

# Drainage and Wastewater Management Plan Technical Summary

May 2023



# Our Regional Plan

## Contents

<b>Our Regional Plan .....</b>	<b>2</b>
<b>Introduction.....</b>	<b>3</b>
<b>Executive Summary.....</b>	<b>6</b>
<b>Our Region.....</b>	<b>9</b>
<b>How we manage our assets.....</b>	<b>10</b>
<b>Introducing our first ever DWMP .....</b>	<b>16</b>
<b>What is happening today?.....</b>	<b>22</b>
<b>Assessing what the future could look like.....</b>	<b>30</b>
<b>What happens if we do nothing?.....</b>	<b>49</b>
<b>Climate change risks .....</b>	<b>54</b>
<b>What are our options? .....</b>	<b>60</b>
<b>Our stakeholder and customer views .....</b>	<b>72</b>
<b>Our Plan .....</b>	<b>86</b>
<b>Addressing uncertainties in our plan .....</b>	<b>100</b>
<b>Delivering our plan.....</b>	<b>103</b>
<b>Financing and bill impacts.....</b>	<b>110</b>
<b>Next steps .....</b>	<b>114</b>

This document explains the process used to create our DWMP, sets out how we have considered other factors such as the use of storm overflows, how we can improve wastewater treatment standards through nutrient reduction plans, and the impacts of climate change relating to coastal erosion and sea level rises. Finally, the document sets out how we have made decisions to balance our plan. It is aimed primarily at stakeholders and regulators who may require this level of detail to support their roles.

## Introduction

We all use and rely on water every day, with most of the water we use ending up in our wastewater network, along with the rainwater that falls on roofs and roads that has nowhere else to go. How we manage this network affects the lives of people and the environment across the region. We take this responsibility very seriously.

The South West is beautiful, there's nowhere else quite like it. Everywhere you look, we are surrounded by water, be it coastal, rivers, reservoirs or lakes. We have two National Parks and nine Areas of Outstanding Natural Beauty. There are plenty of places to enjoy the abundant natural beauty and wealth of species and habitats. Recognising this, millions of tourists flock down here every year to enjoy everything the South West has to offer.

This strong, healthy environment has been a great leveller for the region – freely accessible water, moorland and forestry contribute to wellbeing, support resilient and cohesive communities, and benefit society as a whole. This is important as the South West suffers from high levels of low skill, low pay employment and a growing skills gap. As we invest for the future, we need to recognise that the South West is set apart from the rest of the UK.

## This means we need to manage our region's wastewater carefully.

We inherited an outdated system that today is at odds with the environmental ambition for the region. The landscape and topography of hills and valleys means that water moves relatively quickly into our system. Coupled with relatively poor connectivity for transport and digital infrastructure, managing our wastewater network is a challenging operation compared to most of England. We are on a journey to modernise and transform, and to date we have invested £8bn, as we continue to invest to take away and treat sewage across our remote communities. Last year, for the second year running, 100% of bathing waters met environmental standards, with 99% at good or excellent, compared to 29% in 1991.

But what is being demanded of our networks is changing. We have seen a 20% increase in the population in the region in the last 30 years. And there has been a 50% increase in tourism and 25% extra flows into our treatment works over the last 15 years. Each day over 200,000 wet wipes find their way into our systems – enough to fill 30 double decker buses a year. These cause havoc in the system, especially when they mix with fats and greases to form solid rock-like formations called “fatbergs” – ultimately causing thousands of blockages a year, which in turn can cause pollution and flooding. And with the pandemic, we have seen a shift in the

number of people wanting to live and work in the region.

Moreover, our environment is changing. We're dealing with the impacts of climate change and increasing extremes in our weather and for us, rises in sea levels. Also, as the population grows, there are more houses, driveways and roads. This means ever more waters that we need to take away from homes and businesses, and ever more threats for our assets to cope with. At the same time, customers, politicians, regulators, the media and stakeholders have been clear that we need to do things differently as the current system relies too much on storm overflows. This is no longer acceptable. At the same time, customers, politicians, regulators, policy makers, the media and our stakeholders have been clear that we need to do things differently as current system with its reliance on storm overflows, is no longer acceptable.

So, whilst we have invested heavily over the last thirty years, without further intervention our wastewater networks risk failing to deliver resilient and effective services. That is why we have been working with our customers and stakeholders to develop our future plan.

Drainage and Wastewater Management Plans – or DWMPs – are for the period 2025 to 2050. DWMPs are new for the sector and an industry developed framework with a strong focus on nature-based solutions and partnership working has been developed to guide their production. The role of the DWMPs is to develop plans for the management of drainage and wastewater systems to ensure there are sustainable and resilient to the needs of the future.

For us this means ensuring we can continue our wastewater recycling processes effectively. Our role is to collect wastewater from our homes and businesses, along with the rain that falls and has nowhere to go, to treat it to make it safe to release it back into the environment – where it travels to the sea and the cycle repeats. But the key challenges we face, such as climate change, have the potential to disrupt this recycling process, impacting on drainage and treatment and causing flooding and pollution.

So, an important part of our plans is to build on existing stakeholder relationships, clarifying responsibilities across flood risk and environmental agencies, and promoting a better general understanding of drainage and flooding issues.

This document is our final DWMP, this reflects customer insight, our consultation to date with key stakeholders and flood risk management agencies, and the legal targets being proposed by government to protect rivers and seas.

Meeting these challenges and expectations will involve a step change in investment. We estimate we will need to invest as much in the future as we have in the past. As we look to 2050, we will need to remove an additional 1,447 hectares of surface water, install 550,890m<sup>3</sup> of additional storage, upgrade 2,785km of sewers, upsize 123 works to handle greater flows, upgrade a

[DWMP Technical Summary](#)

further 230 works to deliver higher environmental improvement, and increase coastal protection at 28 more sites.

And given our reliance on storm overflows is unacceptable, and we face extreme pressures from climate change, growth and plastic pollution – we aim to deliver at pace where possible, especially around storm overflows, as we look to deliver most of the outcomes within the next 15 years.

### **This is a plan for the environment.**

It covers all of our wastewater investments to 2050. By publishing this document, we want to encourage further opportunities to partner and innovate. The affordability of customer bills is of paramount importance to us – with bills today lower than they were 10 years ago, we are on track for all customers to have an affordable bill by 2025. So, by publishing this document we hope to encourage debate around how we can innovate around charging to ensure progressive, affordable bills for all – so we can fund the environment we all want to see without anyone worrying about how they will pay their bill.

**Our DWMP is a living plan – and we will continue to measure and update where we are, and what we future plans are, as we look to ensure that services are resilient and we deliver the outcomes we all want to see.**

## Executive Summary

### Our Final DWMP is about bringing water to life.

DWMPs are new for the sector, and an industry-led technical framework has been developed to aid consistency across companies. We predict that whilst we have invested heavily over the last thirty years in our assets, without a significant change in levels of investment, our wastewater networks will be unable to deliver resilient and effective services over the long term.

The main drivers of risk are:

- **Climate change** – as a coastal region with 860 miles of coastline and over one third of the country's bathing waters, we are particularly vulnerable to climate change. Many of our assets are situated in coastal locations, meaning that increasingly volatile weather, severe rainfall events, sea level rise and coastal erosion all have a significant impact on our operations and services
- **Population growth** – new housing developments and increased occupancy of existing homes produces greater wastewater flows to deal with in our networks
- **Urban creep** – paving over of urban areas such as parks and gardens and removing natural soakaways for rainwater surface run off all means more rainwater goes into our sewers rather than drains away naturally.

Our wastewater operations also need to respond to tightening environmental standards and water quality monitoring needs, and support net zero operational carbon. It needs to address the risks that plastics cause - from blockages in our sewers to the increase in microplastics and microcontaminants entering our environment.

When we talk about drainage, we include all of our assets that carry sewage and surface water along with any asset such as land drains that can have an impact on our network. We share responsibility for drainage with others including local authorities and private landowners and it's essential that we work together to achieve the ambitions of the DWMP. This approach is not new to us, but what is different is the scale.

Ultimately, when the drainage system is overwhelmed, the results can be devastating – causing flooding to homes and businesses and pollution to rivers and seas. Over time, without further action we can expect to see:

- Increased risk of sewer flooding to homes and businesses in times of heavy rain – despite three decades of investment to bring sewer flooding to historic and industry leading low levels
- Increased risk that wastewater treatment works do not comply with current environmental standards – risking our target of 100% compliance each year with ever improving standards
- Increased use of storm overflows – potentially impacting on the environment and reversing current plans to lower storm overflow use across the region and particularly at coastal locations.

We have developed a plan to address these risks based on our continuous engagement with customers, and in consultation with key stakeholders and other flood risk management agencies.

Customers have long told us that they worry about the impacts of climate change and growth across the region, and the impact that this has on all infrastructure. And increasingly customers are telling us that the

[DWMP Technical Summary](#)



environment is more of a priority, and they want us to be an environmental leader in the region. It is important that customers trust in our services and operations – so we need to respond to these growing concerns.

Reducing the number of pollution incidents across the region is also a significant area of focus for us and we know that we need to do more to improve our performance.

Regulators and policymakers are also calling for a step change – with recent environmental legislation setting out a steep reduction in the use of storm overflows and improvements in wastewater treatment standards over time, meaning that by 2050 water company operations will not impact adversely on the health of our rivers and seas. Our final DWMP delivers ahead of the 2050 and interim legal targets for overflows, as we look to front end deliver our investment plans.

## **We are already taking action through our current plans**

We know that our customers and stakeholders want to see ambitious DWMP plans – but we are not waiting until 2025 to take action.

Our wastewater system has developed over many decades – we inherited an outdated system which today is at odds with the environmental ambition for the region. Over the last three decades we have been on a journey to evolve the system to meet future demands and protect the environment along the way. This is the focus of our current plans.

We know how devastating it can be when sewer flooding or pollution occurs from our network – and our current plans reflect our commitment to reducing the risk of these incidents happening. We are working with communities to look for innovative and sustainable ways to manage the amount of surface water that enters our sewer network. At South West Water, we call this programme **Downstream Thinking**.

And we want everyone in the South West to feel confident about the water at their favourite beach, or river and to know we are serious about reducing pollutions, our impact on water quality and the use of storm overflows. So, in April 2022 we published our plan to 2025 for healthy rivers and seas – **WaterFit** – which outlines our three-year plan to 2025 to protect and enhance our precious water environment, working with partners, customers, visitors and local communities so that we all play our part.

## **One year on, we have made good progress - whilst accepting there is more to do.**

For the second year running we have achieved 100% bathing water quality across all beaches. Spills at our overflows have reduced by 30% on average in the year, and pollutions have reduced by 50% over two years. As we look to put nature on everyone's doorstep, we are progressing the introduction of coastal water quality standards to inland rivers, and have restored or created over 100,00 hectares of habitats - an area bigger than the size of Dartmoor National Park.

And with 100% monitoring of storm overflows now in place, a year ahead of plan, we have launched WaterFit Live platform, giving customers and visitors live information about the region's bathing beaches, storm overflows and our investments. For more information click [here](#).

## What is the future plan?

Our DWMP picks up from WaterFit. It is a plan for the environment.

Our DWMP provides the opportunity for a further step change in investment which ensures that our assets remain strong and resilient in light of the pressures we face in the South West. It allows us to continue to modernise and transform our wastewater networks to provide services to customers, protecting and enhancing the environment now and for future generations, mitigating and addressing the impacts of pressures such as climate change and population growth.

This means our wastewater system will mitigate and address the threats from sea level rises, coastal erosion, flash flooding, and increasing amounts of wastewater and rainwater entering our system. And it will do this whilst maintaining high levels of service to customers and protecting our environment.

But we cannot do this alone – others have a vital role to play, and success will require new ways of thinking, unheralded levels of collaboration, and above all, changes across all levels of societal behaviour. This is at the core of our DWMP.

Many organisations work together to manage the risk of flooding across the region so we're setting out our priorities so that we can work effectively with our partners. This helps us to manage any conflicts or disagreements where responsibilities may be unclear, identify partnership opportunities where we can work together for mutual outcomes and share resources.

## What is next?

We consider this to be the right plan given the environmental targets proposed by the government, and the priorities of our customers and stakeholders.

We have set out how we will work in partnership with others to ensure sustainable, reliable wastewater services in the future.

We want our DWMP to be a living plan, so we will continue to monitor our performance and adapt our plans as pressures change over time to ensure that our services remain resilient and reflect what matters most to customers.



# Our Region

We provide sewerage services to Devon, Cornwall, the Isles of Scilly and small parts of Dorset and Somerset. We own and operate a complex system of over 23,000 km of sewer and 653 Wastewater Treatment Works (WwTW), providing wastewater services to around 1.8 million people dispersed across the region. Each treatment works has a distinct catchment, for which risks need to be understood.

These catchments are rolled up into 22 strategic planning areas which are broadly aligned to river basin districts and closely follow local government boundaries, which supports engagement – particularly when it comes to highlighting risks and seeking opportunities for collaborative working. The region covers nearly 4,300 square miles (11,137 square kilometres) and, in addition to the 1.8 million residents, our region sees up to 10 million visitors a year.

We use a suite of metrics to assess wastewater performance including the frequency at which storm overflows operate, sewer asset condition metrics, sewer flooding incidents, pollution incidents, and wastewater treatment works compliance with both flow and quality permit conditions.

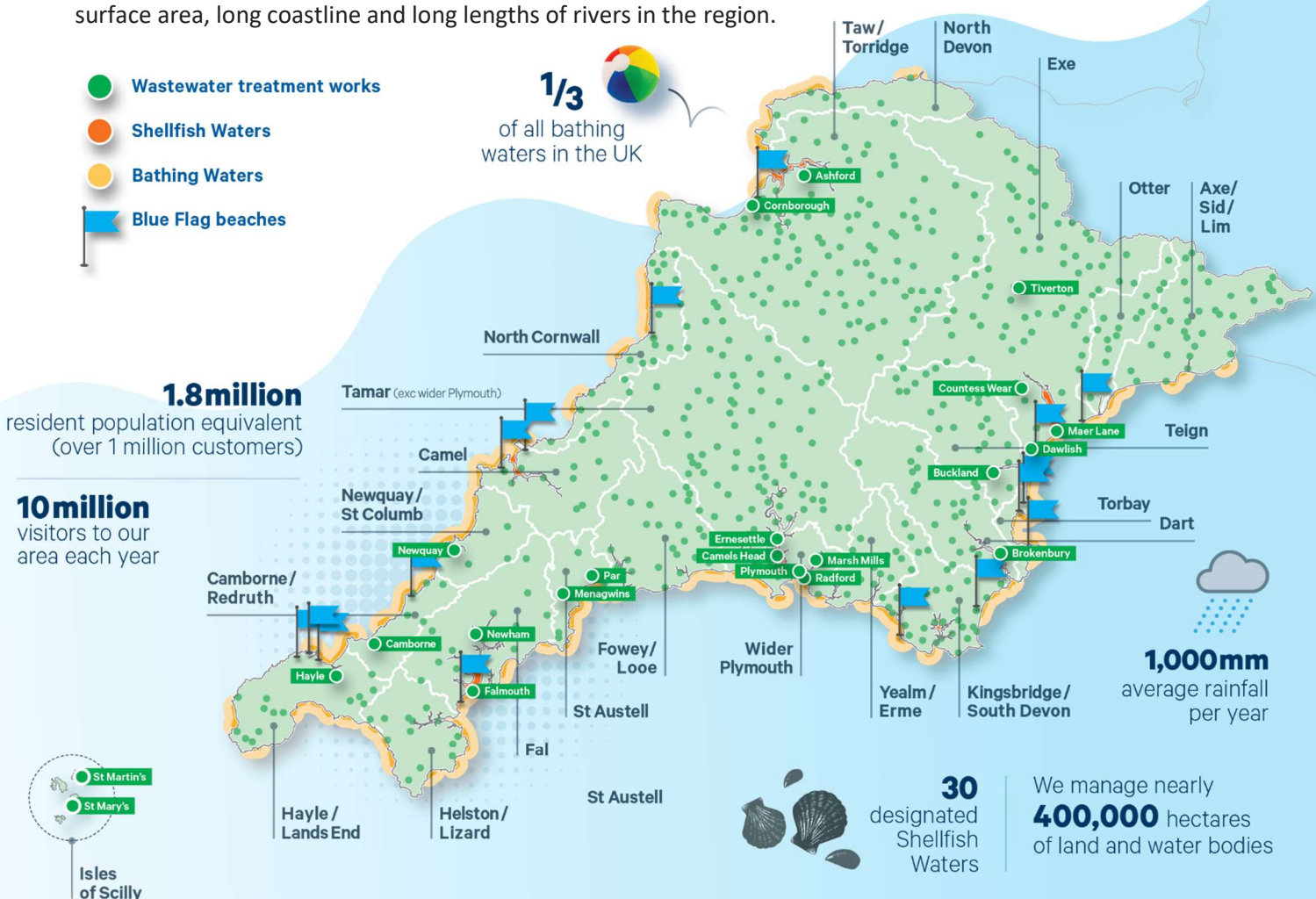
The decisions we make in our DWMP will affect customers and communities for many years. It is important to get those decisions right. The success of our DWMP will be demonstrated by maintaining and improving these key metrics across all 656 catchments under increasing demands over the long term.

## A coastal peninsula

Our region is rural in nature, but with urban communities around the coast such as Plymouth, Exeter and Falmouth. The rural communities in the central parts of Devon and Cornwall are served by relatively short networks with limited capacity and descriptive treatment facilities.

As a coastal peninsula, the region is unique in terms of the proximity of communities - and therefore our assets – to waterways across the region. This increases the propensity to cause minor pollution when things go wrong.

The combination of rural/urban populations in a coastal peninsula means that we have a challenging sewer network to manage, many more treatment works, a large surface area, long coastline and long lengths of rivers in the region.



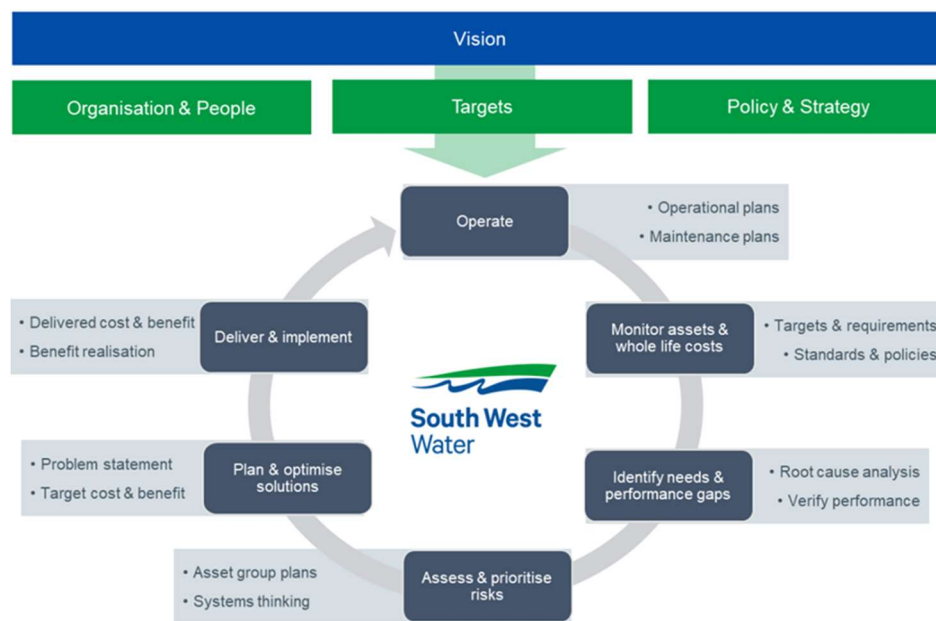
## How we manage our assets

Our unique set of circumstances means that it is important that we manage our assets effectively and develop the right plans for the future.

We see it as essential to use the same information to build our plans as we use to deliver our plans. So, we have a comprehensive and robust asset management policy and system to underpin all of our decisions. This provides the basis for placing customers and stakeholders at the heart of our investment decisions to ensure the effective delivery of our long-term vision and environmental ambition through short-term operational and long-term strategic plans.

We are ISO55001 accredited for our asset management systems, processes, and developmental functions. This external review, benchmark and accreditation is important, as it ensures we make evidence-based decisions, it gives our Board and regulators confidence in our plans, and it drives continual improvement.

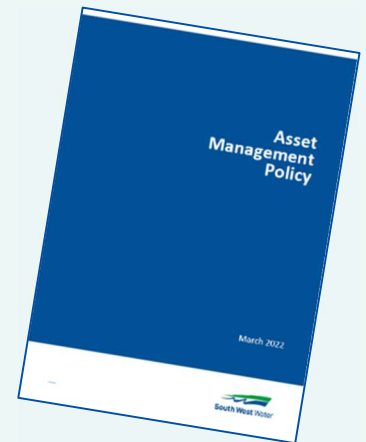
Our asset management approach covers all physical assets. Our roles and responsibilities, culture, asset data and systems are integrated and aligned to support the right decisions and actions at each stage of the lifecycle of our assets: from planning, design, construction, operation, maintenance to decommissioning.



Our **Asset Management Policy** defines the key principles and requirements which we will apply to managing our assets. Through this we will make sure that assets are managed in a way that contributes towards continually improving water and wastewater services by delivering the outcomes our customers expect – safely, sustainably, and efficiently.

Our policy plays a key role in creating an overall ‘Line of Sight’ between our asset interventions and the South West Water Outcomes and Board Pledges. Specifically, it outlines the Asset Management lifecycle principles, and the guidelines and practices, that govern decisions which ensure that South West Water provides a high-quality service to its customers and the environment in the short and long term.

[DWMP Technical Summary](#)



Our Asset Management Policy applies to all assets owned by South West Water and all aspects of each asset, including planning, design, construction, operation, maintenance and decommissioning as depicted below:

This policy is supported by plans and strategies that reflect the clear principles which underpin our approach to managing our assets. These are:

- Deliver value for every pound SWW spent in our investment programme
- Drive to deliver efficiency within the AMP (asset management period) capital programme
- Ensure our regulatory programmes are delivered and that these support compliance and business plan target delivery
- Working collaboratively to deliver outcomes and meet targets, and avoid shortfall and penalties, safeguarding our business performance in the short and medium term
- Deliver for today, tomorrow and for the long term, ensuring our infrastructure is fit for the future, focussed investment to maintain our asset health
- Deliver clear and responsive decision making processes which are evidence based, economic, efficient and deliver sustainable value for our customers, society and the natural environment in the long term. Our processes should empower our teams, minimise red tape and yet provide strong governance and transparency
- We will develop and cultivate our people, data and processes. These key resources are used to underpin our planning, decision making and governance to meet our current and future needs
- We will remain at the leading edge in our asset management and be recognised as such by our stakeholders and regulators.

Risk is central to our framework, and we need to use risk-based decision-making methodologies to ensure we determine optimised and efficient long-term asset strategies.

The overall health of our assets is of critical importance to us – it is core to our approach to maintaining compliance and managing performance. An important part of any future enhancement plan – be that DWMP or any other investment – is that the health and condition of our assets can meet today’s needs, so that only additional investment over and above what is needed to manage assets effectively for today is identified in our overall plans.

Our asset health assessment methodologies are therefore designed to ensure that our assets are fit for purpose today and can meet the demands placed on them today. As pressures increase, ensuring that we maintain or improve asset health gives us the best opportunity to meet the fluctuating and potentially extreme conditions associated with climate change, population growth, and tourism. We simply will not be able to address these future issues if we do not ensure the existing asset base is in good condition today.

So, we use leading methodologies and tools to assess risk and make decisions. Asset health checks are carried out proactively on all WWS

[DWMP Technical Summary](#)



*Kilbury WWTW (Credit: Gail Crocker)*



*Luxulyan WWTW (Credit: Jade Kennerley)*

assets taking various different forms. For example on networks, routine jetting and planned cleansing are carried out in blockage hotspots and CSO's where it is more cost effective than carrying out capital repairs. Other checks on assets such as air valves, storage tanks, CSO's flow control devices are also carried out on a regular basis.

We have also been focused on reducing pollution levels –accepting that one pollution is too many. Our pollution incident reduction plan continues to deliver improvements in performance, at their lowest level for 10 years. With a 50% reduction over the last two years, we continue to take actions to deliver our glidepath to 2025, including rising main replacements, installing sewer depth monitors and continuing our investment in technology and innovation.

Sewer level monitors are installed which give feedback on changes in levels in sewers which can be used to identify blockages that may be forming. Last year we installed 1440 as part of our plans to install 9000 monitors across 23,000km of network over the next few years to expand this capability.

On pumping stations in house vectors carry out wet well cleansing on a planned programme, in house teams carry out regular site checks and maintenance teams carry out MEICA maintenance. On in house operational teams have rounds that they follow to ensure wastewater treatment works are checked on a regular basis and maintenance is carried out by MEICA teams. Regular sampling monitors effluent quality daily so that any changes in quality can be acted on before compliance is put at risk.

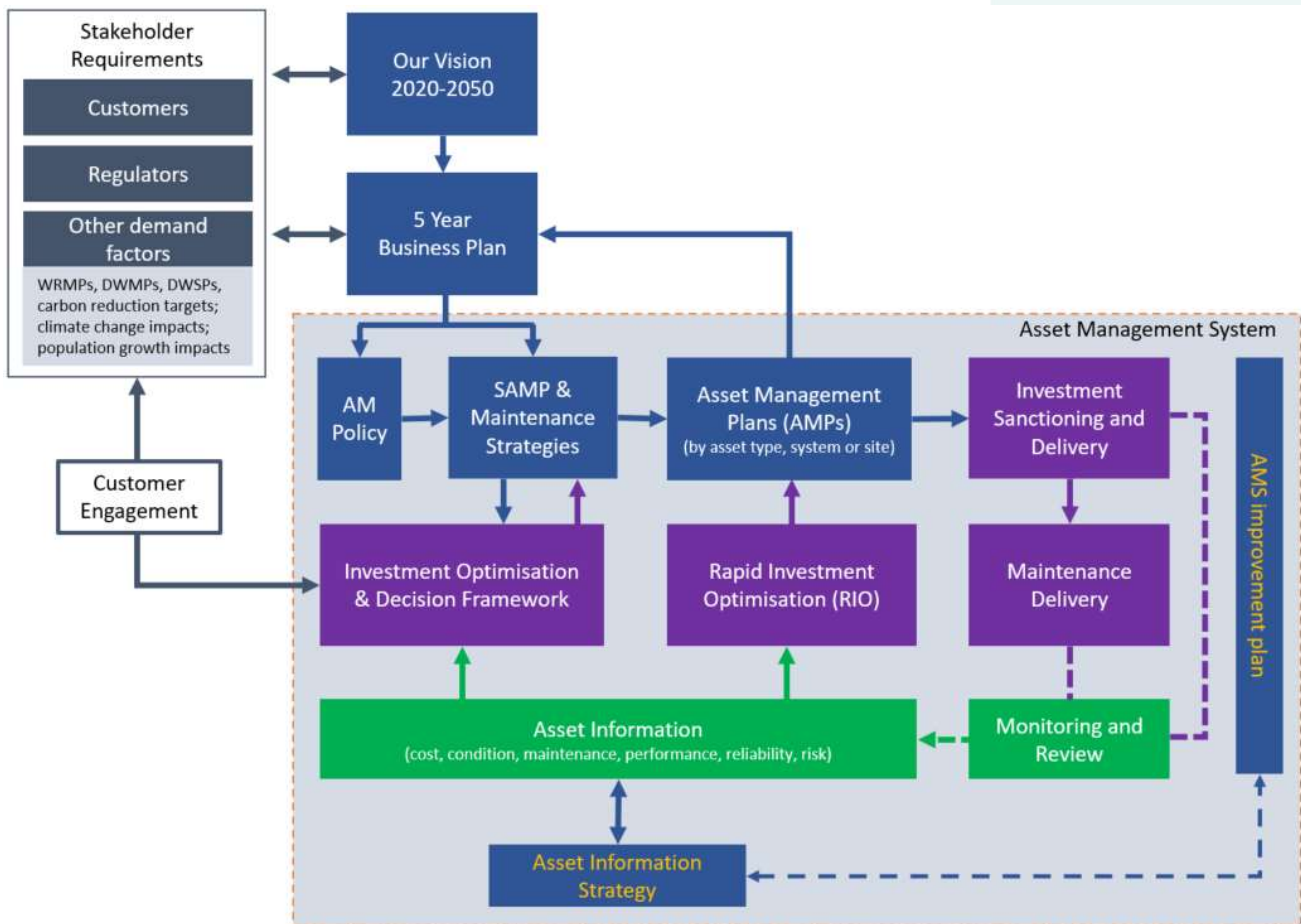
Root cause analysis is carried out particularly on pollution and high priority issues to ensure the issue is addressed correctly.

## **Our asset management toolkit**

We have risk models that look to assess each equipment item or pipe individually as to its current risk (given factors such as age, condition, location, material, failure history etc), and use this to forecast forward risk to see what could happen in the future to service and performance as a result of asset deterioration and external factors such as climate change. We have a suite of statistical, hydraulic and simulation models that allow us to do this.

These models are generally built on a similar structure – breaking down the component parts of risk into the probability of failure, probability of service consequence, and the value and consequence of the failure of service together. We can then see the impact of investment in terms of the change in risk.





Valuing and considering risk in this way allows us to recognise that we can adopt differing levels of risk tolerance for assets depending on levels of system redundancy and our ability to respond and recover from events. Considering risk in this way allows for a line of sight to be established between probability of failure, consequence of failure, impact on embodied and operational carbon as well as the values customer place on different service measures, i.e., customer priorities between flooding and pollution events.

Examples of models include:

- Statistical survival data models that assess the risk of asset failure, mean time to failure, and mean time to restore
- Reliability simulation models to look at the risk of process and works outages at treatment works and pumping stations given the works configuration, load and the extent to which resilience is in place (e.g. redundant assets, hydraulic modelling, SAGIS water quality river catchment modelling.)
- Simulation models that assess wider impacts such as river quality and climate change. For example, climate change models that look at the impacts on the soils across the region and how this may affect asset health: increase in wetting and drying cycles as a result of climate change may then impact on the risk of water pipes or rising mains bursting more resulting in a high level of failure.

These models provide up to date information on individual assets, processes, and works. This provides a wealth of information of the risk of failure and potential impacts on customers and the environment, but also wider impacts such as the carbon and health & safety risks.

We use software tools to process the outputs of these models as we look to make repeatable, evidence-based decisions.

For example, the Asset Investment Manager (AIM) tool, which is populated and routinely updated with predictive analytics around asset deterioration and service impact assessments, uses equipment or pipe level risks to generate programmes of investment – to support the delivery of current plans or to develop future plans. These tools allow huge volumes of assets to be appraised consistently and quickly.

Tools such as AIM allow us to prioritise and optimise investment, risk and service in a transparent and repeatable manner. It is a bottom-up asset level analysis which means we can target the right assets for investment, and aggregate up to show risks, costs, and investment benefits at any level, including asset, system, organisational, cohort and spatial/geographical area.

We can apply multiple investment scenarios to identify the costs and benefits of differing investment strategies. For example, the investment to maintain risk and performance, or to make incremental improvements. Uncertainty can be added in, allowing an adaptive plan to be developed and we have used these too to find the least cost way to deliver asset health improvements over time.

We can then ensure that when we invest to change our risk position, it is either done on the grounds of value for money for customers, to meet legislative obligations or the risk has become unacceptable to stakeholders.

Notably for DWMPs, our performance aspirations have been updated to reflect latest Government guidance and higher environmental ambition, by focusing on improvements to sewer flooding, river water quality, bathing waters, pollutions and storm overflows.

By assessing the current asset health of our systems within our DWMP's, as well as exploring future challenges around climate change, resilience and growth, we are able to calculate risk within catchments and appraise a range of interventions which can be implemented into our long-term plans. This new framework provides greater transparency to stakeholders, it encourages increased collaboration and co-creation of schemes and supports the balancing of investment needs to deliver resilient communities.

## **How will the use of DWMPs affect our asset management processes?**

DWMPs are a catchment planning approach and we can see many positive benefits associated with spatial planning of asset improvements in this manner, whereby catchment activity is prioritised based upon the performance of the catchment and that solutions are developed alongside the need of the catchment as a whole. Such spatial planning lends itself well to engagement with wider stakeholders and with collaboration with other RMAs, such solutions can be co-created together with agreed benefits and deliverables.

The challenge to the approach will most likely be whereby there is a constrained funding position which leads to difficult choices on priorities and the timing of delivery. These will always be difficult choices, but we consider that catchment-based approaches allow a common shared understanding of priority and allow the system of assets and risk

[DWMP Technical Summary](#)



understanding to be developed in consistent, robust and evidentially based manner.

We are already considering and piloting how the DWMP approach to planning, changes the way in which we plan and deliver asset management improvements across catchments. Historically the industry has delivered improvements based upon a least cost prioritisation of individual assets in silos for each asset group. A catchment-based systems approach allows systems thinking risk appraisals to be brought together to inform system improvements rather than individual asset improvements which should lead to more sustainable system decisions and releasing wider benefits across the catchment.

Such a catchment approach is more able to bring together innovations in monitoring and improvements in targeting operational practice through proactive cleansing, storm overflows operation. Targeted customer engagement and behavioural change can also be targeted to see direct improvements on each catchment.

On the face of early application, the catchment approach appears to move away from a least cost investment on individual assets but leads to more sustainable and robust systems which are more able to withstand headroom and climate change impacts. This is more aligned with the sector and regulatory desires on long term thinking and resilience.

## Introducing our first ever DWMP

DWMPs reflect two of Defra's aims: its 25-year environmental plan and its flooding risk action plans. They reflect long-term plans for the period 2025 to 2050.

For us, our DWMP is an important part of our overall business plan. Today the DWMP is about more than just flooding and covers our entire wastewater plan including our response to the Storm Overflow Discharge Reduction Plan reflects future pressures on our networks and treatment works, and the step change in environmental protection that we all want to see, along with the investment required to make it happen.

This is our first DWMP and we will publish one every five years. Our plan is informed by the specific views and insights from our customers and stakeholders on our draft plan that we published in 2022, and also reflecting the ongoing insights from them which we have gathered over time.

### What is a DWMP?

DWMPs are long term, collaborative plans for the next 25 years.

They are an opportunity for customers, stakeholders and regulators to understand the investments needed to address future risks such as:

- **Population growth** – new housing developments and increased occupancy of existing homes
- **Climate change** – more volatile weather, severe rainfall events, sea level rises and coastal erosion
- **Urban creep** – paving over of urban areas such as parks and gardens, removing natural soakaways for rainwater surface run off.

The industry-led technical framework set for DWMPs means that all water companies are required to look at a specific set of risks in a consistent way, namely how to prevent sewers, treatment works and storm overflows from getting overloaded with increasing levels of rainfall and growth in order to protect customers and the environment. All water companies are facing these future risks and a consistent framework allows for comparisons across companies and at the national level.

But DWMPs have the flexibility to allow other bespoke risks that water companies face to also be explored – and we have also considered the wider impacts of climate change risk on our assets, and improvements in wastewater treatment standards to reflect customer and stakeholder views and be in line with proposed legal targets on future discharges.

Our DWMP therefore sets out the risks that we face now and in the future with an without investment, increasing the transparency of our plans, and providing a clear linkage between risks that we face and investment decisions that we make.

## The principles behind DWMPs

All DWMPs are based on a common set of principles and a technical framework developed by the water sector in conjunction with UK and Welsh Governments and the environmental and economic regulators (Natural Resources Wales, Environment Agency and Ofwat).

DWMPs need to meet six key principles:

1. **Be comprehensive, evidence based and transparent** – in assessing, as far as possible, current capacity and actions needed in five, 10 and minimum 25-year periods considering risks and issues such as climate change. Plans should also align, as far as possible, with other strategic and policy planning tools.
2. **Strive to deliver resilient systems** – that will meet operational and other pressures and minimise system failures.
3. **Consider the impact of drainage systems on immediate and wider environmental outcomes** – including habitats and in developing options for mitigation to include consideration of environmental net gain and enhancement.
4. **Be collaborative** – recognising the importance of sectors working together to consider current and future risks and needs and to deliver effective solutions, setting out how they will do this, how they have engaged with and responded to stakeholders.
5. **Show leadership** – in considering the big picture for an organisation's operational capacity to develop and deliver the plan, and mindful of linkages with other strategic planning frameworks.
6. **Improve customer outcomes and awareness** – and ensure solutions and actions provide both value for money and consider societal benefits.

Source: Defra

Following these principles, DWMPs can help to identify problems, clarify responsibilities of the respective agencies involved, and promote a better understanding of drainage and flooding issues.

## The structure of DWMPs

DWMPs are structured into three levels of detail, in order to encourage continued and effective engagement between companies, stakeholders and regulators – at the local level and across the company overall.

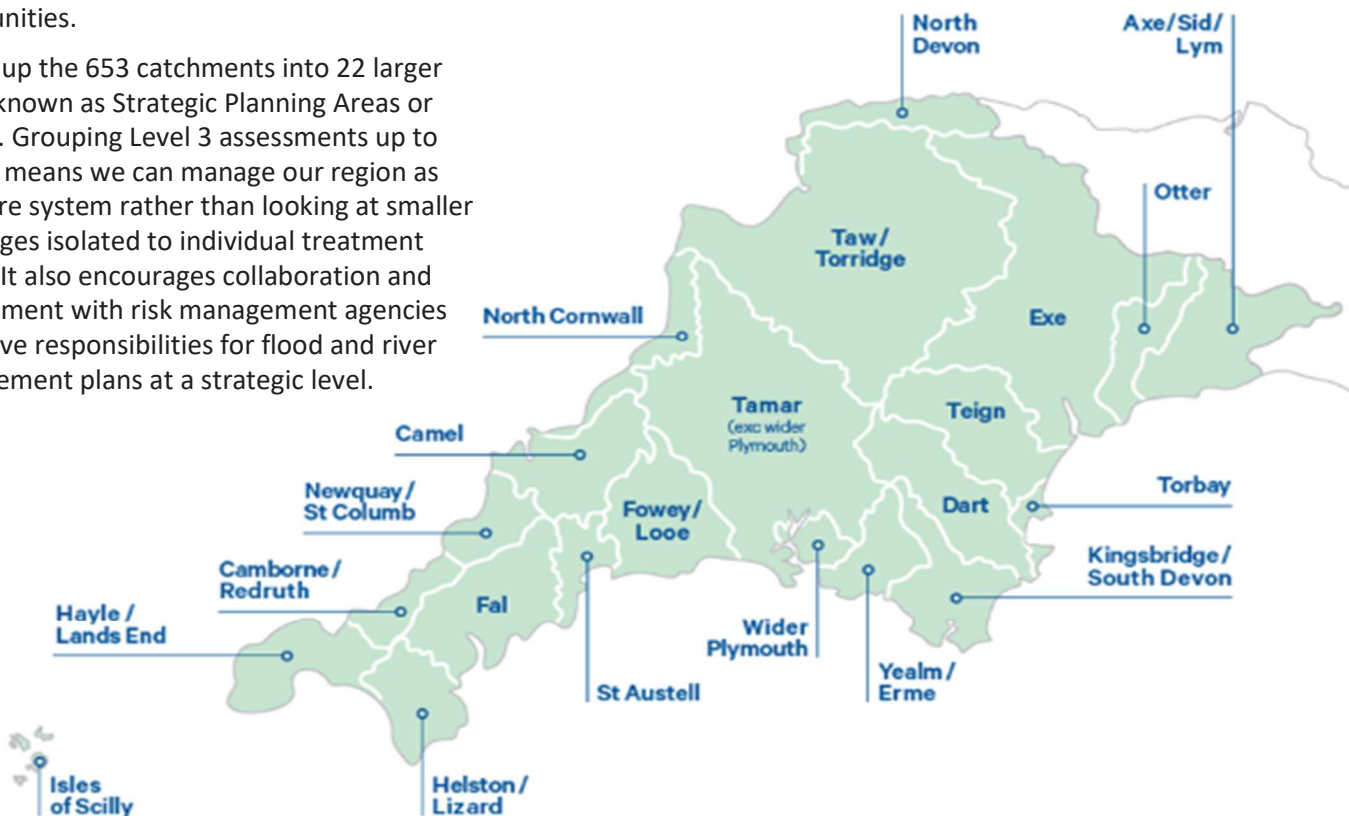
This document shares our strategic objectives and performance targets across our region and we call this our Level 1 Plan. Grouping at this level ensures that we can understand the risks that we face overall which can then inform strategic discussions with our regulators, stakeholders and with Defra. The objectives and targets we detail here are cascaded down into our more detailed plans, ensuring they're connected to local level needs.

We identify our risks at a local level, in our Level 3 plans and these are rolled up into this Level 1 Plan to ensure everything is connected.



Each wastewater treatment works in our region has an area that it serves – we call these areas catchments and currently, we have 653 catchments. When we talk about our plans at catchment-scale, we call them Level 3 plans. Working at catchment level means we can identify local risks, and work with our local partners to develop the right mitigating options for communities.

We group the 653 catchments into 22 larger areas, known as Strategic Planning Areas or Level 2. Grouping Level 3 assessments up to Level 2 means we can manage our region as an entire system rather than looking at smaller challenges isolated to individual treatment works. It also encourages collaboration and engagement with risk management agencies that have responsibilities for flood and river management plans at a strategic level.



## The Isles of Scilly

Not included in the 653 catchments that went through the DWMP process, are five catchments on the Isles of Scilly. Given we only recently took over responsible for wastewater on the islands, we have limited operational experience. Whilst acknowledge the need to invest to improve resilience and environmental protection, we cannot generate a quantitative DWMP for the Isles of Scilly at this time.

We have reviewed the most recent performance data and our growing knowledge of the asset base, risks and issues and our investment programme to 2025, to develop a DWMP based on this experience and our planned programme of investment to 2030, and shared with regulators as part of the PR19 business plan submission.

The Level 2 plan for this region can be found on our website.

## Integrating our plans

Our DWMP forms a key part of our wider plan to deliver our 2050 vision. Our ambitious programme demonstrates a step change in both the scale and approach of how we address environmental risks in our region. We will look for opportunities to integrate our DWMP work into wider investment initiatives to maximise benefits for the environment and our customers.

As we deliver our plan we will look for opportunities to integrate it with our existing planning frameworks and the objectives of our partners and stakeholders across the south west.

Taking a catchment-based approach to planning and adopting a 'Green First' strategy embedding nature-based solutions across our programme, we are designing in opportunities to produce multiple benefits from our solutions.

## How we developed the plan

To develop the plan we have followed a number of key steps set out in the technical framework developed by the industry and endorsed by regulators and Defra.

- Firstly, we collated all the available information about our current performance across the region to ensure we fully understand how we're doing now, and whilst we're performing well on many aspects of our work, it's clear there are things we can do better.
- Secondly, we considered some of the key challenges facing our region over the next 25 years and beyond which are most likely to impact on how rainwater and wastewater is managed in the future. These challenges include climate change, population growth and urban development. The combined effects of these challenges will increase the amount of rain and wastewater needing management. Sea level rise will also create new challenges for the way in which we manage wastewater as many of our sites are located on the coast.
- Thirdly, we model a range of different scenarios and analyse options, to predict the range of actions that we might put in place in each part of our region over the next 25 years.

- In parallel, we have taken into account the views of customers and stakeholders who want us to minimise the impact of our work on the environment, keep bills reasonable whilst maintaining service levels and explore how nature can help solve other wastewater management challenges that we face.

These scenarios cover all of our wastewater investment needs - considering investment to ensure coastal resilience, asset maintenance, and energy recovery from sewage - to build our entire wastewater plan.

In following these steps, we have been guided our Water Industry National Environment Programme, as well as the environmental ambition of Defra's 25 year environment plan, and the environmental targets of the Environment Act 2021. These include:

- Investigating and reducing storm overflow discharges
- Investigating and improving bathing water and shellfish water quality, usually through a reduction in storm overflow discharges
- Investigating and protecting high priority sites such as SSSIs and SACs that are impacted by our drainage and wastewater treatment activities
- Investigating and reducing the impact of nutrients and chemicals from our WwTW discharges, especially Phosphorus, usually by increasing treatment capacity to meet more stringent permit levels
- Investments at WwTWs to meet more stringent requirements under the Urban Waste Water Treatment (England and Wales) Regulations 1994, driven by population growth and to provide increased treatment capacity at septic tanks
- Increased monitoring at WwTWs, SPSs, emergency overflows, and in rivers close to our storm overflow discharge points
- Investigations into future potential improvements in the treatment of nitrogen and microplastics
- Investment in bio-resources

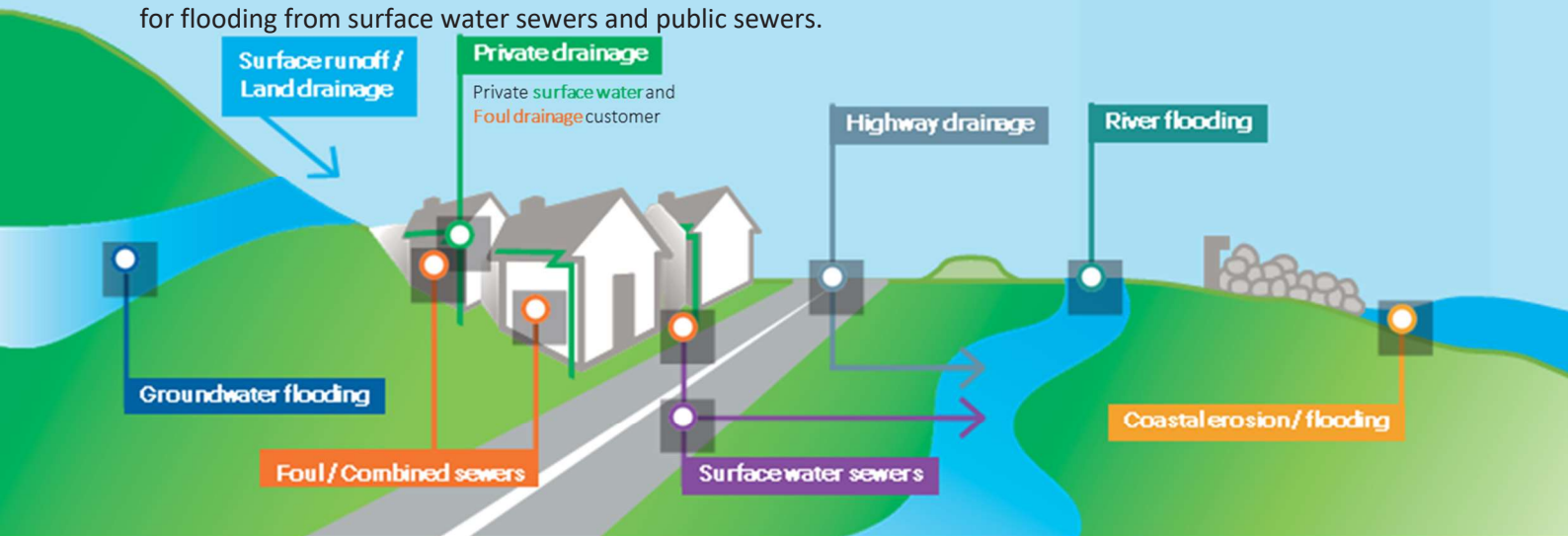
In addition, in line with customer views we have set the target that there is no deterioration in other aspects of our wastewater operations, and the benefits of WaterFit are maintained to 2050 – such as high levels of asset health performance, and water quality that supports all year-round bathing at coastal and inland bathing waters.

The proposed government environmental targets are key contributors to our plans – in effect accelerating our plans to reduce the use of storm overflows and raise standards of wastewater treatment. We have not considered scenarios that fail to meet these targets, but we have looked at different paces and profiles of investment to meet the 2050 targets – and tested these against customer needs. This is how we have built our plan.



## Working with others to manage flood risk

The diagram below illustrates the responsibilities for drainage showing the complexity of ownership and why it is important to have these plans in place. There are many sources of flooding risk, and we are responsible for flooding from surface water sewers and public sewers.



Many organisations work together to manage the risk of flooding across the region so it is important that the DWMP clearly sets out what South West Water is prioritising so that we can work effectively with our partners. This helps us to manage any conflicts or disagreements where responsibilities may be unclear, identify partnership opportunities where we can work together for mutual outcomes and share resources.

Roles and responsibilities for managing flood risk are set out below:

Location	Description	Responsibility
<b>Surface runoff / Land drainage</b>	Landowners are responsible for their land drainage and must not cause problems for neighbours	<ul style="list-style-type: none"> <li>• Lead Local Flood Authorities</li> <li>• Land owners</li> </ul>
<b>Highways</b>	Surface water on roads, highways and pavements, blocked road drains/gullies and overgrown verges	<ul style="list-style-type: none"> <li>• Highways Authorities</li> <li>• National Highways</li> </ul>
<b>Groundwater</b>	Waterlogged ground when water pools on the surface	<ul style="list-style-type: none"> <li>• Lead Local Flood Authorities</li> <li>• Landowner</li> </ul>
<b>Rivers and watercourses</b>	Water draining into rivers and streams from nearby land	<ul style="list-style-type: none"> <li>• Lead Local Flood Authorities</li> <li>• Environment Agency</li> <li>• Riparian Owners</li> <li>• Landowner</li> </ul>
<b>Coastal / Tidal</b>	Rough seas, high tides or storm inundation on lower land	<ul style="list-style-type: none"> <li>• Local Authorities</li> <li>• Environment Agency</li> </ul>
<b>Surface water sewers</b>	Most properties drain rainfall to public sewer, including flows from gutters/roads that end up in public sewers. Highway drainage is provided for rainfall onto the highway but in reality also includes water from fields/other property that finds its way onto the highway	<ul style="list-style-type: none"> <li>• <b>Water and wastewater companies</b></li> <li>• Local Authorities</li> <li>• Housing Associations</li> <li>• Private land owners</li> <li>• Highway Authorities</li> </ul>
<b>Public sewers</b>	Sewer flooding from manholes and covers	<ul style="list-style-type: none"> <li>• <b>Water and wastewater companies</b></li> </ul>
<b>Private sewers</b>	Flooding from cesspits/septic tanks, toilets or internal drains	<ul style="list-style-type: none"> <li>• Homeowner</li> </ul>

## What is happening today?

To be able to measure the effectiveness of our DWMP we need to look at how we are performing now, and what we need to do to improve this position.

Our DWMP ensures we can continue our water recycling processes effectively. Our role is to collect wastewater from our homes and businesses once used, along with the rain that falls and has nowhere else to go, to treat it to make it safe to release it back into the environment – where it travels to the sea and the cycle repeats.

When this works as intended – homes, businesses, rivers and sea are all protected; only rainwater that cannot drain naturally goes into our sewers alongside wastewater to be transported to wastewater treatment works to be treated to high standards before being safely returned to rivers and seas.

So, an important part of our DWMP is understanding how we are progressing against this standard, so we can understand what we need to do next to continue to improve this position.

Today, around 98% of everything that goes down the sewers goes through this process and is released safely back into rivers and seas – but we need to close the gap and rely less on storm overflows.

We know that in the last thirty years, we have made progress in improving the recycling process. There has been significant investment in infrastructure and partnership work, with our 'Clean Sweep' investment resolving the legacy practice of discharging untreated raw sewage into the sea, delivering some of the best bathing waters in Europe. There has also been investment to drive the risk of sewer flooding to historic low and industry leading levels.

Our business plan for 2020-25 continues to provide improvements in bathing water quality, sewer flooding, sewer blockages and collapses, risk of sewer flooding in a storm, and biodiversity measures. Whilst we are on or ahead of target on c.80% of our wastewater performance commitments, we are also aware that reducing pollution incidents and storm overflows is a key area of focus for our plans.

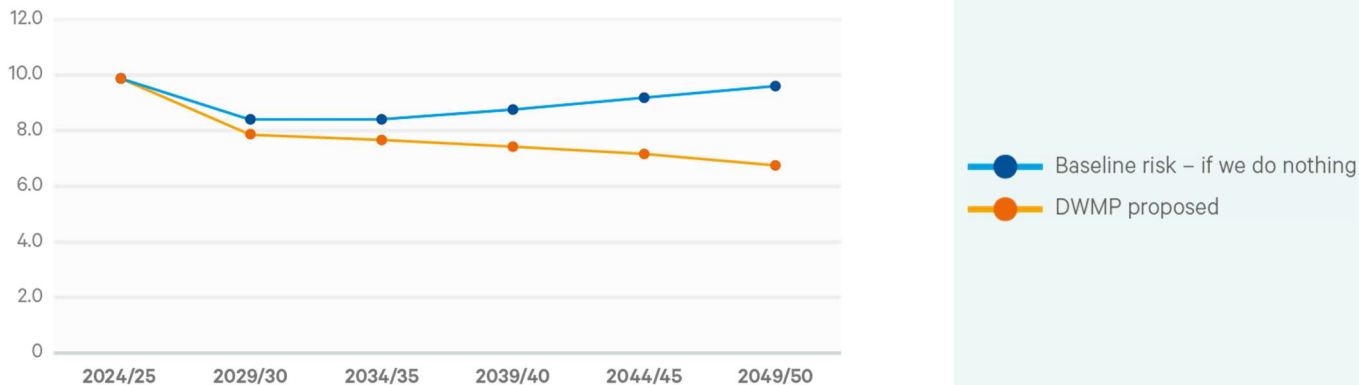
### Blockages and collapses

An important part of our current plans is to ensure the health of our assets – ensuring they are able to deal with flows in the systems, maximising the capacity for future changes.

The health and condition of our assets is good and on target. Blockages and collapses can quickly affect the capacity of the systems, so it's important to invest to bring these down. Ensuring the asset health of the asset base avoids the need for expensive, complex drainage enhancements.

## Sewer collapse performance and targets

( per 1,000km of sewer)



## Sewer flooding

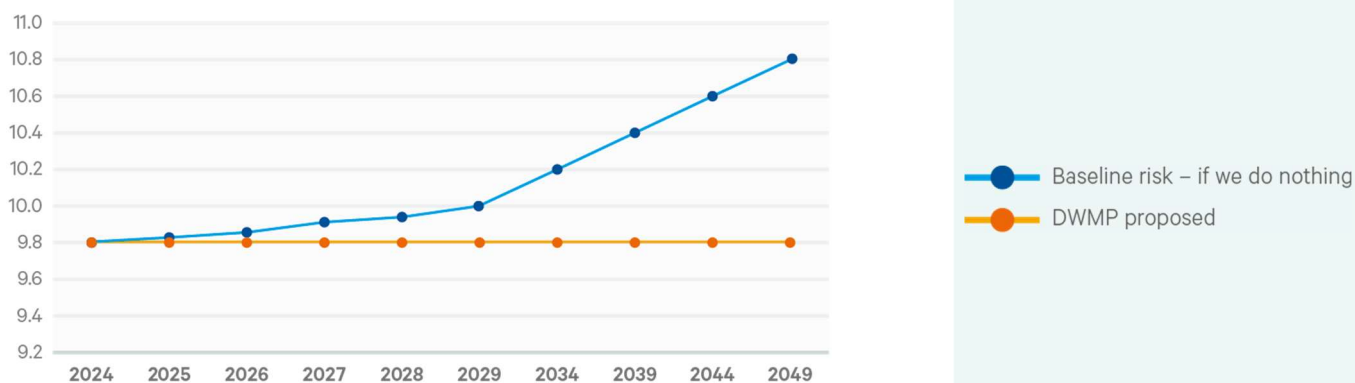
Sewer flooding can have a devastating effect on customers, so over the years it has been a huge priority to bring this down. We continue to do all we can to reduce the likelihood of these events, and we are ahead of our commitment in this area. The graphs below show our current performance and what we're planning to achieve by 2025.

Despite serving 1.7m residents and an increasing number of visitors every year, we now experience less than 100 internal sewer flooding events per year. As well as the number of internal and external sewer flooding incidents a year, we also estimate the percentage of customers at risk of sewer flooding in a severe storm.

The **risk of sewer flooding in a 1 in 50-year storm** measures the number of properties that are at risk from sewer flooding due to intense rainfall, currently expected to occur once every 50 years as it has a 2% chance of occurring in any one year. Any catchments with more than 4% of properties at risk of flooding under this measure is classified as having significant risk. Our performance is good in this area with only c.10 percent of our c.653 catchments over this threshold.

## Properties at risk of flooding in a 1 in 50 year storm

(%)



## Pollution incidents

In the South West Water region, those pollution incidents that cause the greatest harm (Category 1) are infrequent and we have only had one incident in the last four years. There are some incidents (Category 2) that may result in a risk of, or temporarily closing a bathing water. Within our region these occur only a few times per year. The final category of

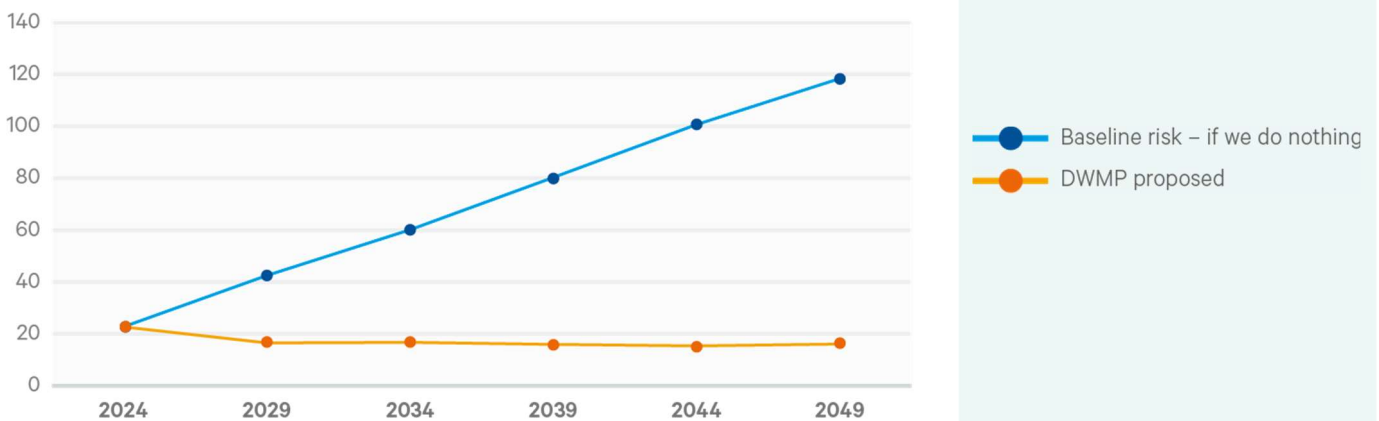
incidents (Category 3) are those which cause little or no harm but may be visible to the public, e.g. an escape from a manhole.

Whilst in the last year we have made progress in reducing the number of pollution incidents that we cause; we know there is more we need to do.

So, driving down the number of pollution incidents from our assets is a key focus area for us and we have made considerable progress. But lasting change can take time. We have delivered a significant improvement in pollutions performance, with c.30% reduction last year, and 50% over the past two years. 2022 was our lowest ever level of pollutions and we are already tracking to deliver lower levels of pollution again in 2023.

Serious pollution incidents are also down by 75% – from eight incidents in 2021 to two in 2022. Behind our pollution reduction is our Pollution Incident Reduction Plan (PIRP) which sets out investment, activities and changes we are making to deliver lower levels of pollution year on year.

### Pollution incident performance and targets ( per 10,000km of sewer)



### Storm overflows

Storm overflows are designed to release excess storm water into rivers and seas when prolonged rainfall occurs and more water enters our sewers than we are able to safely convey or treat. This helps prevent the risk of sewage backing up, preventing homes and public spaces being flooded by allowing a controlled release at a permitted location. We often use tanks to store as much of the diluted sewage before it is released back into the environment.

Storm overflows have been an important topic of debate in recent months, and we have heard from our customers, stakeholders and regulators that our performance in this area is a priority for them.

Much of the attention on our rivers and waterways has focused on the impact of storm overflows. Even though the Environment Agency’s data indicates that only 1% of RNAGs are caused by storm overflow spills, we know these can cause short term water quality issues and cause distress to local communities and are not acceptable. We have installed monitors at all of our 1342 storm overflow locations, which measure how often the storm overflows operate and for how long.

Whilst we do not directly measure the volume of sewage discharged

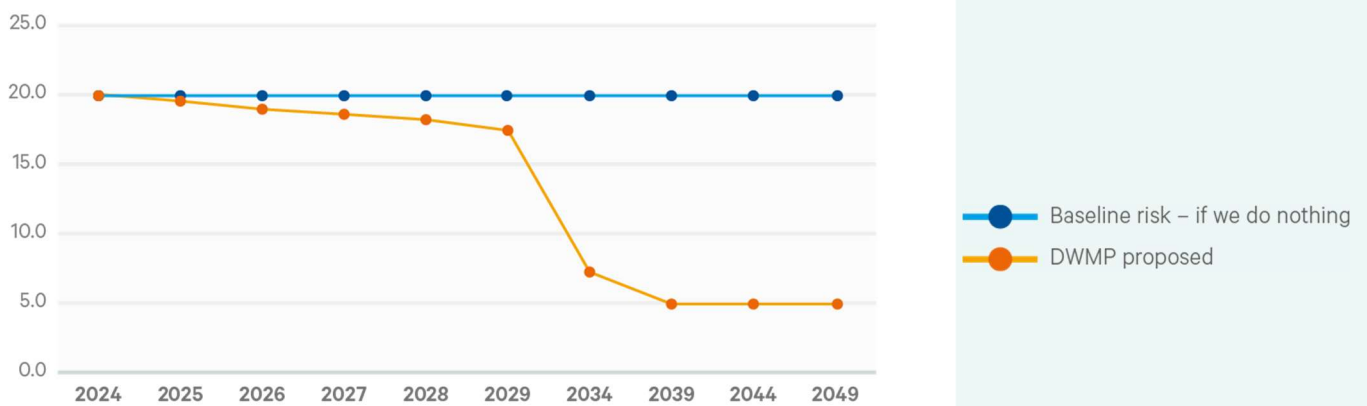
through storm overflows, we have used hydraulic models to compare the calculated volume discharged through overflows to that treated and have found that 2-3% of the volume in the sewers is discharged through storm overflows. So whilst we currently treat c98% of all wastewater which enters the system we agree that 98% is not enough and we need to reduce the number of discharges further.

In the last year, through WaterFit, we extended our storm overflow monitoring programme. 100% of storm overflows are now fitted with Event Duration Monitors (EDM Monitors) and we are using this data to drive our plans as we target no more than 20 spills per location by 2025.

At bathing water beaches and environmentally sensitive areas we will go even lower, achieving no more than 10 per year because we know how important they are to our communities, stakeholders and businesses.

To deliver this, we are upgrading assets and increasing storage at wastewater treatment works, pumping stations and network overflows across the region, as well as identifying ways to reduce surface water flows and groundwater infiltration into the wastewater network.

### Storm overflows programme (average spill per overflow)



Spills at beaches was a particular focus in 2022/3, with a 50% reduction in total number of storm overflow spills and 75% reduction in the duration of spills across the summer bathing season compared to 2021. 79% of all storm overflow monitors at beaches recorded fewer than five spills in 2022. Over the course of the year, the number of spills at beaches fell from 28 to 21.

We have also launched WaterFit Live which provides information on our designated bathing waters where we have a storm overflow alongside information on our improvement plans and wider beach information. Real-time reporting at beaches and rivers will be developed throughout 2023/24.

Our DWMP investment will ensure that this step change in storm overflow reductions will be resilient to the impacts of climate change and will support delivery of the government’s targets on storm overflows.

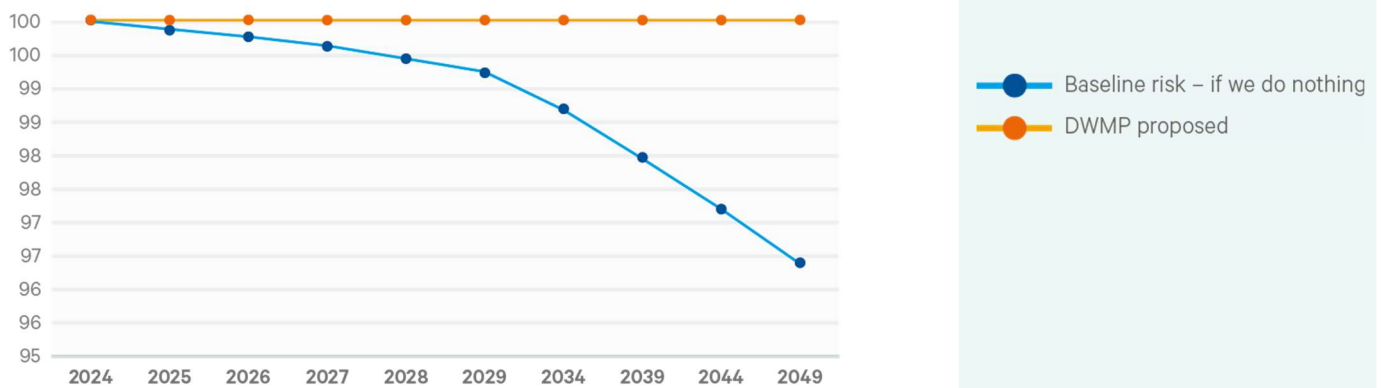
## Compliance with environmental permits at wastewater treatment works

Discharges from our wastewater treatment works are subject to strict environmental permits which must be met. We have seen wastewater treatment processes dramatically improve, allowing environmental permits to tighten – so that more contaminants are removed from wastewater discharges that go into rivers and seas. And we have seen improvements in our performance as we continue to target 100% compliance in this important measure.

Wastewater treatment works are designed to cope with a particular volume of discharges. When wastewater treatment works receive loads over and above the designed levels, the risk of failing environmental permits increases and there are more storm overflow spills to rivers and seas. We continually invest to increase our ability to cope with additional wastewater and rainwater flows into works to protect the environment and prevent pollution.

### Numeric compliance performance and targets

(% of WWTW)



We have improved compliance at our wastewater works, with performance improving to 99.4% in 2022, our best ever treatment works compliance. We are focused on maintaining this performance.

## Bathing water quality

We have 860 miles of coastline and 150 designated coastal bathing waters. We are pleased that our investments in 2021 meant that we achieved 100% of bathing waters meeting standards, with 98% achieving good or excellent quality.

Performance for these standards is measured during bathing water season, from May to September, but we know that our customers and visitors want to enjoy bathing all year round, and we are committed to making sure they can. Improving water quality at beaches within our region ensures that we keep coastal areas available for our residents and our visitors alike, which are important for wellbeing and for tourism: a key component of the economy of the South West.

We know that our customers want to enjoy bathing waters all year round and not just in the bathing season of May to September. This means targeting the total number of spills across the whole year rather than in the summer period. Our current WaterFit plans will target 10 spills on

[DWMP Technical Summary](#)





average at bathing waters by 2025, through targeting additional storage and asset upgrades at coastal wastewater treatment works, pumping stations, and network overflows.

Under the we are required to meet the Bathing Water standards of 2-3 spills per bathing seasons for all storm overflows that are within 1km of a bathing water beach whilst also achieving the 10/spills per annum criteria at the same sites.

## River health – reasons for not achieving ecological good status

Public awareness of the health of our rivers and waterways has risen recently and we are committed to reduce our impact on rivers. One of the tools that we use to better understand the impact that we have on rivers is the Environment Agency’s measurement of river health, known as the ‘Reasons for Not Achieving Good’ (RNAG).

All waterbodies have been assessed for their ecological status, and all of those waterbodies that do not achieve at least ‘Good’ status, must have a reason why, attributed back to the industry or activity responsible.

South West Water’s operational area, almost a third of these reasons are from Agricultural activity or Land Use impact. Almost a half of all reasons are classified as ‘other’ – much of this is the universal spread of atmospheric chemicals such as Polybrominated diphenyl ethers (PBDE) and Mercury.

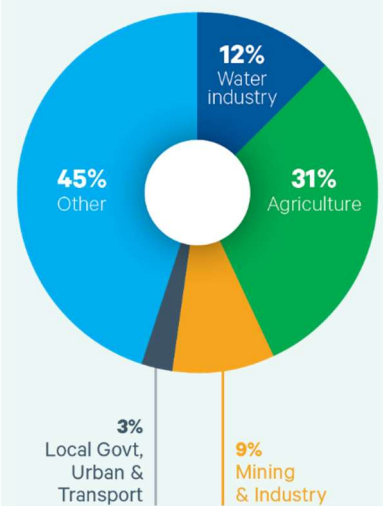
Our operations as a whole, across water supply & treatment, as well as wastewater collection, treatment and disposal, accounts for only 12.5% of the RNAG’s listed by the Environment Agency. We aim to reduce our impact to less than 10% by the end of 2025 as a result of our investment in wastewater treatment process upgrades. – and in the longer term bring this to zero.

We also work with farmers to further reduce impacts on river health. To date, over 115,500 hectares of land has been managed differently to reduce fertiliser and slurry runoff into rivers, protecting rivers important for our drinking water supply. In addition, we have recently announced £1million of funding to help farmers store water on their land to help sustain flows in rivers during drier months, further reducing pressure on this precious resource. This will be delivered in collaboration with the Westcountry Rivers Trust and through Ofwat’s innovation fund.

We are on track to deliver the reduction of our impact by the end of the investment period, and to further reduce our impact by the end of the decade.

### Reasons for not achieving ‘Good’ status in the South West Water area

Cycle 3 (August 2022)  
RNAG summary



Source: Environment Agency

84% of customers worry about the impact of manufacturing and farming on rivers

## WaterFit

In April 2022 we launched our 'WaterFit' plan, a range of investment to support healthy rivers and seas by 2025.

WaterFit has 6 main goals:

- Nurturing Healthy Rivers and Seas
- Putting Nature on Everyone's Doorstep
- Creating and Restoring Habitats
- Inspiring Local Champions
- Creating a Sustainable Future
- Putting People in Control.

One year on we have made good progress. This includes important elements bespoke to our region, our customers and our environment such as bathing water quality, where for the second year running, we have achieved 100% and biodiversity, where we are significantly ahead of target with our innovative Upstream Thinking programme with 107,000 hectares in catchment management, and delivering over 300 hectares of peatland restoration.

### WaterFit delivery one year on – at a glance

Measure	2022		2023
<b>Compliance*</b>	97.5%	→	<b>99.4%</b>
<b>Pollution incidents*</b>	151	→	<b>108</b>
<b>Bathing quality</b>	100%	→	<b>100%</b>
<b>RNAGs**</b>	19%	→	19%
<b>Storm overflows</b>	39	→	<b>28</b>
<b>EDM monitoring</b>	79%	→	<b>100%</b>
<b>Catchment management and habitat creation</b>	95K	→	<b>107K</b>

\* Environment Agency EPA measures

\*\* Reasons for not achieving good ecological status due to water operations

Some of the reductions in storm overflows over the year are due to the drier weather – we estimate that this is 47%, with over half due the interventions we have taken.

We have undertaken 50 interventions in the first year of the WaterFit programme. This includes providing additional treatment capacity at 59 wastewater treatment work and improve efficiency of 54 works by replacing inlet screens. It is also funding investments to pumping stations and increasing our ability to store intense rainfall, reducing the risk of overwhelming our system and creating spills.

More information about WaterFit can be found [here](#)

## WaterFit Live

We know that one of the highest priorities for our customers is the protection and enhancement of the beautiful coastal bathing waters and [DWMP Technical Summary](#)

beaches across Devon, Cornwall and the Isles of Scilly.

During covid, many people reconnected with the environment their doorstep. Increasing numbers of people, residents and visitors alike, took up pastimes like wild swimming and public interest in the state and health of our local environments was heightened.

For some time South West Water have shared information about coastal storm overflows on our website which others, such as Surfers Against Sewage's Safer Sea App, also display alongside information from other sources.

In April 2023 we launched the WaterFit Live app, where, following the installation of event duration monitoring equipment at all storm overflow sites across the region, we share performance data and real time information when a storm overflow is spilling that could affect water quality at designated bathing waters. This allows customers, visitors and water users access to up-to-date information on potential impacts on water quality.

Information about the investment planned to reduce the number of spills is also shown, alongside performance information and data regarding spills recorded from each storm overflow is also shared.

The WaterFitLive app currently focuses on bathing water sites and in the next phase we will show information for all sites where storm overflows can occur. On the app, communities are asked to share their views and thoughts about the investments prioritised in their area and to help us schedule our programme of action over the next fifteen years.

We have also added 'Your Beach, Your Say, Our Investment' functionality to [Waterfit Live](#). Through the app, communities are asked to share their views and thoughts about the investments prioritised in their area and to help us schedule our programme of action over the next fifteen years.

For this reason, we know that the knowledge and experience that customers and coastal communities hold about their bathing waters is invaluable and we foresee real benefit in combining this with our own experience as we develop our detailed local plans. We are working hard with customers and interested coastal community groups in how we develop our plans and prioritise our investments to achieve the best outcome for all users.

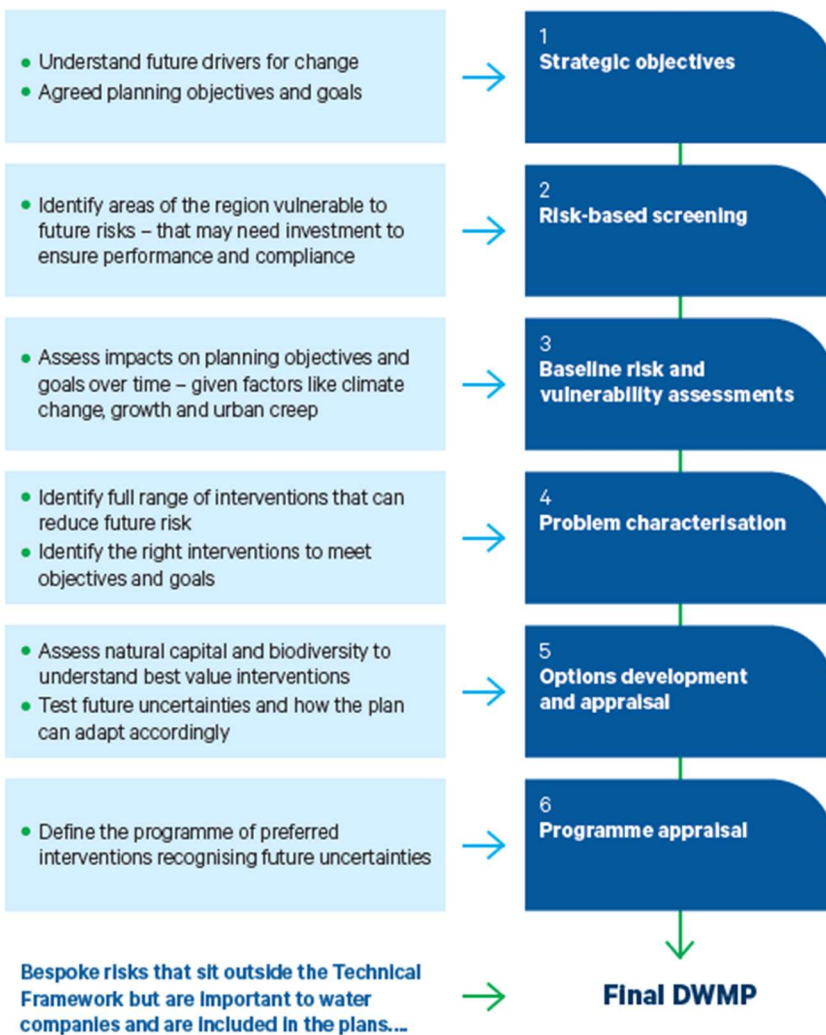
South West Water is signalling that we welcome the voices and input of the communities we serve, as we continue to shape our future investment programme at the beaches and coastal locations that we all care so passionately about which we will use to help inform the implementation of the DWMP over the coming months and years.

To find out more click [here](#)

## Assessing what the future could look like

DWMPs build on our long-established business planning processes, ensuring we can plan for future challenges and mitigate demands placed on our systems.

Recognising the need to work with others to meet future pressures, since 2018 we have been evolving our processes and strengthened our relationships with stakeholders and partners to ensure our future plans meet the needs of the region and our customers, now and in the future.



## Using the DWMP technical framework to assess future risk

Underpinning our DWMP is a robust, analytical framework. Our models and tools provide insights around the risks to the system overall and in the catchments that we serve and interact with, allowing us to identify the right range of actions that we need to take to address the risks we face.

### Planning objectives

We know that our customers and stakeholders want our future performance to maintain the standards and service levels delivered by the investments we have made over the last 30 years, and to go further and make targeted improvements that will benefit the lives of customers and communities, and the environment.

The DWMP is a forward-looking plan out to 2050 on what needs to be done to best manage these risks, using adaptive and resilient strategies, so enhance the quality of life for our residents and visitors and improve the environment.

Due to the open nature of the sewerage asset base, the DWMPs must also consider the impacts of all storm water flows throughout the catchment. This will drive a closer collaboration with other drainage and flood risk management authorities and see SWW invest in these other authorities' plans, where surface water mitigation or attenuation will deliver downstream benefits for SWW and our customers.

Maintaining our target performance in 2025 – including the changes committed to in our WaterFit plan will require additional investment. We expect the demands on our wastewater system to increase, with additional pressures created as a result of the particular challenges faced by the geography and coastal nature of the South West.

In line with the DWMP technical framework, endorsed by Ofwat and Defra, there are six common objectives for 2050. As well as keeping our assets in good health and responding to these common objectives, we are also going further by committing to five additional bespoke objectives. The areas that we will be focusing on are shown below.

Delivering solutions to achieve these objectives will require innovation and collaboration with partners and customers, including some that may be costly and complex to deliver.

When looking forward we understand that factors beyond our control, such as climate change, could undermine the investments we have made to date, and that we will need to invest further just to maintain the 2025 position. Our starting point when developing our DWMP is therefore to ensure there is no deterioration to our performance, and indeed areas of improvement, whilst addressing the impacts of external pressures on our system.



## Measuring our performance

We have set challenging targets for all 11 of our planning objectives to provide transparency to customers and stakeholders on the benefits of investment.

We are aiming to build on the improvements in performance that we've achieved through AMP7. We will take a longer-term view of our assets to manage the impacts of population growth, climate change and urban creep and invest to improve performance in key areas. We'll use our performance data to create insights that will guide our investment at catchment level. Investing on this larger scale will enable us to deliver multiple benefits from our DWMP.

**WWTW with compliance risks** – we're planning to invest in the capacity of our wastewater assets so that they can cope with increases in population and rainfall. We'll be investing in 123 sites over the next 25 years, as we look to upsize them to meet the required flows.

**Reducing nutrient flows** – We plan to invest in 230 WWTW over the next 25 years to reduce the amount of nitrogen and phosphorous entering the river environment. Where our activities are also contributing to 'Rivers not Achieving Good' status, we're also working to minimise our impact on these watercourses.

The collective effects of climate change, urbanisation and population growth, results in increased rain intensity and greater storm water run-off. By 2050, modelling shows if we do not invest further:

- An additional 17,600 properties will face an increased risk of sewer flooding during a 1:50 storm event
- As a result of growth and development an additional 112 wastewater treatment works could be at risk of exceeding their design capacity, potentially causing partially treated flows to enter our rivers and waterways
- More storm water overflows will spill into the environment, reversing the benefits of our WaterFit 2025 investments to achieve cleaner receiving waters

To help us understand how the future change drivers could potentially impact our customers and our assets, we use performance measures as set out in the table below:



Core metrics	2024/25 Target	2050 Modelled	Commentary
Internal sewer flooding Unit number per year	109	41	This is an operational metric concerned with current performance. It is used in the risk-based screening process to identify catchments of future concern and as an early flood indicator if more frequent storms begin to reverse the downward trend.
Number per 10,000 connections	1.37	0.46	
Sewer Flooding risk 1 in 50-year storm event % Population at risk	9.8	9.8	This is a key metric used for modelling future impacts. DWMPs expect to maintain 2050 risk of flooding around the stated 5% figure, despite upward pressures.
Cat 1-3 pollution incidents Number per 10,000 km sewer*	19.5	13.8	This is a key operational metric, concerned with current performance. This is used in the risk-based screening process to identify catchments of future concern and as an early indicator, if storm water overflows and flooding mitigation measures are not delivered.
Storm overflows Average spills	20	<=5.1	This is a regulatory target, and we have modelled the impacts and interventions to meet the target.
WwTWs numeric compliance Permit compliance %	100	100	This is a key metric for modelling future impacts. 100% compliance is a statutory metric.
Sewer Collapses Unit number per year	249	172	This is an operational metric, concerned with performance today. This is used in the risk-based screening process to identify catchments of future concern.
Number per 1,000 km sewer	13.99	6.8	

\* We are keen to commit to a 30% reduction in pollution from 2025 to 2030. As the definition of pollution changes, the levels of targets will also change.

## Delivering multiple benefits

Despite often being driven by individual objectives, we know our schemes can provide multiple benefits. For example, a nutrient reduction scheme to meet the Water Environment (Water Framework Directive) Regulations 2017 has the potential to provide secondary benefits to treatment resilience. Furthermore, if the scheme can be delivered using a nature-based solution, the scheme will deliver wider environmental benefits such as biodiversity net gain and a reduced carbon impact.

There are many cases where interventions can deliver against multiple drivers. For example, an intervention to protect a Site of Special Scientific Interest may also deliver against reducing the impact of nutrients. This has been taken into account in the development of our DWMP.

[The table shares our generic types of interventions. This list of interventions can in many cases deliver multiple benefits.]

	Traditional grey interventions	Blue / green separation & storage	Traditional grey interventions	Blue/green	Interventions at WWTWs – additional treatment capacity
OBJECTIVE 1	P	P	X	X	X
OBJECTIVE 2	P	P	P	P	X
OBJECTIVE 3	P	P	X	X	X
OBJECTIVE 4	P	✓	P	X	X
OBJECTIVE 5	✓	✓	✓	X	X
OBJECTIVE 6	X	X	X	✓	✓
OBJECTIVE 7	P	✓	P	X	X
OBJECTIVE 8	X	X	X	✓	✓
OBJECTIVE 9	✓	✓	✓	X	X
OBJECTIVE 10	X	X	X	✓	✓
OBJECTIVE 11	✓	X	X	X	X

## Understanding the wider impact of the DWMP

In delivering the DWMP, South West Water will deliver extensive benefits for the region, including wider improvements to human health, socio-economic, biodiversity and water quality. Some of these factors, however, could be impacted as the plan is constructed or indeed once intervention and projects are constructed and operational.

The national guidance published by Water UK for producing DWMPs suggests that an environmental assessment to determine the likely significant effects of the DWMP on issues such as biodiversity, air, water, climate, along with other social factors including public health, population and other cultural assets may be required if deemed necessary.

To understand the potential effects across a range of factors, South West Water commissioned both a Strategic Environmental Assessment (SEA) and a Habitat Regulations Assessment (HRA) Stage 1 Screening and Stage 2 Appropriate Assessment.

### Strategic Environmental Assessment

South West Water commissioned a Strategic Environmental Assessment (SEA) of the DWMP at draft and final preferred plan stages in accordance with the standard SEA methodology. A report setting out the findings has been published and can be accessed [here](#)

Overall, the total plan effects and the cumulative effects of the plan are generally neutral or positive to some degree, with moderate positive benefits identified for water resources and flood risk, minor positive for climate change resilience, socio-economic, human health, heritage and biodiversity.

Moderate negative effects are identified for biodiversity and Carbon & Material Assets during the construction phase of a chosen intervention, alongside minor negative effects for the impact of sewer flooding on human health and socio-economic factors and potential impact on heritage features during construction works.

It was recognised that the assessment of likely effects is location specific and that each intervention should be assessed against the SEA objectives at project level.

The SEA is also required to set out measures which could prevent, reduce and as fully as possible offset any significant adverse effects on the environment arising from the DWMP. The report then identifies key such measures which were suggested in response to the draft DWMP and explains how the final DWMP proposes to prevent, reduce and offset such effects.

### Habitat Regulations Assessment

South West Water also commissioned a Habitat Regulations Assessment (HRA) Stage 1 Screening and Stage 2 Appropriate Assessment. The interventions which the DWMP is most likely to be delivered through were categorised in the report into four types. Each type was described and assessed to understand the potential pressures arising. A report setting out the findings has been published and can be accessed [here](#).

The locations of 653 Level 3 catchments were analysed against the locations of the European Sites in order for impacts to be considered in

[DWMP Technical Summary](#)

the HRA.

A total of 400 Level 3 sites were identified as within or partially within a European Site. Given that the DWMP at this stage does not include specific options or detail of the proposed intervention that will be made at each site, the report determined that all 400 sites will need to progress to the appropriate assessment stage.

172 sites were identified as being outside of but within 5 kms of a European site. Of these, 21 were determined to require no further assessment, 58 would require appropriate assessment and mitigation, and 93 would require appropriate assessment as considered in the report.

The plan level appropriate assessment carried out on the 493 Level 3 sites requiring appropriate assessment shows that with appropriate mitigation, no likely impact is expected on any protected sites. Any high level threats associated with the interventions (or options) which are likely to be delivered as the plan is implemented, are expected to be mitigated by siting the intervention appropriately - i.e. not within European Sites or within 500- 1000m of any European Sites.

In addition, the assessment confirms that a further full HRA, including stage 1 screening and stage 2 appropriate assessment will be conducted on each of the 493 Level 3 catchments identified at project level when more information about the specific intervention proposed is available.

Both the SEA and the HRA reports recognise that assessing the impacts of any actual interventions delivered through the DWMP will depend on both the type of intervention and the location. South West Water is fully committed to undertaking the assessments required, alongside monitoring impact and benefits and sharing this information on an annual basis.

## Risk Based Catchment Screening (RBCS)

In applying the risk management framework, the South West region is broken down into Tactical Planning Units (TPUs) known as Level 3 drainage catchments. There are 656 Level 3 catchments throughout the region, each has a WwTW, and they are the basic building block of the plan.

All risk assessments are undertaken at the TPU level (Level 3), however when referencing the risk reports in this DWMP, the aggregated Level 2 plans are used.

In this initial (RBCS) stage, every catchment is risk assessed against a broad range of performance and data planning indicators (17 in total). Many of these data planning indicators are annually audited to check accuracy and robustness. Using the number and nature of indicators breached, it was shown that 280 catchments were performing well or being managed in a way that did not warrant further investigation. As expected, these tended to be small catchments in remote locations, accounting for less than 4% of the region's population.

This left 373 catchments, representing 98% of the connected drainage population, requiring further investigation and therefore needing to advance to the next stage of the risk process. For those catchments that were considered resilient, and did not progress, any change will be picked up as part of the annual RBCS review process.

## Baseline Risk and Vulnerability Assessment – Stage 1

The 373 catchments identified as needing further investigation were subjected to a further risk review. For each of these catchments, a risk rating against six core planning and performance metrics were used to provide the baseline position of system performance (2020 used as baseline year).

As an example, the Level 2 Fal Catchment is provided below.

Group	Description	Value
Physical characteristics	Total population equivalent	98,055
	Baseline sewer length (km)	1,084
Baseline score 2020	Planning objective – internal sewer flooding risk	No significance
	Planning objective – pollution risk	Very significant
	Planning objective – sewer collapse risk	Moderately significant
	Planning objective – risk of sewer flooding in a 1 in 50-year storm	Moderately significant
	Planning objective – storm overflow performance	Moderately significant
	Planning objective – risk of WWTW compliance failure	No significance
Score 2050	Planning objective – risk of sewer flooding in a 1 in 50-year storm	Moderately significant
	Planning objective – storm overflow performance	Moderately significant
	Planning objective – risk of WWTW compliance failure	Very significant

A 2050 position was then derived through modelling, for the above planning objectives, using 1-D and 2-D hydraulic modelling under an agreed set of future change assumptions. These change assumptions all produce increases in water run-off, and the three planning objectives best used to understand how these uncertainties will impact our assets and service levels are listed below:

- Number of properties at risk from a 1 in 50-year storm event
- The impact of increased flows on our Wastewater Treatment Works numeric compliance
- The 2050 target for storm overflows set by the Defra Storm Overflows Discharge Reduction plan guidelines (31 March 2022), Our modelling has assisted in how best we attain intermediary targets, and priorities.

Modelling for future risk was done using the future change assumptions, tabled below.



Scenario	Our DWMP
<b>Climate change</b>	Increase in rainfall intensity of 13% and sea level rises of 0.29m by 2050, based on IPCC scenario RCP8.5 (50th percentile) using the standard industry model by UK Water Industry Research Ltd (UKWIR) to confirm rainfall patterns.
<b>Population growth</b>	ONS forecasts for housing and business growth – this has housing stock change from 1.7m to 2m.  We have flexed the home occupancy rates from 2.2 to 2.4 people to reflect recent trends.
<b>Urban creep</b>	UKWIR models on urban creep. UKWIR’s assessment of the rate of “urban creep” i.e., loss of permeable surface in urban areas is variable across the region.
<b>Per capita consumption</b>	Water use set as per government targets at 110 l/head/day in 2050. This compares to 143 l/h/d currently. No change to business use.
<b>Tourism</b>	No change in tourism of 10 million visitors a year by 2050, each using at least 100 l/head/day of water during peak summer months, applied in catchments known to be holiday destinations.
<b>Solution Costs</b>	The final DWMP plan has used 2022/23 prices.

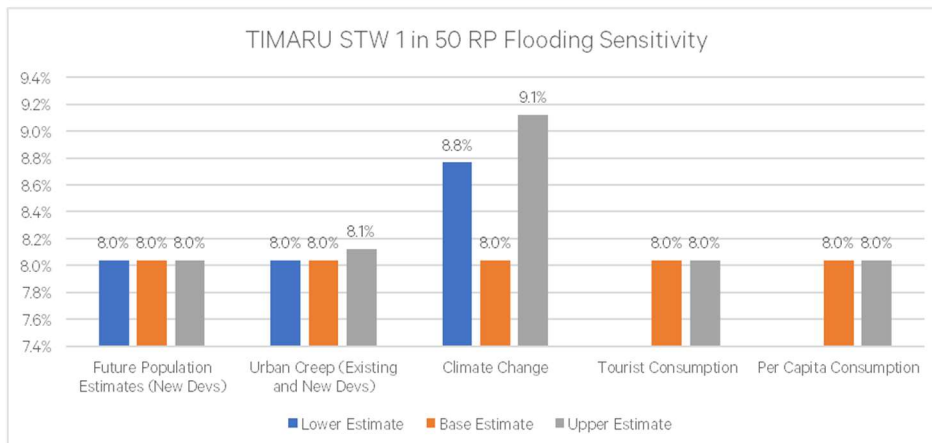
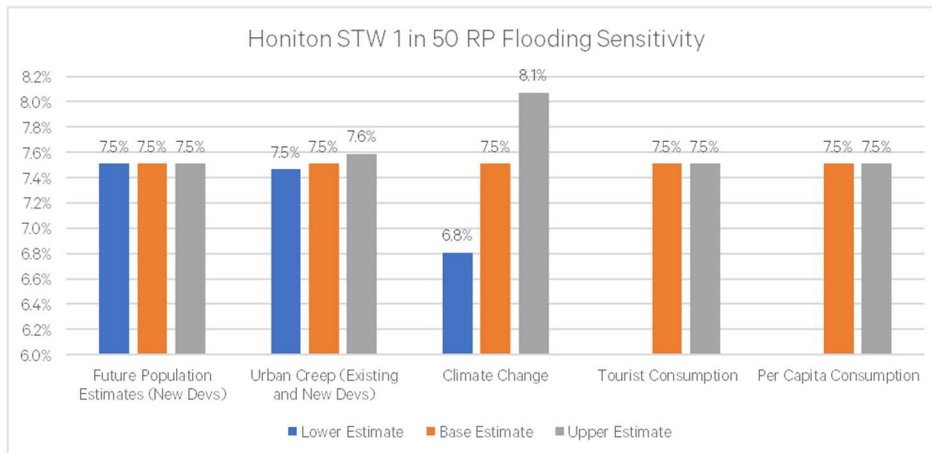
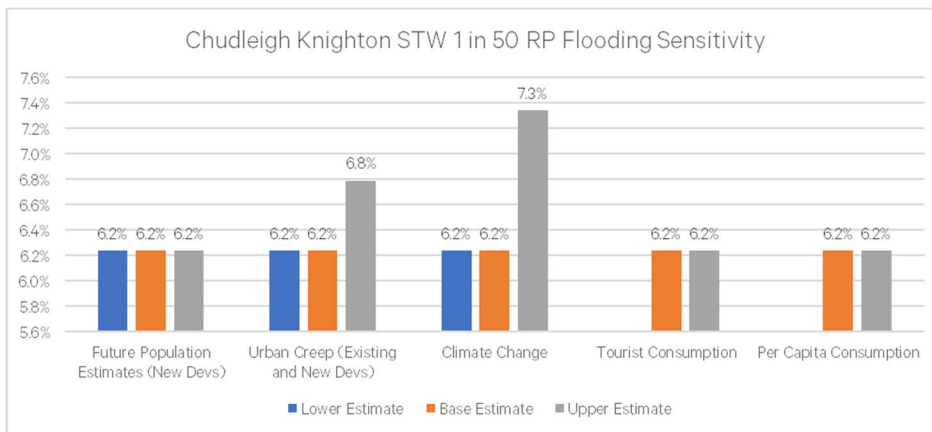
We have conducted sensitivity testing across rural, urban and coastal catchments, to understand which of the future change drivers has the biggest impact. It is clear climate change appears to have the biggest impact on our DWMP modelling. In the sensitivity testing below we ran the following scenarios.

- Urban Creep: Existing and new development urban creep was increased / decreased by 20%
- Climate Change: Base threshold of 13% used (RCP8.5)<sup>1</sup>. Lower threshold of 8% used and upper threshold of 20% used. Uplifting design storm rainfall
- Tourist Consumption: Tourist usage increased by 20% from 100 litres/head/day
- Per Capita Consumption: PCC increased from current predicted 2050 figure of 110 l/h/d to baseline figure of 130 l/h/d.

Example graphs show the impact of these model sensitivities for Chudleigh Knighton, Honiton, and Timaru level 3 catchments.

- Chudleigh Knighton is a small rural catchment, with a population equivalent of 1,078 and approximately 20% combined (foul and surface water) network.
- Honiton is a moderately sized, urban, inland catchment, with a population equivalent of 12,486 and 29% combined network.
- Timaru (Dawlish) is also a moderately sized coastal catchment, that would be particularly impacted by high tourist numbers in the holiday season, Timaru has a population equivalent of 15,071 and 65% combined network (foul and surface water). These three catchments represent rural and urban catchments and, coastal catchments impacted by tourism, reflecting the majority catchment types across the South West region.

<sup>1</sup> RCP 8.5 refers to the concentration of carbon that delivers global warming at an average of 8.5 watts per square meter across the planet. The RCP 8.5 pathway delivers a temperature increase of about 4.3°C by 2100, relative to pre-industrial temperatures. The phrase ‘RCP 8.5’ commonly refers to a climate change scenario of 4.3°C by 2100.



Whilst the sensitivity testing appears to show that climate change has the biggest impact on future flood risk, there are underlying contributory impacts from population growth and urban development that collectively increase the storm water run-off volumes in urban catchments, but not necessarily so in rural catchments. This variance in different catchments has a lot to do with rainfall intensity. In urban catchments more intense rainfall leads to more cases of flash flooding, and greater volumes of surface water which must be managed in a shorter period of time. This overwhelms drains and sewers leading to greater stormwater overflow spills. In rural catchments, so long as the soils are in good condition, more intense rainfall can be absorbed by more permeable grounds and there is less run-off into sewers and storage tanks.

Such a situation emphasises the need for more catchment based solutions and why rainfall intensity can have opposing outcomes in the DWMP versus the Water Resource Management Plans (WRMPs).

## Resilience assessment

Once the RBCS was completed we then assessed our resilience to a range of events that may have a service impact on our assets. This assessment was carried out on 653 sewage treatment works catchments regardless of the RBCS outcomes and our full sewage pumping station asset base.

The needs we assessed were:

- Fluvial and coastal flooding of WWTW and pumping stations
- Power outages
- Outages to remote communications and
- Response recovery plans.

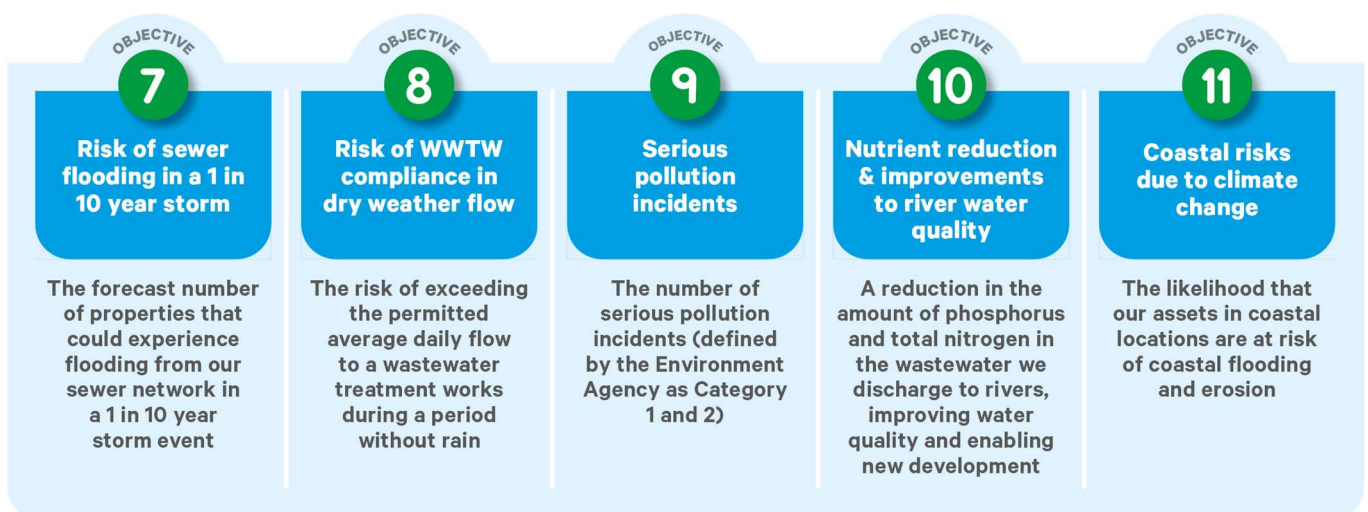
## Baseline Risk and Vulnerability Assessment (BRAVA)

Using the levels of risk category assigned to the planning objectives in the previous BRAVA stage, the risk matrix below was used to assign a letter from A to G to **show the likely timing as to when these risks would compromise each of the planning objectives**, in each catchment.

		BRAVA level of risk result		
Risk pattern	Assessment	2020	2035	2050
A	No risks – system is resilient	0	0	0
B	Long term moderate risk	0	0	1
C	Long term high risk	0	0	2
D	Medium term moderate risk	0	1	*
E	Medium term high risk	0	2	*
F	Immediate moderate risk	1	*	*
G	Immediate high risk	2	*	*

0 (no risk), 1 (moderate risk), 2(at risk) and \*(not tested)

A further five bespoke planning objectives were used, to help us to better understand the nature and complexity of the problems arising, how they relate to one another, and what interventions could be put in place to mitigate them.



The risk ratings were further augmented with commentary around how similar risks have impacted the catchment previously, with Flooding Heat Maps providing visual indicators of the scale of some of the

potential problems within each catchment. This provided a corroborative assessment of modelled outputs against historical performance.

A weighting score was then applied to generate a risk magnitude assessment. Risk category A scored 1, B scored 2, through to G which scored 7. This scoring assessment was used to develop a problem characterisation score and help categorise catchments into Standard, Extended or Complex.

The BRAVA process has also been used to identify /capture wider bespoke risks and or resilience issues that are related to DWMPs.

We have used hydraulic simulation models to understand future risks to our wastewater system. The models help us to understand what can happen when our wastewater systems become overloaded with rainfall, predicting the impact and likelihood of:

- Overloaded sewers, pumping stations and treatment works cause storm overflows
- Overloaded sewers discharging from manholes and lids
- Overloaded wastewater treatment works at risk of failing environmental permits.

We can use these models to understand the potential additional impacts of sewer blockages and collapses – so we can see the impact of improving asset health on the effectiveness of drainage. This helps to ensure we focus first on essential maintenance, before moving onto more complex interventions where the risk may be higher.

Climate change models are also used given the strong link between climate and the amount and intensity of rainwater falling across the region, along with the expected rise of sea level.

The expertise of our operations teams out and about is also important in understanding where risks are emerging, along with local insight from our customers and stakeholders.

## **Problem characterisation, options development and appraisal**

With our improved understanding of the risks and challenges we face, and informed by the views of stakeholders and our operational insight, we have considered the best options – known as interventions – to manage and address these risks.

We have developed a long list of potential interventions, in line with the DWMP Framework and guidance, and these are applied in the catchments – aiming to select the right option at the right time to address the risks in each catchment effectively over the next 25 years.

### **Programme appraisal**

Whilst our models are robust and provide clear findings as set against the technical framework, there is still a lot of uncertainty facing us in the future. To deal with this, we have tested the sensitivity of the results to the assumptions made and the likely benefits of as yet largely untested solutions. Our plan is robust to the assumptions we have made.

Our models can identify areas where nature-based solutions and partnership working is likely to be effective. We have already identified opportunities to work with partners on joint interventions.

### **Bespoke risk assessment**

#### **Analysing wider climate change**

According to the 2021 Intergovernmental Panel on Climate Change (IPCC), we are already experiencing many climate change impacts today, and these are expected to increase, anticipated to be at least 1.5-2°C above pre-industrial levels this century, and with a chance this might go higher. We are already starting to observe the impacts of drought, rising temperatures, flooding, rising sea levels and storm surges, and coastal erosion on our operations.

The South West is particularly vulnerable to climate change, given its 860 miles of coastline, and adjacency to the western approaches of the Atlantic Ocean, exposing the area to impacts from rising sea levels and storm intensity. Given this, assessing climate change risks, and the potential impacts, and possible mitigations on our various operations, assets and networks, is an ongoing and iterative process.

Climate change is predicted to lead to sea level rises and coastal erosion in our region. This is a significant risk to us in the South West given our long coastline and the western approaches of the Atlantic Ocean.

The IPCC models and predicts future climate by making assumptions about the changes to our weather and environment. Representative Concentration Pathways (RCPs) are sets of assumptions that represent plausible and possible climate change futures. RCPs represent the levels of temperature change that result from each scenario, ranging from RCP2.6 where greenhouse gas emissions are strongly reduced and global average temperature rises by 1.6°C by 2100 relative to the pre-industrial period. In contrast RCP8.5 is where greenhouse gas emissions continue to grow without any limit, and the global average temperature rises by more than 4.3°C by 2100. RCP6.0 is a medium stabilisation pathway.

We have analysed what this could mean for our assets using the 2019

[DWMP Technical Summary](#)

Environment Agency flood risk assessment climate change guidance. This provides information on sea level rise due to the anticipated effects of climate change.

Applying these sea level rises to our asset mappings, we can see that without additional coastal flood defences our wastewater assets will be affected, with at least 8 wastewater treatment works and 155 sewage pumping stations at risk of inundation.

Sewers in 9 coastal locations are impacted also. The kilometres effected varies depending on high tide, storm event and climate change scenario. In a worse case climate change scenario and 1 in 200-year storm event, just under 200km of sewers would be at risk of inundation. Overall, >8% of our wastewater assets are at risk from sea level rise.

We continue to track these impacts, reflecting Met Office guidance into our analyses. For our final DWMP, we have prioritised the need for investment at each site between now and 2050, and we will work with risk management authorities as part of the local Shoreline Management Plans in those areas at highest risk of coastal erosion and sea level rise.

### Analysing investment to improve wastewater treatment standards

Our DWMP includes a significant programme of investment to continue to reduce the nutrient loading – namely phosphorus and nitrogen – in our wastewater discharges to the river environment and to reduce the risk to these environments from the potential threat of eutrophication.

This will see phosphates in discharges to rivers reduce, with the current targets set to an 80% reduction nationally in nutrient loading in wastewater discharges by 2038. This investment will also reduce the risk of eutrophication and deliver water quality improvements in many rivers and streams in the south west region, leading to improvements in the Environment Agency's measurement of river health, known as the reasons for not achieving good (RNAG) ecological status.

Approximately 150 our treatment works have been identified for investment to deliver these improvements from 2025 to 2035, which will contribute to achieving this objective, and we anticipate further improvements will be required in the longer term, post 2035, as technological advances are made in the detection and treatment of nutrients in wastewater discharges.

### Integrating with our Long Term Delivery Strategy (LTDS)

We have applied adaptive planning techniques in the development of our DWMP - following the approach with Ofwat's published guidance on long term delivery strategies.

Therefore, our DWMP can be described as an adaptive plan that identifies the priority investment needed between 2025 and 2050, regardless of what the future holds. Beyond 2030, we present pathways to adapt to a range of future scenarios, so that we can manage uncertainty and invest appropriately. The objectives of our long-term delivery strategy (LTDS) are to:

- Respond to our customers' preferences by aligning investment priorities with what they value
- Meet the requirements of government policies



- Future proof the delivery of service against the challenges of climate change and population growth
- Make visible the critical stages of investment and the key decision points over the next 20 years
- Ensure that our customers bills remain affordable now and in the future.

As an adaptive plan, our DWMP will inevitably evolve over time and we have specifically tested and considered the common reference scenarios from Ofwat's guidance in the development of our plans: Climate change; Technology; Population growth and demand.

We have also tested our investment needs against changing customer priorities. We know that customers do worry around flooding and in our engagement and consultation we heard that we need to consider the costs and benefits of reducing the risk of flooding further. Therefore, we have also tested our plans against achieving improving levels of flood protection.

**Climate change** - As we look forward, we know the greatest uncertainty is around climate change. Scientific evidence indicates that global warming is resulting in warmer wetter winters and hotter drier summers. The Intergovernmental Panel on Climate Change (IPCC) has developed a range of Representative Concentration Pathways (RCP) which show plausible greenhouse gas concentration trajectories. Each RCP will have a different impact on our drainage and wastewater systems. The more severe the trajectory, the greater the rainfall intensity and flows into our systems – meaning that we will need to invest in more nature based and surface water separation solutions just to keep still. We have used our hydraulic models to understand this by simulating the sewer network response to different rainfall intensities and observing the increasing/ decreasing likelihood of sewer capacity exceedance and the resultant increase/decrease in flood risk of sewer overflow spills. Our DWMP is based on RCP6.0 (a 2°C increase in global temperatures) – with the less severe (RCP2.6) unlikely and the more severe (RCP8.5 – a 4°C increase in global temperatures) a plausible scenario we need to be ready to adapt to. Climate change can also impact sea level rise, fluvial and pluvial flooding. The impact of this changes on the potential flooding risk of our assets are modelled within our climate change scenarios considered above.

**Technology** – we continue to invest in technology as a way of providing solutions to our challenges, for example, we have monitoring coverage at 100% of our overflows and these EDMs are used to identify early insights into potential network issues and pollution risks. In a high technology future we see this technology investment continuing and we have assumed a 20% efficiency in long-term base maintenance costs from 2040 as a result. Conversely, where technology permits the industry to achieve a lower limit for Nitrogen reduction, we have assumed this would become a new driver under WINEP and we have identified the investment needs accordingly from 2040. In a low technology future, which underpins our preferred plan, we assume the cost efficiency in network management is realised in 2045 and that technology does not advance sufficiently quickly enough to impose tighter treatment requirements before 2050.

**Population Growth / Demand** – Greater population growth and higher

[DWMP Technical Summary](#)

per person water use puts further pressures on the system. There is uncertainty in any population growth forecast, as well as predicting how customers might use water in the future. To support our population growth estimates we use data from the Office of National Statistics (ONS) as the primary basis for our plans. These estimates are region wide and therefore we apportioned these across our wastewater service area using Local Authority plans so that population growth is applied to the areas across our region where development is most likely. This is consistent with our WRMP. These growth forecasts, which are more benign than local authority plans, are then taken forward into all of our future scenarios. Against these growth projections we overlay a high demand future that recognises our plans to reduce per capita consumption of water to 110 l/p/d may not be delivered and which would result in higher flows to the system if consumption remained at 130 l/p/d.

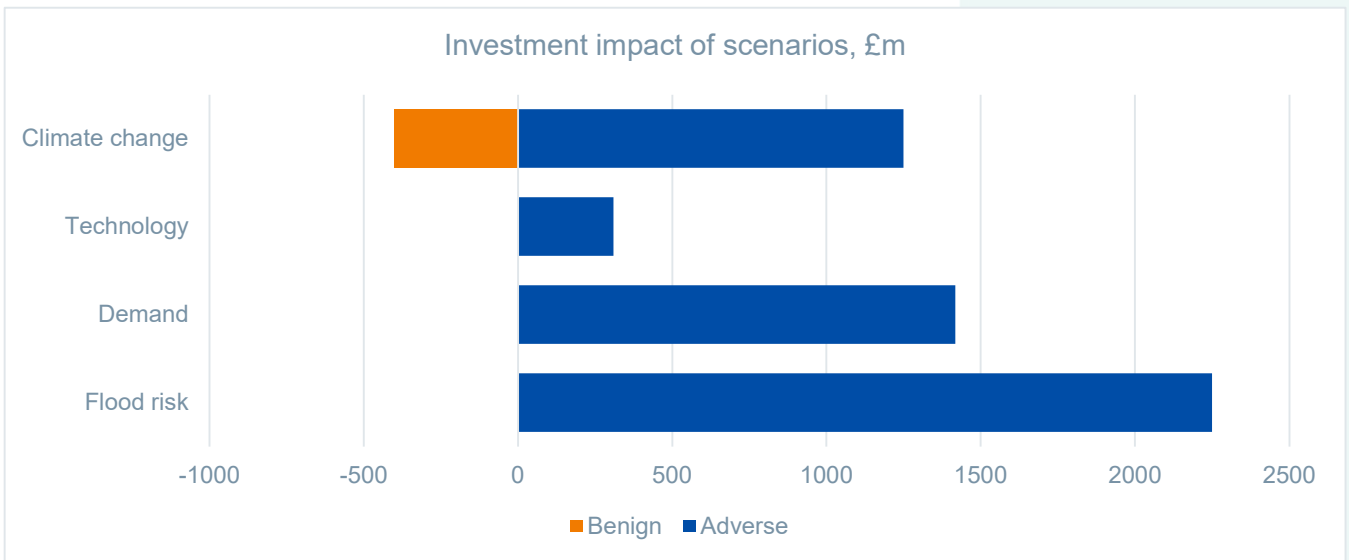
**Flood risk** - Our DWMP is based on maintaining the level of sewer flooding risk, given our sector leading performance around internal flooding, but we have considered further improvements to the protection of customers – reducing the number of catchments that would be at risk of a 1 in 50 year (severe) storm. Given the high priority given to flooding risk, we do not consider a long-term worsening of current service levels as we know this would be unacceptable to customers, and therefore a more benign future scenario is not considered

#### **Other assumptions**

- **Permeable areas:** Paving over of urban areas such as parks and gardens and removing natural soakaways for rainwater surface runoff all means more rainwater goes into our sewers rather than drains away naturally. We use UKWIR's assessment of the rate of "urban creep" i.e., loss of permeable surface in urban areas to calculate these changes. **Wet Wipes:** Plastic wet wipes are also a known issue for the management of the sewer network. We have assumed that plastic wet wipes and other plastic disposal items are banned by Government from 2025.
- **Coastal Erosion:** The impact of coastal erosion on our assets has also been considered through a hazard assessment in vulnerable locations. We have analysed how this risk changes over time but we have varied the extent of potential coastal erosion.
- **Wet Wipes:** Plastic wet wipes are also a known issue for the management of the sewer network. We have assumed that plastic wet wipes and other plastic disposal items are banned by Government from 2025.

	Lower investment (benign scenario)	Most likely	Higher investment (adverse scenario)
Climate change	RCP2.6	2°C increase in temperatures (RCP6.0)	4°C increase in temperatures (RCP8.5)
Technology	New approaches by 2045	New approaches by 2045	New approaches by 2040
Population growth / Demand	Low demand (110 l/p/d by 2050)	Low demand (110 l/p/d by 2050)	High demand (130 l/p/d by 2050)
Flood risk	NA	Manage the long term flood risk protection in a 1 in 50 year storm in an adaptive way (maintaining risk at 10%)	Provide additional flood risk protection to reduce customers at risk of 1 in 50 year storm to 5%

For these scenarios we have tested the investment impact of being more adverse or benign than the most likely planning scenario. This impact is visualized below.



As we look to ensure we position our DWMP as a least regrets investment strategy, we have based our plans on a relatively benign set of scenario's. Therefore, costs may rise over time if the risks we face materialise. This uncertainty is handled through adaptive pathways.

Adaptive pathways have been considered alongside scenario testing in our options development process. This process looks at what might change after we start on our investment journey and what our investment would look like if we adapt and follow these pathways.

The key distinction is that our adaptive pathways consider the cumulative changes in scenarios over time for feasible combinations of scenarios. More information on our adaptive pathways is provided in the 'Our Plan' section of this document.

## Our DWMP

Our overall DWMP reflects all of the analyses we have undertaken identifying the investment on top of our asset health investment needed to 2050.

Looking at the company level risks as a whole, our DWMP reflects the proposed targets around environmental protection and the benefits of investments to customers and communities.

It recognises the environmental ambition for the region set by policymakers for 2050 – seeking the best way to deliver this for customers and communities.

We have followed the technical framework in setting assumptions (around climate change, growth, and urban creep) and the government proposed targets around storm overflows and future wastewater treatment standards. But there remains a lot of uncertainty on the pace and nature of investment and this has been reflected in our profile of investment from 2025 to 2050.

We want our plan to be a living adaptive plan. This means we will continue to review and amend our plans as circumstances change – this is important to ensure investment is value for money and in line with what customers want.

Specifically, our plans will adapt if...

- The proposed interim and 2050 targets set by our regulators change
- If our assumptions around climate change, population growth and urban creep are not right, resulting in more or less volumes of wastewater and rainwater entering our system than we predict and more or less impacts on assets in coastal locations
- The levels of working in partnership to co-create, deliver and fund essential investment changes
- If the way that we charge customers in bills changes – if water bills become progressive rather than regressive as they are today, this would support
- a faster pace of investment whilst still keeping bills affordable
- If we can get more from our base levels of maintenance – reducing the additional investment to deal with future challenges.

To better understand some of these uncertainties, we have tested the sensitivity of our analyses to changing weather conditions, population growth and urban creep assumptions. We will work with regulators and policymakers to understand what may change from their perspective in the future. But overall, we know that over time, we can expect the risks and costs we have estimated to change upwards or downwards over the period.

We have reviewed our planning scenarios and assumptions, aligned them to the long term development scenarios developed by Ofwat and provided choices around the pace of delivery for storm overflows.

## What happens if we do nothing?

Every day of every year we are out and about across the network – cleaning and clearing sewers, operating and maintaining pumping stations and treatment works, and renewing assets at the end of their life, in order to maintain the condition and integrity of our extensive network.

## But what would happen if we just did this – and didn't do anything else?

In developing the DWMP, we have assessed a number of scenarios, including what could happen if we simply chose to maintain the wastewater system we currently have, seeking to deliver the levels of performance which we currently achieve.

As each decade goes by, we witness increasing amounts of surface water, new roads and driveways, and a changing landscape with urban areas expanded.

Essentially, by doing nothing, there would be more water entering our system than we would be able to hold, move and treat. There would also be more risks to the assets that we operate. We would undo all the investments we have made over time and drastically increase the risk of flooding to homes and businesses, the risks of pollution spills damaging the environment and storm overflow discharges would increase. We would not meet the environmental targets set by Defra.

## Flooding risk

Catchment sewer models have been used to predict the number of properties likely to be affected by flooding from manholes in the combined or foul sewer network.

Our modelling shows that by 2050 up to three times as many people will be at high risk of flooding in a rare storm event, increasing the number of properties at risk of flooding in a severe storm by 17,000 properties.

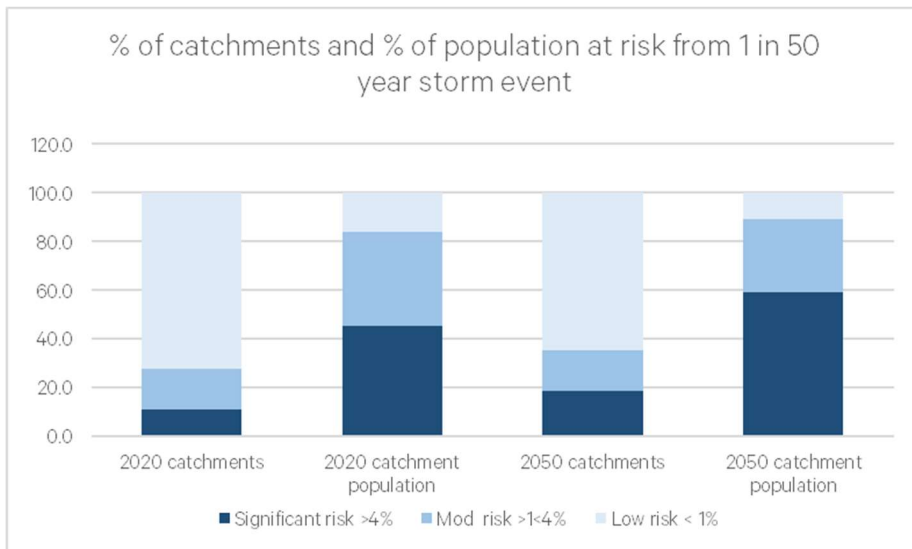
Our target is to maintain the risk of flooding in a 1 in 50 year storm through to 2050, mitigating the impacts of an increasing population in the South West along with climate change challenges. Our bespoke planning objective also targets the same level of performance in more frequent, moderate storms (1 in 10 year events).

Data reflects a prediction of sewer flooding risks from combined and foul sewer networks. They do not differentiate between internal and external flooding and do not consider flooding from surface water sewer or pluvial (rainfall) sources or the combination of all sources (including rivers and the sea).

Modelling calculates the number of properties affected by flooding using a simplified method which converts flood volume to flood area and then reports the level of risk in a catchment.

Catchment Size	Not significant risk	Moderately significant risk	Highly significant risk
<b>Level 3</b>	<1% of population at risk	>1% <4% population at risk	>4% population at risk

The 2020 base year modelling shows that >4% of the population in 69 catchments could have a highly significant risk exposure to flooding, 10.6% of catchments representing 45% of the population. By 2050 this risk increases to include 4% of the population in 121 catchments, if no mitigation interventions are adopted.



The DWMP’s intervention plans aim to manage this flooding risk to 2024/25 forecasted levels.

We’ll continue to improve our performance in reducing the number of sewer collapses with a target of reducing bursts on our pumped sewers as these are more prone to creating pollution incidents when they fail.

We’re aiming to maintain our performance in the top quarter of the water sector, building on our success of bringing down the risk of internal sewer flooding.

The impact of sewer flooding is catastrophic for the communities and businesses, causing disruption to family life while flood damage is made good, which can often take many months to recover. Our customers regularly tell us that sewer flooding is the very worst service failure – and known risks

We have carried out detailed modelling on catchments which are home to our largest populations to understand this better. The findings indicate that, for these catchments, there could be a 25% increase, on average, in the number of properties at risk of flooding, between 2025 and 2050. This is particularly the case with some of our coastal towns such as Lynmouth and Ilfracombe.



## Wastewater treatment compliance

With increased flows caused by growth, urban creep and more intense rainfall events, 123 treatment works would be at risk of being overloaded and unable to meet their environmental permits. Without preventative action to prevent this, this would potentially harm the environment. This is in contrast to Defra’s proposed targets and our own environmental ambition to continue to improve the standard of wastewater discharges.

WwTW with compliance risks - we’re planning to invest in the capacity of our wastewater assets so that they can cope with increases in population. We measure this by looking at their capacity in dry weather and we’ll be investing in 123 sites over the next 25 years.

We’re planning to maintain our improvements in the compliance of our wastewater treatment works, including 100% compliance with our environmental permits. We plan to invest in 230 WWTW over the next 25 years to reduce the amount of nitrogen and phosphorous entering the river environment. Where our activities are also contributing to ‘Rivers not Achieving Good’ status, we’re also working to minimise our impact on these watercourses.

Data is sourced from our calculation of biological oxygen demand (BOD), population equivalent (PE) site capacity (where available), population growth projections and compliance history (284 sites).

Where no BOD PE capacity calculation has been made (88 sites), 2020 risk is assumed to be ‘not significant’ because compliance is 100% and the future risks are linked to growth rates.

The assessment does not include for the risk of permit non-compliance due to operator intervention, power failures or mechanical/electrical failure.

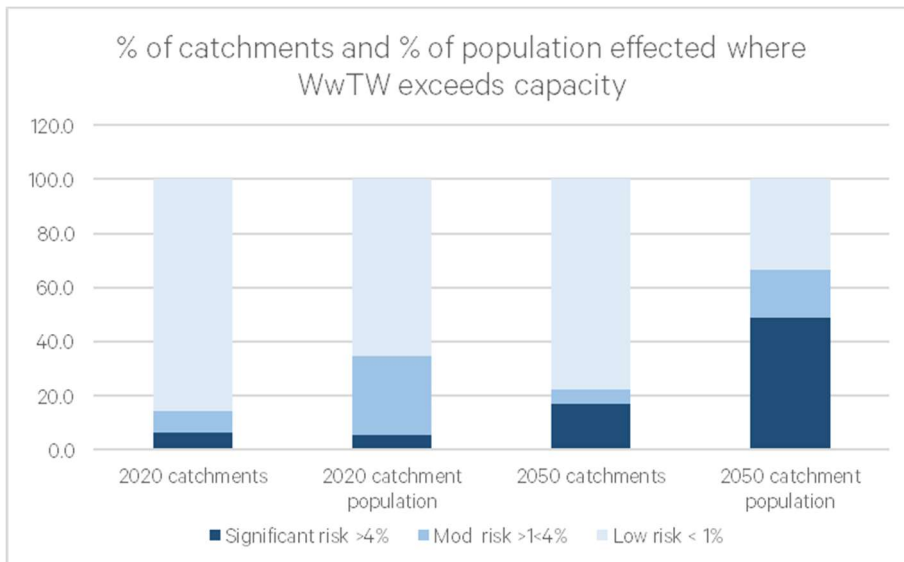
The results provide an indication of where current treatment capacity is consumed and hence the risk of non-compliance is heightened. Results indicate where improvements to process streams might need to be improved.

Catchment Size	Not significant risk	Moderately significant risk	Highly significant risk
<b>Level 3</b>	<<90% of BOD capacity	≥ 90% and ≤100% of BOD capacity	>100% of BOD capacity

The 2020 base year modelling shows that there is the potential for future growth related headroom risks at our WwTWs serving 40 catchments.

This represents 6% of catchments and 5.4% of population. All of these WwTWs are currently under an active management plan. By 2050 this risk at our WwTWs could extend to 110 catchments, representing 17% of the catchments and nearly 49% of the population.

Our plan is to invest to ensure that treatment works compliance is maintained over the 25 year timeframe.



The DWMP’s intervention plan is designed to maintain all wastewater treatment works to 100% compliance of their numeric compliance.

### Chemicals Programme

The wastewater treatment (chemicals) programme (£21m CAPEX) is driven by the ongoing Chemicals Investigation Programme (CIP) and the related national steering group.

The National Chemical Investigations Programme (CIP) is intended as a means of gaining a better understanding of the occurrence, behaviour, and management of trace contaminants in the environment. It is a programme of investigations and monitoring undertaken as a collaborative programme by water companies in England, Wales, and the respective national regulators and co-ordinated through UKWIR.

The AMP7 phase (CIP3) has run from 2020 to 2022 and has expanded the investigations to include additional substances and environments, such as groundwater and estuaries. The outcomes from those investigations can result in new permits for substances of concern.

### Storm overflows

With climate change, population growth and urban creep there would be more dependence on storm overflows to prevent flooding to homes and businesses but this risks causing harm to rivers and seas. Without investment, discharges from storm overflows increase from the levels we will deliver with WaterFit, with higher and more intensive rainfall events leading to higher spill frequencies as well as longer duration spill events.

Defra published their Storm Overflow Discharge Reduction Plan (SODRP) in 2022 which set out targets for each water company to reduce discharges from storm overflows. By 2035 all water companies will have to improve storm overflows discharging into or near designated bathing waters and improve 75% of overflows discharging to high priority nature sites. By 2050 all remaining overflows will require improvement. Screening to protect from sewage litter is also required.

The Storm Overflows Discharge Reduction Plan was published on 26 August 2022 by Defra. This followed the publication of the Environment Act 2021 which placed a legally binding duty on water companies to

progressively reduce the adverse impacts of discharges from storm overflows.

The plan sets out time-bound targets for water companies to reduce storm overflow spills over a 25-year period in order to tackle storm sewage discharges by 2050.

The plan requires that overflows that are causing the most harm will be addressed first, especially in high priority ecological sites such as Sites of Special Scientific Interest, Special Areas of Conservation and chalk streams. The plan also requires designated bathing waters to be addressed in the first 10 years of the programme.

There are a number of headline targets set out in the plan, summarised below.

- Headline target 1: Companies are only permitted to discharge from a storm overflow where it can be demonstrated that there is no local adverse ecological impact, profiled such that:
  - 75% of storm overflows discharging into or close to high priority sites are addressed by 2035
  - 100% of storm overflows discharging into or close to high priority sites are addressed by 2045
  - 100% of all storm overflows are addressed by 2050
- Headline target 2: Companies are to significantly reduce harmful pathogens from storm overflows discharging into and near designated bathing waters by 2035
- Headline target 3: Companies will not be permitted to use Storm overflows to discharges above an average of 10 rainfall events per year by 2050
- Headline target 4: Companies are to ensure all storm overflows have screening controls at point of investment or by 2050 whichever is earlier

It should be noted that headline target 3 does not currently apply to all coastal discharges. However, we recognise the importance of the coastline in our region to our customers and we have requested that Defra considers the inclusion of coastal discharges in the programme. We are pleased that, on the 9th May 2023, Defra confirmed that a consultation will be held regarding the expansion of storm overflow reduction targets to cover all coasts, estuaries and marine protected sites.

Focus is also given to shellfish waters, with the government prioritising action to improve the water quality of the largest shellfish waters in England by 2030.

Water and Sewerage Companies (WaSCs) are expected to consider the pressures of urban growth and climate change in their plans, as well as prioritising the use of nature-based solutions, carbon reduction and biodiversity net gain in their storm overflow discharge reduction planning.

There are also ten bathing water and shellfish sites in the South West that require investment to prevent a deterioration of bathing water quality standards which currently are at 100%.

## Climate change risks

The climate crisis is the single biggest challenge facing humanity and the planet. According to the 2021 Intergovernmental Panel on Climate Change (IPCC), we are already experiencing many climate change impacts today. Unfortunately, these are expected to increase, anticipated to be at least 1.5-2oC this century, and with a chance this might go higher, our assessments consider increases in temperature of 4oC

The impact of increases in global temperatures will potentially lead to longer and deeper droughts, more intensive periods of rainfall and sea rises, all of which could pose a varying degree of risk to our business operations and services. The South West is often thought to be particularly vulnerable to climate change, given its 860 miles of coastline, and adjacency to the western approaches of the Atlantic Ocean, exposing the area to impacts from rising sea levels and storm intensity.

Given this potential vulnerability, we recognise the importance of regularly assessing climate change risks and to continually consider the possible mitigations across our various operations, assets and networks.

We have engaged with the Met Office to provide technical support and advice on a frequent basis, and they also provide us with specific inputs into the risks for the South West. Between the draft and final DWMP we also engaged JBA consultants to undertake specific flood inundation assessments across our coastal assets.

Rising sea levels and coastal erosion have the potential for more localised impacts of varying severity, depending on population density and prior to any strategic or tactical defence activity by either the EA or Lead Local Flood Authorities (LLFAs).

We also continue to work more closely with multiple stakeholders including the EA, LLFAs, local resilience forums and government to help influence policy, to understand and implement mitigations, collaborating on strategies to protect communities and prioritise defences, assets and communities. Countess Wear is a good example of where early engagement with Devon County Council and the EA resulted in a proactive flood resilience scheme protecting to a 1:200 return period.

SWW is collaborating with the local flood and coastal erosion risk management (FCERM) group, and as part of their Flood Coastal Resilience Innovation Programme (FCRIP) we are currently looking for opportunities to join up our DWMP programme, working with other local risk management authorities to optimise solutions and maximise benefits.

Each of the Level 2 catchment DWMPs highlights which assets (sewage treatment works and sewage pumping stations) are at risk, and affected assets attract a modified deterioration rate variable in our Asset Investment Manager database.

Owat and EA have recently published a [joint approach for how water companies should consider flood and coastal resilience in their statutory roles and duties](#). The National Flood & Coastal Risk Management (NFCRM) Strategy for England provides a roadmap which sets out the practical actions required to deliver the national FCERM strategy between now and 2026. The expectations for water companies to work in the spirit of the National FCERM strategy include:

- Take part in more collaborative working and partnerships

[DWMP Technical Summary](#)



**Global  
average  
rainfall  
increases by  
1% to 3% for  
each degree  
of warming**

- Routinely consider wider, long term benefits to communities using a systems and catchment oriented approach
- When required consider adaptive approaches to ensure resilience of their network in face of climate change
- Identify, fund and deliver schemes for supply and wastewater networks and assets.

We recognise the need for such action and the spirit in which this co-development, co-design and co-funding of solutions should be delivered. Clearly the management of such risks will require significant action, resources and funding to be developed and funded through both the water industry price review process and other sources of funding such as flooding defence grant in aid (FDGiA) and local levy funding through LLFA.

Such challenges encompass a wide range of factors such as extreme weather conditions; drought and flooding; land use and catchment pressures; power supply and communications reliability; skills and organisational capacity; supply chain capability; as well as changing environmental and public health challenges to meet the needs of consumers now as well as in the longer term.

The details below form part of the Operational Resilience assessment within the DWMP. Namely:

- Coastal Flood Inundation
- Coastal Erosion
- Fluvial Flooding (Response and Recovery Plans)

## Coastal Flood Inundation

With climate change causing rising sea levels and coastal erosion, wastewater assets in these locations need to be moved if they are not likely to be protected by coastal flooding defences. We have risk assessed our 653 treatment works and 1686 sewage pumping stations along with our sewer assets to understand their risk of being flooded by both storms and sea level rise.

Coastal flood risk was modelled for three climate scenarios, the first representing present-day risk in 2022 and two the future climate change scenarios (RCP2.6 and RCP8.5) representing the projected risk in 2035 and 2050.

To fully assess future risk for each of the climate change scenarios four return events were evaluated as follows using a combination of projection modelling of the southwest region.

Return Events:

- Highest Astronomical Tide (HAT) event - represents the maximum observed tide under average atmospheric conditions.
- 1 in 5-year storm return period event - a high probability event with a 20% chance of happening in any one year.
- 1 in 50-year storm return period event – a moderate probability event with a 2% chance of occurring in any one year.
- 1 in 200-year storm return period event – a low probability event with a 0.5% chance of occurring in any one year.

- Sites have been assessed based upon a number of different storm and flood scenarios considering the risks to the site, the defence of the site, and wider EA flood defence work.

Possible interventions to manage the risks have been identified as the provision of flood defences for the site, either as a SWW deliverable or as part of a wider programme of coastal defences working with EA and other Local Risk Management Authorities (LRMAs) thereby delivering greater benefit for coastal communities.

An alternative intervention is to relocate the asset to a more secure location pending the ability to continue to service local communities. This option is more likely to be part of a wider decision to relocate communities at risk and would be taken in close collaboration with the EA and responsible LRMs.

We modelled our sites to understand the present-day risk and projected risks in 2035 and 2050. From our asset base, five of our treatment works, 14 of our sewage pumping stations and up to 161km of our sewers are at a high risk of being impacted by coastal erosion and sea level rise. We have carried out further work to understand our options for each these sites including protection or relocation.

## Coastal Erosion

UK coastal erosion risk is expected to increase over the longer term due to the impact of sea level rise and climate change. This risk is particularly significant for the SW region due to the extensive coastline and numerous coastal communities who rely on the safe and constant provision of clean and wastewater services.

A hazard assessment of coastal erosion susceptibility has been undertaken. The aim being to better understand the risk posed to SWW assets and provide information whereby asset investment can be effectively prioritised allowing for a more targeted approach for future allocation of operational and capital expenditure.

A detailed assessment of coastal erosion risk was assessed for all of our operational wastewater sites (653 STW's and co-located STC, 1252 SPS's plus associated infrastructure). The assessment built upon an initial high-level screening assessment from a previous PR19 study to identify sites of interest and has been refined by working with consultants (JBA) with expertise in this field. All sites were only at risk from erosion and not from coastal flooding.

- The assessment combines two approaches:
- A high-level analysis to identify sites at coastal erosion risk by 2118
- A detailed site-by-site erosion analysis for the three epochs: 2022, 2035, and 2050

The high-level coastal erosion risk assessment is based on the National Coastal Erosion Risk Mapping (NCERM) dataset. The dataset provides the following information:

- Present-day coastline location – base year 2018
- Inland distance of the coastline (erosion extent) for the three following epochs:
- 20 years in the future (2038), short term



- 50 years in the future (2068), medium term
- 100 years in the future (2118), long term
- Three confidence levels: 5th (greatest erosion extent), 50th and 95th percentiles
- Two scenarios:
- No Active Intervention Policy Scenario (NAI)
- Implementation of Shoreline Management Plan 2 Policies (SMP)

The coastline frontage is split into representative sections with consistent characteristics (cliff behaviour and defence characteristics), utilising NCERM data, geological maps and aerial imagery to quantify erosion rates and calculate the overall erosion risk.

An erosion risk was calculated based on the distance of the asset from the projected cliff edge and a geological scaling factor based on the erodibility of the underlying geology.

The greatest erosion extent from the NCERM dataset - long-term (2118), 5th percentile and no active intervention scenario – is used to identify sites at coastal erosion risk. The present-day coastline is buffered by the greatest erosion extent to create erosion polygons. All in-service sites within the erosion polygons are extracted and identified at coastal erosion risk.

For each identified site, a detailed erosion analysis which includes site-specific conditions that influence the rate of coastal erosion, such as the geology, for the three epochs of the project: 2022, 2035, and 2050 was undertaken.

The difference between the NAI and SMP erosion likelihood rates represents the assets' sensitivity to the management plan and their vulnerability in case of plan's failure. It can be used to inform management strategies:

- joint funding to facilitate the implementation of the SMP
- monitor the shoreline position and/or defence conditions
- asset relocation

Using the stated data sources, SWW sites were assessed to produce a ranked output highlighting those assets at greatest risk from coastal erosion.

## Fluvial and Pluvial Flooding Risk Assessment

We have developed and maintained Response and Recovery Plans for sites at flooding risk which form part of the Resilience assessment within the DWMP methodology. The assessment for PR24 revisited and updated the flood risk assessment. The assessment has been refined by working with consultants (JBA).

UK fluvial flood risk is expected to increase over the 21st century which means that we can expect to see both an increase in the frequency and magnitude of extreme water levels around the UK.

All wastewater functional sites (653 STW's and co-located STC, 1252 SPS's plus associated infrastructure) have been assessed.

To identify sites at risk a high-level screening exercise was undertaken against existing known flood zone extents. The opensource data also includes various datasets relating to flood defences, such as the Areas

[DWMP Technical Summary](#)

Benefitting from Defences (ABD) layer which provides useful details on the effect of existing defences on SWW assets.

A further step was taken in refining the fluvial flood zone data to exclude coastal flooding from the dataset as this risk was appraised separately as part of a Coastal Flood Risk Assessment.

The detailed assessment includes both present day risk and two climate change scenarios (RCP2.6 and 8.5, 50% aligned to the LTDS Common Reference Scenarios) to understand the changes in flood risk over time.

Table 8 shows an example of the risk scoring for STWs with the progression over time demonstrated by the changing risk scores for each future year. The table also shows the potential change in risk as a result of the different climate change scenarios.

The assessment considers both the area flooded and a range of modelled flood depth statistics. These enhanced flood metrics can then combined with asset information and external factors to develop a more detailed assessment of the risk to each shortlisted asset.

For these sites detailed Flood Assessment Reports (FARs) are produced. These reports are designed to be used as a preliminary form of flood risk assessment identifying the potential flood risk for a specified location.

The final suite of FARs will then be used to review and update/augment existing Operational Response and Recovery Plans which are held by Operations.

A_ASSET_NU	A_G3E_FID	Polygon	A_ASSET_NA	Climate Scenario: RCP 2.6				Climate Scenario: RCP 8.5			
				Present day	2031-35	2046 - 2050	Total	Present day	2031-35	2046 - 2050	Total
10557619	293089	Y	CALSTOCK	15	15	15	45	15	15	15	45
234527	289327	Y	KILBURY	15	15	15	45	15	15	15	45
10551673	296271	Y	TIVERTON	15	15	15	45	15	15	15	45
265808	284453	Y	LUXULYAN	15	15	15	45	15	15	15	45
106500	287148	Y	LODGEHILL	15	15	15	45	15	15	15	45
489398	284477	Y	NANSTALLON	15	15	15	45	15	15	15	45
40893	295815	Y	WINSFORD	15	15	15	45	15	15	15	45
225727	1888083	Y	SEATON SOUTH	12	15	15	42	12	15	15	42
81577	289906	Y	YEALMPTON	12	15	15	42	12	15	15	42
39956	295806	Y	DULVERTON	12	15	15	42	12	15	15	42
10079838	285205	Y	PAR	12	15	15	42	12	15	15	42
478068	287525	Y	NORTH FAL/st stev	12	15	15	42	12	15	15	42
11414426	293827	Y	HORRABRIDGE	12	12	15	39	12	15	15	42
83409	292586	Y	BATHPOOL	12	12	12	36	12	15	15	42
45791	295044	Y	EXFORD	12	12	12	36	12	15	15	42
88406	292247	Y	ST COLUMB	12	12	12	36	12	12	15	39
111338	290843	Y	TOTNES	12	12	12	36	12	12	15	39
170220	294287	Y	NORTH MOLTON	12	12	12	36	12	12	12	36
98977	297715	Y	TATWORTH AND FC	12	12	12	36	12	12	12	36
174596	296964	Y	KNOWLE	12	12	12	36	12	12	12	36
10037451	284737	Y	IVYBRIDGE	12	12	12	36	12	12	12	36
122239	297061	Y	WINSHAM	12	12	12	36	12	12	12	36
482469	1885416	Y	FLUXTON STW	10	12	12	34	10	12	12	34
180022	294289	Y	SOUTH MOLTON	10	12	12	34	10	12	12	34
10229634	298631	Y	COUNTESS WEAR	9	12	12	33	9	12	12	33
309285	293355	Y	MILL HILL S T	10	10	10	30	10	12	12	34
261445	295799	Y	SHILLINGFORD	10	10	10	30	10	10	12	32
91727	306862	Y	WHITFORD AND MU	10	10	10	30	10	10	12	32
77403	296293	Y	BRADNINCH	8	10	12	30	8	12	12	32
70041	295561	Y	WIGGINS TEAPE	10	10	10	30	10	10	10	30
291868	1883275	Y	FENITON	10	10	10	30	10	10	10	30
89009	306815	Y	BRANSCOMBE	10	10	10	30	10	10	10	30
96466	291585	Y	SUTCOMBE MILL	10	10	10	30	10	10	10	30
308531	1885740	Y	WILMINGTON	10	10	10	30	10	10	10	30
93967	297050	Y	UPOTTERY	10	10	10	30	10	10	10	30

Table 8: Phase2: Example Fluvial Site Risk Assessment Output Summary

The DWMP modelling shows that due to climate change, population growth and urban creep, the risk of flooding will expand existing critical drainage areas, as well as introduce new sites where the flood risk is elevated from moderately significant to highly significant. Our customers

are concerned about the impact of changing weather patterns, and any risk of increased flooding is one of their major concerns.

The DWMP has brought in previously forecasted future expenditure needed to manage Coastal Resilience out to 2065. This investment will be required to relocate WwTW and sewer pumping stations at risk of inundation, and sewer pipelines corroding much quicker than planned due to seawater intrusion.

## What are our options?

The DWMP approach has brought to the fore the risks to our ongoing wastewater performance over the long-term and brings visibility of sewer networks, stormwater overflows and wastewater treatment works risks into a single plan. To manage and address the risks and future challenges we have a toolbox of interventions, or measures that we can put in place.

### Intervention options

Whilst the need and benefits of developing DWMPs are fully supported and applauded, government expectations of targets and delivered outcomes go beyond the remit of water companies, and the DWMP vision needs holistic changes to how drainage and storm water overflows are treated. More must be done to prevent and or attenuate storm water run off, thereby eliminating the need for expensive interventions be they engineered or natural.

We can use traditional engineering solutions, such as the construction of large underground storage tanks, replacing older sewers with larger ones, or building new sewers and new treatment works. This enables us to manage the increasing volumes of surface water that make their way into our network either by traditional design or unintentionally.

We also have an ambition to deliver more solutions using nature-based solutions. These include swales – narrow, broad grassed areas which temporarily store water and reduce peak flows; or holding ponds to manage surface water runoff after storms and provide an alternative path for the surface water so that it doesn't enter the sewerage network.

We will look to customers and stakeholders to help. The wastewater network is an open system – anyone can put anything into it! That means alongside the waste from our homes and businesses, we also collect rainwater and run off from surfaces. So, we can – and we do – run education campaigns that show customers how they can help to protect wastewater networks and in doing so, protect the environment and reduce flooding risk.

The interventions outlined below are specific to our wastewater network. Our wider wastewater investment plan has bespoke solutions to help us decarbonize our operations, enable us to generate energy from our bioresources and support our coastal resilience.

Whether its government policy or tighter water industry sector planning and controls, catchment side management needs to lead the hierarchy of controls. This includes:

Intervention type	What might this work look like?
<b>Collaborating with stakeholders and communities on nature-based solutions</b>	<ul style="list-style-type: none"><li>• Working in partnership to deliver nature-based solutions in both urban and rural areas</li><li>• Expanding our catchment management activity with local landowners supporting our Upstream Thinking initiative</li><li>• We've provided more detail on our plans in our Technical Appendix</li></ul>
<b>Working with customers</b>	<ul style="list-style-type: none"><li>• Leading behavioural change campaigns – Love Your Loo and Think Sink</li><li>• Promoting water efficiency to reduce flows from sinks and toilets into sewers, such as promoting water efficient appliances</li><li>• Promoting incentives to increase permeable areas in urban areas and new developments to slow the flow of water into drains</li></ul>

<b>Investing in our existing asset base</b>	<ul style="list-style-type: none"> <li>• Sewer cleansing and clearing to remove and prevent blockages</li> <li>• Sewer relining and replacement (to reduce rainwater seeping into sewers)</li> <li>• Pumping station maintenance</li> <li>• Upgrading treating capacity at wastewater treatment works so they can process more flows without harming the environment</li> </ul>
<b>Rethinking how we design and operate our systems</b>	<ul style="list-style-type: none"> <li>• New networks, sewers and treatment works</li> <li>• Separating sewers by constructing new surface water networks</li> <li>• Rationalising smaller treatment works into larger units</li> <li>• Introducing smarter networks and monitoring</li> </ul>

In developing our plans, we consider a hierarchy of measures to mitigate flood risks and improve environmental flows:



## ODA prioritisation

To prioritise Option Development Appraisals (ODAs) to only those sites where risk mitigation is needed, a review was undertaken to see which catchments are at risk of exceeding the following thresholds:

- Sewer collapses of greater than 10 collapses per 1000 km per year
- Pollution & flooding risk incidents greater than 0.1% catchment total, external issues, hydraulic issues, hotspots present.
- Future flood risk (FFR) greater than 5% properties at risk of internal flooding in a 1 in 50 storm event
- Storm overflow (SO) greater than 10 spills per year from any SO
- WwTW Compliance.

Where no thresholds were exceeded, risk was considered low. Of the 373 Level 3 TPU's entering the BRAVA process a further 142 catchments did not proceed to ODA. For those catchments that were considered resilient, and did not progress, they will be monitored annually for any changes.

The 231 catchments that proceeded to ODA were then categorised as 'Standard', 'Extended' or 'Complex' based on their characterization problem score and quality of hydraulic models, to determine our ODA approach taken.

- Standard catchments are small (average population 756) with simpler problems and more straightforward interventions.
- Extended catchments are larger (average population 9,553), have more risks and more complicated solutions.
- Complex catchments are the largest (average population 23,132) with more complex systems and solutions, along with more robust hydraulic models.

The catchment breakdown up to this stage is as follows:

Catchment breakdown	No. of SWW L3s	% of SWW L3s
<b>L3 catchments in SWW Region</b>	656	100
<b>L3 catchments entering BRAVA</b>	373	57
<b>L3 catchments entering into Option Development and Appraisal</b>	373	57
<b>Standard catchments</b>	270	41
<b>Standard catchments requiring Intervention selection</b>	128	20
<b>Extended catchments</b>	64	10
<b>Extended catchments requiring Intervention selection</b>	64	10
<b>Complex catchments</b>	39	6
<b>Complex catchments requiring Intervention selection</b>	39	6



<b>Catchments requiring Intervention selection</b>	231	35
<b>Catchments not requiring Intervention selection but entered the BRAVA process</b>	142	22

## Intervention selection and assessment

Catchment area teams reviewed each TPU and assigned up to three interventions to address the specific catchment risks from the standard list in the DWMP guidance; these are listed in the table below.

Description	Intervention Themed Options
<b>Generic options to minimise &amp; manage water arising in the catchment</b>	<ul style="list-style-type: none"> <li>Promote and make available water efficient appliances to reduce production of wastewater</li> <li>Promote and make available rainwater harvesting systems</li> <li>Promotion of incentives to reduce impermeable areas</li> <li>Asset protection - Education programmes (Love your loo)</li> </ul>
<b>Generic options with catchments to manage surface water flows entering the conveyance system</b>	<ul style="list-style-type: none"> <li>Company installation of source control sustainable drainage systems</li> <li>Sustainable drainage solutions (SuDS) partnerships with key stakeholders</li> <li>Upper catchment solutions/downstream thinking</li> <li>Separate surface water from combined systems by constructing new surface water networks</li> <li>Integrate surface water pathway measures into new and upgraded third party designs</li> <li>Develop a program to reduce infiltration</li> </ul>
<b>Generic option to manage flows within the conveyance system to minimise impacts on customers and environment</b>	<ul style="list-style-type: none"> <li>Implement widespread sewer/pumping station level monitoring, live, network modelling linked to operational responses such as proactive jetting</li> <li>Construct new combined or foul storage systems</li> <li>Replace or upgrade existing networks</li> <li>Inter-catchment network transfers</li> <li>Inter-catchment WwTWs transfers</li> </ul>
<b>Generic option to manage flows and loads at wastewater treatment works to minimise impacts on customers and environment</b>	<ul style="list-style-type: none"> <li>Treat or pre-treat flows at existing pumping stations or within sewer network</li> <li>Upgrade existing works using more intensive processes</li> </ul>

These initial selections were verified through the following checks and reviews:

- Internal review by operational teams, Asset Catchment Managers, and internal wastewater treatment process specialists
- External review by other drainage and flood risk management stakeholders (LLFAs and RMAs)
- Internal hydraulic modelling of selected catchments and extrapolation of modelling results to non-modelled catchments (FFR and SO risk).

## Intervention quantification and costing

Preferred interventions from the DWMP guidance table were quantified using modelling and extrapolation. Up to five final interventions were selected for each catchment reflecting the need for a combination of solutions. Costs were provided by SWW's cost consultant Chandler KBS using unit cost models consistent with delivery over this price control period (uplifted to March 2022 prices). For nature-based solutions unit costs were applied using SWW's own capital project costings from recent SOAF and SUDs schemes, the sample size for the NBS schemes are being improved for the final DWMP.

The costing approach for each asset group is set out below:

- Future flood risk (FFR) – 26 Complex catchments (712k population 42%) across the greater SW region were hydraulically modelled to assess options to address risk, results used to extrapolate to non-modelled catchments. It was assumed at the outset that Nature Based solutions such as SUDs were a possibility wherever surface water separation (SWS) was suggested. Suitability of SUDs for surface water separation has been assessed at a high level using Stantec's geographical information system (GIS) based SWAT analysis (further details of this work is provided below).
- Storm overflows - 12 catchments (equating to 233 Storm Water Overflows – 20%, and 22% of the population) were selected for hydraulic modelling in the autumn of 2021 based upon a variety of receiving waters. Results were used to extrapolate to non-modelled DWMP catchments.
- To further support the response to the DEFRA Storm Overflow guidance which came later, a separate top-down desktop model based on hydraulic model and Event Duration Monitor (EDM) spill data was developed to assess the total need for all catchments. Further modelling is to be undertaken to increase the sample size in preparation for the final DWMP report end in March 2023.
- WWTW compliance – Analyses of BOD and DWF permit versus future population and flow projections were used to assess sites at risk of future compliance failure. The scale of upgrades needed were estimated using a calculation of the increase in population equivalent PE or storage capacity required at the works.
- Sewer collapses – Risks and interventions are noted but any such activities form part of the business as usual planning and investment processes; sewer rehabilitation, operational repairs for the PR24 plan.
- Pollution & external flooding – Risks and interventions are noted but any such activities form part of the business as usual planning and investment processes (e.g. sewer rehabilitation, operational repairs) for the PR24 plan.
- Avoiding duplication of costs – Where we have multiple risks in the one catchment, the same intervention may resolve more than one risk. The prime example of this is where we have recommended surface water separation to address FFR and SO spill risk. The modelling and extrapolation for both has assumed that the recommended separation occurs across the catchment. So, where we have 30% Surface Water Separation (SWS) recommended to address

flood risk, and 20% to address SO risk, the overall solution for the catchment is not 30%+20% = 50%, but 30% as this will resolve both risks. This avoids any double counting of intervention costs.

## Intervention strategies – catchment based solutions

The greatest driver of risk is the impact of climate-related rainfall, an important part of our strategy is to target interventions that reduce the amount of water run-off entering our system – this means working with customers and stakeholders before resorting to more traditional, engineered solutions. Moreover, increasingly we see partnership working and shared solutions as the key to success. This approach is illustrated below:

<b>Working with customers</b>	<b>Community and stakeholder collaborations</b>	<b>Doing something to our existing assets</b>	<b>Building something new</b>
Encouraging customer behaviours which stop or slow down storm run off	Looking across catchments to find most efficient solutions. Collaboration with other organisations to reduce risks	Changes to how we operate to improve performance and capacity	Increasing our network or treatment capacity to cope with more run off

Nature-based solutions bring with them the additional societal benefits of often providing a pleasant outside space for residents and visitors to enjoy. However, they can also require careful planning and partnership working with stakeholders who share our objectives. This can result in a long lead time to carefully design and deliver the solution, meeting the needs of all stakeholders.

As well as installing traditional end of pipe solutions, we have a dedicated nature-based solutions team embedded within South West Water, who are tasked with exploring all opportunities for promoting green solutions. This team works closely with our Upstream Thinking and Downstream Thinking groups, as well as engaging with external stakeholders to deliver innovative and environmentally beneficial projects.’ Our aspiration is to utilise Nature-based Solutions (NBS) and Natural Flood Management (NFM) wherever it is possible and practicable to do so, as a solution to potential flood and SO issues.

We understand and agree that NBS has great benefits, but it doesn’t come without risk or uncertainty. As we have greater certainty in the delivery and outcomes with traditional grey solutions, these may be preferable to manage short term regulatory deliverables. Through the application and then monitoring and evaluation of Green, Blue and BGI solutions, perhaps in lower risk situations such as a multiple solution approach, that risk and uncertainty is likely to reduce changing perception and knowledge on these approaches over time.

## Methodology to a Greener and NBS centred strategy

Nature based Solutions are a key part of our DWMP and we recognise that this is a step change from the traditional engineered approach, i.e. Grey solutions, and that the whole industry (not just SWW) is on a journey in order to be ready. There needs to be a period of learning in NBS for South West Water along with the wider water industry to improve confidence in the certainty of solutions. In addition, there needs to be a better understanding of where we can and what are the options for hybridising between Green, Blue and Grey solutions, in order to maximise the potential for additional benefits to any solution.

### A continuum of infrastructure engineering approaches



*Illustration of the Green, Blue and Grey infrastructure spectrum from Greening the Grey: A Framework for Integrated Green Grey Infrastructure (IGGI), 2017*

We refer to categories of different process types for potential solutions. These processes are called Green, Blue or Grey. A simple definition of these categories is:

- Green – Semi-natural spaces and assets that use ecologically driven processes to treat runoff and enhance the urban environment in a variety of ways
- Blue – infrastructure includes the ponds, waterways, wet detention basins and wetlands within a drainage network
- Grey – Traditional engineering solutions such as tanks for storage of combined and foul flows

## Demonstrating our commitment to NBS

Within the DWMP we have stated an ambition for a minimum of 10% of our interventions being NBS, with an increase to 20% by 2050. In addition to these statements, to maximise the potential for Green, Blue, BGI and IGGI interventions and demonstrate our ambition to NBS, we want to adopt a “Green First” approach from the onset of solution identification once a project need has been identified.

The Green First approach will mean we always begin the scoping of each solution scope by looking at whether Green options can be appropriate,

moving through the Green, Blue, Grey spectrum (as demonstrated in Our Green First Framework document **Error! Reference source not found.**) if not. However, there will always need to be a balance of the use of NBS and meeting urgency and certainty for a solution, which means a Blue or Grey solution (or hybrid such as BGI or IGGI discussed earlier) may be more practical.

We recognise that a best value solution cannot always be “Green” only. But by starting at Green, rather than the tradition of starting at Grey/traditional/known solutions, we will come to practical, best value solutions that will always look to provide as much environmental/biodiversity and societal benefit as is reasonably practicable, in addition to resolving the initial need.

## Surface water separation, SUDs and nature based solutions

DWMP investments in the early years will also focus on better understanding what surface water separation interventions look like, and this includes scoping and trialling more nature-based solutions and SUDs schemes. As the effectiveness and deliverability of these schemes are better understood, we expect to see them rise and the proportion of traditional, more carbon intensive schemes will decline.

Whilst infiltration has been selected in all catchments with the view that this would be the first task to help understand flows and identify opportunities for SWS, SUDs, and other nature based solutions such as Upstream Thinking and Natural Flood Management. Our assumption is that unless specifically ruled out, nature based solutions and SUDs will be possible, so they will be explored wherever surface water separation has been identified.

Potential areas of opportunity for SUDs have been assessed across the 26 catchments modelled. The results give a high level analysis of the percentage of hectares of surface water separation required to achieve a future flood reduction to 5% properties at risk in a 1 in 50 year storm. Where a potential SUDs area meets the requirements, this has been developed as an individual solution. The potential types of SUDs options have been based on four main solutions for this assessment, infiltration basins, non-infiltration basins, swales, and non-infiltration swales.

The SWAT tool provides high-level results that indicate that on average we estimate that SUDs might be suitable for delivering approximately 55% of the SWS required to mitigate the future flood risk in modelled catchments. This ranged from 0% where there was limited space, impermeable land so no infiltration options, and no water courses present to discharge to, to 100% in some catchments.

The importance of SUDs schemes in surface water separation type interventions has already been stressed (eliminate, attenuate more so than treat) and its why SWW will be expanding the Stantec SWAT based program to identify such opportunities across all catchments where feasible.





## Examples of our nature-based approaches

The creation of woodlands to protect the River Umber from bacteriological run-off from the steep-sided valley. Planting thousands of native trees and hedges in the catchment intercepts peak flows of rainfall in the valley, improving both soil health and water quality. These catchment-based actions complement wastewater improvements – including the construction of underground storage tanks to reduce the number of storm discharges into the River Umber during extremely wet weather. These combined efforts with the Environment Agency and local community have successfully improved the bathing water in Combe Martin, benefiting the community and visitors

Working across 80% of our catchments with some 1,700 farmers, we are funding studies to reduce fertiliser and slurry run-off into rivers, protecting rivers important for drinking water supplies.

Under our Green Recovery Initiative, we have expanded catchment management across Dartmoor National Park. This includes peatland restoration – on 1,000 hectares of the most severe damage and degradation in the park. We are also well advanced with plans to plant 250,000 trees by 2025. We will work with key partners to plant trees on land identified – including our own land and that of our partners such as the Wildlife Trusts, to reduce soil erosion and water run-off from agricultural land. In further support of nature-based solutions, SWW is collaborating with other drainage and flood risk management agencies in the South West Region. We are an active member of the Devon based Flood and Coastal Resilience Innovation Programme (FCRIP) who have their own flood risk mitigation plans (Managing Big Problems in Small Places) and we are looking where we can to join up our efforts to deliver multiple benefits. The FCRIP is also undertaking research on how we can de-risk and maximise the efficacy of natural based solutions.

### Case study: partnership surface water separation at Ronsdale Close

SWW have been working with the EA and Plymouth City Council (PCC) to develop the Integrated Urban Drainage Model (IUDM) Options linked to Flooding and Pollutions in Plymouth.

Flooding risks were identified, and collaborative solutions were developed in partnership with the EA and PCC as part of SWW's Downstream Thinking programme.

The high-risk areas were also identified on the EA's Medium-Term Plan. These include locations such as: Pomphlett Road, Lipson Laira and Fellows Place, the Western Approach to Millbay Strategic Pipe and Longbrook Road, which have suffered from chronic flooding.

An example of this collaborative working is the Pomphlett Road and Ronsdale Close scheme, Plymouth, which has been delivered using tri-partite funding. The scheme, which began in March 2019 and was completed in January 2020, included installing 240 metres of new surface water sewers along Pomphlett Road, Ronsdale Close and Grove Road, and 100 metres of pipe to connect to a new surface water sewer. Upgrades were also carried out on 260 metres of combined sewer along Ronsdale Close, with a further 50 metres of sewer being relined.

The advantage of producing collaborative plans in catchments with a long history of flooding and pollution is that we can clearly identify the flooding mechanisms and interactions and develop holistic solutions. This resolves the root cause of the issues where no single Risk Management Authority (RMA) has historically been able to resolve those issues in isolation.

These improvements will protect 22 homes with a history of internal sewer flooding in and around Pomphlett Road and Ronsdale Close as well as Pomphlett Methodist Church, which has previously reported regular external flooding.

In addition to increasing capacity in the sewers, removing surface water from the combined sewerage network will reduce the frequency of stormwater overflows into the Plym Estuary. The scheme also delivered benefits, of reduced localised surface water flooding, highway flooding and environmental enhancements to the intertidal mud flats that were realised by the project partners- EA and PCC. This is an example of how, by working together, we can achieve a better outcome for our stakeholders, customers, local businesses and the environment.

## Case study

### Inland bathing water pilot on the Dart and Tavy rivers

The South West is already home to 150 designated coastal bathing waters. This pilot will explore how we might begin taking the same approach to river bathing waters, starting with two rivers that we know are popular for recreation.

In recognition of the significant value of our rivers and inland waters to communities across the region, as part of our Green Recovery Programme, we are undertaking a £3.9m, three-year Pilot Project on the Rivers Dart and Tavy.

The popularity of our rivers and inland waters as places for recreation has grown significantly over the last 20 years, with people's desire to connect with the natural environment strengthening. The Dart and Tavy Inland Bathing Waters Pilot aims to increase our understanding of the water quality of these two iconic rivers, helping us to target investment on our own impacts and to support changes in agricultural land use where an impact becomes clear.

Since the project began in 2022, we have communicated the project to many stakeholders (including riparian interests, landowners and community groups) on both rivers. Both the project team and the community groups seeking to apply for inland bathing water designations have engaged proactively with the landowners in the emerging target locations and secured their buy-in to the process.

We are delighted that over 50 stakeholders have joined our Stakeholder Steering Group for the project, and we have designed and delivered a communication and engagement campaign that is centred on using the 'Hello Lamp Post' platform. This approach will be used at the candidate inland bathing sites and in other riverside locations to raise awareness of river water quality issues and capture people's perceptions of the river throughout the year.

The first year of bathing season sampling across the Dart and Tavy catchments has been completed to create a baseline of water quality information. The monitoring programme has also been extended in certain locations throughout the winter and preparations are now underway to begin the second bathing season sampling programme. In summer 2023, we will also be using a state-of-the-art genetic monitoring technique called 'Microbial Source Tracking' to determine which types of animals are contributing bacteria to the river water at certain times.

The monitoring programme has included the use of ten near real-time river monitors and 'spot-samples' across both catchments and the data gathered is being combined with the results of the water quality modelling work also underway. We have also been working with stakeholders to help them easily understand and interpret the large volumes of highly complex information this is generating.

We are pleased to have been able to share the water quality data in advance of significant stakeholder events on the river, including the 10K swim on the Dart, and with the Dart Harbour Master ahead of specific events. This data sharing has allowed the organisers of these events to make more informed decisions on river water quality safety.

In 2023 we are planning to support inland bathing water applications by local stakeholder groups engage by tracking river usage via the Hello Lamp Post platform and by providing informative and engaging water quality information to build understanding and encourage collaboration. We are also aiming to extend WaterFit Live to include real time storm overflow data relating to the four potential inland bathing sites.

We are also going to examine the performance of all storm overflows within 5km upstream of the proposed inland bathing water sites and co-develop a programme of improvements (to SWW assets and in the wider landscape) that will achieve the required target of no more than 1 spill per bathing season at these sites.

## Our stakeholder and customer views

Our comprehensive programme of customer and stakeholder engagement has underpinned the development of our DWMP, ensuring that we:

- Work in partnership and develop solutions that provide multiple benefits for our customers, the environment and the economy.
- Promote informed debate about acceptability of different levels of risk
- Create opportunities to listen to our stakeholders and customers and understand their views on the levels service that they want us to provide and the choices and costs to providing those services
- Provide confidence in our approaches to delivering improvements on our drainage and wastewater network.

### How we engage

Engagement with our customers and stakeholders on our future plans is a business-as-usual activity – given the vital role they have in shaping our plans.

We have a range of ways to engage customers and stakeholders and hear their views.

- Customer surveys, focus groups and workshops
- Citizen's juries – our PR24 customer forum
- Social media, customer contact and sentiment tracking
- Stakeholder events – including our multiple-stakeholder Stakeholder Forum
- Supply chain events
- Survey and communications to engage visitors to the region
- Public events – such as our public Watershare+ meetings, local community meetings and more recently our first Your Water, Your Say session
- Public consultations – including the consultation on our June 2022 draft DWMP

Customers today have multiple opportunities to share their views, whether through social media, regional press or as part of community groups and we are continually engaging with them to ensure our plans are focusing on what customers really want and think is important.

We are continually attending lots of community events as well, such as local parish and council meetings. These provide incredibly valuable insight into local needs and the level of support communities need.

Our WaterShare+ Panel has made our environmental performance and plans a priority, encouraging public attendance to meetings, allowing customers and stakeholder groups to come and discuss their needs and priorities and our plans

## Who we engage

Engaging customers and stakeholders in the environmental debate has never been more important.

- Customers – current and future customers
- Visitors and holidaymakers
- Community and customer interest groups
- Environmental interest groups & charities
- Land owners
- Supply chain partners
- Regulators
- Local and national government
- Innovation partners

We also welcome the ongoing dialogue that we have with South West MPs. From our meetings with them we can understand what individual communities need from the water environment, and how we can help support the economy and environment of the region.

## Listening to customers

**Customers** are always at the heart of our plans

So far, we have engaged 23,000 customers over the last 12-18 months directly through surveys, focus groups, workshops and the customer forum – as well as listening through day to day channels.

We know what is important to customers.

Customers' number one priority is to continue to receive a clean, safe secure supply of drinkable water supply. Alongside, increasingly protecting and restoring nature and the environment are seen as essential for us to deliver.

Customers have a good understanding of our impact on the environment. This connection with the environment is most readily understood in terms of the water environment – rivers, reservoirs and coastal waters

– this is seen to link to our core responsibilities and operations.

Customers rightly see us as key custodians of the water environment – and they look to us to make sure they can enjoy their favourite beach all year around; for assurance that loved ones can safely swim, bathe and paddle in the beautiful pristine and biodiversity-

rich bathing waters, rivers and lakes across the region; and to act to ensure tourism is sustainable rather than adding to the pressures on the system.

So, they are concerned to hear about pollution and storm overflows. There is a prevailing view among customers that sewage pollution is the number one issue where we need to improve – and with urgency as there



is a perception that the problem will get worse if not addressed with the onset of climate change.

Many of our customers are worried about climate change. It is nothing new for our customers to express concerns over climate change – but people see first hand the frequency and seriousness of

the impacts of climate change. What was once a concern around flooding has grown for customers to concerns around flooding, pollution, low rivers,

drought, and coastal erosion and sea level rises - and the potential loss of coastal communities. Now more than ever we need to invest to protect public health and the quality of the environment. This means going further and faster to invest in eco-initiatives and core infrastructure improvements.

The environment underpins the economy, tourism, recreation and the way of life in the southwest, and customers expect us to do our bit to support all of these. This means a balanced plan that addresses storm overflow spills, pollution and flooding – with a focus on beaches and rivers that support recreation first.

### **So doing nothing is not an option.**

91% of customers tell us that they want us to invest further in beaches and bathing waters across the region. And in the main, most customers are willing to pay a more each month for this. When asked about future bills rises, the range of responses is very wide, with some customers unable to pay any more than they do today given the impact of the cost of living crisis, and one third of customers willing to pay over £200 a year more for environmental improvements.

What all customers do agree on is that bills need to be fair and affordable. Affordability is an important theme whenever we speak to customers – in every engagement and in every event. This means we need to manage overall bill levels, maintaining a robust affordability toolkit, and ensuring a diverse and innovative approach to tariffs. Many visitors to the region agree that those local to Cornwall and Devon should not pay all of the costs to maintain beaches to which they and other holiday makers benefit from.

And whilst habitat creation is not seen as our core duty, this is where we can make a difference across the region. Customers want to live in a beautiful region, bursting with nature – a view shared by visitors who tell us that biodiversity and nature are an important part of making the region a special place. So, we have the backing of customers and visitors to do more to recover nature and boost biodiversity and our plans need to balance engineered and nature-based solutions.

## **Listening to stakeholders**

### **Engaging and working with stakeholders is not new – what is different is the scale.**

Stakeholder groups, as anticipated, are well informed about many of the future challenges of the DWMP.

Our stakeholders understand how important it is for the DWMP to align with, and reinforce, the priorities of the strategic and local delivery plans that other organisations work to, such as: Flood Risk Management Plans,



River Basin Management Plans, Climate Change Risk Assessments, Local **Nature Recovery Strategies, and Local Plans.**

Responsibility for drainage is shared with other flood risk management authorities, land and drainage asset owners and collaborative working is essential to achieve the ambitions of the DWMP. Stakeholders have been clear that they want to work in partnership to co-create and develop solutions and to deliver and support community engagement initiatives.

We have had strong support from stakeholders for our commitments on coastal bathing water and reducing spills from storm overflows. Our stakeholders share our concerns with the impact of rising sea levels on infrastructure given the maritime nature of our region and the proximity of some of our assets to the coast. We also heard a willingness to be involved as delivery partners in any new catchment management schemes, building on the success of our Upstream Thinking approach, which also has the potential for attracting public and private funds, potentially reducing future pressures on customer bills.

Stakeholders also strongly supported the use of nature-based solutions in tackling wastewater and drainage challenges. 96% of respondents to our DWMP consultation told us that we should use nature-based solutions wherever possible.

## **Our Stakeholder Forum**

To ensure wide awareness and engagement of stakeholders and interested in the development of our strategic plans, including the DWMP, we established a periodic Stakeholder Engagement Forum which brings together colleagues and groups with an interest in how water is managed and the impact on the environment.

As well as receiving regular updates on the development and progress of the draft DWMP, all Forum members were invited to attend three online workshops in September 2022 which focussed on the draft plans, highlighting the challenges we face and debating the scale of investment required, the range of potential solutions and the desired pace of change.

In addition, South West Water raised the draft plans as agenda items on the many external forums and partnerships that we are engaged with. These include Local Flood Risk Management Committees, Local Nature Partnerships, Catchment Partnerships and many other groups and events that we are invited to attend. An annual cycle of one to one meetings with key stakeholders, including local authorities, Chambers of Commerce, tourism representatives and environmental interest groups also flagged consultation process for the draft plans.

South West Water has a well established relationships with key delivery partners for our award winning Upstream Thinking Catchment Management programme. The delivery partners include Cornwall Wildlife Trust, Devon Wildlife Trust, FWAG, South West Lakes Trust and Westcountry Rivers Trust. Those partners were also invited to put forward their proposals for delivering collaborative and nature-based solutions to meet the challenges set out in the draft DWMP.

South West Water's supply chain have also been challenged to bring

forward a range of collaborative and nature-based solutions, and to set out their relevant skills and expertise, as they consider and respond to our call for framework contacts.

## Co-created schemes

To date we have focussed on three areas where we have developed and co-created schemes in Falmouth, Sidmouth and Plymouth to demonstrate the principle of co-creation and co-funding. From this we will co-create schemes across the whole of our programme.

We have included a detailed overview of the work undertaken in Falmouth as part of the DWMP plan to show the process in action.

The Falmouth scheme has shown that there is limited funding within the local councils and other risk management authorities. It has shown that there is a willingness to support and that there are pockets of land available either for the construction of storage tanks or sustainable urban drainage schemes (SuDs), but these are not necessarily in the right locations hydraulically. Most of the agencies involved receive Grant in Aid funding through the Environment Agency and as such cannot commit to funding until later in the development process when these Grant in Aid applications are made.

Whilst these could be supported out of the grant in aid allocations these are limited and are more likely to be in the £10k-£100k arena compared with the millions that would be funded through water companies. It is therefore likely that we are only likely to see 1-2% of financial contributions from third parties across the programme.

## Case study

### Co-funding solutions

We have experience of delivering co-funded solutions through our Downstream Thinking programme, for example at Plymouth. Working with both the Environment Agency and Plymouth City Council, and sharing the costs, we have developed solutions to flooding and pollution risks in Plymouth.

In Central Plymouth, we're developing four surface water separation schemes covering approximately 30% (28.56 hectares) of the impermeable area and green sustainable urban drainage schemes. We have particularly focused on St Levan and Lipson Vale and have been collaborating with Plymouth City Council as we develop our plans.

Central Plymouth has large areas of properties that have surface water discharging into the combined sewer system. This means we have opportunities to remove the surface water but there are challenges that we'll need to resolve. The majority of the coast is bordered with major infrastructure, such as railway lines, major roads and His Majesty's Naval Base Devonport. This means that the opportunities for constructing new outfalls is limited. We're developing our understanding of the challenges and associated costs of large scale projects as we significantly reduce storm overflow spills and flooding.

We've carried out site visits to assess the potential for surface water separation and sustainable drainage systems, and talked to the Council to listen to feedback on our plans. St Levan and Lipson Vale are proposed pilot sites for sustainable drainage systems and we'll also be working more closely with customers as we ask them to be part of our solutions. We've also submitted a bid for funding to support this work, but this is only the beginning. There are more locations for us to explore in Plymouth and at

a strategic level, we are aligning our plans to develop a joint strategy for nature-based solutions.

Similar co-funding opportunities are being explored in Falmouth with Cornwall County Council and the Environment Agency, currently at the modelling stage to understand the root causes of flooding risk. We have also been working with Devon Wildlife Trust to address pollution risk from farming practices in the Ilfracombe area which are exacerbated by flows from a spring entering the combined sewerage system.

## How we consulted customers and stakeholders on our plans

In June 2022 we published our draft Drainage and Wastewater Management Plan (DWMP) and began a 12-week consultation to gain feedback on our plan from customers, stakeholders and regulators.

We engaged with our customers and stakeholders through a variety of routes to gather their views on our draft DWMP.

Our customer feedback was gathered from emails to our DWMP mailbox, completion of an online survey and attendance at DWMP specific customer focus groups. Our stakeholder feedback was also collected through the DWMP mailbox and online survey and attendance at the Stakeholder Forum. We met with stakeholders through three workshops, and our July Stakeholder Forum with over 50 organisations taking part in the conversations. A full list of who we have engaged with can be found in Appendix 1 in our Statement of Response document.

We've also shared our plans, along with feedback from customers, stakeholders and our regulators with our independent advisory WaterShare+ Panel which was established to protect the interests of our customers.

## What we wanted to understand

We asked consultees what their priorities were for our investment in our drainage and wastewater network and were especially keen to hear their views on how we strike the right balance between nature-based solutions and partnership working and whether we've got the right balance between prioritisation and the pace of change.

We also wanted to ask how people felt we could better protect our networks from external factors such as unflushables products.

We were pleased with the good engagement and high levels of trust in our plan and we're grateful to the stakeholders, customers and organisations that took time to engage with our consultation and provide feedback on our plan.

## What we heard

The six key themes that we heard from customers, stakeholders and our regulators throughout the consultation were the importance of:

### Balancing our investment choices

The level of investment that our final DWMP will deliver is a step change from previous years. We've heard from the consultation the importance of developing adaptive plans and sharing the assumptions we've used to develop our solutions.

We understand the criticality of achieving the significant reduction in spills and reducing the impact on our customers and the environment and in some areas this means that we need to deliver solutions that provide immediate benefit. Our plan considers how to maximise the benefits whilst using nature and catchment-based solutions wherever possible.

### Delivering an affordable plan

We heard from customers that fair and affordable bills are essential. This [DWMP Technical Summary](#)

is something that we have heard from customers throughout the cost-of-living crisis, so we need to manage overall bill levels, maintaining a robust affordability toolkit, and ensuring a diverse and innovative approach to tariffs.

### **Demonstrating environmental leadership**

Our customers and stakeholders want us to prioritise bathing water quality investment and understand water quality. We have ensured this is a key focus in our final plan. We are already on an improvement journey and WaterFit Live provides near real-time updates to customers on bathing water quality for a range of locations around the region.

All the groups that responded to the consultation told us championing nature and catchment-based solutions is important. We've also heard the widest range of views about how we balance these solutions with more traditional 'grey' approaches such as storage tanks.

### **Sharing the local impacts of our plan**

Our consultation helped us to understand how important it is that our plan is accessible to our customers and that we share information on what's happening in their local area in a format that's clear. We've also heard how important it is to share the likely bill impacts of our investment programme.

Our customer outline shares the key information about our plan and our level 2 documents provide detail for each of our strategic planning areas.

### **Adaptive planning and risk management**

Our regulators wanted us to detail how we've used adaptive planning to decide on our investments for the next 5 years and with a view on the next 25 years. In particular they wanted to hear how this will support the way we manage risk.

We're sharing more detail on our adaptive planning approach in this document and our Technical Summary document.

### **Providing a robust and detailed plan for storm overflows**

Whilst our regulators have asked for a plan, we heard from all groups that this is a key area they want us to focus our investment in. Our plan provides a view of what investment we'll be carrying out on storm overflows for the next five years and where we aim to be by 2050.

Some of our initial interventions to mitigate risks have been adapted as a result of feedback we received through the consultation. Our Statement of Response provides a comprehensive view of the feedback we've received and how we've adapted our plan based on what we heard from customers, stakeholders and our regulators.

## WaterShare+ Panel

We have shared our plans with the WaterShare+ Advisory Panel, who protect the interests of our customers, and ensure that customer views are represented in the development of our PR24 plans.

While commending the nature of our proposals and range of solutions that we have considered, the Panel are mindful of the potential impact that the level of required investment could have on customer bills – in a financial climate which is already challenging. We recognise this challenge and as part of our PR24 plans we are considering how we might change the way in which customers are charged to be more progressive. The Panel is supportive of steps to modernise and update how we charge for water and wastewater services to ensure bills are fair and affordable, and drive the right behaviours.

Considering both the DWMP and our wider investment plans, the Panel have challenged us to ensure that they are deliverable on the ground.

The Panel endorse our approach to working with the supply chain to address these concerns.

The Panel have reviewed feedback from our regulators on our draft DWMP and support our statements of response for our final DWMP.

## A summary of customer engagement studies that have shaped our plans

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**Green Recovery** (October 2020 to January 2021) – we engaged customers as part of developing our Green Recovery plan through a series of focus groups and quantitative surveys. This showed how the pandemic was shifting customers' relationship with nature, and the increased support for green infrastructure to support the economy and the environment.

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**Environmental leadership** (June 2021) – we engaged customers to understand what it means to be an environmental leader and what they expect from South West Water. An environmental leader is a company that delivers leading levels of performance, has good plans in place for the future, takes the initiative to go beyond what is required, and shares knowledge and innovations. Many of our customers do see us an environmental leader, but we learned that many customers do not know the full extent of our operations and services and they more the do know, the more satisfied they are with our performance and the more that they trust their bills to be value for money.

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**Future long-term strategies** (September 2021) – we tested a range of future environmental and performance strategies from 2025 to 2050, including catchment management, climate change resilience, reducing storm overflows, and reducing carbon emissions. This has helped to understand priorities for the pace, scale and profile of potential investment around key strategic themes – with climate change resilience the highest priority strategy. This showed that customers want to see further improvements, but are mindful of affordability, and those that

[DWMP Technical Summary](#)



can least afford to pay need to  
be protected.

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**National sentiment tracker (October 2021 – March 2022)** – we tracked over 20,000 views on a range of range of environmental issues across the south west and the UK overall, including awareness and attitudes towards environmental issues such as river health. This showed that nationally customers are most concerned about climate change, deforestation, single use plastics and ocean pollution. River pollution was seen as the 6th biggest environmental issue with water companies perceived as a leading cause of poor river health. Customers in the south west were slightly more aware and concerned about environmental issues that across the rest of the UK. The sentiment questions have now been incorporated into our monthly business as usual tracking research.

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**River water quality (February 2022)** – based on the sentiment tracker, we undertook focus groups to better understand customer views on river health, such as what they had heard, where they had heard it, what they trusted, and how we communicate our progress in this area to them. Customers want to know more about this topic, and get their information from a range of sources – social media, local news reports, TV and family and friends – so there is no silver bullet on how we communicate: a multi-channel approach is needed and is now in place, including our first ever TV campaign.

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**WaterFit (April 2022)** – we developed WaterFit after listening and engaging with our customers. We tested the WaterFit commitments in a series of focus groups and 100% of participants said they supported our plans. Customer support was strongest for the commitments on coastal bathing water and reducing spills from storm overflows, and many customers recognised the wider benefits in terms of the economy and jobs, and the impact on health and wellbeing.

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**Testing DWMP priorities and preferences (May 2022)** – we engaged with customer focus groups to test our DWMP, to ensure our plans are in line with their views. This enabled us to understand the right pace and scale for investments, confirm the ambition for partnership working, and gain assurance from customers that our plans focus on the right things. This showed that our plans are focusing on the right topics. Feedback included the following:

- Customers recognise we cannot achieve this alone, and partnership working is a must – customers see there is a need especially to get developers on board as new housing developments are seen to be a problem across the region affecting all infrastructure and essential services
- Base maintenance scenarios alone are not acceptable and there needs to be a step change in investment
- With the current cost of living crisis, large bill increases that

**DWMP Technical Summary**

reduce affordability would be an issue at this time – and plans need to be mindful that they start when we will likely just be exiting a difficult economic period

- Nature-based solutions were popular with attendees, but they also recognised that they would not be quick to deliver outcomes.

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**Willingness To Pay Programme** (January 2022 to January 2023) – we have undertaken an extensive programme of Willingness To Pay (WTP) research as part of our ongoing programme to understand the benefits of investment and what customers are willing to pay for improvements to service and the environment. This programme of work ensures we can prioritise improvements, apply cost benefit principles to our plans, and ensure we understand the overall envelope of bill increases customers will accept.

The research shows that customer willingness to pay to avoid sewer flooding has increased since PR19 – reflecting growing concerns around flooding and climate change. Customers also have higher willingness to pay to reduce pollution, reduce spills and improve bathing water quality further still. Over half of customers consider storm overflows to be a problem and would like to see this used much less frequently and ultimately phased out over time – with spills that impact recreational or environmentally sensitive areas the most important to avoid, as customers look to see improvements targeted where they will benefit the most.

Overall customer willingness to pay has increased since PR19. In PR19 the average willingness to pay for service and environmental improvements was £10-£15. Today, this has increased in range – up to £200, with a third of customers willing pay £200 or more.

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**Youth Board** (March 2023) – The Youth Board is an annual programme where we look to understand the views of young people, our future customers, across the region, and bring these views into our decision making as well as providing development opportunities and business experience for the young people involved. This year, one of the topics the Youth Board looked at was their knowledge of the industry and what challenges we may face in the years ahead. While future customers are well aware of climate change – the link to water and wastewater services was not at all well understood – so we need to more to make the challenges we face tangible to future generations. Those who live in coastal locations are very passionate about bathing water quality – and initial views are that our levels of spills are simply too high.

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**WINEP focus groups** (October 2022 to January 2023) – this research was designed to review our Winep proposals, particularly with regard to storm overflows, river quality monitoring, bioresources, and nutrient reductions. Support was greatest for investment to reduce storm overflows and the least for river quality monitoring.

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**Sewer misuse (January to March 2023)** – this survey showed that customers consider that both behaviour change and infrastructure upgrades are needed to keep sewers clear and clean. There remains some unawareness of the impacts of disposal of household materials down the drains, with one in five saying they flush wipes down the toilet and younger people in particular less likely to see an issue with flushing wipes and to attribute issues to inappropriate disposal rather than to SWW. Seven in ten are aware of ‘fatbergs’ – and are aware that they can cause flooding of raw sewage into homes and pollution to rivers and seas. Customers see education as essential to behaviour change, with preventing blockages seen as a shared responsibility.

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**WaterFit Live (February 2023)** – we engaged our Customer Forum to look at the WaterFit Live platform. Customers welcome the steps to boost transparency – seen as falling in recent years, with (78%) saying the site would be useful for them when they are considering visiting their local beach. Almost all customers (96%) thought the site was easy to use and clear.

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**Net zero (March 2023 to April 2023)** – we engaged customers to understand their attitudes towards achieving net zero, especially in light of new environmental standards and the cost of living crisis.

Customers overwhelmingly see this as an important area even with a large environmental programme on water quality – but don’t always agree on who should pay, with some national outcomes needing to be funded from national incomes.

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**Staycation (March 2023 to May 2023)** – this large national survey of 2000 visitors to the region showed the views of tourists that come to the region. This showed that more than 8 in 10 visitors say their families enjoy the use of coastal bathing waters when they come to the South West, compared to 37% who say they enjoy rivers and inland waters. Almost all visitors say it’s either quite or very important that the beaches in the south west have good or excellent quality coastal water, and one third agree that it is not fair that those local to Cornwall and Devon pay all of the costs to maintain beaches which those holidaying in the area benefit from.

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**Progressive charges (April – May 2023)** – our programme of engagement with customers on progressive charges is underway. Phase 1 has shown that customers are supportive of changes to the way that we charge for water and incentivise sustainable delivery. Charging policy should be simple and clear to understand, fair, support the right behaviour, and aid affordability.

## What this means – customers views on our objectives

OBJECTIVE  
**1**  
**Internal sewer flooding risk**

The instances of sewage in homes - which can be from blockages in the system and overloaded sewers

Our conversations with customers show us that the avoidance of sewer flooding is important to them. Preventing sewer flooding is consistently ranked as one of their highest priorities. Customers welcome our industry leading performance in this area but recognise this is a serious breach of service and support our continued focus on this issue.

OBJECTIVE  
**2**  
**Pollution risk**

The forecast number of pollution risks

Protecting the local environment is, alongside healthy, resilient infrastructure, one of customers two highest priorities for investment and improvement. Our customers rank pollution incidents as a high priority and support our focus on this area as part of a balanced plan. Addressing minor pollution incidents is a lower priority for our customers than other environmental areas for improvement such as storm overflows and bathing water quality.

OBJECTIVE  
**3**  
**Sewer collapse risk**

The forecast number of risks, measuring how well we maintain our assets

Healthy, resilient infrastructure is, alongside protecting the local environment, one of customers two highest priorities for investment and improvement. Our customers support steady improvements in asset health over time.

OBJECTIVE  
**4**  
**Risk of Internal sewer flooding in a 1 in 50 year storm**

The predicted number of properties that could experience flooding from our sewer network in a severe (1 in 50 year) storm

Customers are concerned about the impacts of climate change worsening the risk of internal sewer flooding and consider it important for us to maintain levels of service in this area and not allow risk to increase as climate changes.

OBJECTIVE  
**5**  
**Storm overflow performance**

The number of storm overflow discharges in our catchments

Our customers think storm overflows are being used too often – and they find this unacceptable. Ideally they would prefer storm overflows were not used at all, although they understand why they are needed and that changes to infrastructure take time. Our customers support investment in preventative measures as opposed to measures reducing the impact after an event. However, investment in monitoring to allow for earlier alerts is also welcomed. There is high acceptability of the mandated investment and for us to go beyond the minimum legal requirement.

OBJECTIVE  
**6**  
**Risk of WWTW quality compliance failure**

Assessing if the quality of the final effluent leaving our wastewater treatment works complies with our environmental permits

Whilst protecting the local environment is, alongside healthy, resilient infrastructure, one of customers two highest priorities for investment and improvement, investment in improvements to treatment works permit compliance are a lower priority for customers than investments to reduce storm overflows and sewer flooding.

## Our bespoke planning objectives

OBJECTIVE  
**7**  
**Risk of sewer flooding in a 1 in 10 year storm**

The forecast number of properties that could experience flooding from our sewer network in a 1 in 10 year storm event

Customers are concerned about the impacts of climate change worsening the risk of internal sewer flooding and consider it important for us to maintain levels of service in this area and not allow risk to increase as the climate changes.

OBJECTIVE  
**8**  
**Risk of WWTW compliance in dry weather flow**

The risk of exceeding the permitted average daily flow to a wastewater treatment works during a period without rain

Whilst protecting the local environment is, alongside healthy, resilient infrastructure, one of customers two highest priorities for investment and improvement, investment in improvements to treatment works permit compliance are a lower priority for customers than investments to reduce storm overflows and sewer flooding.

OBJECTIVE  
**9**  
**Serious pollution incidents**

The number of serious pollution incidents (defined by the Environment Agency as Category 1 and 2)

Our customers consistently rank pollution incidents as a high priority. They tell us that they want to see us focus our efforts on preventing more serious pollution incidents.

OBJECTIVE  
**10**  
**Nutrient reduction & improvements to river water quality**

A reduction in the amount of phosphorus and total nitrogen in the wastewater we discharge to rivers, improving water quality and enabling new development

Whilst protecting the local environment is, alongside healthy, resilient infrastructure, one of customers two highest priorities for investment and improvement, investment to reduce contaminants in discharges are a lower priority for customers than investments to reduce storm overflows and sewer flooding.

OBJECTIVE  
**11**  
**Coastal risks due to climate change**

The likelihood that our assets in coastal locations are at risk of coastal flooding and erosion

Customers recognise the importance of protecting coastal works from the stress that climate change can have on water company infrastructure in the future. They feel it is necessary to ensure that works are protected in the future as the effects of climate change worsen risks such as coastal flooding over time.

## Our Plan

Our Drainage and Wastewater Management Plan builds on both the draft plan we consulted on, and the work we are taking through our WaterFit programme to take action to control and manage the emerging challenges to the environment that we face.

We know that doing nothing is not an option. The current system is not acceptable. So, we are responding to the challenges we face, the legal targets we need to meet, and delivering for our customers and stakeholders.

We have explored how we can do this, looking at a number of potential approaches, analysing the costs and timings of potential interventions and the complexity of the issues facing our catchments.

### Our environmental ambition to 2050

Our start for developing the programme has been to understand the long-term environmental ambition – where we want to be by 2050. Once that was established, our focus was then how do we get there – and are there areas of our plan that we can deliver before 2050?

2050 is a milestone for our DWMP and environmental plans overall. By 2050 the government will have delivered its 25-year plan including the delivery of Net Zero.

We too have an ambitious plan for 2050 – we will ensure:

- We address all storm water overflows spills – bringing these to minimal levels as we invest in wastewater treatment works, sewers, pumping stations and nature-based solutions – ahead of 2050 where possible
- Assets and services are protected from the extreme impacts of climate change – managing the upward pressure on flooding risk and adapting to coastal erosion and sea level rises
- Our wastewater treatment works maintain 100% compliance with environmental permits – and wastewater quality standards improve as we upgrade works to reduce even more contaminants from our discharges
- We dispose of sludges carefully whilst maximising the energy generated from sewage – turning waste into a valuable source of renewable energy
- We continue to be open and transparent about our performance – building on Water Fit with ever more monitoring of our performance and impact on the environment – adapting our plans as we learn ever more about our impact on the environment.

Meeting these aspirations is at the heart of our future wastewater plans, and we want to deliver these outcomes efficiently and effectively – ensuring there are no regrets in our long term investment plans.

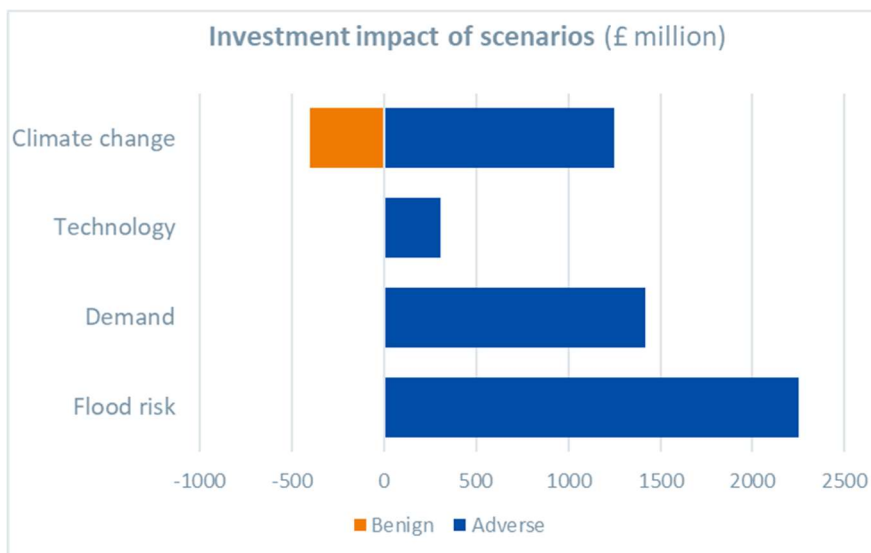


## Central estimates of costs

Our least regrets investment plan has identified an investment position of £7.5bn to 2050. This is the level of investment over 25 years needed to manage flooding risk, address the risks of climate change and population growth, and deliver reductions in the reliance on storm overflows in line with targets set for the sector. It is also the level of investment needed under a most likely future combination of scenarios.

In the section of this document where we '*assess what the future could look like*' we have described how the impact of different scenarios may impact our investment plans under more adverse or benign scenarios:

- Climate change – modelling the impact of different climate change scenarios on network performance
- Technology – considering the benefits that new technology can deliver for efficiency, as well as the additional investments that could be unlocked by new technology and used to achieve greater environmental benefits
- Demand – understanding the additional stresses that greater water uses places on our system.
- Flood risk – testing increasing customer expectations around flood risk protection



This level of investment will:

- Eradicate storm overflow to minimal levels at each overflow, if at all, by 2040
- Create over 550,000m<sup>3</sup> of storage to capture rainwater and reduce overflows – equivalent to building 220 Olympic sized swimming pools and ensuring that our overflows will only spill during heavy weather
- Separate 1,447 hectares of surface water by creating nature-based solutions and sustainable drainage.
- Upgrade more than 2,700km of our sewer network – this is c.12% of our network and is equivalent to the distance from Land's End to Athens
- Upgrading 123 of our 653 wastewater treatment works so that they can accommodate higher dry weather flows as well as upgrading 100 of our WWTW's and SPS so they process more flows without spilling to the environment

- Manage the risk of sewer flooding associated with changing climate change
- Ensure investment to reduce storm overflows supports reductions in the risk of flooding through the application of nature-based solutions.
- By maintaining future flood risk performance in our preferred plan, we give ourselves time to monitoring the effective of nature-based solutions so that if we need to adapt to a more adverse flood risk future, we can do so through more sustainable solutions.

Further improve river water by upgrading treatment processes to remove harmful nutrients from discharges

- Target 350km of improvements to waterbodies within the South West Water drainage supply area, by upgrading our process at 230 sites, as we enhance treatment to the most efficient and economic solutions. This represents approximately 15% of the total length of watercourses in the region.
- Support new developments in the Camel and the Axe catchments by upgrading our wastewater treatment works in these environmentally sensitive areas - thereby supporting the construction of c.9,000 properties whilst keeping nutrient levels neutral “nutrient neutrality”
- River water monitoring
- Rolling out a programme of 2,300 river monitors by 2035 to allow us to understand and communicate our impact on rivers – and allowing us to update and adapt our plans as we learn more about our relationship and interaction with the water environment
- Manage bioresources, ensure coastal resilience, maintain compliance and the health of our asset base, through our entire wastewater plans.

We are agreeing with our regulators how we can progress some of these benefits early – such as reducing spills and accelerating nutrient reductions. Getting an early march on our investment allows us to bring the delivery of our plans forward

## Our adaptive pathways

Our adaptive pathways consider the cumulative changes in scenarios over time for feasible combinations of scenarios. This shows a range of future adaptive pathways starting at £7.5bn, our least regrets scenario, up to what we believe would be the most adverse future at £12.4bn.

These are described as pathways as they are different journeys to our ambition based on different combinations of plausible scenarios - which may or may not be required depending on the different futures we could experience.

Six pathways have been considered which are summarized below:

**Pathway 0: Do nothing** – the status quo is that we do nothing. Under this scenario we would maintain our existing assets. This would mean performance would get worse and we would fail to meet our targets.

**Pathway 1: Low regrets** – this pathway is the most likely combination of investments that we will need to meet the targets set for storm overflows by 2050, ensure no deterioration to flooding risk, and to meet compliance. The future has a 2°C increase to our climate under and it assumes we achieve our planned demand reductions all under a low

technology future. Under this pathway we can keep the most amount of options open for future adaptation and if necessary movement to an alternative pathway.

**Pathway 2: Climate resilient** – this is similar to Pathway 1 – but we experience a 4°C increase to our climate – and we therefore need to be more climate resilient. As with Pathway 1, we meet all legal targets, maintain flood risk to ensure no deterioration to 2050 and increase our resilience to climate change. A low technology and low demand future is assumed under this pathway.

**Pathway 3: Reduce flooding** – this is similar to Pathway 1 with the same climate change risk, but customer expectations change around flooding and we need to reduce the risk further from our 2025 level of 10% of properties at risk of sewer flooding to a 5% level of risk. As with Pathway 1, we meet all legal targets.

**Pathway 4: Enhance resilience** – this is a variant of Pathway 2 we experience a 4°C increase to our climate. The difference in this pathway is that our customer expectations change around flooding and we need to reduce the risk further from our 2025 level of 10% of properties at risk of sewer flooding to a 5% level of risk. We meet all legal targets.

**Pathway 5: Innovative technology** – this builds on Pathway 4 ensuring we can meet all current wastewater targets whilst preparing for a 4°C increase in climate with reduced levels of flooding. Additionally, we are able to adopt new technologies to improve how we analyse and operate our sewer network and monitor the quality of our effluent discharges from our treatment works. A high technology scenario provides efficiency in the management of our sewer network but a net increase is experienced due to investment at our WWTW's due to an assumed tightening of standards.

**Pathway 6: Most adverse** - this is our highest cost plan, dealing with the highest risks we may face. It is based on most adverse scenario we could face - higher levels of population growth and increased demand on our wastewater network in a 4°C future climate. It also considers a low technology future and a higher customer expectation for flood risk protection, moving from 10% to 5%.

The scenarios used in the development of each six pathways and the associated investment needed under these pathways to achieve our ambitions are set out in the following table.

	Pathway 1 (low regret)	Pathway 2	Pathway 3	Pathway 4	Pathway 5	Pathway 6 (most adverse)
Climate Change	RCP6	RCP8.5	RCP6	RCP8.5	RCP8.5	RCP8.5
Flood Risk	Maintain Flood Risk	Maintain Flood Risk	Reduce Flood Risk	Reduce Flood Risk	Reduce Flood Risk	Reduce Flood Risk
Technology	Low	Low	Low	Low	High	Low
Demand	Low	Low	Low	Low	Low	High
Total (£m)	<b>7,498</b>	<b>8,748</b>	<b>9,748</b>	<b>10,998</b>	<b>11,308</b>	12,416
Interventions						
Surface water removal (Ha)	1,447	2,023	2,473	3,023	3,023	3,023
Storage capacity (m <sup>3</sup> )	550,890 (Equivalent to 220 Olympic swimming pools)					
Sewer inspections /upgrades (km)	2,785					
WWTW upgrades for nutrient reduction (Nr)	230	230	230	230	319	319
WWTW & SPS capacity increases (Nr)	100	100	100	100	100	100
Additional DWF and BOD capacity increases (Nr)	123	123	123	123	123	123
WWTW rebuilds for FFT (Nr)	0	0	0	0	0	25

As we move from a low regrets to a more adverse pathway, our investment needs increase to mitigate against the more challenging futures being experienced. Our adaptive pathways deliberately attempt to mitigate these risks through nature-based solutions which is why the surface water removal volumes increase notably as we step through the different pathways.

Under the high demand and high technology pathways investment in WWTW also increase above the levels required in other pathways. This reflects the need for WWTW rebuilds or substantive upgrades to accommodate the additional flows that would be passed directly to treatment under normal operating conditions.

Due to the uncertainty of the adaptive pathways, we consider it right to take a cautious approach – and base our plans on Pathway 1 – least regrets. However, the analysis shows that the costs could be up to 65 per cent higher which means that we need to be ambitious and work at pace if we are to be sure that we do not put excessive cost burdens on future generations. We have considered this as we have looked to profile our investment across AMP periods.

## Programme options

### Our investment plans across the years

Whilst our ambition for 2050 is clear – how we get there, and the pace of delivering our ambition, has been a considerable focus for our plans and our discussions with customers and stakeholders. We know we need to show great ambition.

We have assessed a range of options and scenarios around delivery of the plans to 2050, to understand how the different levels and timing of investment can deliver against the targets set.

In doing so:

- If we invest later, we can ensure bills are more affordable in the short term, we can focus more on nature-based solutions that take time to provide benefits, but allows the pressures such as climate change to grow, and ultimately means the bills that customers pay are greater in later years especially if more severe future scenarios turn out to be true
- If we invest sooner, we can get on with delivering the outcomes we all want to see, meet our customers' and stakeholders' expectations, address climate change risks now, ensure there is time to adapt to a more severe future – but we will need to rely more on traditional solutions to deliver outcomes quickly and bills will rise more in the short term, whilst being lower in later years

Our plan to 2050 needs to balance these considerations.

**Our most likely plan is for Pathway 1 – but we need to expect to adapt in the future. That means there is at least £7.5bn to spend. We have looked to work at pace, bringing investment forward that we know we will need to do to protect the environment and communities, and to be ready and able to adapt to more severe futures if they come to pass.**

Our focus in bringing investment forward has been around our investment in storm overflows. This is where we are being asked to show the greatest ambition.

### Storm overflow investment over the AMPs

We have explored the prioritisation of our storm overflow investment.

We understand our legal requirements, as set out in Defra's Storm Overflow Discharge Reduction Plan (SODRP). In delivering these requirements we have considered which locations to prioritise first. And we have considered how much further we can go in the first five years to deliver sooner in priority areas.

In developing our plans, we have recognised that not all storm overflows are the same. Some are not spilling at all, some are high spilling, some are close to high priority sites such as bathing and shellfish areas, some discharge into rivers and are the cause of rivers not achieving good ecological status (RNAGs), some may be causing distress to local communities. Understanding this through our engagement with customers and stakeholders has allowed us to determine which overflows should be improved sooner.

We have 1,342 overflows:

- c. 500 have minimal if any spills

[DWMP Technical Summary](#)

- 59 are being addressed in our WaterFit plans
- 786 spill more than the target and therefore are the focus on our future investment
- 178 are in high priority areas
- 163 bathing waters or shellfish waters
- 445 other locations

The legal requirement is to address at least 38% of storm overflows discharging in or close to high priority sites by 2030 – and 75% by 2035 and 100% by 2045. And for all remaining storm overflow sites by 2050.

We also have locations to invest in for the bathing water and shellfish drivers at 163 storm overflows. These are included in our programme of storm overflow investment.

For us this means we need to do at least 246 locations in the period 2025-30 compared to the 275 we propose.

We looked at 8 different programme options for storm overflows within Pathway 1, as shown in the table below, all of which ensure that we meet our mandatory regulatory requirements, as outlined in Defra’s Storm Overflows Discharge Reduction Plan (SODRP)

Option	Description	Detail	Number of locations by 2030	2025-2030 cost
1	Legal minimum – least cost	Delivers the legal minimum requirements of the Defra SODRP and bathing water/shellfish drivers at least cost	246	848
2	Legal minimum 100% RNAGs 100% stakeholder/community priorities	Delivers the legal minimum requirements Also addresses high priority locations as identified by our customers and stakeholder (which centres around bathing waters) AND all RNAGs associated with overflows by 2030 After 2030, SODRP achieved at lowest cost	309	1021
3	Legal minimum 100% RNAGs	Delivers the legal minimum requirements AND all RNAGs associated with overflows by 2030 After 2030, SODRP achieved at lowest cost	291	972
4	Legal minimum Catchment approach	Delivers the legal minimum requirements Addresses risks in the top 12 priority catchments After 2030, SODRP achieved at lowest cost	351	1245
5	Legal minimum 100% RNAGs 100% high spillers	Delivers the legal minimum requirements Addresses all RNAGs associated with overflows and any high spilling overflows over 100 spills/annum by 2030 After 2030, SODRP achieved at lowest cost	360	1458



Option	Description	Detail	Number of locations by 2030	2025-2030 cost
6	Legal minimum 100% Stakeholder/community priorities / all the bathing beaches	Delivers the legal minimum requirements Also addresses high priority locations as identified by our customers and stakeholder (which centres around bathing waters)	275	961
7	Legal minimum High spillers	Delivers the legal minimum requirements Addresses 80% of high spilling overflows.	261	989
8	Legal minimum Ten inland Bathing Waters	Delivers the legal minimum requirements Delivers ten inland bathing water sites (two inland bathing waters per annum)	273	981

Of these options, option 6 is our preferred option, and the basis of our WINEP proposals.

Option 6 includes those locations that are most important to our communities and stakeholders and their local areas. Combined with option 6, by 2030 every bathing beach will meet the targets – meaning everyone can have the confidence to enjoy their local beach all year round.

By selecting this option, we will deliver improvements at every beach where we have a discharge by 2030, in line with our Your Beach, Your Say, Our Investment initiative.

This option goes beyond the SODRP – delivering investment at half of all the high priority sites by 2030, against a target of 38%. And we will deliver one third of the total cost expected to achieve storm overflow reductions – demonstrating our commitment to eradicating storm overflows as quickly as resources allow – which is best value for our customers and communities.

More information on the eight options is available in our Alignment to the Storm Overflow Discharge Reduction Plan document.

## Nutrients

We have agreed a 10-year programme of nutrient removal investment with the Environment Agency through the Water Industry National Environment Programme, focused on increased removal of phosphorous, to reduce the risk of eutrophication in the watercourses to which we discharge as well as meeting improvements to descriptive sites and septic tanks.

Our 10-year programme is based on the legal minimum and therefore is a staggered programme between the 2025-2030 and 2030-2035 periods. This is our legally mandated programme the estimated cost of this programme is c. £500m. More information on these investments is included in The Technical Appendix of our plan.

## Bioresources investment over the AMPs

Our Bioresources plans aim to manage sewage sludge so as to create value as a by-product from wastewater treatment.

We already give farmers our processed sludge as a source of fertiliser. However, sludge disposal can impact on rivers if it runs off fields into rivers (say during heavy rain) and farmers need to use organic manure and sludge in accordance with the farming rules for water.

Over time there is a risk of the loss of this landbank. Tighter environmental regulations around farming or changing customer attitudes towards the use of this as fertiliser are risks we face.

We need to accelerate investment in a more resilient approach to Bioresources that future-proofs against the withdrawal of the landbank and helps us to deliver on our Net Zero strategy.

The ultimate destination for sludge is pelletisation or destruction. And in the interim, we can improve sludge quality and add more storage, so that it can be stored when it is not appropriate to spread to land.

Discussions are ongoing with regulators on which of these options to take – we consider the destruction route to be the best for our region given the risks to the land bank in the South West. Both of these require the same dewatering and digestion capability and have similar overall costs c.£190m.

## Continuous river monitoring

Continuous river monitoring will allow us to fully understand our impact on the environment. These will be located close to our overflows, giving us the information we need to review and adapt our plans going forward.

Whilst still subject to consultation, our legal requirement is likely to be installing 2300 monitors – in clusters around 250m apart – in rivers where we have storm overflow discharges by 2035. The capital cost of the programme is c.£260m with c.£160m of operating costs as the monitors are expensive to maintain.

One option is to spread these costs evenly across the years 2025 to 2035. However there is much to learn about these monitors, including how we install and maintain these safely along rivers – recognising rivers can be hazardous in some weather conditions. Supply chain capability is currently limited at around a tenth of the size of the proposed programme and so this is an area where innovation will be required as well as growth in capacity and capability and so over time the monitors will improve, become more robust and resilient, easier to maintain and cost less.

Moreover, our customers support a slower paced investment programme in favour of accelerated investments elsewhere – as they recognise the opportunity cost of investment here.

A second option is a smaller programme over the period 2025-2030 and a larger one in 2030-2035. This is our preferred option. 60 Our Drainage and Wastewater Management Plan

## Flooding and coastal resilience

We have identified investment at a number of coastal locations over the 25 year period, investing a total of £69m of enhancement investment and

£32m of maintenance investment over the period. By 2030 we have identified, 8 wastewater treatment works, 15 sewer pump stations, and just under 200km of sewers to be reviewed and where appropriate protected and relocated to avoid the impacts of coastal erosion and sea level rises. The cost of the improvements by 2030 would be c.£20m.

We have considered the options of Resistance, Redundancy, Reliability and Response/recovery in the development of our solutions whilst also engaging with both the EA and Shoreline Management plans. Initially we have considered Resistance solutions for these locations but will consider the relocation options should the options of managed retreat be considered by the local communities.

## Details of our best value plan

Our Best Value plan generates the greatest economic benefit for customers, the environment and society, compared to costs, over the long-term.

It takes account of affordability for customer bills, the short term and long-term risks, the uncertainties around the costs and benefits and the flexibility and adaptability of our programme to meet future needs.

It allows us to respond to the pressures facing our wastewater system now and over the next 25 years. It delivers against proposed government policy and delivers improvements to support customers, communities, and society. Our customers and stakeholders have told us very clearly that they care about the impact storm overflows can have on the environment, communities and economy of the south west region. We have listened to their concerns and are acting accordingly.

Our best value plan, begins with our least regrets plan (pathway 1) and considers where investment can be accelerated to do deliver benefits early where they are supported by customers.

In this case, our best value plan achieves the following:

- An accelerated storm overflow programme which delivers one third of our overall storm overflow investment and addresses half of our high priority sites by 2030
- Our mandated programme of nutrients and septic tanks
- A slow start to our continuous river monitoring programme whilst meeting compliance with 2035 targets
- Secured bioresources investment to ensure safe management of this product and renewable energy recovery

This is the plan that aligns with our customer and stakeholder views. Our Strategic Environmental Assessment shows that this plan delivers environmental benefits – that we want to deliver at pace.

Our best value plan requires an investment programme of £7.5 billion over 25 years to 2050, to meet a marked reduction in the frequency of storm overflow use and to maintain wastewater treatment works performance and manage sewer flooding.

The outcomes our plan will deliver are described below:

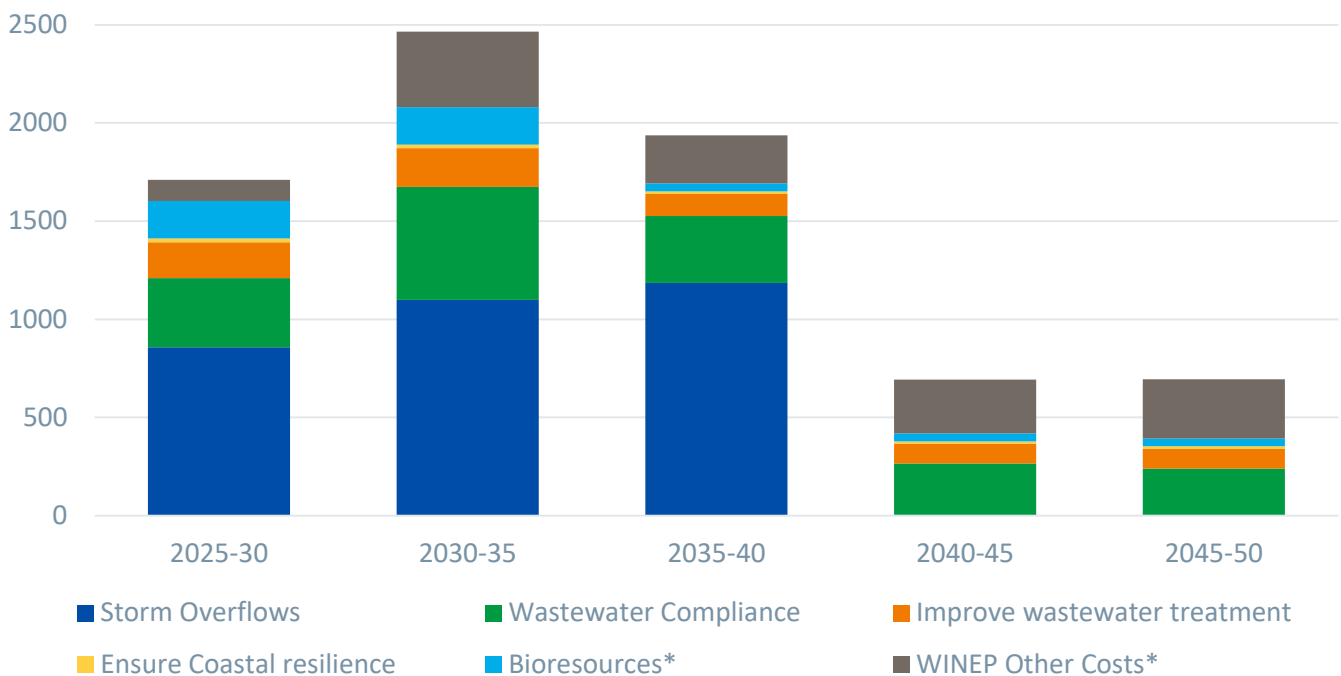
- No storm water overflow will spill no more than ten times a year, or create any ecological or public health impacts -and screened to prevent sewage litter. Storm overflows discharging close to designated bathing waters will discharge less than 3 times in a bathing season. We will focus on ecologically sensitive and high priority rivers and bathing water sites first. We'll outperform Government targets and deliver this programme 10 years ahead of its legally required completion date.
- Mitigate the risk of coastal erosion and flooding at 8 wastewater treatment works, 15 sewage pump stations, and 200km of sewers - which have been identified as at risk from coastal flooding and erosion, and seawater intrusion, due to climate change and rising sea levels. We plan to relocate these sites at highest risk and continue to monitor emerging risks as we develop our understanding of the risk climate change poses to our assets.

- Our wastewater treatment works will maintain 100% compliance despite the upward pressures from extra flows in the system.
- Compliance with tighter environmental permits as we look to raise wastewater quality standards by reducing phosphates in discharges by 80% by 2037, in line with the Defra targets and anticipate new standards for total nitrogen, selected metals and other emerging organic contaminants.
- Current flooding risks will be managed, so that the current percentage of the population at risk of flooding in a severe storm is maintained despite the upward pressures of climate change, population growth and urban development.
- Investment through to 2050 is paced across the five-year periods in the interests of intergenerational fairness, with a shift from traditional solutions to natural.
- Flood management so that overall circa 50% of the flow is impacted by our plan and is delivered through nature-based solutions and all of our solutions are considered for nature-based delivery approaches . i.e. 50% of solution delivered by storage and 50% through nature based solutions.

Our investment needed for the plan is detailed in the table below and is paced to ensure that we get early improvements, meet the targets and address emerging risks.

This totals £7.5bn over the 25-year period, of which £1.7bn is profiled within 2025-30. This includes £911m for storm overflows in the first five years.

**Breakdown of our preferred plan - Scenario 1b: best value (£ million)**



Risk driver (£m)	2025-30	2030-35	2035-40	2040-45	2045-50	Total
<b>Storm Overflows</b>	£858	£1,099	£1,185	£0	£0	£3,141
<b>Wastewater Compliance</b>	£351	£576	£341	£265	£240	£1,773
<b>Improve wastewater treatment</b>	£183	£197	£112	£101	£100	£693
<b>Ensure Coastal resilience</b>	£20	£18	£14	£13	£13	£78
<b>Bioresources*</b>	£190	£190	£40	£40	£40	£500
<b>WINEP Other Costs*</b>	£108	£385	£245	£274	£301	£1,313
<b>Total</b>	<b>£1,710</b>	<b>£2,465</b>	<b>£1,937</b>	<b>£693</b>	<b>£694</b>	<b>£7,498</b>

\* bioresources and some WINEP investments are not included within our DWMP data tables

The investment is made up of:

- 1,446 hectares of separating surface water from our sewage network and creating sustainable urban drainage solutions - rainfall from an area twice the size of Falmouth will be removed from our system
- 550,890m<sup>3</sup> additional storage to our network to deal with increased flows, that's the equivalent of 220 Olympic sized swimming pools
- 2,785km of our c.23,000 km of sewer will need to be upgraded - stretching from Lands End to Athens if we laid it out it a line. We'll be upgrading and reviewing these sewers to undertake surface water separation and remove unwanted surface water and groundwater from entering the sewer
- 123 of our 653 treatment works will be upsized to ensure they are of the right capacity
- A further 225 treatment works will be upgraded to meet new environmental targets and tighter discharge permits
- 786 of our 1342 storm overflows will need investment to meet the legal targets alongside the installation, replacement or upgrade of 1,122 screens
- 8 wastewater treatment works, 15 sewer pump stations, and just under 200km of sewers are protected and relocated to avoid the impacts of coastal erosion and sea level rises
- Surface separation and storage solutions increasingly delivered using natural flood management techniques – so that we target 50% of the flow by our plan being delivered through nature-based solutions and all of our solutions are considered for nature-based delivery approaches. i.e. 50% of solution delivered by storage and 50% through nature-based solutions
- Installing 2300 river water quality monitors by 2035
- Putting in place a step change in bio-resources and treatment facilities in order to reduce our reliance on the land bank, while delivering significant reduction in carbon and reducing bio-solids volumes

This is in addition to our base maintenance plans. Note, some wastewater costs remain to be determined as we continue to work with Defra and regulators on our bioresources and river quality monitoring programmes. Our final Business Plan that we will publish in October 2023 will address

any changes to our costs.

The outputs and activities associated with the programme are as follows:

Type of investment	2025-30	2030-35	2035-40	2040-45	2045-50	Total
Separating surface water from our sewage network and creating sustainable urban drainage solutions (hectares removed)	352	651	445	0	0	1,448
Additional storage added to our network (m3)	153,773	272,909	124,207	0	0	550,889
Increasing the capacity at our wastewater treatment works (number of works)	3	30	30	30	30	123
Upgrade our wastewater treatment works for nutrients (number of works)	48	103	43	22	14	230
Upgrade fast forward flow at wastewater treatment works and sewage pumping stations (number of works)	0	25	25	25	25	100
Investing in our network enhancements (km)	215	174	168	0	0	557
Investing in improvements to our storm overflows (number of overflows)	275	260	252	0	0	787



## Addressing uncertainties in our plan

We know that there is uncertainty in the future drivers of change - and this creates questions over our plan. But we have sought to balance these in developing our plans. We can be confident that given the targets set, we have the right plan.

Uncertainties we face	How our plan responds
<p><b>What if the targets and standards set by our regulators change over the next 25 years?</b></p>	<p>The plan enables us to meet our current regulatory requirements and includes investment in higher levels of environmental monitoring which will improve our ability to adapt should regulations be tightened.</p> <p>We will review Defra’s proposed storm overflow targets and wastewater treatment targets – these have the biggest impact on our plans. We have adopted a narrow definition for the maximum 10 spills a year – every year, every location, no matter the cost, no matter the weather. A wider definition or a different target would change our plans and lower the investment profile.</p>
<p><b>What if we cannot deliver interventions in partnership with other bodies?</b></p>	<p>An important part of our plan is to work in partnership – we have an aspirational 10% of our plan in this area. We are committed to this target.</p> <p>We are working with landowners across the region, environmental delivery partners, academic institutions and our broader supply chain to build capacity and prepare for increased investment in both nature-based solutions and other cutting-edge technologies.</p>
<p><b>What if customers do not find the plans affordable?</b></p>	<p>Our plan is ambitious and therefore involves considerable investment. But we know there is much we can do to lower the costs to our customers. We will continue to look for co-funding of our plans, challenge the assumptions in our plans (such as the interpretation of the targets), look for innovations, extend our affordability toolkit, and continue to lobby for progressive water bill charging.</p> <p>We will continue to support our customers to afford their bills as we have committed to do, including our plan to tackle water poverty in the region.</p>
<p><b>What if there is more or less wastewater and rainwater in the region entering the system?</b></p>	<p>Whilst this is difficult to predict with certainty, we have worked with the Met Office and modelled for an increase in rainfall and considered the impacts that this will have on the wastewater system, including where additional investment might be required. And we will ensure as we implement our plans, we focus on those areas where we can start to see the impacts of climate change and increased flows.</p>
<p><b>What if climate change impacts that affect our assets around the coast?</b></p>	<p>This is also difficult to predict with certainty, but we use the Environment Agent’s guidance to look at these trends and work with the Met Office around ensuring we are modelling these impacts correctly.</p> <p>We have modelled the impact of sea level rise on our assets, many of which are located at coastal sites, and made assumptions about how sea level rise will impact on their ability to remain effective over the course of the plan – if sea defences are robust this will bring down costs. We will continue to work with the Met Office to understand the timing and uncertainty of risks.</p>
<p><b>What if we just look to maintain the levels of performance that we currently have as a minimum?</b></p>	<p>We have modelled the costs of various scenarios and we know the costs of just maintaining current performance – and this does not meet Defra’s 25 year plan ambitions.</p>

## Our trigger points

We have identified trigger points which will allow us to respond to future uncertainties, ensuring we apply the interventions at the most suitable and cost-effective time – and determine if we have to deviate from our most likely pathway (P1).

Our trigger points will be monitored and reported at each update of our DWMP. Where a more adverse or benign scenario is observed, that will be a trigger for us to move to one of the adaptive pathways in our plan. For example, if we observe that we are trending towards a mostly likely climate change scenario of RCP8.5, then the following pathways which have included this future would become a more appropriate investment programme: P2 – Climate resilient, P4 – Enhance resilience, P5 – Innovative technology and P6 – Most adverse.

We have identified trigger points against the most influential elements that impact our plans:

- Rainfall intensity from climate change
- Sea level rise from climate change
- Customer preferences about flood risk
- Technology availability
- Increasing demand from population growth or customer behaviours

These investment triggers are summarised in the table below and these will be incorporated these into our long term delivery strategy.

Trigger	Approach	Resulting pathway(s)
<b>Rainfall intensity from climate change</b>	<ul style="list-style-type: none"> <li>• Updates from the Met Office as further climate modelling forecasts are developed – and risks to overall flooding is updated</li> <li>• Undertake collaborative research around adaptive climate change decisions for DWMP through UKWIR or other water research bodies.</li> <li>• SWW, along with local universities has already invested in climate change induced impacts on our full water cycle of operations and services, the programme is called SIM4NEXUS, and we are assessing the merit of further investment to see if such modelling has cost/benefit returns</li> </ul>	P2 – Climate resilient P4 – Enhance resilience P5 – Innovative technology P6 – Most adverse
<b>Sea level rise from climate change</b>	<ul style="list-style-type: none"> <li>• Track number of properties experiencing coastal related risk incidences and seawater inundations</li> <li>• Track sea and river level heights in key locations around the region aligned with proposed river quality monitoring with the Environment Act.</li> </ul>	P3 – Reduce flooding P4 – Enhance resilience P5 – Innovative technology P6 – Most adverse
<b>Customer preferences about flood risk</b>	<ul style="list-style-type: none"> <li>• Track customer preferences from our customer and stakeholder research and engagements sessions</li> <li>• Track the impact of annual storms and relate trending to SO spills or regional flooding data</li> </ul>	P5 – Innovative technology P6 – Most adverse

Trigger	Approach	Resulting pathway(s)
<b>Technology availability</b>	<ul style="list-style-type: none"> <li>• Use the data enrichment trends, from better tracking of overflow spills, now we have more event duration monitors and spill data</li> <li>• Track developments in WWTW treatment technology allowing lower limits to be achieved</li> </ul>	P5 – Innovative technology
<b>Accelerated population growth creating increased demand</b>	<ul style="list-style-type: none"> <li>• Tracking and monitoring developments in our region and working with local planning authorities on growth projections</li> </ul>	P2 – Climate resilient P4 – Enhance resilience P6 – Most adverse

## Delivering our plan

**We'll need integrated delivery to enable our plan to be efficient. The scale of DWMP for the whole sector will mean that the availability of skills and resources will be at a premium. Working at catchment-scale with our interventions makes sense for both the environment and affordability for our customers.**

Deliverability is a key consideration in the development of our DWMP, at £1.7bn in AMP8 and over 7.5bn over the next 25 years, this will be the largest environmental programme we will have delivered since the clean sweep programme. It is important that the way we deliver the programme looks for opportunities to reduce cost whilst delivering value for customers and delivering sustainable environmental outcomes. It is essential that we get the right balance between quality, cost and sustainability whilst delivering the benefits with momentum and pace.

Our procurement strategy is already well underway in preparation for the transition to AMP8. We are one of the largest companies in our region and we have a mature and resilient supply chain that has its roots in Alliance partnering. Our delivery partners have been actively engaged throughout the development of our long-term strategic plans and they understand what is required to deliver these projects.

We also recognise that we learn from our recent shortcoming in the delivery of the AMP7 investigations that we need to re-organise internally, capitalising on the integration with Bristol Water, we are bolstering our Design and Build delivery model with an intelligent client capability that is aligned with AMP8 work packages.

### Supply chain

Our vision for AMP8 and beyond is to have a fully integrated supply chain for the delivery of South West Water's Capital Programme where we co-design, innovate, contract and deliver in a collaborative environment. We will be co-located with our partners as a fully integrated delivery organisation, identifiable by our partnership brand, with a collective approach to problem solving, to co-create value as a single delivery community. Due to the scale and complexity of AMP8, and the opportunity to deliver an accelerated programme, we have already initiated our transformation programme to building upon the success of our H50 Alliance, to create a best in class delivery model.

We have recently made significant changes to our client-side capability, capitalising on the merger with Bristol Water, we have grown our engineering senior leadership team and appointed six heads of delivery across Clean Water, Waste Water Devon, Waste Water Cornwall (and Isles of Scilly), Reactive Maintenance, Drought and Resilience, and Major Projects and Transformation.

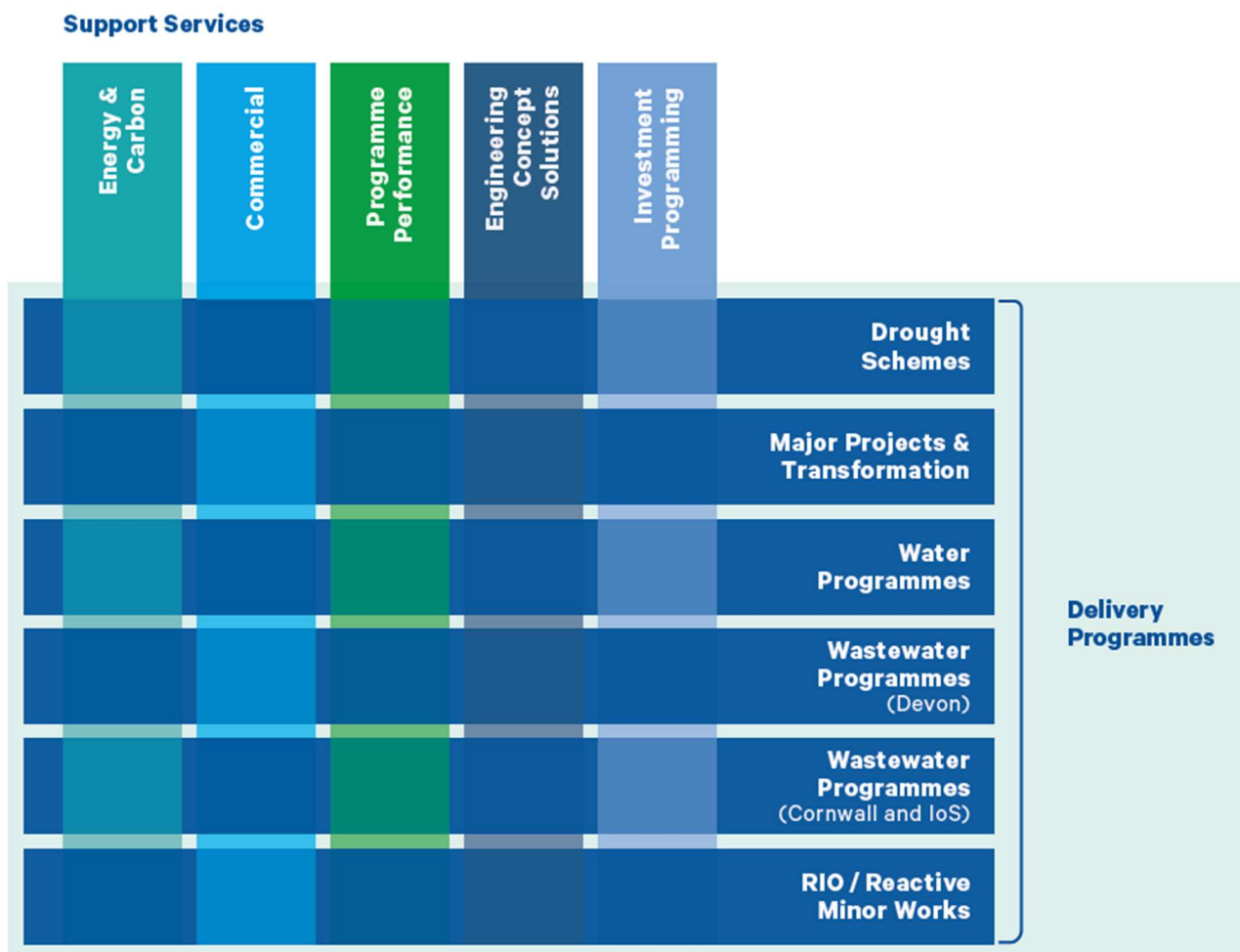
Furthermore, we've expanded our delivery support services to enhance our PMO capability and we've been growing our Asset Management team, insourcing wastewater modelling ahead of DWMP and SOAF delivery, as well as growing our Energy and Carbon capability to ensure we are seizing every opportunity to reduce carbon emissions and remain on track to meet our "Promise to the Planet".

Our integrated delivery model will enable a more effective approach to risk management, ensuring a clear understanding of risk ownership, impact, and the cost of transferring risks to the supply chain.

In our preparation for transitioning to AMP8 we have been engaging with the market to understand how we can incentivise investment in the water industry and secure the partners we need to meet the demand. Having conducted extensive market research during the early part of 2022, which included supply chain surveys, 1-2-1 interviews and workshops, we are implementing the following:

- Longer frameworks to encourage investment in the region
- Simplified and fairer contractual terms, with a more equitable share of risk
- Better foresight of the programme; including a more “programmatic” approach to contracting
- A more agile and intelligent internal client capability

To that end, we are already going to the market and renewing our Tier 1 (Civils) framework ahead of AMP8. We have modelled the type, scale and complexity of our AMP8 capital programme and identified that we need a minimum of four Tier 1 Contractors to meet the demand, and that they will be in place to begin work on any “accelerated” or “transition” capital programme if required once our business plan is approved.



Our MEICA framework is performing well, and the evolving complexity and volume of schemes is stimulating growth for all our Tier 2 contractors.

As such, we have extended our existing MEICA framework for another 18 months, whilst we focus on Tier 1 procurement, ahead of expanding our Tier 2 supply chain from for to no less than six partners ahead of AMP8.

To incentivise the industry, following our market engagement, we have reviewed our commercial model to balance the pain/gain share and we're reviewing the clauses in our contracts to make them as simple as possible. We're engaging with the wider construction industry and listening to the feedback, and we envisage the way we are positioning our contracts will encourage reinvestment in the sector, to ensure we can rise to the challenge of AMP8. Integrated delivery models and alliancing are often challenged for lacking in commercial tension; we intend to align our framework partners by geography, principally Devon (Bournemouth and Bristol) and Cornwall (IoS).

We will maintain the "best athlete" approach for the allocation of work but retain the option to compete elements of the programme through "mini competitions," with the potential for suppliers to bid for work in the lot they are not aligned to.

### **Agility and efficiency –the end-to-end delivery model**

Our current delivery model was adopted off the back of our H50 Alliance and has been refined and refreshed to ensure we optimise the business benefits from our existing contracting frameworks. This model is being refined further, to simplify the delivery runways and expedite project governance to enable delivery at pace,

in-step with our transition to AMP8, and in the spirit of a fully integrated delivery model. Our contracting partners will be embedded at every stage; from assisting with the definition of the problem statement, to accelerating optioneering in the Concept Team to deliver buildable solutions, through to post project reviews.

We are already getting projects into delivery sooner by allocating Programme and Project ownership early, right from the point by which a problem statement is defined, with accelerated optioneering through the introduction of the Concept Team.

We will build upon our experience and lessons learnt from AMP7 regarding innovation and experimentation, specifically in the nature and catchment-based solutions. We will continue to work closely with stakeholders, including our Upstream Thinking Partners, universities, and colleges to procure a supply chain that will make us market leaders in this area of the industry.

### **Partnering to co-create value**

Having transitioned from an Alliance model to our current Design and Build framework in AMP7, we have gained more positive commercial tension but may have lost some of the benefits of a more integrated delivery model. In response, our recently formed Engineering Concept Team is a fully integrated centre of excellence, made up of South West Water/Bristol Water employees and supply chain partners. The vision is for this to become an "alliance hub" that will be at the heart of engineering delivery, embedding best practice across all our programmes, implementing innovation, and driving our Net Zero agenda. Our contracting partners are already embedded in our main office, in and amongst the Engineering Directorate.

We are also growing our “self-delivery” capability having trialled this over the past 12 months and we will look to expand the number of suitable programmes that fit this delivery methodology.

We continue to develop a more integrated and agile delivery model that seeks to capitalise on the benefits of co-location and open architecture knowledge sharing, whilst maintaining commercial tension to ensure we get the best value for our customers and the environment.

## A strong track record

We are on track to deliver our 2025 promises. 80% of our performance commitments for South West Water are on track. In our Bristol Water region, we have met 76% of our performance commitments, with a focus on areas where performance falls short of the targets.

We are delivering our largest environmental programme for 15 years. We have committed significant additional expenditure beyond our AMP7 business plan including:

- Investing £82m as part of our Green Recovery programme to accelerate programmes focused on public health, protecting the environment, and addressing climate change.
- Re-Investing efficiencies so that we can deliver £330m in our wastewater programme to 2025 through our WaterFit programme which was launched earlier this year to accelerate healthy rivers and seas.

Additional investment through our Cornwall Resilience programme to boost resilience in the region through repurposing disused quarries and trialling desalination.

## Building capacity

We’re doubling our apprenticeship and graduate schemes to 1000 by 2030 and offering 5000 work placement opportunities.

We recognise we’re still learning and developing as an “Intelligent Client” but we’re transitioning to a more integrated client function at pace, drawing on some of the best talent in the industry, we concluded our procurement of Professional Services Consultants in May 2023 to enable this evolution. We’ve consolidated our three consultancy frameworks under a single NEC4 Professional Services Contract, comprising of three lots, increasing our suppliers from three to eight strategic partners.

We have a good track record in growing our own talent, our apprentice and graduate programmes are some of the best in the industry and they continue to play a key role in developing and growing talent. Our recently formed Engineering Concept Team is a fully integrated centre of excellence, made up of South West Water/Bristol Water employees and supply chain partners. We are creating a “think tank” of industry experts who will identify the best engineering solutions for our customers. The vision is for this team is to become the “alliance hub” that will be at the heart of engineering delivery, embedding best practice across all our programmes, implementing innovation, and driving our Net Zero agenda.

The South West continues to have the lowest unemployment rates in the UK, making recruitment a challenge. Fortunately, we have a well-established hybrid working environment, underpinned by our “work where you work best” flexible working policy, allowing us to draw upon a National



pool of talent.

We are a mature and agile business in this respect, and we have a realistic ambition to increase internal resource by at least 30% over the next 18 months. We continue to score highly in the Great Place to Work annual survey and we have seen a positive improvement in retention since the COVID pandemic. Moreover, our teams are more diverse than ever, and we have already addressed the issues around ageing workforce having pulled many of our Graduate and Apprentices through to permanent positions in the business.

The future WINEP programme is a multi-AMP programme whether being delivered over 10 or even 25 years in the case of the Storm Overflow Discharge Reduction Plan. We recognise the need to grow and develop capacity and capability within both our own staff and within the supply chain over this period. To ensure we have a sustainable and capable workforce for the WINEP programmes of the future.

We will continue to develop our graduate and apprenticeship programmes working with universities and technical colleges across the region whilst also encouraging our delivery partners through similar activities.

We know that we will need to develop new skills and innovative approaches, in particular to deliver nature and catchment-based solutions. We will continue to work closely with local partners, including our Upstream Thinking Partners, universities, and colleges to develop the supply chain necessary to respond to these programmes.

## **Building on our existing partnerships**

Over the last 15 years we have co-delivered nature and catchment based solutions with our Upstream Thinking Partners and local landowners. Previous solutions have included biodiversity improvements, fish and eel passes, invasive species projects and catchment schemes

to improve drinking water quality. We know that working with our partners who are already embedded in the landscape partners deliver a subtler and more sustainable approach.

The mix of solution types, including increased use of nature-based solutions, that we will use to deliver from AMP8 onwards will require us to work closely with a broad range of delivery partners and suppliers. We want to ensure solution delivery is scaled appropriately, enabling local partners who have existing relationships with communities and landowners, to support us in delivering our programme, as well as supporting our more traditional supply chain to work differently.

During 2022 we have met with our upstream thinking partners fortnightly to discuss how we can work together to deliver WINEP in AMP8. Our partners are keen to undertake more work, particularly catchment management and have presented to us the opportunities they see to collaborate.

We know that we will need to innovate, doing things differently and looking at a systems-based approach to delivering schemes from multiple drivers within catchments. We will build on our existing long-term relationships and are already looking to develop new partnerships.

We are already looking to upscale our Upstream Thinking programme and have recently been awarded funding from the Ofwat Innovation Fund to explore how we can work with partners to identify the value of slowing the

[DWMP Technical Summary](#)

flow of water.

Each catchment already has a Catchment Partnership; a coalition of stakeholders that form an important forum for discussions on future investment priorities. The maturity of our model in the south west already sets us apart. We are exploring with our partners the support that they can provide including funding, resources, approaches and land.

Co-delivery with our partners will be key to identifying and sustaining our WINEP solutions and we know that this delivery route is likely to be more complex than our previous WINEP programmes.

## Transition investment

Our DWMP programme will invest circa £200m per annum over the 2025-2040 period in order to deliver improvements to those overflows which do not meet the standards set out within the Defra Storm Overflow Discharge Reduction Plan (SODRP). Yet our customers and stakeholders would like this work to start as soon as possible and deliver the benefits earlier.

As we have already described, we are bringing onboard new capacity in 2023-24 and 2024-25 with both partner support for both feasibility and detailed design as well as Tier 1 and Tier 2 capacity to begin the construction and delivery of the improvements within the WINEP and the Waterfit 2040 programme.

Alongside this we have identified many early deliverables within the WINEP and DWMP programme which will need to be undertaken in the 2023-24 and 2024-25 period in order to meet the Regulatory compliance dates set within the WINEP. The table below sets out the number of WINEP deliverables in the first two years of the 2025-2030 period.

These 931 outputs representing 62% of the total 1499 AMP8 WINEP outputs, but are delivered in the first two years (40% of time) and will require circa £150m of investment in 2024-25 to enable this delivery. This includes starting work on c.60 storm overflows in order to support both the Bathing Water and Shellfish Water investments.

These elements do not include the Acceleration schemes which have already been previously identified and funded through the recent announcements from Ofwat and Defra.

It is our expectation that we will propose this additional expenditure to support the delivery of the identified outputs as part of the transitional funding within our October business plan submission, with activity and funding beginning from Q3 2023-24 through to the end of 2024-25 and then continuing as part of the WINEP delivery from March 2025.

	31/3/26	31/12/26	31/3/27	30/4/27	30/6/27	Total
<b>Bathing Water improvements</b>	9		10			19
<b>Shellfish schemes</b>					15	15
<b>Phosphate schemes</b>	3		2			5

<b>EDM and MCERTs installations</b>		565				565
<b>Chemical schemes</b>			4			4
<b>Investigations schemes</b>				323		323
<b>Total</b>	12	565	16	323	15	931

Table showing WINEP schemes to be delivered in first two years of the AMP8 programme.

## Financing and bill impacts

Our DWMP sets out our view of the future impacts of population growth, climate change and growing expectations on our assets and operations.

### Where are we today

We have pledged to address water poverty in our region, with the goal to ensure that by 2025 no customers are paying more than 5% of their household income on water and sewerage bills.

Meeting this pledge will deliver affordable bills for all our customers five years earlier of the sector wide commitment to address water poverty by 2030. We are on track to deliver this commitment with over 93% of customers with an affordable bill today, compared to 87% in 2019/20.

We have a well-developed affordability toolkit to support customers who struggle to pay their bills, including:

- social tariffs that reduce or cap customer bills (**WaterCare** and **WaterSure**)
- the **FreshStart** fund to support customers who are new to debt or struggling to pay their bills due to the impact of life changing circumstances
- a payment matching scheme called **ReStart** to support customers in getting out of debt improving payment habits
- **WaterCare+**, a scheme that provides benefit entitlement checks and home efficiency audits as well as tariff reviews to ensure that we are supporting customers to maximize their income and minimize their bills
- Supporting people to access all the help they are entitled to, with our highly skilled **Benefits Entitlement Checks** – unlocking up to hundreds of pounds a month for financially vulnerable customers

More information on our support schemes is available on our website.

**Through these schemes and our affordability toolkit, we are on track for 100% affordable bills by 2025.**

### Looking forward

Our DWMP is ambitious and requires a step change in the level of investment to meet those ambitions.

As we look ahead to 2050 and beyond, we see significant investment requirements as we look to build resilience to climate change, invest for a larger population, maintain compliance, and reduce pollution and storm overflows in line or ahead of government targets.

As we have before, we will continue to improve and efficiencies, and deliver innovation, to keep the extra costs as low as possible.

Our best value plan that meets our new legal obligations and prepares us for the impacts of climate change, will require efficient investment of c.£7.5bn to 2050 – more if some of these pressures are greater than forecast today. The cost of delivering our plans for the period 2025-2030 will require c.£1.7bn for our DWMP.

To be able to deliver this investment will need finance. We raise finance

through a range of sources: through customer bills, from investors and lenders. Getting finance from lenders and investors means that we can keep bills lower than they would otherwise be, and we need to get the balance between what is recovered through bills and what is borrowed right.

Moreover, we know that customers don't like volatile bills. So we will aim to ensure gradual changes to customers' bills, and avoid overburdening any particular generation of customers by smoothing the costs over time.

## Financing our plan

We need to ensure we can attract investors and lenders to secure financing for our plans, with fair returns to investors. As we look to 2050, we know that we will need to raise more finance than before.

### Did you know?

Infrastructure finance is like a mortgage on a home. A mortgage allows you to purchase or maintain a home. The monthly payments to the mortgage provider allow you to pay back the loan gradually. You also have to pay interest on the loan which is part of the monthly amount.

By raising finance from investors, we can keep customer bills lower. We raise less through customer bills than we spend, with part of the customer bill used to pay back what we have borrowed with interest. These are our dividend payments. Our regulator sets dividends – at the level similar to what you get when you put money in the bank.

We continue to have a strong capital structure and target a mix of funding instruments to finance our activities efficiently. South West Water currently has one of the lowest effective interest rates across the industry with our mix of fixed, floating or index linked debt. This is supported by the Pennon Sustainable Financing Framework in place since 2018 which will support the DWMP investments as these are focused on the protection of the environment – a key factor in our Sustainable Financing Framework.

## The impact on customer bills

This is the largest programme of investment we've ever carried out in our region - and this will impact on customers' bills. We will use financing to keep these costs lower than they would otherwise be.

The impact on customer bills for our preferred plan is shown below. For comparison we show the bill impacts if we were not to accelerate our storm overflow investment to 2040. Both are shown for monthly and annual bills.

## Bill amounts – in real terms (excluding inflation)

		2025-30	2030-35	2035-40	2040-45	2045-50
<b>Best Value Plan</b>	<b>15 year total Wastewater bill impact (c.£)</b>	<b>£75</b>	<b>£170</b>	<b>£230</b>	<b>£270</b>	<b>£275</b>
	Monthly bill impact	£6	£14	£19	£23	£23
<b>A slower paced</b>	<b>25 year total Wastewater bill impact (c.£)</b>	<b>£75</b>	<b>£140</b>	<b>£200</b>	<b>£240</b>	<b>£260</b>
	Monthly bill impact	£6	£12	£17	£20	£22

We estimate average bills needs to increase by £6 a month over the period 2025 to 2030.

Our best value plan is to accelerate storm overflow investment over 15 years. We can see the impact on bills of this compared to delivery over 25 years. Over time the difference in terms of the impact on bills is small and we can accelerate without adding much to customer bills.

### Affordable bills

Average bills will rise by £6 a month over the period 2025 to 2030. A key decision is who should bear this cost. If there is no change to how we fundamentally charge customers for the services we provide, all customers can be expected to see an uplift in proportion to the size of their bill.

We've spoken with a wide range of our customers as we've developed the plan and for most our customers the increases in bills proposed are affordable, even if we work at pace and deliver faster than the regulations require us to.

In order to ensure that bills remain affordable for all, we have looked to see if there is another way. We are exploring ways in which we minimise the investment our customers need to pay for in their bills – such as working on partnership on shared outcomes, sharing experiences and co-funding investments.

We are also looking at how bills and charges are set. There hasn't been any change to the way we charge for water for 30 years – and for many customers the current charging framework does not seem very fair. They worry whether bills can remain affordable for all with a large investment programme. They want everyone to pay their fair share – that includes tourists and homes with low occupancy rates. They also get frustrated when they save water – and others don't. Innovation in charging is important – especially for those that struggle the most to pay household bills.

We have been looking at progressive charges, and we know from our analysis that we can deliver the investment set out whilst protecting our resident customers from large bill impacts. We are looking carefully at progressive charges – to ensure that the cost of increased capacity, particularly near bathing waters, is recovered from those who benefit the

most. We are also looking at how we charge for properties occupied part of the year and where sewers are congested. We look forward to working through these proposals with regulators as we continue through the business planning process.

This bill impact will form part of our full Business Plan submission in October 2023. Our full plan will include investment for all of our assets across the Greater South West.



## Next steps

Our DWMP informs our next five-year business plan that we will submit to Ofwat, our regulator, in October 2023. Our business plan will set out all of our investment from 2025-2030 alongside considering our long-term priorities.

A cornerstone of the DWMP framework and process is collaboration between water companies and key stakeholders. To be successful in developing an effective plan that provides innovative solutions and better value for customers, while protecting our environment and ensuring we meet the future pressure on our drainage systems, we need to work together, and we rely on the active participation of our stakeholders.

Whilst this is our final DWMP, we will continue to work with our customers and stakeholders to shape our PR24 business plan submission and co-create a plan which takes account of future pressures and provides better value solutions for our customers and protects the environment in a sustainable way. This plan will also be considered within the context of all the other investment programmes and where there may be overall affordability constraints, it may require that the DWMP inputs and outputs are refocused and re-prioritised to deliver outcomes that are within the overall affordability limits set by customer affordability.

We will continue to discuss the DWMP with customers through our ongoing customer engagement channels, including our Annual General Meeting in July. We have also established a Stakeholder Forum with delivery partners and interested parties from all sectors across the region which will further add to the insight gained over the last two years through workshops and focus groups.

Between now and our final determination and any interim submissions in the price review process may result in further changes driven by government, regulatory and community expectations, such as evolving policy on Defra's targets on storm overflows or river water quality monitoring. This will then feed into our wider PR24 programme for optimisation, ensuring we are presenting our best value plan alongside our other commitments such as the WINEP, WRMP and enhancement and maintenance programmes.

[DWMP Technical Summary](#)

Once our plan has been published, customers and stakeholders will be signposted to the webpage where they will be able to provide feedback to us.

In addition, for those stakeholders where we want to explore partnership working on some of our intervention options, we will carry on the process we have started, with further engagement sessions, sharing communication content tailored and delivered to meet their needs.

We understand that many of our partners will find Level 2 maps generally better for their planning purposes, but Level 3 maps can provide details that add context and ensure focus on the right solutions.

We will annually review our DWMP to assess whether there has been any material change of circumstances. We expect to undertake this first review in March 2025 following the completion of the Final determination in December 2024. Subject to any material changes of circumstance we may then republish the DWMP to set out any revised plans, outputs or outcomes for customers or the Environment.

Visit

[www.southwestwater.co.uk/dwmp](http://www.southwestwater.co.uk/dwmp)  
to find out more.