the link between blue green infrastructure solutions to reduce storm overflows spills and the beneficial impact this will have on flood risk. This has been included in the DWMP data tables. Interventions to reduce the 2050 modelled hydraulic flood risk have been phased into the long-term plan. These risks and interventions have been identified using a high-level approach based on the volume of 'flood water' that would require storage in the network, or attenuation through blue-green infrastructure solutions. These high-level solutions will require further validation and development as part of cycle 2 of the DWMP.

Although the DWMP plan is primarily driven by the SODRP, as described the link has been maintained to flood risk reduction and to performance and risks associated with our WwTW and asset health

metrics which have been built into the plan. This will facilitate selection of the most effective and efficient solutions to address risks in the short and long term.

5. Storm overflows

5.1 What is a storm overflow?

Combined sewers carry foul water from homes and businesses as well as rainwater. Where rainwater cannot pass through impermeable surfaces such as paved areas, roofs, and highways, in many cases it drains to the combined sewer.

Usually, wastewater in sewers travels to one of our wastewater treatment works to be treated before it is safely returned to the environment. As rainwater can be unpredictable, we have permitted storm overflows on our sewer network to act as a relief valve, reducing the pressure on sewers during heavy rainfall events. Storm overflows stop the system from backing up and flooding homes and gardens by allowing heavily diluted wastewater to be discharged into watercourses.

Storm Overflows on the sewer network are also known as Combined Sewer Overflows (CSOs). Their operation is permitted by the EA and closely monitored by us and the EA. Many storm overflows have preliminary treatment such as screens or storm settlement before any discharge is made to the environment. YW have 2214 permitted storm overflows. The number of storm overflows fluctuates as sites are permitted or revoked and for the DWMP24 represents the position in November 2022.

98.1% of our Storm Overflows have Event Duration (EDM) installed. We plan to have 100% coverage by the end of 2023 where practicable. EDM records the number and duration of spills, which water companies report annually. In 2021, there were 70,062 spills from storm overflows in Yorkshire totalling 406,131 hours. In 2022, there were 54,273 spills from storm overflows in Yorkshire totalling 232,054 hours. This data can be accessed via the below link:

<https://www.yorkshirewater.com/environment/storm-overflow-and-event-duration-monitoring/>

YW is working to make this data available to everyone in near real time. Our near real time EDM reporting of storm overflow spills will be live by January 2024.

5.2 Investment in storm overflows in Asset Management Plan 7 (AMP7) 2020–2025

As part of the Water Industry National Environment Programme (WINEP) for AMP7, we are investigating the environmental impact of 158 frequent spilling overflows. By March 2023 we had completed 91 of these investigations, with a further 67 to be completed by March 2025. These investigations will help to support our storm overflow investment programme in AMP8 and beyond.

As part of our AMP7 commitments, we are investing £137 million by 2025 in storm overflow spill reduction improvements, investigation, and increased monitoring. We have also committed a further £180million of investment into driving reductions to our storm overflow spill frequency by the end of AMP7. This will focus on reducing spill frequency across a number of our storm overflow assets targeting a 20% reduction from the 2021 numbers. This programme of work is still in development and any investment in AMP7 will be reflected in future programmes of work for AMP8 and beyond but is not included within DWMP24 or WINEP related storm overflow submissions. Any improvements made in AMP7 that meet the requirements of the SODRP will be in addition to the number of interventions planned for AMP8. This may mean that for a small number of storm overflow assets, these will be completed in AMP7 and replaced in AMP8 with interventions brought forward from AMP9. This will be subject to agreement with the Environment Agency, with any changes reflected in cycle 2 of the DWMP.

Before the end of AMP7, we will also have increased the storm tank capacity at 50 of our larger wastewater treatment works. This will mean that we will be able to store an average of 29% more stormwater on these sites, instead of it being discharged to the environment in heavy rainfall.

In AMP7 we installed 58 solar-powered cameras on key storm overflow locations with a focus on the river Wharfe. This trial was part of our Dynamic Asset Maintenance transformation programme. These cameras allowed us to quickly assess the performance of our assets and mobilise our response more effectively and support the telemetry information we already receive from these assets. However, the decision has been made not to go ahead with scaling up this pilot to the wider business. Throughout the pilot, the cameras encountered a lot more wear and tear from flooding and vandalism than we anticipated. The attrition rate was higher than anticipated meaning this option is no longer viable. We still have the 17 cameras installed at 'active' sites which will be left in place and will continue to be used to enhance our operational response.

5.3 The Environment Act, Storm Overflow Discharge Reduction Plan & WINEP

The sewer system was constructed over the past century. Since then, increased rainfall, climate change, population growth and urban creep has put real pressure on sewer capacity. Society's expectations of the environment have also changed. A combination of these factors means that the future of combined sewer systems and the operation of associated storm overflows needs to be adapted to meet existing social expectations.

A Defra taskforce was established on storm overflows in August 2020 and the Environment Act 2021 contains new duties on government and water companies to "secure a progressive reduction in the adverse impact of discharges from storm overflows".

The government published a consultation on the Storm Overflow Discharge Reduction Plan⁴ at the end of March 2022 and following the consultation period the government published its final Storm Overflow Discharge Reduction plan⁵ on the 26 August 2022. The Environment Act means that the targets set out in the SODRP are legally binding and will require Water Companies to deliver the largest infrastructure programme in water company history.

The SODRP aggregates the requirements into three target areas:

1. Protecting the environment:

Headline target: Water companies will only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact. Sub-targets:

The headline target must be achieved for most (at least 75%) of storm overflows discharging in or close to high priority sites (as defined in Annex 1) by 2035. It must be achieved for all (100%) storm overflows discharging in or close to high priority sites by 2045. Water companies must achieve this target for all remaining storm overflows sites by 2050.

Annex 1 - Defining 'High Priority' sites: High priority sites include Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SAC), Urban Wastewater Treatment Regulations sensitive areas, chalk streams and waters currently failing our ecological standards due to storm overflows.

2. Protecting public health in designated bathing waters

Headline Target: Water companies must significantly reduce harmful pathogens from storm overflows discharging into and near designated bathing waters, by either: applying disinfection; or reducing the frequency of discharges to meet Environment Agency spill standards by 2035.

3. Ensuring storm overflows operate only in unusually heavy rainfall events

Headline Target: Storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050.

⁴ <https://consult.defra.gov.uk/water-industry/storm-overflows-discharge-reduction-plan/>

⁵ <https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan>

Screening Requirements for storm overflows water companies will be required to ensure all storm overflows have screening controls.

The report also contains the below requirements for water companies:

1. Water companies must comply with all their existing regulatory obligations and duties, including permits issued by the Environment Agency.
2. The Government expects water companies to have maps of their sewer networks and understand where properties with separate rainwater pipes are connected to their combined sewer network.
3. Water companies will clearly set out how they will meet their storm overflow targets in their Drainage and Wastewater Management Plans.
4. In developing the best solutions, water companies should base their decisions on robust evidence and explore ways in which they can maximise wider benefits where solutions can address multiple issues, delivering best value for people and the environment
5. We expect water companies to achieve year on year reductions in the amount of surface water that is connected to their combined sewer network.
6. We expect water companies to prioritise a natural capital approach, considering carbon reduction and biodiversity net gain, as well as catchment level and nature-based solutions in their planning.
7. We expect water companies to consider treatment of sewage discharges as an alternative solution where appropriate.

The details for each target area were published by the EA in the WINEP driver guidance in 2022

5.4 DWMP and storm overflows: Investment PR24 and beyond

A healthy and resilient natural environment is vital if we are to address the biodiversity crisis (Dasgupta review 2021⁶) and mitigate the impacts of climate change. It is widely acknowledged that giving people the opportunity to enjoy time outdoors in the natural environment has significant benefits for health and wellbeing.

We recognise that as a water company, we have a key part to play in helping to improve river water quality for people and wildlife. At YW we are working towards delivering 'A thriving Yorkshire. Right for customers. Right for the environment.' And we share the government's ambition for a significant reduction in the use of storm overflows. We recognise that achieving the step change in storm overflow performance that is required will not be easy. We are committed to playing our part but recognise that river health is not solely the responsibility of water companies, with other sectors such as agriculture and transport having a significant role to play.

DWMP24 has required significant hydraulic modelling undertaken within the 5-year DWMP cycle. 91% of our priority storm overflows are located within our promote catchments. 85% of all our storm overflow assets are within our promote catchments. For draft, we costed improvements based only on those storm overflows within catchments triggering through to the BRAVA stage following RBCS. Based on the new SODRP and our consultation feedback, our approach has been to include costs and solutions for all storm overflow assets within the final DWMP24. Where we have a model, we have used this to provide a notional solution and cost, and where we do not have models that cover an overflow we have used an extrapolated cost.

The SODRP sets out clear milestones to achieve improvements and meet targets for the priority overflows and the non-priority overflow asset base. These are detailed in Table 1 below. We have set out our plan to meet these requirements. Our WINEP submission for AMP8 covers 211 storm overflow

⁶ <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>

assets for investment and is predominately made up of priority and inland and coastal bathing overflows. We are investing in assets impacting the inland bathing water at Ilkley and focusing investment on two proposed bathing water designations at Wetherby & Knaresborough. In our WINEP24 submission to the EA, we included interventions to meet the inland bathing water requirements for storm overflows at these locations. This will be reviewed in line with WINEP24 final agreements with the EA. remains subject to finalisation and confirmation by the EA.

Table 1: Storm overflow discharge reduction plan targets

AMP	AMP8	AMP9	AMP10	AMP11	AMP12
Year	2030	2035	2040	2045	2050
% of high priority site storm overflows improved	38%	75%	87%	100%	100%
% of bathing water sites improved		100%			
% of total storm overflows improved	14%	28%	52%	76%	100%

Source: <https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan>

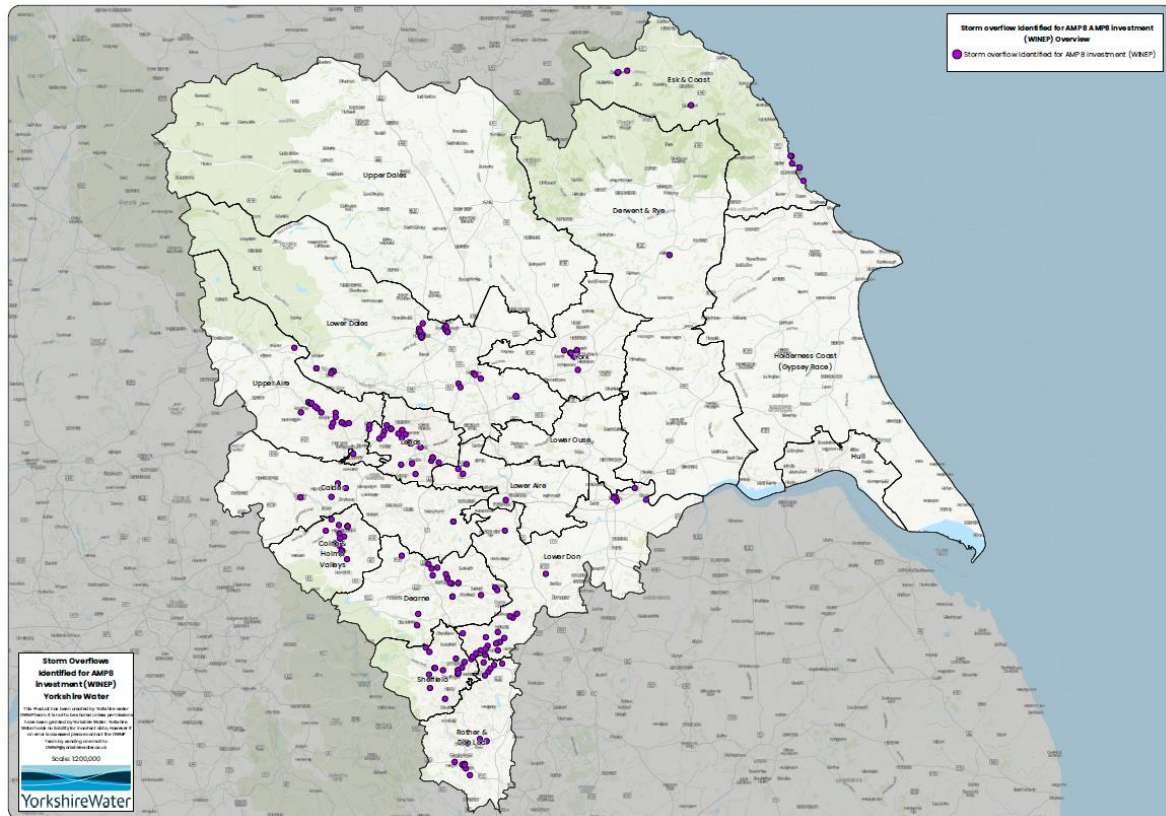
We have set out our long-term plan to meet these requirements. Our short-term plan, WINEP submission for AMP8, for the regulatory period 2025–2030 is detailed above. Our medium-term AMP9 investment plan for the regulatory period 2030–2035, focuses on any remaining coastal bathing assets and high priority sites and we will be looking to incorporate the outcomes of the no local ecological harm investigations into this plan in cycle 2. Our longer-term plan across AMPs10–12 for the regulatory periods spanning 2035–2050 is to complete the priority sites and address all assets requiring intervention: That is to meet the requirements and installation of screens to ensure all assets have a compliant screen by 2050. This plan is also reflected in the Ofwat LTDS (Long Term Delivery Strategy) data tables that will accompany the PR24 business plan submission. We will work to enhance our SODRP in future AMPs and through future cycles of the DWMP as we build on learnings from delivering blue-green interventions and continue to grow and embed our partnerships, to allow optimal delivery of the plan. We have added a company ambition to our overflow delivery plan: We will aim to achieve 20% of our AMP8 overflows delivered with a blue-green infrastructure components to the solution. This increases in AMP9 and subsequent AMPs to 50% of solutions delivered with a blue-green infrastructure components to the solution each AMP. See Section **Error! Reference source not found.** below, which describes how we are monitoring our surface water removal and some case studies on blue-green approaches.

Two different delivery scenarios have been developed for implementing improvements to storm overflows in the DWMP24:

- **Reduce + Enhance:** Adopt blue-green solutions to manage and reduce the amount of rainfall entering our network to reduce our levels of risk (e.g., through the use of blue-green infrastructure and nature-based solutions or Sustainable Drainage Systems (SuDS) which look to manage flow in a cost-effective way whilst benefitting the environment and surrounding communities), then utilise traditional grey infrastructure solutions to meet the target if necessary.
- **Enhance:** Increase the capacity of our network through traditional ‘grey’ solutions, i.e., building bigger pipes, storage tanks and upgrading our existing assets.

Our submission for WINEP EnvAct drivers for AMP8 consists of an £800 million programme tackling 211 storm overflows across the region, as seen in Figure 6: AMP8 WINEP storm overflow plan Figure 6 below. These are predominately high priority sites as defined by the EA, alongside a number of proposed and actual inland and coastal bathing assets.

Figure 6: AMP8 WINEP storm overflow plan



6. Planning Areas

In line with the DWMP framework⁷, we have utilised a three-tiered approach consisting of different geographical levels for reporting. This can be seen in Figure 7.

Figure 7: DWMP Levels for Yorkshire



⁷ <https://www.water.org.uk/policy-topics/managing-sewage-and-drainage/drainage-and-wastewater-management-plans/>

Our Level 1 area represents our overarching plan for Yorkshire based on the wastewater boundary for our region. Our Level 1 plan is our high-level strategic output and includes our outline approach to maintaining and improving a resilient wastewater system for Yorkshire.

We have divided the region into 17 Level 2 Strategic Planning Areas (SPAs) which are generally aligned with the Environment Agency's (EA) river basins alongside 4 urban areas (Hull, Leeds, Sheffield and York). Each SPA generally consists of a number of smaller individual catchments aggregated together so that stakeholders and customers can understand our plan at both local and regional levels. They represent a mix of rural and urban catchments, discrete drainage areas, varying hydraulic flood risk to properties, storm overflow risks and WwTW flow and compliance issues. The 17 Level 2 SPAs are listed in Table 2. Further detail on our storyboards for each Level 2 can be seen in Appendix B.

We have 617 Tactical Planning Units (TPUs) or WwTW catchments within our overall Level 1 area. These we have designated as our Level 3 catchments. The boundaries are defined by the extent of the properties served by a WwTW and include all of the upstream foul, surface and combined sewer network, wastewater pumping stations and storm overflows. The defined Level 3 catchments allow stakeholders and customers to identify which catchments are relevant to them and what our plans are for maintaining or improving those catchments to ensure a resilient local system. Further details can be seen in Appendix C.

Between draft and final we have made amendments to our approach to our DWMP build up linked to the requirements to deliver the Storm Overflow Discharge Reduction Plan. This means each and every storm overflow has now been included in our plan and the drainage area relating to that overflow has been generated, we have called this a Level 4. We have also generated flood clusters and linked them to storm overflows where possible to optimise delivery and benefits. The below images in Figure 8, show a range of flood clusters and how these link to other storm overflow and network assets.

Figure 8: Flood cluster examples

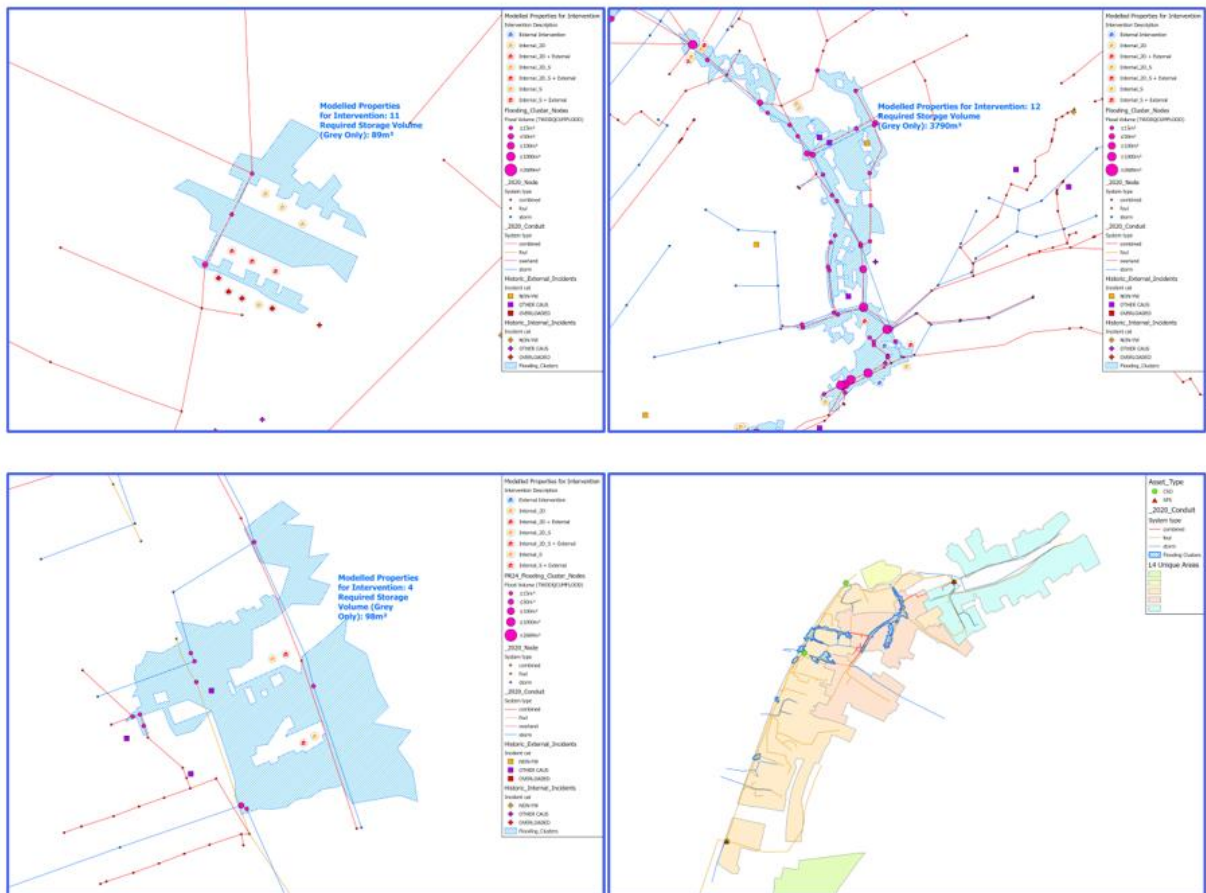


Table 2: Level 2 SPA Area and Catchment Details

Level 2 SPA	Area Description	No of Level 3 Catchments
Calder	Urban	38
Colne & Holme Valleys	Rural, small towns and villages	8
Dearne	Urban areas, larger towns and some rural areas	50
Derwent & Rye	Rural, small towns and villages	68
Esk & Coast	Rural, coastal towns and bathing beaches	22
Holderness Coast (Gypsey Race)	Rural, coastal towns and bathing beaches	75
Hull	Urban	2
Leeds	Urban	1
Lower Aire	Urban areas, larger towns and some rural areas	12
Lower Dales	Rural, small towns and villages	53
Lower Don	Urban areas, larger towns and some rural areas	34
Lower Ouse	Rural, small towns and villages	15
Rother & Doe Lea	Urban areas, larger towns and some rural areas	23
Sheffield	Urban	9
Upper Aire	Rural, small towns and villages	28
Upper Dales	Rural, small towns and villages	159
York	Urban	20
Total		617

6.1 Impacts of climate change on the Yorkshire region

Our climate is already changing. We have seen a 1.1 degree rise in global temperature since the last century⁸ and rainfall in the UK has become more intense⁹, as warmer air can hold more moisture. Sea levels are rising along the Yorkshire coastline and storms are becoming more frequent and more severe. Further change is inevitable due to the carbon emissions already released into the atmosphere. The rate and severity of these changes is dependent on how much additional carbon is emitted.

In general, climate change will bring warmer, wetter winters and hotter, drier summers to our region. Rainfall will become more intense and more rain will fall in short, sharp bursts. There will be an increased risk of more frequent and heavier storms. Sea levels will rise. These changes will have various impacts on our sewer network and on the environment. For example, warmer, wetter winters will increase the risk of widespread flooding, such as that seen during the Boxing Day floods in 2015: It was declared a major incident for the north of England and saw the Prime Minister chair an emergency Cabinet Office Briefing Rooms (COBR) meeting.

These weather events can mean that our sewage network is overwhelmed, and our treatment works are inundated leading to dilute sewage being discharged untreated to rivers or the sea. High flows in rivers can also erode the protection around our sewer pipes, leaving them exposed to damage. High flows in rivers can also cause outfalls to be submerged or damaged and preventing them from freely discharging. Storms can lead to power cuts which can affect our ability to treat or pump sewage. Our sewer system can also be overwhelmed by the volume of rainfall and back up, causing flooding in customers' homes and gardens or in the street.

Hotter, drier summers may mean less flow in our sewers, causing more risk of blockages. Or sewage may become more concentrated and potentially septic as it is less diluted and sits in our sewers for longer. If rivers are low during dry spells in the summer, there is the potential for greater damage to the natural environment from storm overflows. Warmer rivers mean less oxygen dissolves in the water which can impact fish and other wildlife, as well as affecting the chemical quality of river water. Hotter summers could also dry out the clay soils we have in our region causing ground movement. This

⁸ <https://www.metoffice.gov.uk/research/climate/maps-and-data/about/state-of-climate>

⁹ <https://www.sciencedirect.com/science/article/pii/S2212094721000372>

means that our sewer pipes are more susceptible to cracking or breaking, which could result in sewage escapes.

Additional detail on climate change projections for the region and how we have accounted for climate change within our DWMP is provided in our DWMP Technical Summary document.

7. Partnership working

Partnerships are formed by interested parties who come together to deliver outcomes that have benefits for all parties. Working in partnership with others means that we can deliver more for our customers and the environment. We've continued to develop and deliver partnership projects to reduce flood risk and improve river health, whilst delivering community and environmental benefits in Yorkshire. Partnerships take many forms, from Strategic Partnerships; Project Partnerships and partnerships to operate and maintain assets.

As a Risk Management Authority (RMA) in Yorkshire, our role is to manage flood risk, manage the risk of flooding to water supply and sewerage facilities, and flood risks from the failure of our infrastructure. We must ensure that we have the appropriate level of resilience to flooding, to be able to maintain essential services during civil emergencies (including those defined by the Security & Emergencies Direction¹⁰) and manage the impact and reduce the risk of flooding and pollution to the environment.

We are part of a large region with 14 Lead Local Flood Authorities (LLFA). The region has several areas of complex shared risk, such as York and Hull which are particularly prone to flooding. Our duties alongside other RMA's include collaboration and engagement with all 14 of our LLFAs, Internal Drainage Boards (IDBs), local, regional and national Environment Agency and private landowners on matters relating to flooding. This forms a crucial part of partnership working and the co-design, co-delivery and funding of schemes to reduce flood risk across the region.

7.1 The importance of partnership working

Partnership working is key to helping manage drainage and wastewater, now and in the future. It needs to form the cornerstone of what we do, to help us achieve the desired outcomes for our customers, and the environment. Our vision is that through partnerships of varying sizes, alongside other organisations and communities we will:

- co-invest in time, commitment and funding
- co-create solutions
- identify co-funding from sources within and external to the water sector, and
- consider who is best placed to deliver solutions and transfer funding as required through mature working.

Traditionally, many drainage and wastewater problems have been solved through hard engineering, water company focused approaches. We believe that we can instead resolve many of these problems, either fully or in part, through partnership solutions and working with communities. It is particularly important when looking at surface water management, due to the fragmented nature of responsibilities across a number of Risk Management Authorities (RMAs). This is further discussed in the government report Surface water and drainage: review of responsibilities¹¹.

The government plans to implement Schedule 3 of the Flood and Water Management Act 2010 in 2024. This will extend powers to a newly create Sustainable Drainage System Approving Body (SAB) who will approve and adopt sustainable drainage systems (SuDS) as part of new developments. The right to connect to the sewer for drainage from private new development sites under the current Section 106¹² of the Water Industry Act 1991 will be conditional upon a SAB approved sustainable drainage design

¹⁰ <https://www.gov.uk/government/publications/water-company-security-and-emergency-measures-ministerial-direction>

¹¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911812/surface-water-drainage-review.pdf

¹² <https://www.legislation.gov.uk/ukpga/1991/56/section/106>

for the new development, with water authorities becoming a statutory consultee in the planning process.

We welcome Schedule 3 as a framework which supports and aligns with our own ongoing investment in assets to address climate change, urbanisation and a growing population. SuDS slow, store and infiltrate rainwater that would otherwise enter the sewer network unrestricted. Implementing Schedule 3 will unlock opportunities to build resilience into our communities and when supported by new national standards, will not only relieve pressure on our drainage infrastructure, but also deliver high quality blue-green infrastructure. This includes benefiting biodiversity and water quality and creating amenity value for our Yorkshire communities.

We recognise that effective partnerships take time and effort to forge, create, and build trust. Good practice in developing them can be followed, but flexibility and creating common values is critical. Those which are successful are invested in fully by each partner (including money, time, and effort) and recognise the value of the contributing and connected stakeholders.

One partnership will always be unique to another: Different values, objectives, characteristics, previous experience, and the organisations involved create uniqueness, even if the common cause has similarities. Flexible approaches to joint working will provide positive outcomes. Our experiences show that many continuous funding streams, including timescales and investment horizons are mis-aligned across the partnership and require greater effort to enable co-funding to align. In some circumstances, it has not been possible to align co-funding within an acceptable timescale. The opportunities for policy and regulatory change to better support this method of delivery in the future are described in our position statement, 'Making Partnerships Work' published in September 2021¹³

We believe that our partnerships create value when we form them in the right way: Where all parties come together at the start, with the ability for others to join along the journey. Partners, stakeholders, and communities alike need to have their voice heard and their input valued.

7.2 Partnerships at YW

We will be seeking to continue to strengthen our existing partnerships and identify opportunities to develop new strategic partnerships in the future. As one of our strategic aims within the DWMP is to remove surface water from the network, the cross organisational nature of this challenge spanning RMAs, means we are likely to need to work in strategic partnership across the region, to develop a blue-green plan for Yorkshire. We will also be looking to mature our processes and ways of working to deliver project level partnerships, which will be an important part of delivering our storm overflow programme.

We currently have a performance commitment measure in AMP7 - Working with Others (WWO) which has delivered in partnership. We also have three strategic wastewater partnership schemes running within Yorkshire which are detailed as case studies in the final technical document appendices. These are Living with Water, Bathing Water and Connected by Water. These case studies seek to demonstrate what can be achieved when working together and how this can support the DWMP aspirations to expand partnership working.

We have a long-standing commitment to partnership working and have delivered multiple schemes in partnership with our LLFAs and the EA over the last ten years, including collaborative working with Scarborough Borough Council on the new sea wall in Runswick Bay, contributing to property level flood protection to complement Leeds Flood Alleviation Scheme 1(FAS), and multi-agency schemes in Malton, York, Doncaster and elsewhere to protect against flooding. We have built on this learning and are now developing and delivering strategic level partnerships across whole sub regions such as Living with Water and our emerging Connected by Water partnerships.

We have also reviewed and refreshed our internal processes and established a new Surface Water Management Group. This group meets quarterly and seeks to identify and bring together any

¹³ <https://www.yorkshirewater.com/media/dlobrmno/position-paper-making-partnerships-work.pdf>

opportunities for collaborative projects. It prioritises these linked to available funding, scale of benefits delivered and ensures the successful development and delivery of partnership opportunities.

At YW we have a well-established flood risk and engagement team who work alongside the Yorkshire Lead Local Flood Authorities (LLFA) and the Environment Agency to better understand and manage flood risk in the region. The team are responsible for representing the company at a number of forums including the Regional Flood and Coastal Committee (RFCC) and the local Flood Risk Partnership meetings as well as at authority specific forums and local council meetings. These meetings can be proactive and reactive but should ultimately lead to better understanding between Risk Management Authorities (RMAs) and the opportunity to manage shared risks in partnership.

This partnership approach has delivered surface water removal from a combined sewer in the Sheffield area; disconnection of a watercourse that was discharging to a sewer system in Otley; installation of a small storage tank for 3 properties in York and re-routing of surface water in the village of Roos, in the East Riding. The team also manage the process for sharing hydraulic models and other data which can be used for strategic planning of larger flood alleviation schemes.

7.2.1 Living With Water

In 2023, the Living with Water (LWW) partnership commenced work on its first collaboratively designed and delivered scheme as part of the blue-green plan for Hull. The installation of permeable paving on a densely populated inner-city street will capture rainwater falling on the property roofs, front yards, pavement and road; storing and slowing the flow of water into the local combined sewer. The project will increase flood resilience to over 80 properties and has been designed to manage the impacts of climate change. This has been coupled with a Hull City Housing project¹⁴ to update the frontage of the properties, which provides a further opportunity to manage surface water from downpipes and remove them from the traditional drainage system. The two schemes will deliver major regeneration to the area, as well as flood resilience benefits. This can be seen below in images in Figure 9 depicting work onsite at Rosmead Street and an artist's impressions of the street after construction.

Figure 9: Rosmead Street



Design work is progressing quickly for four other projects in the AMP7 programme, with all schemes expected to start on site in 2023. The programme will install a range of SuDS assets across the city in partnership with the local authorities to improve management of surface water from roads and roofs. The assets to be installed range from swales and ponds to geo-cellular storage. All of the projects are supported by in-depth customer consultation and co-creation with numerous community events and engagement.

Local schools have also taken up Living with Water lessons to raise awareness of flood risk among students and provide an opportunity for them to share their ideas for SuDS designs with our delivery partners. Living with Water has recently developed a digital platform to allow students and communities to retrofit SuDS on their street, supporting them to learn more about SuDS, their appearance and their associated costs and benefits. The team have also added to the Living with Water education offering by creating a Scout and Girlguiding badge which raises awareness of flood resilience through fun resources. Below is a link to these resources.

¹⁴ <https://www.yorkshirewater.com/news-media/news-articles/2022/living-with-water-and-hull-city-council-to-transform-rosmead-street/>

[Living with Water Badge Resources | Living With Water.](#)

The images below, Figure 10, depict the online resource, a group of scouts interacting with the LWW badge and resources and an example of our presence at an engagement event.

Figure 10: Living With Water engagement



7.2.2 DIG (Doncaster, Immingham and Grimsby)

We continue to develop strategic partnerships where there is opportunity to work collaboratively to deliver greater benefit to customers and the environment. One new partnership currently being formed and scoped is Doncaster, Immingham and Grimsby – known as DIG. As part of the Flood and Coastal Resilience Innovation Fund, Yorkshire Water is working with Doncaster Council to create SuDS in two areas of Doncaster. This is to reduce flooding, increase flood resilience and improve the local environment over 5 years from 2022–27. We have finished the first phase of investigations and are now working to find construction partners capable of making our early designs a reality. This partnership involves, YW, Anglian Water and a number of council areas.

With extensive monitoring in place on our sewer networks, we are engaging with local residents and schools to understand our design constraints and improve public understanding of rainwater management and our ambitions. This included extensive questionnaire surveys of the local area and visits for schools to our learning labs. By the end of the project, we are hoping to have significantly reduced flooding impacts in the area and greatly improved the understanding of our customers around the work we do at Yorkshire Water, including customer engagement.

7.2.3 Growing Resilience project

We also have well established partnerships in the Calderdale area. Between 2019 and 2021, and in partnership with the National Trust, we delivered the Growing Resilience project. This was a £2.6 million project which delivered 151 hectares of woodland creation with 112,000 trees planted, 862 Natural Flood Management interventions, 86 hectares of restored heathland and 103 hectares of restored peatland across YW and National Trust land. This work links to our aspirations to slow the flows of surface water reaching our sewers by containing it in upland areas using trees and 'leaky dams'¹⁵.

The YW land was at Gorpley Reservoir in the Upper Calder Valley and some pictures of the tree planting can be seen below Figure 11.

Figure 11: Tree planting at Gorpley Reservoir



¹⁵ <https://www.yorkshirewater.com/news-media/news-articles/2019/national-trust-natural-flood-management-january-2019/>

7.2.4 Landscapes for Water and Catchment Partnerships (CaBA)

Building on this partnership success and catchment working, we are now working with National Trust on a larger project, Landscapes for Water. This is aiming to deliver multiple aspects of habitat restoration, woodland creation, natural flood management and upland restoration across some 5,500 hectares of YW/National Trust land in the South Pennines. The woodland creation is being funded largely through the White Rose Forest, as part of the Northern Forest programme, and we are currently in the process of finalising a bid to West Yorkshire Combined Authority (WYCA) to fund the Natural Flood Management (NFM) components. The programme is running in parallel with, and complementary to, other ongoing activities such as YW's investment in upland restoration. Our upland restoration programme across the region, whilst focussed primarily on improving raw water quality (for drinking water), also provides other benefits. This includes improved retention of water in blanket bogs, helping to slow the flow, reduce sediment in runoff, providing more diverse habitats and biodiversity, protecting sequestered carbon and over time, to sequester more carbon. In the future, there will be potential to explore options that would result in direct alignment of the DWMP and the Water Resource Management Plan.

We are actively involved in numerous catchment-based initiatives that incorporate nature-based solutions. These are often co-designed and delivered with members of the Catchment Partnerships (CaBA) and meet the aims of wider communities. Examples of this include biodiversity enhancement programmes, SuDS, invasive species control, and whole river connectivity / fish pass initiatives. We are increasingly delivering our responsibilities through working in partnership and focussing on the wider needs of communities and the environment, rather than only addressing our own assets and compliance. This partnership approach has many advantages including leveraging funding, so delivers greater value to our customers than if we acted alone. This approach to partnership working across catchments ensures that we unlock the full potential of our on-going water quality investment and ensures we deliver optimal outcomes for our customers and the environment.

We have worked closely in AMP7 with a number of CaBA partnerships and voluntary groups to help facilitate the extent of and quality of citizen science monitoring. The outcomes from these programmes have not only included improved knowledge of our own impacts, leading to future investment, but also more engaged customers and partners, helping us work jointly on solutions to restore nature. One example is working with the Esk and Coastal Streams Catchment Partnership to set up a multi-agency monitoring approach to the river Esk, particularly focused on preservation of endangered freshwater species. A combination of YW, EA and citizen science; public participation in research and monitoring has taken place to build an evidence base. This is linked to our WINEP24 submission, under the 25-year environment plan driver for water quality upgrades in AMP8. YW has been able to support the training of volunteer monitoring groups as well as setting up data share mechanisms and allowing the North York Moors National Park to commission their own independent monitoring to validate results.

We recognise we have a responsibility to help ensure that catchment management plans and Local Nature Recovery Strategies (LNRS) are produced in a way that will lead to meaningful outcomes for biodiversity and we can ensure we can align with the plans. We have provided 5 years staff time funding to Catchment Partnership officers at various CaBA host rivers trusts. This is to allow the time to co-create their catchment management plans and ensure they are as effective as they can be.

We are currently establishing a strategic partnership between ourselves and the Rivers Trusts within Yorkshire (see below). The purpose of the group is to build an informal, collaborative forum within which the parties can support each other and identify opportunities to work together. The aim of this Partnership is to enhance and protect the resilience and sustainability of river catchments within the Yorkshire region. During its initial, development phase, the partnership will focus on a series of recognised operational issues linked to assets/nodes, with a view to identifying additional operational and strategic areas of focus for intervention in due course.



7.2.5 Maintenance Partnerships – Dronfield

One further partnership to highlight is linked to the operation and maintenance of the Gosforth Valley detention basin which stores surface water and offers treatment capability via its wetland function. The basin is maintained in partnership in a landlord and tenant arrangement with YW and Lea Brook Valley (LBV) charity. As seen below, Figure 12.

Figure 12: Gosforth Valley detention basin



8. Customer and stakeholder engagement

We have been engaging with our customer and stakeholders to ensure we are approaching our DWMP to meet wider needs. Our approach to customer and stakeholder engagement has been wide ranging including the development of online data portals, direct engagement with stakeholders and customer market research.

8.1 YW DWMP Hub

Our innovative online hub is the main interface with customers and stakeholders, allowing us to share interactive maps and data reflecting the core issues highlighted in the DWMP. The Hub can be accessed through the following link:

<https://drainage-and-wastewater-management-plan-yorkshirewater.hub.arcgis.com/>

We have designed the Hub to be flexible, allowing it to evolve over time and enabling us to ensure suitability for individual stakeholder groups. Stakeholders have their own space within the Hub within which they can see the area relevant to them. This allows engagement on a more bespoke level as the information provided is relevant to the individual stakeholder. They are also able to share their own data with YW in a secure environment. A series of datasets and dashboards containing flooding, capacity and environmental impact information are available to our key local stakeholders for each of our Level 2 areas. If you are a key local stakeholder and require access, please email: dwmp@yorkshirewater.co.uk or click on the Hub links to sign up.

The Hub has over 183 maps and 95 operational dashboards across the 17 different strategic planning units. Figure 13, Figure 14, Figure 15 and Figure 16 provide examples of the interface and data held within the Hub:

Figure 13: Visual representation of YW Hub landing page

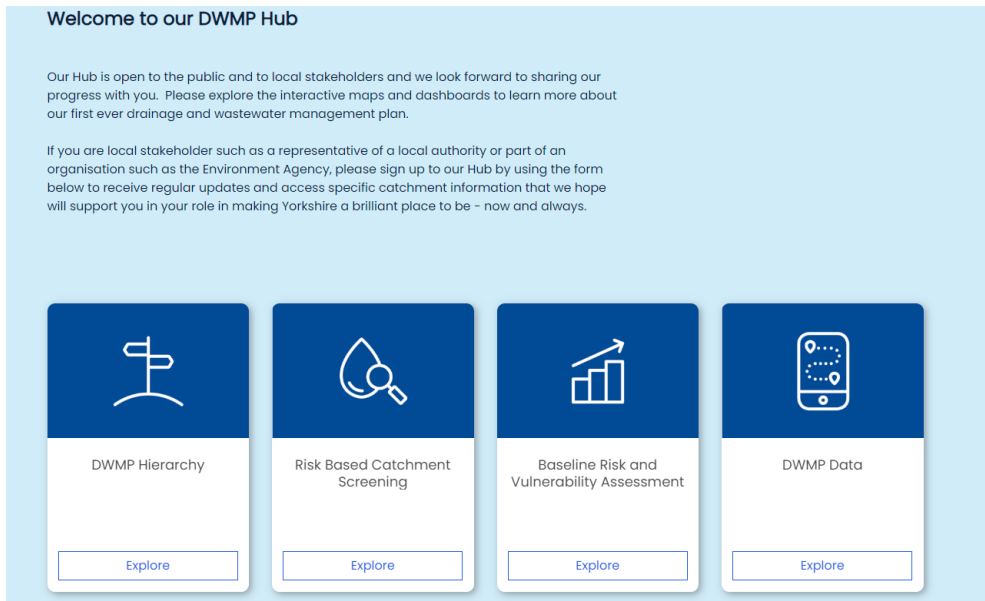


Figure 14: Example of visual representation of Level 1, 2 and 3 catchment detail from YW Hub

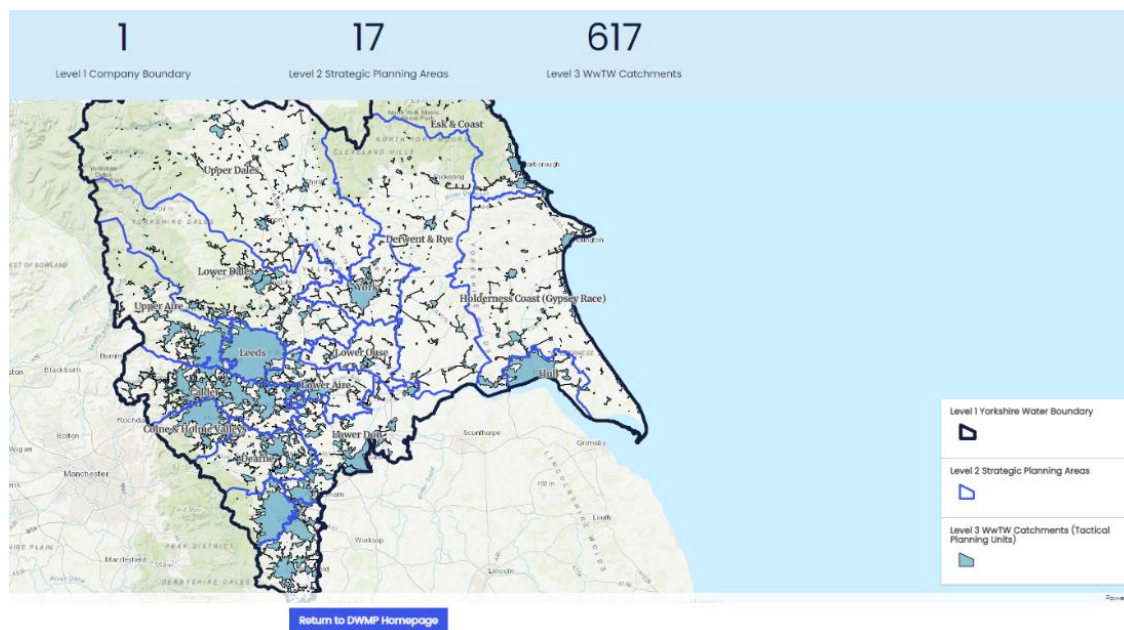


Figure 15 : Example of visual representation of Level 2 and 3 catchment detail from YW Hub

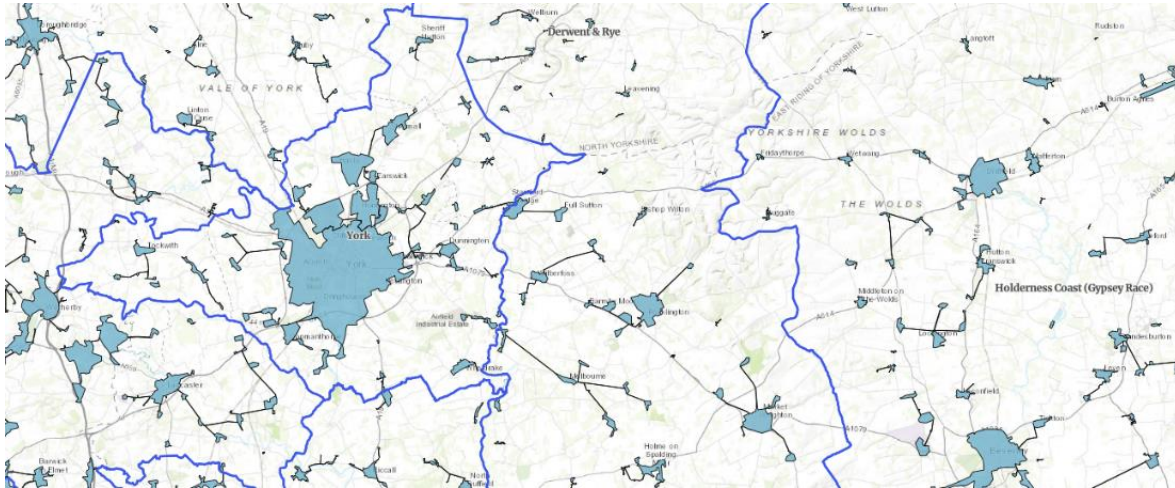
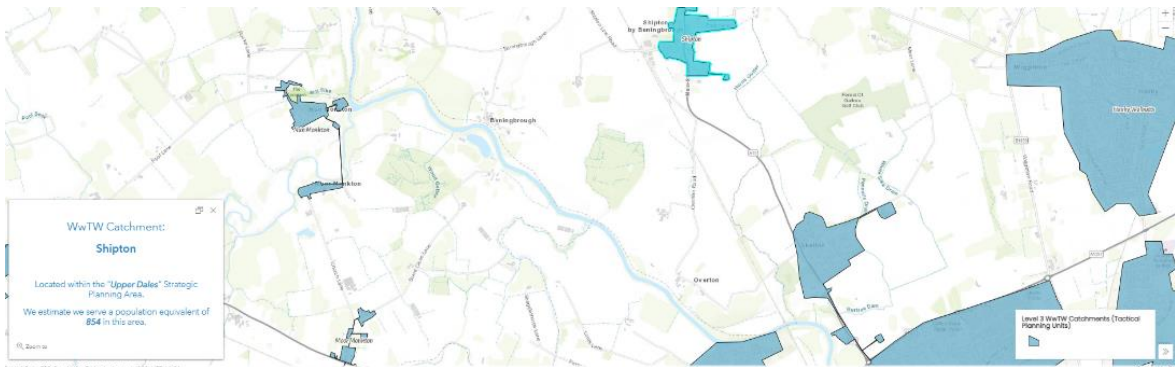


Figure 16: Example of visual representation of Level 3 catchments from YW Hub



8.2 Engagement with our stakeholders

To inform the development of our long-term strategies, and our five-year business plan, we have been working to establish a co-creation process with the Yorkshire Leaders Board. The Yorkshire Leaders Board is made up of the Leaders and Chief Executives of each of the 16 local authorities in Yorkshire, plus the two regional Mayors. In 2021 we agreed a process of structured engagement with the Leaders Board, through a series of regional roundtable events with representatives from the local authorities nominated by the Yorkshire Leaders Board. These events are broadly structured in three phases:

- **Phase one** involves us talking to local authorities about their local challenges, and their priorities across a wide range of issues. This helps us to understand the challenges the region is facing and the needs of local authorities.
- **Phase two** takes these discussions further and applies them in the context of our emerging long-term strategies to play water's role in making Yorkshire a brilliant place to be – now and always. These discussions allow us to explain the frameworks we operate within for long term strategic planning (DWMPs, WRMPs, etc) and will allow us to co-create our long-term visions and strategies in partnership with local authorities to ensure they reflect the needs of the region.
- **Phase three** will take the long-term joint strategies we've created and apply them to the five-year business plan, resulting in a co-created business plan for 2025 – 2030.

Throughout this process we will be reporting back to the Yorkshire Leaders Board on the work of the regional roundtables. At each stage we aim to demonstrate how the feedback we are receiving is being built into our plans and is making a material difference to our approach.

Our engagement on the DWMP has been a key part of this overall approach. We held a regional roundtable in December 2021 which focused on understanding the challenges faced by local authorities and their priorities. This gave us valuable feedback and helped us understand differences within the region on key issues such as economic development and housing growth strategies. We then built on this with a further roundtable in February 2022, where we discussed the DWMP framework in the context of how it could support their priorities identified in the first roundtable. This second roundtable helped us to begin to gather more detail around where we should be pitching our level of ambition, as well as identifying opportunities for collaboration through the DWMP.

In May 2022, we held a further roundtable to update local authorities on progress with the DWMP and to brief them on the implications of the new storm overflow targets.

Internally, the outcomes of the regional roundtables and other stakeholder engagement are captured and fed into our PR24 governance processes. This ensures that stakeholder feedback is provided directly to practitioners who are developing our plans, through to our PR24 Steering Group. This is made up of senior managers and Directors, then through to the YW Leadership Team and ultimately the Board.

The YW region is also served by councils not included in the Yorkshire Leaders Board, so separate engagement has been required to ensure all local authorities have had chance to view and input into the plan. The level 2 Strategic Planning Area that covers Rother & Doe Lea has the following councils: Bolsover & NE Derbyshire District Councils, Derbyshire County Council, Chesterfield Borough Council. Opportunities for engagement and liaison with us and on our plan, have therefore been offered, as well as access to the DWMP Hub.

We held a face-to-face engagement workshop in January 2023 and invited every LLFA, the EA, Rivers Trust and National Park representatives to engage with us on our plans, ask questions and identify potential interactions. We provided an overview of the DWMP process, our modelling, the different scenarios we have used and had maps showing our plans for stakeholders to review and comment on. We will use this information to further refine our plans. Our partnerships team and flood risk and engagement team will be following up any opportunities identified and will continue to work closely with each stakeholder. This is to identify and progress any opportunities linked to delivery of our SODRP and flood clusters in a blue-green solution and to develop our approach to co-development for cycle 2 of the DWMP.

8.3 Customer research

We commissioned Turquoise to undertake a series of customer market research workshops designed to cover a variety of demographics over 10 workshops in February / March 2022. This covered over 80 customers with a mixture of householder (HH) and non-householder (NHH) customers.

A deliberative, qualitative approach was employed to investigate household and non-household customer views upon what the core focus and priorities should be for YW's DWMP.

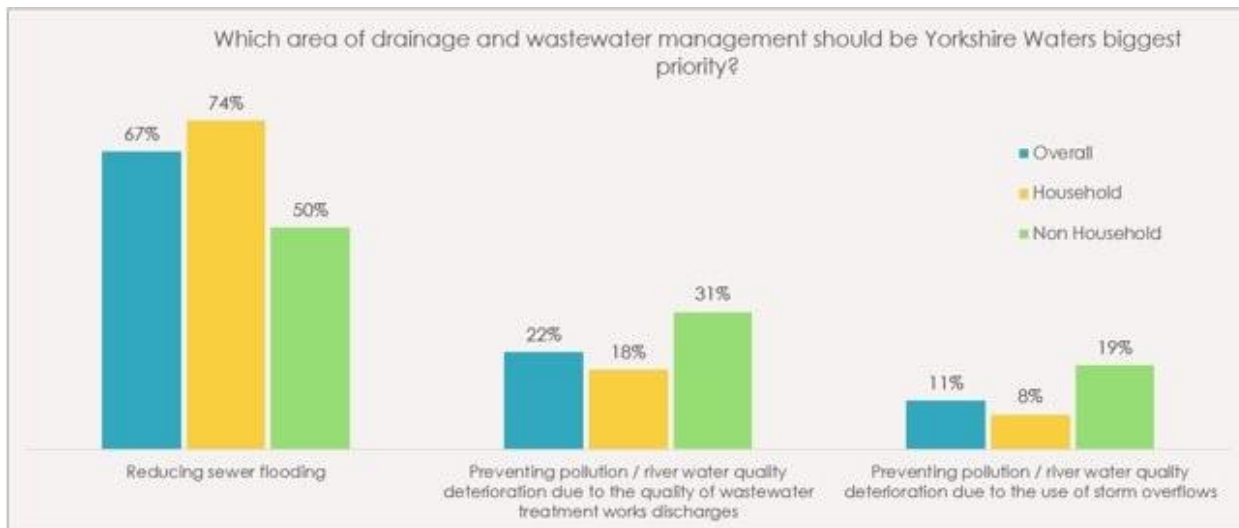
The overall aim of the research was to assess customers' views of what a 'best value' DWMP plan would look like, including the drivers of investment and how this should be prioritised to ensure resilient drainage and wastewater services in the YW region into the future.

There was a general lack of awareness of YW activities and water company activities. In regard to wastewater, this was even less so and customers identified a need for education, particularly on topics like responsibilities for different drainage systems, tackling blockages and how the sewer network interacts and functions.

Customers wanted us to hit our current targets as a priority. They recognised that more investment was needed given increasing populations and climate change to ensure that improvements and regular maintenance were undertaken. Equally, the consensus was that YW needed to improve because it was felt that the current wastewater system is not fit for purpose.

Customers were often shocked and appalled by storm overflows. Specifically, the function that they play in relieving the sewer system to prevent flooding and potentially leading to untreated sewage discharging into rivers and seas. Once the issues were explained to customers, how the system operates and why, they then felt that storm overflows were a necessary 'Plan B' or a backup contingency plan to prevent sewage entering their home. In terms of priorities, internal sewer flooding was seen as more of a priority than storm overflow spills, as seen below in Figure 17.

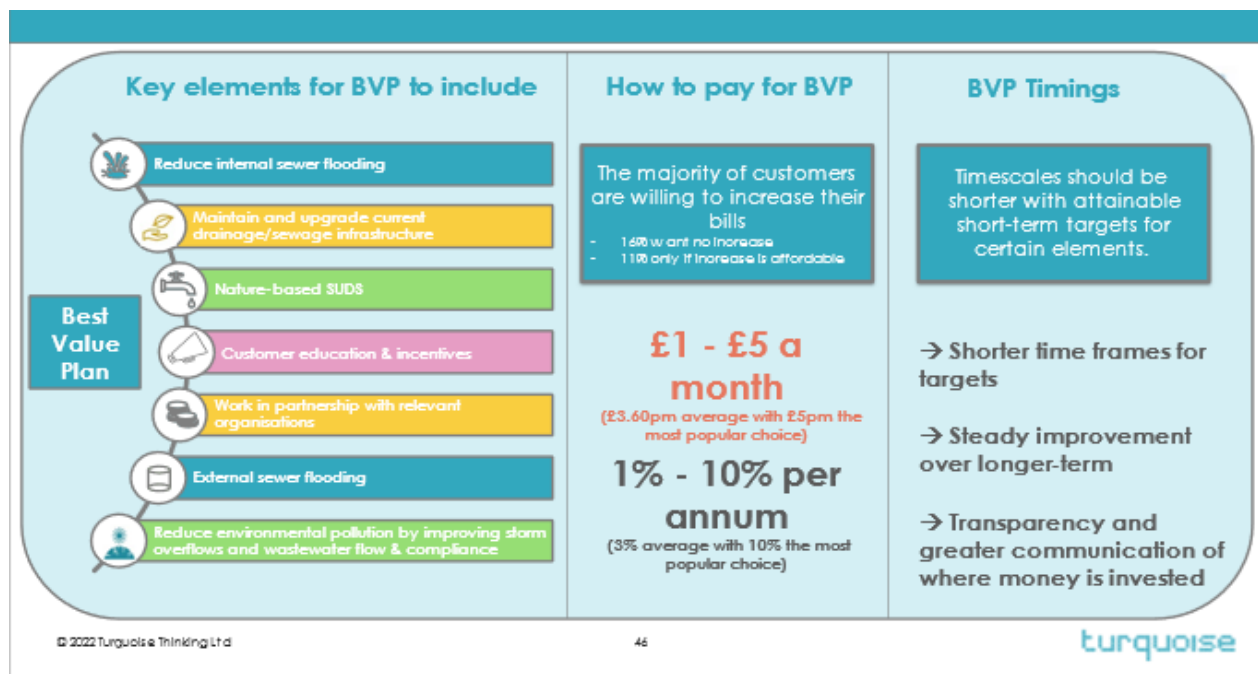
Figure 17: Summary of workshop outputs: Risk prioritisation



Source: Turquoise on behalf of Yorkshire Water

Customers were asked as a final exercise to create a BVP based on everything they had heard and learnt across the workshops. The key outcomes are shown in Figure 18:

Figure 18: BVP Summary of workshop outputs: BVP outcomes



Source: Turquoise on behalf of Yorkshire Water

Customers priorities for the short-term were around YW hitting targets and maintaining the network. Customers priorities for the medium-term were around YW making improvements and

adapting to future challenges. For the longer-term customers wanted YW to look towards exceeding targets and continuing to adapt to future challenges.

9. Process steps and methodology

9.1 Risk Based Catchment Screening (RBCS)

Risk Based Catchment Screening (RBCS) is one of the first processes completed during the development of the DWMP. All the Level 3 catchments within the YW region have been subjected to a high-level risk-based assessment against a series of indicators to establish potential levels of risk, both now and in the future. Indicators include issues such as flooding, pollution, WwTW compliance and system capacity. Those catchments identified as carrying higher levels of risk proceed to the more detailed Baseline Risk and Vulnerability Assessment (BRAVA). Further detail on the assessments undertaken as part of this process are provided in Section 10 of our DWMP Technical Summary document.

This process resulted in 335 Level 3 catchments progressing through to BRAVA. These 335 catchments represent 99% of the population of Yorkshire and they are predominantly urban areas with a mixture of more rural catchments included. The remaining 282 Level 3 catchments have been assigned a runway of "Observe" for the purposes of the DWMP. These will be subject to review during future cycles of DWMP development.

The individual RBCS results for each of the 617 Level 3 catchments is provided within the catchment summaries provided in Appendix C These are also collated and summarised for each Level 2 within Appendix B.

9.2 Planning objectives

The DWMP framework outlines the need for risks to be measured against a series of planning objectives. Where possible, our planning objectives align with our standard performance commitments but focusing on hydraulic capacity for the first cycle of the DWMP. We have shared these with our stakeholders via the Yorkshire Leaders Board for comment. By measuring both our current and future performance against these, as part of BRAVA, we can identify where interventions and investment may be required.

9.2.1 National planning objectives

We worked collaboratively with the other water companies and Water UK to establish six national planning objectives against which outputs were produced by all Water Companies and provided to key stakeholders for review in December 2020 for information.

Further detail on the approach taken to establish these planning objectives and the methodologies for assessing against them during BRAVA is provided in the technical note, BRAVA planning objectives for the first cycle of DWMPs¹⁶, produced by Water UK. A summary of the national planning objectives is provided in Table 3 below:

Table 3: National Planning Objectives Summary

Ref	Planning Objective
PO-01	Risk of sewer flooding in a storm
PO-02	Storm overflow performance

¹⁶ <https://www.water.org.uk/wp-content/uploads/2020/07/BRAVA-planning-objectives-for-the-first-cycle-of-DWMPs.pdf>

Table 3: National Planning Objectives Summary

Ref	Planning Objective
PO-03	WwTW Compliance
PO-04	Internal sewer flooding
PO-05	Pollution incidents
PO-06	Sewer collapses

We have built upon the national planning objectives, and in some instances, expanded our asset performance assessments beyond the stated requirements, in order to understand our risk position against three key themes that reflect our strategic drive and ambition, shown below in Table 4. Through the refinement of the national planning objectives, we have introduced an increased level of granularity to improve our understanding of our asset performance and associated risk position to inform the development of our plan.

Table 4: Strategic ambition and bespoke Planning Objectives

We take care of your wastewater and protect you and the environment from sewer flooding	PO-07: Managing risk of internal property sewer flooding from hydraulic causes (1 in 30 year) PO-08: Managing risk of external flooding within the property curtilage from hydraulic causes (1 in 30 year)
We protect and improve the water environment	PO-09: Managing Storm Overflow Performance PO-10: Wastewater Treatment Works (WwTW) Flow Compliance PO-11: Wastewater Treatment Works (WwTW) Quality Compliance
A resilient future network*	PO-12: Managing risk of internal property sewer flooding from hydraulic causes PO-13: Managing risk of external flooding within the property curtilage from hydraulic causes

*this represents the Risk of 1:50 storm outlined in our Strategic Context document.

9.3 Baseline Risk and Vulnerability Assessment (BRAVA)

The 335 Level 3 catchments that progressed through the RBCS stage were then advanced to the BRAVA stage where they were assessed in greater detail against the Planning Objectives described in Section 9.2, both National and Bespoke. For these assessments we have undertaken extensive hydraulic modelling work and utilised existing performance data in combination with predictions of climate change, population growth, urban creep and changing water usage to understand our levels of risk in the baseline year of 2020, and how these are predicted to change as we progress to the future design horizons of 2030, 2050 and 2080.

Initially, we assessed the catchments against the six national Planning Objectives and results, utilising a 0, 1 and 2 scoring system, were published in 2020. For our bespoke Planning Objectives, we have combined the results of the BRAVA assessments in to four key Planning Themes, as shown in Table 5, and assigned scores against each of these themes using a 0-5 scoring system, providing increased granularity of results. The same hydraulic models and simulation results have been used in the National and Bespoke Planning Objectives in the majority of instances.

Table 5: Mapping of bespoke planning objectives to planning themes

Planning Theme	Bespoke Planning Objectives
Flood Risk	PO-07: Managing risk of internal property sewer flooding from hydraulic causes (1 in 30 year) PO-08: Managing risk of external flooding within the property curtilage from hydraulic causes (1 in 30 year)
Storm Overflow Performance	PO-09: Managing Storm Overflow Performance
WwTW Compliance	PO-10: Wastewater Treatment Works (WwTW) Flow Compliance PO-11: Wastewater Treatment Works (WwTW) Quality Compliance
Resilience	PO-12: Managing risk of internal property sewer flooding from hydraulic causes PO-13: Managing risk of external flooding within the property curtilage from hydraulic causes

Further detail on the assessments undertaken as part of this process are provided in Section 10.3 of our final DWMP Technical Summary document.

The individual results for each of the 335 Level 3 catchments are provided within the catchment summaries provided in Appendix C. These are also collated and summarised for each Level 2 within Appendix B.

Wider Resilience

In addition to the detailed BRAVA for each of the 335 Level 3 catchments that required it, we have also undertaken a wider assessment of critical resilience issues for all 617 Level 3 catchments in line with the DWMP framework. This assessment has focused on four main areas of risk or potential need:

- Fluvial and/or coastal flooding of WwTW and critical pumping stations
- Power outages
- Outages to remote communications (telemetry systems)
- Response recovery plans

Each Level 3 has been classified as either Low, Medium or High risk. The results of this assessment are provided in the Level 3 storyboards provided in Appendix C. We have a growing asset base and are continually taking steps to improve our resilience through installing appropriate measures on existing and new assets where required. We continue to review our preparedness and use learning from previous events to develop the plans we have in place to deal with outside events. We will continue to monitor our levels of risk and resilience through subsequent cycles of DWMP development.

9.4 Problem characterisation

In determining the next steps for each BRAVA catchment, a runway has been assigned within the Problem Characterisation stage. This considers both the calculated risk level for the bespoke BRAVA Planning Themes, an assessment of confidence in the results of the BRAVA that was undertaken and the timing of risk materialisation. The assessment was carried out separately for the network-based themes (flood risk and storm overflow performance), and the WwTW compliance theme. Each of the Level 3 BRAVA catchments were classified as; Monitor, Investigate or Promote based on the most significant of the network and treatment runway assignments in terms of level of intervention required (i.e. Promote greater than Investigate, which is in turn greater than Monitor). Monitor, Investigate and Promote are defined as follows:

- **Monitor** – Small catchment or lower risk. Future monitoring required.

- **Investigate** – Higher risk but with reduced confidence. Uncertainty in data should be reduced through investigation to confirm outcomes of risk assessment and if optioneering is required.
- **Promote** – Higher risk and sufficient confidence. Catchment should proceed through to option development and appraisal stage (ODA). Catchment level interventions to be developed and costed.

Table 6 summarises the overall outcome of Problem Characterisation:

Runway	Nr of Level 3 Catchments
Monitor	96
Investigate	65
Promote	174

The runway assigned to each of the 335 Level 3 catchments is provided within the catchment summaries provided in Appendix C. These are also collated and summarised for each Level 2 within Appendix B.

9.5 DWMP Scenarios

The previous stages of DWMP development have evaluated current and future risk within the catchments that triggered BRAVA against the national and bespoke planning objectives. The highest risk catchments have been identified and have been through preliminary screening to understand potential drivers within each catchment and will now progress through to Option Development and Appraisal (ODA).

The developed options will need to drive to a target level of service by 2050. It is likely that different levels of service will require different solutions which will in turn change the investment requirement and potential cost benefit assessment.

We initially developed four scenarios for our dDWMP to address the risks we have identified. This was explored through our consultation and our feedback had a clear preference for DWMP Scenario 2. DWMP scenario 2 has been expanded to allow us to meet the requirements of the Storm Overflow Discharge Reduction Plan (SODRP), as detailed below in Table 7.

Table 7: Scenario 2 summary

Element	Details	Timing
	Annual average of no more than 10 spills per storm overflow	
	Annual bathing season average of no more than 2 spills per storm overflow discharging to coastal bathing waters, to support achieving excellent bathing water classification	75% high priority sites achieved by 2035
Deliver the requirements of the Storm Overflow Discharge Reduction Plan	Annual bathing season average of no more than 1 spill per storm overflow discharging to inland bathing waters	100% bathing water sites achieved by 2035
	Installation of continuous water quality monitoring to assess any impact from storm overflows and wastewater treatment works discharge outlets	Monitoring installed by 2035
	Provision of screening at all storm overflows	Screens by 2050
	Ensure no local ecological harm from storm overflows	

Table 7: Scenario 2 summary

Element	Details	Timing
Reduce Modelled Hydraulic Flood Risk	Reduce model predicted risk of internal and external hydraulic sewer flooding of properties up to a 1 in 30 return period, compared to the 2050 position	By 2050
Maintain WwTW Compliance	Ensure all of our wastewater treatment works remain compliant with current environmental permits and any future changes to permits	100% in AMP8

9.6 Options development and appraisal

The main aims of the Option Development and Appraisal (ODA) process is to provide a framework that will enable us to develop robust and best value interventions to address the levels of risk associated with our planning themes, where these arise in the planning period.

It is important to note that the ODA undertaken for the DWMP provides only the first step in our Yorkshire Project Lifecycle. A common risk management hierarchy is utilised throughout all stages of the Project Lifecycle; this is the basis of the DWMP Risk Management Hierarchy shown in Figure 19 below.

Figure 19: Risk management hierarchy

DWMP Risk Management Hierarchy		
1	Monitor	Monitor performance.
2	Investigate	Gather additional data and/or information to improve understanding of risk and support development of cost beneficial interventions, if required.
3	Optimise (operate and invigorate)	Operate and maintain systems to maximise existing capacity and minimise risk. Domestic and business customer education.
4	Reduce or remove	The management and control of rainfall induced flows to reduce the quantity of flow within the wastewater system. Where appropriate schemes should be developed (and funded) in Partnership with stakeholders to develop mutually beneficial solutions.
		Generic customer side management options to manage the use of water in customer properties (domestic and trade).
		Measures to reduce the contaminant load within the wastewater system.
		Measures to reduce the receptor risk (where other options have been demonstrated to be non cost beneficial).
5	Enhance (fabricate)	Construct new assets using efficient construction approaches to manage flows and loads within the conveyance system or at wastewater treatment works to minimise impacts on customers and the environment.

Monitor and Investigate are assigned outcomes from the Problem Characterisation stage and are dependent on the catchment size, risk level and data confidence.

Optimise solutions are not considered within the developed costed plan for this cycle of our DWMP. This is due to the current level of uncertainty regarding where best to deploy emerging technologies and what level of performance enhancement they would deliver.

Within our dDWMP a Level 3 approach was taken, and options were developed for both Reduce and Enhance approaches for Promote catchments only. For our final DWMP we have refined our approach to undertake optioneering at a Level 4. Our developed plan costs include full regional coverage for storm overflows, in order to comply with requirements of the SODRP. Additionally, flood risk mitigation has been assessed for all BRAVA Level 3s.

For each identified risk we have considered two potential approaches in order to achieve our scenario targets by 2050: These are outlined below:

- **Reduce + Enhance:** Adopt blue/green solutions to manage and reduce the amount of rainfall entering our network to reduce our levels of risk (e.g., through the use of nature-based solutions or Sustainable Drainage Systems (SuDS) which look to manage flow in a cost-effective way whilst benefitting the environment and surrounding communities), then utilise traditional grey solutions to meet the scenario target if necessary.
- **Enhance:** Increase the capacity of our network through traditional 'grey' solutions, i.e., building bigger pipes, storage tanks and upgrading our existing assets.

These are coupled with solutions to address WwTW compliance risk, primarily focussed on wastewater treatment works modification.

Further detail on the approaches taken to developing and costing these options is provided in Section 10.7 of our DWMP Technical Summary document.

10. Programme optimisation and appraisal

Following generation of the modelled and costed options referred to above, the following steps were undertaken in order to generate a plan:

- Determine which solution form to be selected: Reduce + Enhance or Enhance only
- Determine how the solutions should be phased throughout the planning period.

These decisions were applied in different ways to create three different plans:

- Core Plan
- Preferred Plan
- Least Cost Plan

These are summarised below in Table 8.

Table 8: Plan Summary

Plan	Delivery Ambition
Core	Delivers regulatory requirements (SODRP, WINEP) Delivers the company blue-green ambition for SODRP
Preferred	Delivers regulatory requirements (SODRP, WINEP) Delivers flooding ambition Delivers the company blue-green ambition for SODRP
Least Cost	Delivers regulatory requirements (SODRP, WINEP) Delivers least cost interventions

For the storm overflow programme, the core plan and the preferred plan are the same in terms of timing of delivery and method of delivery.

It was not possible to generate a true 'best value plan' by following a 'free optimisation' approach – this is because the requirements of the SODRP and the WINEP require delivery of prescribed interventions to defined timescales. In order to meet the requirements of the SODRP, meet stakeholder expectations around the deployment of blue-green infrastructure and deliver interventions to WINEP prescribed dates we have developed a preferred plan.

We have used our Decision-Making Framework (DMF)¹⁷ to assess the costs and benefits associated with delivering our solutions and which of the approaches we have used. YW utilises the Six Capitals approach in investment decision making and this is incorporated into the Decision-Making Framework (DMF). The Six Capitals as applied in YW are outlined in Figure 20 below:

Figure 20: Our Six Capitals



By using the Six Capitals approach, we are able to examine our impacts and dependencies on Six Capitals to better understand how we create or destroy value with what we do or don't do. As an extension of this, we are also able to see a monetary value of impacts where practicable. The Six Capitals approach to investment decision making was applied to the DWMP options.

11. Level 1 and 2 output summaries

We have selected our preferred plan as our main pathway to deliver the DWMP24. This is based on the consultation feedback, as discussed in Section 4, which showed a preference for delivering the SODRP and to reduce flooding risk to our customers. It also now incorporates all the regulatory targets we must achieve via WINEP.

Our core plan serves to offer a low or no regrets approach to delivery of the regulatory targets and incorporates our company ambition to move away from traditional grey storage solutions to more blue-green and partnership lead solutions over time. The first five years of our long-term plan is largely interventions that are required to meet statutory requirements as such is deemed to be a low or no regrets approach.

We have included a least cost plan and determined our constrained preferred plan as "best value" as due to the optimisation, constraints of the SODRP and the application of the company ambition to the plan it has not been possible to produce a 'freely optimised' best value plan.

Our short-term plan is aimed at delivering the PR24 business plan and incorporates accelerated schemes, SODRP WINEP and WINEP. All sites are modelled and have a high quality of data driving the solutions, resulting in high levels of certainty in the AMP8 period.

This is the same for AMP9 although the results of the WQ monitoring and the AMP8 EnvAct_INV4 outcomes will provide further detail to allow for our medium-term plan to be updated and amended as required for cycle 2.

¹⁷<https://www.youtube.com/watch?v=iZ6CixsmPSA>

Our long-term plan from AMPs 10–12 contains decreasing levels of certainty over the solution detail due to lesser confidence models, the requirement for more detailed investigations and the need to review the water quality and ongoing EnvAct_INV4 investigations. These AMPs will see the most change in terms of costs as a result of updated data and information and experience gained in delivery of the earlier years of the plan.

With each five-year cycle of the DWMP, WINEP and periodic review business planning we will see updated and latest information regarding climate change and growth rates and an assessment will be made of how this will impact the solutions required as we move towards 2050 and beyond.

The below tables seek to demonstrate the overall plan costs and benefits and potential bill impacts to our customers. This is then further presented as our short-, medium- and long-term plans, further detail is provided in Table 9.

This information has been produced in our data tables which accompany this document. This information will also be reflected in our LTDS tables which will be submitted with our PR24 documentation in October 2023.

Monitoring of DWMP delivery will be critical and we intend to be transparent in our delivery progress. In the early years of the plan, the requirements are largely statutory outcomes associated with the SODRP and WINEP. Progress towards these outcomes will be monitored annually and reported to our regulators.

Table 9: Level 1 Plan Capital Costs – CAPEX (price base 2020–21)

	Short-Term by 2030	Medium-Term by 2035	Long Term by 2050	Total
Preferred Plan	£1.47b	£4.32b	£36.71b	£42.49b
Core Plan	£1.39b	£4.06b	£11.41b	£16.87b
Least Cost Plan	£1.31b	£2.21b	£6.62b	£10.14b

Figure 21: Preferred Plan Costs and Benefits

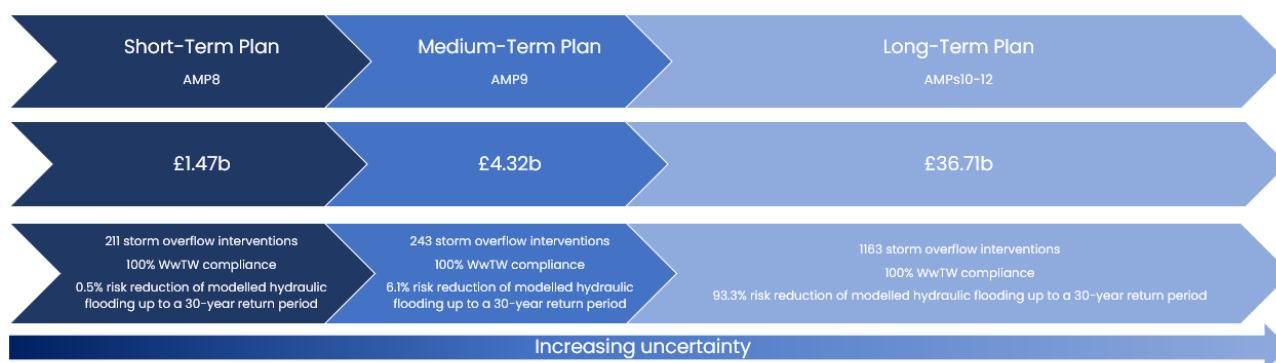


Figure 22: Core Plan Costs and Benefits

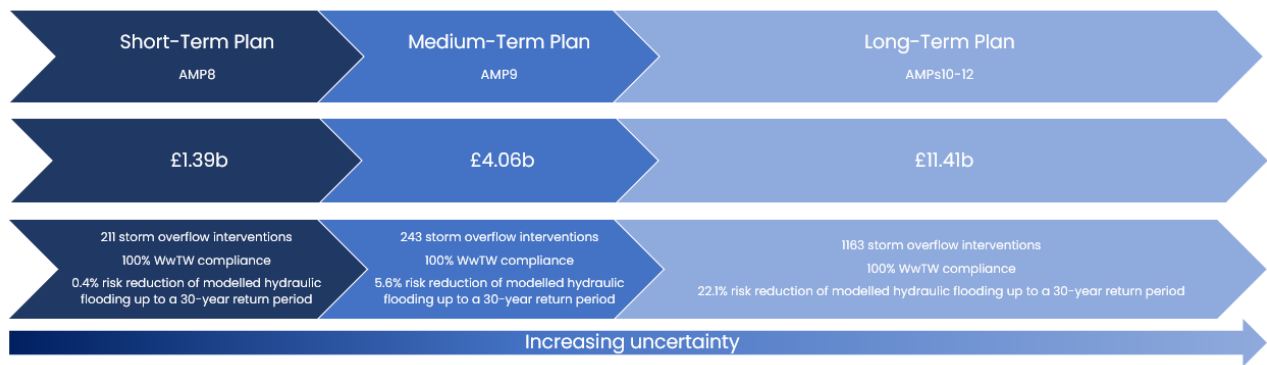
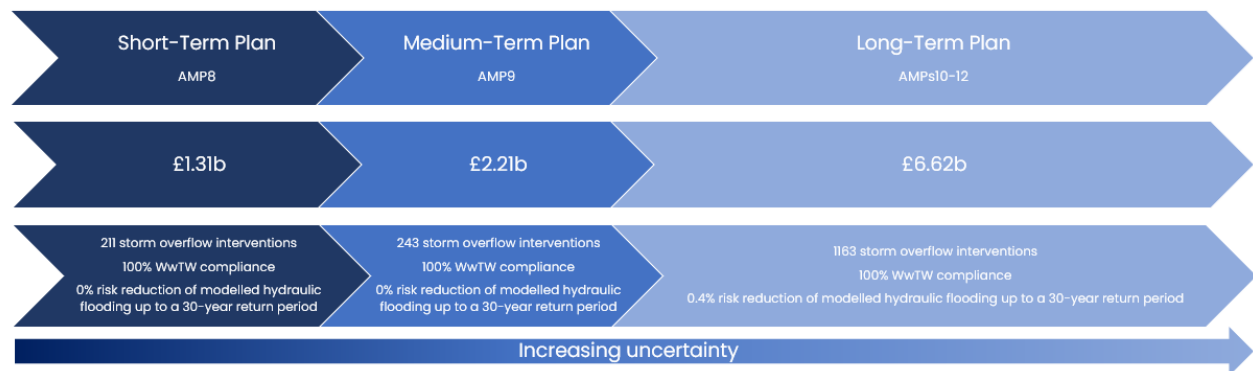


Figure 23: Least Cost Plan Costs and Benefits



The associated bill impacts of our DWMP plans, by AMP, are shown below in Table 10.

In setting out our plans for the future, we recognise the huge part we have to play in supporting a thriving Yorkshire. We talk to our customers every day and understand our customer and stakeholder priorities. For us to meet these priorities and the broader statutory requirements, we have prepared a challenging long-term plan, where uncertainty increases in future years. We have considered the impact that these plans will have on the average water bill each year in Yorkshire for whole planning period.

Table 10 : Bill Impacts by AMP (taxable)

Plan	AMP8	AMP9	AMP10	AMP11	AMP12
Preferred Plan	£28.20	£108.02	£225.86	£345.56	£671.15
Core Plan	£27.22	£102.98	£215.23	£274.67	£316.27
Least Cost Plan	£26.09	£78.98	£144.34	£174.23	£195.63

Below in Figure 24 to Figure 40 are the preferred plan costs and benefits for each of our Level 2 SPAs. The costs do not include any investigations, monitoring or EnvAct_IMPI costs as these have been applied at Level 1 only, as these relate to regional investment or span multiple Level 2s.

Figure 24: Level 2 Calder Preferred Plan Costs and Benefits

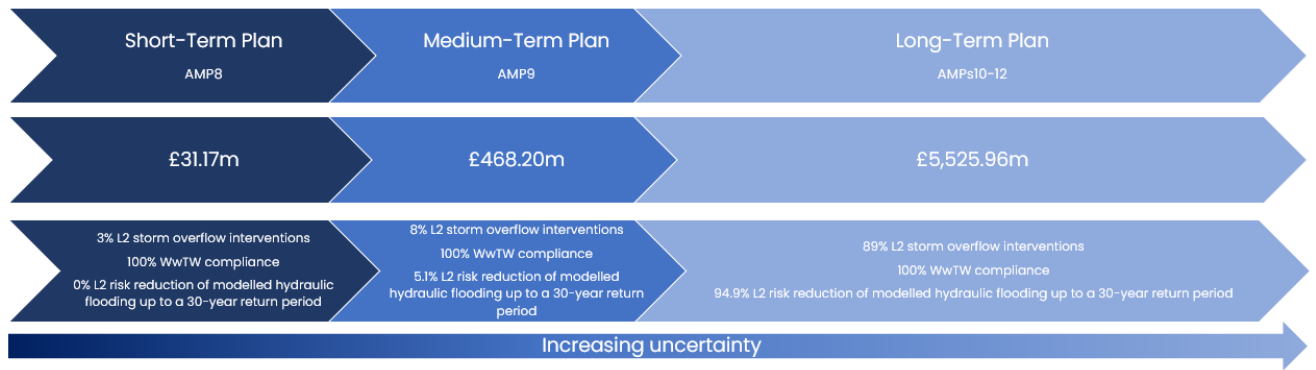


Figure 25: Level 2 Colne and Holme Valley Preferred Plan Costs and Benefits

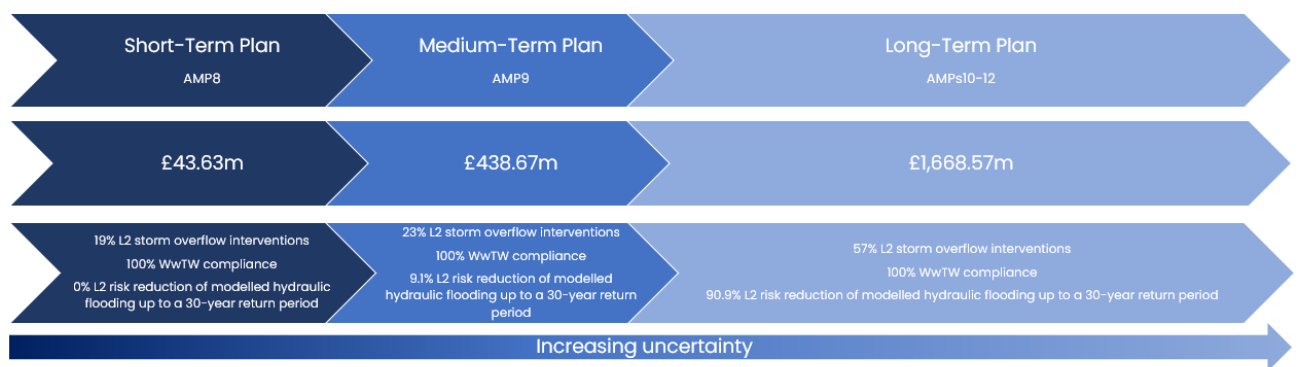


Figure 26: Level 2 Dearne Preferred Plan Costs and Benefits

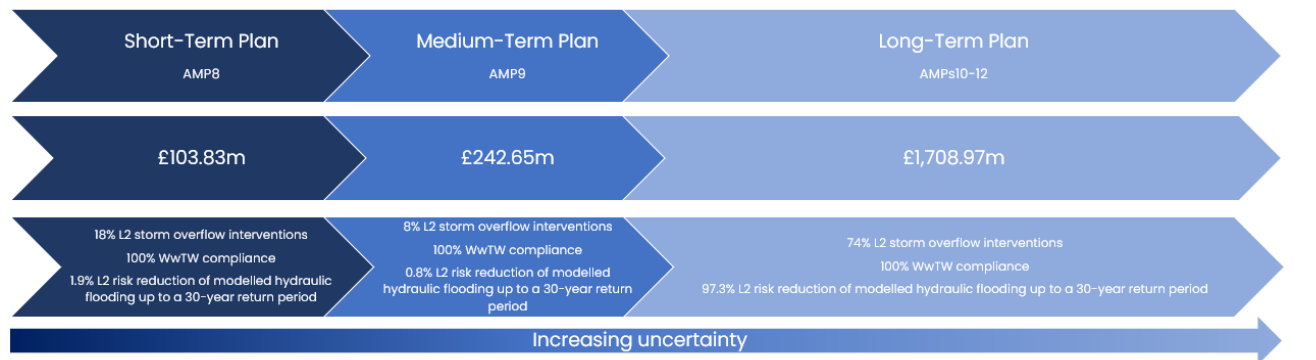


Figure 27: Level 2 Derwent and Rye Preferred Plan Costs and Benefits

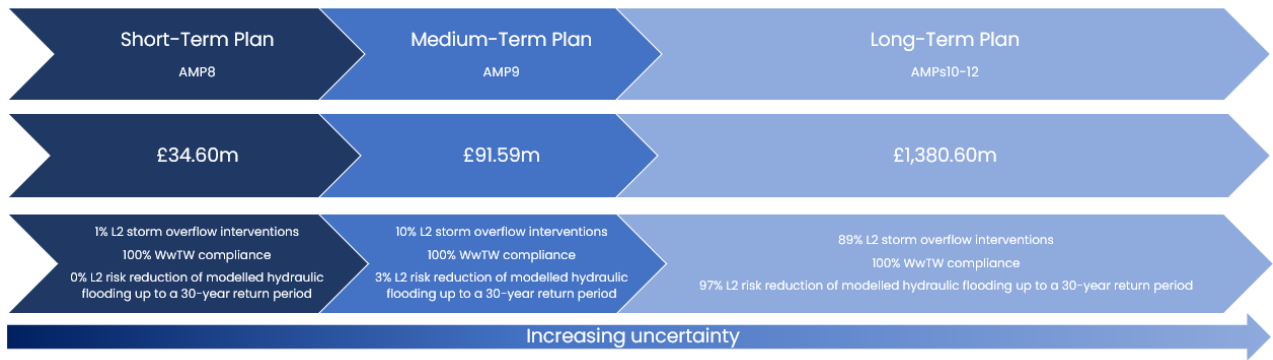


Figure 28: Level 2 Esk & Coast Preferred Plan Costs and Benefits

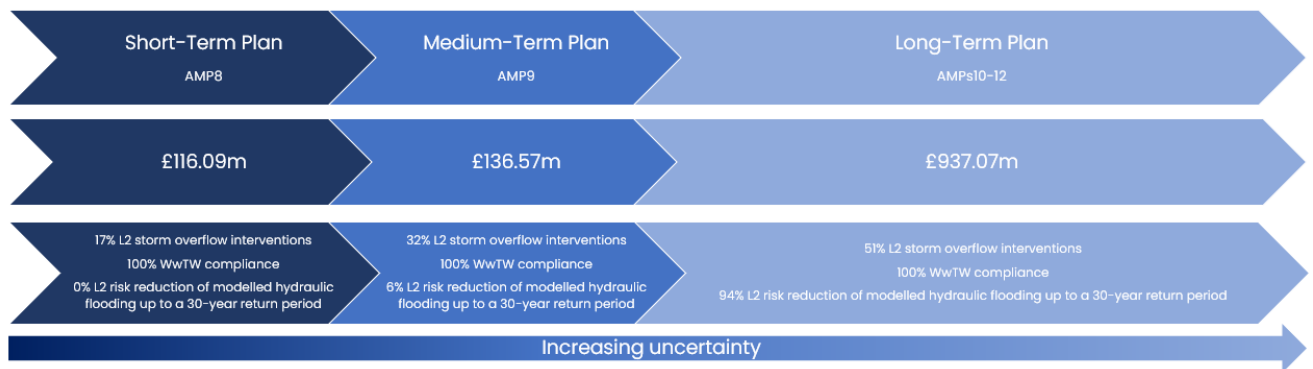


Figure 29: Level 2 Holderness Coast (Gypsy Race) Preferred Plan Costs and Benefits

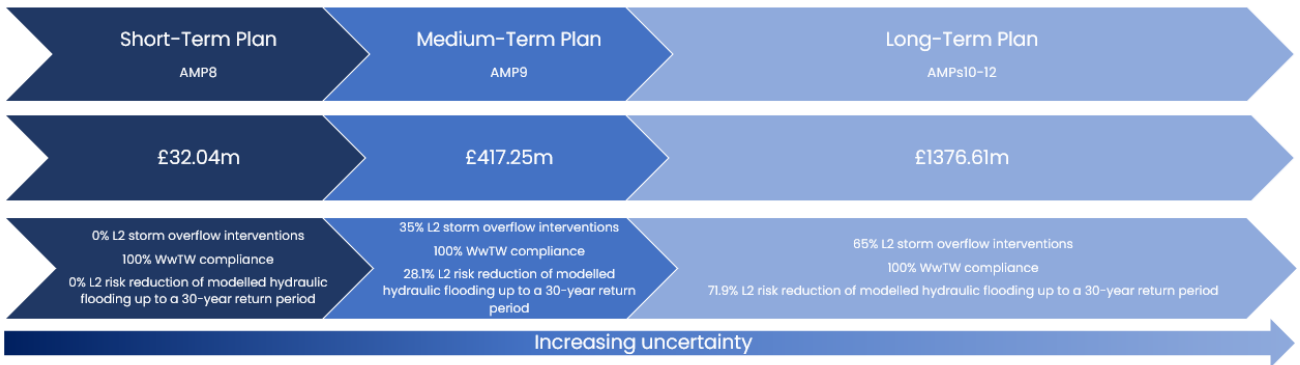


Figure 30: Level 2 Hull Preferred Plan Costs and Benefits

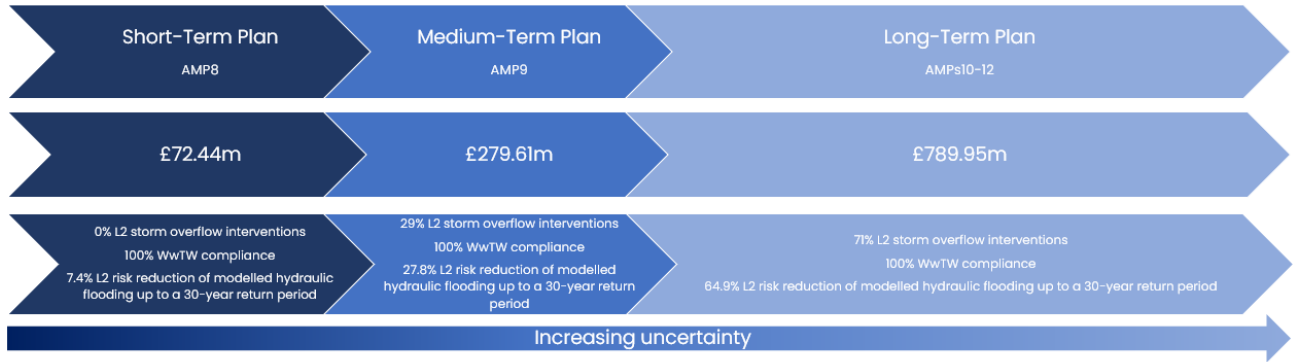


Figure 31: Level 2 Leeds Preferred Plan Costs and Benefits

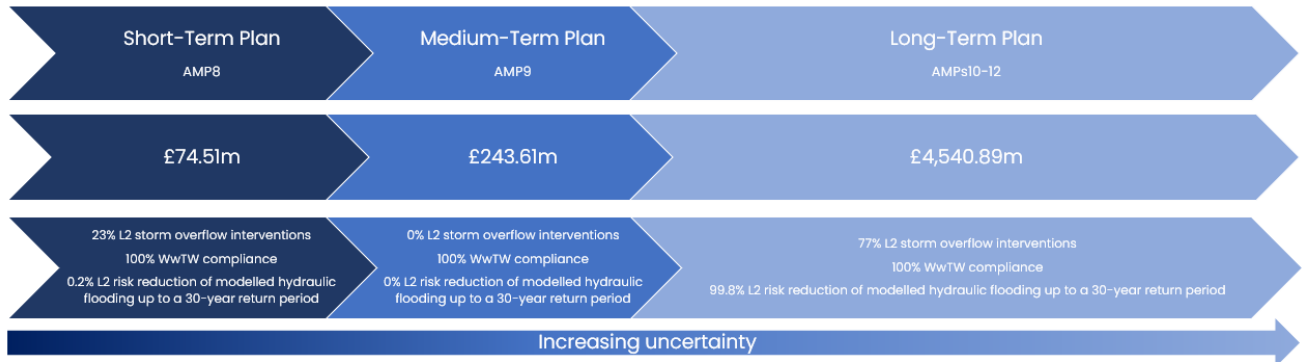


Figure 32: Level 2 Lower Aire Preferred Plan Costs and Benefits

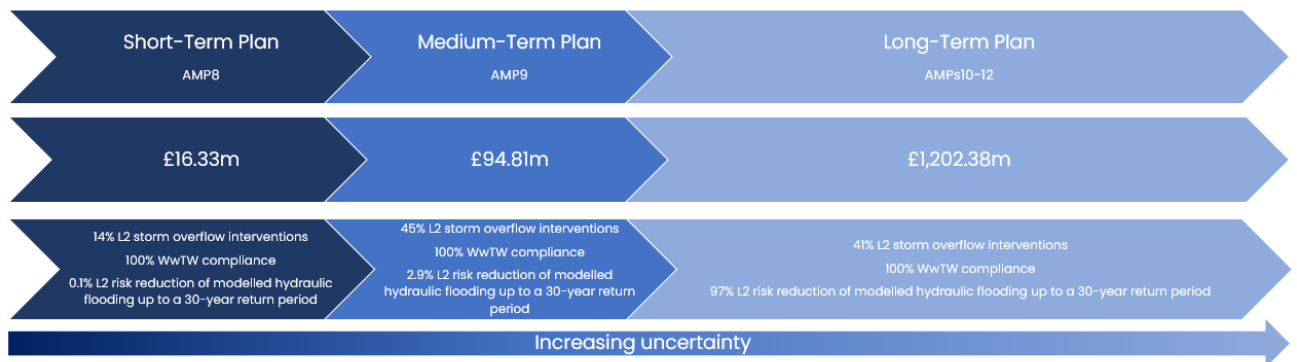


Figure 33: Level 2 Lower Dales Preferred Plan Costs and Benefits

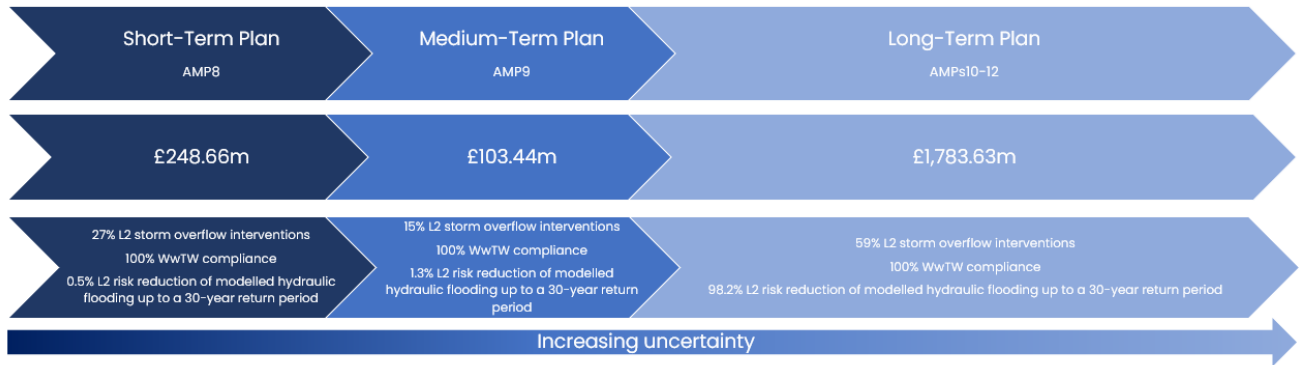


Figure 34: Level 2 Lower Don Preferred Plan Costs and Benefits

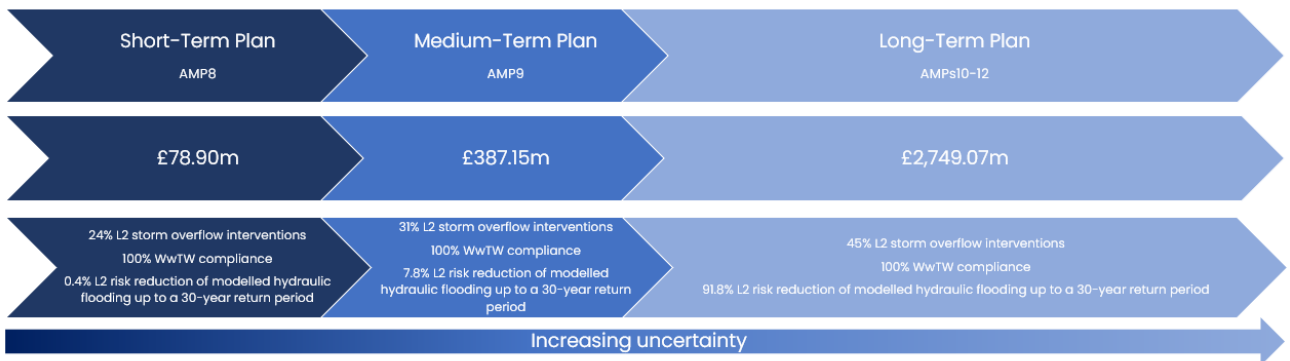


Figure 35: Level 2 Lower Ouse Preferred Plan Costs and Benefits

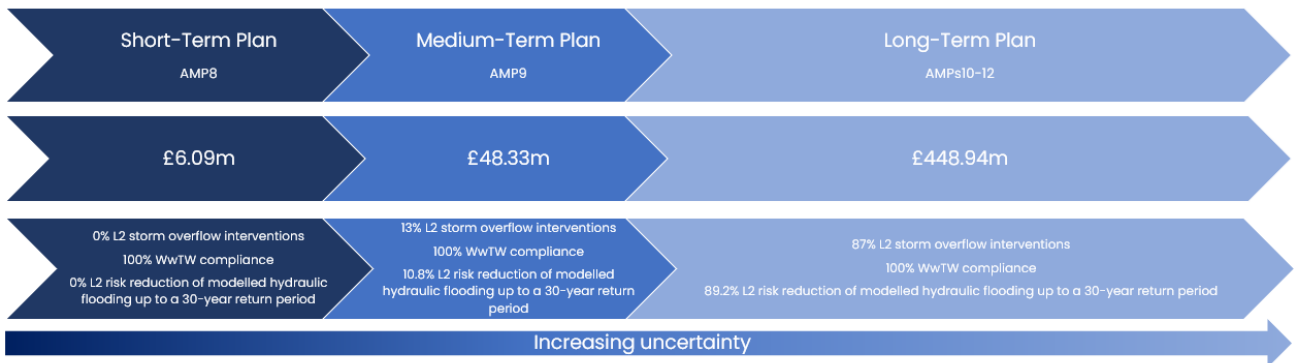


Figure 36: Level 2 Rother and Doe Lea Preferred Plan Costs and Benefits

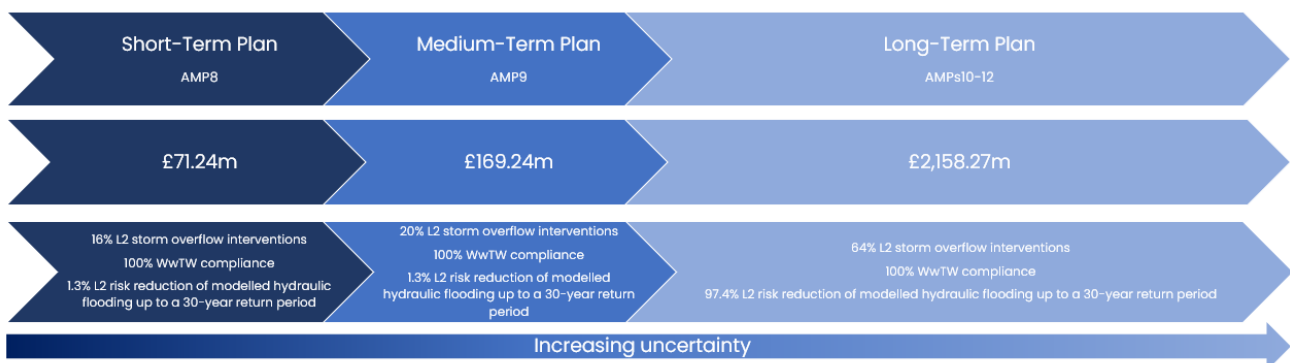


Figure 37: Level 2 Sheffield Preferred Plan Costs and Benefits

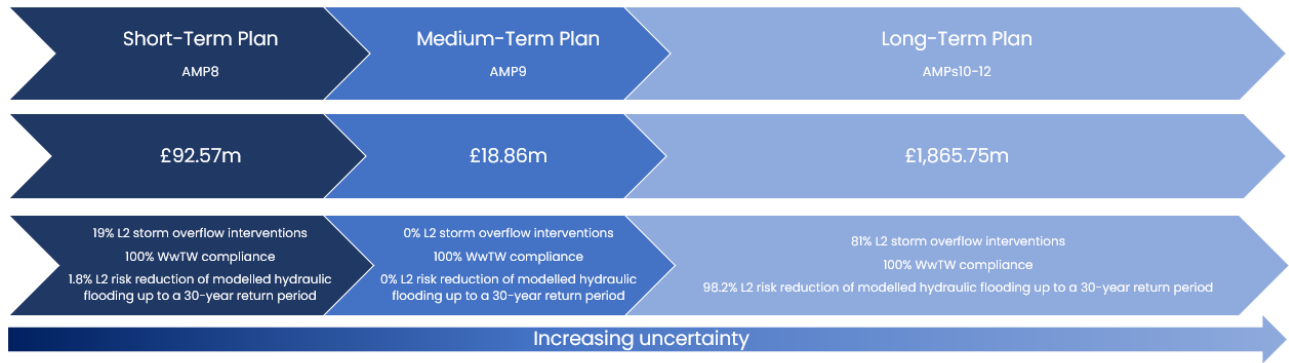


Figure 38: Level 2 Upper Aire Preferred Plan Costs and Benefits

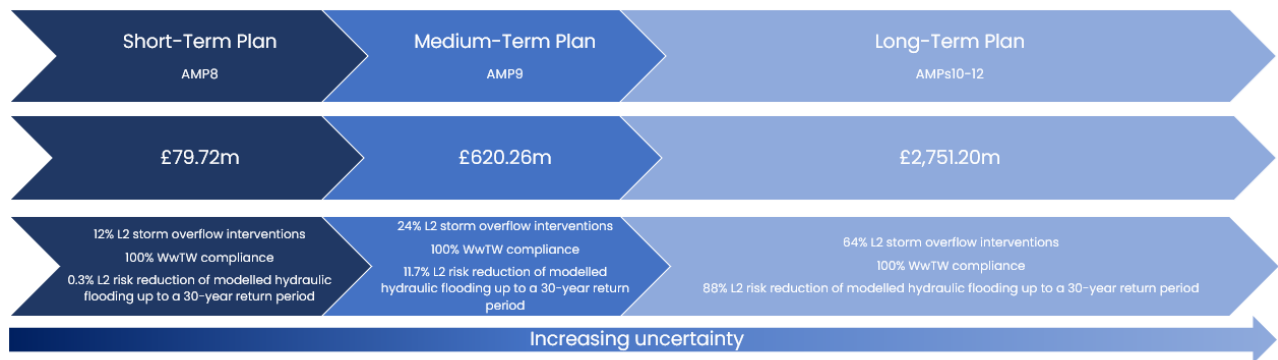


Figure 39: Level 2 Upper Dales Preferred Plan Costs and Benefits

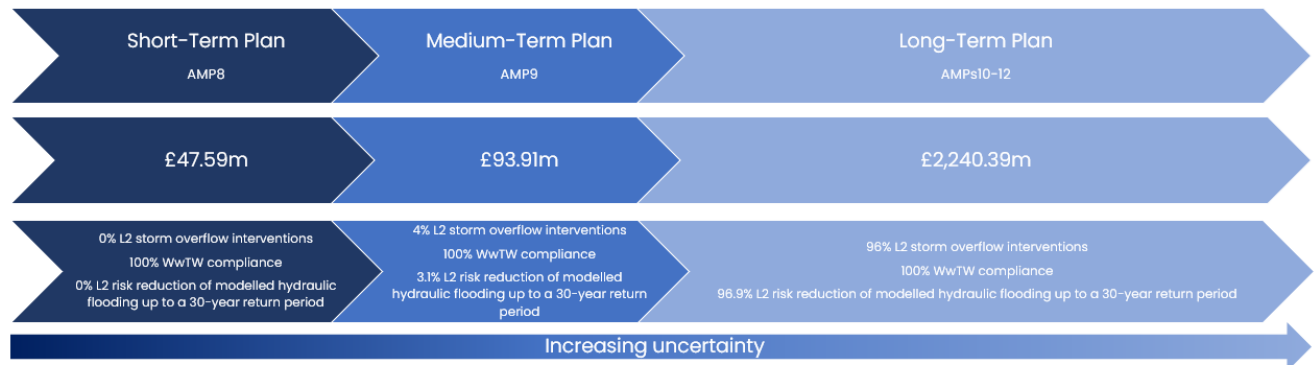
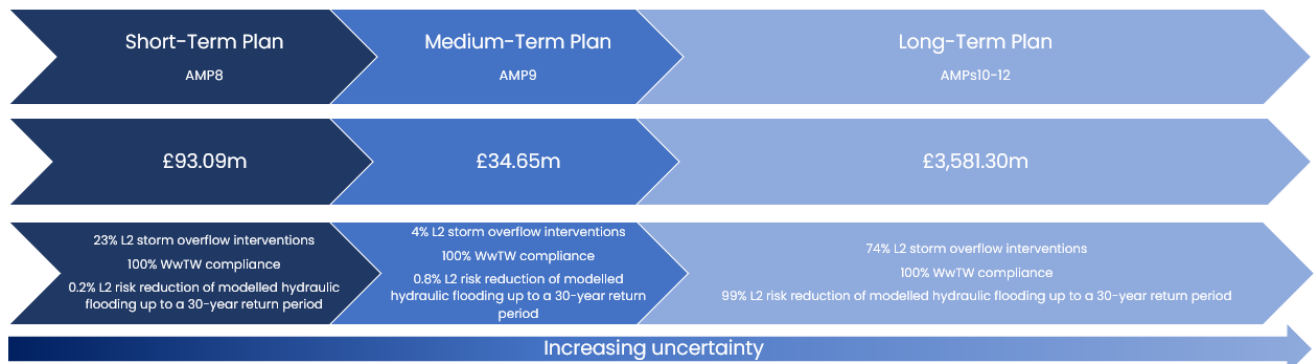


Figure 40: Level 2 York Preferred Plan Costs and Benefits



12. Data Tables

Ofwat have issued a set of data tables to accompany the final DWMP24. The data tables for the final DWMP were issued in December 2022, with the requirement that these are submitted and published with the final DWMP24 by 31 May 2023. The tables utilise data that is synonymous with many elements of the broader wastewater PR24 business plan and have links to the Long-Term Delivery Strategy tables with reference to adaptive planning and pathways linked to the common reference scenarios. If changes occur between submission of the DWMP in May 2023 and the PR24 Business Plan in October 2023 that impact the data in the DWMP tables, then the DWMP tables must be amended and resubmitted with the PR24 Business Plan. We have published our data tables and accompanying commentary document.

These are available at:

<https://www.yorkshirewater.com/about-us/drainage-and-wastewater-management-plan>

13. Next steps

Following final publication of the DWMP24 and its associated data tables, we will continue to work with our PR24 team to incorporate the needs of the DWMP into our business plan and also reflect our longer-term plans in the associated LTDS tables. This will set out in detail how we will manage all aspects of our wastewater service. It will contain a detailed view of how we plan to deliver the first five years of the long-term 25-year ambition set out within our DWMP.

Through our established partnerships we will continue to work with others to collaboratively develop and deliver solutions and will proactively identify opportunities for new partnerships. This will help to lay the foundations for future collaborative working and successes for our customers and the environment. Through continued engagement with our customers and stakeholders we will ensure that we deliver the best value solutions to customers and the environment.

We will commence work on the next cycle of DWMP development in Summer 2023 working with Defra and other regulators and a cross water industry task and finish group. This will incorporate learnings taken from cycle 1 and any changes required for cycle 2 to ensure there is clarity on scope, outputs and remit of the DWMP29. Cycle 2 will allow us to make use of newly available datasets, including climate change and growth projections and ensure we can incorporate learning and feedback from the completion of our first DWMP through our audit feedback and internal review.

We have identified the potential levels of investment required in the medium and long-term to reduce our risks and achieve our long-term targets. Through subsequent cycles of our DWMP, we will adapt it based on the outcomes of investigations, installations of WQ monitors and live EDM data, alongside innovation pilots and improvements in technology. Alongside this, continued monitoring of solution impacts, emerging risks and increased monitoring and certainty about the impacts of climate change and population growth will make our future DWMPs robust. We will also consider new and emerging technologies and innovation that offer opportunities to provide best value.

Appendices

14. Appendix A

14.1 Acronyms & Abbreviations

Term	Description
AMP	Asset Management Plan or Period – Is the term given to the five-year or regulatory period covered by a water company’s business plan. AMP1 refers to the first planning period after the water industry was privatised, this covers the period 1990 to 1995. AMP7, covers the period 2020 to 2025. AMP8 covers the period 2025 to 2030.
AMR	Antimicrobial Resistance
APM	Association of Project Management
AONB	Area of Outstanding Natural Beauty – is an area of countryside that has been designated for conservation due to its significant landscape value.
APR	Annual Reporting Review – Yearly process of reviewing Water Company performance against targets agreed with Ofwat.
ASP	Activated Sludge Plant
BAG	Biodiversity Action Group
BAU	Business as Usual activity
Bath Ice v2	Bath University – Inventory of Carbon Emissions
BGI	Blue-Green Infrastructure – Natural and semi-natural assets which aid in surface water management whilst also providing wider environmental benefits.
BNG	Biodiversity Net Gain
BofQ	Bill of Quantities
BRAVA	Baseline Risk and Vulnerability Assessment – An assessment of the baseline position of performance and risk across the sewerage system and understanding of wider resilience issues.
BVP	Best Value Plan
CaBA	Catchment Based Approach – An initiative which aims to work in partnership with Government, Local Authorities, water companies, environmental NGOs and businesses to maximise the natural value of the environment.
CAF	Capacity Assessment Framework – An initiative to develop a standard way to assess how much capacity is available in drainage systems now and what may be available in the future.

Term	Description
Catchment	In natural terms, an area with several water bodies such as rivers, lakes, and streams. In sewerage terms, an area which is drained by a series of interconnecting sewers and assets. Also referred to as a Level 3 WwTW Catchment or Tactical Planning Unit.
CAPEX	Capital Expenditure – Is expenditure to acquire or upgrade physical assets such as property, pipes and treatment works.
CCW	Consumer Council for Water – An executive non-departmental public body which represents the interests of water and sewerage consumers in England and Wales and takes up unresolved complaints.
CDM	Construction (Design and Management) Regulations
Coastal Bathing Water	A designated coastal bathing site
Combined System	A sewerage system consisting of both rainwater and used wastewater from sinks, baths, and toilets.
CSO	Storm Overflows on the sewer network are also known as Combined Sewer Overflows.
DAP	Drainage Area Plan – A single, or series of, hydraulic modelling studies which are developed to explore and understand the performance of the sewerage network.
DAVE	Design and Value Engineering Toll – relates to WwTW
DAZ	Drainage Area Zone – The area drained by a network of sewers and associated assets.
DEFRA	Department for Environment, Food and Rural Affairs.
Descriptive WwTW	A small wastewater treatment site without a numerical discharge consent
Detention Tank	A structure that is designed to store excess wastewater and/or surface for a period of time.
DMF	Decision Making Framework – An innovative set of processes and tools, aimed at making the most efficient expenditure decisions to ensure excellent service and benefit to customers.
DIG	Doncaster, Immingham and Grimsby
DST	Decision Support Tool – A system or process which aids in optimising decision making by quantifying risk and value to optimise investment.
DWF	Dry Weather Flow – The average daily flow to a wastewater treatment works (WwTW) during a period without rain.
DWMP	Drainage and Wastewater Management Plan – A new way for organisations to work together to improve drainage and environmental water quality.
DWMP Hub	Our online Drainage & Wastewater Management Plan stakeholder portal.

Term	Description
EA	EA- A non-departmental public body tasked by the UK government with protecting and enhancing the natural environment. The EA are the environmental regulators responsible for rivers, flooding and pollution.
EDA	Enterprise Decision Analytics - Our programme optimisation tool which supports the decision making process.
EDM	Event Duration Monitoring – monitoring of storm overflows, including whether or not a spill event is happening and how long it lasts.
EPA	Environmental Performance Assessment - Was introduced by the EA(EA) in 2011 as a non statutory tool for comparing performance between water and sewerage companies (WaSCs).
ESF	External Sewer Flooding – Flooding to property curtilage or land such as gardens due to hydraulic incapacity of sewers.
FAS	Flood Alleviation Scheme
FCERM	Flood and Coastal Erosion Risk Management – EA managed programme of investment to mitigate risk due to flood and coastal erosion. Current plan runs from 2021 – 2027.
FDGiA	Flood Defence Grant in Aid
FEH13 rainfall	Flood Estimation Handbook 2013 – Provides catchment level descriptors and rainfall estimation procedures. Used in modelling the impact of rainfall events.
FFT	Flow to Full Treatment
Flood Cluster	Areas of hydraulic flood risk grouped based on proximity.
FOG	Fats, oils and greases
Foul System	A sewerage system consisting of waste from sinks, baths, and toilets.
FRMP	Flood Risk Management Plan – Explains the risk of flooding from; rivers, the sea; surface water; ground water and reservoirs within a River Basin District. Current plan runs from 2021 – 2027. Reviewed by the EA and Lead Local Flood Authority.
FUTURE-DRAINAGE	A Newcastle University led consortium involving the Met Office, JBA Consulting and Loughborough University, funded by the NERC (UKRI) UK Climate Resilience Programme. It has used the new UKCP high resolution 2.2km data (UKCP Local) to derive more robust rainfall uplift estimates for the high greenhouse gas emissions scenario RCP8.5.
FWMA	Flood and Water Management Act 2010 - UK Act of Parliament relating to the management of the risk concerning flooding and coastal erosion. The Act aims to reduce the flood risk associated with extreme weather, compounded by climate change.
GIS	Geographical Information System - A system to capture, store and analyse spatial data.

Term	Description
Grey Infrastructure	Traditional methods of wastewater management such as concrete detention tanks.
GWDE	Groundwater Dependant Terrestrial Ecosystem
HE	Historic England – Non-departmental public body tasked with protecting the historic environment of England.
HH	Customer household/property
HRA	Habitats Regulations Assessment – Several distinct stages of assessment which must be undertaken in accordance with regulation to determine if a plan or project may affect the protected features of a habitat site.
I&I	Inflow & Infiltration – Terms used to describe two of the ways surface water enters the foul sewer network. Inflow is where surface water enters the system from above ground sources whilst Infiltration is groundwater which seeps into sewers through cracks in pipes.
iCASP	Yorkshire Integrated Catchment Solutions Programme – An academic body which uses research to benefit the environment, economy, and society of Yorkshire.
iWharfe	Multi-agency and community project to understand, monitor and enhance river water quality on the river Wharfe
IDB	Internal Drainage Board
Inland Bathing Site	A designated inland riverine bathing site
ISF	Internal Sewer Flooding – Flooding to the inside of a property’s habitable area, either via direct connections to the sewers, such as toilets or by water seeping through doorways.
LBV	Lea Brook Valley Charity
Level 1 Company Plan	The YW region
Level 2 Strategic Planning Area	Aggregation of Level 3 catchments to form the overarching Level 1 strategic plan for the company. Aligned to River Basin Districts and political boundaries.
Level 3 WwTW Catchment	A wastewater catchment including all connected properties which drain to a specific WwTW.
Level 4	The spatial extent of the upstream catchment draining to an individual storm overflow.
LLFA	Lead Local Flood Authority – County councils and unitary authorities, LLFAs lead in managing local flood risks from surface water, ground water and smaller watercourses.
Local Plan	Population, property and occupancy forecasts derived from local plans published by the local council or unitary authority.

Term	Description
LPA	Lead Planning Authority – Usually the planning department of the district or borough council whose duty it is to carry out specific planning functions for a particular area.
LTDS	Long Term Delivery Strategy – tables provided by Ofwat as part of the price review process reviewing predicted enhancement expenditure to 2050.
LNRS	Local Nature Recovery Strategies
LWW	Living With Water – A partnership between YW, Hull City Council, East Riding of Yorkshire Council, the EA and the University of Hull working together to build flood resilience within the region.
MABR	Membrane Aerated Biofilm Reactor
M&E	Maintenance and Electrical
MasterMap	A map dataset of Great Britain's landscape provided by the Ordnance Survey.
MCZ	Marine Conservation Zone – is a type of marine nature reserve in UK waters. They are areas designated with the aim to protect nationally important, rare or threatened habitats and species.
MTP	Medium Term Plan of investment arising from the FCERM programme.
NBS	Nature-based solutions – Solutions which aid in surface water management whilst also providing wider environmental benefits.
NCA	National Character Areas – is a natural subdivision of England based on a combination of landscape, biodiversity, geodiversity and economic activity.
NCERM	National Coastal Erosion Risk Mapping produced by the EA.
NE	Natural England – A non-departmental public body responsible for ensuring that England's natural environment is improved and protected.
NFM	Natural Flood Management
NFU	National Farmers Union – Is a member organisation/industry association for farmers in England and Wales.
NGO	Non-Governmental Organisation – a non-profit organisation, typically with social or environmental aims.
NHH	Non-Household customer – business customers and premises
NNR	National Nature Reserves – in England are designated by Natural England as key places for wildlife and natural features in England. They were established to protect the most significant areas of habitat and of geological formations.
NPV	Net Present Value

Term	Description
Numerical Consented WwTW	A wastewater treatment works with a numerical discharge consent
NWEBS	National Water Environmental Benefit Survey
NYAA	Normal Year Annual Average
OAR	Options Assessment Report
ODR	Options Development Report
ODA	Options Development and Appraisal – A stage of the DWMP process which should enable companies to develop a series of robust "best value" interventions to identified risks across the sewerage network.
Ofwat	Water Services Regulation Authority or Office of Water Services – The economic regulator of water services in England and Wales.
OPEX	Operational Expenditure – The day-to-day spending on running of services such as staff costs and energy bills.
ONS	Office for National Statistics. Producers of population, property and occupancy forecasts.
P4Y	Partnerships for Yorkshire
PA	Programme Appraisal
PAS2080:2016	Global standard for managing infrastructure carbon 2016 version
PCC	Per Capita Consumption – A measure of how much clean water consumed by a person in a day.
PE	Population Equivalent – A measure of the amount of oxygen-demanding materials discharged by one person each day.
PLR	Property Level Resilience
PFAS	Perfluoroalkyl and Polyfluoroalkyl Substances
PIMP	Percentage Impermeability
POT	Peak over Threshold a recognised approach to model extreme values
PRIP	Pollution Reduction Improvement Plan
PR24	Price Review 2024 – The Ofwat periodic review of price limits to be in 2024 to set prices for the regulatory period 2025–2030.
Q90	The nonparametric 10-percentile value of a time series of measured total daily volume arriving at a WwTW throughout a year. The 10-percentile figure is that value exceeded by 90% of the recorded daily values. It's also known as the Q90.

Term	Description
RAMSAR	The Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitat, is an international treaty for the conservation and sustainable use of wetlands. It is also known as the Convention on Wetlands.
RBCS	Risk Based Catchment Screening – Stage within the DWMP where catchments are screened based on risks.
RBD	River Basin District – Defined by the EA and covers an entire river system, including river, lake, groundwater, estuarine and coastal water bodies.
RBMP	River Basin Management Plan – A process for setting out how organisations, stakeholders and communities will work together to improve the water environment. Current plan runs from 2021 – 2027. Reviewed by the EA in England.
RCP	Representative Concentration Pathway – Utilised within UKCPI8 to represent a range of climate outcomes.
RCV	Regulatory Capital Value
RFCC	Regional Flood and Coastal Committee
Rising Main	A type of sewer where wastewater is pumped to another part of the sewerage system
RMA	Risk Management Authority – These are designated under the Flood and Water Act, 2010 as organisations which carry out flood and coastal erosion risk management activities. Water companies are designated RMAs for the purposes of managing flooding from sewers and reservoirs.
RNAG	Reasons for Not Achieving Good – ecological status relating to rivers
ROCC	Regional Operational Control Centre
RoFSW	Risk of Flooding from Surface Water
RTS	Regional Telemetry System – remote viability and alarm system for assets
S24	Section 24 – A drain which serves more than one property which was in existence pre 1 January 1937 and is the responsibility of the Sewage Undertaker.
SAAR	Standardised Annual Average Rainfall – Rainfall averages for the UK over a given period.
SAB	Sustainable Drainage Approving Body
SAC	Special Area of Conservation – Protects one or more special habitats and/or species listed in the Habitats Directive.
SAGIS	Source Apportionment GIS – A discrete ArcGIS-based digital information management and visualisation platform which serves an integrated system for modelling water quality in rivers and lakes.

Term	Description
SCADA	Supervisory Control and Data Acquisition – remote visibility, control and alarm management system for assets.
Schedule 3	Part of the Flood and Water Management Act 2010 – links to sustainable drainage systems for new developments
SEA	Strategic Environmental Assessment – A systematic decision support process, aiming to ensure that environmental aspects are considered appropriately in planning.
Sewer	A conduit designed to transport wastewater or surface water.
Sewerage	A system by which wastewater or surface water is transported.
SgZ	Safeguard Zone
Six Capitals	Financial Capital – Our financial health and efficiency Human Capital – Our workforce’s capabilities and wellbeing Manufactured Capital – Our pipes, treatment works, offices and IT Intellectual Capital – Our knowledge and processes Natural Capital – The materials and services we rely on from the environment, especially water Social Capital – Our relationships and customers trust in us
SMF	Service Measure and valuation Framework – A process designed to identify the reasons for investment and value of carrying out such investment.
SOAF	Storm Overflow Assessment Framework – An assessment intended to address the problems caused by discharges from storm overflows which are considered to be operating at too high a frequency.
SPA	Special Protection Area (SPA) – This is land classified under Directive 79/409 on the Conservation of Wild Birds. SPAs are strictly protected sites.
SPZ	Source Protection Zone
SOEP	Storm Overflow Evidence Project – An independent research project that considers options, costs, and benefits for reducing storm sewage discharges in England.
SODRP	Storm Overflow Discharge Reduction Plan
SPA	Strategic Planning Area – A region designated for reporting purposes which contains several WwTW catchments.
SPF	Strategic Planning Framework – These frameworks set a long-term direction of travel for key areas of company activities and usually involve collaboration with other regulators and stakeholders. The outputs from strategic planning frameworks will need to inform, and align with, each company’s long-term strategy. Companies already have several long-term strategic planning frameworks. These frameworks include water resources management plans (WRMPs), drainage and wastewater management plans (DWMPs), the water industry national environment programme (WINEP) in England.

Term	Description
SPU	Strategic Planning Unit – our Level 2 areas
SSSI	Site of Special Scientific Interest – A designation denoting a protected area usually due to a rare species contained within or important physiological features.
Storm Overflows	An asset within the sewer network or at a wastewater treatment works that allow discharges of excess wastewater and rainwater to spill flows when its capacity is exceeded (usually when there are heavy storms). They prevent the sewerage system from backing up and flooding properties by discharging untreated but dilute sewage into the receiving river or stream.
SuDS	Sustainable Drainage Systems – A range of techniques for sustainably managing the flow of water run-off from a site on the surface e.g., by storing it in water butts, ponds, or swales, and so reducing the loading on conventional piped drainage systems. Also referred to a blue-green or nature based solutions.
Surface Water System	A sewer system that typically drains rainwater that has fallen on roads and roofs.
TOTEX	Total cost of Expenditure (CAPEX + OPEX) – TOTEX is the mechanism for planning and reporting capital and operational spend. The object is to achieve the optimum combination to deliver the required business plan outcomes. It applies to both water and waste but not to retail.
TPU	Tactical Planning Unit – Catchment area of one or more Wastewater Treatment Works, also referred to as a WwTW Catchment.
UKCP09	UK Climate Projections 2009
UKCP18	UK Climate Projections 2018
UKWIR	UK Water Industry Research – A body responsible for facilitating the water industry's research agenda and programme.
UPM	Urban Pollution Management Manual – A planning guide for the management of urban wastewater discharges during wet weather.
UPS	Uninterruptable Power Supply (UPS – a battery system designed to prevent critical loads losing power).
VAP	Vulnerable Asset Plan – plan to address and temporarily mitigate vulnerability for a named asset.
Wastewater	Water which has been used in a home, business or in an industrial process which requires treating.
Wastewater Pumping Station	Wastewater Pumping Station – An asset which pumps sewage, typically towards a treatment works site.
WaSC	Water and Sewerage Company

Term	Description
Water UK	Engages with companies and regulators to ensure customer receive high quality tap water at a reasonable price and that our environment is protected and improved.
WFD	Water Framework Directive - A European Directive to provide a coordinated approach to water management with the European Union (EU) by bringing together strands of water policy under one piece of framework legislation. Member States must produce plans for river basin management districts that set out a programme of measures aimed at protecting bodies of surface and groundwater.
WINEP	The water industry national environment programme (WINEP) is the programme of work water companies in England are required to complete to meet their obligations from environmental legislation and UK government policy.
WISER	Water Industry Strategic Environmental Requirements - A steer from EA which describes the resilience and flood risk obligations that the water industry must take into account when developing business plans.
WRMP	Water Resources Management Plan - A statutory plan which all water companies must produce every five years. They are designed to set out how the water company intends to achieve a secure supply of water for their customers in the future.
WTW	Water Treatment Works – infrastructure used to produce and treat drinking water.
WWO	Working with Others – a YW Performance Commitment focusing on partnership working.
WwTW	Wastewater Treatment Works – infrastructure used to treat wastewater and rainwater before returning it safely back to the environment.
WYCA	West Yorkshire Combined Authority
YDRT	Yorkshire Dales Rivers Trust
YW	Yorkshire Water

15. Appendix B

15.1 Level 2 Storyboards

These are available at:

<https://www.yorkshirewater.com/about-us/drainage-and-wastewater-management-plan/>

16. Appendix C

16.1 Level 3 Catchment Storyboards

These are available at:

<https://www.yorkshirewater.com/about-us/drainage-and-wastewater-management-plan/>