

# Yorkshire Water

## Draft DWMP24

June 2022



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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<sup>1</sup> 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.

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

- 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.

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.

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.

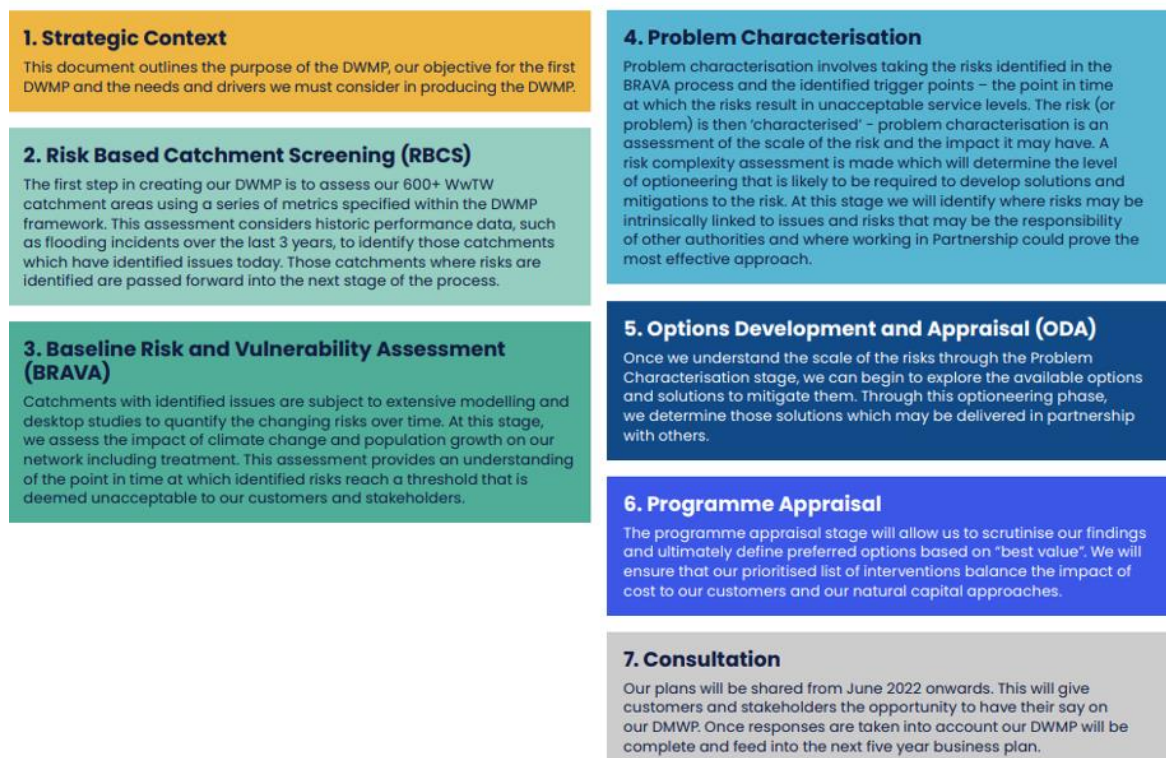
- Provide a clear, transparent, and consistent planning approach, with sufficient agility and adaptability to respond to long-term drivers for drainage and wastewater services.
- Promote informed debate about acceptability of different levels of risk.
- Provide greater confidence to customers, regulators 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 framework<sup>2</sup> 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>

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

<sup>2</sup> <https://www.water.org.uk/policy-topics/managing-sewage-and-drainage/drainage-and-wastewater-management-plans/>

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 as we have established business as usual processes for tackling blockages, collapses, and associated campaigns to address unsuitable materials in the sewer network.

### **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. We will seek to align the DWMP with our PR24 planning process.

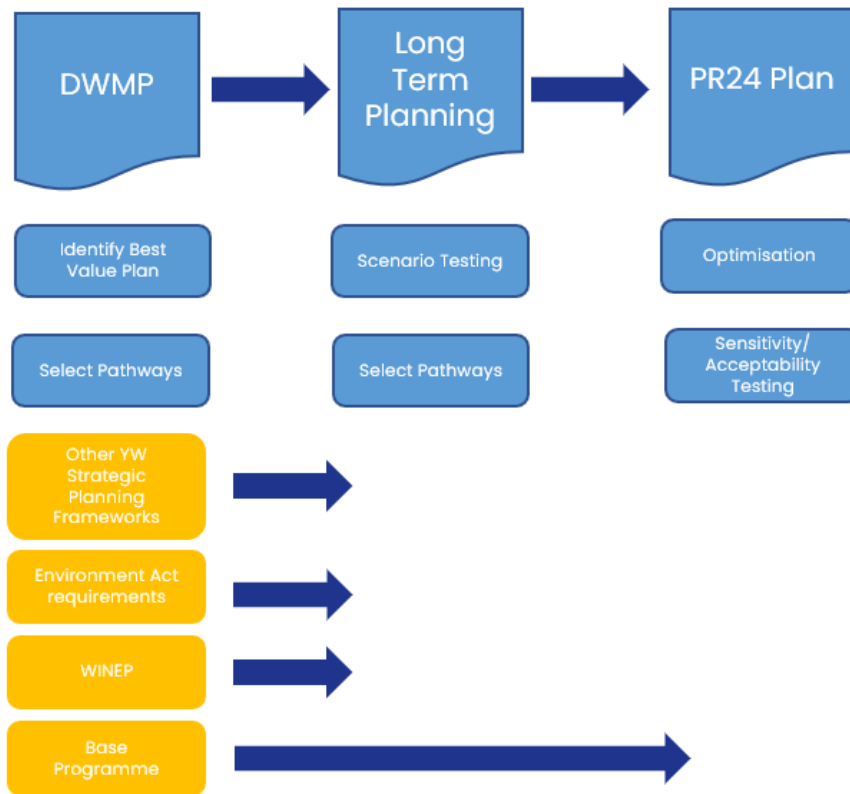
#### **3.1 The price review process**

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 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. Similar to the DWMP, the WRMP incorporates future pressures on water supply and demand due to predicted changes to the climate. It also looks at future changes in population, housing, water use and metering trends in Yorkshire. The WRMP and DWMP follow the same time horizons and principles, to ensure resilient water and wastewater services now and in the future. Where appropriate, it is important that the two are considered together and complement each other when making business decisions. Whilst efforts have been made to align the data and processes utilised within our DWMP with both the previous WRMP (WRMP19 for the regulatory period 2020-25) and WRMP24 which is currently under development (for the regulatory period 2025-30), differing timescales and requirements have meant this has not always been possible. Differences between the two are discussed further throughout our DWMP Technical Summary document, accessed by clicking the link below:

<https://www.yorkshirewater.com/draft-DWMP24>



### **3.3 Water Industry National Environment Programme (WINEP) and DWMP**

As the DWMP and WINEP development for PR24 is happening concurrently, there is limited opportunity for the DWMP to include delivery of environmental improvements identified through the WINEP planning process. The main area of expected overlap will be the delivery of storm overflow improvements, where it is anticipated the DWMP will provide the evidence required for WINEP development. Section 4 of this document covers this in more detail.

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 WINEP is the most important and substantial programme of environmental investment in England. 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 WINEP for PR24 is under development and water companies must submit optioneering evidence for solutions to address environmental risks and issues identified with the EA by 30 November 2022.

The WINEP for 2025–2030, is anticipated to implement some aspects of the first delivery phase of the DWMP24, for example the government's Storm Overflow Discharge Reduction Plan. This is expected to be alongside the supply-demand and capital maintenance elements of the water company's business plans.

## **4. Storm overflows**

### **4.1 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. YW have 2246 permitted storm overflows.

We monitor spills from 97% of them, with a plan to have 100% monitoring coverage by the end of 2023. In 2021, there were 70,062 spills from storm overflows in Yorkshire totalling 406,131 hours.

### **4.2 Changing expectations and the Environment Act**

The sewer system was originally 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 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 Plan<sup>3</sup> at the end of March 2022 and this contained three new target areas:

1. Protecting the environment: Water companies shall only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact. This must be achieved for all storm overflow sites by 2050.
2. Protecting public health in designated bathing waters: For storm overflows discharging into and near designated bathing waters, water companies must significantly reduce harmful pathogens by either applying disinfection, such as with ultraviolet radiation, or reduce the frequency of discharges to meet EA spill standards by 2035.
3. Ensuring storm overflows operate only in unusually heavy rainfall events: Storm overflows must not discharge above an average of 10 rainfall events per year by 2050.

The consultation closed on 12 May 2022 and the Secretary of State has until 1 September 2022 to publish the final Storm Overflow Discharge Reduction Plan.

### **4.3 Tackling storm overflows in Asset Management Plan 7 (AMP7) 2020–2025**

We are investing £137 million by 2025 in storm overflow improvements, investigation, and increased monitoring.

Over the next few years, we are increasing 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 into a watercourse. We are also making improvements to 14 overflows that will improve over 24km of river and reduce spills by over 750 hours on average a year. In addition to this, by 2025 we are going to significantly reduce spills on a further 15 of our most frequently spilling overflows from 2021.

We are also investigating the environmental impact of 158 frequent spilling overflows as part of the Water Industry National Environment Programme (WINEP). By March 2022 we had completed 30 of these investigations, with a further 30 to be completed by September 2022. This has resulted in three storm overflows identified for improvement.

In 2021 we started a programme of installing 58 solar-powered cameras on wastewater outfalls, with plans to install more as part of a pilot scheme to improve the visibility of our network. This is one of many initiatives, as part of our Dynamic Asset Maintenance transformation programme. Whilst outside of the DWMP remit, it offers mutual benefits for storm overflows. The installation phase commenced across assets that discharge to watercourses including the River Wharfe and other key locations across the region. These cameras will allow us to quickly assess the performance of our assets and mobilise our response more effectively. This is in addition to the 97% overflows already monitored by telemetry.

### **4.4 PR24 and beyond: DWMP and storm overflows**

A healthy and resilient natural environment is vital if we are to address the biodiversity crisis<sup>4</sup> 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 proud to play water's role in making Yorkshire a brilliant place to be – now and always and we share the government's ambition for a significant reduction in the use of storm overflows.

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<sup>3</sup> <https://consult.defra.gov.uk/water-industry/storm-overflow-discharge-reduction-plan/>

<sup>4</sup> <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>

Addressing storm overflows is a key element of the DWMP and a core planning objective. Our DWMP scenario targets are aligned within the Storm Overflow Discharge Reduction Plan consultation, as discussed in Section 8.5 of this report. The DWMP scenarios do not include reference to priority storm overflows, coastal or inland bathing targets or any of the screening or monitoring requirements in the Storm Overflow Discharge Reduction Plan consultation. This is due to evolving position on requirements and we will reflect an updated position based on the latest regulatory direction in our final DWMP.

#### 4.5 Details of the Storm Overflow reduction plan in our DWMP

DWMP24 has required significant hydraulic modelling undertaken within the 5-year DWMP cycle. All storm overflow improvements within the DWMP are reported at a wastewater treatment works (WwTW) catchment level rather than individual overflow assets. Improvements have focused on delivering an annual average spill frequency due to rainfall of no more than 10 spills per year and then eliminating ecological harm from storm overflows. The Risk Based Catchment Screening was undertaken in 2019 so only those storm overflows within catchments triggering through to the BRAVA stage have been included with a sub-set of these progressing through to optioneering.

Further work will be required between draft DWMP due in June 2022 and final DWMP24 due in March 2023. During that time, we will develop the WINEP for PR24 in line with the Storm Overflow Discharge Reduction Plan which will be confirmed by 1 September 2022. This will determine the long-term delivery strategy for storm overflows in line with the DEFRA guidance as set out below. This will include priority overflows, designated bathing waters (including our recent inland bathing designation at Ilkley) and screening of storm overflows.

### 5. Planning Areas

In line with the DWMP framework<sup>5</sup>, we have utilised a three-tiered approach consisting of different geographical levels for reporting. This can be seen in Figure 3.

**Figure 3: DWMP Levels for Yorkshire**



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.

<sup>5</sup> <https://www.water.org.uk/policy-topics/managing-sewage-and-drainage/drainage-and-wastewater-management-plans/>

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 1. 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.

**Table 1: Level 2 SPA Area and Catchment Details**

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

## 5.1 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 century<sup>6</sup> and rainfall in the UK has become more intense<sup>7</sup>, 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.

<sup>6</sup> <https://www.metoffice.gov.uk/research/climate/maps-and-data/about/state-of-climate>

<sup>7</sup> <https://www.sciencedirect.com/science/article/pii/S2212094721000372>



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 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<sup>8</sup>.

## 6. Partnership working

### 6.1 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, ourselves, and regulators. Our vision is that by maturing partnerships which are a range of sizes, alongside other organisations, and communities we will:

- co-invest in time and commitment
- 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 approaches. We believe that we can resolve many of these problems, either fully or in part, through partnerships and working with communities. It is particularly important when looking at surface water flooding, due to the fragmented nature of responsibilities across a number of Risk Management Authorities (RMAs).

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.

We will be seeking to continue to strengthen our existing partnerships and identify opportunities to develop new partnerships in the future where working in partnership increases the value we deliver for customers. As one of our strategic aims within the DWMP is to remove surface water from the network, the cross organisational nature of this challenge, means we are likely to need to work in partnership to do this.

We have a performance commitment measure - Working with Others (WVO) which has recently delivered in partnership, a number of different schemes, including working with North Yorkshire County Council and Network Rail to design and install permanent over-pumping infrastructure to address

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<sup>8</sup> <https://www.yorkshirewater.com/draft-DWMP24>

flooding in Malton and Norton and collaboration with the EA and East Riding of Yorkshire Council to improve the EA's Pollution Predictor Model at Scarborough and Bridlington beaches. We also have three larger partnership schemes running within Yorkshire, Living with Water, Bathing Water and Connected by Water. These are examples of what can be achieved when working together and how this can support the DWMP aspirations to expand partnership working.



## 7. 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.

### 7.1 YW DWMP Hub

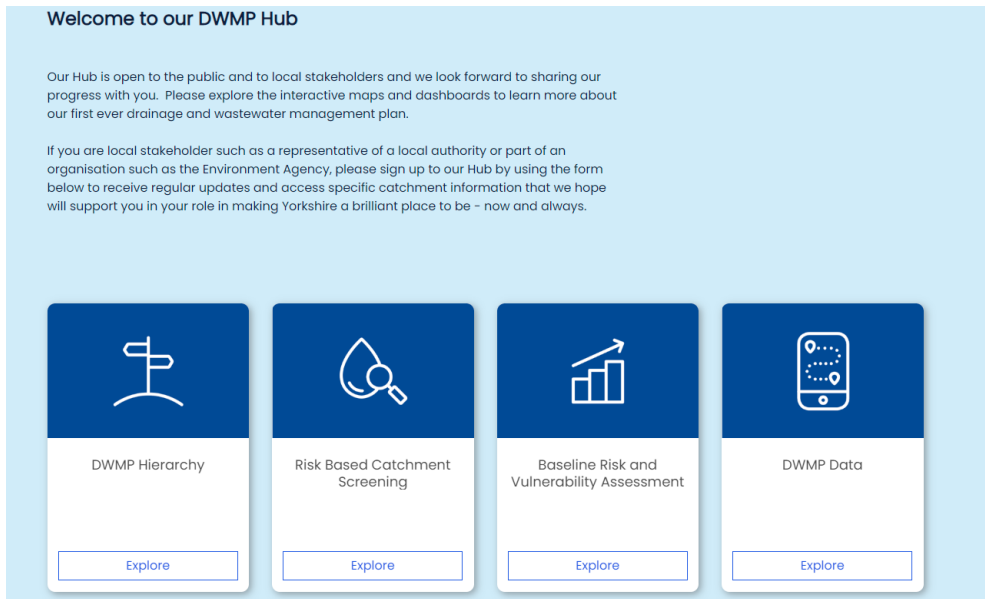
Our innovative online hub is the main interface with customers and stakeholders, allowing us to share interactive maps and data reflecting the core issues highlighted in the DWMP. The Hub can be accessed through the following link:

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

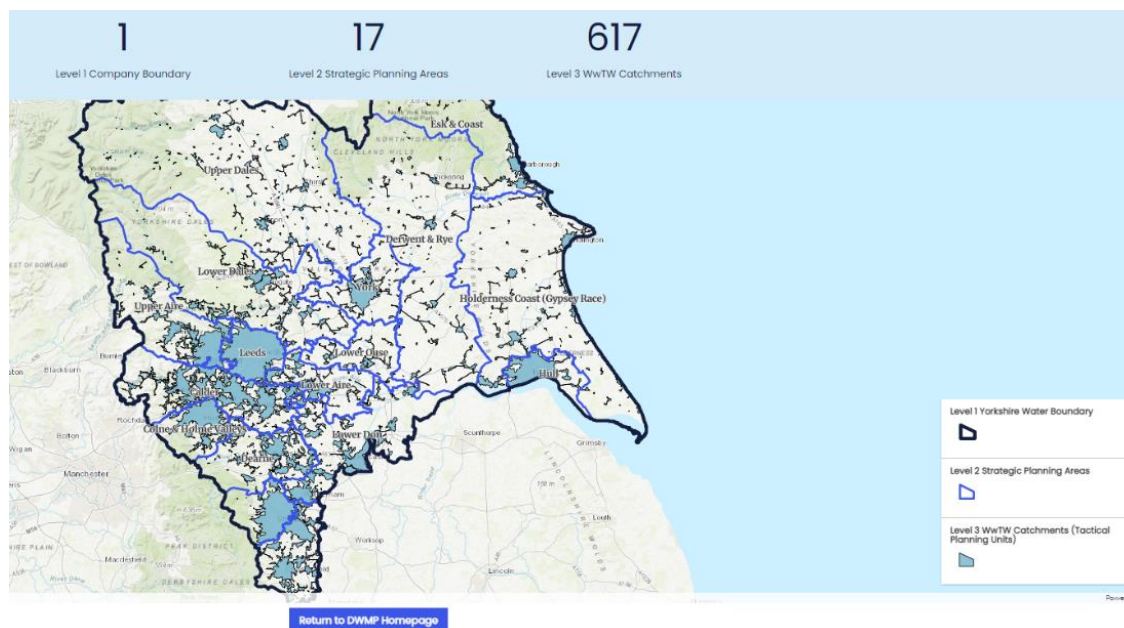
We have designed the Hub to be flexible, allowing it to evolve over time and enabling us to ensure suitability for individual stakeholder groups. Stakeholders have their own space within the Hub within which they can see the area relevant to them. This allows engagement on a more bespoke level as the 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](mailto: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 4, Figure 5, Figure 6 and Figure 7 provide examples of the interface and data held within the Hub:

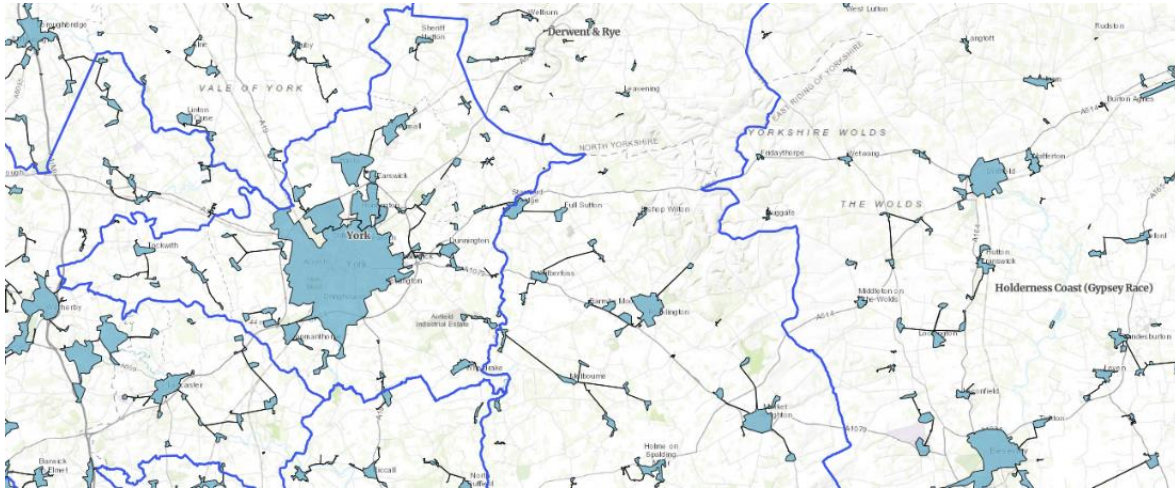
**Figure 4: Visual representation of YW Hub landing page**



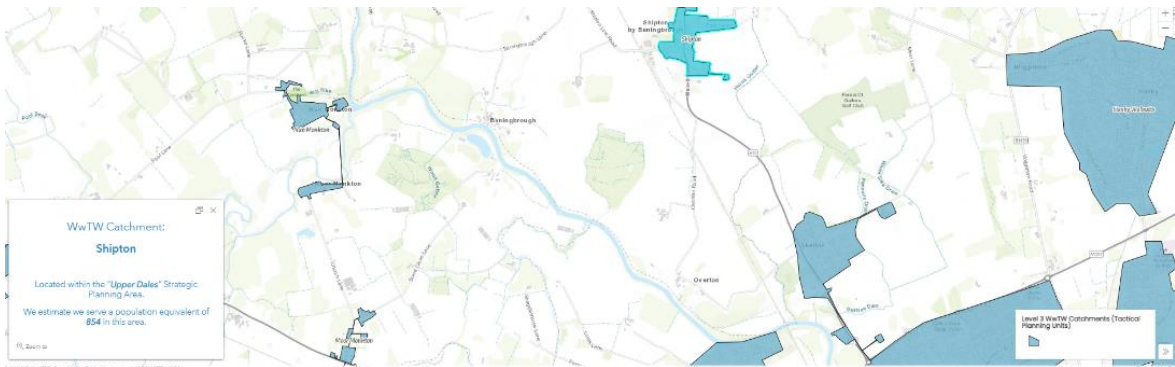
**Figure 5: Example of visual representation of Level 1, 2 and 3 catchment detail from YW Hub**



**Figure 6 : Example of visual representation of Level 2 and 3 catchment detail from YW Hub**



**Figure 7: Example of visual representation of Level 3 catchments from YW Hub**



## 7.2 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 with the Leaders Board a process of structured engagement through a series of regional roundtable events with representatives from the local authorities nominated by the Leaders Board. These events are broadly structured in three phases shown in Figure 8 below:

**Figure 8: Yorkshire Leaders Board Phases**



Throughout this process we will be reporting back to the Leaders Board on the work of the regional roundtables. A series of DWMP roundtable events have taken place which focused on understanding the challenges faced by local authorities and their priorities, seeking feedback on our level of ambition



and identifying opportunities for collaboration through the DWMP. The next step in this ongoing process is to hold further roundtable discussions at a sub-regional level for more detailed discussion and to shape local partnership approaches and opportunities.

The Yorkshire Water region is also served by councils not within the Yorkshire Leaders Board so separate engagement has been undertaken to ensure all local authorities have been given the opportunity to review and input throughout the development of the plan through the offer of access to the DWMP Hub.

There have been monthly liaison and working sessions with local representatives from the EA Integrated Environmental Planning team and Yorkshire Region Flood and Coastal Erosion Risk Management (FCERM) Programme team. This has allowed us to work together to support the EA in aligning their Flood Risk Management Plan (FRMP) to our own DWMP.

We have had regular meetings with the Yorkshire Customer Forum to discuss the DWMP and share and shape progress and we have also met with the Environmental sub-committee of this forum. The Yorkshire Customer Forum was brought together by Yorkshire Water under the guidance of the Independent Chair to support the company to manage its business in the best interests of its customers. The Yorkshire Forum for Water Customers membership is made up of a number of customer and stakeholder representative bodies including the Consumer Council for Water (CCW), Natural England (NE), National Farmers Union (NFU), organisations concerned with vulnerability and affordability and other community leaders.

### **7.3 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.

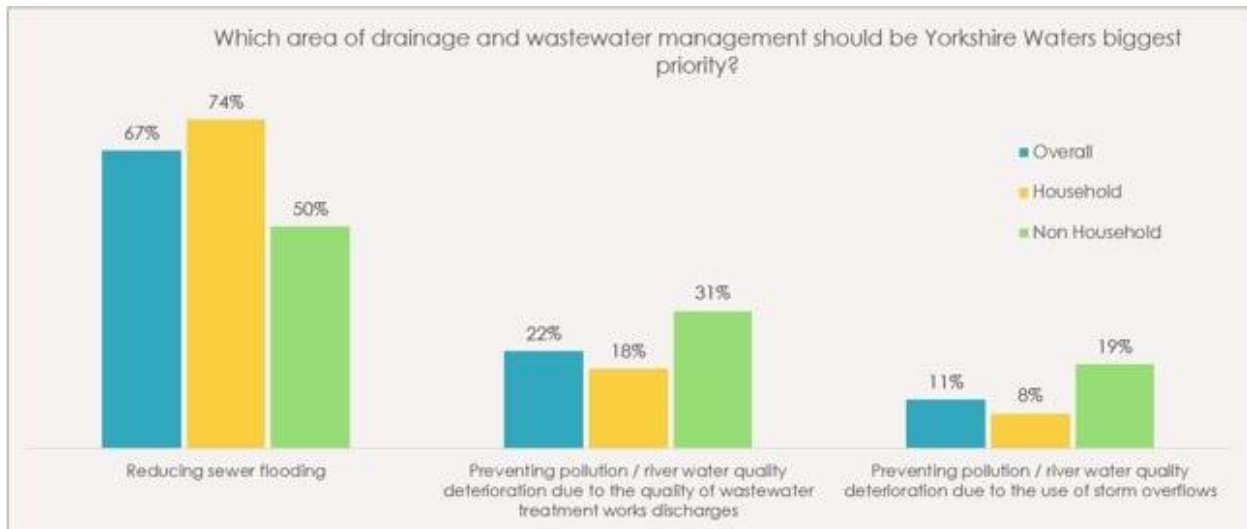
The overall aim of the research was to assess customers' views of what a 'best value' DWMP plan would look like, including the drivers of investment and how this should be prioritised to ensure resilient drainage and wastewater services in the YW region into the future.

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 9.

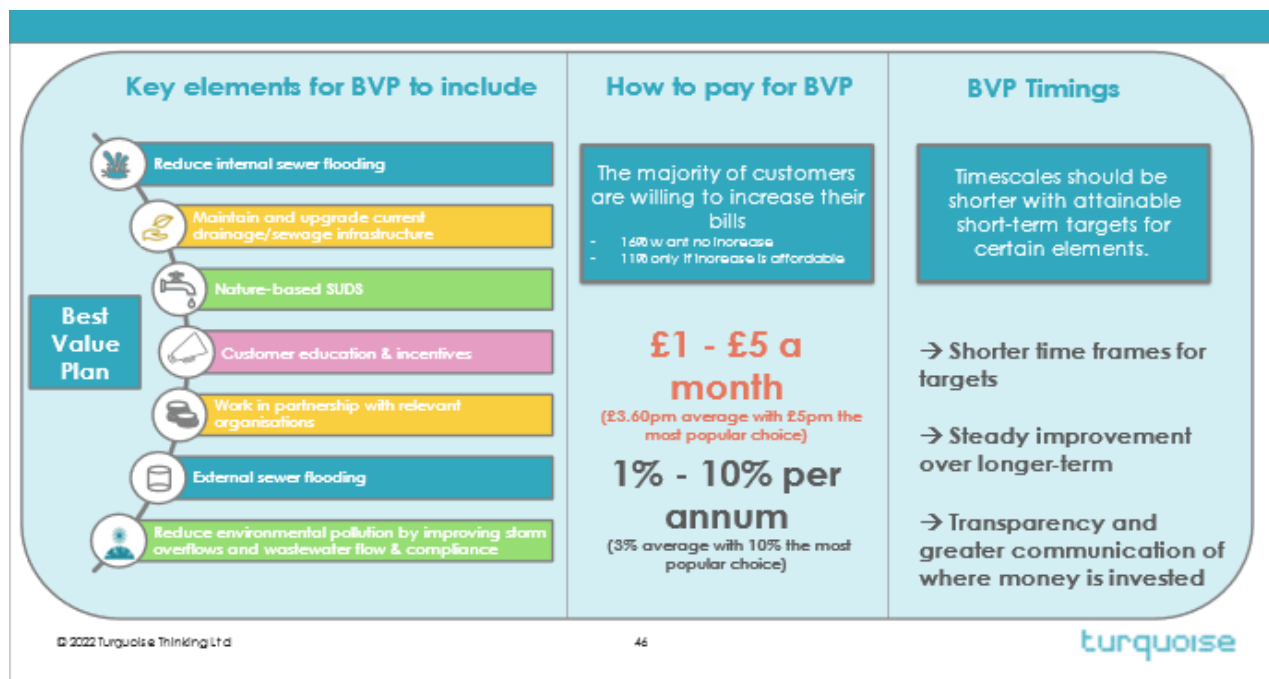
**Figure 9: Summary of workshop outputs: Risk prioritisation**



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 10:

**Figure 10: 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.

## 8. Process steps and methodology

### 8.1 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 7.1 of our DWMP Technical Summary document<sup>9</sup>

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.

### 8.2 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.

#### 8.2.1 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 DWMPs<sup>10</sup>, produced by Water UK. A summary of the national planning objectives is provided in Table 2 below:

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<sup>9</sup> <https://www.yorkshirewater.com/draft-DWMP24>

<sup>10</sup> <https://www.water.org.uk/wp-content/uploads/2020/07/BRAVA-planning-objectives-for-the-first-cycle-of-DWMPs.pdf>

**Table 2: National Planning Objectives Summary**

Ref	Planning Objective
PO-01	Risk of sewer flooding in a storm
PO-02	Storm overflow performance
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 3. 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 3: Strategic ambition and bespoke Planning Objectives**

<b>We take care of your wastewater and protect you and the environment from sewer flooding</b>	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)
<b>We protect and improve the water environment</b>	PO-09: Managing Storm Overflow Performance PO-10: Wastewater Treatment Works (WwTW) Flow Compliance PO-11: Wastewater Treatment Works (WwTW) Quality Compliance
<b>A resilient future network*</b>	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.

### 8.3 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 8.2, 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 4, 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 4: Mapping of bespoke planning objectives to planning themes**

<b>Planning Theme</b>	<b>Bespoke Planning Objectives</b>
<b>Flood Risk</b>	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)
<b>Storm Overflow Performance</b>	PO-09: Managing Storm Overflow Performance
<b>WwTW Compliance</b>	PO-10: Wastewater Treatment Works (WwTW) Flow Compliance PO-11: Wastewater Treatment Works (WwTW) Quality Compliance
<b>Resilience</b>	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 7.3 of our DWMP Technical Summary document<sup>11</sup>.

The individual results for 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.

#### **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.

#### **8.4 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:

<sup>11</sup> <https://www.yorkshirewater.com/draft-DWMP24>

- **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 5 summarises the overall outcome of Problem Characterisation:

<b>Table 5: Problem characterisation runway assignment: Overall</b>	
<b>Runway</b>	<b>Nr of Level 3 Catchments</b>
<b>Monitor</b>	96
<b>Investigate</b>	65
<b>Promote</b>	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.

## 8.5 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 have developed four different plans to deliver four sets of targets, identified as different scenarios. These scenarios are shown in Figure 11:

**Figure 11: Scenario Detail**



Our four scenarios represent the latest information available linked to the storm overflow discharge reduction plan measures incorporating an annual average of no more than 10 spills per storm overflow, and an annual average of no more than 10 spills per storm overflow plus no environmental harm from storm overflows. It should be noted that only storm overflows within our Promote catchments are included in our costed plan and any overflows that require intervention linked to the reduction plan will be addressed as part of our business planning processes, as discussed in Section 4.5 of this report.

## 8.6 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.

We have developed a generic solution hierarchy, shown in Figure 12 below:

**Figure 12: Generic DWMP solution hierarchy**

Generic DWMP Solution Hierarchy		
0	<b>Observe</b>	To be re-reviewed within future DWMP cycles
1	<b>Monitor</b>	Monitor catchment performance.
2	<b>Investigate</b>	Gather additional data and/or information to improve understanding of risk and support development of cost beneficial interventions, if required.
3	<b>Optimise</b>	Operate and maintain systems to maximise existing capacity and minimise risk.
		Domestic and business customer education.
4	<b>Reduce</b>	The management and control of rainfall induced flows to reduce the quantity of flow within the wastewater system.
		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	<b>Enhance</b>	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.

This is a hierarchical process to stage the level and nature of intervention we need to deploy within the catchment.

As discussed in Section 8.1 of this report, Observe is automatically assigned to all catchments that did not trigger within the RBCS process. Monitor and Investigate are assigned outcomes from the Problem Characterisation stage and are dependent on the catchment size, risk level and data confidence.

Optimise, Reduce and Enhance are all steps to be evaluated for those catchments that were assigned Promote within the Problem Characterisation stage. A list of generic options has been created which has been aligned to each of the stages within our DWMP solution hierarchy. Further detail on these

generic options and how they have been considered within our plan is detailed in Section 7.7.1 of our DWMP Technical Summary document<sup>12</sup>.

Following an assessment of the generic options and how these can be considered within the DWMP, for each of our network Promote catchments, we have considered two main potential approaches in order to achieve our scenario targets by 2050: These are outlined below where 'X' denoted the Scenario number:

- X.1 Increase the capacity of our network through traditional 'grey' solutions, i.e., building bigger pipes, storage tanks and upgrading our existing assets. This option approach considers network modification only.
- X.2 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 still necessary. This option approach considers a reduction in rainfall induced flow and network modification.

These are coupled with solutions to address WwTW compliance risk, primarily focussed on treatment modification. Further detail on the approaches taken to developing and costing these options is provided in Section 7.7.3 and 7.7.4 of our DWMP Technical Summary document.

## 9. Programme optimisation and appraisal

We have used our Decision Making Framework (DMF)<sup>13</sup> to assess the costs and benefits associated with delivering solutions for each of our Promote catchments, and which of the approaches discussed in Section 8.6 of this report should be utilised to meet the scenario targets. YW utilises the Six Capitals approach in investment decision making and this is incorporated in to the Decision Making Framework (DMF). The Six Capitals as applied in YW are outlined in Figure 13 below:

**Figure 13: Our Six Capitals**



<sup>12</sup> <https://www.yorkshirewater.com/draft-DWMP24>

<sup>13</sup> <https://www.youtube.com/watch?v=iZ6CixsmPSA>

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.

We have undertaken two key plan optimisations. A Net Present Value (NPV) approach to determine a best value plan with optimised costs and maximised benefits, and an assessment of the least cost (i.e. lowest TOTEX) option to deliver the required targets. Further detail on the processes undertaken for these optimisations is provided in Section 8 of our DWMP Technical Summary document<sup>14</sup>.

## 10. Level 1 and 2 output summaries

Our Level 1 Best Value Plans (BVPs) illustrate a range of costs and pathways we can adopt to help us achieve the targets set out in the storm overflow reduction plan and without deteriorating our hydraulic flooding risk position to properties we can invest to hold firm on our position or invest to reduce the hydraulic flooding risk position to properties. This also includes investing at WwTW's to ensure our WwTW's have sufficient capacity to allow us to remain compliant with our current environmental permits. The costs for our Level 1 have been compiled and represent a combination of blue-green and grey only solutions as selected by our optimiser. These cost ranges are set out in Table 6 below:

**Table 6: Level 1 25-Year Best Value Plan - Cost Ranges +/-25%**

<b>Scenario 1</b>	£28.8 billion	£47.9 billion
<b>Scenario 2</b>	£30.1 billion	£50.1 billion
<b>Scenario 3</b>	£23.1 billion	£38.5 billion
<b>Scenario 4</b>	£24.3 billion	£40.5 billion

Our Level 1 least cost plan considers the most cost-effective way to deliver the outcomes required. These least cost option cost ranges represent considerably more grey solutions than the BVP and deliver less overall benefit. This is seen in Table 7 below.

**Table 7: Level 1 25-Year Least Cost - Cost Ranges +/-25%**

<b>Scenario 1</b>	£21.2 billion	£35.3 billion
<b>Scenario 2</b>	£22.8 billion	£37.9 billion
<b>Scenario 3</b>	£9.7 billion	£16.2 billion
<b>Scenario 4</b>	£11.8 billion	£19.6 billion

The nature of what our 2025-2030 (AMP8) investment programme may look like, given the requirement to deliver priority storm overflow solutions within tight deadlines and affordability and deliverability considerations will potentially mean we have to start on a core pathway of least cost investment. This will drive mainly grey solution options e.g., storage tanks but we would still look, where practicable, to invest in blue-green solutions and use adaptive planning to move away from the grey-only approach in the future. As cost certainty and the rates of climate change and population growth become clearer, then the gap between our BVP's and the least cost plans should start to converge.

<sup>14</sup> <https://www.yorkshirewater.com/draft-DWMP24>



This will mean we can adapt and change our plan to deliver most efficient and beneficial outputs for all.

As described, we have approached our DWMP as a strategic plan that outlines the needs and requirements of drainage, wastewater and environmental water quality for the next 25 years and beyond. We have taken a catchment-based approach to identify the risks and potential risk mitigations associated with the hydraulic aspects of our wastewater service. This catchment-based approach means we have chosen to present the potential costs as a range as, in this phase of the plan development, there remains significant uncertainty. As we progress towards our final DWMP and our PR24 submission, we will develop a more granular view of the necessary interventions and their associated costs.

For the draft DWMP we have presented our Level 1 plan costs with a 25% certainty band. When this is considered at a Level 2 catchment level, the cost certainty band is 50%. This increased range at this more granular catchment level arises from uncertainties associated with storm overflow requirements, specifically the definition of priority overflows, changes to catchment-based delivery methods and the externalities of climate change and population growth.

Our BVP cost range is shown below in Table 8 for each Level 2 and for the four evaluated scenarios.

**Table 8: Level 2 BVP costs – all scenarios +/- 50%**

**Level 2 Calder 25-Year BVP Cost Range**

<b>Scenario 1</b>	£2.6 billion	£7.7 billion
<b>Scenario 2</b>	£2.8 billion	£8.3 billion
<b>Scenario 3</b>	£2.1 billion	£6.3 billion
<b>Scenario 4</b>	£2.3 billion	£7.0 billion

**Level 2 Colne & Holme Valley 25-Year BVP Cost Range**

<b>Scenario 1</b>	£1.0 billion	£3.0 billion
<b>Scenario 2</b>	£1.1 billion	£3.2 billion
<b>Scenario 3</b>	£0.8 billion	£2.5 billion
<b>Scenario 4</b>	£0.9 billion	£2.7 billion

**Level 2 Dearne 25-Year BVP Cost Range**

<b>Scenario 1</b>	£1.0 billion	£3.0 billion
<b>Scenario 2</b>	£0.1 billion	£0.3 billion
<b>Scenario 3</b>	£0.8 billion	£2.5 billion
<b>Scenario 4</b>	£0.9 billion	£2.6 billion

**Level 2 Derwent & Rye 25-Year BVP Cost Range**

<b>Scenario 1</b>	£0.4 billion	£1.3 billion
<b>Scenario 2</b>	£0.4 billion	£1.0 billion
<b>Scenario 3</b>	£0.4 billion	£1.2 billion
<b>Scenario 4</b>	£0.4 billion	£1.2 billion

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**Level 2 Esk & Coastal 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£0.4 billion	£1.1 billion
<b>Scenario 2</b>	£0.4 billion	£1.2 billion
<b>Scenario 3</b>	£0.3 billion	£1.0 billion
<b>Scenario 4</b>	£0.3 billion	£1.0 billion

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**Level 2 Holderness Coast (Gypsey Race) 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£0.4 billion	£1.1 billion
<b>Scenario 2</b>	£0.4 billion	£1.2 billion
<b>Scenario 3</b>	£0.3 billion	£0.9 billion
<b>Scenario 4</b>	£0.3 billion	£0.9 billion

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**Level 2 Hull 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£2.7 billion	£8.0 billion
<b>Scenario 2</b>	£2.7 billion	£8.0 billion
<b>Scenario 3</b>	£1.2 billion	£3.7 billion
<b>Scenario 4</b>	£1.2 billion	£3.7 billion

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**Level 2 Leeds 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£2.7 billion	£8.1 billion
<b>Scenario 2</b>	£2.8 billion	£8.3 billion
<b>Scenario 3</b>	£2.6 billion	£7.8 billion
<b>Scenario 4</b>	£2.7 billion	£8.1 billion

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**Level 2 Lower Aire 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£0.7 billion	£2.0 billion
<b>Scenario 2</b>	£0.7 billion	£2.2 billion
<b>Scenario 3</b>	£0.5 billion	£1.5 billion
<b>Scenario 4</b>	£0.5 billion	£1.5 billion

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**Level 2 Lower Dales 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£0.9 billion	£2.8 billion
<b>Scenario 2</b>	£1.0 billion	£2.9 billion
<b>Scenario 3</b>	£0.7 billion	£2.2 billion
<b>Scenario 4</b>	£0.8 billion	£2.3 billion

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**Level 2 Lower Don 25-Year BVP Cost Range**

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<b>Scenario 1</b>	£1.4 billion	£4.3 billion
<b>Scenario 2</b>	£1.4 billion	£4.3 billion
<b>Scenario 3</b>	£1.1 billion	£3.3 billion
<b>Scenario 4</b>	£1.1 billion	£3.4 billion

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**Level 2 Lower Ouse –Year BVP Cost Range**

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<b>Scenario 1</b>	£0.1 billion	£0.4 billion
<b>Scenario 2</b>	£0.1 billion	£0.4 billion
<b>Scenario 3</b>	£0.1 billion	£0.3 billion
<b>Scenario 4</b>	£0.1 billion	£0.3 billion

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**Level 2 Rother & Doe Lea 25–Year BVP Cost Range**

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<b>Scenario 1</b>	£0.8 billion	£2.5 billion
<b>Scenario 2</b>	£0.9 billion	£2.6 billion
<b>Scenario 3</b>	£0.7 billion	£2.1 billion
<b>Scenario 4</b>	£0.7 billion	£2.1 billion

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**Level 2 Sheffield 25–Year BVP Cost Range**

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<b>Scenario 1</b>	£1.3 billion	£3.9 billion
<b>Scenario 2</b>	£1.4 billion	£4.3 billion
<b>Scenario 3</b>	£1.3 billion	£3.8 billion
<b>Scenario 4</b>	£1.4 billion	£4.1 billion

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**Level 2 Upper Aire 25–Year BVP Cost Range**

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<b>Scenario 1</b>	£3.3 billion	£4.9 billion
<b>Scenario 2</b>	£1.9 billion	£5.6 billion
<b>Scenario 3</b>	£1.4 billion	£4.1 billion
<b>Scenario 4</b>	£1.6 billion	£4.8 billion

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**Level 2 Upper Dales 25–Year BVP Cost Range**

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<b>Scenario 1</b>	£0.5 billion	£1.5 billion
<b>Scenario 2</b>	£0.5 billion	£1.5 billion
<b>Scenario 3</b>	£0.5 billion	£1.4 billion
<b>Scenario 4</b>	£0.5 billion	£1.4 billion

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**Level 2 York 25–Year BVP Cost Range**

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<b>Scenario 1</b>	£0.6 billion	£1.9 billion
<b>Scenario 2</b>	£0.6 billion	£1.9 billion
<b>Scenario 3</b>	£0.5 billion	£1.5 billion
<b>Scenario 4</b>	£0.5 billion	£1.5 billion

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Our least cost plan is show below in Table 9 for our Level 2 SPAs.

**Table 9: Level 2 Least Cost Plan – All Scenarios +/-50%**

**Level 2 Calder 25-Year Lowest Cost Plan Range**

<b>Scenario 1</b>	£2.1 billion	£6.6 billion
<b>Scenario 2</b>	£2.4 billion	£7.2 billion
<b>Scenario 3</b>	£1.0 billion	£3.1 billion
<b>Scenario 4</b>	£1.3 billion	£3.8 billion

**Level 2 Colne & Holme Valley 25-Year Lowest Cost Plan Range**

<b>Scenario 1</b>	£0.8 billion	£2.5 billion
<b>Scenario 2</b>	£0.9 billion	£2.8 billion
<b>Scenario 3</b>	£0.5 billion	£1.5 billion
<b>Scenario 4</b>	£0.7 billion	£2.0 billion

**Level 2 Dearne 25-Year Lowest Cost Plan Range**

<b>Scenario 1</b>	£0.6 billion	£1.9 billion
<b>Scenario 2</b>	£0.6 billion	£1.9 billion
<b>Scenario 3</b>	£0.3 billion	£0.8 billion
<b>Scenario 4</b>	£0.3 billion	£0.9 billion

**Level 2 Derwent & Rye 25-Year Lowest Cost Plan Range**

<b>Scenario 1</b>	£0.4 billion	£1.1 billion
<b>Scenario 2</b>	£0.4 billion	£1.1 billion
<b>Scenario 3</b>	£0.3 billion	£0.9 billion
<b>Scenario 4</b>	£0.3 billion	£0.9 billion

**Level 2 Esk & Coastal 25-Year Lowest Cost Plan Range**

<b>Scenario 1</b>	£0.3 billion	£0.8 billion
<b>Scenario 2</b>	£0.3 billion	£0.9 billion
<b>Scenario 3</b>	£0.1 billion	£0.3 billion
<b>Scenario 4</b>	£0.1 billion	£0.4 billion

**Level 2 Holderness Coast (Gypsey Race) 25-Year Lowest Cost Plan Range**

<b>Scenario 1</b>	£0.3 billion	£0.9 billion
<b>Scenario 2</b>	£0.3 billion	£0.9 billion
<b>Scenario 3</b>	£0.1 billion	£0.3 billion
<b>Scenario 4</b>	£0.1 billion	£0.3 billion

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**Level 2 Hull 25-Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£2.5 billion	£7.5 billion
<b>Scenario 2</b>	£2.5 billion	£7.5 billion
<b>Scenario 3</b>	£0.7 billion	£2.0 billion
<b>Scenario 4</b>	£0.7 billion	£2.0 billion

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**Level 2 Leeds 25-Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£1.0 billion	£3.0 billion
<b>Scenario 2</b>	£1.2 billion	£3.5 billion
<b>Scenario 3</b>	£0.6 billion	£1.8 billion
<b>Scenario 4</b>	£0.8 billion	£2.3 billion

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**Level 2 Lower Aire 25-Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£0.6 billion	£1.8 billion
<b>Scenario 2</b>	£0.6 billion	£1.8 billion
<b>Scenario 3</b>	£0.4 billion	£1.2 billion
<b>Scenario 4</b>	£0.4 billion	£1.3 billion

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**Level 2 Lower Dales 25-Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£0.8 billion	£2.5 billion
<b>Scenario 2</b>	£0.9 billion	£2.6 billion
<b>Scenario 3</b>	£0.4 billion	£1.3 billion
<b>Scenario 4</b>	£0.4 billion	£1.3 billion

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**Level 2 Lower Don 25-Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£1.0 billion	£3.0 billion
<b>Scenario 2</b>	£1.0 billion	£3.0 billion
<b>Scenario 3</b>	£0.3 billion	£0.9 billion
<b>Scenario 4</b>	£0.3 billion	£1.0 billion

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**Level 2 Lower Ouse -Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£0.08 billion	£0.2 billion
<b>Scenario 2</b>	£0.08 billion	£0.2 billion
<b>Scenario 3</b>	£0.04 billion	£0.1 billion
<b>Scenario 4</b>	£0.04 billion	£0.1 billion

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**Level 2 Rother & Doe Lea 25-Year Lowest Cost Plan Range**

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<b>Scenario 1</b>	£0.5 billion	£1.7 billion
<b>Scenario 2</b>	£0.6 billion	£1.7 billion
<b>Scenario 3</b>	£0.2 billion	£0.6 billion
<b>Scenario 4</b>	£0.2 billion	£0.7 billion



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#### Level 2 Sheffield 25-Year Lowest Cost Plan Range

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<b>Scenario 1</b>	£0.6 billion	£1.8 billion
<b>Scenario 2</b>	£0.7 billion	£2.2 billion
<b>Scenario 3</b>	£0.3 billion	£0.9 billion
<b>Scenario 4</b>	£0.5 billion	£1.4 billion

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#### Level 2 Upper Aire 25-Year Lowest Cost Plan Range

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<b>Scenario 1</b>	£1.4 billion	£1.3 billion
<b>Scenario 2</b>	£1.7 billion	£5.0 billion
<b>Scenario 3</b>	£0.6 billion	£1.7 billion
<b>Scenario 4</b>	£1.1 billion	£3.3 billion

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#### Level 2 Upper Dales 25-Year Lowest Cost Plan Range

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<b>Scenario 1</b>	£0.5 billion	£1.3 billion
<b>Scenario 2</b>	£0.5 billion	£1.4 billion
<b>Scenario 3</b>	£0.3 billion	£1.0 billion
<b>Scenario 4</b>	£0.3 billion	£1.0 billion

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#### Level 2 York 25-Year Lowest Cost Plan Range

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<b>Scenario 1</b>	£0.6 billion	£1.7 billion
<b>Scenario 2</b>	£0.5 billion	£1.7 billion
<b>Scenario 3</b>	£0.3 billion	£0.9 billion
<b>Scenario 4</b>	£0.3 billion	£0.9 billion

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## 11. Next steps

In the short-term, we will be working on our final plan, which is due for publication in March 2023, by continuing to develop our plan and incorporating feedback from the consultation process that will run until the 23 September 2022. We will be working closely with Defra and the EA to ensure that our final DWMP accurately reflects the evolving requirements for storm overflows. We would welcome your comments on our draft DWMP24 and you can access the consultation through the link below:

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

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.

Alongside these changes to our DWMP we will be developing our business plan for 2025-2030. 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. We will seek to incorporate before final and within the next cycle of the DWMP the recommendations from the Strategic Environmental Assessment that has been undertaken and can be accessed through the link below:

<https://www.yorkshirewater.com/strategic-environmental-assessment>

Within this document Section 7.1.1 highlights the key recommendations.

In the medium- and long-term we will commence work on the next cycle of DWMP development, which will start in April 2023. This will make use of newly available datasets, including climate change projections and we will incorporate learning and feedback from the completion of our first DWMP.

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 our DWMP based on the outcomes of investigation, continued monitoring of scheme impacts, emerging risks and increase our certainty about the impacts of climate change and population growth by monitoring against current projections. We will also monitor new and emerging technologies to see where these offer opportunities to provide best value.

Through continued engagement with our customers and stakeholders and partnership working we will ensure that we deliver the best value solutions to communities, customers and the environment.

# Appendices

# 1. Appendix A

## 1.1 Acronyms & Abbreviations

<b>Term</b>	<b>Description</b>
<b>AMP</b>	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.
<b>AONB</b>	Area of Outstanding Natural Beauty - is an area of countryside that has been designated for conservation due to its significant landscape value.
<b>APR</b>	Annual Reporting Review - Yearly process of reviewing Water Company performance against targets agreed with Ofwat.
<b>BAU</b>	Business as Usual activity
<b>BGI</b>	Blue/Green Infrastructure - Natural and semi-natural assets which aid in surface water management whilst also providing wider environmental benefits.
<b>BRAVA</b>	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.
<b>BVP</b>	Best Value Plan
<b>CaBA</b>	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.
<b>CAF</b>	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.
<b>Catchment</b>	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.
<b>CAPEX</b>	Capital Expenditure - Is expenditure to acquire or upgrade physical assets such as property, pipes and treatment works.
<b>CCW</b>	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.
<b>Combined System</b>	A sewerage system consisting of both rainwater and used wastewater from sinks, baths, and toilets.
<b>CSO</b>	Storm Overflows on the sewer network are also known as Combined Sewer Overflows.

<b>Term</b>	<b>Description</b>
<b>DAP</b>	Drainage Area Plan - A single, or series of, hydraulic modelling studies which are developed to explore and understand the performance of the sewerage network.
<b>DAZ</b>	Drainage Area Zone - The area drained by a network of sewers and associated assets.
<b>DEFRA</b>	Department for Environment, Food and Rural Affairs.
<b>Detention Tank</b>	A structure that is designed to store excess wastewater and/or surface for a period of time.
<b>DMF</b>	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.
<b>DST</b>	Decision Support Tool - A system or process which aids in optimising decision making by quantifying risk and value to optimise investment.
<b>DWF</b>	Dry Weather Flow - The average daily flow to a wastewater treatment works (WwTW) during a period without rain.
<b>DWMP</b>	Drainage and Wastewater Management Plan - A new way for organisations to work together to improve drainage and environmental water quality.
<b>DWMP Hub</b>	Our online Drainage & Wastewater Management Plan stakeholder portal.
<b>EA</b>	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.
<b>EDA</b>	Enterprise Decision Analytics - Our programme optimisation tool which supports the decision making process.
<b>EDM</b>	Event Duration Monitoring - monitoring of storm overflows, including whether or not a spill event is happening and how long it lasts.
<b>EPA</b>	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).
<b>ESF</b>	External Sewer Flooding - Flooding to property curtilage or land such as gardens due to hydraulic incapacity of sewers.
<b>FCERM</b>	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.
<b>FDGiA</b>	Flood Defence Grant in Aid
<b>FEH13 rainfall</b>	Flood Estimation Handbook 2013 - Provides catchment level descriptors and rainfall estimation procedures. Used in modelling the impact of rainfall events.
<b>FOG</b>	Fats, oils and greases
<b>Foul System</b>	A sewerage system consisting of waste from sinks, baths, and toilets.



<b>Term</b>	<b>Description</b>
<b>FRMP</b>	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.
<b>FWMA</b>	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.
<b>GIS</b>	Geographical Information System – A system to capture, store and analyse spatial data.
<b>Grey Infrastructure</b>	Traditional methods of wastewater management such as concrete detention tanks.
<b>HE</b>	Historic England – Non-departmental public body tasked with protecting the historic environment of England.
<b>HH</b>	Customer household/property
<b>HRA</b>	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.
<b>I&amp;I</b>	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.
<b>iCASP</b>	Yorkshire Integrated Catchment Solutions Programme – An academic body which uses research to benefit the environment, economy, and society of Yorkshire.
<b>ISF</b>	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.
<b>Level 1 Company Plan</b>	The YW region
<b>Level 2 Strategic Planning Area</b>	Aggregation of Level 3 catchments to form the overarching Level 1 strategic plan for the company. Aligned to River Basin Districts and political boundaries.
<b>Level 3 WwTW Catchment</b>	A wastewater catchment including all connected properties which drain to a specific WwTW.
<b>LLFA</b>	Lead Local Flood Authority – County councils and unitary authorities, LLFAs lead in managing local flood risks from surface water, ground water and smaller watercourses.
<b>LPA</b>	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.
<b>LWW</b>	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.

<b>Term</b>	<b>Description</b>
<b>MCZ</b>	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.
<b>MTP</b>	Medium Term Plan of investment arising from the FCERM programme.
<b>NBS</b>	Nature-based solutions – Solutions which aid in surface water management whilst also providing wider environmental benefits.
<b>NCA</b>	National Character Areas – is a natural subdivision of England based on a combination of landscape, biodiversity, geodiversity and economic activity.
<b>NCERM</b>	National Coastal Erosion Risk Mapping produced by the EA.
<b>NE</b>	Natural England – A non-departmental public body responsible for ensuring that England's natural environment is improved and protected.
<b>NGO</b>	Non-Governmental Organisation – a non-profit organisation, typically with social or environmental aims.
<b>NFU</b>	National Farmers Union – Is a member organisation/industry association for farmers in England and Wales.
<b>NHH</b>	Non-Household customer – business customers and premises
<b>NNR</b>	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.
<b>NPV</b>	Net Present Value
<b>ODA</b>	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.
<b>Ofwat</b>	Water Services Regulation Authority or Office of Water Services – The economic regulator of water services in England and Wales.
<b>OPEX</b>	Operational Expenditure – The day-to-day spending on running of services such as staff costs and energy bills.
<b>PA</b>	Programme Appraisal
<b>PCC</b>	Per Capita Consumption – A measure of how much clean water consumed by a person in a day.
<b>PE</b>	Population Equivalent – A measure of the amount of oxygen-demanding materials discharged by one person each day.
<b>PLR</b>	Property Level Resilience
<b>POT</b>	Peak over Threshold a recognised approach to model extreme values
<b>PR24</b>	Price Review 2024 – The Ofwat periodic review of price limits to be in 2024 to set prices for the regulatory period 2025-2030.

<b>Term</b>	<b>Description</b>
<b>RAMSAR</b>	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.
<b>RBCS</b>	Risk Based Catchment Screening – Stage within the DWMP where catchments are screened based on risks.
<b>RBD</b>	River Basin District – Defined by the EA and covers an entire river system, including river, lake, groundwater, estuarine and coastal water bodies.
<b>RBMP</b>	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.
<b>RCP</b>	Representative Concentration Pathway – Utilised within UKCPI8 to represent a range of climate outcomes.
<b>Rising Main</b>	A type of sewer where wastewater is pumped to another part of the sewerage system
<b>RMA</b>	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.
<b>ROCC</b>	Regional Operational Control Centre
<b>RoFSW</b>	Risk of Flooding from Surface Water
<b>RTS</b>	Regional Telemetry System – remote viability and alarm system for assets
<b>S24</b>	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.
<b>SAAR</b>	Standardised Annual Average Rainfall – Rainfall averages for the UK over a given period.
<b>SAC</b>	Special Area of Conservation – Protects one or more special habitats and/or species listed in the Habitats Directive.
<b>SAGIS</b>	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.
<b>SCADA</b>	Supervisory Control and Data Acquisition – remote visibility, control and alarm management system for assets.
<b>SEA</b>	Strategic Environmental Assessment – A systematic decision support process, aiming to ensure that environmental aspects are considered appropriately in planning.
<b>Sewer</b>	A conduit designed to transport wastewater or surface water.
<b>Sewerage</b>	A system by which wastewater or surface water is transported.

<b>Term</b>	<b>Description</b>
<b>Six Capitals</b>	<p>Financial Capital – Our financial health and efficiency</p> <p>Human Capital – Our workforce’s capabilities and wellbeing</p> <p>Manufactured Capital – Our pipes, treatment works, offices and IT</p> <p>Intellectual Capital – Our knowledge and processes</p> <p>Natural Capital – The materials and services we rely on from the environment, especially water</p> <p>Social Capital – Our relationships and customers trust in us</p>
<b>SMF</b>	Service Measure and valuation Framework – A process designed to identify the reasons for investment and value of carrying out such investment.
<b>SOAF</b>	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.
<b>SPA</b>	Special Protection Area (SPA) – This is land classified under Directive 79/409 on the Conservation of Wild Birds. SPAs are strictly protected sites.
<b>SOEP</b>	Storm Overflow Evidence Project – An independent research project that considers options, costs, and benefits for reducing storm sewage discharges in England.
<b>SPA</b>	Strategic Planning Area – A region designated for reporting purposes which contains several WwTW catchments.
<b>SPF</b>	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.
<b>SPU</b>	Strategic Planning Unit – our Level 2 areas
<b>SSSI</b>	Site of Special Scientific Interest – A designation denoting a protected area usually due to a rare species contained within or important physiological features.
<b>Storm Overflows</b>	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.

<b>Term</b>	<b>Description</b>
<b>SuDS</b>	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 as blue-green or nature based solutions.
<b>Surface Water System</b>	A sewer system that typically drains rainwater that has fallen on roads and roofs.
<b>TOTEX</b>	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.
<b>TPU</b>	Tactical Planning Unit – Catchment area of one or more Wastewater Treatment Works, also referred to as a WwTW Catchment.
<b>UKCP09</b>	UK Climate Projections 2009
<b>UKCP18</b>	UK Climate Projections 2018
<b>UKWIR</b>	UK Water Industry Research – A body responsible for facilitating the water industry's research agenda and programme.
<b>UPM</b>	Urban Pollution Management Manual – A planning guide for the management of urban wastewater discharges during wet weather.
<b>UPS</b>	Uninterruptable Power Supply (UPS – a battery system designed to prevent critical loads losing power).
<b>VAP</b>	Vulnerable Asset Plan – plan to address and temporarily mitigate vulnerability for a named asset.
<b>Wastewater</b>	Water which has been used in a home, business or in an industrial process which requires treating.
<b>Wastewater Pumping Station</b>	Wastewater Pumping Station – An asset which pumps sewage, typically towards a treatment works site.



## 2. Appendix B

### 2.1 Level 2 Storyboards

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

### **3. Appendix C**

#### **3.1 Level 3 Catchment Storyboards**

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