Cambridge Water

South Staffs Water

South Staffordshire Water PLC

Climate change adaptation report 2024

Securing your water future

About South Staffordshire Water PLC

We operate Cambridge Water and South Staffs Water

We are part of the South Staffordshire Plc group of companies

We are a water only company, and do not take away and treat waste water

We are regulated by Ofwat, the Environment Agency and the Drinking Water Inspectorate

We have been a successful, privately-run business for 170 years. We have never been in public ownership

We provide clean water to more than 1.7 million people and 42,000 businesses every day

Structure of this climate change adaptation report

While this report is primarily aimed at Defra for the fourth round of reporting under the Adaptation Reporting Power (ARP4), we recognise that many people will have an interest in it. This includes our customers and other stakeholders, our people and our investors. So, we have structured this report in a way that is easy to navigate and that will be meaningful to all readers.

Joint Chair/Director Foreword

As the provider of an essential public service for more than 170 years, we recognise the significant impact a changing climate will have on our ability to deliver clean drinking water supplies to customers in our Cambridge and South Staffs regions.

At the same time, we recognise the important role the England and Wales water sector has to play in protecting and enhancing the natural environment and helping the UK Government to meet its net zero ambitions – all while keeping customers' bills affordable and providing help and support to those who need it most.

We've got a long-term vision for our business, which focuses on securing the water future for our customers, our communities and the environment we all rely on and enjoy. This includes tackling the dual challenges of climate change and population growth.

Key to this is the need for us to clearly identify the current and future risks associated with these challenges and to put in place the appropriate mitigations and adaptations.

This document describes how we'll ensure future water supplies for customers across both regions. We also set out how we'll continue to deliver reliable supplies of clean drinking water, maintain resilient assets, minimise the impact of our activities on the environment and effectively manage the risks associated with our business-a-usual activities.

It also demonstrates our ambition to lead in adapting to climate change and to share our knowledge with others within and outside the water sector. And it demonstrates our support for the UK Government in its climate assessments.

Going forward, we'll continue to integrate climate risks into our strategic planning and business-as-usual activities. This includes using the latest climate data to inform our risk assessment process and learning from the climate events that are already happening – such as drought and flooding. It also includes investing in tools to model future climate scenarios that will help us to develop our knowledge and understanding even further.

Lord Chris Smith
Chair

Caroline Cooper
Strategy and Regulation Director

Executive Summary

Over the past 170 years, South Staffordshire Water PLC has provided high-quality water supplies to customers in our Cambridge and South Staffs regions. As a responsible, customer-focused and regulated business, we have to maintain a balance between making sure we play our part in delivering climate change resilience and restoring and enhancing the environment – all while keeping our bills affordable to customers.

For our long-term vision to 2050, we have developed five ambition statements to address this challenge holistically. Captured within these statements is our ambition as a business to lead in adapting to climate change and run a safe, efficient and sustainable business, with a highly skilled workforce.

We know that climate change will affect both our capacity and our capability for service delivery and the environment that we strive to protect and enhance. This climate adaptation report will detail the extent of current and future climate change impacts and outline measures being implemented in the short and long term to adapt to these impacts, as reflected in our business plans and strategies. We will voluntarily submit the report to the Department for Environment, Food and Rural Affairs (Defra) in the 4th round of reporting under the Adaptation Reporting Power (ARP). The Climate Change Act 2008 encompasses the ARP and provides for infrastructure operators and public bodies to report on how they are addressing climate change impacts now and in the future.

Our customers and stakeholders

We have engaged customers to understand their views on our long-term ambitions for climate change adaptation. Our research tells us they prioritise investing in climate resilience now to mitigate future risks, despite recent shifts in priorities because of events like the COVID-19 pandemic. There is also a consistent preference for even bill profiles up to 2050, and our customers prioritise timely investments.

As a business, we emphasise partnership and collaboration to tackle climate change challenges. This includes participating in industry working groups. It also includes engaging with stakeholders such as regional water groups, communities, and various organisations, to co-create solutions and seek third-party funding to reduce the burden on customers through the bills they pay.

Integrating climate risks into our decision making

To assess climate risks on our operations and stress-test our long-term plans we have used the climate scenarios from Ofwat, informed by the UK Climate Projections (UKCP18) These scenarios range from a low climate scenario (RCP2.5) with significant global reductions in greenhouse gas (GHG) emissions, to a high climate scenario (RCP8.5) with no reductions.

Under the high climate scenario by the end of the century both regions are projected to experience the following.

- Hotter, drier summers: maximum summer temperatures could reach 42.8°C in our Cambridge region and 40.8°C in our South Staffs region, with summers being up to 60% drier.
- Wetter, warmer winters: maximum winter temperatures could reach 20.5°C in our Cambridge region and 20.1°C in our South Staffs region, with winters being up to 30% wetter.
- More frequent and intense weather extremes: rainfall intensity could increase by up to 20% in summer and 25% in winter.

Our in-depth climate risk assessment, conducted by a dedicated working group, determined the priority climate risks set out below. These have been cross referenced back to the UK Third Climate Change Risk Assessment (CCRA3) water sector risks throughout the report.

We fed the priority risks back into our corporate risk register to ensure climate risk management is part of our strategic, tactical, and operational decision-making processes. We scored risks based on impact and probability, with a

predominantly cautious risk appetite set by the Board. The Audit and Risk Committee reviews our significant risks, which are disclosed in our annual report and financial statements. Assurance measures include benchmarking against best practices and guidelines, monitoring emerging risks through global data, and implementing effective risk-based assurance arrangements through the independent Group Risk Control and Audit function.

Our key climate change risks

Securing future water supplies

Both our Cambridge Water and South Staffs Water supply areas are now classified as areas of serious water stress by the Environment Agency. Our demand forecasts show that both regions are facing water scarcity in the long term because of increasing water consumption, particularly during prolonged periods of dry weather, combined with the need to reduce groundwater abstraction rates. So, we must focus on ensuring long term water supply sustainability for both regions in the face climate change and population growth.

Our Water Resources Management Plans for both regions, published every five years, outline our strategies for supply and demand management. Adaptations to climate change include short-term measures such as abstraction reductions by 2030 and water efficiency campaigns, as well as long-term targets including a 50% reduction in leakage by 2050.

In our South Staffs region, demand management measures are projected to be sufficient to ensure a secure water supply to the public while also protecting the environment. But in our Cambridge region, we are implementing supply options like the Fens reservoir to ensure a long-term, sustainable water supply for the region.

Additionally, we consult on and publish separate drought plans for our Cambridge and South Staffs regions every five years. These operational documents set out our plans for managing water supplies in the event of a lengthy period of dry weather and a lack of rainfall. Our drought resilience efforts aim to withstand 1-in-500-year droughts. We are already meeting these enhanced resilience levels in our South Staffs region and future supply sources for Cambridge will secure the same for this region.

Delivering a resilient supply of good quality water

Ensuring we always have high-quality drinking water for our customers is our top priority. An assessment of climate change impacts to drinking water quality conducted for our long-term delivery strategy highlighted several future risks. This included more frequent, intense rainfall leading to increased pollutant run-off and increased temperatures causing algae blooms in our surface waters.

As a result, we developed an adaptive planning pathway, with investments into our treatment processes and raw water storage by 2050 identified as solutions. Additionally, we have a proposed programme of enhancements to our service reservoirs starting in 2030 to address water quality challenges arising from increased temperatures at these assets.

Our ongoing catchment management programme aims to improve raw water quality at source across a wide scale. Working with local landowners and farmers through a grant and advice-based programme, we have delivered many benefits, including under sowing of crops to reduce pollutant run-off. In the long term, we will be expanding the range of pollutants we tackle and reviewing the appropriateness of an increased land holding strategy.

Maintaining asset reliability and resilience

Increased likelihood of severe weather events, subsidence, flooding and extreme temperatures in the future will accelerate the deterioration of our infrastructure – that is, our treatment works, pipes, and pumping stations – and cause supply disruptions. Our asset management plan stretching to 2050 will deliver long-term adaptive measures required for our infrastructure to achieve our operational ambitions in the face of climate change.

We are focused on continuous investment into the resilience of our assets, and our new resilience modelling capabilities incorporate future climate predictions and deterioration forecasts to help us identify long-term investment needs.

From 2025 to 2030, we have proposed investment to address single points of failure, continue mains renewal and mitigate risks associated with water supply interruptions. In the longer term, we will be investing in the operational resilience of our production assets, including our two major water treatment works as well as our groundwater source stations and boosters. This includes continuation of our power resilience programme, new interconnecting mains and additional drinking water storage by 2050. Our productions sites with high flood risk have been identified and flood resilience measures installed. These include flood defence barriers, multiple access points and flood alarms. However, further work is required improve our understanding of future flood risks.

Minimising the impact of our activities on the environment

Alongside securing water supplies, we also prioritise protecting and enhancing the environment – working with partners to ensure sustainable water supplies and flourishing local habitats that are resilient to climate change impacts. Over the next 25 years, we will need to reduce the volume of water we abstract from our existing groundwater sources to protect rivers from extreme low flows during hot, dry summers. Increased temperatures will also drive changes in habitat composition and the spread of invasive non-native species.

We have worked collaboratively within our regional water resource groups to plan water abstraction reductions across both regions by 2030 to prevent future deterioration of waterbodies. From 2025, we will also carry out investigations to determine further reductions required to meet the Environment Agency's defined 'environmental destination' beyond 2030.

Every five years, we develop our Water Industry National Environment Programme (WINEP), which aims to enhance biodiversity, remove invasive species, and protect key habitats. Under WINEP, from 2025 to 2030, we will be implementing site specific-habitat management plans and nature-based solutions within our catchments to enhance climate resilience of river habitats. In our Cambridge region, this includes restoration of internationally rare chalk streams to protect and enhance brown trout habitats.

To help limit the dangerous impacts of global warming on people and the environment, we are committed to reducing our carbon emissions from our operations into the atmosphere by 2050. This includes reducing both operational emissions and those embedded in our supply chain. Our current focus is on reducing scope 1 and 2 GHG emissions, with initiatives such as converting generators to biofuels and installing energy-efficient pumps and lighting. Looking ahead, we will continue to drive our net zero ambitions through a combination of activities, including demand reduction, efficiency measures, and customer and stakeholder engagement.

Managing interdependent risks

Increased variability and intensity of weather events, including heatwaves and flooding, will place additional stress on critical infrastructure such as energy and transport. This can further exacerbate the challenge of maintaining water services. We have adopted holistic approaches, such as 'systems thinking' workshops, to develop and enhance our ability to elicit interdependent risks from the bottom up.

We are improving our preparedness for cascading failures in infrastructure through the continuation of our power resilience programmes, renewable energy exploration, and technology investments. We recognise that disruption to water supplies can also negatively impact the communities we serve. Our established emergency preparedness teams can respond to supply outages at varying scales, providing targeted assistance to our most vulnerable customers.

In our supply chain we are moving away from 'just in time' delivery and adopting a more resilient 'procure and secure' approach. In the short term, this includes maintaining built-in contingencies such bulk storage of materials and generators for use in the event of power cuts. In the long term, we intend to reduce our reliance on the chemicals we use in our treatment processes. We are also seeking opportunities to collaborate with our supply chain partners to reinforce productive relationships.

Conclusion

At South Staffordshire Water PLC we will continue to actively integrate climate change risk into our governance processes and business planning. We listen to the views of our stakeholders to develop holistic adaptation plans that capture interdependent risks.

Our climate risk assessments are routinely reviewed, and we will take lessons from climate events such as drought and flooding that we are already experiencing. Recent investment into new modelling tools is allowing us to better prepare for future climate scenarios and we will continue to improve our understanding of how these changes will impact our operations long term.

Ongoing water supply and demand management, asset renewal and outage contingencies are maintaining our climate resilience in the short term. However, key actions including upgrades to our water treatment and storage, reducing water abstractions and investing in supply sources will be required if we are to meet our climate adaptation and operational ambitions long term.

Building resilience to a changing climate, and our ability to adapt quickly and flexibly to emerging challenges, are key considerations for all our business strategies and plans. So, our climate change adaptation report has strong links to a number of other plans, including our long-term delivery strategy and our Water Resources Management Plans. Links to these reports can be found toward the end of this report in the ‘further information’ chapter.

Part 1: Setting the context for this report

We know that climate change will affect both our capacity and our capability for service delivery and the environment that we strive to protect and enhance. This climate adaptation report outlines our understanding of the current and future impacts of climate change on our Cambridge and South Staffs regions. It also details our existing and proposed climate change adaptation measures, which are reflected in our business plans and strategies.

Introduction

We are voluntarily submitting this report to Defra in the fourth round of reporting under the Adaptation Reporting Power (ARP4). Along with other water company reports, it will be used to inform the UK Government's understanding of climate change risks in the water sector.

Similar reports across a range of sectors contribute to the five yearly UK-wide assessment of risks and opportunities arising from climate change known as the UK Climate Change Risk Assessment (CCRA). Risks identified in the CCRA are addressed in the Government's National Adaptation Programme (NAP), which aims to deliver resilience to climate change on the ground. Outputs from both the third Climate Change Risk Assessment (CCRA3) published in 2021 and the third National Adaptation Programme (NAP3) published in 2023 have been used to shape our climate change adaptation report.

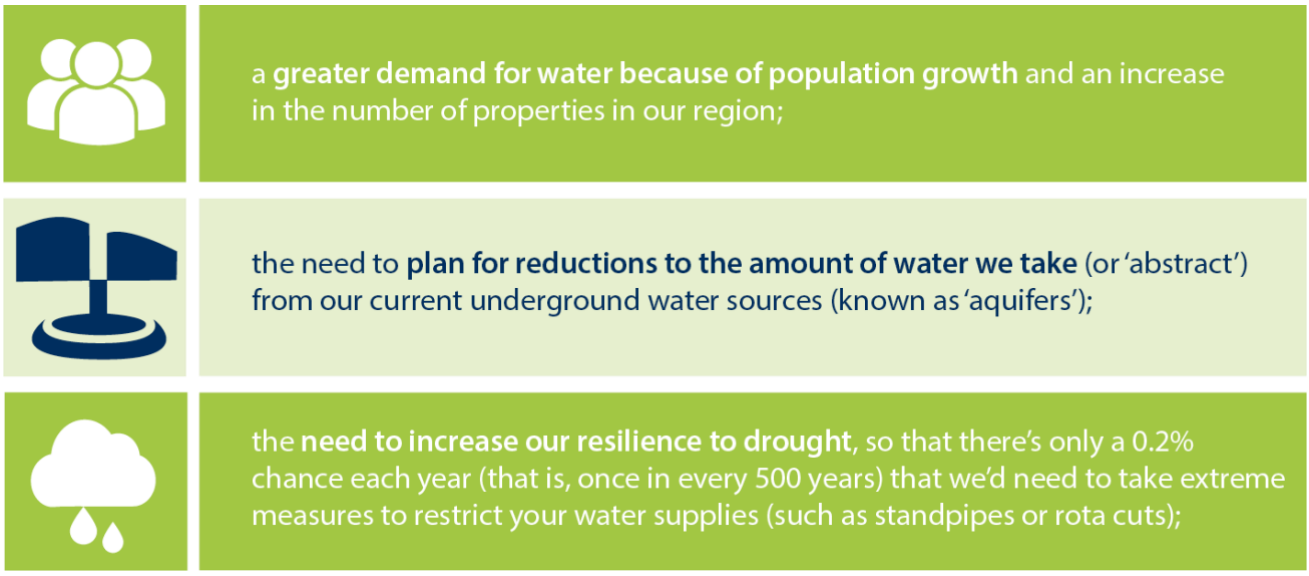
Current and future challenges

In 2021, the Environment Agency reviewed water availability in the UK and doubled the number of areas categorised as 'seriously water stressed' to 14. This included the Cambridge Water and South Staffs Water areas of supply. In 2022, hot weather and high-water demand put unusual stress on the water resources of England. This impact was keenly felt in both our water supply regions, and we saw very high demand putting further pressure on our water resources.

Growth in population and properties across both regions is exacerbating water resource pressures, as is customer demand for water, which increased during the COVID-19 pandemic, and in the South Staffs Water region is still higher than pre-pandemic levels.

Our Cambridge region in particular is one of the driest and fastest growing regions in the UK, and significant future housing growth is planned in the coming years. We acknowledge that not all our existing abstractions are sustainable over the long term and may already impact river flows. Many rivers across the Cambridge region are internationally rare chalk streams with unique habitats which have been modified by human activities, increasing their sensitivity to events such as drought.

In recent years, we have also seen an increase in severe weather and flooding at our production sites because of intense rainfall events. In 2023, there were eight named storms across the UK from August to December and overall, it was a wetter than average year. This has put pressure on our water treatment processes because of increased pollutant run-off from surrounding land in our catchments. In November 2023, one site in our Cambridge region had to be temporarily taken out of supply while we resolved water quality issues associated with localised flooding.



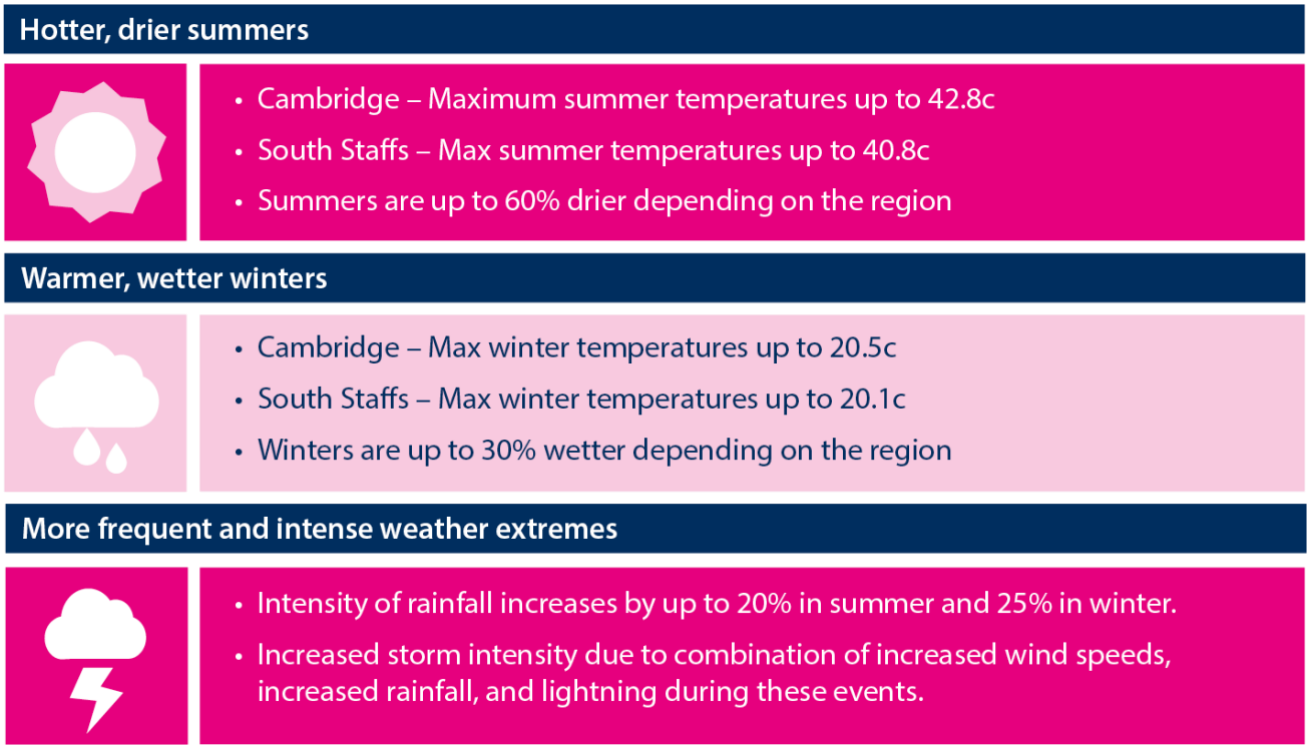
Climate Data

We have used the CCRA3 and Ofwat climate change scenarios to develop our understanding of climate change risks. The Ofwat scenarios are based on the Representative Concentration Pathways (RCPs) used by the Met Office latest UK Climate Projections (UKCP18). These projections provide the most up-to-date assessment of how the climate in the UK may change in the future.

The low climate scenario reflects the UKCP18 projections for RCP2.5, in which significant reductions in GHG emissions are made globally, mitigating temperature increases to between 0.3 degrees and 1.7 degrees by 2081 to 2100.

The high climate scenario reflects the UKCP18 projections for RCP8.5, in which there is no reduction of GHG emissions. It is essentially a 'worst case scenario', under which we have stress tested our long-term plans.

Under the high climate scenario, by the end of the century we are projected to experience:



Our commitment to climate change adaptation

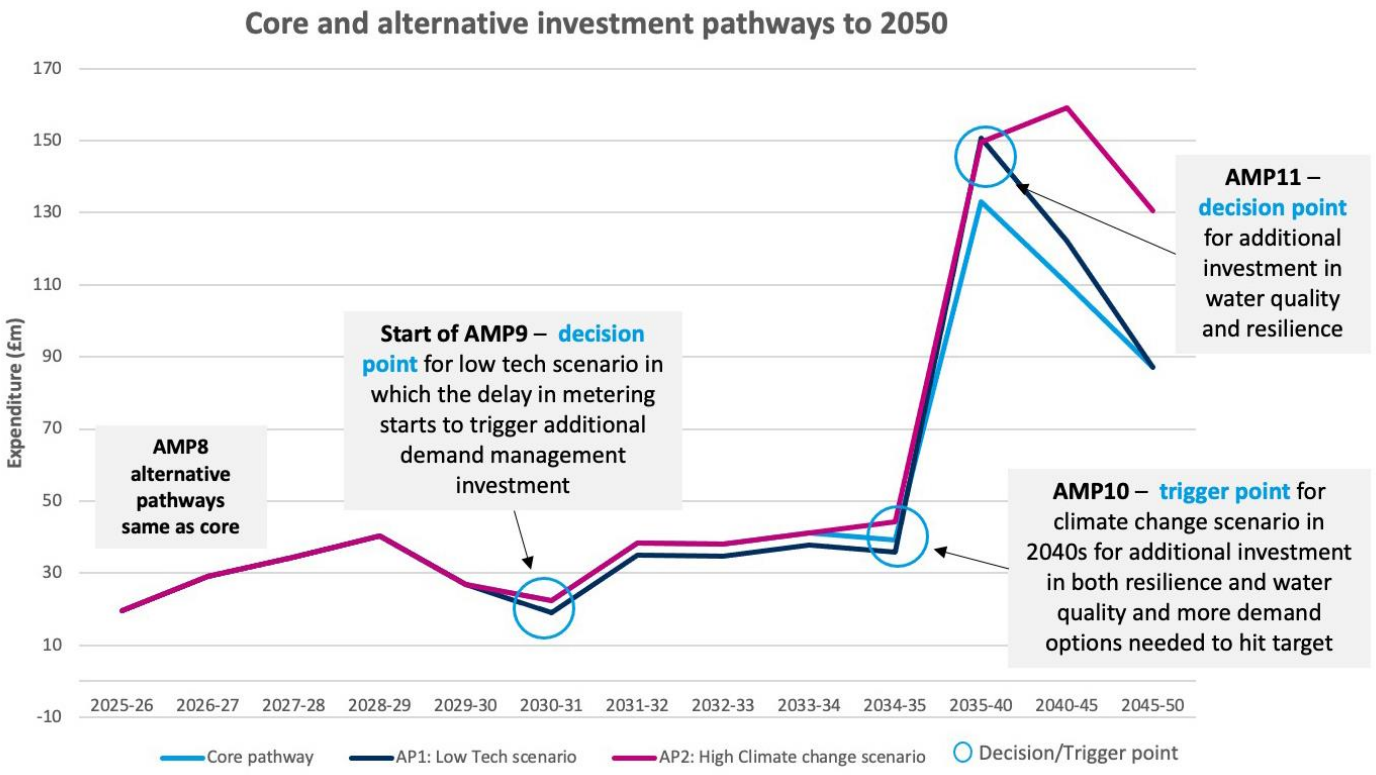
As a responsible, customer-focused and regulated business, we have to maintain a balance between making sure we play our part in delivering climate change resilience, restoring and enhancing the environment and keeping our bills affordable to customers.

For our long-term vision to 2050, we have developed the following ambition statements to address these challenges holistically, which our people and the Board have helped to shape.

To continue embedding climate change adaptation and mitigation within our short- and long-term business strategy, we are committed to:

- encouraging sustainable practices within our business and across our supply chain;
- fostering a strong culture of innovation;
- making sure our people have the skills needed to deliver our long-term ambitions;
- collaborating with stakeholders to generate positive impacts and share knowledge;
- using renewable energy;
- and making sure our network of treatment works, pipes and pumping stations are resilient to extreme weather events.

Climate change considerations in our long-term adaptive planning



We recognise the importance of linking our short-term business plans with the long-term challenges we will face in the future, which includes climate change. So, we have stress tested the impacts of climate change on the core pathway of our long-term delivery strategy to ensure our investment strategy contains the necessary activities to deliver our long-term targets and ambitions efficiently under a range of plausible scenarios.

Many of the new approaches, tools, and models we developed during our most recent business planning period serve both our short-term from 2025 to 2030, and our long-term delivery strategy, which looks ahead to 2050. In many cases, the same tools, techniques, systems, models and approaches have been applied with a longer time horizon selected.

For example, our new model for predicting bursts spans the full horizon of the long-term delivery strategy, builds in new variables driven by the Ofwat common reference scenarios (notably climate change in this case), and determines our five-year infrastructure renewals expenditure linked to the desired performance commitments for that time frame. While there are areas we can still improve; we are pleased with the coverage of models and data-driven approaches to decision-making across all horizons.

To ensure our core pathway is robust and able to meet all plausible scenarios, we tested our strategy against Ofwat's common reference scenarios to see where the pathway may need to adapt (which may include feasibility studies or enabling works) and where an alternative investment pathway is triggered under a certain scenario.

We identified certain decision and trigger points where additional investment was required under two scenarios – the high climate change scenario and the low technology scenario. The high climate change scenario triggered the need for additional investment into water quality and operational resilience from 2035. We discuss this in more detail in the 'Key climate change risks' chapter. The low technology scenario triggers a need for additional investment into demand management from 2030.

Our long-term adaptive plans undoubtedly carry high levels of uncertainty. So, they require continuous monitoring to ensure the key activities and their relationships that inform the triggers and/or decision points for investment are clearly identified and tracked against proposed metric(s) where possible or key activities. This way, we can make timely and cost-

efficient decisions as we refresh and adapt our plan. In appendix B, we summarise the existing controls for our key climate-related risks and our proposed adaptation measures up to 2050, as reflected in our long-term delivery strategy.

Our approach to managing risk and uncertainty

Our risk management framework aims help us to integrate risk management as part of the culture across our business and our daily activities. We ensure risk management is part of our strategic, tactical and operational decision-making. This means that whenever there are risks that could significantly affect company objectives, the necessary resources are made available to mitigate those risks.

Our climate change working group, led by our Environment and Energy departments, have carried out an in-depth climate change risk assessment. This has informed our corporate risk register and is reviewed quarterly. To identify and assess relevant climate risks, the working group were guided by the Climate Change Risk Assessment 2021 (CCRA3, specifically the water sector briefing, as well as the Ofwat common reference scenarios for climate change. We also assessed our level of risk understanding and identified areas for improvement as our risk assessment framework matures. The risks, detailed in appendix A, were assessed using our corporate risk scoring method to ensure alignment with our risk register.

The assessment process highlighted the following five key risk themes that are explored in further detail in this report and cross-referenced back to the CCRA3 risks*.

- Securing future water supplies.
- Delivering a resilient supply of good quality water.
- Maintaining asset reliability and resilience.
- Managing interdependent risks.
- Minimising the impact of our activities on the environment.

*Note: Risks from the CCRA3 Environment sector have also been included in the climate change risk assessment, as it was determined our environmental obligations increasingly form a core part of our business operations and statutory responsibilities, and therefore require consideration.

Risk scoring process

For each identified risk, we determine a risk appetite. This reflects the amount and type of risk we are willing to seek, accept or tolerate in pursuit of our strategic and business objectives. The Board is responsible for setting our approved risk appetite. At the time of writing, this is predominantly set at ‘cautious’ for both water and climate change related risks.

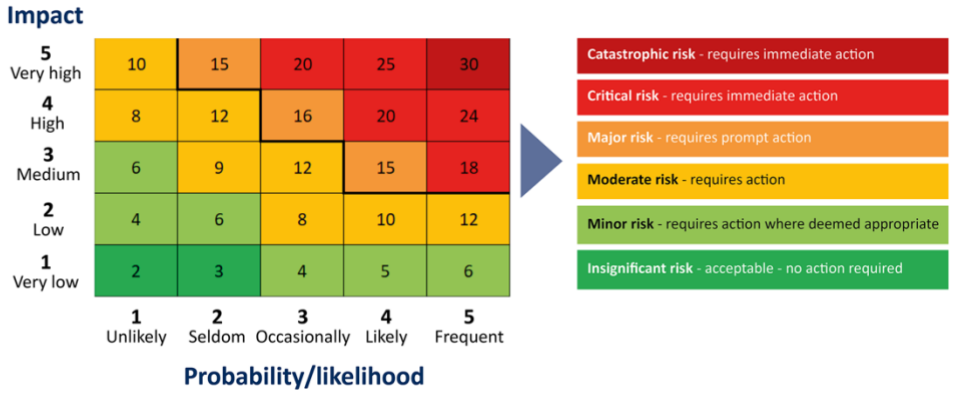
We assess risks are against two factors: the impact on the business; and probability or likelihood of the risk occurring. For impact scoring, we evaluate impacts across ten different aspects, including environment, water quality and health and safety.

The overall rating of each risk is determined by taking the product of the impact and probability scores (impact x probability) and weighting this for impact. This compound score enables us to focus on the most important risks. Priority and greater management time is given to implementing controls over these risks, rather than focusing on those risks which are of less significance, but which may be more easily controlled.

Risks are given pre-control and post-control risk scores, as well as action plans to bring the risk in line with the target appetite. Action plans for significant risks are disclosed to the Audit and Risk Committee for review and are included in our annual reports and financial statements.

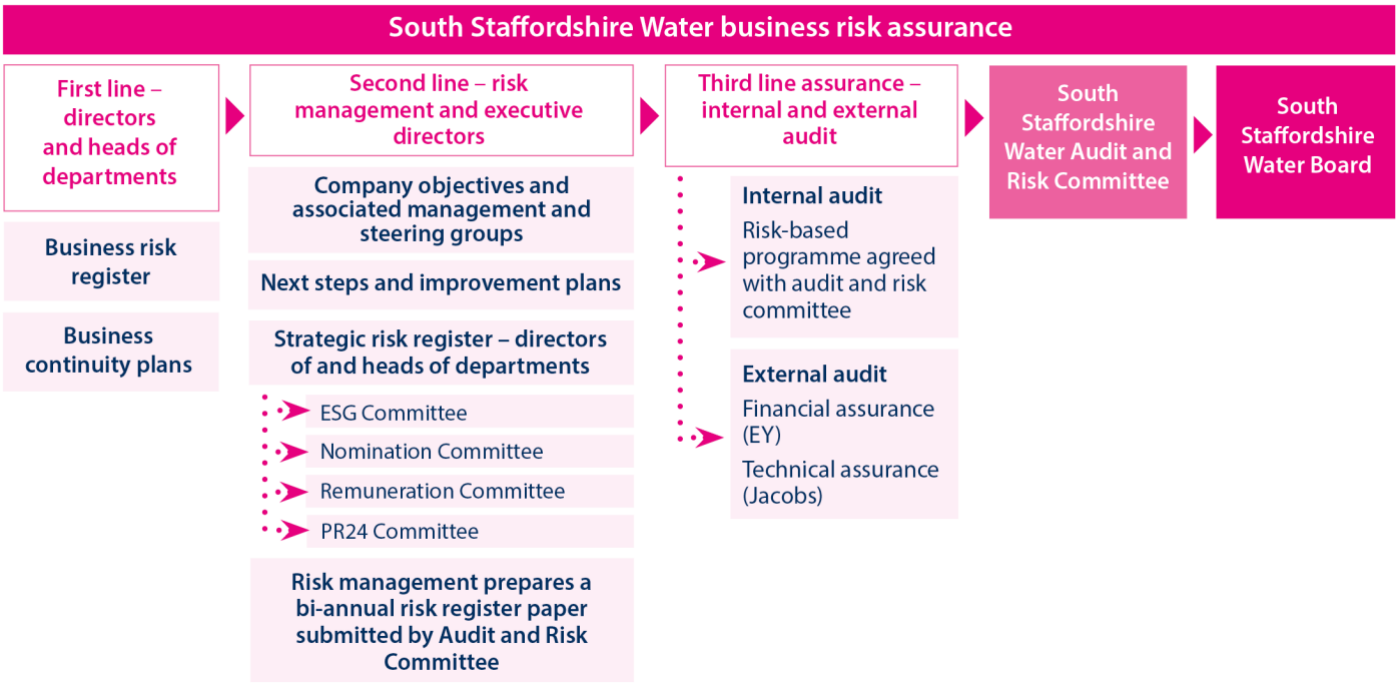
Probability/likelihood

5	Frequent	>50%	Occuring or done many times at short intervals
4	Likely	20-50%	Probable
3	Occasionally	1-20%	At frequent or irregular intervals
2	Seldom	0.1-1%	Not often, rare
1	Unlikely	<0.1%	Not likely to happen,improbable



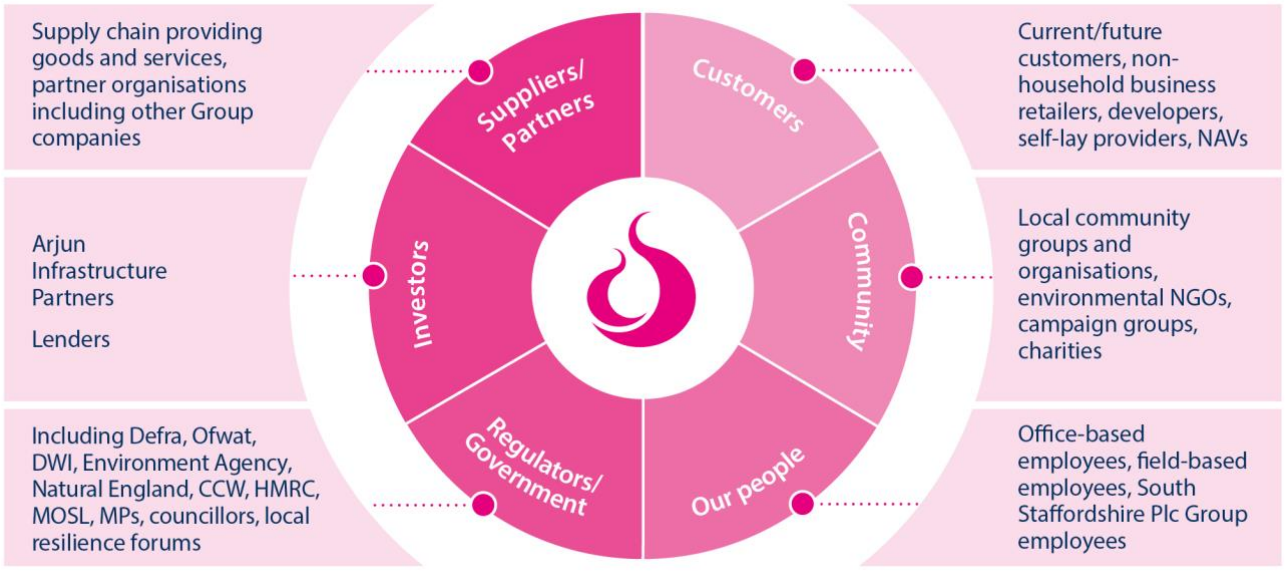
Assurance

We benchmark our corporate risk management maturity against good practices and guidelines, as well as reviewing emerging risks through the Global Economic Forum global risks perception data. We also ensure effective risk-based assurance arrangements are in place through the independent Group Risk Control and Audit function, which allows us to monitor the effectiveness of our risk management processes on a routine basis through a control framework.



Taking the views of customers and stakeholders into account

Improving our approach for Ofwat's PR24 price review process



Providing a vital public service gives us the opportunity to interact with tens of thousands of customers and other stakeholders every year. To achieve our vision and to deliver wider public value, it is important that we engage to understand how we can best meet the needs of the communities we serve. To support our long-term delivery strategy and short-term plans to 2030, we have carried out our most in-depth and widest reaching research and engagement programme to fully understand what our diverse population of customers, stakeholders and citizens expect us to deliver now, and in the future. You can find out more about our approach on our website.

Part of this engagement focused on consulting with our customers on how we can achieve our long-term ambitions, which includes adapting to climate change. We have asked a wide range of customers and future customers for their preferences on our level of ambition for key issues that are affected by climate change, such as water quality risks and supply interruptions. We have also asked customers about the pace and sequencing of key investment choices in our strategy to adapt to these risks, considering the important dynamic between intergenerational fairness of paying for long-term investments.

We used the following approaches to conduct the engagement for our long-term adaptive planning.

- A wide-ranging research programme to inform the Water Resources Management Plans for our Cambridge and South Staffs regions, carried out at a local and regional level. This covered engaging with customers on key issues around the resilience of supply and demand options that could be used to ensure water supplies over the long term.
- Our first ever Citizens' Jury, where we engaged customers from both supply regions about our strategy for achieving net zero operational carbon emissions by 2030 and the long-term approach to achieving net zero embodied carbon emissions by 2050.
- Ongoing conversations with the H2Online communities in our Cambridge and South Staffs regions about our long-term vision and customer priorities.
- Customer valuations research studies, both at local and regional level, and the collaborative PR24 outcome delivery incentive study, led by Ofwat.
- Our customer priorities tracker, specifically the qualitative focus groups, exploring long-term priorities to 2050, including intergenerational fairness over bill profiles.

We have taken care to ensure we have reached a robust and representative sample of customers. This includes customers in vulnerable circumstances and those who are harder to engage, such as future and non-household customers.

What our customers told us

Building on our learnings from the previous price review and water resources management planning processes, we have presented to customers the notion of long-term uncertainty in our planning because of factors such as climate change. Our research shows that:

- customers have a growing awareness of the challenge climate change presents for us and there is understanding that this is likely to cause disruption to services;
- there is majority support across both regions for the use of adaptative measures to help ensure best value decisions are made around the long-term investments needed to ensure our services are resilient to climate change;
- just over half of the customers surveyed as part of the water resources management planning process said they were concerned about the impact of climate change on the natural environment in their local area;
- following the COVID-19 pandemic, there was growing evidence that action to address climate change was needed more urgently but, driven by the cost-of-living pressures which emerged in early 2021, environmental concern generally has transformed from a core concern for investment now to a longer-term issue and, for some customers, a secondary concern; and
- despite this, customers have been clear that they want us to invest in climate change resilience now to mitigate future risks to service, rather than waiting for deterioration to materialise and causing bill shocks for future generations as we recover our position. Our research has shown a consistent majority preference for an even, natural bill profile up to 2050 and that important investments should not be delayed.

We have also looked at a wider affordability scenario, recognising the changing nature of affordability and our local challenges. An alternative plan was not deemed appropriate at this time given the uncertainty of the impact of the proposed Fens reservoir on customers' bills. Instead, we will monitor and track levels of water poverty across both regions to enable us to adapt our affordability strategy. This will ensure we deliver our ambition of eradicating water poverty and that our customers' water bills are affordable, both now and in the future.

A synthesis report detailing the insights from our customer engagement programme and wider sector, can be found in the report we commissioned from one of our research partners, Impact.

Case Study: Engaging with future customers through our Young Innovators' Panel

Since 2017, we have delivered a step change in our customer engagement, including with our future customers. We launched a Young Innovators' Panel in our South Staffs region in 2018 to bring the voices of young people aged between 16 and 18 directly into our business. Our Cambridge region Young Innovators' Panel launched in 2019. For the students, being a member of the Panel gives them the opportunity to work in teams to overcome a business challenge and directly shape our plans. They then present their ideas to members of the Board and our Executive team.

We launched the recruitment process for our 2023 South Staffs Panel in March 2023, receiving a record number of applications (Around 70 students). We ran a competitive three-week process to select our 25 Panel members. The first session in June included immersive sessions about how our company operates, along with group discussions with subject experts from across the business on specific issues around water efficiency, pollution, climate change and global water security.

The students were then split into four teams and briefed to create an engaging educational resource that could be incorporated into a classroom-based workshop for Key Stage 3 pupils (that is, 11- to 14-year-olds). They then returned to the business in July to deliver their pitches to a judging panel comprising senior executives, an independent Board member and the Chair of the Independent Stakeholder Group. We also invited three Key Stage 3 pupils from the Friary School in Lichfield to provide feedback from a target audience perspective.

The pitches featured ideas that came in the form of app designs or board games, which would enable Key Stage 3 pupils to develop their understanding of each topic through game play and an exploration of the world of water and the impacts that climate change will have on water supply. The winning team presented an interactive board game aimed at educating young people about the impact of climate change around the world, with players travelling the globe and answering questions.

Our education co-ordinator has turned these ideas into a tangible addition to our education outreach activities. The aim is to help future generations learn how to place more value water on as a finite resource. We are actively looking at ways to assess the success of this approach and track its impact.

Partnership working

Key to facing the challenges of climate change is working in partnership with a range of stakeholders and communities. This is to ensure we reduce negative impacts and generate improvements for local communities while making sure we leave the environment in a better state for future generations. We are exploring innovative approaches and seek third party funding to co-create these improvements where possible to reduce the burden on customers through the bills they pay. Below, we set out some examples of the partnership working we have carried out.

Regional water resources groups

We are key members of Water Resources East (WRE) in our Cambridge region and Water Resources West (WRW) in our South Staffs region. Many of our decisions around the approach to key elements of our adaptive planning have been agreed through work streams within these groups to ensure consistency. This includes the approach taken to elements such as climate change modelling, environmental destination, and growth projections.

The regional groups combined the supply and demand needs from each water company, and non-public water supply sectors, to create regional water resources plans. The five regional plans were overlaid to create a national picture of water resources, which ensures that best value plans, for both customers and the environment, to meet the water needs of the country are developed.

Communities

Through collaboration with local groups and organisations, including local businesses, religious groups, universities, and charities, we provide opportunities to educate and inform our communities about the ways we can help them, and how they can work with us in return to mitigate and adapt to climate change.

Case Study: Water use in faith communities

In 2023, we launched a diversity-led, water efficiency project, which aims to support customers of different faiths and cultures to reduce their water use. The project received funding from Ofwat's Innovation Fund, which is designed to drive innovation and collaboration in the water sector to benefit individuals, society, and the environment.

We think the project will deliver a number of objectives, including water savings of about 200,000 litres. It will also enable us to develop a more inclusive water efficiency framework and toolkit linked to faith and culture that can be adapted and scaled up across the England and Wales water sector. And we think it will help us to establish new communication channels and stakeholder relationships with our seldom heard communities.

In March 2024, we launched our first campaign for the project in partnership with Cambridge Central Mosque. This focused on the opportunity to save water during the Islamic practice of Wudu (ablution), the ritual washing performed in preparation for prayer and worship.

In August 2024, we launched our second campaign focused on saving water in South Asian communities. Many families in South Asian communities wash rice up to seven times before cooking, and we wanted to understand why and how excess water from that washing could be reused. Ping Coombes, MasterChef winning South Asian chef, has fronted a series of videos for us demonstrating how to wash rice using less water. Ping has also looked at what can be done with the starchy leftover water.

Collaboration and open data

We will continue to work across different teams and functions, collaborating and sharing insight with the wider water sector, stakeholder groups and experts. This includes making better use of open data approaches to untap cost efficiencies and opportunities for improved climate change adaptation. We recognise how open data can transform the approach we take to tackling the long-term challenges we face – in particular, the impact of climate change on water resources. We also recognise that as well as building resilience with our water supplies and assets, we also have to build resilience in our data and management, to enable us to address these long-term challenges. So in August 2023, we engaged with our people from across our Cambridge and South Staffs regions and with other stakeholders at an open data sprint on the theme of 'Future proofing Cambridge: how to solve a future water challenge'. The aim was to understand patterns in our current water use data. We wanted to develop innovative and novel approaches to assessing the potential insights. Having shared our consumption data with attendees, we divided them into groups and tasked them with finding out where water usage is highest and to suggest ideas for reducing this use. At the end of the sessions, each team presented their findings. Because we had a mix of people with different areas of expertise within each team, we gathered a wide range of insights on potential demand reduction initiatives, including:

- weather-based communications initiatives and campaigns;
- tailored interventions for affluent communities, with approaches designed based on house or garden size; more environmental leverage in affluent communities;
- and targeted water efficiency strategies without restrictions on water use for those who may struggle to pay their water bills.

We will build these open data insights into our BAU activities as part of our long-term strategy to build holistic resilience across our capabilities.

We are also currently part of a number of collaborative industry working groups such as the water efficiency steering group, UKWIR (UK Water Industry Research) programmes and Water UK. Most recently we have engaged with the national collaborative studies led by Ofwat and the consumer watchdog CCW, sharing our learnings to help shape guidance and research design.

Part 2: Key climate change risks

Securing future water supplies

An increase in long, dry summers because of climate change will impact our supplies by reducing water availability in areas that are already water stressed. This will also drive demand for water, an issue intensified over the long term by rising populations in both regions. As a result of these combined impacts, we will need to implement ambitious supply and demand management options to secure future water supplies.

Related CCRA3 risks

- I8. Risks to public water supplies from reduced water availability.

Short-term mitigation and adaptation

Water Resource Management Plans

We publish an updated Water Resources Management Plan (WRMP) for our Cambridge and South Staffs regions at least every five years. These plans detail our predictions for water demand over the next 25 years and review a range of potential options to ensure water is available to supply. The most recent plans published earlier this year (WRMP24) include many changes since our previous 2019 plans, particularly in relation to climate change and its impact on future water availability, both for public water supply and for environmental needs. We also aligned our plans with the Water Resources East and Water Resources West regional water resources groups by using the latest climate change projections from UKCP18.

Abstraction reductions

We carried out an assessment of the impact of climate change on the availability of water supply in our WRMP24 for both regions. For our Cambridge water resource zone, the overall vulnerability to climate change in the long term was assessed as 'low'. The most vulnerable sources identified were three individual groundwater sources. However, by 2030, we will have reduced the volume of water we abstract from these sources to prevent extreme low flows in chalk streams and protect associated wildlife (see page 34). This reduction in abstraction will have a greater impact on water availability in the short term, which is why the impact from climate change is considered to be low.

All the groundwater in our South Staffs region comes from the Sherwood sandstone aquifer, which has a high level of resilience to changes in temperature and demand, with a current view of this being around 15 years. Initially, the South Staffs water resource zone was classified as having 'medium' vulnerability but, to align with other companies in the Water Resources West group, we adopted a 'medium to high' vulnerability approach when modelling climate change scenarios.

Similar to our Cambridge region, we have agreed to reductions in the volume of water we abstract across our sources by 2030. Further reductions will be implemented by 2050, which we predict will protect the related waterbodies and catchments from the impacts of climate change over the long term, while maintaining a healthy supply/demand balance.

Drought resilience

Through our WRMPs, we have sought to ensure a step change in drought resilience. This includes carrying out studies to identify the actions required to make our system resilient to a 1-in-500-year drought, whereas the previous requirement was a 1-in-200-year drought. In reality, this means that the chance of an extreme drought reduces from 0.5% to 0.2% in any given year. In our South Staffs region, we are already at the enhanced level of drought resilience now required, so there is no current need for any new supply options. Our Cambridge region will require more investment in supply sources in the future, as outlined on page 24.

We consult on and publish separate drought plans for our Cambridge and South Staffs regions every five years. These operational documents set out our plans for managing water supplies in the event of a lengthy period of dry weather and a lack of rainfall. The latest plans from 2022 reflect our climate change ambitions and the levels of service we maintain during high demand periods. These operational documents set out our plans for managing water supplies in the event of a lengthy period of dry weather and a lack of rainfall.

Case Study: Drought Response

The need to ensure our supplies are resilient to future periods of long dry weather is becoming increasingly apparent. In 2021, the Environment Agency declared both our Cambridge and South Staffs regions as areas of serious water stress. In 2022, hot weather and high-water demand pushed both regions into drought.

In our Cambridge region, we reached record-breaking levels of water demand that have not been broken since at least 1995, while in our South Staffs region the River Severn experienced an unusually high 114 days of river regulation from the Environment Agency. This limited the output of our largest water treatment works, as maintaining flows in the river is critical to preserving ecological health of the river and supplying a natural, sustainable flow along its entire course.

We recognised the significance of the 2022 drought early on and took a number of steps to prepare for and combat the drought as effectively as possible.

In our Cambridge region, we initiated Summer Action Plan (SAP) meetings in June as a result of a lack of spring rainfall and the lasting abstraction licence effects of a freeze-thaw event during the previous winter. We use SAP meetings as a planning structure to increase the resilience of our supply network by instituting enhanced water resources and leakage monitoring, as well as increasing response times to unplanned abstraction site outages. Those attending the meetings are a multi-disciplinary group with representatives from the technical and operations sides of the company.

We also put a hold on new planned capital works projects to ensure no abstraction sites were taken out of supply. At the peak of the drought, SAP meetings were held twice a day. By using our RAG (Red, Amber, Green) system for our action plans, we have been able to scale our responses to the different demand conditions

In our South Staffs region, we initiated strategic conservation meetings for our Blithfield reservoir in June, to ensure early management of and preservation of water levels in light of the reduced rainfall. This included weekly meetings to understand Blithfield's position, forecast its expected level and devise a rolling plan to enact any changes that could preserve and increase the reservoir's volume.

Using the outputs of our conservation meetings, we increased our engagement with the Environment Agency to regularly update its understanding of the water resources situation and to explain our planned responses to the drought. This laid out clearly the steps we took during the drought. This was a positive solution that we have since incorporated into our business-as-usual (BAU) work.

We also understand that a greater level of communications with our customers during periods of drought is required to alleviate the stress on our network that high water demand causes. We have committed to improving the relevance and spread of our communications and create a range of pre-prepared content ahead of periods of high demand. In addition, we will work with third parties that are also affected by high water use to increase our customers' awareness of the need to use water wisely. We will also educate customers about the causes, effects and responses to drought to reduce the demand on our water supply and to help them save money on their bills.

Long-term mitigation and adaptation

Demand management

In our Cambridge and South Staffs WRMPs, we have detailed several long-term demand management proposals to address future water supply deficits. These include ongoing water efficiency campaigns, rolling out a universal metering programme across both regions by 2035, and reducing leakage by 50% by 2050. We forecast that the introduction of the Government led water efficiency labelling scheme for white goods by 2025 will also be a key enabler for reducing demand.

We think these demand management options will be sufficient to meet predicted supply deficits in our South Staffs region. For our Cambridge region, detailed analysis and modelling work carried out shows that we will need to implement ambitious long-term supply options, in addition to managing demand, if we are to meet the needs of all water users in the future.

Supply management

To achieve our drought resilience ambitions and meet the water needs of a growing population in our Cambridge region, we are implementing several different supply options. These include a bulk supply transfer from Anglian Water's Grafham reservoir, and the construction of the Fens reservoir. This will subsequently deliver a reduction in the volume of groundwater we abstract, resolving future climate change impacts on supplies that would be vulnerable to low flows. We discuss each of these options in more detail below.

Grafham transfer

Our supply-side options rely largely on bringing water into our Cambridge region from outside the supply area. This is because of the unique geology of the region, with all our current water supplies taken from chalk aquifers. As a result, there are very few environmentally viable options available to us.

Our Grafham transfer scheme involves taking a bulk supply of water from Grafham reservoir in Anglian Water's operating area. This could provide around 26 million litres of water a day (Ml/d) from the early 2030s. This scheme is dependent upon completion of the Grand Union Canal and Minworth strategic resource options, which will enable Affinity Water to reduce its current transfer from Grafham, freeing up water to transfer into our Cambridge region.

Fens reservoir

Working with Anglian Water, we are proposing a new reservoir in the Cambridgeshire Fens to help meet the growing demands on water supply in the East of England. The new reservoir, which could supply water by the mid- to late-2030s, is at the heart of a whole new water supply project. Along with the associated water infrastructure needed to transfer water to the reservoir, treat the water, and supply it to homes and businesses, it will secure a reliable water supply for generations to come.

While the supply and demand investments we are making today will help to keep taps running, based on climate and growth projections for our Cambridge region, the available supply will fall well below the demand for water unless we plan for future resources now. Having this new water resource, which could supply up to 87 Ml/d, will reduce demand on sensitive chalk stream habitats, helping us to protect and restore the environment. It will also make us more resilient to a changing climate, reducing the impact of droughts while helping to manage river levels in wetter periods.

Artist's impression of Fens reservoir

Case Study: 'Can for the Cam' campaign

We have a long-term ambition to help all our customers use water wisely. Key to this is our strategy to deliver reductions in household water use through sustained behavioural change activities.

During the summer months, for example, we typically supply an extra 15 Ml/d to customers in our Cambridge region. This means we sometimes have to pipe extra water in from elsewhere or take more from underground sources, which can impact the chalk stream habitats that are a feature of the region.

To help address this, between July and September 2023 we ran our 'Can for the Cam' campaign, targeted specifically at reducing customers' water use. We chose Cambridge for the campaign because data from the Office for National Statistics (ONS) shows that it has a higher proportion of gardens (91% of households) than the national average.

The purpose of the campaign was to cut seasonal high demand, reducing the need for us to bring in water from outside the region and helping us to protect local chalk streams, including the River Cam.

'Can for the Cam' encouraged customers to switch from using hosepipes to watering cans in their gardens. The average hose can use up to 1,000 litres of water an hour; in comparison, a watering can only uses around 200 litres of water an hour.

We used a variety of communication channels to spread the message about the campaign, including social media, print and online promotion, podcasts and events. Key to this was making sure customers understood the link between the water they use and the impact this has on the local environment. So, we educated our customers on water scarcity and worked with local environmental organisations to promote water saving hints and tips.

We had a target to save 500,000 litres of water – or 500 fewer hours of hosepipe use – each day as a result of the campaign. Our calculations showed that we nearly doubled this target, with customers using 940,000 litres of water less each day than they would have done without our campaign.

In June 2024, we learned that the campaign received a 'Highly Commended' in the Behavioural Change Campaign of the Year category at the UK Green Business Awards. It has also been nominated for Water Efficiency Project of the Year at the national Water Industry Awards – the water sector's 'Oscars'.

We were keen to carry forward the success of this campaign into the 2024/25 financial year. So, we worked with behavioural change specialists from Cambridge University to help shape a follow-up campaign and in 2024 launched a new, ambitious initiative: 'Yes We Cam'. This comprehensive water conservation campaign aims to engage residents across Cambridgeshire by fostering a community-wide effort to save water, adopt more sustainable water usage practices and work together to protect the precious and unique local chalk streams. Yes We Cam' seeks to reduce current water demand by encouraging people to get involved by taking simple yet effective measures. Residents can sign up to one of six individual pledges, such as taking shorter showers, turning off the tap whilst brushing teeth and using the eco-mode on appliances. We aim to smash last year's target by saving 2 million litres of water a day. That would reduce local water use by over 4% and keep that water in the local chalk streams, as well as saving the carbon emissions to pump and treat that water.

Delivering a resilient supply of good quality water

More frequent and intense heavy rainfall events will increase pollutant run off into our raw water sources. Higher temperatures can lead to algae blooms in our surface water sources and increased water quality challenges for our raw water storage. This will strain our water treatment processes and could reduce water quality, posing risks to public health. Ensuring we always have high-quality drinking water for our customers is our top priority, and this is why it is specifically referenced in our ambition statements. Water quality is also consistently referenced in our customer engagement as a hygiene factor that we must always continue to deliver.

Related CCRA3 risks

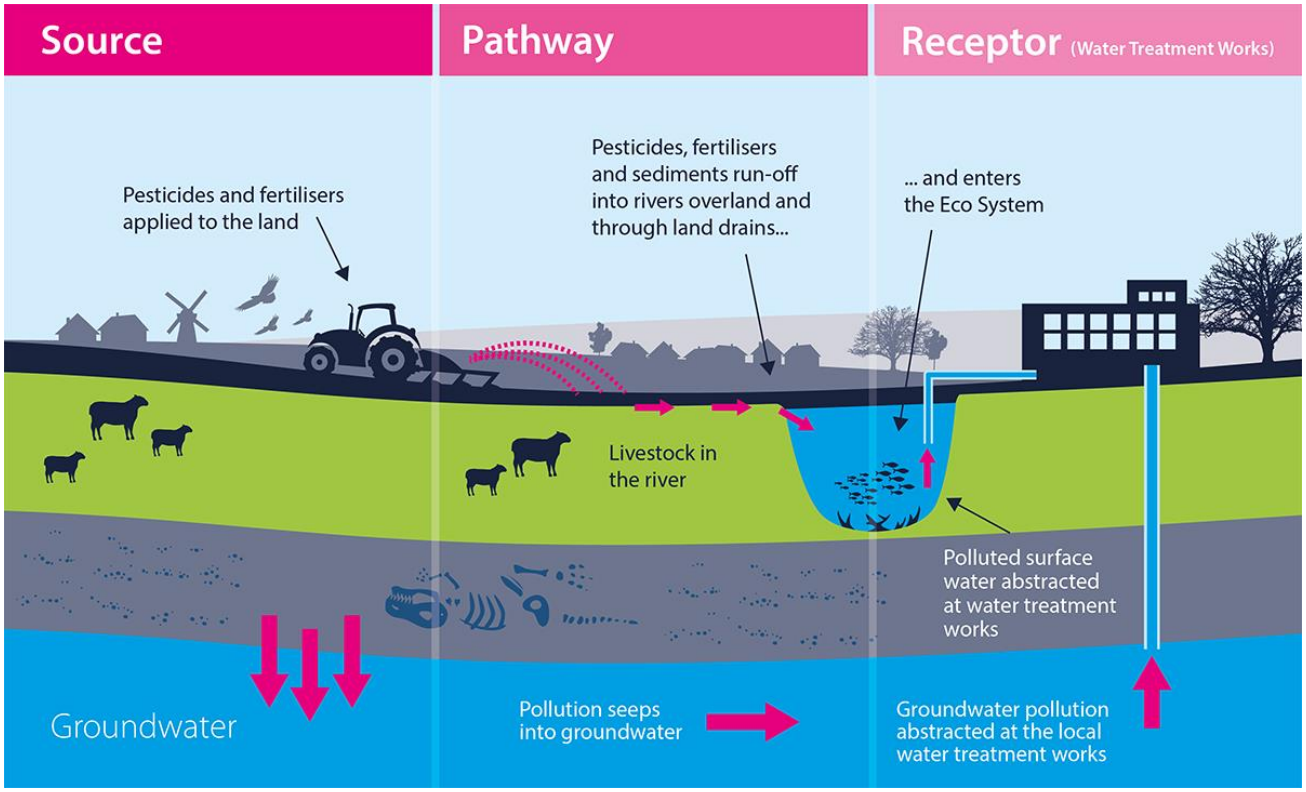
H10. Risks to health from poor water quality and household supply interruptions.

Short-term mitigation and adaptation

Catchment management

Our catchment management programme and SPRING (Slug Pesticide Rethink – Ideas for Nurturing Growth) scheme allows us to mitigate water quality risks at source through joint working with local landowners and farmers. Through a grant and advice-based programme, we have seen significant success in reducing nitrates and metaldehyde in raw water. We have delivered many benefits through nature-based solutions, including under sowing of crops to reduce pollutant run-off during heavy rainfall.

From 2025, this work will move from our WINEP into our BAU activity and is included in our PR24 business plan. We plan to expand both the area we cover with the SPRING scheme, but also the range of pollutants we tackle. From 2030, we will also review appropriateness of an increased land holding strategy to allow more direct catchment management. These measures will help deliver improved raw water quality enabling us to maximise our existing raw water resources. We will continue to review our catchment management approach each year to ensure we are truly resilient to the shocks and stresses the future will bring.



Service reservoirs

We already see, and have data and models to prove, that our service reservoirs are challenged during warmer weather – both microbiologically and from a trihalomethane perspective. Even under the benign climate change scenario, we still see temperatures increase and we think it is likely we will see additional water quality failures in the short to medium term as a result. So, we are planning to launch a programme of strategic enhancement from 2030 onwards, including improving reservoir turnover, redesigning inlet and outlet arrangements and optimising chlorine residual management across our networks.

Long-term mitigation and adaptation

Analysis of long-term impacts on water quality

For our business plan for 2025 to 2030, we worked with third party consultants Atkins to further understand how the impacts of climate change affect raw water quality, and at what point our existing infrastructure is no longer fit for purpose. The analysis evaluated the potential risk to drinking water quality at the two largest surface water treatment works in our South Staffs region in relation to climate change-related impacts on river flows under the Ofwat high climate change scenario.

The key findings from the assessment included the following.

- More frequent low flow events will increase the number of days on which abstraction from the River Severn is constrained. This may increase the need to abstract water more often on other days when water quality is poor, reducing the degree to which water quality passing into the treatment works can be managed at the intake.
- Some increase in algal populations is projected in the River Severn because of an increase in low flow events. But these changes are modest and are unlikely to result in a substantial increase in the risk to drinking water.
- A moderate increase in phosphorus and nitrates into Chelmarsh reservoir is predicted, which could increase eutrophication (excessive nutrient enrichment) of the reservoir and associated water quality problems, including algal blooms, taste and odour problems, algal toxins and organic load to the works.

These changes are likely to occur in the medium term from 2040 onward and increase in magnitude beyond this date.

New surface water treatment

Informed by the raw water quality assessment and led by the principles of drinking water safety planning, we developed our long-term core and adaptive planning pathways for water quality. For surface water treatment, we identified an alternative investment pathway, which includes a new treatment process to manage an increased level of organics coming onto our surface water works, with 2040 as the trigger point. The most effective treatment solution would be an advanced oxidisation plant at both our surface water treatment works which would enable us to meet our THM (Trihalomethane) regulatory requirements.

Given the many uncertainties of climate change, there are elements we are aware of but are still in the process of understanding how to monitor and implement during the decision-making process. This includes how the changes in water temperature may impact nutrient removal and the impact on drinking water quality. Also, before these changes in water quality at the intakes come into effect, water company investment in nutrient removal and proposed implementation of regional water transfer schemes may modify these risks. So, we would need to consider these influences before investment takes place to mitigate the projected increased risk to drinking water quality.

The key findings and analysis from our raw water study are further detailed in ‘SSC32 Long-Term Delivery Strategy climate change impacts on raw water quality technical report’.

Raw water storage

In addition to a further level of treatment, our longer-term analysis suggests that additional raw water storage at both surface water treatment works would make us more resilient to the shocks and stresses we would see in the high climate change scenario. The cost confidence of such schemes is currently quite low, and this will be a key area for us to monitor so that we can adapt our core pathway to include feasibility or pilot studies before trigger points. With affordability in mind, we currently intend spreading this investment over the ten years from 2040 to 2050, prioritising our largest treatment works first.

Case Study: Treatment upgrades in our South Staffs region

As part of the Government's post-COVID green recovery initiative, Ofwat approved an additional £15 million capital investment to accelerate the pace of upgrades at our water treatment works in our South Staffs region, to a £40 million total investment. The upgrades, due for completion in 2025, include a new filtration system that will improve water quality and provide more security around water supply in the region. This innovative system will also increase efficiency and significantly reduce energy consumption, allowing us to play our part in the water sector's ambition to achieve net-zero carbon emissions by 2030.

Maintaining asset reliability and resilience

As a business with a long history of delivering reliable services to customers, we recognise the importance of always investing in our assets to ensure their resilience to climate change impacts. An increased likelihood of severe weather events, subsidence, flooding and extreme temperatures in the future will accelerate the deterioration of our infrastructure and cause supply disruptions. We must deliver a rolling programme of investment and maintenance to ensure a secure water supply for customers across our Cambridge and South Staffs regions in the long term.

Related CCRA3 risks

- I1. Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures.
- I2. Risks to infrastructure services from river, surface water and groundwater flooding.
- I7. Risks to subterranean and surface infrastructure from subsidence.

Short-term mitigation and adaptation

Infrastructure investments

From 2025 to 2030, we will invest in the base maintenance of our infrastructure assets, primarily related to our mains renewals and mains conditioning programmes. We are also seeking additional funding to deliver resilience enhancement solutions across both regions such as new boreholes, mains, and associated infrastructure. These investments will remove single points of failure that would prevent us from delivering water reliably to customers during extreme weather events. Our full asset management plan for PR24 can be found on our website.

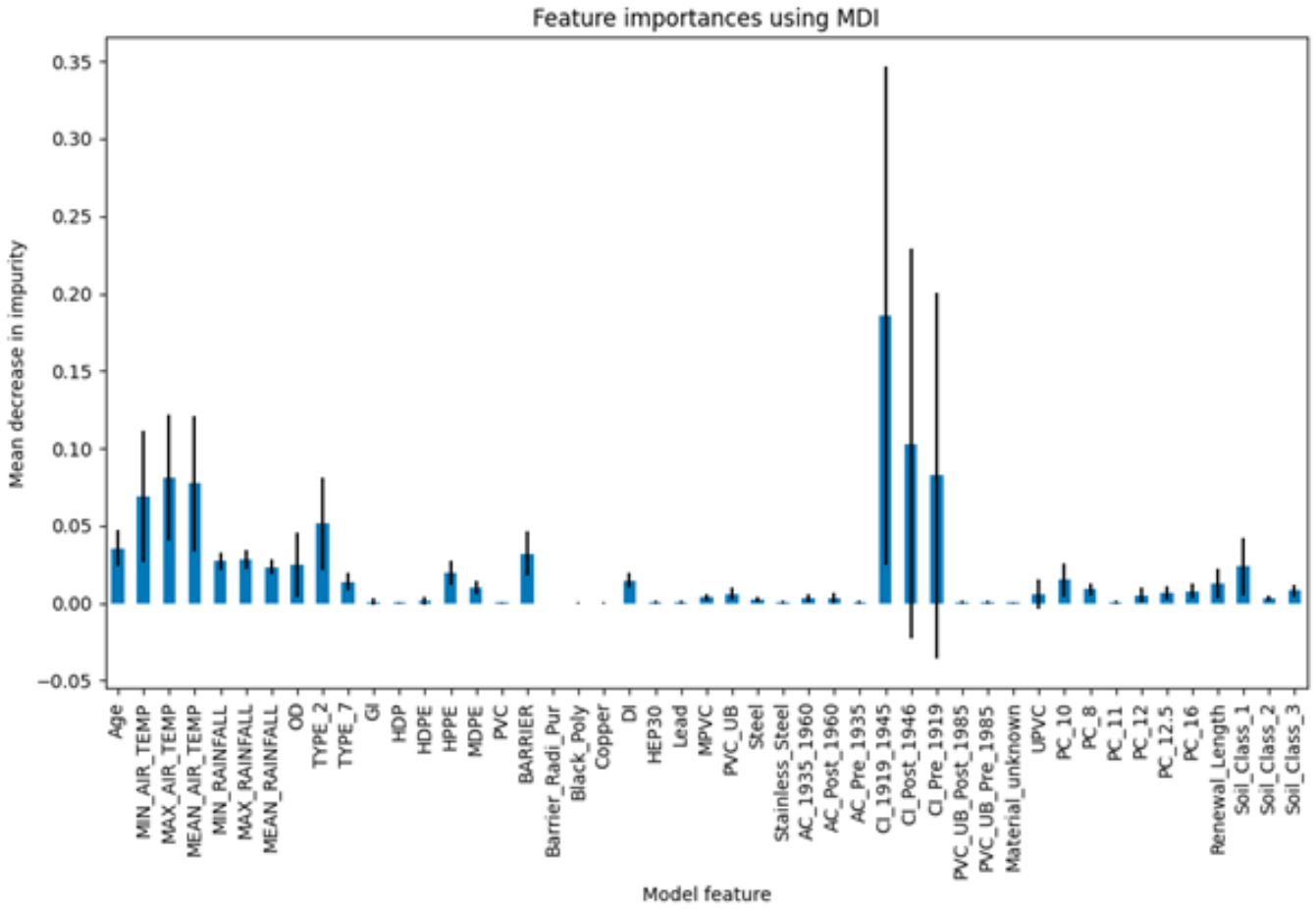
Mains deterioration modelling

We need to renew our mains to manage the long-term serviceability of our networks and maintain reliable services to customers. Replacing water mains at the end of their useful life also contributes to improved resilience. We have built a comprehensive mains infrastructure model that uses robust historical datasets and assesses our operational resilience, forecasting to 2050, as we plan for the future.

The new model has been trained to consider the characteristics of the network components within our supply area alongside climate predictions to determine an expected number of failures each year. The model is based on machine learning principles and requires time to train so an accurate forecast can be developed. No model is perfect in its predictions, but the results show a significant increase in the accuracy of predicting burst numbers for both regions when compared with previous models.

Results from this model also validated what we have observed in recent years during extreme weather scenarios. After cast iron pipes, the next most significant parameter within the model is air temperature, followed by age and then rainfall. Climate-sensitive parameters such as air temperature and rainfall appear in our top five parameters, driving burst rates across our pipe cohorts.

We do not observe a substantially material increase in mains deterioration rates to 2050 even with climate parameters included. As a result, we have not included additional enhancement expenditure greater than 0.4% in our business plan for 2025 to 2030. However, early results from our model indicate this is likely to change as we gather more data during periods of extreme weather and continue to develop the model.



Flood resilience

More frequent intense rainfall events pose a risk of flood damage to infrastructure, as well as groundwater contamination. Flooding can also impact transport infrastructure, impeding access to critical company assets. This can hinder repair efforts and exacerbate water supply disruptions.

During the planning for our latest business plan, we enhanced our value framework by including a flooding model within our Natural Capital value range to improve our understanding of investment requirements for flood resilience. Our productions sites with high flood risk have been identified and flood resilience measures installed, including flood defence barriers, multiple access points and flood alarms.

We also carry out internal investigations following flood events, identifying corrective measures to mitigate impacts in the future. Our asset management plan stretching to 2050 will deliver long-term adaptive measures required for our infrastructure to achieve our operational ambitions in the face of climate change. But further work is required in the short term to better understand the severity of flood risk under future climate scenarios.

Long-term mitigation and adaptation

Operational resilience

Over the next 25 years we will be investing in the operational resilience of our production assets, including our two major water treatments works and our groundwater source stations and boosters. The scope of this works include:

- continuing with our power resilience programme;
- implementing increased automation and control of systems to more efficiently manage processes on site;
- installing alternative supplies and booster stations; and
- developing duty/standby work streams for sites that are critical to supply.

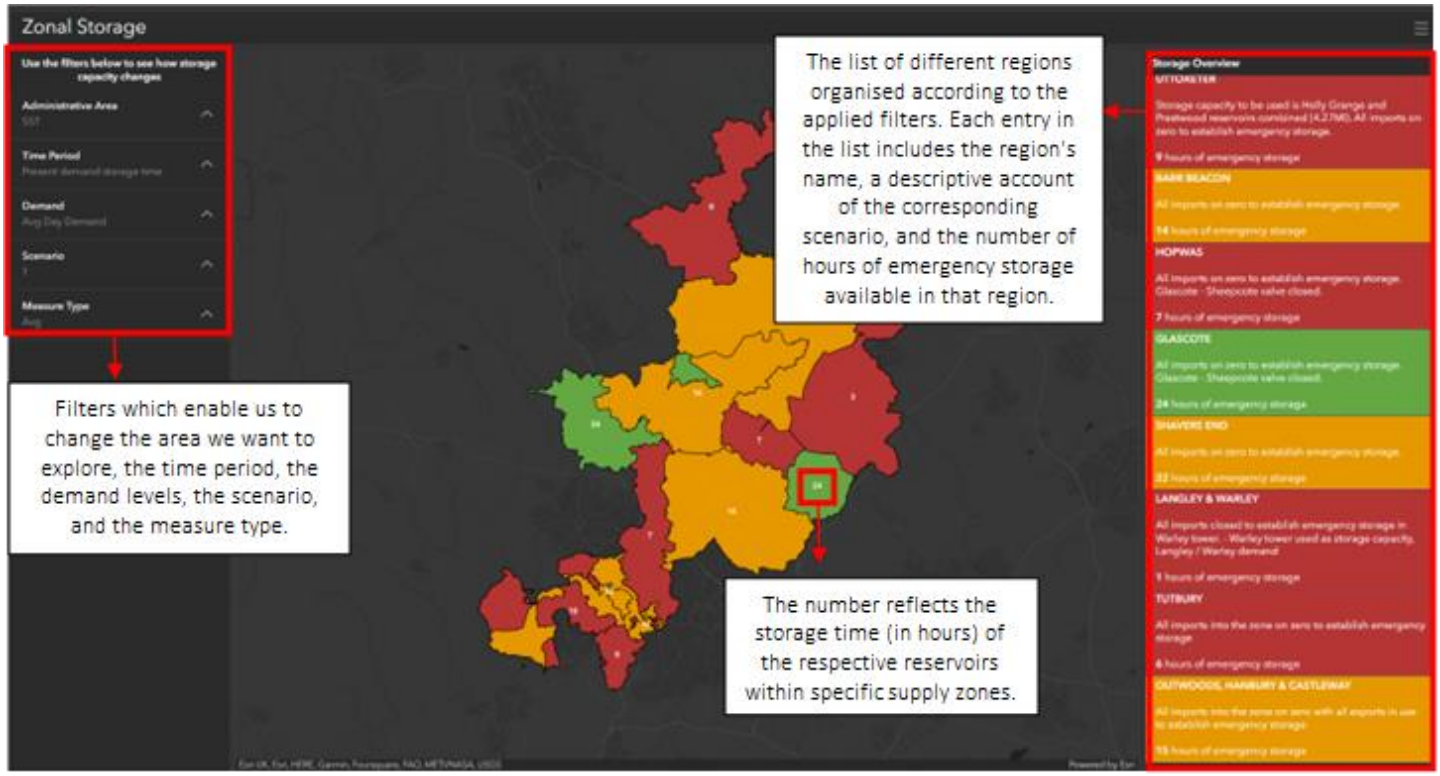
Our long-term plans also include investment in the operational resilience of our networks and the supply zones they feed. Alongside the continued maintenance of our assets, this will minimise the disruption caused by climate-related supply interruptions in the future. Proposed investments include new interconnectors that allow us to move water between supply zones and infrastructure renewals. New drinking water storage within our supply zones also forms part of our long-term plans and we discuss this in more detail below.

Supply zone resilience

In preparation for our latest business plan, we developed a new internal model for determining water storage levels within all our supply zones. The model can replicate conditions we would experience under the Ofwat high climate scenario, such as reduced reservoir levels (reflecting a lack of raw water) and increased demand.

This allows us to stress test our networks and identify under what conditions, and environmental factors, customers would be put at risk of losing supply. Throughout this stress testing, we aimed to achieve close to 24 hours emergency storage in every zone, unless there is a suitable level of alternative supplies and interconnectivity to other zones.

Under the high climate change scenario, we identified supply zones within our South Staffs region that would not meet our ambition of 24 hours storage. The trigger point for this will be 2040, when investment into additional storage would be required to achieve our operational resilience ambitions in the face of a changing climate. It is difficult to identify an exact year when we would know we are on the high climate scenario pathway as opposed to the current most likely, or even the low scenario. Part of our monitoring plan will be to track global climate forecasts, which are likely to change as we see a push towards net zero emissions in the 2030s by much of the infrastructure sector.



Case Study: Taking a strategic view of asset management

Over the course of the current five-year planning period to 2025, we have taken a more strategic approach to our asset management function. This includes restructuring our asset management team, with analytical and tactical delivery roles as core functions. We also developed an improved approach to understanding the value in our investment programmes, enabling us to make more informed and effective business decisions. And we recognised the need for a balanced and transparent process in generating and managing our investment programme.

Key to this was the need to link our decision-making both to customers' priorities and strategic business requirements through an approach that balances costs, risks and improvements in performance. There was also a need to inform our long-term delivery programme, with a particular focus on the five-year planning period from 2025 to 2030.

To help address these challenges, in 2022 we implemented Copperleaf H2O, an asset investment planning tool that is now used widely throughout the water sector in both the UK and further afield. Implementing this system has given us a focal point within which investment options are effectively linked to our improving picture of asset risk and our customers' priorities, and our understanding of value through the Six Capitals Framework. It has also enabled us to see and analyse investment at a granular project level, all the way up to a whole portfolio appraisal. This is set within the context of our own business targets and performance commitments.

As an early adopter of the Copperleaf system in the England and Wales water sector, we have been at the forefront of pushing the existing capability through our bespoke implementation. We have also driven new features and functionality to help the wider Copperleaf user community. This is something we are regularly asked to showcase. During the 2023/24 financial year, Copperleaf played a critical role in helping us to determine the scale of the investment programme at the heart of our business plan for 2025 to 2030. We also carried out work to understand more about how we use the system as a BAU tool to support the overall governance, tracking and monitoring of our ambitious capital programme against our many internal and external commitments.

Minimising the impact of our activities on the environment

At South Staffordshire Water PLC, we take our environmental stewardship role seriously. So, while we recognise the need to ensure a secure water supply for our customers, it is crucial we continue to enhance and protect the environment from where we abstract that water, leaving it in a better state for future generations. Over the next 25 years, we will need to reduce the volume of water we abstract from our existing groundwater sources. This is to protect habitats, including the chalk streams in our Cambridge region, from extreme low river flows during hot, dry summers. Higher temperatures will also drive changes in habitat composition and increase the spread of invasive non-native species. Because of the widespread scale of these impacts, it is crucial we address these challenges at a catchment level by engaging in partnership working where possible.

Related CCRA3 risks

- N1. Risks to terrestrial species and habitats from changing conditions.
- N2. Risks to terrestrial species and habitats from pests, pathogens, and invasive species.
- N11. Risks to freshwater species and habitats.
- N12. Risks to freshwater from pests, pathogens, and invasive non-native species.

Short-term mitigation and adaptation

Water Industry National Environment Programme (WINEP) 2025 to 2030

We develop our WINEP every five years. The programme outlines the environmental activities we propose to carry out over the next five-year planning period to enable and deliver environmental benefits across our Cambridge and South Staffs regions. We develop WINEP schemes in line with Environment Agency guidance, and activities have both statutory and non-statutory drivers, with opportunities to enhance the environment, create communities more resilient to the effects of climate change, and support economic growth. Our plans have been developed with input and ongoing liaison with the Environment Agency.

Our programme for 2025 to 2030 is our most ambitious yet and builds on the investigations we have carried out during the current five-year planning period to 2025 as we look to take forward options identified to implementation. Our programme looks at supporting key areas such as:

- delivering biodiversity improvements on our landholdings, prioritising action within environmentally protected areas, through implementing site-specific habitat management plans;
- supporting the removal and control of invasive species on our landholdings and within our catchments by improving biosecurity, raising awareness and employing dedicated control programmes;
- delivering biodiversity improvements and protection of key species within our catchments through partnership working; and
- supporting chalk stream restoration, identifying several morphological measures to improve flows for the ecology until future abstraction reductions can be made.

Nature-based solutions

We are keen to ensure we take positive action to enhance climate resilience of river habitats in the short term, while we await the outcome of longer-term abstraction investigations. Through our catchment prioritisation work carried out through the WRW regional group we have identified some short-term nature-based solutions we could support in our South Staffs region, such as hydro-morphological changes and fish passes.

Our previous Cambridge region investigations into chalk stream restoration measures to protect and enhance brown trout habitats also identified several morphological measures to improve flows for the ecology until future abstraction reductions can be made. The measures will also provide natural flood management during periods of intense heavy rainfall. This restoration work will start in 2025, with a programme to restore seven chalk streams in our Cambridge region, with a total cost of more than £13 million. The programme will extend into 2030 and likely to expand further through future years to deliver Water Framework Directive (WFD) objectives.

The Environment Agency monitors our WINEP performance each year. We will also review the measures implemented each year and work with regional partners to ensure delivery of no/low regret activities.

Maintaining environmental compliance

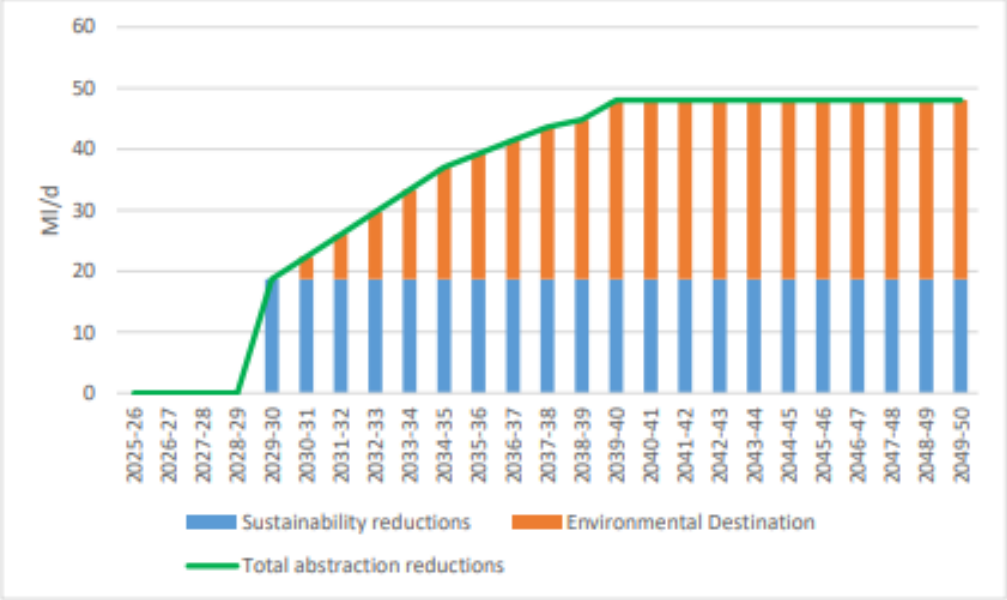
Other activities we carry out to minimise our environmental impact include working closely with our operational technology and water production teams to monitor and maintain regulatory compliance for selected discharge permits and abstraction licences. At present, this is a key focus in our Cambridge region because of the impact of our abstraction from the aquifer on chalk stream habitats across Cambridgeshire. This is discussed in more detail under our 'Environmental destination' section below.

Long-term mitigation and adaptation

Environmental destination

The Environment Agency National Framework for water resources, developed from the Government's 25-year environment plan, provides an early assessment of how much we may need to reduce abstraction by to meet future environmental needs and goals. It calls for a shared environmental destination – the agreed level of reductions by 2050 – across each regional planning groups.

Working collaboratively within the WRE and WRW regional water resource groups, we have sought to understand the impact of our abstractions on the environment. In our WRMP24, we have proposed reductions in the volume of water we abstract by 2050, focusing on sources the Environment Agency considers present a risk of deterioration to the environment. In our Cambridge region, restricting our abstraction licences to address this risk will lead to an immediate deficit in our supply/demand balance and we face significant challenges to meet the needs of the environment and manage growth over the long term. We have addressed these in our Cambridge region WRMP with a combination of supply-side options, including the Fens reservoir and an extensive demand management programme.

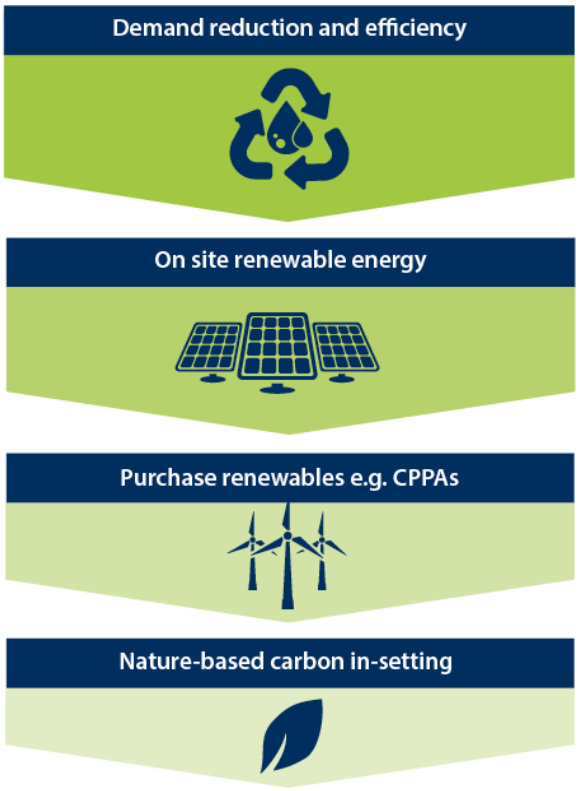


However, there is uncertainty in the exact volume of abstraction reductions required, as well as the most effective solutions under a changing climate. It is possible that for some of the catchments, the abstraction reductions we have planned will not be sufficient; yet in others, it may lead to an increased flood risk. We are planning further investigations for 2025 to 2030 to accurately determine the scale of the abstraction reductions required for both regions beyond 2030.

These extensive investigations will help us to understand the true nature of the abstraction reductions necessary to achieve the required environmental destination. This will include catchment monitoring, desk-based investigations and modelling to confirm the scale of the reductions required, the locations, and a priority and timescale for delivery. Investigations will also consider the historic environment, future climate change impacts and any risk and benefits associated with the abstraction reductions required.

An UKWIR project is also under way, which aims to provide a framework both for the water companies and regulators for delivering environmental destination. The project is due to be completed by the end of 2024. The research will also advance understanding of how to predict flow and ecological responses in a changing climate, helping to develop the scope of our investigations. We will work with Severn Trent Water on these investigations where appropriate as we share catchments. By the end of 2030, we will be able to adapt our core plans to deliver the scale of reductions required and bring schemes forward where there is scope to do so.

Net-zero commitments



To help limit the dangerous impacts of global warming on people and the environment, we will reduce our carbon emissions from our operations into the atmosphere by 2050. This includes both our own operational emissions, and the embedded carbon associated with our supply chain. These actions will help to reduce the frequency and intensity of extreme weather events (such as heatwaves, heavy rainfall and droughts).

The water sector is unique in that as well as providing an essential public service and being the owner of major infrastructure assets, water companies are also landowners and custodians of the natural environment. In addition, they are energy-intensive businesses, leading to millions of tonnes of GHG emissions each year.

The activities we have carried out to reduce our emissions during 2020 to 2025 include converting the diesel generators at our Hampton Loade water treatment works to biofuels, acquiring electric vehicles and installing electric vehicle charging points, and investing in more energy efficient water pumps. Alongside these activities, we have also carried out a full renewable energy assessment and have explored a range of energy efficiency opportunities. This includes, but is not limited to, converting standby generation of biofuels, re-using heat from existing operations rather than replacing boilers, and installing low-energy lighting and energy management controls across our sites.

Looking ahead, we will continue to drive our net zero ambitions through a combination of activities, including demand reduction, efficiency measures, and customer and stakeholder engagement. In addition, we will consider the suitability of Corporate Power Purchase Agreements (CPPAs) for our business. These are long-term contracts between the owner of a renewable energy plan and the corporate buyer for the delivery of 100% green electricity and the corresponding Energy Attribute Certificates. The electricity can be delivered virtually through a Virtual PPA, or physically through a Physical PPA.

We will also consider nature-based insetting solutions targeted at our value chain and communities. Insetting is an approach to carbon footprint reduction that helps companies to meet their sustainability goals, while supporting actions that are relevant to their stakeholders and communities. It involves implementing of nature-based solutions such as reforestation, agroforestry, renewable energy and regenerative agriculture.

Case Study: Encouraging biodiversity with the PEBBLE fund

Our PEBBLE (Projects that Explore Biodiversity Benefits in the Local Environment) offers funding of up to £10,000 for any projects designed to improve, restore, or create new habitats which benefit biodiversity, the environment, and have a positive impact on the local community. Applications are invited from local river interest groups, environmental organisations and charities, community organisations and schools. Over the past seven years, PEBBLE has funded more than 50 projects, improving over 53 hectares of land.

In 2019, the RSPB team at Middleton Lakes, near Tamworth, was awarded a PEBBLE grant to improve habitats on the reserve for wading birds. This included creating two experimental 'wader' bumps on lower areas of ground. These small bumps of earth are above the flood level, providing a safe place for nesting birds. The site experiences small-scale spring flooding, which has been getting worse over the past few years. Although the flooding is minimal, it is enough to wash away any nests and prevent the area from being used by nesting birds. Since the project ended in September 2020, the wader bumps have become a favourite area for nesting lapwing, as well as wigeon, shelduck, greylag geese and cormorants.

Managing Interdependent risks

During flooding, storms or extreme temperatures, cascading failures in other critical infrastructure such as energy and transport can further exacerbate the challenge of maintaining reliable water supplies. Loss of power, failure of IT systems and supply chain difficulties are all more likely to occur in the future high climate scenario. This is driving us to adopt a holistic approach to managing climate-related risks, collaborating with external stakeholders including our catchment partners, suppliers, and local communities to increase resilience.

Related CCRA3 risks

- I1. Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures.

Short-term adaptation and mitigation

Power resilience

Third party power asset failures, which reduce grid reliability during extreme weather, have been identified as a significant threat to achieving our production resilience ambitions long term. Our ongoing power resilience programme at our production sites is reducing our reliance on the energy grid. We have a prioritised list of production sites (including booster stations) where we will install generator connection points to eliminate the impact of brownouts/blackouts. We

will complete this programme by 2030. Our energy transition programme will also continue improving power resilience through gradual deployment of 'behind the meter' renewable sources and CPPAs up to 2050.

Community resilience

Disruption to water supplies because of climate-related impacts, such as extreme weather events or drought can negatively impact the communities we serve. These impacts can disproportionately affect our most vulnerable customers, some of whom may require access to water for medical purposes. To enhance community resilience, we have an emergency preparedness team and a dynamic incident team capable of responding to supply outages at varying scales. Through our Priority Services Register, we can also provide targeted assistance to our most vulnerable customers. Long-term improvements to our network resilience, such as mains renewals, will help mitigate the impacts felt by communities in the event of supply disruptions.

Long-term adaptation and mitigation

Supply chain resilience

Extreme weather events, including flooding and heatwaves, can affect the availability and reliability of supplies essential to our operations such as power supply and water treatment chemicals. This could not only lead to supply disruptions but also increase our supply chain costs and put us at risk of financial penalties from our regulators.

To aid business continuity, we have built in contingencies at our production sites for supply chain failures. These include areas for bulk storage of materials and generators for use in the event of power cuts. It also includes moving from 'just in time' delivery and adopting a more resilient 'procure and secure' approach. In addition, we have taken steps to identify alternative suppliers for components and consumables.

Over the long term, we will enhance our supply chain resilience by exploring renewable energy options to be installed in the next 25 years. This includes, but is not limited to, wind power, solar power and biofuel gas. We will also explore sustainable ways to reduce our reliance over time on the chemicals we use in our treatment processes, while maintaining the high-quality water supplies our customers expect and pay for.

To help deliver these enhancements, we will collaborate with our suppliers to develop our procurement processes, prioritising environmental criteria and integrating climate change risk assessments. In addition, we will take part in sector working group meetings and use supplier audits and other reporting mechanisms to identify supply issues early, particularly for critical consumables.

Technological resilience

It is an exciting time for innovation in the water sector as new technology is being developed and trialled that will help us to achieve our service ambitions. Our long-term delivery strategy outlines a number of investments into new technology that will help to reduce leakage, pipe bursts and unplanned interruptions to our customers' water supplies by predicting when pipes and other assets might fail. But how we use these technologies could be hindered during severe weather events because of power grid failures or extreme heat causing accelerated degradation of ICT infrastructure. While our investments into renewable energy will help us become self-sufficient and less vulnerable to power grid failures, we need to develop our understanding of these interdependent risks and work with our supply chain to ensure we build resilience into the new technologies we adopt.

Case Study: Systems Thinking Workshops

When developing our latest business plan, we enhanced our ability to elicit interdependent risks from the bottom up, eventually transitioning these into identification of investment needs. We set out to create an innovative environment through structured 'systems thinking' workshops where asset experts can rethink the way the infrastructure is operated and propose sustainable, long-term investment solutions.

The sessions brought together a wide range of expertise from our Production, Water Resources, Water Quality, Networks, Asset Management and our Capital Investment Delivery teams. Crucially, these workshops were informed by both the outputs of expert risk analysis and by our supply zone resilience and asset deterioration modelling. These sessions were integral in ensuring captured risk was viewed holistically by key stakeholders, with an understanding of the interdependent nature of our asset base across both infra and non-infrastructure criticality assessments.

Given that so many people from across the business were involved in our systems thinking workshops, the outputs were diverse – ranging from specific infrastructure and non-infrastructure assets, strategic supply capability and more generic strategies relating to our internal processes, such as emergency planning. We found this process helpful in:

- identifying the knowledge and experience of our people;
- highlighting areas for improvement;
- facilitating a joined-up approach across our business; and
- fostering a culture of collaboration across different teams and functions.

Part 3: Conclusions, next steps and further information

Conclusions and next steps

This report outlines the pathway we will take to achieve our business ambition of leading in climate change adaptation. Our climate change risk assessment points to several key areas which pose significant risks to our operations in the long term. Through our governance processes we will monitor risks and review the lessons learned from climate events. By adopting an adaptive planning approach that stretches over the next 25 years, we can be prepared to manage the impacts of risks in a dynamic and timely manner.

Our business plans outline the short- and long-term investments required to reduce risk to acceptable levels across our functions including water resources, water quality, our assets and the environment. We will continue to evolve these plans, guided by our regulatory requirements, and in turn mature our climate change adaptation approach. Customer concerns about climate change are imperative to us and we will engage them on adaptation as we shape our plans.

Our iterative risk management process and 'systems thinking' workshops give us improved visibility of climate related risks in the round. To address gaps in our understanding and drive innovation, we will strengthen existing partnerships and seek more opportunities to collaborate with our stakeholders. We understand that ultimately, we cannot achieve our climate change adaptation ambitions in isolation.

Further information

- Our long term vision to 2050
- Securing your future water. Business Plan 2025 - 2030
- Customer engagement strategy and key insights

- Cambridge Water Resources Management Plan (WRMP)
- South Staffs Water Resource Management Plan (WRMP)
- Cambridge Drought Plan
- South Staffs Drought Plan
- Our environment policy

- Our asset management approach to best-value investment planning through 2025 – 2030 and beyond
- 'SSC32 Long-Term Delivery Strategy climate change impacts on raw water quality technical report'.

Glossary

Below, we define some of the terminology used throughout this climate change adaptation report.

AMP – Asset Management Period: A five-yearly period during which water companies plan and execute their investment in infrastructure.

ARP – Adaptation Reporting Power: A legal provision allowing the UK Government to require certain organisations to report on how they are addressing climate risks.

CCW – Consumer Council for Water: An organisation that represents the interests of water consumers in England and Wales.

CCRA – UK Climate Change Risk Assessment: Government-led five-yearly assessment of risks and opportunities posed by climate change across the United Kingdom.

Common reference scenarios: Descriptions of the future to be used by all water companies to inform their long-term delivery strategies. The scenarios consider a range of benign and adverse assumptions around the future trajectories of: climate change; technology; demand; and abstraction reductions.

NAP – National Adaptation Programme: Five-yearly strategic plan developed by the UK Government to address the risks and opportunities identified in the UK Climate Change Risk Assessment

Ofwat – the Water Services Regulation Authority: The economic regulator of the water and sewerage sector in England and Wales.

Ofwat high climate scenario: A climate scenario used by Ofwat to assess the potential impact of extreme climate conditions on the water sector, based on RCP8.5.

Ofwat low climate scenario: A climate scenario used by Ofwat to assess the potential impact of mild climate conditions on the water sector, based on RCP2.5.

PEBBLE - Projects that Explore Biodiversity Benefits in the Local Environment: A South Staffordshire Water PLC biodiversity fund offering up to £10,000 for projects aimed at improving, restoring, or creating habitats which benefit biodiversity, the environment, and have a positive impact on the local community.

PR – price review: A periodic (five-yearly) regulatory review by Ofwat for determining the pricing structure and investment plans for water companies in England and Wales.

RCP – Representative Concentration Pathways: Greenhouse gas concentration trajectories used for climate modelling and research.

RCP 2.5: A low-emission pathway where significant mitigation measures are taken to reduce greenhouse gas emissions.

RCP 8.5: A high-emission pathway where emissions continue to rise throughout the 21st century.

SPRING - Slug Pesticide Rethink – Ideas for Nurturing Growth: South Staffordshire Water PLC's environmental protection scheme, set up to support farmers in our high-priority catchment areas willing to explore catchment-friendly land management.

UKCP18 – United Kingdom Climate Projections 2018: Climate projections developed by the UK Met Office to provide updated and detailed information on how the UK's climate is likely to change over the 21st century.

WFD – Water Framework Directive: A European Directive that aims to protect and sustainably manage water bodies, including rivers, lakes, groundwater, and coastal waters, to ensure their long-term health and availability.

WINEP – Water Industry National Environment Programme: Five-yearly programme of environmental obligations and improvement projects that water companies must undertake as part of their regulatory requirements, coordinated by the Environment Agency.

WRE – Water Resources East: A regional group focusing on water resources planning and management in the East of England.

WRMP – Water Resources Management Plan: Sets out how water companies intend to achieve a secure water supply for customers and a protected and enhanced environment over a 25-year timeframe. Companies are required under the Water Industry Act 1991 to prepare a WRMP at least every five years and review it each year.

WRW – Water Resources West: A regional group focusing on water resources planning and management in the West of England.

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Appendix A: Climate Risk Summary

DEFRA CCRA3 Sector Risk Details	Impacts	Risk owner	Present risk score	2050 Risk score	2100 Risk score	Risk understanding (hi, med, lo)
I1. Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures.	During flooding, storms or heatwaves, cascading failures in other critical infrastructure such as energy and transport can further exacerbate the challenge of maintaining water services during emergencies and cause supply chain failures.	Asset Management, Security & Resilience	10	15	20	M
I8. Risks to public water supplies from reduced water availability.	Rising populations and increased demand during dry periods necessitates investment in demand reduction measures and alternative water sources. Challenges meeting demand while ensuring water quality and reliability.	Water Resource	10	15	20	H
H10. Risks to health from poor water quality and household supply interruptions.	Increased pollutant run off during heavy rainfall events and increased temperatures reduce raw water quality putting strain on water treatment processes. Supply interruptions due to infrastructure failures or water contamination can further exacerbate health risks and cause regulatory non-compliances.	Water Quality	10	15	20	H
I2. Risks to infrastructure services from river, surface water and groundwater flooding.	Flooding can cause service disruptions and contamination of water supplies as well as increased need for investment in flood protection measures and infrastructure upgrades to mitigate risks.	Asset Management	8	12	16	M
I7. Risks to subterranean and surface infrastructure from subsidence.	Ground instability and damage to underground and surface infrastructure, impacting service reliability and increasing maintenance costs of burst mains and leaks.	Asset Management	3	6	9	L

DEFRA CCRA3 Sector Risk Details	Impacts	Risk owner	Present risk score	2050 Risk score	2100 Risk score	Risk understanding (hi, med, lo)
N1. Risks to terrestrial species and habitats from changing conditions. N2. Risks to terrestrial species and habitats from pests, pathogens, and invasive species. N11. Risks to freshwater species and habitats. N12. Risks to freshwater from pests, pathogens, and invasive nonnative species.	Increased challenges delivering regulatory environmental improvement programs and achieving biodiversity net-gain due to changes in habitat composition. Necessitates increased investment to manage pests, pathogens, and invasive species to achieve environmental objectives.	Environment	3	6	9	M
I3. Risks to infrastructure services from coastal flooding and erosion	South Staffs Water and Cambridge Water company areas are not within risk zone for saltwater intrusion, therefore risk not applicable.	Asset Management	N/A	N/A	N/A	L
N10. Risks to aquifers and agricultural land from sea level rise, saltwater intrusion	South Staffs Water and Cambridge Water company areas do not encompass any coastline, therefore risk not applicable.	Water Resource	N/A	N/A	N/A	L

Appendix B: Risk Action Plan

DEFRA CCRA3 Sector Risk Details 2021	2100 Risk Score	Current controls	Future actions	Monitoring
I1. Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures.	20	Bulk storage areas at production sites. Generators at production sites. Incident response team and emergency response exercises. Contingency suppliers. Treatment chemical use reduction scheme. Collaboration with suppliers to develop and improve procurement processes. Climate factors in asset modelling. Power resilience programme including generator upgrades and renewable energy exploration.	**2025 - 2030:** Network and production resilience programs including: Continuation of power resilience programme. New boreholes as enhancement solution. New control systems to better manage processes on site. Duty/Standby streams for sites critical to supply. Infrastructure renewal and conditioning schemes. Further modelling focused extreme weather events and unplanned outage. **2030 – 2050:** Additional potable water storage. New interconnecting mains & booster stations.	Monitoring of unplanned outage events, supply interruptions, burst mains events and power failures. Extreme weather event data capture to develop models. Supplier audits British Water supply chain feedback.
I8. Risks to public water supplies from reduced water availability.	20	Water resource management planning. Contribution to regional water resource planning. Drought management planning. Summer and winter action plan meetings. Supply zone resilience modelling. On going leakage reduction program. Demand management programs/ efficiency campaigns. Upgrades at two major surface treatment works to increase resilience.	Cambridge WRMP supply options **2025 - 2031**: Grafham Transfer. **2025 - 2036**: Fens Reservoir. **2035 - 2040**: Fenstanton borehole recommission. **2035 - 2040**: Milton water recycling. Demand management schemes (both regions) **2025 - 2035**: Universal metering. Non household consumption reduction. Water labelling no minimum standards. **By 2050:** PCC 110 l/h/d (excl WL & metering). 50% leakage reduction.	Effectiveness of demand management activities including smart metering, leakage improvements, behaviour change programmes and government water labelling initiatives. We will continue to model and monitor the impact of changing demand profiles in both regions and if this leads to further storage requirements. We have several mechanisms for monitoring our performance, including annual reviews, quarterly reviews of performance commitments and monthly steering groups. These are detailed in our WRMP's.

DEFRA CCRA3 Sector Risk Details 2021	2100 Risk Score	Current controls	Future actions	Monitoring
H10. Risks to health from poor water quality and household supply interruptions.	20	On going catchment monitoring, management, and improvement schemes (SPRING). Drinking water safety planning & regime compliant to regulatory standards. Upgrades at two major surface treatment works to increase resilience. Continued borehole maintenance program including headworks improvements.	**2025 - 2035**: Implementation of strategic water quality enhancements including upgrades to nitrate and PFAS treatment processes. Review appropriateness of an increased land holding strategy to improve catchment management. Understand and plan mitigation for bringing surface water into our groundwater only Cambridge region. Quality optimisation at storage reservoirs. Ongoing water fittings regulations enforcement programme. **2035 - 2050**: Review of natural capital for nature-based solutions within catchment at landscape scale. Further enhancements to groundwater & surface water treatment processes. Quality enhancements at service reservoirs. Additional enhanced water fittings regulations. enforcement programme. Developing cost confidence of different solutions to mitigate impact of climate change.	Our SPRING and catchment management programme is reviewed annually and the need for future investment reviewed. We also continually monitor the impact of water quality trends and emerging requirements, with in depth annual reviews and as and when needed for new regulatory drivers to standards.
I2. Risks to infrastructure services from river, surface water and groundwater flooding.	16	As described for risk I1 but also: Site specific flood risk assessments. Flood defences where required including, flood barriers & alarms. Flooding included in Natural Capital value range.	Resilience measures as described for risk I1 but also: **2025 - 2030:** Further work and assessment required to understand changes to flood risk at sites under future climate scenarios.	Monitoring of unplanned outage, supply interruptions and water quality failures due to flooding events and associated costs.
I7. Risks to subterranean and surface infrastructure from subsidence.	9	As described for risk I1 but also: Use of long-term mains deterioration modelling. Pre-planned mains renewal and conditioning. Infrastructure safety inspections.	Resilience measures as described for risk I1 but also: **2050 - 2030**: Further modelling improvements and data collection in extreme weather events to increase understanding of subsidence impacts.	Monitoring of unplanned outage, supply interruptions and water quality failures due to subsidence and associated costs. Case by case review of subsidence reports and subsequent effects.

DEFRA CCRA3 Sector Risk Details 2021	2100 Risk Score	Current controls	Future actions	Monitoring
N1. Risks to terrestrial species and habitats from changing conditions. N2. Risks to terrestrial species and habitats from pests, pathogens, and invasive species. N11. Risks to freshwater species and habitats. N12. Risks to freshwater from pests, pathogens, and invasive nonnative species.	9	Compliance with statutory environmental regulations. Delivery of WINEP which includes sustainable water resource measures and biodiversity improvements. PEBBLE biodiversity fund. SPRING catchment scheme. Converting to biofuels at largest treatment works. Acquiring electric vehicles & installing electric charging points. Investing in more energy efficient pumps. Renewable energy assessment.	2025 - 2030: Chalk stream restoration project in Cambridge region. Biodiversity improvements on existing land holdings including invasive species control and protected species investigations. Investigations to improve uncertainty around abstraction reductions for environmental destination. Implementation of sustainable abstraction reductions. Consider the suitability of Corporate Power Purchase Agreements (CPPAs). Consider nature-based insetting solutions. 2030 - 2050: Environmental destination abstraction reductions.	Annual review of short-term catchment measure options, working with regional partners to ensure delivery no/low regret activities. Environment Agency environmental performance tracker (continuous and reported quarterly). WINEP delivery monitoring and reporting to EA. Development of 25-year environment plan to provide clear line of sight for environmental protection and improvement.