Long-term delivery strategy 2025 to 2050

2 October 2023

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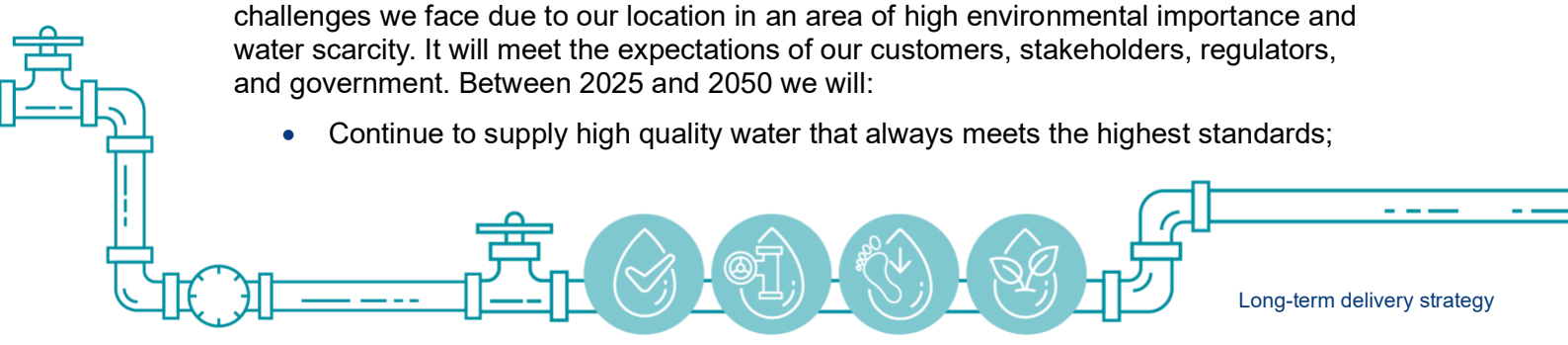
1. Executive summary

Introduction to our LTDS

1. Our long-term delivery strategy (LTDS) sets out the outcomes we will deliver through a forward-looking, 25-year investment plan. It is a robust plan for the future, enabling us to make the right investments at the right time to achieve our long-term ambitions and deliver best value to our customers, the environment and wider society.
2. Using adaptive planning, we are prepared for future uncertainties and can alter our path if needed, making our service more resilient to change. We have planned for eight common reference scenarios identified by Ofwat that cover high and low climate change, demand for water, abstraction reduction and technology. Through a core and two alternative adaptive pathways, we have identified the optimum investment needed to achieve our long-term ambitions across all plausible scenarios, strengthening our approach to long-term investment planning.
3. The investment in our core pathway is essential for the future and the transformation of our service. It will enable us to achieve our long-term performance ambitions, deliver our customers' priorities, meet new legal and regulatory requirements and address risks in a timely manner. It sets the context for our business plan for 2025 to 2030, identifying the enhancement expenditure needed during the five-year period to deliver our short and long-term outcomes.
4. We will use our adaptive LTDS to inform our subsequent five-year plans. If needed, we will move to one of our alternative pathways that include additional investment required only in more adverse future scenarios. A monitoring programme will inform our decisions about if an alternative adaptive pathway should be followed and the additional investment triggered, to enable us to achieve our ambitions.

Our ambition

5. Our LTDS will enable us to achieve our purpose – **to harness the potential of water to enhance nature and improve lives** – through strong stewardship of our existing assets and a forward-looking programme of investment. It will deliver our vision to:
    - Transform our performance through digital innovation and smart technology where we aim to be one-step ahead, solving issues before they become problems and making systems-based, intelligence-led decisions about how we invest for the future;
    - Build the trust of our customers so they value water and the service we provide and are willing to play an active role in helping us tackle the challenges facing our local environment and our water supplies; and
    - Enhance the environment and provide our local communities with wider benefits from our day-to-day business activities so we improve the lives of current and future generations.
6. The long-term outcomes and level of ambition we have put forward reflects our already strong performance and highly resilient operation, while recognising the significant challenges we face due to our location in an area of high environmental importance and water scarcity. It will meet the expectations of our customers, stakeholders, regulators, and government. Between 2025 and 2050 we will:
    - Continue to supply high quality water that always meets the highest standards;

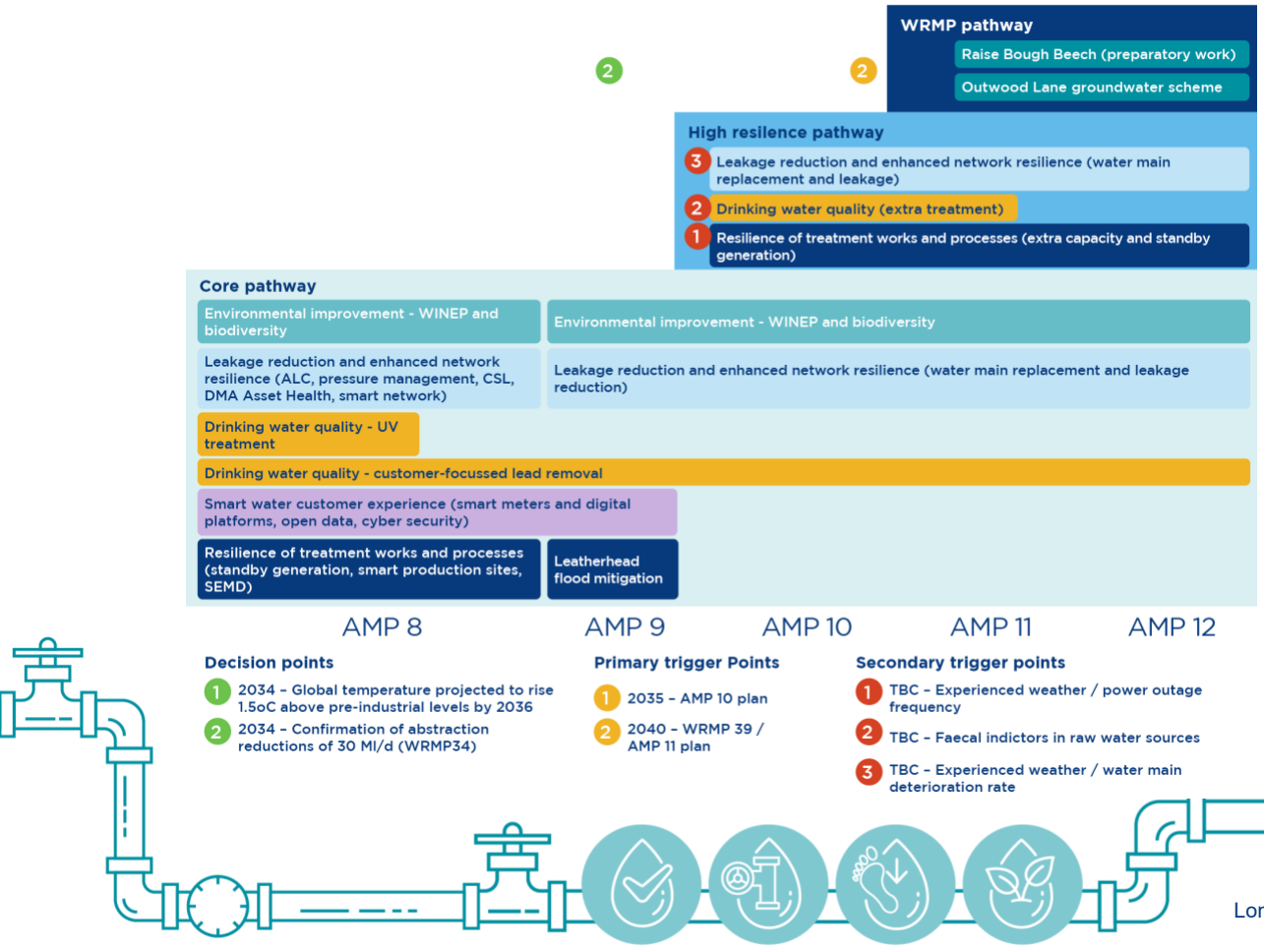


- Reduce leakage by over 62% (from 2019/20 levels), exceeding the Government's target in line with our customers' expectations;
- Eliminate interruptions to customers' water supplies that last longer than three hours;
- Reduce the number of burst mains that require repair by 50%;
- Reduce the number of contacts we receive about the taste, smell and appearance of our water by almost half;
- Lower per capita consumption by 26% to achieve the Government's domestic consumption target of 110 litres per person per day and reduce business consumption by 17% - both from 2019/20 levels;
- Eliminate all unplanned outage at our water treatments works and make them more resilient as the climate changes;
- Enhance the environment we rely upon by delivering all our statutory requirements and going further to improve the quality and resilience of our water sources;
- Increase biodiversity by 25% on the land we own and create additional gains on third party land by working with others; and
- Reach net zero carbon emissions by 2050.

Our LTDS

7. Our LTDS is summarised in the figure below, which shows the main investment areas in our core and alternative adaptive pathways between 2025 and 2050.

Figure 1: Our LTDS core and alternative adaptive pathways



Our core adaptive pathway

8. We have considered the common reference scenarios provided by Ofwat and our own bespoke scenarios to identify the no and low regrets investment that is required in all or most scenarios and this has been included in our core adaptive pathway. It includes £56 million of enhancement investment between 2025 and 2030 to enable us to make progress against our long-term performance ambitions, meet all statutory regulatory requirements, make our service more resilient to existing risks and enable us to adapt to climate change.

9. The key areas of enhancement expenditure[1] for AMP8 are organised into five 'clusters' including:

   (a) Drinking water quality enhancement - £9 million:

   - Install UV treatment at two of our water treatment works to remove the risk of Cryptosporidium; and
   - Replace the lead pipes to supply 170 schools, colleges and nurseries to protect young people most at risk from lead exposure.

   (b) Enhancing the resilience of our treatment works and processes - £7 million:

   - Make our water treatment works more resilient to climate change and security threats; and
   - Roll out smart technology across our water treatment works and pumping stations.

   (c) Additional leakage reduction and enhanced network resilience - £10.5 million:

   - Increase our leakage reduction activity and further enhance our smart network; and
   - Embed our DMA[2] Asset Health initiative that uses no-dig technology to assesses the condition of our water mains, so we target our future maintenance and mains replacement programmes as efficiently as possible.

   (d) Smart water customer experience - £24.5 million:

   - To fund the accelerated installation of 194,000 smart meters to further reduce leaks, help customers to lower their water use, integrate and analyse all our supply and demand data from source to tap to improve our performance; and
   - Enhance how we use data to engage with our customers, open our data and put the necessary cyber security in place to protect our customers.

   (e) Environmental improvement - £5 million:

   - Deliver our statutory WINEP (Water Industry National Environmental Programme) schemes, additional environmental enhancement and biodiversity gains.

10. The enhancement expenditure required will result in an average bill increase of £14.09 across the 2025 to 2030 period.

11. Our adaptive planning process has identified further core pathway enhancement expenditure required after 2030. This includes:

    - A 20-year programme of targeted water mains replacement informed by the advanced understanding of our asset health and deterioration rate through our

[1] Enhanced expenditure quoted is pre-efficiency challenge detailed in Chapter 7 Explaining our costs of our main business plan submission and includes £1.7 million of retail costs.
[2] DMA refers to a District Meter Area

DMA Asset Health initiative to further reduce leakage, mains bursts and supply interruptions;

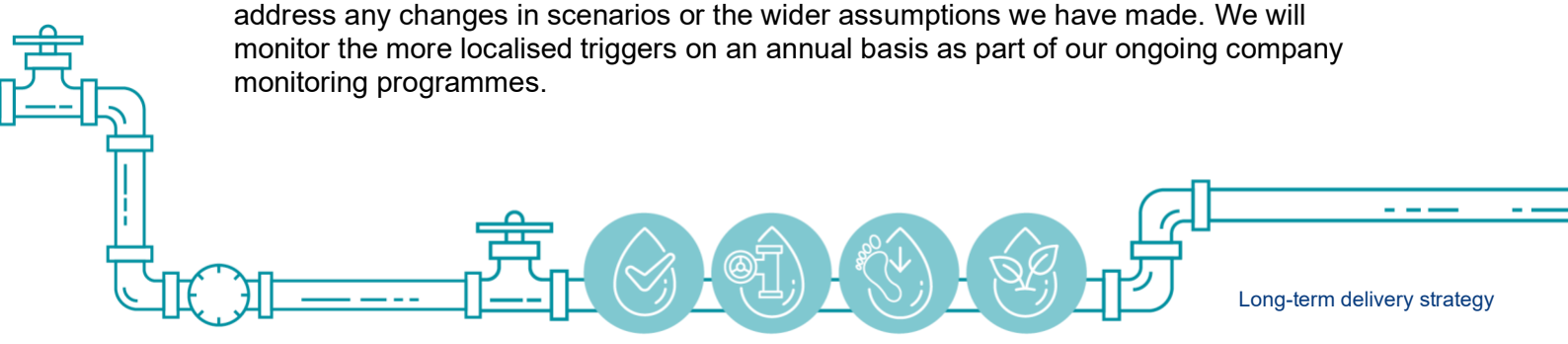
- A continuation of proactive leakage management activity to address the higher proportion of smaller and harder to reach leaks that will be more difficult to find and fix as we reduce our overall leakage level;
- The final two years of our accelerated smart meter roll out so all metered customers have a smart meter;
- Protection of our Leatherhead pumping station and boreholes from river flooding and improved water management in the Eden catchment;
- Further work to enhance the environment and biodiversity using catchment and nature-based solutions; and
- Ongoing lead pipe replacement targeting premises that pose the greatest risk to customers.

Our alternative adaptive pathways

12. Our alternative adaptive pathways include investments that would only be required under more adverse scenarios.
13. Our Water Resource Management Plan (WRMP) alternative pathway has identified the additional investment needed if we face a scenario where abstraction reduction of 30 million litres per day is required. In this pathway we would need to invest in a new source of water at Outwood Lane and we may need to begin preparatory work to raise Bough Beech reservoir, in addition to the investment required in our core pathway.
14. Our high resilience pathway will be followed if we experience a more adverse climate change scenario. It would be triggered if global temperatures rise by 1.5°C above pre-industrial levels, currently projected to be at the earliest in 2036. Individual investments would be triggered by the local impacts of this level of climate change, including more extreme weather events, frequent power outages, a deterioration in raw water quality and a quicker rate of water main deterioration. Additional investment in this pathway includes:
    - Additional treatment, such as UV treatment, at sites at risk from contamination;
    - Capability to provide more on-site back-up power generation to mitigate the increasing risk of power outages; and
    - Additional leakage reduction and mains replacement activity so we can achieve our ambition even if the climate becomes more extreme.

Monitoring

15. Monitoring is a key element of our adaptive strategy. We will monitor the rate of population growth in our supply area and climate change through our ongoing WRMP annual review and five-yearly update. The decision around future abstraction reduction is expected following WINEP investigations in AMP8. We have identified a number of related metrics that will be assessed no less than annually. We will include a section within our Annual Report dedicated to out LTDS monitoring plan.
16. Our LTDS will be embedded into our existing corporate governance structure. It will be reviewed and updated every five years to inform our future business plans and to address any changes in scenarios or the wider assumptions we have made. We will monitor the more localised triggers on an annual basis as part of our ongoing company monitoring programmes.



2. Introduction to our long-term delivery strategy

Our long-term delivery strategy looks 25-years ahead to identify the investment we will need to make, under a range of future scenarios. In this chapter we explain what a long-delivery strategy is and how we have developed it to inform PR24 and our future business plans. We explain the process we followed to derive our long-term delivery strategy and provide more detail on the scenarios we have planned for over the next 25 years and the impact we expect them to have on our business.

A. The role of long-term delivery strategies

17. Our long-term delivery strategy (LTDS) looks at the investment we expect to make in our service up to 2050, based on an adaptive planning approach. Such an approach allows us to optimise the profile of investment over time and minimise the potential for unnecessary investments. It sets out the long-term outcomes we aim to deliver and explains how we will meet them in a broad range of plausible future scenarios. This means we can identify and monitor changes in key external factors proactively and be ready to adapt when we need to. This will ensure we can continue to meet the needs of our customers and the environment, regardless of what the future holds.

18. To make our plan holistic, we have considered a broad range of potential projects and solutions to meet the equally broad range of potential future scenarios. These cover areas such as ways in which we can enhance our drinking water quality and the resilience of our water treatment works and processes, further leakage reductions (building on our industry leading position),[3] and various ways we can enhance our interaction with the natural environment.

19. Our LTDS identifies the investment required over the next five years and beyond. This is the no/low regrets investment that is required in most future scenarios we may face and represents our core adaptive pathway.

How our LTDS has informed our PR24 business plan

20. Our LTDS sets the context for our PR24 plan. It includes the enhancement investment included in our core pathway, that is required between 2025 and 2030, including:

    (a) Drinking water quality enhancement;

    (b) Enhancing the resilience of our water treatment works and processes;

    (c) Additional leakage reduction and enhanced network resilience;

    (d) Smart Water Customer Experience: Enhanced Smart Water Management, Open Data, and Security; and

    (e) Environmental enhancement.

21. Our business plan for 2025 to 2030 includes more detail on each of the individual enhancement cases that we have put forward for additional funding and explains the

[3] We are already one of the leading water undertakers with respect to low levels of leakage, as a percentage of distribution input.

associated costs and how they have been calculated. In addition, we tested customer acceptability of our preferred PR24 plan and whether they could afford the bill increase it requires.

How our LTDS will inform our future plans

22. Our LTDS provides our best estimate of the costs associated with future investment to help us understand the trajectory of customer bills across each five-year period to 2050.

23. In addition to our core investment pathway, we have identified two alternative adaptive pathways. These alternative pathways present the programme of investment that would be required to effectively meet our long-term ambition, should scenarios arise that mean our core pathway is no longer the best way of delivering our ambition. Each has a decision point and trigger point that identifies when we would need to move from one to another. We will monitor the scenarios closely so that we know when we are approaching a trigger so that we will be ready to make the decision to move to an alternative pathway, if appropriate.

24. We will review our LTDS regularly to make sure it is based on the most up-to-date information about schemes and costs. This will include assessing any new schemes or delivery options that are identified, including innovative solutions that are developed that enable us to deliver outcomes more efficiently. We'll also consider whether alternative scenarios need to be tested to ensure we are planning appropriately and taking account of any new or emerging risks or opportunities.

Our approach to adaptive planning

25. To plan our adaptive pathways effectively, we first set our long-term ambition and developed measurable KPIs to ensure progress towards achieving that ambition. These cover the Common Performance Commitments set by Ofwat for PR24 and beyond.

26. With our ambition determined, we identified optimal plans for meeting that ambition in a broad range of potential future scenarios. These included the eight Common Reference Scenarios provided by Ofwat, plus two further bespoke scenarios that we identified as being important to us that were not covered by the bespoke scenarios.

27. Where multiple feasible projects were identified that could respond to one of the implications of the relevant scenarios, we determined which option represented the optimal investment, defined as providing the maximum (relatively balanced) return between all relevant stakeholders.[4] This enabled us to produce an optimised adaptive plan with a 'core' adaptive pathway based on current conditions and the most likely expected future conditions, and alternative adaptive pathways (encompassing changes in planned investments / projects) that the company would need to implement if alternate scenarios materialise.

28. Our small size means that we have fewer strategic options than many of our larger neighbours, and there are some activities that are essential (and/or highly beneficial to our customers) in all, or almost all circumstances. In addition to our WINEP obligations, these activities include smart metering, further leakage reductions (from an already industry leading position), enhancing our customer engagement and enhancing the resilience of the assets and processes that we use to serve our customers.

29. We expand on how the above framework for adaptive planning has been implemented in the development of our LTDS, in Section B below, with further detail in Appendix SES001 (LTDS Development Process).

[4]Stakeholders references all parties impacted, with examples including Customers (customer satisfaction, prices), the business (ROI, available capital) and Government (Regulatory compliance, objectives, etc) among others]

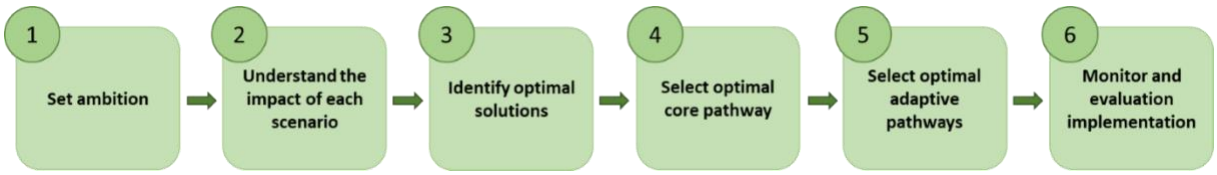
Inputs into our long-term delivery strategy

30. Our LTDS brings together the long-term plans of each of our wholesale business areas into one 25-year adaptive strategy. The business areas include:
    - Drinking water quality – our drinking water safety plans, and the resilience of our assets and processes;
    - Water resources – our WRMP aligned to the regional plan prepared by Water Resources South East (WRSE);
    - Water network – our water treatment works and network asset investment plans;
    - Water environment – our WINEP; and
    - Carbon – our net zero carbon emissions route map.
31. Our LTDS includes the long-term targets set by the Government and our regulators in legislation and regulation that we must meet, and government policy expectations. This includes the Government's Strategic Policy Statement to Ofwat, the Environment Act, the Environmental Improvement Plan, and the Government's Plan for Water, among others.
32. We have engaged extensively with our customers and customer representatives to ensure that our LTDS reflects the views of customers and other stakeholders. We produced an early look at our vision and ambition in October 2022 for customer feedback (Appendix SES002 LTDS – Long term Ambitions and Priorities) which we considered, alongside insight from our customer research programme. This included challenge from both our Customer (CSP) and Environmental Scrutiny Panels (ESP) on our level of ambition, the timing and sequencing of our investment programme and the options we have included. Full details of our customer engagement programme and how it has informed our LTDS and PR24 business plan can be found in Chapter 5 of our main business plan submission.
33. We have considered the level of performance improvement that can be delivered from base expenditure and the gap between that, and the level of performance we are aiming to achieve between 2025 and 2050. This has identified where extra investment through enhancement expenditure is required across the 25-year period. It is this enhancement expenditure that is presented in our core and alternative pathways.

B. How we have developed our long-term delivery strategy

34. At a high level, we deployed a six-step process to develop our LTDS, as set out in the figure below.

Figure 2: The six main steps in our LTDS development process



Source: SES001 LTDS Development Process

35. We expand on each of these six steps below and provide further details in Appendix SES001 - LTDS Development Process, which highlights salient features of how we have used the Copperleaf decision making support tool to develop our strategy.

Stage 1: Setting our ambition

36. Our ambition has been informed by:

    (a) Our customers' priorities and expectations of long-term performance;

    (b) Statutory, regulatory and policy requirements and strategic priorities for the water industry (including the Government's Strategic Policy Statement to Ofwat, our WRMP, WINEP, the Government's Environmental Improvement Plan to support the Environment Act and its integrated Plan for Water); and

    (c) Our current performance and future performance projections (including, for example, a detailed analysis of our performance against our performance commitments, comparative performance, consideration of alternative glidepaths and areas where we are optimally positioned to lead on behalf of the industry).

37. By working closely with our Board, CPS and ESP we have brought together these three areas and derived the long-term performance we aim to achieve by 2050 for each outcome.

Stage 2: Understanding each of the scenarios and their impact

38. Ofwat has prescribed eight common reference scenarios, which we have analysed to understand the impact they could have on our business over the 25-year planning period. The eight common reference scenarios are:

    (a) High climate change scenario;

    (b) Low climate change scenario;

    (c) Faster technology scenario;

    (d) Slower technology scenario;

    (e) High demand scenario;

    (f) Low demand scenario;

    (g) High abstraction reductions scenario; and

    (h) Low abstraction reductions scenario.

39. We have also identified two further scenarios which we consider to be material to the future strategic considerations the business will need to make. These 'bespoke scenarios' have been considered alongside the Common Reference Scenarios. They take into account a range of local and company-specific factors. The two bespoke scenarios are:[5]

    (a) Customer bad debt scenario; and

    (b) Supply chain interruption scenario.

40. A summary of the different scenarios can be found in Section C of this chapter and further detail on the common and bespoke scenarios is provided in Appendix SES003 – LTDS Future Scenarios Detailed Report.

Stage 3: Identifying optimal solutions for each scenario

41. Stage 3 involves identifying investment plans that meet our long-term ambitions in each of the LTDS scenarios. We have optimised our plan using a valuation framework to enable us to identify the best value plan for our customers and the environment.

[5] These scenarios have been derived by an analysis of the SES Water risk register to identify plausible extreme scenarios directly relevant to SES Water that are not covered by the common reference scenarios.

42. Our high-level approach can be summarised as:

(a) Stage 3A: Identifying a 'long list' of potential projects and activities that may be needed to secure our ambitions in any (or all) of the scenarios, together with the relevant 'optioneering' to identify the various possible ways in which each of those projects can be delivered and the possible options for carrying out those activities.

(b) Stage 3B: Using Copperleaf's value framework to identify the various costs and benefits of each possible option. This included taking account of the six 'Capitals':

- Natural Capital (examples include: efficiency benefits, operational carbon, embedded carbon, water leakage, per capita consumption, low pressure);
- Social Capital (examples include: C/D-Mex customer experience, safety risk, unplanned outage, water quality compliance (CRI – Compliance Risk Index), risk of severe restrictions in a drought, public perception benefit);
- Financial Capital (examples include: financial, legal and reputational risk, investment cost (Capex/Opex/Total cost), water quality compliance (CRI), priority service for vulnerable customers);
- Manufactured Capital (examples include: water supply Interruptions, mains repair);
- Intellectual Capital (examples include improved plan execution); and
- Human Capital (examples include: employee experience benefit).

(c) Stage 3C: Filtering this long list to determine the projects and activities that are relevant for each of the LTDS scenarios. This includes ensuring that each of the options to be fed into the Copperleaf decision support tool was:

- Technically feasible in that scenario. For example, to ensure that in the high climate change scenario, there was no option to abstract more water at a given point and time than would be physically available in that scenario, and in the slower technology scenario, to ensure that a high-tech solution option was not included before the technology becomes available, and so forth; and
- Legally compliant in that scenario. For example, to ensure that in the high abstraction reductions scenario, there was no option to abstract water where no abstraction licence would be available in that scenario.

(d) Stage 3D: Using Copperleaf's decision support tool to determine an optimised plan for each of the LTDS scenarios.

43. Given the relevant constraints for each scenario, the Copperleaf tool selects the best combination of options to meet our ambition in that scenario. This includes the trading of costs and benefits in respect of each of the six Capitals and adjusting the timing and sequencing of projects (within the constraints) to give a plan that delivers the optimal balance between all the relevant stakeholders. The output of Copperleaf is, therefore, an optimised business plan for each of the LTDS scenarios.

44. Further detail on each of these stages, and how we deployed the relevant Copperleaf tools and techniques is included in Appendix SES001 LTDS Development Process. We note that the Copperleaf solution we have used is tailored specifically for water utilities in the UK and is aligned with both ISO 55001 and Ofwat's Outcome Delivery Incentives.[6]

Stage 4: Selecting the optimal core pathway

[6] https://www.copperleaf.com/solutions/copperleaf-h2o/ (Date accessed: 31/05/2023)

45. Having followed the process in Stage 3, we were able to determine which projects represented no or low regrets, as well as projects that were only required in a minority of scenarios. We defined our core pathway as comprising:

    (a) Investments and activities that need to be undertaken to meet short-term requirements;[7]

    (b) No Regret investments and activities;

    (c) Low Regret investments and activities;

    (d) Investments and activities required to keep future options open (such as enabling work or learning and monitoring), or required to minimise the cost of future options;[8] and

    (e) Investments and activities needed to meet the high demand scenario in 2025 to 2030.[9]

46. The outputs of the Copperleaf process included the costs of each option, split between base costs and enhancement costs. This allowed us to generate the cost data for the core pathway.

47. Ofwat's efficient cost allowances are made up of base and enhancement expenditure. Appendix 9 of the PR24 Final Methodology describes base expenditure as including "*routine, year-on-year costs, which companies incur in the normal running of their businesses; expenditure on maintaining the long-term capability of assets; expenditure to improve efficiency; and expenditure companies require to comply with current legal obligations*".[10] Enhancement expenditure is described as "*generally where there is a permanent increase or step change in the current level of service to a new 'base' level and/or the provision to new customers of the current service level*".[11] We have taken this guidance into account in preparing both our PR24 Business Plan and LTDS.

48. For the purposes of our PR24 business plan, we have benchmarked our ongoing base costs using Ofwat's industry datasets and have submitted a series of well-justified enhancement claims that include CAPEX and incremental OPEX to support our forecast step change in performance levels in AMP8. It is the combination of our forecast enhancement and efficient, benchmarked base expenditure that is needed to enable the delivery of our proposed performance commitments and to support our ongoing operations to achieve this level of performance in AMP8.[12]

49. Similarly, for the purposes of preparing our LTDS, which requires us to forecast and report only our enhancement expenditure including and beyond AMP8, we have adopted the following principles and approach:

    (a) We have assumed that a certain degree of performance improvement can be achieved from ongoing base costs, and that the investment we need to undertake beyond AMP8 to support the resilience of our business and future step changes in performance over and above this, is enhancement expenditure. This enhancement expenditure includes incremental OPEX, where appropriate.

    (b) We have then assumed that the ongoing expenditure that is required to maintain this new base level of performance and the long-term capability of our invested asset base in subsequent AMPs will become part of our base cost. This means that the reported enhancement expenditure in our LTDS tables excludes the incremental

[7] [PR24 and beyond: Final guidance on long-term delivery strategies, page 7]
[8] [PR24 and beyond: Final guidance on long-term delivery strategies, page 7]
[9] [PR24 and beyond: Final guidance on long-term delivery strategies, page 42]
[10] [Creating tomorrow, together: Our final methodology for PR24, Appendix 9: Setting expenditure allowances, Table 2.1]
[11] [Creating tomorrow, together: Our final methodology for PR24, Appendix 9: Setting expenditure allowances, Table 2.1]
[12] Further information on our AMP8 costs can be found in our main Business Plan submission Chapter 7: Explaining our costs.

expenditure in subsequent AMPs to when the enhancement was made, as we have assumed this will be funded as base expenditure.

50. We note this forecast split of base and enhancement expenditure is, therefore, premised on Ofwat's base cost modelling adequately reflecting the ongoing costs we and other companies incur as we invest in the capability of our assets and future step changes in performance levels. The process we have gone through to prepare our LTDS has highlighted the importance of Ofwat's future base cost assessments capturing the ongoing impacts of enhancements and our LTDS assumes that adequate ongoing base cost allowances will be provided at future AMPs to support our plans.

Stage 5: Identifying the relevant adaptive pathways

51. Once the core pathway was defined, we compared the projects required in each of the individual scenarios (that would, by definition, only be undertaken in a limited range of circumstances),[13] with the core pathway to derive the alternative adaptive pathways. We identified the relevant decision points, indicating when a decision needs to be taken to deliver our ambition, and trigger points (the point at which an alternative pathway needs to be followed). Decision points and trigger points were determined on a case-by-case basis for the alternative adaptive pathways.

52. It can be seen from the preceding sections that we have a limited number of alternative adaptive pathways. This is because we are one of the smallest companies, and, therefore, have a limited range of options available to meet changes in the external environment. This means that for a potentially broad range of changes, the specific actions we would take are similar.

53. To the extent that the same or broadly similar projects (which weren't in our core pathway) were required at broadly similar times in more than one of the LTDS scenarios, we brought those into the same alternative adaptive pathway. Completing this mapping exercise for all the activities not in our core pathway resulted in two alternative groupings of projects, which represent our alternative adaptive pathways. This includes the specified alternative adaptive pathway that reflects our revised draft WRMP. These are referred to as follows:

    (a) WRMP alternative adaptive pathway; and

    (b) High resilience alternative adaptive pathway.

54. For each pathway, we have determined the decision and trigger points, as defined in Ofwat's guidance.[14] Further details on our alternative pathways can be found in LTDS Chapter 5.

Stage 6: Monitoring and implementing the pathways

55. To determine our progress along the core pathway, and any requirement that may exist to switch to an alternative adaptive pathway, we have designed monitoring procedures described in Chapter 5. In particular, we will need to monitor the external environment in order to determine when it may be necessary to move between alternative adaptive pathways. This enabled us to determine relevant metrics, decision points and trigger points.

[13] [PR24 and beyond: Final guidance on long-term delivery strategies, page 11]
[14] [PR24 and beyond: Final guidance on long-term delivery strategies, pages 18-19]

B. The impact of potential future-scenarios on our business

56. In this section, supported by Appendix SES003 LTDS - Future Scenarios Detailed Report, we provide an overview of the scenarios considered, and our assessment as to the anticipated impact to our business over the next 25 years (to 2050). In particular, this covers:

    (a) Parameters tested between plausible extremes;

    (b) Deemed interdependencies between scenarios;

    (c) The range of possible impacts, and

    (d) Our determination as to the appropriateness of combining scenarios.

Common reference scenarios

57. The common reference scenarios are all paired, such that each material driver of uncertainty (climate change, technology, demand and abstraction reductions) considers a 'high' and a 'low' plausible extreme scenario, as set out in the PR24 Final Guidance on Long-Term Delivery Strategies. We have, therefore, considered the impact of these scenarios separately in each subsection below.

Low climate change scenario

58. The effects of climate change are expected to be widespread and impactful on all organisations. Climate change is particularly significant for water companies as some of the most profound consequences of climate change will affect water availability. For the UK, the Met Office has described the primary effects of climate change as being (i) hotter and drier summers, (ii) warmer and wetter winters, and (iii) more frequent and intense weather extremes. Due to the relationship between climate and water we have considered climate change effects as a part of our strategic planning for many years, publishing our most recent Climate Change Adaptation Plan in 2021[15].

59. The low climate change common reference scenario is defined using the Representation Concentration Pathway (RCP) 2.6 at the 50th percentile probability level. In this scenario it is forecast that global average temperatures increase by 2°C by the end of the century.

60. We consider the low climate change scenario to be a best-case scenario whereby effects of climate change have little to no impact on our operations compared to the climate we currently operate in. That is, the effects outlined by the Met Office above are mild in their extent beyond current levels.

61. We are already beginning to see the effects of climate change on a range of our operations. This includes the increasingly flashy[16] nature of the River Eden, the swings in soil moisture deficit between summer and winter impacting leakage and mains repair rates, the deterioration in raw water quality owing to surface water runoff and surcharging sewers, higher customer demand during periods of hot weather and the increasing numbers of power outages in rural areas following temperature extremes.

62. Having modelled the benign low climate change scenario, we have established that the activities already planned in our core pathway will be sufficient to manage the effects of climate change in this scenario. We have not, therefore, needed to identify an adaptive pathway for this scenario.

[15] SES Water, Climate Change Adaptation - adaptation reporting power (ARP3) report, 2021.
[16] Hydrologists use the term "flashy" to refer to rivers where there are sudden rises and falls of the water level, particularly during storm events.

High climate change scenario

63. The high climate change common reference scenario is defined using the RCP8.5, 50th percentile probability level. This scenario is considered a 'business-as-usual' scenario where no intervention is made to slow or reduce the release of carbon-based emissions. Consequently, global temperatures are forecast to rise approximately 4°C by the end of the century in this scenario. This rise in temperatures would result in a testing global scenario where extreme weather events become frequent and the socio-economic effects are likely to be considerable, driven by drought, flooding, food shortages and mass migration.

64. There are a number of local impacts on us in this scenario, the most material primary impact on our plans is a higher risk of prolonged drought conditions in our region. Secondary impacts under the high climate change include damage to infrastructure, decline in and increased pollution of natural capital, riverbank erosion and increased risk of flooding events.

65. To address more severe drought conditions in the high climate change scenario we have identified a set of investments that would be a part of our high resilience alternative adaptive pathway. These investments include making our water treatment works more resilient to power outages and flooding and increasing the rate of water main replacement. Further detail on these alternative adaptive pathways can be found in LTDS Chapter 5.

Demand

66. Customer demand is a key variable in our future planning as we assess the infrastructure investment that would be needed to meet our customers water demands and the auxiliary services provided to our customers (e.g. smart meters). The demand common reference scenarios are dependent on two factors. Firstly, a growth factor that is determined by two forecast measures: (i) local plans published by the local planning authorities and (ii) ONS population and household projections. In addition to population growth, demand is also influenced by a building regulations and product standards factor.

67. In respect of the building regulations and product standards, Ofwat has relied on a 2019 study by Artesia and Water UK to guide this parameter. We note the key finding of this study is that "*a mandatory government-led scheme to label water-using products, linked to tightening building regulations and water supply fittings regulations, was the 'single most cost-effective intervention to save water*". Hence, we have taken due account of water labelling forecasts in our consideration of the demand scenarios.[17]

68. In addition to Ofwat's requirements we have considered additional factors that we believe will affect demand. These include government intervention to reduce usage, smart metering rollout, changes in consumer behaviours and other consumption reduction measures.

Low demand scenario

69. In the low demand common reference scenario, the growth factor is the ONS projections. This projects that we will serve 346,570 properties with a population of 795,670 by 2050. The low demand scenario assumes the introduction of a mandatory government-led scheme to label water-using products by 2025 as well as building regulations and minimum product standards in future years, which we estimate will lead to a total saving of 24 litres per head per day by 2050.

[17] For completeness, whilst water labelling is a relevant factor for the demand scenarios, the WRMP guidance does not permit us to rely on Government interventions for the demand side projections for the WRMP itself.

70. The low demand scenario puts little restraint on our modelling as it allows investments to be made at a slower rate as demand effects are less severe. The activities planned for in our core scenario will be sufficient to manage this scenario.

High demand scenario

71. The high demand common reference scenario reflects the local planning authority housing plan forecast for the full period. In this scenario, by 2050, we anticipate serving 372,589 properties with a population of 863,569. Ofwat's high demand scenario sets out we should not assume any demand reductions from building regulations or product standards, but we have assumed six litres per head per day saving from water labelling. By 2050, we will have installed 284k smart meters at existing properties, delivering 46.44Ml/d of further consumption reductions.

72. We note that "*in 2025-30 the core pathway should include investment to meet outcomes under the high demands scenario*".[18] Based on this guidance, we consider the low demand scenario in 2025 to 2030 to be a best-case outcome, however one that we do not account for in our core or adaptive pathways in the first five years of modelling.

Abstraction reduction

73. Abstraction reductions are also of vital consideration to our operations in meeting water demand sustainably and efficiently. We plan in detail our abstraction demands and are actively involved in work with the Environment Agency and our neighbouring water companies to establish a sustainable abstraction regime for the future, that reflects the impact a changing climate will have on our natural environment.

Low abstraction reduction scenario

74. Ofwat's requirements for the low abstraction reduction scenario are simply no more than current known legal requirements up to 2050. We do not currently have any legal obligations to reduce our abstractions (such as licence capping) and we therefore estimate, under this scenario, our daily water available for use would be 175.68 Ml/d. Under these abstraction levels we can continue our normal service to customers with little to no disruption under all demand scenarios.

High abstraction reduction scenario:

75. Ofwat's high abstraction reduction scenario requires us to model our abstraction reduction around the Environment Agency's 'enhanced' scenario. The scenario provides greater environmental protection for Protected Areas and Sites of Special Scientific Interest (SSSIs). We have considered the local priorities of our region to supplement our assessment, in particular the condition of its chalk rivers.

76. In the high abstraction reduction scenario, where we follow the 'enhanced' scenario, daily water available for use would reduce to146.39 Ml/d, as we would need to reduce abstraction by just under 30Ml/d from groundwater sources within our supply area.

77. In isolation, the high abstraction reduction scenario would have a severe impact on our ability to meet our customers' water demand. We have, therefore, identified the additional enhancement expenditure required, including a new groundwater source, which is included in our WRMP alternative adaptive pathway.

Technology

78. We view technology as a keystone in our long-term strategy as technological advancements can provide value to customers across all aspects of the value chain.

[18] PR24 and beyond, page 42

79. We note that Ofwat's guidance between the adverse and benign scenarios is not about *if* technological advancements will be undertaken but *when*. We envisage rapid technology roll outs as being the most beneficial to our operations and, therefore, to our customers.

80. The technology scenarios provide targets for the following:

- Smart water supply network:
- Full smart meter penetration;
- Low-emission HGVs and fleet and carbon-free baseload electricity by 2035;
- Full open access to datasets across water companies and other utilities;
- Equating the whole-life financial cost of low-carbon construction materials with that of conventional building materials; and
- The need for non-digital backups to counteract cybercrime.

81. In addition to the LTDS guidance, we consider other technological advancements that we envisage rolling out in the next 25 years, including:

- DMA asset health advanced underground diagnostic technology;
- Smart iDMA network monitoring and management advancement;
- Smart above-ground sensor capabilities for smart abstraction, treatment and distribution input;
- AMI smart metering (advanced metering infrastructure) of homes and businesses, including digital interfaces and communications;
- Open data master data management, orchestration, syndication, and open integration connectors for data exchange and sharing; and
- Investment in cyber security, including Managed Detection and Response, Zero Trust, and separation and securitisation of corporate and operational systems.

82. Over time, and as our data increases in span, volume and quality, and alongside technological advancements in smart sensory assets, we anticipate a further shift in manual and semi-manual activities. This will lead to the development and implementation of machine learning and artificial intelligence platforms to drive decision making and action taken across assets, operations, the customer experience, and require associated cyber countermeasures and defences.

Slower technology scenario

83. The slower technology scenario requires companies to meet the requirements listed above at various stages between 2040 and 2050 (excluding carbon-free baseload electricity). This would be a disappointing outcome for us and our customers as we are already ahead of this scenario in many areas. As one of the most innovative companies in the sector, we are ahead of this scenario in some areas already, such as the implementation of fully smart water networks. Since the first five years of our plan is based on existing technologies, our core adaptive pathway would be sufficient to meet this scenario up to 2050. This assumes where the core driver for slowing technology advancement is driven by increases in cyber threats, that our existing technologies will countermeasure this, or where future versions of the cyber assessment framework (CAF) would help identify and support the necessary adaptations which would be assessed through future price controls.

Faster technology scenario

84. The faster technology scenario requires companies to meet the requirements listed above at various stages between 2030 and 2040 (excluding carbon-free baseload

electricity). In some cases (for example, the adoption of smart networks and smart meter penetration) we will be ahead of these timelines and our push to advance technology use is the keystone of our long-term business plan. Indeed, our leading technological position means that our core pathway includes the investment needed to maximise the use of these smart technologies to support our ambition so would, therefore, be sufficient to meet this scenario.

Company-specific/bespoke scenarios

85. The below company-specific scenarios are not paired, and as such are considered as only one-off events/scenarios. The detail regarding how they were identified is provided in Appendix SES003 LTDS- Future Scenarios Detailed Report. We have considered the impact of each below.

Bad debt

86. This risk infers a scenario where there is one or more extended periods where a material proportion of customers suffer sustained financial hardship (or believe that they are going to suffer sustained financial hardship) to the point where they do not pay their water bills, or only pay a proportion of their water bills.

87. The company identified this risk as a plausible extreme, following its experience during the financial crisis. In this scenario, there would be a significant increase in the bad debt and late payments from customers (requiring larger bad debt provisions), and an increase in customers requiring social tariffs (over and above that assumed when the previous price control was set). We have assumed that this effect lasts for more than one year. More details on the modelling assumptions can be found in Appendix SES003.[19]

88. Having modelled the impacts of the scenario, we have confirmed that our core adaptive pathway is resilient to this outcome, albeit only by the narrowest of margins. It would, however, require a material increase in the amount of capital in the business. This could be provided by additional debt (within the debt headroom of the core adaptive pathway), additional equity, or a combination of the two. With any of these options, this additional capital would need to be financed.

Supply chain resilience

89. This risk infers a scenario where parts of our normal supply chain become disrupted because of factors outside our control, potentially beyond the limit of a normal supply chain ‘hedging’ strategy. In order to deliver our ambition in this scenario, we would, therefore, need to contract with an alternative supply chain. Naturally, our original supply chain would be the most efficient option, and have an optimal balance of insourcing vs outsourcing, so we would face additional costs to utilise an alternative supply chain.

90. We have assumed that these additional costs would relate to both OPEX and CAPEX in both the retail and wholesale business areas[20]. More details on the modelling assumptions can be found in Appendix SES003.

91. As with the bad debt scenario above, having modelled the impacts of the scenario, we have confirmed that our core adaptive pathway is resilient to this outcome, albeit only by the narrowest of margins. It would, however, require a material increase in the amount of capital in the business. This could be provided by additional debt (within the debt

[19] In essence, we have assumed that bad debt is 60% above the baseline level in the first year of incremental bad debt, 40% above the baseline in the second year of incremental bad debt, and 20% above the baseline level in the third year, reverting to the baseline level by year 4.
[20] In essence, we have assumed that the retail operating costs, wholesale operating costs and wholesale capital costs in one year are 10% higher than planned, followed by two years where these costs are 5% higher than planned.

headroom of the core adaptive pathway), additional equity, or a combination of the two. With any of these options, this additional capital would need to be financed.

3. Our ambition

In this chapter we set out our long-term vision and ambition. We describe how we will deliver our purpose and the outcomes we will achieve for our customers and the environment. For each outcome, we have set a performance ambition from 2025 to 2050, showing the progress we expect to make over each five-year business plan period. We explain how we have set our ambition for each outcome, including how they reflect our customers' priorities as well as government and regulatory requirements. For each outcome we explain how much performance improvement we expect to achieve from base expenditure, which in turn identifies where we need enhancement expenditure to deliver our long-term ambition through our long-term deliver strategy (LTDS).

A. Our purpose and long-term vision

92. Water is essential for a clean and thriving environment and a healthy and prosperous society. We are a purpose-led organisation that aims to harness the potential of water to enhance nature and improve lives by placing customers and the environment at the heart of decision-making.

93. Our LTDS sets out how we will achieve this through strong stewardship of our existing assets and a forward-looking programme of investment. It will deliver our vision to:

    (a) Transform our performance through digital innovation and smart technology where we aim to be always one-step ahead, solving issues before they become problems and making systems-based, intelligence-led decisions about how we invest for the future;

    (b) Build the trust of our customers so they value water and the service we provide and are willing to play an active role in helping us tackle the challenges facing our local environment and our water supplies; and

    (c) Enhance the environment and provide our local communities with wider benefits from our day-to-day business activities so we improve the lives of current and future generations.

94. The ambition put forward in our LTDS reflects the long-term expectations of our customers, stakeholders, regulators, and government. At its heart is our 25-year plan to continue to secure resilient and sustainable water resources by further reducing leaks and providing additional help to our customers to lower their water usage. We have set ambitious targets in both areas, as it is critical that we stay ahead of the challenges we face from climate change and population growth, in what is already a water-stressed part of the country. Our actions will make our service more resilient for our customers and help protect our local environment and are an integral part of how collectively the South East's water companies will deliver secure water supplies for future generations.

95. Working with our customers in an increasingly collaborative way will be essential to our success. We've used customer insight to inform our strategy and we will continue to work with our customers as we deliver our ambitions. Reducing demand for water will require us to transform how we engage with our customers, particularly as water use in our area is currently above average.

96. We have steadily reduced leakage over recent years, consistently meeting or exceeding our target, so now around 13% of the water that we put into supply is lost through leaks. Two thirds of this water is lost through leaks on our pipes and the rest from our customers'. This compares to 20% total leakage in 1993. This represents some of the best performance in the industry. Our customers expect us to lower leakage levels further. To meet these expectations, we intend to surpass the leakage reduction target set by the Government to halve leakage by 2050 (from 2019/20 levels). This is ambitious for three reasons:

    (a) We are starting from a base leakage level well below the industry average, so sustained leakage reductions are comparatively harder and more expensive to deliver;

    (b) We will achieve the 50% reduction target nine years earlier than required; and

    (c) We will deliver just over a 62% reduction in leakage by 2050 which will mean that less than 8% of the water we produce will be lost through leaks.

97. This level of performance will be frontier shifting and we are, therefore, committed to continue sharing our learnings and innovation to help other companies make more rapid progress in this area.

98. Achieving ambitious reductions in demand and leakage are the cornerstones of our work to improve the environment and increase the resilience of our service. Such ambitions will enable us to leave more water in local sources where it is needed to help the environment adapt and improve in the face of climate change. Investigations over the next five years will reveal exactly where our existing abstractions will need to be reduced. However, our LTDS plans for a range of future scenarios that could see up to 30 million litres of water per day left in the environment by 2050, due to abstraction reduction.

99. The combination of leakage reductions and helping our customers use water even more efficiently will help us to maintain water supplies during droughts and enable us to share water with our neighbouring companies as more transfers are constructed between companies, as set out in the Water Resources South East (WRSE) regional plan.[21]

100. Our smart network and asset health initiatives will continue to transform how we operate, maintain, and invest in our network by helping us find and fix even the smallest leaks more quickly, react rapidly to bursts and address other issues that could interrupt supplies before they escalate. We will continue to work with our supply chain partners to develop our capabilities to bring further benefits to the reliable, resilient, and sustainable operation of our infrastructure. Beyond 2030, we will continue to undertake targeted and optimised investment to ensure we build a network fit for the future. Alongside this we will be equipped with enhanced methods of controlling pressure and responding to outages if they do occur, so that by 2050, no-one will lose their water supplies for more than three hours and we will halve the number of burst mains each year. This will also enable us to meet our long-term leakage target and continue to lead the industry in this area.

101. Our commitment to protecting and enhancing the environment is supported by the activities included in our WINEP. It includes catchment management schemes to stop pollution from non-point sources such as farming from contaminating our raw water sources, and further investigations to identify which sources may be at risk in the future. We are taking action to protect species that live in our local rivers, such as installing eel screens, and reducing the spread of invasive non-native species that threaten our environment.

102. We will continue to enhance nature and support its recovery, delivering wider value to society by enabling our customers and communities to reap the benefits that a high-quality local environment brings. To achieve this, we will commit 80% of the land we own

[21] WRSE revised draft regional plan, August 2023

to increasing biodiversity and plan to create more than 530 additional biodiversity units – a 25% increase by 2050 on our own land. We will also identify opportunities for further biodiversity gains on third party land in partnership with others.

103. Ensuring full compliance with all prevailing and applicable environmental permitting and licencing remains a focus and commitment. We will continue to reduce the risk of pollutions (caused by the after-effects of burst mains) by managing our supply network to minimise such occurrences, and when they do, respond rapidly to limit the impact. Where external factors, such as climate change or third-party activities, threaten our ability to meet environmental or drinking water quality regulations, or maintain our high standards of service, we will identify the risks and invest in addressing them in a timely and proportionate way.

104. We plan to go beyond our statutory requirements, with the support of customers, to deliver multiple benefits across all our catchments. We have included a non-statutory scheme within our WINEP in our largest catchment – the River Eden catchment – to build its resilience. This catchment is critical to the long-term security of our water resources as well as providing an important home for nature. We will then apply learnings into other catchments, including those that are home to chalk streams. This supports the aspirations of the Government's 25-year Environment Plan and this, along with our future catchment focused work will deliver further biodiversity gains over time.

105. In addition to our focus on improving our local water environment, we will continue to work to reduce our carbon emissions, so we reach net zero by 2050, in line with the Government's target and the IEMA greenhouse gas reduction hierarchy[22]. Our approach will be based on a mix of primarily market-based carbon reductions, supplemented by a range of location-based interventions, where this is proven to be the most efficient and effective approach, addressing both operational and embedded emissions reduction simultaneously.

106. The water we supply will meet the highest quality standards and we will minimise the number of concerns raised by customers about the taste, odour, or appearance of their water from our already upper quartile position. We will replace lead pipes where they pose the greatest risk to our customers, initially targeting properties that have the biggest exposure risk to those most vulnerable including children and young people. Longer-term, we will collaborate with others, both within and outside of the sector, to develop innovative, cost-effective methods of eradicating the risk of lead from our drinking water supplies.

Our strategic choices

107. As we look across our business and key performance areas for the future, we have made strategic choices about our level of ambition and how this is reflected across our LTDS. As a small water-only company, we need to be pragmatic and proportionate about where we focus our time and resources, so we continue to improve our service in a way that is deliverable and affordable for customers. That said, we are already a positive disruptor in the industry. Our agility and culture of innovation has seen us lead the industry in its transition to smart technology and intelligence-led asset management that is already delivering multiple benefits for our customers and the environment, as well as those of other companies through the learnings that have been shared with others.

108. As we continue to move forward, we have segmented our strategy in to three key areas:

[22] Institute of Environmental Management and Assessment Pathway to Net Zero, 2020.

(a) Asset integrity and resilience - we will continue to lead the industry and target consistent, upper quartile performance in:

(i) Water quality;

(ii) Leakage reduction;

(iii) Supply interruptions;

(iv) Mains bursts; and

(v) Water supply work outage.

(b) Enhancing nature and improving lives – we will deliver our purpose by:

(i) Increasing biodiversity;

(ii) Abstracting water sustainably;

(iii) Complying with all environmental laws and regulations;

(iv) Building natural capital and increasing access to nature; and

(v) Engaging and educating our customers and working with our communities.

(c) Open learning – we will aim to make rapid advances in our performance by innovating, sharing our successes, opening up our data in all areas and learning from others in:

(i) Reducing household and non-household water consumption;

(ii) Reducing carbon emissions to net zero; and

(iii) Supporting customers who need extra financial and non-financial support.

109. Across all three areas we have made calculated and considered projections of how much performance improvement can be delivered through base expenditure and we'll continue to deliver efficiencies, improve processes and innovate before we ask our customers to pay more.

How our LTDS meets Ofwat's public value principles

110. Our LTDS considers how we can deliver more social and environmental value through the delivery of our core services. We have used Ofwat's public value principles to inform the development of our strategy and our decision making. The principles will continue to guide the delivery of our strategy, so we maximise the value we create for our customers, communities and the environment.

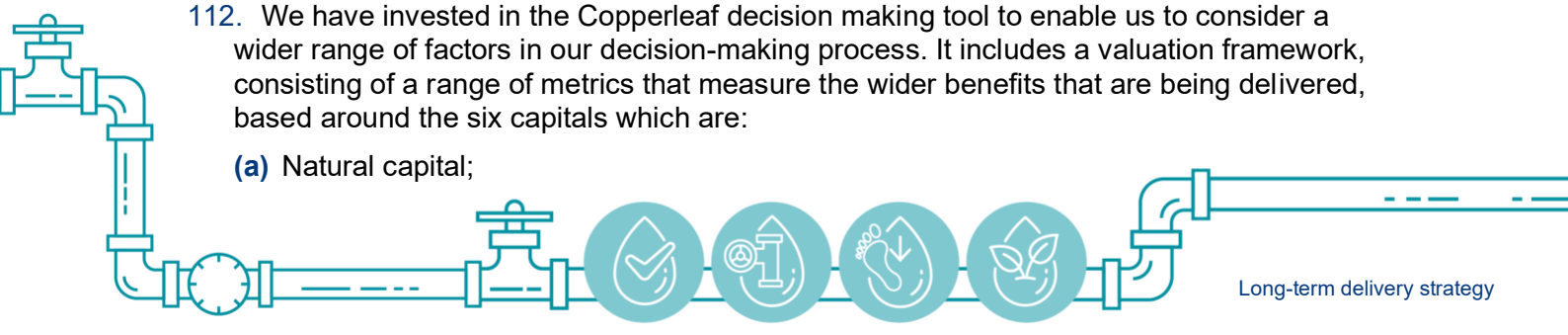
Creating further social and environmental value

111. We have considered a range of factors, beyond cost to help us choose solutions that deliver wider benefits and contribute to increasing public value. Each option we have considered has been assessed against a range of value criteria to inform our decision making. This will enable us to deliver more through the provision of our core services and the future investment we make to further improve our performance and meet higher legal and regulatory standards.

Measurable, lasting and important benefits to customers and communities

112. We have invested in the Copperleaf decision making tool to enable us to consider a wider range of factors in our decision-making process. It includes a valuation framework, consisting of a range of metrics that measure the wider benefits that are being delivered, based around the six capitals which are:

(a) Natural capital;



(b) Manufactured capital;

(c) Human capital;

(d) Intellectual capital;

(e) Social capital; and

(f) Financial capital.

113. Led by our senior team, we are embedding this decision-making approach across our business, but it has been central to the development of our LTDS and has facilitated broader thinking about our investment choices. It will be expanded to assist with a range of business requirements at operational, tactical and strategic levels as we continue to develop our understanding and embedment of the six capitals as the basis of our system-based decision-making framework.

Open with performance information

114. We will continue to report transparently to our customers and our communities on how we are performing, and we will build metrics associated with public value into our reporting. This will help us build and maintain trust with customers and stakeholders and facilitate collaboration, with the aim of furthering public value through partnership working.

115. We will continue to report on our performance through publications such as our Annual Performance Report and 'Keeping it Clear' – our guide to our finances and governance – published annually. As part of our plan to build trust, we will develop our website to make it easier for customers to find information about how we are delivering in key areas that matter to them such as water quality and leakage reduction at any time, making sure that information is understandable and accessible to all.

116. Our 'Your Water, Your Say' session, which was held in April 2023 to enable customers and stakeholders to challenge our developing plan, saw one of the largest number of attendees despite us being one of the smallest companies. It was highlighted by CCW and Ofwat as being one of the most well planned and executed open challenge sessions held and we received positive feedback from our customers who attended. We intend to build on this success at the second session later this year and will also introduce more regular opportunities for customers to engage directly with our leadership team and challenge us on our delivery and the issues that matter most to them.

Customer support

117. We have used customer insight to set the level of ambition we aim to achieve and the pace at which we will deliver improvements. This has included the collaborative industry research as well our own bespoke research programme that gave our customers choices in the areas of performance they could meaningfully influence. We have only proposed solutions that go beyond our legal and regulatory duties, which come at extra cost, where we have robust evidence of customer support. This includes going beyond the Government's target for leakage reduction, the inclusion of a non-statutory scheme to enhance the environment and build the resilience of the River Eden catchment and our plan to replace lead pipes at locations where they pose the greatest risk to customers. We have also phased our long-term investment to reflect our customers' priorities and keep bills affordable. Full details of our customer engagement programme and how it has influenced our LTDS and PR24 business plan can be found in Chapter 5 of our main business plan submission.

Collaboration to optimise solutions and maximise benefits

118. We have a long record of collaboration including our work to embed new technology into our business. Our partnership with Vodafone, Royal HaskoningDHV and Technolog

enabled us to become the first water company to roll out smart technology across our underground network, and we will continue to work with both existing and new partners to help deliver our vision.

119. We will continue to work in partnership with other stakeholders to maximise the benefits we will deliver. Indeed, some of our work associated with improving the environment is wholly dependent on collaboration with third parties and we have considered this in the development of our LTDS. Likewise, achieving the significant reductions in water use at home and work will require a transformation in how we engage with customers to help them change their behaviour, alongside the way we work with relevant third parties – such as local authorities, charities and energy retailers. Our ESP and CSP both encourage us to connect with new partners and learnings from other companies and sectors.

120. Being a small water company, we already recognise the importance of building strong relationships with supply chain partners, providing full line-of-sight of the challenges faced and sharing in the success of the solutions delivered. These relationships remain vital to us and will continue to form a key element of our strategy over the next 25 years.

121. We will continue to work transparently with other water companies in the bilateral sharing of successes – and failures – in the delivery of plans. We have been particularly active in openly sharing our industry-leading work to implement a smart network and our iDMA approach to asset health through knowledge showcases and at a number of national and international conferences. We will continue to be active members of a wide range of industry forums, focused on developing and improving best practice and delivering on our belief that the sector is stronger when openly collaborating – as every customer, irrespective of where they live – should be eligible for the best possible level of service.

122. We will continue to play an active role in WRSE so that we plan our water resources in a collaborative way and deliver the optimal set of solutions for customers and the environment, including sharing water resources with our neighbouring companies as the region becomes more interconnected.

Company capability, performance and circumstances

123. Our current performance and track record have been a key factor in determining the level of ambition we have set across our outcomes. We have taken full account of where we are starting from and how quickly we can make progress toward our long-term targets. Our advanced use of smart technology and intelligence-led asset health decision-making that we have implemented since 2020 is already delivering benefits to customers through our consistent and high level of performance in leakage and supply interruptions. We intend to build on this and further extend our use of these important tools in the planning and delivery of our future investment, as we have proved how effective they are and how well equipped we are, to use them.

B. Our outcomes and performance ambitions for 2050

124. In the following section we set out our long-term ambition for each of the main customer and environmental outcomes we will deliver between 2025 and 2050.

Provide high quality water supplies from sustainable sources

High quality water supplies

125. Our 2050 ambition is to have always provided high quality water that meets the highest drinking water standards. Specifically, this relates to the Drinking Water Inspectorate's

(DWI) CRI, customers contacts about the taste, odour or appearance of their water and our unique requirement to soften water, as shown in the table below.

Table 1: Water quality forecast performance

Performance commitment	2025	2030	2035	2040	2045	2050
Compliance risk index (CRI)	0.0	0.0	0.0	0.0	0.0	0.0
Customer contacts about water (contacts per 1,000 customers)	0.60	0.60	0.53	0.48	0.40	0.33
Softening (mgCa/l)*	0.0	0.0	0.0	0.0	0.0	0.0

Source: SES Water Forecast Outcomes Data Table LS1

126. We will remain fully compliant with the drinking water regulations over the next 25 years and meet any new, more stringent regulations that are required and any additional performance metrics that are introduced. Our ambition is to continue our current strong performance, even as standards become higher and metrics evolve. We will also address any risks to our water quality proactively, so we always provide our customers with clean, healthy drinking water amongst the best in the UK.

127. We have some of the lowest rates of customer contact about the taste, odour and appearance of our drinking water in the industry with only 0.6 customers in every 1,000 contacting us. Reducing this further will be challenging and there are limited options available to us. That said, our long-term ambition is to reduce contacts by almost half by 2050 by eradicating the unauthorised use of fire hydrants on our network (responsible for around 10% of contacts currently), and the additional stabilisation of our network during planned and, where possible, reactive or emergency works. In addition, we'll improve how we proactively communicate with customers when our essential work does risk customer concerns being raised.

128. The ambition to continually reduce customer contacts reflects the fact that our extensive dialogue with customers consistently shows that water quality is their top priority. It is essential that our customers have confidence that the water they drink is safe and tastes good. We'll also continue to meet our statutory obligations to soften 80% of the water we supply to a medium hardness of 80 mg/l on average.

129. A key part of our long-term strategy to supply high quality water is to address the risk of our water sources being contaminated by non-point source pollution. Where possible we will work with farmers and landowners on catchment-based schemes included in our WINEP to stop pollution and deliver wider environmental benefits. However, in some areas, the risk associated with contamination from these pollutants is already too high, so the only solution is to install new treatment facilities which requires additional investment.

130. Customers have told us lead replacement is an area that they expect us to invest in over the next 25 years. Currently 45% of the communications pipes across our network are made of lead, due to the age of the housing stock in parts of our region. Like the rest of the sector, we keep our water supplies safe from lead exposure by adding a chemical called orthophosphoric acid at each of our water treatment works, alongside undertaking an ongoing monitoring programme to detect lead levels in customers properties.

131. In addition, we currently go beyond statutory requirements as we replace lead communication pipes when we detect lead at >5ug/litre in customers' drinking water. This is lower than the drinking water quality regulations require. We also offer to replace

customer supply pipes when lead is detected at concentrations greater than 10ug/l in customers drinking water. We are trialling the replacement of lead service pipes where customers have shared lead supply pipes. We call this our 'Statutory+ programme'. Our current replacement rate for all lead communications or supply pipe replacement activities is around 700 per year.

132. Our customers told us that they want us to go further to reduce lead and have shown a preference for us to take a risk-based approach by targeting those most at risk from lead exposure first. Our LTDS, therefore, includes a programme of customer-focussed lead pipe replacement. We will replace any remaining communications and supply pipes, supplying schools, colleges and nurseries, so we remove all lead from the pipes that supply these premises. Beyond this, we will look to remove lead from other premises such as community centres, sports clubs and village halls. Our long-term target is to eradicate lead from the main drinking water supply of all of these establishments over the next 15 years. This will be in addition to the continuance of the statutory+ programme.

133. Alongside this, we will work with the industry, academia and supply chain partners to identify an economically viable solution to the eradication of lead from all properties. This may take the form of a future change in law around the ownership of supply pipes (akin to that in the wastewater sector and the transfer of shared sewers), a technological innovation that facilitates more cost-effective solutions to lead pipe replacement, and/or the introduction of a government grant-based scheme or similar (akin to the Green Deal) that helps customers fund the costs of lead replacement.

Table 2: lead pipe replacement forecast

Target	2030	2035	2040	2045	2050
Statutory+ lead replacements	2,875	2,875	2,875	2,875	2,875
Enhanced lead replacements*	170	170	170	170	170
Total lead replacements	3,045	3,045	3,045	3,045	3,045

*Note: * Includes replacement of communication and supply pipes*
Source: SES Water

Sustainable abstraction

134. Across our region, we hold 19 licences to abstract water, and are fully compliant with their conditions. Some of these are located close to chalk aquifer-fed streams, which form a vital and endangered ecosystem. Abstraction from four of these sources is thought to influence flows in the adjacent chalk streams, namely the River Darent, River Wandle and River Hogsmill. In the Wandle and the Hogsmill we have provided augmentation flows to help support these streams since the 1960s.

135. Our 2050 ambition is to only use sources where we can take water without harming the environment. Between 2025 and 2050 we will reduce our abstraction from sources where it is not sustainable to continue taking water at the rate we do now and leave more water in the environment. The amount of water we leave will be determined by WINEP investigations in the first five years of our LTDS and subsequent changes to our abstraction licences, so our 2050 target will be determined on their completion.

136. Our WRMP will identify the best value solutions to replace any existing abstractions. Our revised draft WRMP[23] is an important input into our LTDS as it plans for a range of possible abstraction reduction scenarios, from 11 Ml/d to 30 Ml/d. Abstraction reduction is

[23] SES Water revised draft WRMP, August 2023.

also one of the common reference scenarios we have used to develop out LTDS and our adaptive strategy shows when it triggers additional investment.

Deliver a resilient water supply from source to tap and minimise wastage

Resilient water supplies

137. Our 2050 ambition is for our water supplies to be resilient to climate change, including severe drought, and other external events that may occur. Our WRMP reduces the risk of emergency restrictions on water use such as standpipes and rota cuts from being needed once in every 200-years to once in every 500-years, on average, by 2040, in-line with government policy.

138. By 2025, we will have completed a £45 million investment programme to reduce the risk of supply interruptions to our customers by connecting all properties to at least two water treatment works. This improves the resilience of our customers' supplies and enhances our ability to move water around our operating region, mitigating some of the risks associated with drought. Between now and 2050, we will continue to optimise how we utilise this improved supply functionality from both a sustainable abstraction and cost to supply perspective, whilst at the same time maintaining the original contingency capability envisaged at the outset of the resilience programme.

139. We have eight water treatment works with unplanned outage levels consistently at around 1.2%, below our target outage of 2.34%. Our long-term ambition is to eliminate unplanned outage so that our sites are as reliable and resilient as possible.

Table 3: Unplanned outage performance forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Outage	1.2%	1.0%	0.75%	0.50%	0.25%	0.0%

Source: SES Water Forecast Outcomes Data Table LS1

140. We will achieve this though continuing our focus on optimal maintenance and targeted investment in our water treatment works, confident that our knowledge and approach to timely interventions at these sites has yielded high levels of reliability in the past.

141. Whilst river flooding is not assessed as a key risk to most of our water treatment works, the risk of surface water flooding will likely increase and targeted investment to address this could be needed at a number of sites, depending on the rate of climate change. The risk of repeated power outages at our sites is increasing, particularly for those located outside the London Boroughs. This is due to climate change and the stability of power supplies to more rural distribution systems. As such, we have considered the long-term investment needed to reduce the risk such external factors pose to unplanned outage and the resilience of our treatment works and processes.

Water supply interruptions and mains repair

142. Our 2050 ambition is for no customer to have their water supply interrupted for more than three hours. Achieving this challenging level of service will require the complete eradication of unnecessary errors in network operation and maintenance, combined with targeted investment in technology and fully resilient assets, which strikes the right balance between performance improvement and affordability.

143. Having a constant supply of water is a high priority for customers and we currently perform well in this area, with customers losing their water supply for less than four minutes each year, on average. Our ambition is to maintain our industry leading performance and continue to reduce interruptions over the 25-year planning period.

144. Linked to this is the number of burst water mains we experience as these can often result in a temporary loss of supply and are a measure of the condition of our underground pipework. Historically, we have performed well in this area, with an average of 76 bursts per 1,000 pipe per year compared to the industry average of 150 bursts, over the first three years in AMP7. Last year we saw more bursts than normal, largely due to the impact the drought had on soil moisture deficit (a key factor known to influence burst rates) which increased to levels not seen since the 1970s. The subsequent freeze/thaw in December 2022 compounded the weather-related impact on network performance. Collectively, for us, this caused burst rates to increase by around two-thirds, or 100 per 1,000km, but even in this challenging year, our burst rate remained some 40% lower than the industry average in the first two (benign) years of this AMP and customer supply interruptions remained below our target.

Table 4: Supply interruptions and mains repair performance forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Water supply interruptions (minutes lost per year)	0:04:00	0:03:30	0:03:00	0:01:45	0:01:00	0:00:00
Mains repair	59.0	54.0	48.2	43.0	38.4	33.8

Source: SES Water Forecast Outcomes Data Table LS1

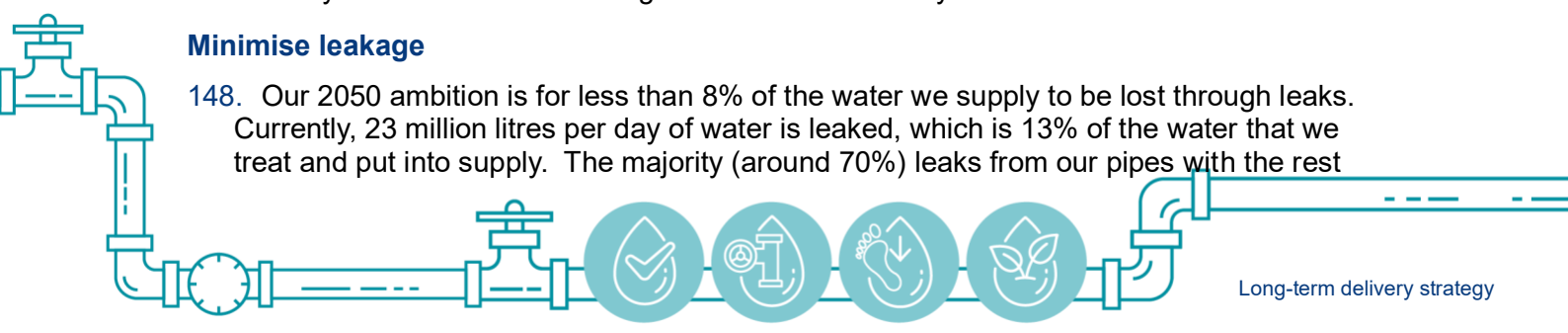
145. By 2050, the number of burst mains we need to repair will reduce to almost half as we utilise the outputs of our DMA asset health initiative, which will continue to be enhanced over the coming years. This industry-leading innovation focuses on the stewardship of our network and enables more targeted investment decisions. The ongoing reduction in mains repairs is important due to its contribution to leakage, its risk to supply interruptions and water quality incidents, the level of disruption repairs can cause to communities and the potential impact bursts have on pollution to adjacent watercourses.

146. This work, which has adopted technology not previously utilised in the UK, undertakes non-destructive, in-situ testing of our metal infrastructure (which comprises around 70% of the total of our supply network) to assess the residual thickness (and therefore indicative condition and remaining useful life). It allows us to target mains replacement far more efficiently, reducing unnecessary disruption and expenditure. Our work in this area also includes the creation of recommendations around enhanced pressure management and improvements in network inter-connectivity to improve resilience and flexibility. We have so far assessed more than 40% of our network using this technique.

147. Collectively this approach will allow us to optimise the replacement of life-expired assets whilst at the same time prolong the useful life of others over the course of the next 25 years and beyond. In June of this year, our DMA Asset Health initiative won the Water Industry Awards for asset management initiative of the year.

Minimise leakage

148. Our 2050 ambition is for less than 8% of the water we supply to be lost through leaks. Currently, 23 million litres per day of water is leaked, which is 13% of the water that we treat and put into supply. The majority (around 70%) leaks from our pipes with the rest



from our customers' supply pipes. This is amongst the best performance in the industry and many of the leaks that we now need to tackle are smaller and harder to find, which requires different tactics and interventions.

149. We intend to surpass the Government target in the Environmental Improvement Plan (EIP), which is to reduce leakage by 50% by 2050. This is because our customers expect us to do more to reduce leakage as quickly as possible and have indicated that they will be more willing to reduce their own water use if we can demonstrate progress in this area. More than 50% of customers surveyed have told us they don't think the Government leakage target goes far enough.

150. When presented with investment options, only 25% of customers chose for us to reduce leakage by 50% by 2050 with 75% of customers surveyed choosing for us to go further than the Government target. 40% expected us to reach the target more quickly, while others would prefer us to go further, and they want us to prioritise this investment over other areas (SES018 Customer Research Outputs - Bespoke 2 report).

151. Our ambition is to halve leakage by 2041 and continue to drive it down by more than 62% by 2050, so as much as possible of what we sustainably abstract remains available for use.

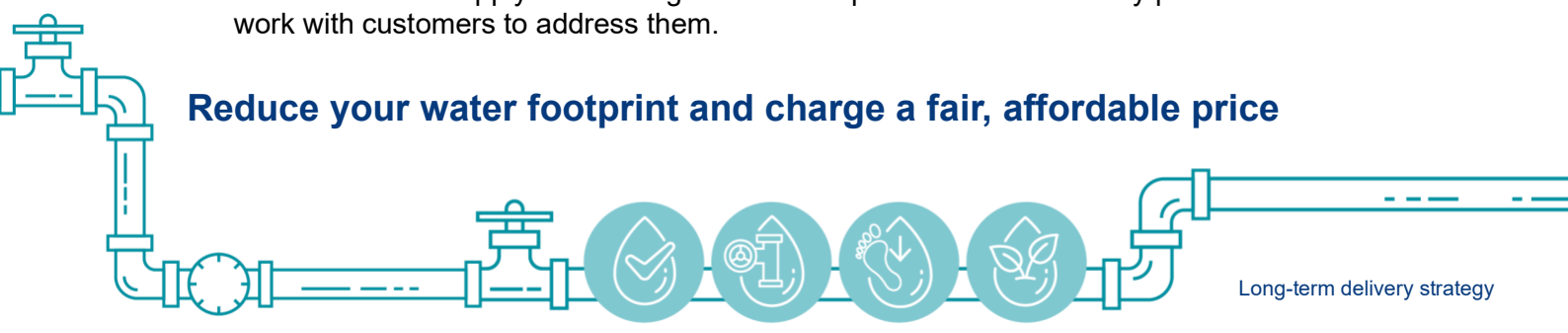
Table 5: Leakage performance forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Leakage (Ml/d)	-12.7%	-26.6%	-38.1%	-47.2%	-55.4%	-62.5%

Source: SES Water Forecast Outcomes Data Table LS1

152. The rollout of smart technology across our network, which we completed in 2022, has made us the first company to have a fully smart water network. This has already halved the time it takes us to detect and repair leaks and has reduced the amount of water lost from the average leak by between 30 and 40%. Further phases of smart network are currently in development and implementation, which we predict will provide yet more sustained benefit. Our plans centre around the principal of faster awareness, location and repair. Reducing the runtime of all three of these components of network events will further reduce both the volume of water lost and the customer impact of each event. Our smart network expansion coupled with improved active leakage control processes are targeted to deliver a 1Ml/d (5%) reduction in leakage in AMP8 and up to a 27% reduction in leakage by 2050. The other elements of our leakage reduction strategy include replacing old water mains and using smart meters to detect leaks on customers' pipes.

153. We predict that the roll-out of smart metering to all households and commercial premises will derive significant and sustained benefits through the timely reduction of customer-side leakage. It is responsible for around one-third of total leakage – which has historically proven very challenging for the sector to achieve material inroads into due to difficulties in detecting it in homes which are not metered. Our plan targets at least a 0.7Ml/d (3%) reduction in leakage as a result of our smart metering roll out but we believe the benefits for leakage could be even greater than this due to the future benefits of having enhanced flow data monitoring of customers supplies which will enable us to be alerted to future supply side leakage events far quicker than is currently possible and work with customers to address them.



Reduce your water footprint and charge a fair, affordable price

Household and business water consumption

154. Our 2050 ambition is to reduce household consumption to 110 litres per person per day (on average) and reduce business consumption by 17%. These reductions are required to maintain an appropriate water supply demand balance, increase resilience and protect the environment from unsustainable abstraction in the long-term.

155. This aligns with the targets set by the Government in its EIP, including the interim targets during a normal year. Our forecast reductions are set out in the table below.

Table 6: Household and business consumption reduction performance forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Per capita consumption (% reduction from baseline)	-3.5	-11.0	-16.0	-20.5	-23.1	-25.7%
Business consumption (% reduction in water use)	-7.2	-5.1	-8.1	-11	-13.9	-16.9%

Source: SES Water Forecast Outcomes Data Table LS1

156. Several factors impact the levels of water use within our region. This includes the warmer climate in the South East, the underlying demographic spread across our customer base combined with the housing type (with higher proportions owning gardens and swimming pools), and the current levels of meter penetration.

157. Household water use in our region is around 155 litres per person per day, roughly 5% above the current average for England. We are behind our target to roll-out universal metering as we continue to feel the impact of the pandemic and address residual issues associated with our billing system update (which is delaying the transfer of metered customers onto measured bills). We know that the average household consumption for customers on measured bills is around 135 litres per person per day and we expect our total per capita consumption to approach this level once our universal metering programme is concluded and reaches at least 85% penetration – in-line with the highest achieved to date in the sector.

158. Reducing water consumption by 26% from our 2019/20 levels by 2050 is a significant challenge. We have developed a multi-faceted strategy to help achieve this. As described previously, our customers have indicated that they will be more willing to reduce their own consumption if we do more to tackle leaks, therefore achieving our ambition in these areas is closely linked and our focus is on working with our customers to help them become more water efficient and reduce wastage from leaks and plumbing losses.

159. Smart metering and the enhanced customer experience that can be delivered as a result, is key to achieving our target in both areas and we propose an ambitious roll-out to enable us to make rapid progress. This reflects the Government's expectation, as set out its integrated plan for clean and plentiful water, for water companies to consider how rapidly they can increase smart meter installations for household and non-household customers.

160. Furthermore, such an approach will allow us to make significant inroads over time into reducing customer-side leakage (which comprises around a third of our overall leakage figure) and the tackling of plumbing losses in customer homes (which comprise around 10 litres per head per day of our PCC figure). In both cases, the provision of smart meters will help identify leaks and continuous usage almost immediately and target the

necessary interventions with the customer to resolve them. Collectively, this will reduce both leakage and PCC.

161. Our customers have mixed views on reducing demand and smart metering. The responses we received to our draft WRMP consultation showed high levels of support for both and WRSE's research on the draft regional plan showed that customers support a balanced plan that includes demand reduction alongside new supplies. We know from our more detailed discussions with customers that we have more to do to reassure customers about how we will use their data, develop tariffs and to demonstrate the benefits of smart meters, including to reduce leaks which is a key outcome of smart metering that our customers want. We will continue to work with them to shape and deliver our smart metering programme and to create tariffs that will incentivise efficient water use.

162. Achieving the full benefits of smart metering will be dependent on using the data it provides effectively to help us engage with and support our customers reduce their water usage. This is a complex area, and we know that some customers may be unwilling to engage with us and be resistant to change. To support our customers as much we can, we propose to provide an appropriate and segment/preference orientated account interface – allowing them to see information that will help them understand and manage their usage in the way they want to. This interface will continually be developed to ensure the platform remains suitable, relevant, fresh and engaging. Additionally, we will trial and ultimately introduce more progressive tariffs designed to consistently encourage more sustainable use of water in the home. Versions of incentivised block weighted and seasonal tariffs form part of our development plan – all facilitated by the increased functionality that smart meters provide.

163. The household consumption reduction we are targeting is dependent on the implementation of new water efficient government policies. The WRSE regional plan, which has informed our WRMP, has modelled different implementation scenarios and the impact they have on consumption reduction. To meet the targets, set out in the Government's EIP, we require the following policy interventions being made:

(a) Mandatory water labelling for all water using appliances by 2024 – already committed to by the Government;

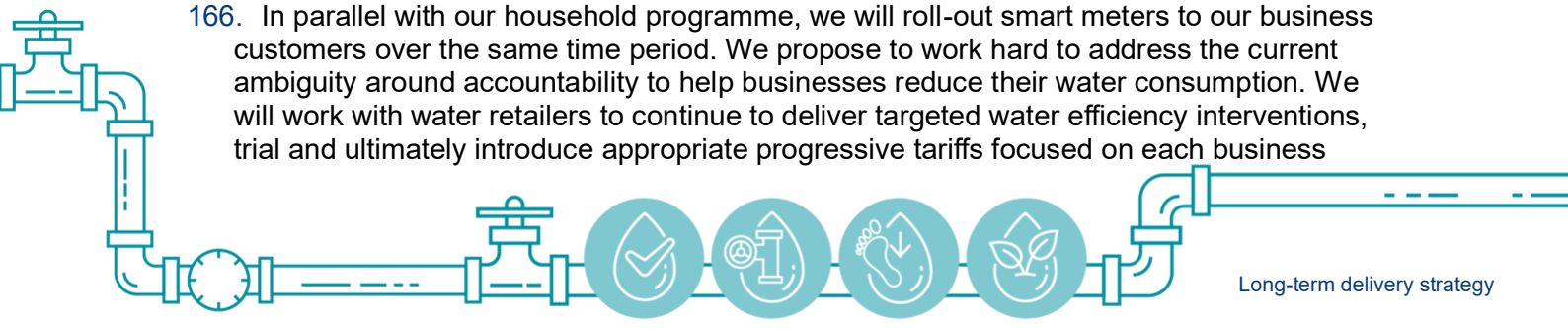
(b) Minimum standards for all water using products for sale in England by 2035; and

(c) Building regulations requiring higher water efficiency standards in new homes by 2040.

164. The WRSE regional plan includes sensitivity runs that show what alternative investment is required at a regional level if these policies are not implemented, in-line with the identified timings, and we address this in the assumptions and uncertainties section of Chapter 7 of this document.

165. Across our supply area, we serve around 14,000 non-household customers via a number of water retailers. Broadly speaking, these business customers fall into three categories: more than half (53%) are domestic-type businesses (possessing similar traits to households in terms of consumption and attitudes towards water use), 37% are commercial-type businesses and 10% are industrial water users. Currently, around 86% of the businesses we serve are metered. Daily consumption across this customer base ranges from a few litres per day to 1.5 million per day by our highest user.

166. In parallel with our household programme, we will roll-out smart meters to our business customers over the same time period. We propose to work hard to address the current ambiguity around accountability to help businesses reduce their water consumption. We will work with water retailers to continue to deliver targeted water efficiency interventions, trial and ultimately introduce appropriate progressive tariffs focused on each business



segment. Our focus on larger industrial customers will be more bespoke, with Gatwick Airport, our largest customer, being a primary focus.

Table 7: Pace of household and business smart meter roll out*

Target	2026	2027	2028	2029	2030	2031	2032
Smart metered properties %	14%	29%	43%	57%	71%	86%	100%

**Based on 87% total meter penetration.*
Source: SES Water rdWRMP24

Improve the environment and have a positive impact on our local area

Pollution incidents and discharge permit compliance

167. Our 2050 ambition is to not have caused any pollution categorised as serious or significant (known as category 1 and category 2 incidents) and minimise the occurrence and impact of pollution incidents categorised as minor (known as category 3 incidents). Doing so will reduce the impact our operations have on the environment.

168. We have a strong environmental record, having caused no category 1 and 2 pollutions to the environment for more than 15 years and consistently complying with our discharge permits. This is a result of our ongoing focus on the operation, maintenance and investment in all our above and below ground assets and the training and focus provided to our employees and supply chain partners. We will continue to maintain this strong performance as we know that our customers expect us to protect the environment and its health is essential for our service. Our commitment to halving burst mains will also reduce our environmental impact as category 3 pollution incidents are typically caused when treated water enters a watercourse. When category 3 incidents do occur (due to the after-effects of burst mains) we will ensure we respond, assess, report, mitigate and resolve appropriately.

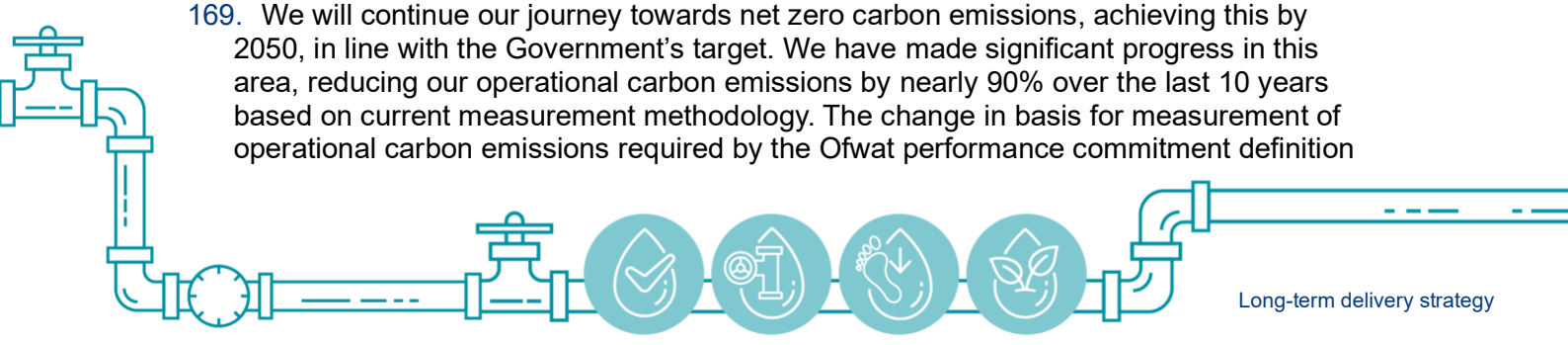
Table 8: Pollution incident (water) and discharge permit compliance performance forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Pollution incidents (category 1 and 2)	0	0	0	0	0	0
Discharge permit compliance	100%	100%	100%	100%	100%	100%

Source: SES Water Forecast Outcomes Data Table LS1

Greenhouse gas emissions

169. We will continue our journey towards net zero carbon emissions, achieving this by 2050, in line with the Government's target. We have made significant progress in this area, reducing our operational carbon emissions by nearly 90% over the last 10 years based on current measurement methodology. The change in basis for measurement of operational carbon emissions required by the Ofwat performance commitment definition



fundamentally changes both the levels of emissions we report, and our trajectory over the period to 2050, set out in the table below.

Table 9: Operational greenhouse gas emissions performance commitment forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Operational greenhouse gas emissions (kgCO2e/Ml)	367.98	339.7	328.4	327.5	324.9	322.2

Source: SES Water Forecast Outcomes Data Table LS1

170. The Ofwat performance commitment definition does not reflect reductions in emissions driven by reducing water demand, which is the primary focus of our net zero route map. It is instead heavily focussed on location-based interventions which for a company of our size and geography, are inefficient and difficult to deliver. In order to ensure we can continue to monitor progress against our 2050 net zero target, we plan to report against two additional metrics which we believe better demonstrate the work we will progress. One is focused on operational emissions and one on embedded emissions. Both are explained in Appendix SES063 PCDs and Additional Reporting Metrics.

171. Throughout our research programme customers have had polarised views about how quickly we achieve net zero. When presented with choices about how quickly we reach net zero and the cost of doing so, the majority (78%) of customers supported us achieving the Government's 2050 target, with half of customers choosing the option that had no additional impact on their bill. Just over a quarter supported us making more rapid progress to reach net zero operational emissions by 2030, a 75% reduction in total carbon by 2035 and net zero by 2050.

172. Having assessed the rate at which decarbonisation of the grid is happening and the impact that our ongoing work to reduce water use, become more energy efficient and reducing our reliance on fossil fuels will have, we have determined that aligning with the Government's target is the appropriate level of ambition as we don't have customer support to increase bills to go further in this area.

Enhancing our local environment and increasing biodiversity

173. Our region covers six river catchments the Eden, Mole, Darent (in largely rural surroundings), Wandle, Hogsmill and Beverley Brook (in largely urban or sub-urban surroundings). These ecosystems will provide the second area of focus for our biodiversity enhancement work.

174. Our 2050 ambition is to enhance the environment and increase biodiversity on the land we own and work on. Our operational sites are based across a mix of locations: generally urban or sub-urban in the north of our area and sub-urban or rural in the central and southern reaches. We believe the opportunity to deliver material and long-lasting biodiversity net gain on a number of these sites should be an integral part of our plan and welcome the inclusion of biodiversity enhancement as a common performance commitment.

175. Since PR19 we have seen our customers' attitudes towards the environment evolve and there is now a higher expectation for us to go beyond simply protecting the environment to actively improving it. We consider this to be in part a result of the pandemic, with customers recognising the link between access to a high-quality environment and their own wellbeing, particularly during lockdown periods. Furthermore, the increased awareness of issues facing our rivers, largely driven by the high levels of

publicity surrounding stormwater spills by wastewater companies and the increased popularity of sports like wild swimming and paddleboarding have brought river health into sharp focus for our customers. 71% of our customers believe investment in the environment is important or somewhat important and when presented with options, 72% opted for us to go beyond our statutory requirements.

176. The Government has committed to supporting nature recovery and increasing biodiversity and we believe we have a role to play in achieving this on our own sites and the areas we work. In fact, over the last five years we have improved the way we manage the land we own. This has led us becoming the first and only water company to hold the Wildlife Trusts Biodiversity Benchmark, which positions us well for the future.

177. Our plan aims to expand upon this work – and our learnings to date – such that our biodiversity performance commitment covers almost 80% of the land we own. Three operational sites – comprising over 260 hectares – will become our initial focus as their locations are strategically important in relation to the ability to progress landscape-wide biodiversity enhancement, along with improved amenity and educational opportunities as part of work to deliver ecosystem services. Our ambition is to create 530 new biodiversity units on our own land by 2050 – increasing the overall number of biodiversity units created by at least 25%. As our WINEP progresses over AMP8 we will nominate additional land to deliver biodiversity net gain, in partnership with other stakeholders. This is yet to be calculated.

178. The table below shows the net change in number of biodiversity units per 100km^2.

Table 10 Biodiversity net gain performance commitment forecast

Performance commitment	2025	2030	2035	2040	2045	2050
Net change in # of biodiversity units per 100km^2	0.00	3.01	3.61	58.34	63.99	63.99

Source: SES Water Forecast Outcomes Data Table LS1

179. Our WINEP contains investment to protect habitats in water sources from which we abstract water and to reduce the spread of invasive non-native species, both of which are statutory requirements. In addition, we want to go further to deliver a programme of work that will enhance the River Eden and River Mole catchments, the health of which we are reliant upon for our abstraction operations, to explore a range of nature-based solutions to improve both the water quality and quantity in these rivers. By working with nature, and delivering solutions in partnership with others, we will make water resources more resilient and deliver wider benefits including biodiversity enhancement, reducing flood risk and improved amenity. The delivery of our statutory and non-statutory WINEP schemes over the next 25 years provides the second tranche of biodiversity enhancement within our plan.

180. Customers are supportive of this additional investment in our environment, with 72% of customers opting for us to go further than our statutory environmental requirements.

C. Performance improvements from base expenditure

181. In this section we explain what level of performance we expect to achieve from base expenditure for each of the performance commitments we have set between 2025 and 2050. In the table below we summarise the level of performance we expect to achieve

form base and enhancement expenditure. Further details can be found in our main business plan submission Chapter 6 The outcomes we will deliver.

Table 11: Projected performance from base and enhancement expenditure for common performance commitments

Performance commitment	Unit	Target PCL vs base	2030 AMP8	2035 AMP9	2040 AMP10	2045 AMP 11	2050 AMP 12
Leakage	% reduction from 19/20 baseline	Delivered from base	-14.4	-16.4	-18.4	-20.3	-22.3
		Improvement from enhancement	-12.2	-21.7	-28.9	-35.0	-40.2
		Net performance	-26.6	-38.1	-47.2	-55.4	-62.5
PCC	% reduction change from 19/20 baseline	Delivered from base	-5.2	-6.9	-8.2	-9.2	-10.2
		Improvement from enhancement	-3.2	-5.2	-5.3	-5.2	-5.0
		Gov	-2.5	-3.9	-7.0	-8.7	-10.5
		Net performance	-11.0	-16.0	-20.5	-23.1	-25.7
WSI	Minutes per property	Delivered from base	00:03:41	00:03:31	00:02:29	00:01:58	00:00:59
		Improvement from enhancement	00:00:11	00:00:31	00:00:44	00:00:58	00:00:59
		Net performance	00:03:30	00:03:00	00:01:45	00:01:00	00:00:00
Mains repair	# repairs/ 1,000km main	Delivered from base	56.5	54.0	51.5	49.0	46.5
		Improvement from enhancement	-2.5	-5.8	-8.5	-10.6	-12.7
		Net performance	54.0	48.2	43.0	38.4	33.8
Unplanned outage	% of peak week production capacity	Delivered from base	1.13%	1.01%	0.76%	0.51%	0.26%
		Improvement from enhancement	-0.13%	-0.26%	-0.26%	-0.26%	-0.26%
		Net performance	1.00%	0.75%	0.50%	0.25%	0.00%
Water quality contacts		Delivered from base	0.60	0.55	0.52	0.46	0.40

	# of contacts / 10,000	Improvement from enhancement	0.00	-0.02	-0.04	-0.06	-0.07
		Net performance	0.60	0.53	0.48	0.40	0.33
Business demand	% reduction from 19/20 baseline	Delivered from base	-2.8	-4.6	-6.9	-9.3	-11.8
		Improvement from enhancement	-2.3	-3.5	-4.1	-4.6	-5.1
		Net performance	-5.1	-8.1	-11.0	-13.9	-16.9
Biodiversity	Net change in # of biodiversity units per 100km2	Delivered from base	2.41	2.89	46.67	51.19	51.19
		Improvement from enhancement	0.60	0.72	11.67	12.80	12.80
		Net performance	3.01	3.61	58.34	63.99	63.99
Greenhouse gas emissions	$KgCO_2e$ /Ml	Delivered from base	343.0	337.4	337.2	334.9	332.5
		Improvement from enhancement	-3.2	-9.0	-9.8	-10.0	-10.3
		Net performance	339.7	328.4	327.5	324.9	322.2

Source: SES Water Data Table LS2

How we've calculated what level of performance base expenditure will deliver

182. There is not a set method for projecting the level of performance that will be achieved from base expenditure in the future. There are a number of factors that could influence what is achievable in the future, including improvements in technology, better use of data and evolution of asset management strategies. Importantly – as we have stated elsewhere in our LTDS and PR24 business plan submission – it is the combination of our forecast enhancement and base expenditure that is needed to enable the delivery of our performance ambition, including forecast performance improvements from base. Key enhancement investments on our core pathway will provide the platform for our business to continue to drive performance improvements from base expenditure.

183. For example, as we have set out above, the fast-track investment in smart meters, is a strategic and enabling enhancement scheme for future AMPs, critical to our ambitions to reduce leakage, protect the environment and facilitate household and business demand reduction targets. Our investment in smart meters, and supporting infrastructure, will unlock opportunities to use new data to support more effective routine management and planning of our network, and greater opportunities to support customer behaviour change via support to and deeper engagement with our customers, including exploration of more progressive tariffs to help incentivise behavioural change. Similarly, many other opportunities to drive performance improvement from base are dependent on the supporting enhancement investment in our strategic plan.

184. In order to derive a projection of how much base expenditure will contribute to performance improvement in the future, we have developed an Excel tool that provides a disaggregated, three step approach to establish what performance improvements may be achievable from base. Appendix SES005A Explaining our costs sets out the approach. In summary:

(a) Step 1 – Define long-term performance ambition and delivery.

(i) For the core pathway, we define the total performance ambition for each Performance Commitment between AMP 8 and AMP 12

(ii) Split required expenditure amounts between base and enhancement in each AMP (derived directly from our Copperleaf valuation tool)

(iii) Identify which schemes are expected to contribute to performance improvements in future AMPs by PCL.

(b) Step 2 – specify the level of performance that will be delivered from individual options by the end of each AMP period.

(i) We attribute the forecast performance improvement to individual schemes and initiatives in each AMP (schemes can be both base, enhancement or a mix).

(ii) The level of attributable performance is then netted against the total level of performance that is forecast for each PCL (from step 1)

(c) Step 3 – The residual level of performance is apportioned between base and enhancement based on the split in cumulative TOTEX for those expenditure items that are relevant to that PCL.

(i) This is a simple assumption, that residual performance improvement (after Step 2) is attributed according to the split of base and enhancement spend for schemes expected to contribute to PCL improvement in our plan.

(ii) In practice, this final step is only used to allocate a relatively small proportion of residual performance improvement given that forecast PCL improvement is predominantly attributed directly in Step 2.

Performance levels from base expenditure

185. In the table above we show the level of performance improvement that we expect to achieve from base and enhancement expenditure, for each performance commitment in each AMP. Further details of the breakdown can be found in Data Table LS2.

186. In summary, we expect our forecast base expenditure to contribute to the following areas of forecast performance:

(a) Leakage: The base proportion of our leakage improvement relates to ongoing levels of activity in active leakage control, the operation and maintenance of our iDMA software and network sensors and our targeted mains replacement programme. Enhancement expenditure specifically focused on leakage and performance improvements we expect to achieve from smart metering and an increased rate of targeted water main renewal post 2030.

(b) PCC and business demand: we have assumed that a proportion of PCC and business demand reduction targets will be achieved from base schemes, including water efficiency self-service tools, free packs and visits, and our education provision to properties/premises. We expect enhancement spend to contribute to performance improvements, including the fast-track rollout of smart meters and developing progressive tariffs. PCC and business demand is an area where there is a considerable uncertainty of the pace of performance improvement that can be

achieved, given the behaviour change that is required of our customers. As discussed above, it is also a performance area where the level of ambition will in-part rely on the Government implementing water-efficient policies, that will make an important contribution to us achieving the proposed targets and without which, we are likely to fall short on our performance ambitions.

(c) **Water supply interruptions:** We expect a decreasing proportion of our performance improvement over successive AMPs to derive from our base spend. This includes initiatives related to maintenance of asset health, air valve replacement programmes, and our ongoing infrastructure and mains renewals and replacement programmes. We also expect our base spend on IT to contribute to WSI performance improvement over time.

(d) **Mains repair:** We have attributed performance improvements from our forecast ongoing base expenditure in air valve replacements and ongoing infrastructure renewals programme. This will support the performance improvements that we also expect to achieve from investment in DMA Asset Health and leakage reduction enhancement schemes.

(e) **Unplanned outage:** We have assumed that our ongoing base spend on AGA Maintain Asset Health and smart networks production capability will make a significant contribution to our performance ambitions in this area. We also propose to invest to enhance the resilience of our network infrastructure, which will contribute to unplanned outage reductions over time.

(f) **Water quality contacts:** We have assumed that improvement will primarily be delivered through base expenditure, with secondary benefits from other enhancement activity.

(g) **Biodiversity and GHG:** Through the widescale adoption of new management approaches across our nominated land, we will create an environment where good quality habitats can become established and be sustained. We will continue to adopt efficient and effective location-based interventions – primarily focused on energy efficiency – to help reduce carbon emissions but reassert that our net zero plan will be driven by market-based activity.

4. Our LTDS core adaptive pathway

In this section we present the core pathway of our long-term delivery strategy and the rationale behind our decision making. Our core pathway includes all the enhancement expenditure we need to meet our ambition between 2025 and 2050 across the majority of future scenarios. We explain why the investment identified is needed and how it offers the best value solution when compared to other options. We also set out the bill impacts associated with our core pathway across the 25-year planning period.

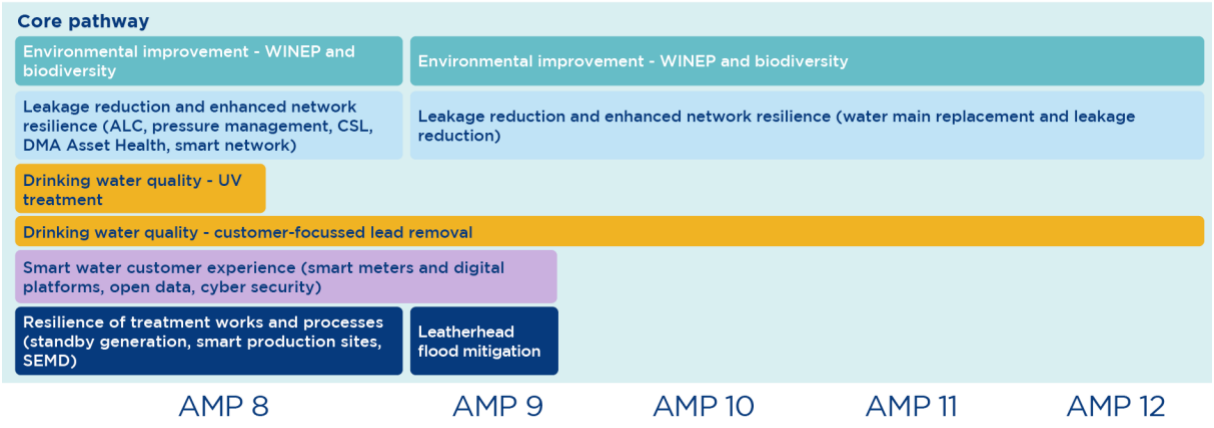
A. Introduction to our LTDS core adaptive pathway

187. We have identified a core adaptive pathway from 2025 to 2050, which includes the enhancement expenditure required to meet our long-term ambitions in the majority of future scenarios. It includes circa £56 million[24] of investment between 2025 and 2030 and £250.8 million in total over the 25-year period.

188. As described in LTDS Chapter 2, our core adaptive pathway represents our no and low regrets investment. We worked to ensure that our plans are optimised, having appraised a range of different options, and deployed the Copperleaf valuation framework and optimisation tools to ensure we invest in the most appropriate solution that delivers best value to our current and future customers.

189. The key elements of our core adaptive pathway are shown in the figure below.

Figure 3: Our core adaptive pathway



Source: SES Water

[24] Enhancement expenditure costs are pre efficiency savings detailed in Chapter 7 Explaining our costs of our main business plan submission and include £1.7 million of retail costs.

B. Core adaptive pathway enhancement investment 2025 to 2030

190. It can be seen from the figure above that the enhancement investment within our core adaptive pathway between 2025 and 2030 has been organised into five investment clusters:

(a) Drinking water quality enhancement;

(b) Enhancing the resilience of our water treatment works and processes;

(c) Additional leakage reduction and enhanced network resilience;

(d) Smart Water Customer Experience: Enhanced Smart Water Management, Open Data, and Security; and

(e) Environmental enhancement.

191. We provide detail of the investment required in each of these clusters (in 2022/2023 prices) and why it is needed in our core adaptive pathway. Detailed enhancement cases have been prepared and can be found in Appendices SES006 – SES010.

Drinking water quality enhancement

192. Drinking water quality enhancement expenditure is required to ensure we continue to provide high quality drinking water and address external risks that could compromise water quality and our ability to meet the regulations set by the DWI. It will enable us to maintain our strong performance against the Compliance Risk Index (CRI) and proactively remove more lead pipes to help protect public health. This enhancement expenditure, detailed below, falls into three categories:

- Installation of UV treatment at Kenley and Cheam water treatment works;
- Drinking water quality protection (WINEP schemes and investigations); and
- Our customer focused lead replacement programme.

Installation of UV treatment at Kenley and Cheam water treatment works	
Scheme description and driver	Enhancement expenditure needed to protect treated water quality from the risk of Cryptosporidium in raw, groundwater sources at Kenley and Cheam water treatment works. It involves the installation of UV treatment at both sites. The need for the scheme has been identified through our raw water monitoring programme, disinfection policy and Drinking Water Safety Plans and is supported by the DWI (Appendix SES011a – DWI Letters of Support UV installation and SEMD). Faecal indictors have been detected through our operational monitoring and there have been historical detections of Cryptosporidium at both sites. Delivery of the schemes will support the continuation of our industry-leading position against the Compliance Risk Index (CRI) and water quality contacts. It will also contribute to our strong unplanned outage performance by reducing the risk that water production is halted, due to water quality issues.
Cost	£5.21 million of enhancement investment is required.
Delivery	The UV installation will be completed by 2027.
Low/no regrets investment	It is no regrets investment as it is required in all scenarios to address an already known risk to drinking water quality and meet DWI regulations. The risk could increase further in an adverse climate change scenario due to greater fluctuations in groundwater levels and higher risk of sewer and surface water flooding.

	We considered three options in detail for addressing the risk associated with Cryptosporidium: • Catchment management; • Maintain interim solution that would use a temporary UV unit, hired and connected when required; and • Installation of permanent UV treatment.
Best value investment	The permanent UV treatment is the preferred option as it inactivates the Cryptosporidium and is the only way to fully mitigate the immediate risk of deteriorating water quality. Catchment management for a hazardous risk such as Cryptosporidium is unquantified, and its effectiveness is not guaranteed. Likewise, continuing with a reactive process is not considered an effective solution due to the level of risk. UV treatment would add a multi-barrier approach to disinfection in general, providing greater protection to water quality. Its installation will also enable us to review the current level of chlorine dosing with the potential to reduce chemical costs.
Further observations	UV treatment is currently only needed at two sites (it is already at Elmer and Bough Beech). The WINEP investigation completed in January 2022, identified the risk posed by surcharging sewers and recognised that it is outside the control of SES Water, with further catchment activities to focus on liaison with Thames Water. Further investment in UV is included in our high resilience alternative pathway should it be needed.

Drinking water quality protection	
Scheme description and driver	This enhancement expenditure includes schemes and investigations within our WINEP that are driven by the statutory requirement to prevent the deterioration of our raw drinking water sources from pollution in drinking water protected areas. Two catchment management schemes are planned for AMP8. The first aimed at addressing pollution from the pesticide flufenacet[25] in the Eden surface water catchment and Bough Beech reservoir and the second focused on nitrate pollution in the Brewer Street groundwater catchment. Long term monitoring data suggests a deteriorating trend for both of these parameters. Two investigations are also planned for AMP8. The first to better understand the interaction between the River Mole and elevated groundwater nitrate levels at Leatherhead and the second to investigate elevated nitrate in 14 of our boreholes all located within the Epsom North Downs Chalk groundwater body.
Cost	The enhancement expenditure required is £0.35m for the Bough Beech flufenacet scheme and £0.1m for Brewer Street nitrate scheme. A further £0.12m enhancement is required for two groundwater nitrate investigations.
Delivery	We expect the schemes at Bough Beech and Brewer Street to continue throughout AMP8 into AMP9. The investigations are due for completion by 2027.
Low/no regrets investment	The schemes are addressing a known risk and deteriorating trend of water quality. The schemes are needed in all scenarios to meet statutory requirements. The investigations are required to inform future investment decisions.

[25] Flufenacet is an oxyacetanilide herbicide

Best value investment	Both schemes will take a catchment-based approach involving a series of targeted interventions aimed at preventing deterioration with respect to flufenacet concentrations within the Bough Beech reservoir and to address nitrate pollution in our Brewer Street boreholes. Alternative treatment solutions were considered but screened out at an early stage as they are likely to incur greater cost and would not deliver any additional wider benefits for the environment and local community. Currently, our treatment processes and source blending are sufficient for ensuring the levels of flufenacet and nitrate are below drinking water limits, allowing us time to proceed with a catchment management solution.
Further observations	Future investment to address elevated groundwater nitrate in our Leatherhead boreholes and the boreholes forming part of the Epsom North Downs Chalk groundwater body investigation will be included in our future WINEP and our LTDS core pathway if required.

Customer-focussed lead replacement programme	
Scheme description and driver	Our ambition is to the replace the lead pipes that supply water to customers who are at most risk from lead exposure. This enhancement expenditure will involve the replacement of lead pipes – communication and supply pipes – at high-risk premises including schools, colleges and nurseries to eliminate lead exposure at these premises by 2030. This investment goes beyond our statutory duty to replace lead pipework when >10ug/l is found in drinking water samples at customers' homes and is supported by our customers. In our Bespoke 2 research, 76% of customers rated it important or very important to invest in lead pipe removal and 70% of customers chose an option that included us starting our lead replacement programme with a risk-based approach.
Cost	£3.8m of enhancement expenditure is required to deliver our customer-focussed programme.
Delivery	We will deliver lead replacement at circa 170 premises between 2025 and 2030. We will continue to deliver the same type of lead replacement works, systematically addressing the higher risk premises first, over subsequent AMPs
Low/no regrets investment	The eradication of lead from drinking water supplies is a core focus of the DWI. However, to achieve this in an economically viable manner, technological advancement is required to reduce the unit cost of pipe replacement, and it is likely that a change in law is required to facilitate ease of access to shared lead supply pipes located beneath homeowners' properties. Unless and until these changes arise, we are focusing our attention on the areas that present the highest risk to the public and where we have customer support for additional investment.

Best value investment	We looked at three options focused on the progressive removal of lead as part of an enhanced programme of works. These were: • Option (a) – Removal of all customer lead communications pipes by 2050 – which was deemed both cost prohibitive and of limited benefit, since properties would continue to have lead supply pipes; • Option (b) – The removal of lead supply pipes as well as communication pipes – which was also deemed cost prohibitive and legally highly challenging owing to the issue of shared supply pipes running through multiple properties; and • Option (c) – An approach focussed on this highest risk and highest exposure volumes, where a fully lead-free supply is provided at targeted premises. By adopting a lead-free approach to nurseries, schools and colleges, we are focusing resources on higher risk and higher 'volume' sites – meaning that the cost per unit of risk reduction is lower than in other applications.
Further observations	Over time, as technology moves on and unit costs reduce, we will continue to eradicate lead from the drinking water supplies of more premises, without incurring disproportionately high unit costs for the delivery of this work.

Enhancing the resilience of our water treatment works and processes

193. Enhancement expenditure is required to increase the resilience of our boreholes, water treatment works and other assets that are involved in the abstraction and treatment of water from external risks including climate change and third-party activity. It will ensure that unplanned outage levels remain low, and our water production process can continue seamlessly in the face of external events, so customers' water supplies are not impacted. This enhancement expenditure, detailed below, falls into the following categories:

- SEMD security requirements
- Site resilience standby programme
- Site generator connection points
- Leatherhead flood protection
- Bypass programme for service reservoirs
- Smart water production sites
- Run to waste facilities.

SEMD security requirements	
Scheme description and driver	Investment required to meet SEMD requirements, as identified through independent audit, with recommendations supported by the DWI (Appendix SES011) and included in our Drinking Water Safety Plan.
Cost	£1.7 million of enhancement expenditure.
Delivery	The work will be completed by March 2029.
Low/no regrets investment	This is no regrets investment as it is needed to meet the Government's SEMD requirements.

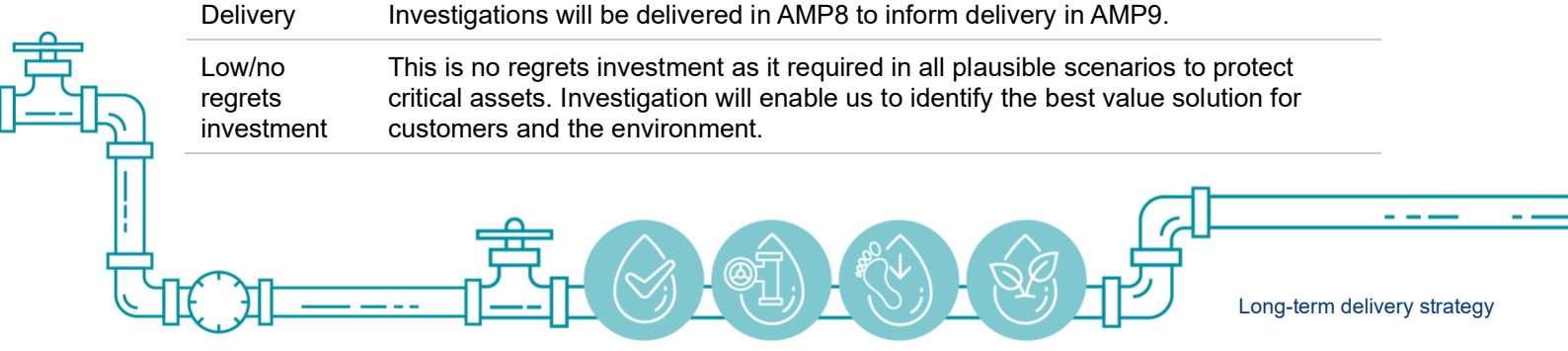
Best value investment	Investment covers new intruder detection at operational sites and fence replacement, alternative water provision and physical security uplifts at 30% of our sites including the replacement of doors, window bars and kiosks in order to achieve SEMD compliance. Equipment will be sourced through a National Protective Security Authority security catalogue and ensure competent internal resources for maintenance of new systems to reduce operational costs.

Site resilience standby programme	
Scheme description and driver	Enhancement expenditure is required to mitigate the risk of power outages at our Bough Beech treatment works that can result in unplanned shutdowns of the drinking water production process. It is part of our power management strategy, developed to mitigate the effects of increasing power outages that we are experiencing as a result of climate change. Since 2020 we have seen a 70% increase in the number of power outages at Bough Beech due to its rural location. The investment will enable the seamless, auto-synchronisation changeover from mains power to on-site generation, helping to mitigate the risk of water quality related incidents and unplanned outage.
Cost	£1.2million of enhancement expenditure is required.
Delivery	March 2029. We anticipate a six-month lead time and 12 months to deliver.
Low/no regrets investment	Investment at Bough Beech is needed due to address an existing problem under all scenarios.
Best value investment	We considered the following options: • Option a – Doing nothing and continuing to be exposed to and incur the costs and risks associated with repeated power outages on key sites; • Option b – Installation of battery technology as a form of large-scale uninterruptable power supply; and • Option c – The provision of power monitoring and auto-synchronisation changeover on priority sites in order to seamlessly switch to standby generation (already installed at these sites) and maintain stability of operation. Option c is considered the best value option as it takes a risk-based approach, prioritising the site that is most vulnerable. Option b is deemed highly expensive in mind of the average peak loads of these sites – around 1MW.
Further observations	We will continue to monitor power outages at our other sites as there is a chance they could increase as the climate changes. We have included further investment in our high resilience alternative pathway. Outage levels have not materially increased at other key sites in recent years and run at around 20% the levels of Bough Beech outages.

Site generator connection points

Scheme description and driver	Our power management strategy identifies the need to mitigate the risk of power outages at our 55 borehole and pumping station sites, increasing the overall resilience of our water production operation. It is required as the number of power outages is increasing, and the trend is for this to continue and become more widespread. It will involve installing connection points for standby generators so we can quickly and safely connect mobile generators and continue to supply raw water to our treatment works and maintain supplies to customers. It will enable us to meet the Government requirements through Programme Yarrow to be resilient to widespread power outages across our whole operational area, not just site-specific outages.
Cost	£1 million of enhancement expenditure is required.
Delivery	Delivery throughout AMP8.
Low/no regrets investment	This project was required in five of the eight common reference scenarios, with the more adverse climate change, demand and abstraction reduction scenario requiring an alternative project to install additional fixed generators at up to 10 of our most critical sites. The connection points that we would install as part of our core pathway investment could be used in the future to connect a fixed generator. We therefore consider this to be low or no regrets investment as it increases our resilience.
Best value investment	The options we considered were: • Option (a) – Do nothing and continue to run the risk posed by power outages; • Option (b) – Provide standby generation capability at all sites, thereby incurring significant cost and embedded carbon delivering new assets with average levels of utilisation below 1%; and • Option (c) – Provision of plug and play generation connection points at all critical sites, and the formalisation of the necessary hire agreements with providers of standby generation capacity. Option (c) was chosen, avoiding the significant cost of under-utilised assets in both investment and maintenance aspects. Furthermore, if DNO network stabilisation improves in the future, reducing the need for standby generation capacity, our chosen option would minimise the level of stranded assets which have little or no future use but increase our resilience to future events.
Further observations	Additional enhancement investment required if there were to be significant climate change impacts is included in our high resilience alternative pathway.

Leatherhead flood protection	
Scheme description and driver	Our Climate Change Adaptation report (SES004) has identified a heightened risk of fluvial flooding of our Leatherhead boreholes from the River Mole. These important boreholes help supply over 155,000 customers across Mole Valley and parts of the adjacent district councils and if they were to become flooded it is likely to take many days or potentially weeks before they are returned to supply owing to the risk of contamination of the aquifer with pollutants including highway runoff containing hydrocarbons.
Cost	£0.23 million of enhancement expenditure is required in AMP8.
Delivery	Investigations will be delivered in AMP8 to inform delivery in AMP9.
Low/no regrets investment	This is no regrets investment as it required in all plausible scenarios to protect critical assets. Investigation will enable us to identify the best value solution for customers and the environment.



Best value investment	Options we have considered. • Option (a) – new flood protection infrastructure; and • Option (b) – a catchment solution to reduce surface water flood risk. Our preference is to take option b catchment-based approach to investigate possible solutions and consider the wider benefits that could be delivered to the environment through partnership working. This work will enable us to look at wider management of water in the River Mole catchment to support ambition to enhance biodiversity and increase the resilience of our water resources. This work may be linked to future WINEP scheme delivery.

Bypass programme for service reservoirs	
Scheme description and driver	Service reservoirs provide local storage before water is supplied to customers. If a storage reservoir goes out of service due to water quality or integrity issues it can result in an interruption to customer supplies. This enhancement investment will put in place bypass arrangements around service reservoirs so water supplies can be provided directly into the DMA from our water treatment works to increase resilience and reduce the risk of supplies being interrupted.
Cost	£0.5 million of enhancement expenditure is required.
Delivery	March 2030.
Low/no regrets investment	This investment is required in all eight common reference scenarios. It will install bypasses at five critical sites including Headley reservoir, Outwood reservoir and North Looe reservoir.
Best value investment	We considered the installation of bypasses at all our sites or the prioritisation of the most critical sites. We have chosen to prioritise sites that supply critical customers such as Gatwick Airport, East Surrey Hospital and a large population that would cause significant disruption if removed from service.

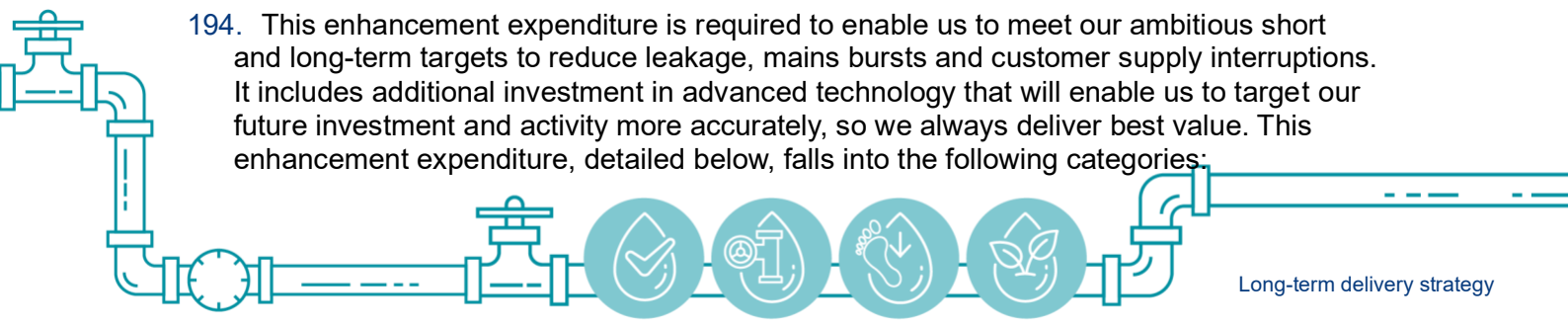
Smart water production sites	
Scheme description and driver	This project consists of two key areas. The first is to continue the roll out of 'Aquasuite OPIR' a smart tool from Royal HaskoningDHV that accurately predicts demand within a supply zone and uses these predictions to ensure abstraction, pumping, reservoirs and valves (abstraction, treatment and distribution) are optimised to meet demand with maximum efficiency and effectiveness. The second area is to enhance the capabilities of our current computerised maintenance management system (CMMS) to include the installation of next generation sensors across our treatment works and pumping stations to continuously monitor the health of our most critical assets, and ensure that our maintenance and investment programme is as efficient as possible, reducing plant failures which can impact our unplanned outage and water supply interruptions performance commitments.
Cost	£0.46 million of enhancement expenditure is required in AMP8.
Delivery	March 2030.
Low/no regrets investment	This investment is required in all eight common reference scenarios. It will extend our smart technology implementation across all our above ground assets so we can monitor our entire production and supply process.

Best value investment	We considered three options: • Option (a) – Maintain AMP7 coverage; • Option (b) – Fast roll out of 'Aquasuite OPIR' and CMMS upgrade; and • Option (c) – Slow roll out of 'Aquasuite OPIR' and CMMS upgrade. We selected Option (b), as our analysis identified this delivered the best value for customers. Smart production sites will deliver performance improvements across a number of performance areas and the faster roll out will enable us to do this more cost effectively than the proposed slow roll out. Better understanding our assets will allow us to better target planned interventions and avoid sub-optimal investment. It is a logical progression on the performance improvements we have delivered through our smart network in the current AMP and will continue to develop in AMP8.

Run to waste facilities	
Scheme description and driver	This enhancement investment is needed to meet regulatory good practice. Three of our water treatments works – Elmer, Kenley and Westwood – currently do not have facilities in place to enable us to quickly drain non-compliant water, should water quality fall below the required standards. This means that tanks would need to be returned to supply prior to receiving a verified sample result which is no longer permitted by the DWI. Currently, it can take up to 36 hours to drain and clean the tanks and wait for sample results that confirm water quality has returned to the necessary standards. During this time, we cannot treat any water at the site, and we are reliant on our other works to maintain supplies to customers. Installing run to waste facilities will enable us to remove non-compliant water more quickly.
Cost	£0.83 million of enhancement investment is required.
Delivery	March 2030.
Low/no regrets investment	Installing run to waste facilities is no regret's investment as it is needed in order for us to be meet regulatory expectations under all the common reference scenarios.
Best value investment	We considered three options: • Option (a) - Run to waste facilities at three sites to discharge water to waste; • Option (b) - Run to waste facilities to divert wastewater to the head of the works; and • Option (c) - Provision of additional infrastructure standby tanks and/or pipe work modifications. We selected Option (b), as it would be designed to return water to the head of the works to prevent waste and remove the risk of non-compliance with discharge permits. The option to build additional infrastructure does not offer best value at this time due to its higher cost, carbon cost and discharge compliance issues.
Further observations	Extra infrastructure could be required in a high climate change or high demand scenario, therefore we have included it in our high resilience alternative pathway.

Additional leakage reduction and enhanced network resilience

194. This enhancement expenditure is required to enable us to meet our ambitious short and long-term targets to reduce leakage, mains bursts and customer supply interruptions. It includes additional investment in advanced technology that will enable us to target our future investment and activity more accurately, so we always deliver best value. This enhancement expenditure, detailed below, falls into the following categories:



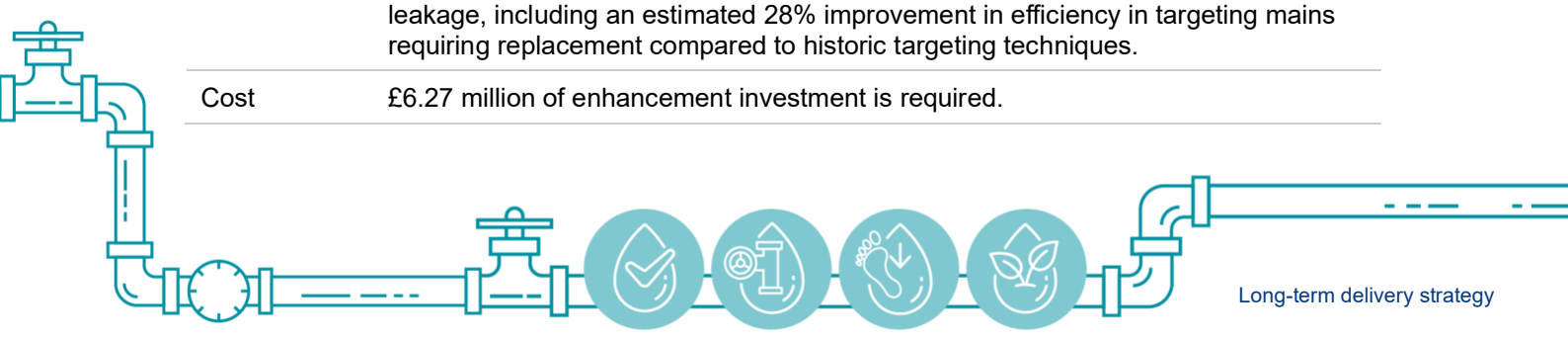
- Smart supply network enhanced usage;
- DMA Asset Health advanced usage;
- Active leakage control (ALC);
- Pressure optimisation programme; and
- Reducing customer side leakage.

Smart supply network enhanced usage	
Scheme description and driver	We rolled out smart technology across our supply network in 2022, through the implementation of enhanced sensors and artificial intelligence (AI) at DMA level. Our trials in the current AMP have shown there to be great potential in enhanced monitoring and analytics in more targeted areas. This enhancement expenditure will expand our current network through the provision of additional next generations sensors and software, and enhanced systems that will help localise leakage and other network events further so we identify them earlier and have more accurate information about their location so we can respond more rapidly. We anticipate that in DMAs where we adopt this technology, we will be able to reduce the leak location time by up to 75% by quartering the detection area for our detection field technicians. It will mean we can find smaller non-visible leaks faster and reduce their overall runtime and associated leakage impact. It will also allow for further trials with new technologies as they enter the market so that we can remain agile to new approaches and deliver continuous improvements.
Cost	£1.1 million of enhancement expenditure is required.
Delivery	Throughout AMP8.
Low/no regrets investment	It is no regrets investment and was selected by the Copperleaf optimiser in all the common reference scenarios. The initiative contributes to the delivery of our ambitious leakage reduction target across all the scenarios over the 25-year period by informing our active leakage control (ALC) activity which is a critical part of our ongoing leakage strategy. Our customers have told us they expect us to go beyond the Government's target to halve leakage by 2050. To achieve our ambition to exceed this target and reduce leakage by 50% by 2041, we need to use our enhanced smart network to inform our ALC activity so that we will have fewer leaks at any one time and those that occur will run for less time. The combined effect is to reduce the overall volume of leakage at any given time. Leakage reduction at this rate is included in our WRMP, and is essential to secure resilient supplies to our customers and enable us to transfer water to our neighbouring companies Southern Water and South East Water, as part of the regional water resources plan. It will increase our resilience to severe drought and support the delivery of any future reductions in abstraction from our existing water sources. Furthermore, it will contribute to ongoing reductions to supply interruptions as we'll be able to respond to burst mains more quickly and, when they do occur, provide a better service to customers, including those who are vulnerable and require additional support, such as bottled water during such incidents. The combined scores of these values outweigh the cost to deliver the work.

Best value investment	In developing our LTDS we considered four options for this investment which were: • Option a - Maintain our current smart network (no enhancement funding needed); • Option b - Option (a) plus targeting the implementation of the enhanced smart network in 50% of our supply area; • Option c - Option (a) plus implementation of the enhanced smart network in 100% of our supply areas; and • Option d - Option (c) with additional enhancement to use the latest technology to create a fully integrated smart system to pinpoint network events down to property level. Our chosen option is (b) which our analysis shows offer best value for our customers at this time as it means we can build on our already industry-leading smart network at a pace that is in line with technology development in the sector and will focus on the areas where it will have the most impact. Our evidence to-date suggests that there is less benefit to be achieved in some DMAs, therefore we will target those where we are confident it will further enhance our leakage performance and it is no regrets investment. It is a logical progression from what we have delivered in the current AMP, adding further value and delivering benefits in a number of performance areas while remaining affordable for customers and avoiding sub-optimal investment.
Further observations	Like our DMA Asset Health programme, it is an excellent example of how we are using technology and data to inform our decision making to drive performance and deliver efficiencies for customers and it will continue to deliver benefits for future generations. We consider this will deliver a frontier shift in water supply interruptions and leakage reduction performance across the industry and will continue to share our learnings.

DMA Asset Health advanced usage

Scheme description and driver	Our DMA asset health initiative underpins our future ambition to reduce leakage, supply interruptions and mains bursts. This advanced diagnostic technology will enable us to the assess the condition of our underground pipework accurately and target our current and future investment in leakage and mains repair accurately, delivering best value for our customers. We will use the data to create advanced condition deterioration curves, enabling us to predict future performance and optimise our interventions in our future asset planning. A first for the UK water industry, it involves undertaking non-destructive, in-situ testing of our metal infrastructure to assess the residual thickness and therefore indicative condition and remaining useful life. We will complete the DMA asset health assessment across our entire network, giving us a full picture of asset health and performance. We will then conduct acoustic condition assessments of 10% of our asset base, which will provide ground-breaking insights into the rate of deterioration. By strategically selecting which mains to test, we will build up a representative sample of our network so we can make intelligence-led decisions on future asset interventions, our objective being to only replace water mains when they have reached the end of their useful life and there are not any less expensive or more environmentally preferable options available. Our leakage strategy requires us to use a range of interventions to achieve the ambitious target we propose from our already industry-leading position. This project offers a holistic approach and will provide tangible and sustainable benefits in leakage, including an estimated 28% improvement in efficiency in targeting mains requiring replacement compared to historic targeting techniques.
Cost	£6.27 million of enhancement investment is required.



Delivery	The investment proposed is phased so that by the middle of AMP8 we have completed the assessment of our entire network. This will enable us to target the most urgent assets for intervention or renewal and will inform our enhanced mains renewal programme from AMP9. The deterioration modelling across AMP8 and AMP9 will represent the first phase of our programme to continually monitor the health of our supply network, enabling us to make the transformation to proactive asset intervention.
Low/no regrets investment	This is no regrets enhancement expenditure as it was selected by the Copperleaf optimiser under all the common reference scenarios. It provides value across a broad range of network performance areas, specifically contributing to performance improvement in leakage, mains repair and water supply interruptions. The combined scores of these values considerably outweigh the costs to deliver the work and the sooner we build up our enhanced level of understanding the sooner we can use it to inform our investment decisions. In AMP7 it has already delivered 1.5 million litres per day of leakage reduction and contributed to reducing PCC, preventing mains failures and supply interruptions. We have seen from our work during AMP7, that using this technology reduces our reliance on more traditional active leakage control methods which require more physical resources and ongoing investment in leak locations technology such as acoustic noise logging devices.
Best value investment	We modelled four different options for this investment: • Option (a) – Complete the DMA Asset Health assessment started in AMP7 across our supply network; • Option (b) – As option (a) plus 10% retesting and deterioration analysis with work spread across AMP8 and into AMP9; • Option (c) – As Option (b) with all work completed in AMP8; and • Option (d) – As Option (c) but with 20% retesting and deterioration analysis. The preferred Option (b) has been selected as best value because it strikes the best balance between helping us achieve our ambitious targets with affordability. Using the optimiser, we have considered the cost constraints and phased the work to ensure that customer bills in the short-term are balanced with those of future generations. It is an excellent example of how investment in advanced technology will deliver long-term benefits and ensure that our future investment is well targeted and strategically planned so that we don't store up problems for the future and bills remain fair across current and future generations. We consider it to deliver best value for our customers.

Further observations	This investment is fundamental to our future below ground asset strategy. The work we complete in AMP8 will provide immediate benefit by helping us target our annual water main renewal programme. The enhanced understanding of network condition and rate of deterioration will enable us to target our future water mains replacement programme more accurately and replace our water mains at an appropriate rate, so we maintain our strong performance in the face of climate change. The Chief Executive of the National Infrastructure Commission wrote to Ofwat in May 2023,[26] expressing concern that the current rate of asset replacement in the UK, which averages at 0.4%, is too low and urged further work to develop a more in-depth and forward-looking assessment of asset health in the future, which we strongly agree with. We consider that our work in this area should make a significant contribution to developing this far greater understanding of the health of our underground assets and we would share the outcomes of our DMA asset health enhanced usage work with Ofwat to help the development of its work. We will continue to share our learnings with our industry colleagues so customers across the country benefit from our innovation and enhanced performance. To that end, we consider the approach we are progressing will be frontier shifting, as we are already in the industry upper quartile in all three measures, and we are the first UK water company to embed this advanced asset management technology into our investment decision-making process. Our industry-leading initiative will contribute to a step-change in performance across the industry.

Active leakage control	
Scheme description and driver	ALC or 'find and fix' is an integral part of our leakage strategy over the short and long-term, and that of all other water companies. We have a strong track record, having consistently met our leakage target over the last 20 years, even when faced with challenging weather events. We will use our smart network to proactively detect more leaks, including smaller leaks that are harder to detect using traditional methods, and fix them rapidly. Our ALC contract is industry leading and continues to be the only working model in the UK where our contractors are paid only for real volumetric reductions in leakage, enabled by our enhanced network data.
Cost	£1 million of enhancement expenditure is required.
Delivery	Across AMP8 we will deliver a further one million litres per day of leakage savings – around a 4.5% reduction in leakage. ALC continues to play a role in future AMP periods.
Low/no regrets investment	ALC is critical to us achieving the 26.6% reduction in leakage by 2030 (from 2019/20 levels) – in-line with the targets in the Government's Environmental Improvement Plan and achieving our long-term leakage target. To achieve this stretching target, we need to deliver a range of interventions across the 25-year period. Our modelling shows it is no-regrets activity as it is needed in all scenarios.
Best value investment	We favour a strategy of continuous focus and improvement in ALC, investing proportionally alongside other interventions while being ready to adapt as new technology and approaches are developed. We considered a range of ALC options, alongside the other interventions to meet a range of different leakage targets including one which is more stretching than what we have proposed. The option we propose offers good value for money and balances improved performance with affordability over the next five years, while making room for other intervention types such as asset renewal, which although more costly, offer more long-term benefit.

[26] National Infrastructure Commission: Letter to Ofwat on asset management (18 May 2023)

Pressure optimisation programme	
Scheme description and driver	Pressure optimisation, like ALC, is an ongoing part of our leakage strategy and critical to the delivery of our short and long-term targets. The programme will be informed by our DMA asset health initiative, enabling us to identify where pressure optimisation can deliver the most benefit and best value for money, the aim being for our network to be fully optimised by the end of AMP8. We have based our target on our experience in AMP7, where over the first three years of the AMP we have already reduced leakage by an estimated 1.5 million litres of water per day through pressure optimisation across half of our network. In AMP 8 we will appraise and deliver pressure optimisation across the remainder of our network, to achieve a further 2Ml/d of savings over the course of AMP8.
Cost	£2.1 million of enhancement expenditure is required.
Delivery	Across AMP 8.
Low/no regrets investment	Pressure optimisation is a tried and tested method for achieving sustainable leakage reduction and is no regrets activity as it is needed in all future scenarios to achieve our long-term leakage ambition. It is the least expensive way to reduce leakage which is important when considering customer affordability over the next five years. It will involve the delivery of multiple schemes per year (5 to 10), implemented on a DMA basis using our enhanced knowledge of our network extending pressure optimisation across our entire network. Having a fully optimised network will continue to deliver long-term benefits and contribute to our ambition to halve leakage by 2041, in line with our customers' expectations and as set out in our WRMP.
Best value investment	We have considered different levels of pressure optimisation and the role it plays as part of our wider leakage strategy. The investment in pressure optimisation we have put forward delivers significant benefits while keeping bills affordable for customers over the next five years. Pressure management provides instant and sustainable leakage savings and its relative low cost compared to other options means that it makes sense to maximise its use before moving on other interventions. By leveraging the benefits, it will provide us over the next five years, it will give us with a full picture of our long-term investment needs, so we can adjust our strategy if required.
Further observations	As well as recognising the short and medium term benefits it delivers in leakage reduction, it also has longer-term benefits as optimising pressure will help prolong the life our water mains and enable us to defer expenditure on them. In addition to reducing leakage, it is also a successful way of preventing burst mains, reducing the number of mains repairs and associated supply interruptions so provides benefits across a number of performance areas.

Reducing customer side leakage

Scheme description and driver	Customer side leakage (CSL) accounts for at least 30% of total leakage, with recent studies indicating it could be up to 50% of leakage in some areas. Historically, our ability to detect where CSL occurs has been limited to ALC activity or information fed back from periodic meter reading. More recently increased metering has begun to make it easier and smart meters, which provide near real-time data, will significantly improve our ability to detect leaks on customers' supply pipes more quickly and more efficiently. We anticipate that faster detection through smart meters will yield an initial reduction in leakage by at least 0.5 Ml/d in AMP 8 with further savings expected when our proposed 7 year roll out programme is complete in AMP9. This is a conservative estimate based on an assumption that 7% of properties will be found to be leaking when the meter is installed and then a 5% reoccurring breakout rate each year following the install. Knowing about leaks in near real time will help us to confirm them more quickly and work with our customers to get them fixed. The enhancement expenditure will enable us to deliver a circa 10-fold increase in CSL and establish dedicated resources to support our customers through the process, including a new legal compliance function and processes to ensure that all known leaks are repaired in a timely manner.
Cost	£0.5 million of enhancement expenditure is required.
Delivery	Across AMP 8.
Low/no regrets investment	The investment is needed in all scenarios to meet our leakage target. We have based our leakage benefit assumptions on a combination of theoretical modelling by industry specialists and through consultation and knowledge sharing with Anglian Water and Thames Water who have completed elements of their programme in AMP7 following the roll-out of smart metering technology in their supply areas.
Best value investment	This initiative offers excellent value for money to our customers due to the multiple benefits it brings. This includes the leakage benefits, helping customer to reduce plumbing losses (and therefore PCC), save money and have an improved customer experience. Establishing this programme in AMP 8 will enable us to defer necessary increases in investment in mains replacement to AMP 9.
Further observations	We will continue to work collaboratively with other utilities on this element of our plan a further example being our intention to work jointly with other utilities in the South East to develop consistent CSL policies, creating clarity for all customers.

Smart water customer experience: enhanced smart water management, open data and security

195. This enhancement expenditure will deliver a fully smart customer experience through the provision of smart meters to all customers. The benefits of the meters will be maximised by comprehensive data management and digital integration that will enable us to provide our customers with near real-time information about their water usage and deliver targeted and personalised communications to help them identify wastage within their homes and become water efficient. It will also enable us to open data, in line with Ofwat's expectations while ensuring we keep our customers protected from cyber-attacks. This enhancement expenditure, detailed below, falls into the following categories:

- Enhanced Smart Water Management (AMI Smart Metering): Smart metering of homes and businesses, enhanced data management, digital integration, interfaces and communication;
- Open data in the water industry; and
- Cyber Assessment Framework (CAF) and e-CAF Cyber security.

Enhanced Smart Water Management (AMI Smart Metering): Smart metering of homes and businesses, enhanced data management, digital integration, interfaces and communication	
Scheme description and driver	Providing smart meters to all homes and businesses will enable us to transform the way we serve our customers. The addition of smart meters to our already smart network will mean that we are able to monitor our entire water network, from treatment works to tap. It will provide us with detailed insight into where there are leaks and wastage and how customers are using water. Together enabling us to deliver our ambitious targets to reduce demand and leakage over the next 25 years. We project this will reduce household demand by 4.9 litres per person per day, business demand by 0.8Ml/d and reduce leakage by 0.5 Ml/d by 2030, as set out in our revised draft WRMP. We have accelerated our smart meter rollout over seven years – 2025 to 2032 – because it enables leakage to be reduced in a more affordable way over the AMP8 period and make quicker progress in reducing demand, in-line with government targets. This investment includes new digital technology enabling customers to access near real-time information about their water consumption in a secure and protected way. It will enable us to integrate our systems and data management so we can maximise the use of the additional data we gather and have one view of the customer. We'll use this data to provide enhanced, tailored, and regular communication to our customers to inform them about trends in their consumption, offer timely help and advice and where they can find further information and tools we provide. In addition, we will synchronise the data with external data sets as part of our Open Data in the Water Industry work. Through this advanced data analysis, we will identify our highest users and provide extra support through home visits, water audits and the provision of water saving devices to help them make savings. This enhanced communication and targeted water efficiency advice should reduce consumption by a further 2.2 litres per person per day.
Cost	£22.3 million of enhancement expenditure is required.
Delivery	Across AMP8 we will install 194k meters and put in place the data management, digital platforms and customer engagement required to maximise their usage.
Low/no regrets investment	This investment includes 202,530 smart devices that will replace the standard meters already in place in 85% of homes (by 2025) and businesses. This represents a rollout rate of 71% to both properties and businesses. This is no regrets investment as it is a critical enabler of our demand management activities, which are needed in all future scenarios to secure our water resources, increase resilience to drought and enable us to protect and enhance the environment by reducing abstraction from sources where it's no longer sustainable to take water.

Best value investment	The options we have considered relate to the pace of roll-out of AMI smart metering and how we prioritise its roll-out. We have considered a seven-year and 12-year AMI smart meter implementation, including associated technology. We discounted a 'do nothing' option and a rollout without the supporting technologies because this would leave us unable to achieve the Government's leakage and PCC targets. We also examined the possibility of mitigating costs by exploring a data management solution equivalent to the Smart DCC (Data Communications Company) solution seen in the energy sector. However, this would take time to develop comparative to our proposed solution which therefore better meets the urgency in which we need to reduce PCC and leakage. We do however anticipate this is a solution for future consideration and plan for our solution to help inform and steer policy setting in the case of data sharing principles, data standards, technology selection and procurement, implementation, and integration. A major factor in our decision to propose our preferred option of a seven-year implementation was based on a comparable cost per data read test. This analysis demonstrated that more expediated access to meter read data would equate to £8.00 lower cost per 1m data reads over the course of AMP8, or 61% lower cost per 1m data reads when compared with a twelve-year option.
Further observations	In the future, smart metering will enable us to offer more progressive tariffs to our customers. As well as incentivising efficient water use, we have the opportunity to help customers struggling to pay by offering a wider selection of tariffs to help keep bills affordable for all. As well as being essential investment to reduce leaks and consumption, this investment will help us improve our customer experience in the round. Increasing customer satisfaction and building trust will be essential to delivering the challenging and sustained reductions in demand that are required. The enhanced data we collect will also enable us to improve our demand forecasting and supply requirements and be more transparent about our water supply operation and how it is performing. We believe this is also an important aspect of building customer trust and confidence through our demonstrable work to invest in our operation and therefore the environment and our customer service.

Open data in the water industry

Scheme description and driver	We are committed to providing more open data as part of the existing Stream project collaborating with other water companies, including pioneering the industry's first water footprint dataset which is where we will combine our existing smart iDMA network and new AMI smart meter data amongst other internal and externally synchronised datasets to derive a detailed view of where and how all water within our business and region is being used. As recognised in Ofwat's H2Open – Open data in the water industry paper[27], there is a "huge untapped opportunity" and the case for change includes: innovation and collaboration; encouraging new business models; providing insights on company performance and assets to improve decision making; enabling companies to work collaboratively to use open data to tackle shared challenges and improving transparency. Our programme consists of three actions to deliver the open data element of our smart water customer experience: • Open data integration and governance development; • Reciprocal data share and procurement; and • SES Water footprint pilot.
Cost	£1.8 million of enhancement expenditure is required

[27] H2Open – Open data in the water industry: a case for change paper, October 2021

Delivery	Open data integration and governance development and reciprocal data share and procurement will be delivered by 2027/28. SES Water footprint will be delivered across AMP8.
Low/no regrets investment	Our strategic choices around our level of ambition are designed to ensure our plan is proportionate and pragmatic, based on our comparative size. Our strategy can be segmented and summarised into three key areas as follows: • Supply integrity and resilience; • Open learning; and • Enhancing Nature and Improving Lives. This strategy and how data plays a key role in it is supported by Ofwat's open data expectations, and therefore represents no regrets investment. This expenditure will ensure we stimulate more innovation and collaboration, encourage new business models and service offerings that increase efficiencies and enhance the customer experience, provide insights on company performance and assets, improving decision making, enable the use of open data to tackle shared challenges, and improve transparency and build trust with customers, communities, our regulators and stakeholders.
Best value investment	Investment in open data underpins delivery of many areas of our business plan. We have considered options related to the combination and timing of the work. In our early analysis and assessment, we discounted a 'do nothing' option because this would leave SES Water unable to manage and utilise data effectively relative to existing needs and future targets and open data requirements. Most of the expenditure (nearly £1.2m) relates to the introduction of open data integration connectors which enables others to connect directly into secure sources of data in real-time as required, as well as the continuous surfacing of the datasets to customer and community facing systems. In addition, it includes the procurement and ingestion of credit bureau data through a reciprocal share arrangement. This empowers our ability to validate data on a live and continuous basis, as well as blend it with other data points we do not organically capture or own. This will ensure the data we use and promote the sharing of will remain accurate and trustworthy. There is a final element of incremental investment (£0.6m) to develop the data model and representation of the SES Water Footprint. This is where we will combine the various datasets and provide a single source of these insights through a demonstration which can be shared, analysed, and mined by the masses for the purposes of improving ours' and others' understanding and resulting innovation, action and change in relation to our societal relationship and need for water use, now and into the future. This, we believe will help underpin future price controls as part our and others' LTDS plans and support our regulator(s) to deliver the step change and frontier shift(s) required to meet a range of futures as part of industry scenario planning.
Further observations	In the future, it will enable us to share and collaborate on AMI Smart Meter and Smart iDMA Network leakage data for modelling and analysis, and future water resources planning purposes, consumption, and PCC data, including how this relates to customer demographics, property type, and Priority Service needs. In addition, we will be able to synchronise and orchestrate AMI Smart Meter and Smart iDMA Network asset health data compared with other companies. We will also be able to better asses customer affordability and payment data relative to demographic, property type, and priority service to help support propensity to pay and affordability modelling compared with consumption behaviours and needs. This can help bill impact assessment research in future price reviews, as well as continue to share and enable an improved priority service made available through the use of open connectors to third parties and other utilities under the GDPR basis of legitimate interest.

CAF and e-CAF Cyber security	
Scheme description and driver	As we install smart meters and increase the amount of customer data we store and use, we need to enhance our cyber security measures to keep our customers' personal data safe and secure. This is in line with the DWI's enhanced Cyber Assessment Framework (e-CAF) targets, detailed in the DWI e-CAF letter dated 23rd June 2023. It also delivers the cyber security initiatives required across our Operational and Informational Technology estates to meet existing targets for resilience against limited capability attacks, sector specific profile for CAF, the 'DWI SSP', by 31st March 2025, and the new target for resilience against moderate capability attacks, enhanced CAF, the 'DWI ECAF', by 31st March 2028. The investment covers a Managed Detection and Response Service to provide comprehensive visibility and handling of security incidents. It combines 24/7 monitoring with a global team of security analysts and intelligent software, building on our current provision by responding to the ever-increasing cyber landscape, including Advanced Threats, Rapid Incident Response, freeing up limited IT capacity and resources, and to improve security posture and become more resilient to a potential attack by optimising security configuration and eliminating rogue systems. It also reflects that now we operate in a world of hybrid working practices, we can't rely on perimeter-based network security. We have adopted a 'zero trust' and secure by design approach focused to data and service protection that assumes an attacker is present in the environment. It can be expanded to include all assets (devices, infrastructure components, applications, virtual and cloud components) and subjects (end users, applications and non-human entities that request information), enabling us to cover the risk associated with this new technology and prevent data breaches. Each of these have received the support of the DWI to ensure we remain complaint under the NIS regulations.
Cost	£0.4 million of enhancement expenditure is required.
Delivery	This will be delivered in years one to three so that we can meet the e-CAF deadline of 31 March 2028.
Low/no regrets investment	It is no regrets investment to ensure we are complaint with DWI's e-CAF and is essential to support our smart meter roll out.
Best value investment	We have considered both an in-house solution and an outsourced solution for both the Managed Detection Response as a Service and Zero Trust system. Acknowledging that we have to invest to ensure we remain compliant with the CAF and e-CAF requirements, the main consideration is cost compared to effectiveness of the model and solution we embed. Developing an in-house Managed Detection Response is less cost efficient so we have selected an outsourced option which will also deliver greater resilience through third-party expert capability.

Environmental improvement

196. This enhancement expenditure is required to deliver our statutory obligations under the WINEP together with further environmental enhancements and biodiversity gain. This enhancement expenditure, detailed below, falls into the following categories:

- WINEP – environmental destination, low flows and protected landscapes;
- WINEP – river restoration;
- WINEP – Chiddingstone eel screens and invasive non-native species (INNS) washdown and monitoring;
- WINEP – River Eden catchment scheme; and

- Biodiversity net gain (BNG).

WINEP – environmental destination and low flow	
Scheme description and driver	This element of our WINEP is to investigate the impact of our existing abstractions on the environment and define the abstraction reductions required to support the sensitive catchments we operate in. It is a statutory requirement, focused on our groundwater sources within the Hogsmill, Wandle and Darent catchments, all of which are home to rare chalk streams, as well as the Eden groundwater catchment and Beverley Brook catchments – all of which we have committed to environmental destination in our WRMP. In addition, we are involved in a regional investigation into abstraction being led by WRSE. We will also complete an investigation into our Clifton's Lane water treatment works site which, when in operation[28], may have an impact on the Reigate Heath SSSI. The investigations relate explicitly to the abstraction reduction common reference scenario as the outcome of these investigations will determine where we will need to leave water in the environment, influencing the amount of water available in the future. Our next WRMP, which will be informed by the updated regional plan, will reflect this, enabling us to plan ahead with greater certainty.
Cost	£1.18 million enhancement cost for all AMP investigations.
Delivery	Across AMP8.
Low/no regrets investment	It is no-regrets as are needed to meet statutory requirements and inform our long-term plan to secure water resources and the future iterations of the WRSE regional plan.
Best value investment	Investigations will inform best value decision making.
Further observations	The level of abstraction reduction is a key trigger point in our adaptive strategy as it could require additional investment in new water sources, alongside our activity to reduce leakage and water consumption – which is set out in our WRMP alternative adaptive pathway.

WINEP – Chiddingstone eel screens and species protection	
Scheme description and driver	Within our WINEP there is investment driven by the statutory requirements to protect the habitats of species that share our water sources and environment and monitor INNS. The Chiddingstone project will install eel screens at our Chiddingstone pumping station, on the River Eden, and deliver the requirements of the eel regulations. We will also install a washdown facility at our Bough Beech reservoir and undertake a programme of INNS monitoring.
Cost	£2.0 million enhancement expenditure – Chiddingstone eel screens project £0.2 million enhancement expenditure – INNS washdown and monitoring
Delivery	INNS monitoring completion by April 2027[29], Chiddingstone project completion by September 2027; and washdown facility completion by March 2030.
Low/no regrets investment	No regrets investment as required to meet statutory requirements.

[28] Our Clifton's Lane site is brought into operation as a supply side option for our Drought Plan.
[29] References the Environment Agency WINEP completion date, but we intend to monitor throughout the AMP.

Best value investment	We conducted high-level screening of five different options for the Chiddingstone project, all of which involve the replacement of the existing non-compliant eel screens: • Option (1a) – Installation of Hydrolox screens at the upstream end of the intake lagoon. Two variants of this option were considered, an option that was compliant with the Eels Regulations and an option that was compliant with the site-specific constraints recommended by the Environment Agency; • Option (1b) – Installation of Hydrolox screens at the location of the existing coarse bar screen. As above, two variants were considered; • Option (2) – Installation of Passive Wedge Wire Cylinder screens at the upstream end of the intake lagoon; • Option (3) – Replacement of the existing band screens and inclusion of a fish recovery and return system; and • Option (4) – Replacement of the existing band screens with Geiger MultiDisc screens and inclusion of a fish recovery and return system. We also considered but discounted behavioural deterrents and the KLAWA eel pass system as they were less effective at preventing eel passage, and we discounted sub-gravel intakes as implementing a system at the Chiddingstone intake would have required significant capex. Option (3) and (4) were discounted due to high costs. We have selected Option (1b) (site-specific compliance) as our preferred option. Although it is not the lowest cost option, we have discounted the lower cost options for the following reasons: • Option (2) will potentially reduce the hydraulic performance of the intake and has an onerous construction scope; and • Option (1b) (Eel Regulations compliant) does not offer the level of compliance preferred by the EA as the approach velocities exceed 0.3m/s.

WINEP – River Eden catchment scheme	
Scheme description and driver	Our engagement with customers and stakeholders has shown support for us to go beyond our statutory requirements and carry out further work to enhance our local rivers. We have identified the opportunity to deliver a catchment and nature-based solution in the River Eden catchment that will align with the aspirations of the Government's 25-year Environment Plan. The schemes objectives are to enhance the management of water within the catchment, making this important source of water that we rely upon to refill Bough Beech reservoir more resilient while also delivering wider environmental improvements and increasing biodiversity.
Cost	£0.36 million enhancement expenditure is required, split across the WINEP investigation and proposed work to initiate the first in-catchment solutions.
Delivery	The initial investigation will be delivered in AMP8.
Low/no regrets investment	This investigation is supported by customers and is aimed at informing catchment scheme and interventions that deliver water resource resilience benefits. Longer term, we consider there to be opportunities to change the way we abstract from the River Eden, making more water available at critical times and supporting the transfers to other water companies identified in the WRSE regional plan and our WRMP. This could remove the need for us to increase the capacity of Bough Beech reservoir, a scheme that is included in our adaptive WRMP and required in more adverse future scenarios, just after 2050. We have included the preparatory work required for this scheme within our alternative adaptive WRMP pathway.

Best value investment	The investigation will lead to detailed development of the scheme. We plan to deliver interventions in partnership and have initiated relationships with key stakeholders (including the Environment Agency, Natural England, local planning authorities, WRSE, Southern Water, the agricultural sector, South East Rivers Trust SERT, local wildlife trusts and the built environment sector) to scope out the wider benefits that could be delivered. We envisage partners and funding to become available in due course as these investigations progress.

Biodiversity net gain	
Scheme description and driver	We are committed to enhancing biodiversity, across both our owned land and the extent of our supply area. Building on the foundations of two (soon to be three) Biodiversity Benchmark awards, we propose to nominate four key sites (amounting to 80% of our owned acreage). These sites are strategic in terms of their locations in relation to other biodiversity and environmental habitat designations and will be the subject of concerted biodiversity enhancement schemes, and combined, will see a BNG of 23% over AMPs 8 to AMP12. These sites include the Bough Beech estate and Fetcham Springs – areas that also provide significant benefit to their local communities. Over AMP8, the development of our WINEP schemes, and site-specific investigations will provide insight into areas outside of our ownership where we can provide further biodiversity net gain through working in partnership with others. We will nominate further land and assess the level of BNG possible as we collaboratively develop scopes of work and understand the impact we are able to have.
Cost	£0.3million enhancement expenditure
Delivery	1.2% in AMP8, increasing to 23% in AMP12.
Low/no regrets investment	No regrets investment as required to meet statutory requirements of PR24 performance commitment.
Best value investment	We have considered the extent of our land holdings and chosen sites where we can deliver significant biodiversity net gain, whilst also contributing to the communities formed through use of the sites. For example, at Bough Beech, the work done on BNG will have a diverse range of benefits for all stakeholders and land users at the site – from the charity work done at Bore Place, to the sailing and angling clubs.
Further observations	WINEP programmes such as the River Eden catchment scheme will provide opportunity for a holistic approach to environmental enhancement – and form the basis of further nomination of land for BNG.

C. Core adaptive pathway enhancement investment 2030 to 2050

197. In this section we summarise the enhancement expenditure required from 2030 to 2050, and break this down by AMP period, with the projected level of additional investment required for each enhancement expenditure area which includes:

- WINEP drinking water protection
- Customer-focussed lead replacement
- Leatherhead flood mitigation

- Leakage reduction (excluding mains replacement)
- Water mains replacement
- Continued smart metering; and
- River Eden environmental enhancement.

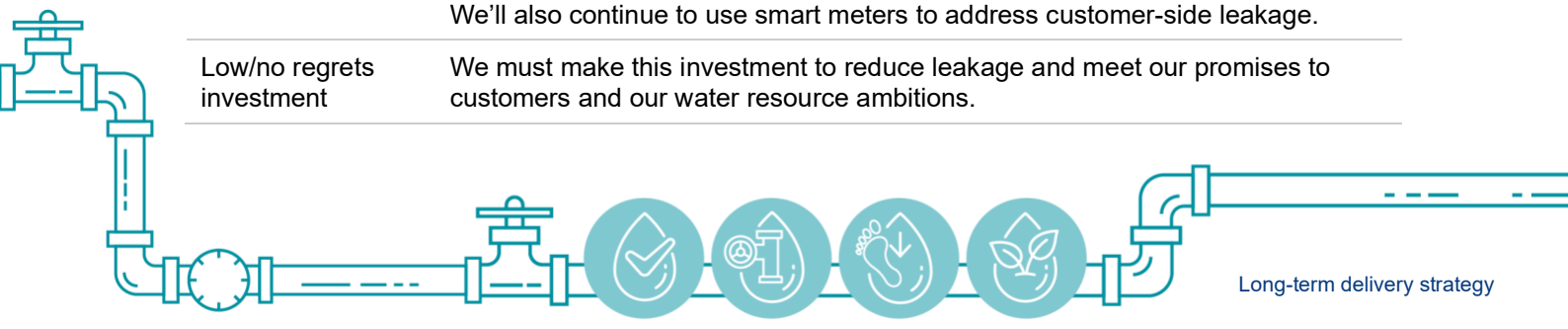
WINEP drinking water protection	
Scheme description and driver	Catchment work to address flufenacet at Bough Beech and nitrates at Brewer Street will continue in AMP9.
Cost	£0.4 million enhancement costs for Bough Beech. £0.1million enhancement costs for Brewer Street.
Delivery	AMP 9.
Low/no regrets investment	No regrets investment informed by investigations and needed in all scenarios to mitigate a known risk and avoid the need for additional treatment facilities.
Best value investment	As well as their probable primary WINEP drivers, these catchment schemes can deliver wider environmental benefits and we will look to increase biodiversity on third party land.
Further observations	AMP8 WINEP investigations could drive additional investment in AMP9 and beyond, costs for these have not yet been assessed.

Customer focussed lead replacement				
Scheme description and driver	In AM9 to AMP12 we will continue to take a risk-based approach to replacing lead pipes at premises frequented by people most at risk of lead exposure.			
Cost	AMP9 - £3.4m enhancement	AMP10- £3.4m enhancement	AMP11- £3.4m enhancement	AMP12- £3.4m enhancement
Delivery	Our ambition is to replace the lead pipes that supply water to customers who are at most risk from lead exposure. This enhancement expenditure will involve the replacement of lead pipes – communication and supply pipes – at high-risk premises including schools, colleges and nurseries to eliminate lead exposure at these premises by 2030. We will continue to deliver the same type of lead replacement works, systematically addressing the higher risk premises first, over subsequent AMPs, this includes childminders, hospitals and maternity units, church halls, play groups, community hubs and sports clubs. Alongside this programme we will continue to work at removing lead pipework connected to social housing, much of which is on larger diameter pipework on shared common services. AMP9 – continuation of focus on schools, colleges and nurseries. AMP10 – completion of schools, colleges and nurseries. Provision of lead replacement to childminders. Review and replacement of service pipework at hospitals and maternity units. AMP11 – Review and replacement service pipework to church halls, playgroups and community hubs. AMP12 – Completion of other previous areas of focus and offering to sports and leisure clubs and facilities.			

Low/no regrets investment	The risk-based is supported by customers and will enable us to continue to replace lead pipes in a cost-efficient way until there is a change in technology, legislation or regulatory requirements relating to lead pipe removal.
Best value investment	As per AMP8 investment decision making.
Further observations	We will refine our costs and programme based on our experience of delivery in AMP8.

Leatherhead flood mitigation	
Scheme description and driver	This scheme will deliver the necessary flood mitigation required at Leatherhead. Our preference is to pursue a catchment-based approach and use natural flood management techniques to protect our boreholes and infrastructure, which is investigated in AMP8, However, we have expressed the costs associated with an infrastructure scheme at this point as a worst-case option.
Cost	£1 million of enhancement expenditure.
Delivery	AMP9.
Low/no regrets investment	Low regrets investment as protecting a critical site from flooding.
Best value investment	The catchment scheme has potential to contribute to wider water management in the Mole catchment and enhance the resilience of our water sources and infrastructure whilst increasing biodiversity. The AMP8 investigation will set out more detailed options that allows us to make a certain case for the best value investment.
Further observations	If a catchment scheme is possible, we envisage additional partners and funding will become available (as the AMP8 investigation progresses and we identify the wider benefits of a green infrastructure solution together with a catchment stakeholder mapping exercise).

Leakage reduction (excluding water main replacement)				
Scheme description and driver	This investment is required to deliver our leakage reduction strategy between AMP9 and AMP 12 to achieve our target of over 62% leakage reduction by 2050. It comprises enhanced expenditure for additional ALC, smart network enhancement and DMA Asset Health investment, and will also contribute to mains repair and supply interruption performance.			
Cost	AMP9 - £5.2m enhancement	AMP10 - £3.6m enhancement	AMP11 - £4.3m enhancement	AMP12 - £5.6m enhancement
Delivery	In a continuation of our leakage reduction programme from AMP8 we will target leakage reductions across a range of intervention strategies, splitting our efforts in areas of Prevent, Aware, Locate and Mend (PALM). Our strategy in this area will comprises of continuing to enhance our smart network and use it to finetune our ALC processes to ensure we maximise the potential from our investment, apply new technologies and approaches to deliver continuous improvements. We'll also continue to use smart meters to address customer-side leakage.			
Low/no regrets investment	We must make this investment to reduce leakage and meet our promises to customers and our water resource ambitions.			



Best value investment	We will continually access the effectiveness and efficiency of our leakage reduction strategies, ensuring that we are delivering value for money for our customers. Part of this commitment will be to constantly look to integrate new technologies and approaches into our operations
Further observations	This programme offers wider resilience benefits in addition to the leakage reduction benefits.

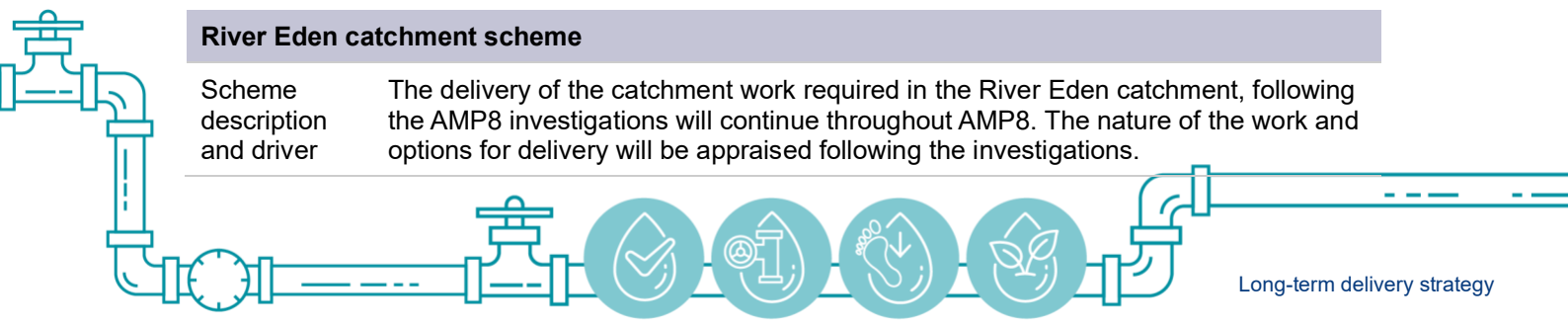
Water mains replacement programme

Scheme description and driver	From 2030 we will increase the rate at which we replace old water mains to enable us to meet our long-term performance ambitions for leakage, mains repairs and supply interruptions. The generally good condition of our water mains is reflected in our current industry leading performance in mains repair and supply interruptions. However, our network is ageing, and by AMP9 the average age of our pipes will be 70 years and we will need to begin targeted enhanced mains replacement to both maintain service and deliver the improved performance we are targeting. We currently replace our water mains at the rate of 0.3% per year funded by £33 million of base expenditure. Driven primarily by the need to maintain stable serviceability on our network and meet our performance commitments for mains repairs and supply interruptions (SI3). In AMP8 we have also committed to use mains renewal to help us reduce leakage and exceed the Government's leakage reduction target, in-line with our customers' expectations, we expect to increase our mains replacement rate to 0.9% per year in AMP9 and then to 0.6% per year in each AMP thereafter. This rate of improvement will, combined with our other leakage activity, reduce leakage by 38% by the end of AMP 9. It will also reduce supply interruptions to 03.00 minutes per customer per year and mains repairs to 52.7 repairs per 1,000km by 2035.			
Cost	AMP9 – £60m enhancement	AMP10 - £30m enhancement	AMP11 - £30m enhancement	AMP12 - £30m enhancement
Delivery	We will target at least a 1Ml/d reduction in leakage through targeted asset renewal per AMP starting in AMP9. This equates to a third of our leakage reduction volume and will require us to replace an additional 50-100km of mains in each AMP (1.5-3% of our network). We passionately advocate asset renewal as an integral part of our medium to long term leakage reduction strategy as it delivers sustainable benefits in the long term and good value and service to our customers. AMP9 sees elevated asset renewal costs compared to the later AMPs for two principal reasons. Firstly, it's an enhanced programme targeting a least 20km per year, following the decision to defer this activity in AMP8 in order to keep bills affordable and secondly, we assume that by AMP10 new innovative pipe laying techniques will be market ready and will drive down the cost of renewal/refurbishment.			

Low/no regrets investment	Our leakage strategy includes a range of intervention-types and we have assessed the balance and sequencing of these different interventions across the planning period. Mains replacement is the most sustainable way to address leakage caused by ageing infrastructure, however it is also the most expensive option. Saving 1 Ml of water through mains replacement costs £60m compared to £1.2m for ALC or £1m for pressure management. Whilst ALC and PM are clearly cheaper they are also limited in their potential and so as we progress though our reduction plan mains renewal is an essential part of our strategy. Using our industry leading DMA Asset Health initiative, we have identified the optimal strategy for mains replacement, balancing improved performance with affordability. We have sequenced this investment alongside other interventions, maximising the leakage reductions we can deliver from less expensive interventions first. From AMP9, our modelling shows that the other interventions will no longer be enough to achieve our ambitious leakage target and that our mains will have deteriorated to a point where an enhanced replacement programme is required. It is no regrets investment to achieve our long-term leakage target, mains repair and supply interruption targets.
Best value investment	Our calculated decision to defer enhancement investment to AMP 9 is based on the confidence we have in the condition of our assets based on the knowledge gained from our recent condition assessment, which will be built on during AMP8. As highlighted in Section B, our DMA Asset Health project will enable us to target our mains replacement work more accurately and the use of this advanced assessment technique in our decision making will ensure that we make no-regrets investment in mains repairs. It will also ensure that we replace mains at the optimum rate for the future and deliver best value to our customers. We have considered affordability when putting forward this enhancement expenditure in AMP9 and beyond. Whilst we recognise mains replacement is more expensive, we cannot defer investment beyond AMP9 without storing up problems for future generations, which could be compounded if we experience a higher climate change scenario.
Further observations	We continue to work collaboratively with the industry to find new, more efficient ways of renewing of refurbishing mains with the aim to extend asset live and reduce leakage in the most cost-effective way possible.

Continued smart metering rollout	
Scheme description and driver	Continuation of smart meter roll out across household and business customers by 2032 to achieve 90% smart meter penetration.
Cost	£6.8 million enhancement expenditure.
Delivery	Completion by March 2032
Low/no regrets investment	No regrets investment as will enable delivery of PCC and business demand reductions required by government and included in our WRMP.
Best value investment	As described in Section B, above.

River Eden catchment scheme	
Scheme description and driver	The delivery of the catchment work required in the River Eden catchment, following the AMP8 investigations will continue throughout AMP8. The nature of the work and options for delivery will be appraised following the investigations.



Cost	We anticipate enhancement funding in the region of £0.66million which we will refine as part of the AMP8 investigation.
Delivery	AMP 9
Low/no regrets investment	This forms 'phase two' of our catchment approach to the Eden catchment, following the 'phase one' investigation in AMP8. It is no regrets investment as we work with partners and share funding to implement catchment and nature-based solutions in the catchment to address local flooding issues, improve our river abstraction (at sustained flow), improve water quality at source and ultimately reduce the need for increased storage at Bough Beech.
Best value investment	Our AMP8 investigation will define appropriate catchment interventions and quantify, with greater certainty, the best value assessments for the interventions it is appropriate for us to support (such as where there are benefits to our operation and customers). We will therefore refine our future cost assessments on this basis.
Further observations	Improvements to the catchment and development our supply options relating to Bough Beech and the River Eden will inform our WRMP to seek best value in managing our water resources. We have also included £0.4m for biodiversity net gain across the remaining AMPs.

198. It is likely that further environmental enhancement scheme opportunities will be identified following AMP8 WINEP investigations. Where possible we will work in partnership and use natural features and processes to deliver multiple benefits to the environment, including biodiversity net-gain.

D. Core adaptive pathway – bill impacts

199. The bill impact of our core pathway can be found in data table LS7. We summarise the bill impact per AMP in the table below. The increase in AMP9 is primarily due to the increase in water mains replacement to reduce leakage.

Table 12: Core pathway bill impact

Bill impact (Average change in bill per AMP)	AMP8	AMP9	AMP10	AMP11	AMP12
LTDS core pathway	£14.09	£29.82	£35.93	£35.75	£35.49

**Price base 2022/23 FYA (CPIH deflated)*
Source: SES Data Table LS7

5. LTDS alternative adaptive pathways

In this chapter we explain the two alternative adaptive pathways within our LTDS, covering our strategy and rationale. Each pathway contains an alternative investment programme, where the investment would be triggered by specific scenarios, enabling us to look ahead and plan for future uncertainties, should they develop. Our first alternative adaptive pathway reflects the reported pathway of our WRMP. Our second alternative adaptive pathway is a high resilience pathway, where we need to increase investment in a more adverse climate change scenario. We also include details of how we will monitor the scenarios we have planned for and their respective trigger points.

A. Alternative adaptative pathways

200. Our alternative adaptive pathways include packages of investments that would only be required under specific circumstances. These are higher regrets activity as they are only required in more adverse scenarios.

201. We have considered the common reference scenarios provided by Ofwat to identify the no and low regrets investment that is required in all or most scenarios and this has been included in our core pathway. In addition, we have identified specific investment that is only required in certain scenarios and have grouped this into two alternative adaptive pathways:

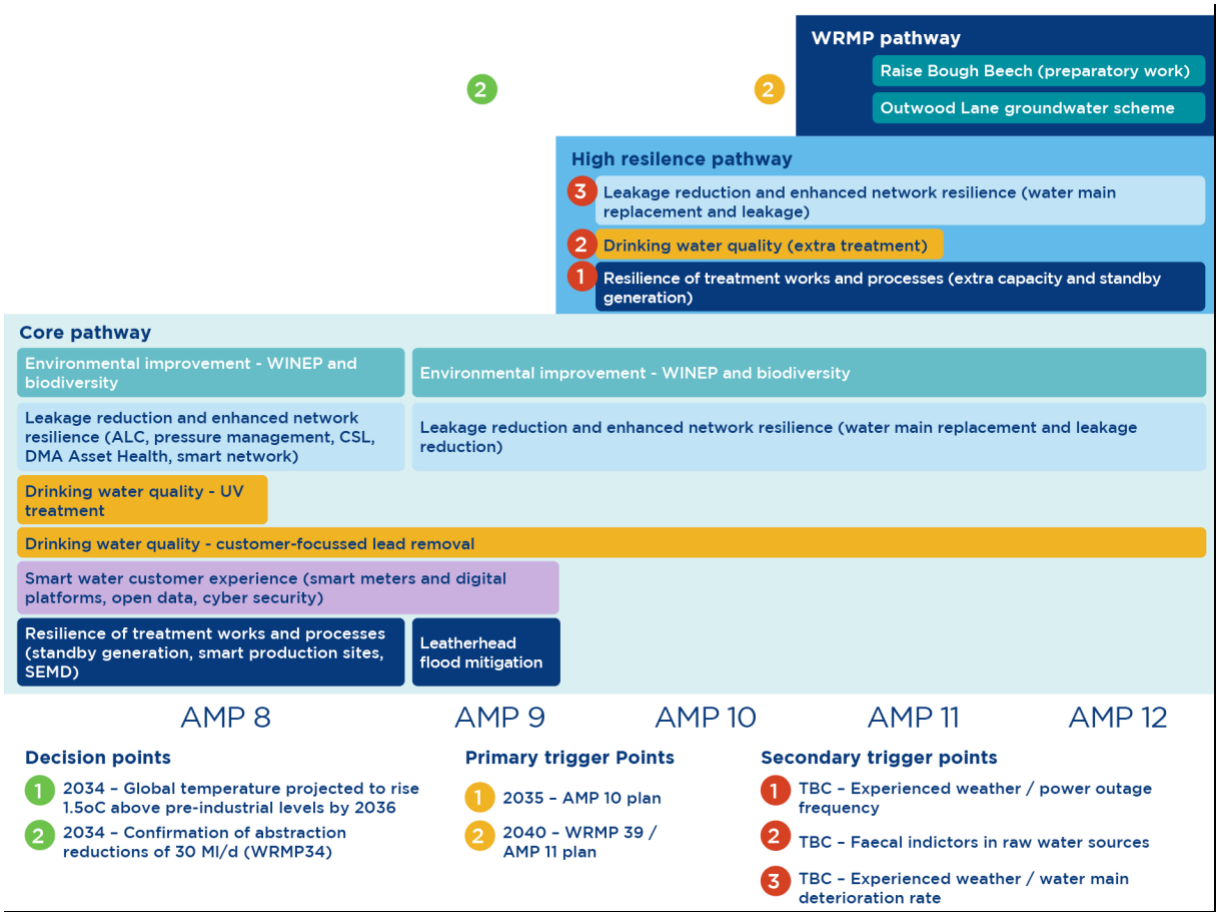
(a) Our WRMP alternative adaptive pathway;[30] and

(b) Our high resilience alternative adaptive pathway.

202. The figure below summarises our LTDS core and alternative adaptive pathways and their respective trigger points.

Figure 4: Our LTDS core and alternative pathways

[30] We note that whilst the genesis of this alternative adaptive pathway is the WRMP process, it does, however, include a range of enhancements that would otherwise be required to deal with some of the changes in the external environment inherent in the common reference scenarios, particularly the adverse scenarios relating to demand and climate change.



Source: SES Water

B. WRMP alternative adaptive pathway

203. Our WRMP alternative adaptive pathway reflects the reported pathway of our revised draft WRMP. Our WRMP has been informed by the WRSE regional plan, and both meet the requirements of the Water Resources Planning Guideline (WRPG) produced the by the Environment Agency and Ofwat.

204. The WRSE regional plan and our WRMP are both adaptive, has and have used similar but not completely aligned scenarios to those required in our LTDS, covering a wider range of future scenarios. The adaptive regional plan[31] is made up of nine pathways that each plan for a different combination of population growth, climate change and abstraction reduction forecasts as these are the primary drivers of our future water needs. Each result in a different shortfall in regional water supplies. The regional plan identifies the optimum programme of investment by the six member companies to address the deficit and secure water supplies for the future in a timely manner. Our WRMP reflects our share of this investment.

205. WRSE has identified a reported pathway that is the best value way of meeting the statutory requirements and regulatory and policy guidance, that complies with the WRPG. The WRSE reported pathway is the basis of our revised draft WRMP published in August 2023. Our revised draft WRMP is presented in our LTDS as an alternative adaptive pathway, as required in Ofwat's LTDS guidance.

[31] WRSE revised draft regional plan (August 2023).

206. The WRMP alternative pathway is set out in PR24 data table LS3a and shown in the figure above. It aligns with our core pathway and includes the investment in leakage reduction, household demand and business demand that will enable us to meet the interim targets set out in the Government's EIP and secure the supply demand balance. It also enables up to four transfers to be provided to Southern Water and South East Water identified by the regional plan to increase connectivity and move water around to optimise supplies across the region. The enhancement investment required to deliver these transfers is included in the receiving companies' plans.

207. After 2035, the activity to reduce leakage and customer consumption continues in-line with our core pathway. The pathways diverge because the WRSE regional plan reported pathway is based on a high abstraction reduction scenario, which requires additional investment in AMP 11 and 12 to develop new water sources to replace those we are no longer able to use. Our core pathway does not cover the high abstraction scenario, therefore does not include this additional investment. The tables below summarise the additional investment in our WRMP alternative pathway.

Outwood Lane groundwater scheme	
Scheme description and driver	This scheme would be needed to provide additional water supplies through increasing the amount of water that can be produced from an existing borehole at Outwood Lane.
Cost	£1.4 million of enhancement expenditure.
Delivery	The scheme would need to be utilised from 2049, and preparatory work is expected to begin in AMP11, for delivery in AMP12 if required.
Scenarios required and trigger point	This scheme will only be required in the high abstraction reduction scenario. It would be triggered if we are required to reduce our existing abstractions by 30 million litres per day.
Best value investment	The scheme has been identified in the WRSE best value regional plan.

Raise Bough Beech reservoir	
Scheme description and driver	Within the WRSE adaptive plan is a scheme to increase the capacity of Bough Beech reservoir to provide an extra 12 million litres of water per day. This scheme does not feature in the reported pathway of the revised draft WRSE plan or our revised draft WRMP. However, it is required in the pathway that plans for a higher level of population growth 2048.
Cost	£3.2 million of enhancement expenditure required for preparatory work.
Delivery	AMP 12
Scenarios required and trigger point	The scenario it is identified in falls outside the scenario range covered by Ofwat's common reference scenarios. However, because of the future uncertainties we face, and the potential risks associated with the delivery of other companies' supply schemes and the demand management activity required, we have included investment to cover the preparatory work, needed. This reflects the potential future need to keep this option open, beyond the LTDS planning period
Best value investment	The scheme has been identified in the most adverse scenario of the best value regional plan.

Further observations	The River Eden catchment scheme that we have included in our core pathway could reduce the need for this scheme in the future by improving the management of water in the catchment. Its objective is to assess and undertake a range of nature-based solutions designed to slow the flow in the river, allowing more water to be retained over longer periods each year, and therefore facilitate some abstraction through the spring to maintain greater volumes in Bough Beech for longer.

Decision point and trigger point for the WRMP alternative adaptive pathway

208. The WRMP alternative pathway will be driven by the Environment Agency's decision-making around the level of abstraction reduction across the region's water sources. This decision-making will be informed by the WINEP investigations included in our core pathway which we will carry out between 2025 and 2030.

209. By 2034, we expect to understand which of our existing abstraction licences will need to change, what conditions of our licence will change and how that affects the amount of water we can abstract from them, and the timing of implementation. This will enable us to understand how much water will no longer be available to abstract and when, which will be reflected in our future WRMP.

210. At present, we have no confirmed changes to our abstraction licences. However, our current forecast shows that should we need to reduce abstractions in-line with the Environment Agency's 'Enhanced' abstraction reduction scenario we would no longer be able abstract around 30 Ml/day from our existing sources. The sources we would expect to reduce abstraction from are our groundwater sources in the Hogsmill Wandle and Darent catchments. This is because they support flows in sensitive chalk streams. If this is required, additional investment is triggered.

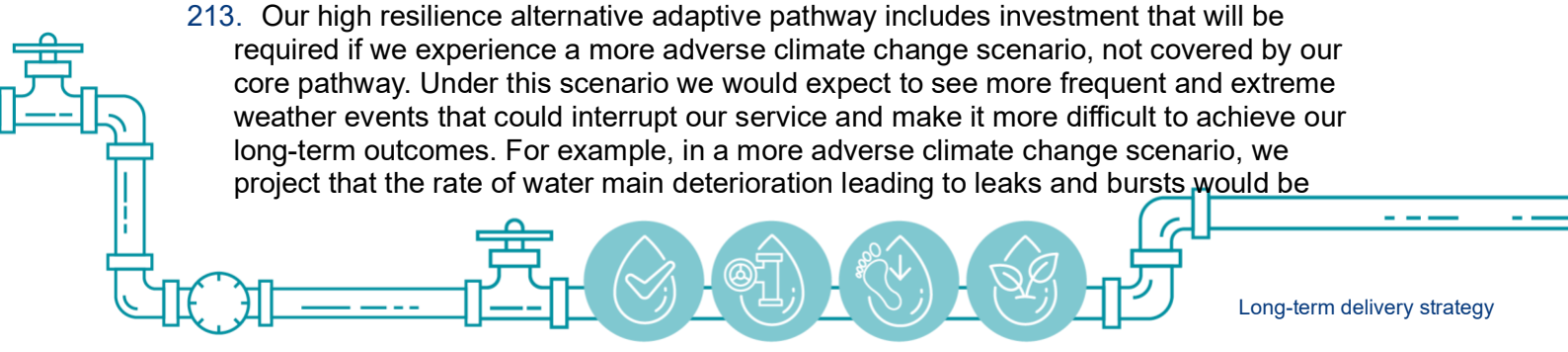
211. In essence, the trigger for this pathway would be that we need to meet the 'Enhanced' abstraction reduction scenario. The decision point will be in 2034 when we have confirmation from the Environment Agency about licence changes and update our WRMP. Our current projections show that the additional investment required would be triggered in AMP11.

Likelihood of the WRMP adaptive pathway being triggered

212. We note that the design parameters and approach for the WRMP mean that there is a reasonable probability that the enhancements in the WRMP pathway will be required. We estimate this to be slightly lower than 50% because the WRMP pathway was derived based on slightly conservative assumptions on average. Whilst these assumptions are conservative, the probability of the WRMP pathway enhancements being required can never be significantly below 50%, because we will be obliged to keep sufficient headroom in our water balance calculation, triggering the requirement for additional investment. On this basis, we have judged the probability of the WRMP alternative adaptive pathway being required to be between 40% and 50% with a mid-point probability of 45%.

C. High resilience alternative adaptive pathway

213. Our high resilience alternative adaptive pathway includes investment that will be required if we experience a more adverse climate change scenario, not covered by our core pathway. Under this scenario we would expect to see more frequent and extreme weather events that could interrupt our service and make it more difficult to achieve our long-term outcomes. For example, in a more adverse climate change scenario, we project that the rate of water main deterioration leading to leaks and bursts would be



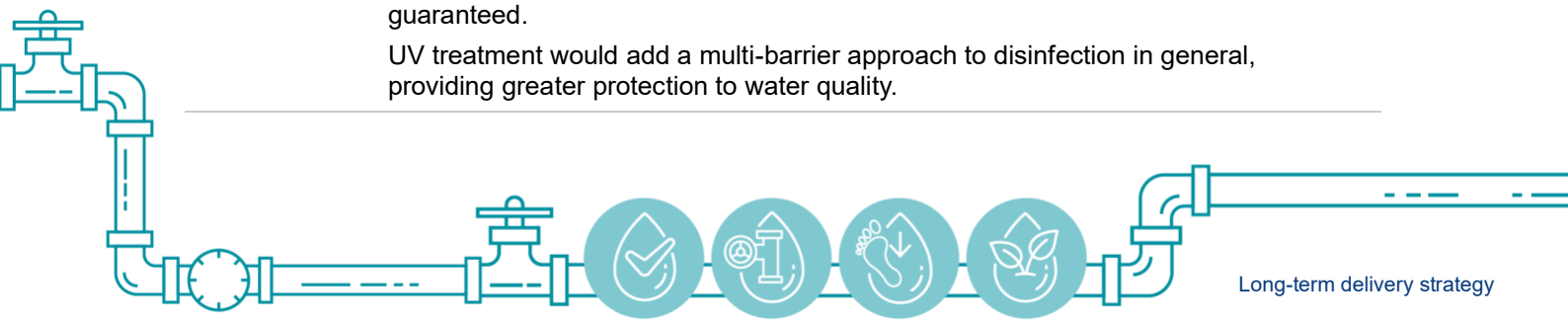
quicker, meaning we would need to invest more to achieve the 2050 targets we have set. We would also expect the frequency of power outages at our sites to increase and we may also see a greater deterioration in raw water quality due to more surface water flooding and surcharging sewers.

214. We have brought all this potential investment into one alternative adaptive pathway, although different factors would trigger the individual investments within the pathway. Our ongoing monitoring, set out below, in Section D of this chapter, will determine when a particular investment would be needed. The investment included in our high resilience pathway is summarised in the following section.

Drinking water quality enhancement

215. In our high resilience pathway, we reflect the potential impacts that climate change could have on the quality of our water supplies. Our core pathway included investment in UV treatment at two sites where water quality monitoring is detecting faecal indicators, so investment is required in AMP8 to protect water quality. In an adverse climate change scenario, there is a risk of further deterioration in raw water quality (e.g. Cryptosporidium could increase due to an increased prevalence of surcharging sewers). This could give rise to further investment to protect water quality outlined below.

Increased treatment facilities due to deteriorating raw water quality (e.g. UV treatment)	
Scheme description and driver	Additional enhancement expenditure could be needed to protect raw water quality should we start to detect faecal indicators, or other contaminants, through our raw water monitoring programme at all treatment works. It will involve the installation of additional treatment processes to address contaminants from our raw water sources e.g. UV treatment to address the risk of Cryptosporidium. Delivery of the schemes would support the continuation of our industry-leading position against the CRI and water quality contacts. It will also contribute to our strong unplanned outage performance by reducing the risk that water production is halted, due to water quality issues.
Cost	The enhancement expenditure required is estimated at £2.35m.
Delivery	The earliest we would expect to deliver this would be in AMP10
Scenarios required and trigger point	The installation of additional raw water treatment (e.g. UV treatment) was not selected by Copperleaf in any of the common reference scenario optimisations. However, this investment has been included in the high resilience alternative pathway due to the known risks of surcharging sewers on raw water quality we are currently experiencing at our chalk aquifer sources at Cheam and Kenley. In a high climate change scenario, the types of weather events that cause surcharging sewers will be more frequent. The trigger point such as faecal indicators are detected through our water quality monitoring programme in the raw water of sources at our treatment works.
Best value investment	We will progress catchment management activities to focus on liaison with Thames Water and Southern Water to try and mitigate risk. However, if we do begin to detect faecal indicators the more probable solution is the installation of UV treatment as it inactivates the Cryptosporidium and is the only way to fully mitigate the immediate risk of deteriorating water quality. Catchment management for a hazardous risk such as Cryptosporidium is unquantified, and its effectiveness is not guaranteed. UV treatment would add a multi-barrier approach to disinfection in general, providing greater protection to water quality.



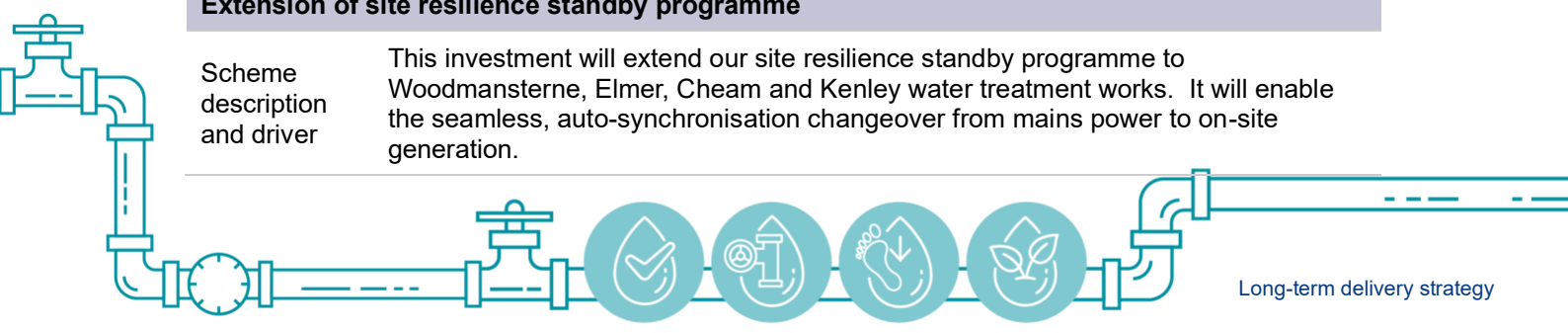
Further observations	We have concerns over the level of investment currently being directed to exfiltrating (leaking) and surcharging sewers via WaSCs Drainage and Wastewater Management Plans (DWMP). This is due to the current, and likely extended focus and costs associated with mitigation required for combined sewer overflows, and whilst some of the measures required for mitigation will also help reduce sewers spilling in the catchment, the overlap is not significant.

Enhancing the resilience of our treatment works and processes

216. As described in our core pathway, power outages can impact on our drinking water production process. We project that these would become more frequent in a high climate change scenario, so we would need to invest to increase the resilience of our treatment works to power outages and reduce the risk of unplanned outage and loss of customer supplies, particularly if there was a widespread outage so we were unable to provide an alternative water source. The investment required is summarised below.

Fixed site generators	
Scheme description and driver	Our power management strategy identifies the need to mitigate the risk of power outages at our borehole sites and pumping stations, increasing the overall resilience of our water production operation. Our core pathway included connection points at all sites. In our high resilience alternative pathway we would invest in additional fixed generators at up to ten of our sites to mitigate the higher risk of power outages caused by climate change.
Cost	£0.45m of enhancement expenditure is required.
Delivery	The earliest trigger point would be AMP10. Delivery would be up to two years from when the trigger point threshold is met.
Scenarios required and trigger point	The more adverse climate change, demand and abstraction reduction scenario require investment to instal fixed generators at the 10 most high-risk sites, utilising the connection points we install in AMP8. We will monitor the data on power outages we receive from the local electricity distribution network operator and use this to inform our decision making. The trigger point for this work would be a combination of increased power outages at these critical sites and the nature of our host DNO, UK Power Network's investment to ensure resilient supplies across all areas. We predict the earliest that this action would need to be taken in during AMP10.
Best value investment	The option continues to take a risk-based approach and will be informed by the most up-to-date information. The other option considered for the high resilience alternative adaptive pathway was to provide standby generation capability at all sites, thereby incurring significant cost and embedded carbon delivering new assets with average levels of utilisation way below 1%.
Further observations	The extent to which the sector and Ofgem, via its RIIO price control strategy, predict and address these risks via proactive investment in energy distribution networks will dictate the extent of need for this work. As with current power stability issues, we are seeing our suburban and rural sites incur more outages than our urban sites – and predict this trend will continue.

Extension of site resilience standby programme	
Scheme description and driver	This investment will extend our site resilience standby programme to Woodmansterne, Elmer, Cheam and Kenley water treatment works. It will enable the seamless, auto-synchronisation changeover from mains power to on-site generation.



Cost	Expected to be approximately £1.2m of enhancement expenditure in AMP10 and £1.2m enhancement expenditure in AMP11.
Delivery	The earliest trigger point would be AMP 10. It is expected that each installation would take 12-18 months to deliver and we anticipate installing two in AMP10 and two in AMP11.
Scenarios required and trigger point	The investment selected by Copperleaf in the optimised plan was for auto-synchronisation at all sites in the core pathway. Due to our sites in more urban areas having more resilient electricity distribution connections, it was decided that those sites would be moved from the core pathway to the high resilience AAP, thereby ensuring the need for significant cost and embedded carbon in delivering new assets would only be required in a high climate change scenario. We will monitor the data on power outages we receive from the local electricity distribution network operator annually and use this to inform our decision making. If any site has >10 outages in a single year this investment would be required at that site.
Best value investment	As technology in this area improves, we are likely to see a reduction in the costs for these types of installation. The deferral of all sites except Bough Beech from the core pathway will allow us to deliver these additional installations more efficiently, should they be required

Additional infrastructure at key sites	
Scheme description and driver	This investment would increase our resilience at three sites – Kenley, Elmer and Westwood – via the installation of additional infrastructure, such as additional tanks to allow for standby/duty operation of contact tanks and/or treated water tanks. We need be able to take these tanks out of service for planned maintenance every five years to drain, clean and inspect, as required by the DWI. From the end of AMP7 we will do this using our network resilience schemes and/or scheduling planned works in low demand periods. In a high climate change scenario, we may not have these options available to us as the increased level of demand won't allow for the duration of planned shutdown we would need, and additional infrastructure would be required.
Cost	Up to £1.0million of enhancement expenditure for all three sites.
Delivery	It is expected that the additional infrastructure required would take 12 to 18 months to deliver per site. This would be dependent on the site and whether two or more sites meet the trigger threshold in the same year.
Scenarios required and trigger point	The earliest trigger point would be AMP10. The more adverse climate change and high demand scenarios require investment in the additional infrastructure at the three key sites listed above. The trigger point will be driven by any inability to reduce distribution input (DI) due to high climate change to the extent that actual DI exceeds our current peak week production capacity.
Best value investment	The best value investment was the 'Do nothing - rely on existing resilience schemes to maintain supplies' option, which was selected in the core pathway.

Flood mitigation at key sites

Scheme description and driver	This investment would mitigate the risk of river or surface water flooding to operational sites currently categorised as being either at medium or low risk of flooding as assessed by the Environment Agency. Sites at high risk have already been addressed, with the exception of Leatherhead PS, which is in our core adaptive pathway. Medium risk risks are Goat Bridge PS and Purley Cross boreholes. Low risk sites are Westwood WTW and Chiddingstone PS. Additional work would be initiated if, due to climate change, the EA reassessed these risks as high.
Cost	£0.75m of enhancement expenditure required.
Delivery	The earliest trigger point would be AMP10, and this work would be delivered in less than 12 months.
Scenarios required and trigger point	More adverse climate change will result in the EA updating their flood risk assessment for both river (fluvial) and surface water (pluvial) flooding. These schemes will be triggered in the event that the EA reclassify any of them to have moved from medium to high or very high risk.
Best value investment	Of the four medium or low risk sites currently without mitigation, we will look to prioritise nature-based solutions as a focus of mitigation. We are seeking to reduce the risk at Chiddingstone through our non-statutory WINEP work on the Eden catchment aimed at slowing the flow and mitigating flood risk. Westwood would require partial flood protection for an element of the site if the risk cannot be mitigated through off-site measures working with third parties. Scheme costs are associated with this project only.
Further observations	The two medium risk sites would both become non-operational in the event of flooding and therefore would not require protection for mitigation. Goat Bridge is used to augment flows in the River Wandle and would be surplus to requirement in the scenario set out. Purley boreholes would be isolated in flooding event as the raw water main used to convey water from them to Kenley works would be re-tasked to pump floodwater in the opposite direction away from site. These two schemes are therefore not priced.

Raw water main renewal	
Scheme description and driver	This investment will see us need to double our investment in the replacement of raw water mains. This is required to mitigate the risk of asset failure and related unavailability of the bore holes that mains transport water from. The premise here is that if climate change triggers are hit then there will be a higher demand for water and so more borehole sources will be required simultaneously and also the risk to change in climatic conditions will drive increased burst mains failures on our aging raw water main network.
Cost	£5 million per AMP in AMP10, AMP11 and AMP12.
Delivery	Raw water mains renewals will be delivered alongside the wider mains renewal programme using the same contracts and frameworks. We will target at least an additional 8km of raw water mains replacement per AMP. We will target the worst performing and most critical (in terms of consequence of failure) assets first with targeting assisted by our industry leading mains condition assessment approaches.
Scenarios required and trigger point	More adverse climate change will lead to a marked increase in mains failures due to soil/ground movement caused by rapidly wetting and drying cycles. Coupled with increased failures will be a greater demand for water to meet the needs of communities in hotter drier conditions.

Best value investment	Best value for the business was to replace a base level of assets in order to maintain stable serviceability. However, if trigger levels are met this higher investment strategy will be required to continue to maintain stable service.

Additional leakage reduction and enhanced network resilience

217. We have set ambitious targets to reduce leakage, supply interruptions and burst mains by 2050. In a more adverse climate scenario, achieving these targets will be more challenging due to the impact that a changing climate can have on our assets.

218. During hot dry weather, we typically see an increase in the soil moisture deficit. This hardening of the ground can increase the likelihood of our underground pipes being damaged – causing both leaks and mains bursts. Likewise, more extreme freeze thaw events, like those that we have seen over recent years, also lead to an increase in mains bursts and more leakage due to the sudden change in temperature.

219. If we see such conditions more frequently, we are likely to see a quicker deterioration in the health of our underground assets and more frequent failures with higher consequences. This will mean we will need to make additional investment to achieve the levels of performance we have targeted for leakage reduction, mains repairs and supply interruptions, summarised below.

Enhanced mains replacement	
Scheme description and driver	In a high climate change scenario, we would need to increase the rate at which we replace our water mains to compensate and mitigate the impacts of climate change. Climate change is likely to increase the speed of deterioration of our water mains, and we would expect to increase our mains replacement rate from 0.3% to 0.8%, in order to mitigate climate change impacts and continue to achieve the ambitious leakage, mains repair and supply interruptions we have set ourselves. As described in Chapter 5 our core adaptive pathway, mains replacement is part of our overall leakage strategy that includes a mix of interventions. In a high climate change scenario, mains replacement and Active Leakage Control (ALC) are the only two that we can further enhance to enable us to meet our long-term ambitions in this more adverse scenario. Further pressure management could provide little additional benefit due to limitations in the current technology and approach and the already advanced state of pressure optimisation that our network is in.
Cost	£50 million of additional enhancement expenditure (on top of the £30 million required in core pathway), totalling £80 million enhancement expenditure per AMP across AMP 10, AMP11 and AMP12.
Delivery	The earliest trigger point would be AMP 10. We would need to mobilise at least a year early, in order to increase supply chain resources.
Scenarios required and trigger point	The main trigger will be climate change levels. However, the core pathway investment we are making in our DMA Asset Health initiative will help us to closely monitor the condition of our network and the rate at which it is deteriorating. This will contribute to our monitoring and help us identify when this particular investment should be triggered.
Best value investment	Mains replacement provides the most long-term, sustainable benefits. It will also help to make our network more resilient to further extremes of climate change.

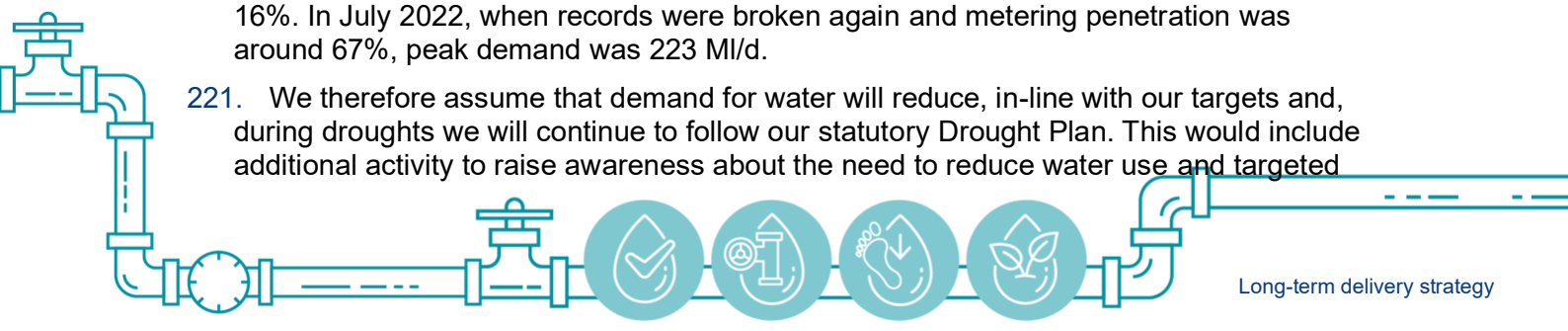
Further observations	As in our core pathway, our DMA Asset Health initiative would continue to ensure that we targeted the water mains that are most at risk or leaks and bursts, so we invest as efficiently as possible. The deterioration modelling that we intend to start in AMP8 will aid our understanding of which of our assets are experiencing the worst impact of climate change, enabling us to target this extra investment in the right place.

Active leakage control	
Scheme description and driver	In a high climate change scenario, we would expect to see more leaks occur, due to the impact climate change will have on our underground assets, as described previously. To mitigate this and enable us to meet our long-term leakage target, we would need to increase our ALC activity so we can keep the amount of water that is leaking at any one time down to the levels we have modelled in our leakage reduction plan.
Cost	We have assumed a 50% increase in burst mains and leakage under this scenario which would require the following total ALC expenditure (a 50% increase on core pathway costs). Whilst base costs would remain unchanged enhancement expenditure would need to significantly increase to include all of the additional activity and ensure performance remains as per the core pathway plan. • AMP10 – £14.7m enhancement • AMP11 – £17.2m enhancement • AMP12 – £21.4m enhancement
Delivery	The earliest trigger point would be AMP10 but we will track trends throughout AMP8 and AMP9 to look for evidence of increasing leakage outbreak and the requirement for additional ALC to sustain our core pathway leakage reduction ambitions.
Scenarios required and trigger point	The main trigger point will be climate change, however in addition to this we will closely track ALC activity metrics including leak job numbers by type and frequency taking into account natural variability in the data.
Best value investment	This investment is balanced with the more costly main renewal investment. Although more of a short-term intervention, it enables us to keep total costs down while continuing to meet our long-term targets.
Further observations	The impact of climate change on our ALC activity will be a gradual transition as opposed to an immediate one. This means that we may only require partial additional funding. We will commit to appraising the impact in each price review so that we can request the correct level of funding relative to the level of impact we are experiencing.

Smart Water Customer Experience

220. In a high climate change scenario, we would expect to see hotter drier summers. These peaks in hot weather typically bring with them an increase in demand for water. We are already seeing the impact of both temperature extremes but also the benefits of widescale metering. On 10 August 2003, during the European heatwave, and the then record-breaking UK temperature, our demand peaked at almost 250 Ml/d (around 40% above average for the time of year), at a point when metering penetration was around 16%. In July 2022, when records were broken again and metering penetration was around 67%, peak demand was 223 Ml/d.

221. We therefore assume that demand for water will reduce, in-line with our targets and, during droughts we will continue to follow our statutory Drought Plan. This would include additional activity to raise awareness about the need to reduce water use and targeted



communication with consumers using smart meter data. If required, we would introduce temporary restrictions on customer water use to help lower peak demands. In Section 6, The Foundations of our LTDS, we provide more detail about our assumptions and the uncertainties associated with behaviour change.

Decision points and trigger points for the high resilience adaptive pathway

222. As noted in LTDS Chapter 2, as a small company, we have relatively few actions available to us to mitigate changes in the external environment. This, in turn, has resulted in a limited number of alternative adaptive pathways. A corollary of this, is that changes in a range of different external parameters need to feed into the decision points and trigger points for the high resilience alternative adaptive pathway.

223. The primary trigger for us to move to the alternative pathway would be an increase in the rate of climate change. We anticipate that if we experience climate change in South East England resulting in a 1.3ºC increase in average temperatures above pre-industrial levels, we would need to consider making the additional investment set out in this alternative pathway. This is based upon projections from the Intergovernmental Panel on Climate Change (IPCC) and verified in the 2015 Paris Agreement, which state the 'tipping point' for irreversible climate change occurs when the global average temperature rise exceeds 1.5ºC above pre-industrial levels.

224. UK climate projections data (UKCP18 – 2022 update) provided by the Met Office indicates that temperatures in the South East are around 0.2ºC lower than the global average, and therefore an increase in average temperatures of 1.3ºC would signify the equivalent to a 1.5ºC rise globally. We anticipate the earliest point that this would be reached, based on current climate change projections provided by UKCP18 data under the RCP8.5 scenario, would be 2036.

225. It is recognised that the effects of reaching this tipping point in climate change may occur over several years – both in the run up to, and beyond, the point at which 1.5ºC global temperature rise is reached. We anticipate that by 2034, ahead of the AMP10 price review, we would understand whether we expect to reach the trigger point in 2036, which would be our decision point to move to the alternative pathway which would then be triggered in 2035.

226. There are a number of impacts of climate change that we would also monitor and use as specific triggers for the different areas of investment. These sub-metrics that would trigger additional investment include:

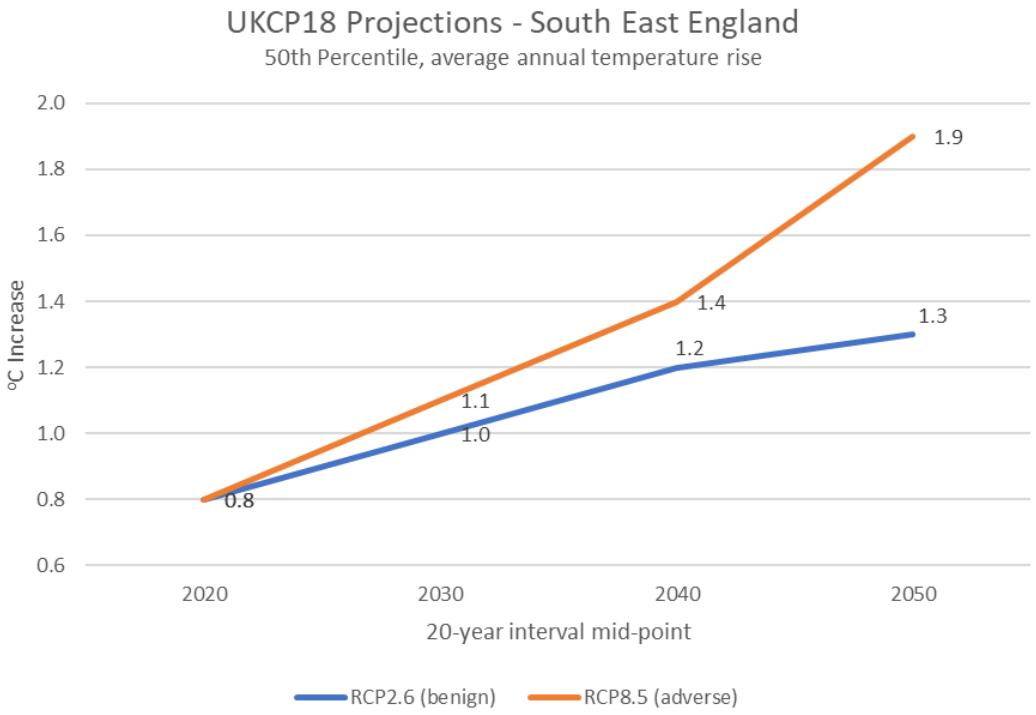
- Raw Water Quality – levels of faecal indicators and other contaminants in raw water sources;
- Experienced weather – will include continuous data, such as rainfall and temperature as well as extreme events, such as drought/freeze/thaw and flooding in our operational area;
- Power outages – data from the distribution network will be used to monitor the frequency and impact of power outages at our operational sites; and
- Mains deterioration – we will use our advanced DMA Asset Health initiative to provide accurate data on the condition of our wate mains and the rate of deterioration.

Likelihood of the high resilience adaptive pathway being triggered

227. UKCP18 data confirms that a 1.5ºC rise in global average temperatures is projected in both the benign (RCP2.6) and adverse (RCP8.5) scenarios, the difference being when exactly this increase in temperature will be reached.

228. As shown below, for South East England, this is projected to be 2036 (adverse scenario) and 2050 (benign scenario). It is arguable, therefore, that the likelihood of a high resilience adaptive pathway being triggered is virtually certain, it being a matter of when, rather than if.

Figure 5: UKCP18 Projections for South East England



Source: UKCP18 data (published in 2022), UK Met Office

229. The specific actions that we will need take will depend upon exact nature of the climate change that is seen. As such, whilst it is envisaged that the earliest trigger point for this high resilience alternative adaptive pathway will be the start of the AMP10 price review with the decision point coming a year ahead of this. If it is not reached at this point, we will continue to monitor projections and reassess the trigger point accordingly.

230. With global efforts focused on combatting climate change, the ability to follow a benign pathway and potentially even outperform it must remain a possibility, thus deferring and potentially avoiding reaching the tipping point of 1.5ºC globally. In terms of likelihood of having to enact the high resilience alternative adaptive pathway, it is currently put at 50%. This is based on projections earlier in 2023 by the Met Office[32] stating an equivalent percentage change of limiting global temperature rises to 1.5ºC by 2030.

D. Monitoring Plan

231. We undertake a substantial amount of monitoring as part of the statutory requirements for our WRMP. Broadly, the external factors we monitor for WRMP purposes include:

[32] Reducing odds to limit warming to 1.5°C rise - Met Office

(a) Population growth (both population growth and trend statistics, and the number of new connections;

(b) Climate change; and

(c) Environmental destination (which will encompass the profile of abstraction reductions).

232. There are also company-specific factors that we will also monitor for WRMP purposes, these include:

(a) Demand – distribution input and consumption trends; and

(b) Experienced weather – both general weather patterns and the frequency of operational outages caused by climate change.

233. This WRMP monitoring regime is designed to identify the relevant decision points and trigger points for the WRMP, and hence automatically covers the monitoring for the WRMP alternative adaptive pathway. We provide an annual monitoring report to the EA and every five-years our WRMP will be updated, in-line with the updated WRSE regional plan.

234. In addition, we have incorporated the additional triggers we have identified for our high resilience alternative pathway, into our monitoring plan. This is set out in the table below.

Table 13: Components of the LTDS monitoring plan

	Component	Rationale	Monitoring	Stakeholders
External factors affecting adaptive pathways				
Population growth	Population growth (unit)	Review population trends against low, medium and high growth profiles.	Ongoing population forecasts, recorded in regulated annual reporting. Annual monitoring to remain in case trends are earlier than expected trigger point.	Regional companies and WRSE, in the event population is diverging from expected growth forecasts and preferred plan.
	New properties (unit)	Review whether new connections (properties) are matching expected level of growth.	Developer enquiries will indicate level of homes coming 'on-line' and allow us to assess any immediate risks to delivery of the plan due to immediate population growth.	
Climate	Climate change	Assess whether climate change is line with specific projections and the associated impacts on supply.	Climate accounting reports and insights, such as from the Met Office and the Climate Change Committee.	Regional companies and WRSE, in the event climate change is aligning to specific projects that inform our adaptive pathway.
Environmental destination	Profile of abstraction reductions	Define a revised set of abstraction profile reductions based on AMP8 investigations that may alter supply forecast.	Static levels of abstraction reduction and operational constraints that may arise to deliver preferred profile.	Regional companies and WRSE, in the event environmental destination is altered and affects supply forecasts.

Company specific monitoring and performance				
Demand	Distribution input (Ml/d)	Assess whether DI is meeting expected levels as this will enhance our assessment of population growth and proficiency of our demand management strategies.	Our annual DI record, presented in our Annual Review submission to the Environment Agency.	Business leadership in the event DI trend (and further components) require corrective action and if there is a risk to customer supply. Companies due to receive bulk supplies. WRSE in the event DI indicator is showing differing picture to population trends.
Climate change	Experienced weather (continuous data)	Interpret experienced weather against historical patterns to inform rate of change.	Ongoing weather recording, including rainfall and temperature from company sites.	Business leadership and operation, with upward knowledge to regional groups where experience weather is impacting supply availability.
	Power outage (discrete data)	Interpret impact and frequency of outages on operational performance.	Third party (electricity provider) outage reporting.	Business leadership and operation to inform business planning to maintain/enhance asset resilience as required.
	Raw water quality	Assess whether water quality is deteriorating and presents a risk of contamination	Ongoing water quality monitoring of our raw water sources for faecal indicators and other contaminants	Business leadership to inform operational activity and Drinking Water Safety Plans DWI
	Condition of water mains and deterioration rate	Assess the condition of our underground pipe work as an indicator of climate change impacts and to inform future renewal rates	Annual condition assessments to be carried out informed by our advanced DMA Asset Health and deterioration rate assessment	Business leadership and operation to inform business planning to maintain/enhance asset resilience as required.

Source: SES Water

235. The external factors listed above will be monitored through the ongoing WRMP process and reflected in future WRMPs, to determine if the investment in the WRMP alternative pathway is required. These and the additional metrics will be monitored by the business and will be used to inform decision making on when we reach the triggers associated with the high resilience alternative pathway, and the specific investment identified within it. Further detail on how we will embed our monitoring into our wider governance processes is provided in Chapter 6 of this document.

E. Alternative adaptive pathways – bill impacts

236. The bill impacts for our two alternative pathways are shown in the table below.

Table 14: Alternative adaptive pathways bill impact

Bill impact (Average change in bill per AMP)	AMP8	AMP9	AMP10	AMP11	AMP12
WRMP alternative pathway	£0.00	£0.00	£0.00	£0.01	£0.72
High resilience alternative pathway	£0.00	£0.00	£17.98	£33.82	£43.81

**Price base 2022/23 FYA (CPIH deflated)*
Source: SES Data Table LS7

6. The foundations of our long-term delivery strategy

As with any strategy, there are a number of key assumptions underpinning our LTDS, and a range of uncertainties associated with them. In this chapter, we set out the key assumptions we have made and the uncertainties that relate to each and how we will monitor them. We also explain how we will embed adaptive planning into our business, integrating it with our existing frameworks for systems-based resilience, risk management and Board governance.

A. Introduction

237. Our long-term delivery strategy is underpinned by a number of key assumptions that are material to us delivering our ambition. In line with the LTDS Guidance, we have grouped them as follows:

- Material company-specific and local factors;
- Socioeconomic factors, such as economic growth and changes in household incomes;
- Government and regulatory policy;
- The activities of other water companies and sectors, such as their contribution towards long-term targets;
- The condition of the natural environment;
- Consumer behaviour and attitudes;
- Customer affordability and vulnerability;
- The costs of inputs;
- The availability of skills;
- The capacity of the supply chain;
- Levels of asset health and resilience;
- Innovation within the company;
- Cost efficiencies; and
- Progress towards key long-term outcomes.

238. For the avoidance of doubt, the assumptions we have made for our LTDS (and our Business Plan as a whole) reflect our best current knowledge and informed predictions of the future.

239. For each of these key assumptions, there are corresponding uncertainties. Whilst our assumptions are based on the latest data and evidence available, there is inevitably some uncertainty as to what the future holds, so not all of these assumptions may hold in practice. To the extent that these assumptions do not hold, we may need to take some corrective actions, and take account of new developments in future iterations of our LTDS.

240. The following sections explain each group of assumptions listed above, the uncertainties around these assumptions, and some consequences of these uncertainties. We also cover how we will monitor our progress and the external environment to determine the extent to which the assumptions need to be refined and adjusted over time.

B. Foundations of our LTDS

Material company-specific and local factors

Assumptions

241. We have made a number of assumptions relating to 'Green Belt' status, local demographics, and abstraction from chalk aquifers.

242. A material proportion of the geographical area we supply is designated as "Green Belt" for planning purposes, and this restricts the number, location and types of new buildings and extensions to existing buildings that can be constructed. Our key assumption is that this 'Green Belt' designation is retained for the period covered by our LTDS, and that it continues to place similar restrictions on development and construction of new buildings. This is consistent with the constraints local authorities are under when they develop their local authority housing plans, and should, therefore, be consistent with the full range of demand scenarios considered in our LTDS.

243. A partial corollary of the 'Green Belt' assumption is the assumption that the demographics of our supply area do not change materially over the course of the LTDS period, such that the comparative affluence and span of social classes remains broadly constant, and that the mix of housing types does not change materially.

Uncertainties

244. The key uncertainties with respect to material company-specific and local factors are the extent to which government will end up loosening planning restrictions in 'Green Belt' areas either as a result of pressure to accelerate the construction of energy infrastructure for net zero (electric charging points for vehicles, greater electric distribution capacity for heat pumps and electric vehicle charging, local generation and so forth), or because of population pressures (and the growing need for housing and accommodation).To the extent that 'Green Belt' designation is reduced in its geographical scope, or watered down, this will have potential implications for:

- the mix of commercial vs residential properties;
- the number of new commercial and residential properties requiring supply; and
- the sociodemographic mix of households (and, consequently water usage patterns).

245. We will closely monitor developments in government housing policy. We will also continue to track the demographics of our local area to identify any changes.

Socioeconomic factors

Assumptions

246. Our key assumptions with respect to socioeconomic factors largely overlap with demographic assumptions discussed in the "material company-specific and local factors" category above. In essence, we have assumed that the demographic mix in our area does not change materially.

Uncertainties

247. The key uncertainty with respect to socioeconomic factors is the extent to which the demographics of our customer base remain constant. If there is a substantial increase in homebuilding (for example, because 'Green Belt' land becomes available for development) and this changes the demographics, then water usage patterns may change accordingly. This could make it harder to hit PCC targets, for example. If this were to be the case, we may need to develop additional water resources, or bring forward some investments to make existing sources more resilient.

248. We use our own and third party data to understand the demographic mix of our supply area and this will maintain under constant review. The installation of smart meters will also enable us to track water consumption trends, develop a deeper understanding how usage patterns are linked to socioeconomic factors and how these change over time, enabling us to adapt our demand reduction strategy as required.

Government and regulatory policy

Assumptions

249. We have assumed that there will not be a transfer of supply pipes from private ownership to company ownership. We recognise this this issue is being debated at the moment, but our assumption is that ownership remains as is over the timescale of the LTDS.

250. We have also assumed that the Government's integrated plan for water, environmental plan and net zero strategy will not change materially over the timescale of the LTDS.

251. We have assumed that the Government will implement new water efficient policies to reduce demand for water. The Government has already committed to introducing a mandatory water label for all water using products, expected by 2025. In addition, the WRSE regional plan identifies the need for minimum standards for water using products by 2035 and tighter building regulations by 2040. There is currently no government commitment to introduce these measures, however, our WRMP is based on the assumption they will be introduced and therefore it is an assumption of our LTDS.

Uncertainties

252. The key uncertainties with respect to government and regulatory policy are:

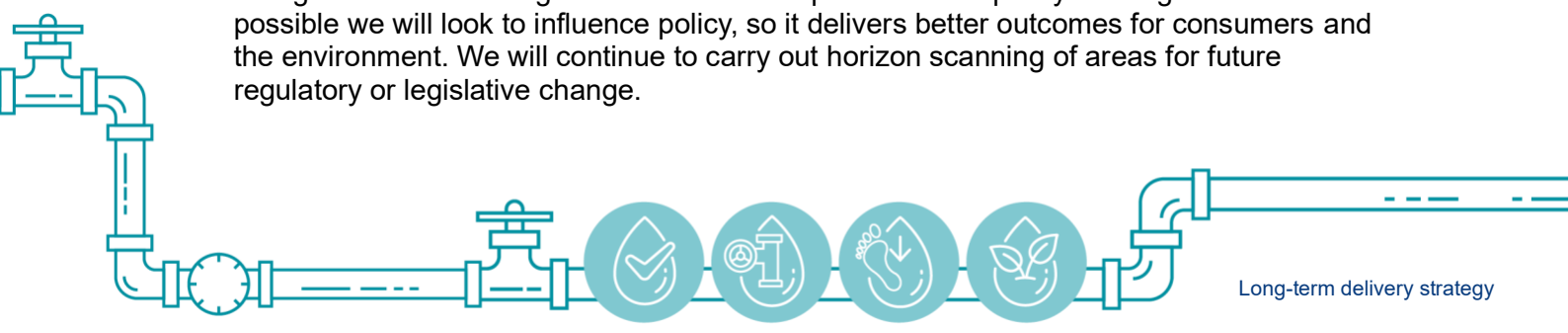
(a) Whether supply pipes are transferred from private ownership to company ownership and any expectations reducing eradication of lead from drinking water supplies that may be attached to this change. If this happens, we will need to increase our totex accordingly;

(b) Whether the Government's integrated plan for water and other environmental plans change. If they do, there will presumably be consequential changes needed to our plans;

(c) Whether the Government does commit to the new water efficient polices in-line with the WRSE regional plan and our WRMP: and

(d) Whether the Government's net zero strategy and plans change, and/or fail to be met. This uncertainty would likely require additional totex.

253. We will continue to be active members of Water UK's groups and networks that work with government and regulators in the development of new policy and regulation. Where possible we will look to influence policy, so it delivers better outcomes for consumers and the environment. We will continue to carry out horizon scanning of areas for future regulatory or legislative change.



The activities of other water companies and sectors, including their contribution towards long-term targets

Assumptions

254. We have assumed that our supply chains, in particular energy networks and supply chains will continue to decarbonise in line with net zero policy, such that we can continue to be supplied with electricity without jeopardising our net zero targets. We have also assumed that electric and/or hydrogen fuel cell powered vehicles will be available in due course, even in LTDS common reference scenarios that do not have an explicit assumption in this area, and that this transition will continue in line with existing government net zero policy.

255. We have assumed that the industry will continue to plan water resources on a regional basis, and that the other regional water companies will continue to participate in WRSE and its successors. This is particularly important as we are a small company. We have also assumed that if other companies become water stressed, our customers will not be required to pay extra to help meet those shortfalls, whether or not those shortfalls are met in part or in full by resources from us.

Uncertainties

256. In terms of the activities of other sectors, the key uncertainties are:

(a) Whether our supply chains, and in particular the energy supply chains will decarbonise in line with net zero policy. If progress is slower than envisaged, we are likely to require additional totex to reduce our carbon footprint to meet our environmental ambition.

(b) When reliable and economic electric and/or hydrogen fuel cell powered vehicles of all types will be available, and when conventionally fuelled vehicles will be phased out. If progress in this area is slower than envisaged, we are likely to require additional totex to reduce our carbon footprint to meet our environmental ambition.

257. In terms of the activities of other water companies, the key uncertainties are:

(a) Whether our customers will be required to fund investments to help relieve water stress in other areas. For example, if we are required to provide bulk supplies to other water companies, including new appointed variations (NAVs), that have not been planned for. The implications will depend on the specific circumstances but could result in the need for us to develop more water resources and/or develop new sources sooner.

(b) Whether integrated water resource planning continues at a regional level in a similar way to the status quo. If regional coordination is lost, or coordination is introduced across a larger area – perhaps with the creation of some form of system operator, this could have material implications. The implications of this are hard to determine, but it is likely to result in changes to the way water resource planning is undertaken.

258. We will keep the activities of others under review through our membership of and involvement in a range of industry forums and subject matter expert groups, such as WRSE, a number of Water UK working groups, UKWIR, Spring and MOSL's RWG, amongst others.

The condition of the natural environment

Assumptions

259. We recognise that the wastewater industry faces significant challenges with respect to the speed and cost of rectifying Combined Storm Overflow (CSO), sewer flooding, and

sewer infiltration and exfiltration issues. We have assumed that these will not be fixed quickly, and that there will continue to be a gradual decline in the quality of raw water, including higher levels of pathogens, nitrates and phosphates over the LTDS timescales. We have, therefore, included additional water treatment capability to deal with this gradual decline, particularly in the more urban areas, and reflected the potential need for future investment in our high resilience alternative pathway.

260. Our risk assessments and monitoring conducted in response to the release of updated DWI guidance on PFAS[33] in 2022 has confirmed that our treated waters are wholesome and do not require the adoption of any additional treatment. We have assumed that the risk assessments conducted capture the full extent of the potential sources of PFAS contamination, that the sampling data we have collected is representative of all raw water challenges and that there is a stable regulatory environment that does not lower the standards currently adopted.

Uncertainties

261. In terms of the condition of the natural environment, the key uncertainties are:

(a) Whether the gradual decline in water quality we have observed partly as a result of CSO, sewer flooding and sewer infiltration and exfiltration continues at the same pace. Given the current, intense, focus on this area, it is possible that the situation will improve and that, as a result, we may be able to reduce or postpone some of the investment planned to deal with these water quality issues. For example, if all CSO discharges were to be prevented, this would mitigate or delay the need for some future investments, particularly temporary and permanent UV installations that would otherwise need to be installed in the areas impacted by this contamination. It is also possible that climate change and other factors may cause further deterioration. If this were to happen our costs would likely increase because additional water treatment steps would be required (requiring additional equipment and associated operating costs), and/or different water treatment processes would be required, and/or existing water treatment processes would need to work harder.

(b) We are still at the early stages of capturing data in respect of emerging contaminants, such as PFAS, and so we may have yet to have accurately determined the full extent of any risk to our treated water under all climatic conditions. Additional treatment may be required if there are circumstances under which some sources exhibit higher concentrations of PFAS that cannot be adequately reduced through blending.

262. We will continue to assess our raw water sources and treated waters and verify those risk assessments through enhanced raw and treated water quality monitoring programmes across all of our sources and works, in-line with DWI requirements. Monitoring programmes will be continually reviewed and updated to ensure we have the data we need to verify the appropriateness of treatment adopted.

Consumer behaviour and attitudes

Assumptions

263. Without specific intervention, we have assumed that our customers' attitudes to water usage do not change materially over that period. We have therefore planned targeted and specific investment in smart technology, digital platforms and enhanced customer engagement to positively influence customers' water using behaviour. We will use the first five years of our LTDS to develop partnerships and collaborate with others in the sector to establish best practice and drive innovation to inform our long-term behaviour change strategy.

[33] PFAS – per and polyfluoroalkyl substances.

264. In the light of recent events that have made consumers more sceptical towards water companies, we have assumed that we will need to increase our community communications to engage constructively with our customers. This will be designed to try and reverse the erosion in trust in water companies' abilities to do the right thing and provide a stronger base of understanding upon which to build behavioural change upon.

265. Additionally, we have assumed that smart metering will be acceptable to almost all of our customers and will not be opposed on the grounds that the data collection is too intrusive to the extent that we are unable to achieve the smart meter penetration rates required.

Uncertainties

266. In terms of the condition of consumer behaviour and attitudes, the key uncertainties are:

(a) Whether customers will remain happy for us to install and collect data from smart meters. The data collected from water smart meters is of a more personal nature than that derivable from energy smart meters for example. This may have implications for the smart metering programme.

(b) Whether customer behaviour changes as projected. If it does not, that may require alternative measures to be implemented within our water resource plans, including the reduction or removal of proposed bulk transfers to support neighbouring water companies and/or the development of new water sources. Sensitivity analysis at a regional level to explore the changes in resource planning in the event of low demand management and a low level of government-led interventions indicated that our supply side options would be required earlier – most notably the raising of Bough Beech being utilised from 2051, a relatively significant infrastructure development. Several transfers remain in best value sensitivity modelling. This would prompt detailed customer engagement to explore the trade-offs between hard infrastructure to maintain supply and a regional principle of cross boundary planning.

(c) Whether or not the Government will make water smart metering mandatory in our area.

(d) Whether current industry legitimacy issues associated with storm overflows and other issues can be overcome with respect to our customers through our planned customer engagement.

267. We will monitor water use patterns and trends and using our enhanced customer and demographic data, identify whether differences emerge between different customer groups. We will continue to suggest to Government that smart metering becomes mandatory in water stressed areas.

Customer affordability and vulnerability

Assumptions

268. As described above, we have assumed that the demographics of our supply area will not change materially over the LTDS period, such that the comparative affluence and span of social classes, and within that the level of need for financial support, remains broadly constant.

269. We recognise that there is discussion ongoing about a potential sector wide single social tariff cross funded at a national level. With no detail on the design or timescales for such a tariff, we have assumed that we will need to provide our own company scheme for the period of this LTDS. Should a single social tariff be implemented, we will put transitional arrangements in place to mitigate any downside risks to our customers.

Uncertainties

270. In terms of customer affordability and vulnerability, the key uncertainties are:

(a) Whether the Government implements a single social tariff – cross funded at national level, the detailed design of any such tariff and the implications for our customers.

(b) Whether we see any significant changes to relative levels of financial and other vulnerability as the result of larger than predicted demographic growth or other unforeseen social shifts.

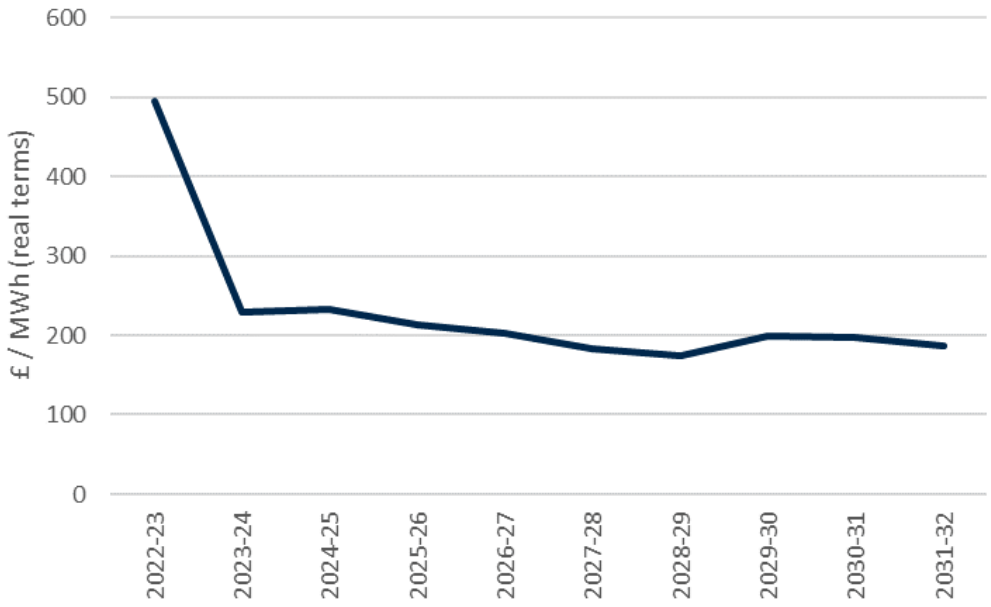
271. We will continue to monitor the status of a single social tariff and work with regulators and colleagues across the industry on its design and delivery, should it be progressed.

The costs of inputs

Assumptions

272. We have made a range of assumptions regarding the cost of inputs. Full details can be found in the main business plan documents, data tables and data table commentaries. The key assumption in this area is that our energy costs will follow the trajectory of the forward curves for the next AMP, and reduce in real terms after that, in line with the figure below.

Figure 6: UK Energy price forecasts, £ / MWh, real terms



Source: Cornwall Insight, July 2023

273. Inherent in this assumption is a further assumption that there is no redistribution of carbon levies between the different fuel sources. We have also assumed we will migrate our power purchasing from a Renewable Energy Guarantees of Origin ("REGOs") basis to a longer-term renewable power purchase agreement. Our cost assumptions are:

(a) Chemical costs will remain constant in real terms. There is a material risk that the war in Ukraine may result in higher gas prices and, therefore, higher chemical costs, or that the reconstruction of Ukraine will create additional demand for chemicals, driving prices up in real terms.

(b) Our supply chain partners continue to choose to provide adequate resource to our programmes of work despite the demands placed through the £50bn to £200bn reworking of CSOs or other projects. If significant additional demands are placed on the civil engineering / water sector / environmental consulting supply chains, this would result in material cost increases which we have not included in our assumptions. We are vulnerable to this type of risk due to our small scale and our innovative approach to contracting that allows us receive discounts from our suppliers, as we provide a roughly constant baseload of work, and allow our suppliers use the Intellectual Property ("IP") generated with us.

(c) We have assumed that the cost of abstraction licences remains constant in real terms.

Uncertainties

274. In terms of the costs of inputs, the key uncertainties are:

(a) Whether energy costs remain as predicted. To the extent that they are materially higher or lower than anticipated by the forward curves, our operating costs will be proportionately higher or lower. This can impact the economics of some of our energy saving initiatives, and the cost of achieving the net zero targets.

(b) Whether chemical costs remain as predicted. To the extent that they are materially higher or lower than anticipated, our operating costs will be proportionately higher or lower.

(c) The extent to which our supply chain gets deployed on a substantial national push to rework CSOs, rather than being available to us. If this happens, there will be material cost increases, and potentially significant delays in securing supply chain resources for our projects.

(d) Whether other national programmes (such as net zero, or defence projects) place unanticipated demands on our supply chain. If this happens, there may be material cost increases, and potentially significant delays in securing supply chain resources for our projects.

(e) Whether the Government will decide to use abstraction licencing as a significant form of revenue generation, perhaps by holding licence auctions. If this were to be the case, it is likely we would face additional abstraction licence costs and potentially the loss of some licences to competitive bidders.

275. We will use a broad range of sources at both a company and industry level, to monitor macro-shifts in economics that could give rise to material changes in input costs covering key commodities, good and services. This will help inform how and when to procure these inputs, where flexibility exists to do so.

The availability of skills

Assumptions

276. Except when the specific parameters of our bespoke scenarios require a different assumption, we have assumed that all the relevant skills will be available to us when required in practice, to be sourced as appropriate through employee recruitment, training, retraining, and through the companies in our normal supply chain.

277. We have assumed that the progression of artificial intelligence will assist in the rebasing of skilled resource requirements for certain functions, and that this will have positive benefits in the cost efficiency of delivering these aspects of our work. Specifically, some analytical and customer service functions, along with aspects of our production and supply functions, as well as wider supply chains' work. We anticipate this being supported

through the available automation of routine tasks, predicting, and modelling maintenance, sharing expert knowledge through systems and processes, improving training and simulation, and eventually remote and data-driven decision making and operating.

Uncertainties

278. In terms of the availability of skills, the key uncertainties are:

(a) Whether there is sufficient environmental consulting expertise. (As a small company we cannot afford to retain a large number of internal experts)

(b) Whether we can secure the expertise necessary to continue lead the industry to become a fully smart utility.

279. In both cases, if these skills are in short supply, this would result in higher costs, and potential delays to the implementation of some of the smart technology enhancements.

280. We will monitor the liquidity in specific skills and labour markets that are pertinent to our requirements, collaborating with the rest of the sector as necessary to minimise the risk of resource shortfalls and resultant cost implications.

The capacity of the supply chain

Assumptions

281. Other than when specific bespoke LTDS scenarios require different assumptions, we have assumed that our supply chain has sufficient capacity and remains available to us. Inherent within this is an assumption that our supply chain will continue to choose to work with us and have also made an explicit assumption that the smart metering supply chain has sufficient capacity.

Uncertainties

282. In terms of the capacity of the supply chain, the key uncertainties are:

(a) The extent to which our supply chain gets deployed on a substantial national push to rework CSOs, rather than being available to us, as noted above.

(b) Whether other national programmes (such as net zero, or defence projects) place unanticipated demands on our supply chain limiting its availability to us, as noted above.

(c) Whether the smart metering supply chain has sufficient capacity to meet the simultaneous demand from the various companies. If supply chain capacity is limited, this could delay and/or increase the costs of implementation.

283. Providing sufficient line of sight of workload – by volume and type – is essential in mitigating this risk. We will work with our supply chain partners to monitor and understand industry-wide constraints and adjust our plans – where possible.

Levels of asset health and resilience

Assumptions

284. Except where there are explicit enhancements, we have assumed that the allowed level of base expenditure will be sufficient for us to maintain or marginally increase the current levels of serviceability. We have also assumed that we will continue – both individually and in collaboration with and outside of the – sector to develop more sophisticated and accurate measures of asset health and resilience through the ongoing development and embedment of our smart technologies.

Uncertainties

285. The key uncertainty is the extent to which current levels of serviceability can be sustained or marginally improved at current levels of base expenditure, or whether the materialisation of the risks set out above require step increases in base funding to maintain serviceability – such as to combat the impacts of climate change.

286. We will continue to enhance our understanding of the health of our underground assets and the rate of its deterioration using our DMA Asset Health initiative. As described in LTDS Chapter 6, this will be a trigger for potential future investment.

Innovation within the company

Assumptions

287. We are proud of our strong track record in terms of innovation in support of delivering strong performance, and we are widely recognised as being one of the most innovative companies in the industry. Recent innovations include:

- Being the first (and only) company in the industry to have developed and successfully deployed a fully smart water distribution network (iDMAs). This innovative, award-winning technology allows us to become aware of and locate leaks faster than others (roughly a 40% reduction in the time it takes to locate and repair leaks), helping us secure an industry-leading position of having a smaller proportion of distribution input lost in leaks than any other company.
- Developing and deploying our DMA asset health technology. This is an award-winning innovation that allows us to be better evaluating the condition of our mains, and delivering a more resilient infrastructure system, and preventing leakage through network calming and other measures.
- Using Internet of Things (IoT) technology to monitor energy usage for items of equipment in ½ hour intervals, thereby being able to optimise energy usage.
- Developing the Universal access point for water (UAP4W), as recognised by Ofwat.[36]

288. Our business plan assumes we will build on our existing position and continue to be highly innovative, and industry leading. For example:

- We already have a first-generation fully smart water network, so we plan to enhance this by using smart meters as additional network sensors, as well as for leakage detection and billing purposes (as far as we are aware, this is unprecedented and, therefore, industry leading, with the risks associated with this);
- We plan to complete the full assessment of and resultant interventions on every part of our supply network through our DMA asset health work. Doing so will mean we are the first company to have a complete understanding of network integrity, and have delivered all viable pressure management and resilience improvements to deliver a fully calmed network;
- We plan to transfer our IoT knowledge and expertise into other areas including above ground asset strategies; and
- In combination, this technology will enable us to manage our treatment and pumping regime to optimise energy usage (to a higher degree than any other company).

[34] See: https://www.utilityweekawards.co.uk/2022winners/
[35] See: https://waterindustryawards.co.uk/2023-winners/
[36] See: https://waterinnovation.challenges.org/winners/uap4w/
[37] See: https://www.ofwat.gov.uk/ofwat-award-farmland-water-battery-storage-and-leak-detecting-broadband-cables-in-latest-innovation-competition

289. Naturally, there is some risk inherent in being in the leading position with respect to innovation, however our strong track record suggests that we are well placed to continue to lead the industry.

Uncertainties

290. In terms of innovation within the company, the key uncertainty is:

(a) Whether the risks inherent in innovation and being the first mover cause issues. It is inherently the case that not all innovation is fully successful, and it is likely that these risks will manifest from time to time in unforeseen ways.

(b) Whether our fast-paced innovation and industry leading position lead to un-forecast benefits. Whilst there are risks in innovation, there are also benefits, which can be hard to forecast.

291. Continued activity and monitoring in this area will be done through our active involvement in the innovation community and regular horizon-scanning utilising the significant internal experience within our organisation dedicated to innovation.

Cost efficiencies

Assumptions

292. Our key assumption with respect to cost efficiency is that we will continue to improve our efficiency in line with the industry efficiency frontier. We will aim to deliver this through a combination of ongoing innovation, development of key supply chain partner relationships and the optimisation of our operational and investment-related activities.

293. We have assumed that customer adoption of digital self-service options will continue to increase and that inbound contact volumes will decrease as we move to increasingly automated, proactive service interactions informed by data. We have also assumed that we will retain a customer service team locally in Redhill but that this will be supplemented by offshore resource to perform some activities and to provide flexibility during operational peaks.

Uncertainties

294. There are risks to achieving the levels of cost efficiencies set out in our assumptions. Whilst the econometric modelling makes an allowance for scale, it can be the case that the rate of efficiency improvement is also a function of scale. There is a risk, therefore, that smaller companies may be unable to deliver the efficiency improvements of an average company, by virtue of their scale.

Progress towards key long-term outcomes

Assumptions

295. In line with our existing track record, our assumption is that we will continue to deliver in the round against our performance commitments for the rest of the current AMP and beyond. We have also assumed that in making our LTDS a live and dynamic process, embedded as a critical but evolutionary activity, that we will continue and adjust of plan – and its outcomes – as time progresses.

Uncertainties

296. The key uncertainty is that there are unforeseen and material events that make it challenging for us to deliver against our targets in one or more of our priority areas and associated performance commitments.

C. Embedding adaptive planning into our business

297. As described in LTDS Chapter 5, we have a monitoring plan for our alternative pathways. This includes the monitoring we are required to do for our WRMP that covers six of the Common Reference Scenarios. We have also incorporated additional metrics into this plan that can act as triggers to additional investment, and potentially tell us when we can defer investment.

298. The areas of uncertainty associated with the assumptions we have listed in Section A of this chapter, will continue to be monitored through our existing corporate and operational mechanisms.

299. Through our normal Board and related Committees' governance processes and controls, including the Board consideration of the Company's risk register and performance metrics, and the impacts of external factors on our longer-term planning, we can monitor the effect of potential areas of future change for our business and adapt our plans accordingly.

300. The use of our systems-based resilience framework (Appendix SES043 – Resilience Framework), where we review – within our Audit Committee processes – areas of improvement across the business with respect to resilience related matters, allows us to address areas where the business requires to adapt for internal and external pressures, and helps to embed adaptive planning within our business.

301. We will continue to play in active role in industry forums that look to identify and influence future government and regulatory policy to deliver better outcomes for customers and the environment. Through horizon scanning we will identify potential areas for future change and understand the implications on our business, so if material we can address through our LTDS.

302. Our LTDS is focused on delivering the outcomes covered by the Common Performance Commitments set by Ofwat at the PR24 price review along with all current statutory and regulatory requirements. Should new areas emerge, through our engagement with customers and stakeholders which we feel should be included within our long-term ambition we will build them into future iterations of our LTDS, so our long-term plans and investment continue to align with our customers' priorities.

Reporting

303. As described in Chapter 5, we produce an annual review of our WRMP and we will include the required aspects of our LTDS scenario monitoring within this report.

304. We will also report on progress against our LTDS and our monitoring of the scenarios and trigger points we have identified, and any changes to the wider assumptions that we have made in our Company Annual Performance Report.

7. Board governance and assurance

Our Board has been directly involved in the development of our LTDS. This includes setting our ambition and making sure that it aligns with our Company purpose and long-term vision, ensuring that the views of our customers have been taken into account, challenging management to ensure that our LTDS is optimised and efficient, and ensuring that the correct monitoring and checks have been incorporated into our strategy in support of adaptive planning. This Chapter includes the statement of assurance from our Board and highlights the involvement of our Board in the development of our LTDS.

A. Board assurance statement

305. This Board assurance statement has been documented in support of our long-term delivery strategy (LTDS). The SES Water Board of Directors ('the Board') confirms that it is accountable for the overall business planning process, takes ownership of the long-term delivery strategy (LTDS) and business plan, and has ensured that the business plan submission is consistent with the LTDS and represents the first five years of the LTDS core pathway.

306. As a Board, we recognise the importance of good governance and assurance to ensure that all of our stakeholders can have confidence in our future plans and our ability to deliver them.

307. As a Board, we are confident that we have submitted the best possible long-term strategy that is aligned with our Company purpose, reflects our Company vision, and is high quality, ensuring that we deliver long-term value for customers, communities and the environment at PR24 and in the longer term.

308. The Company's full Board has been integral to the governance surrounding the development and submission of the LTDS. The LTDS, including data tables and compilation of supporting information, has been developed following well established Company systems and processes with associated internal assurance checks prior to the application of external assurance where required.

309. The Board have taken account of Ofwat's general requirements for the LTDS and the more specific expectations in respect of board assurance. We have provided direction and challenged management throughout the strategy development process, sought supporting assurance, and are confident that the strategy:

- Has been developed on the basis of accurate and consistent data and information;
- Reflects the Board's ambition for the future;
- Is high quality and will effectively and efficiently deliver our long-term vision;
- Is based on adaptive planning principles and accounts for future uncertainties;
- Has been informed by engagement with our customers, stakeholders and the communities we serve, and balances the delivery of required investment across current and future customers; and
- Will enable us to meet our statutory and licence obligations, now and in the future.

The Board confirms that the LTDS reflects the long-term vision and ambition that is shared by the Board and Company management:

310. As a Board, we endorse the Company's purpose to harness the potential of water to enhance nature and improve lives, and we confirm this LTDS will deliver the Company's long-term vision to transform performance through digital innovation and smart technology, to build the trust of our customers so that they value water and the service we provide, and to enhance the environment and provide local communities with wider benefits from our business activities.

311. Our long-term ambition has been defined in terms of the outcomes the Company will deliver, aligned to the performance commitments set by Ofwat for PR24, with a key focus on securing resilient and sustainable water resources through reducing leakage and supporting customers to reduce their water usage.

312. The Board and management are confident that our shared ambition reflects the expectations of customers, stakeholders, regulators and government, and will exceed those expectations where we are confident that our past performance and innovative approaches will enable us to efficiently deliver a faster improved performance, where that is supported by our customers.

313. Our ambitious long-term plans for 2050 include surpassing the leakage reduction target set by government to achieve the 50% reduction target nine years earlier than planned; ensuring that no customer experiences an interruption to their supply that lasts greater than three hours; and reducing household consumption to 110 litres per person per day. The Board believes these plans will enable the Company to stay ahead of the likely future challenges brought by climate change and population growth.

314. The Board supports the plans to ensure investment supports our current industry leading water quality performance and to go beyond our statutory duties to replace lead pipework where it benefits customers who are most at risk.

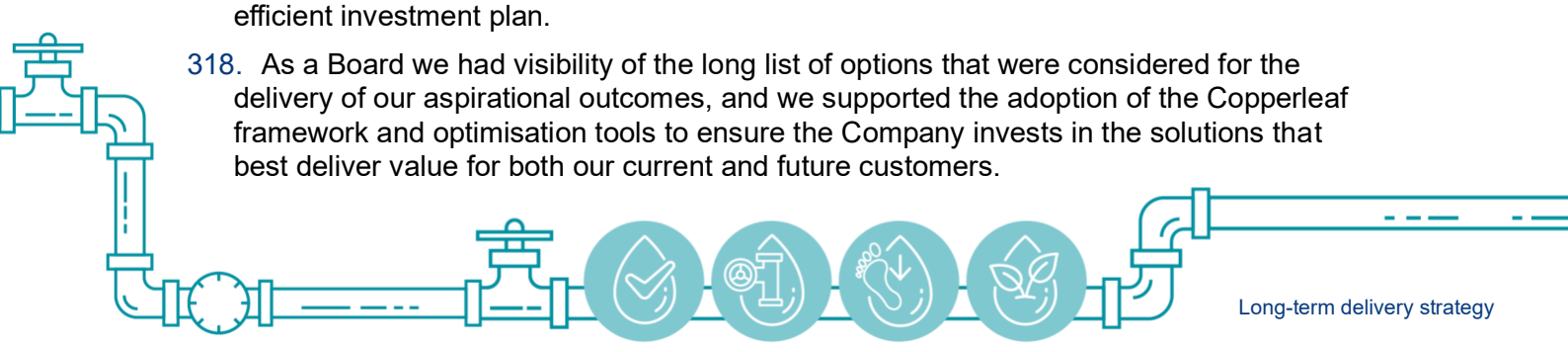
315. In support of the Company's purpose, the Board's ambition is to enhance our local environment by continuing to manage abstractions and discharges to consent limits, maintain our long-standing record of zero serious pollution incidents, reduce net operational greenhouse gas emissions to zero by 2050, increase biodiversity on 80% of land that we own and deliver a Water Industry National Environment Programme (WINEP) that goes beyond our minimum statutory requirements, in support of resilient and good quality water resources.

The Board is confident that our LTDS is high quality and represents the best possible strategy to efficiently deliver our stated long-term objectives, given future uncertainties:

316. Our LTDS clearly sets out our long-term ambition and the outcomes the Company aims to deliver. The Board recognises that there are many uncertainties that may adversely impact our current future plans and has therefore ensured that management have considered a broad range of plausible scenarios to identify the potential impacts of those uncertainties.

317. A core adaptive pathway has been developed to enable the Company to reach its long-term ambitions in the majority of future scenarios and represents our no and low regrets efficient investment plan.

318. As a Board we had visibility of the long list of options that were considered for the delivery of our aspirational outcomes, and we supported the adoption of the Copperleaf framework and optimisation tools to ensure the Company invests in the solutions that best deliver value for both our current and future customers.



319. The Board supports the Company delivering activities such as leakage reduction and increased community engagement that are likely to be essential in all scenarios, and the plans that ensure we will have taken the necessary preparatory steps to take advantage of the optimised adaptive pathways we have identified, should the need arise, such as the planned WINEP programme on the River Eden that will help secure greater resilience for the range of potential future uncertainty that we face from issues such as climate change and population growth, whilst also allowing us to meet tougher environmental standards.

320. The Board understands that the LTDS has to be underpinned by a number of key assumptions and is confident that the assumptions used reflect our best current knowledge and informed predictions for the future.

321. The Board specifically notes the dependence of our LTDS on our WRMP, that has been developed to accurately reflect the regional plan developed by WRSE. The Board is satisfied that the Company's data inputs to that process have been externally assured by Atkins and Artesia, the regional plan has been independently assured by Jacobs under the guidance of the WRSE Executive Team and notes the uncertainties that highlight the dependence of our plan on the stability of the regional plan.

322. The Board has agreed the monitoring plan that will ensure the Company can respond appropriately to changes in the external operating environment such that the LTDS is refined and adjusted over time, and alternative adaptive pathways are triggered if required.

323. The Board recognises that the strategic choices available reflect a small water company and the limited Company resources, but is confident that our proven past innovation, our approach to seeking solutions that deliver multiple benefits and our planned future collaboration to optimise solutions and deliver maximum benefit will result in a deliverable, proportionate and efficient outcome programme.

The Board is confident that the LTDS will enable the Company to meet its statutory and licence obligations, both now and in the future:

324. Our LTDS considers the long-term targets set by the Government and our regulators in legislation and regulation, and government policy expectations. This includes the Government's Strategic Policy Statement to Ofwat, the Environmental Improvement Plan to support the Environment Act and the UK Government's Plan for Water.

325. The Board endorses the LTDS approach to maintain an assumption that there are no material changes to the legislation outlined above, and no transfer of supply pipe ownership from private to Company ownership or introduction of retail competition.

326. Our LTDS looks ahead and sets out where we expect to need further enhancement expenditure in the future to achieve our long-term outcomes and ambition and to maintain alignment with all regulatory requirements.

327. The LTDS incorporates the outputs of our WRMP, that has itself been informed by the WRSE regional plan, and both meet the requirements of the Water Resources Planning Guideline (WRPG) produced by the Environment Agency and Ofwat.

328. The WRSE reported pathway, used as the basis for our revised WRMP published in August 2023 and considered as defining the best value route to meet statutory requirements and regulatory and policy guidance, was externally assured for WRSE by Jacobs.

329. The Board is confident that the future plans and enhancement expenditure identified will ensure the Company meets all statutory and licence obligations, building on the base expenditure that supports our current level of regulatory compliance.

330. Our LTDS and business plan specifically include efficient costs for the Company-specific statutory obligation to partially soften 80% of the water we supply.

The Board confirms that the LTDS is based on adaptive planning principles:

331. Our LTDS sets out the long-term outcomes the Company aims to deliver and explains how they will be met under a range of plausible scenarios.

332. The Board is satisfied that monitoring is in place and key decision and trigger points have been identified to ensure our planned investment profile can be adapted if needed in the future, so that it continues to meet the expectations of our customers, irrespective of new challenges.

333. The Board has reviewed the approach taken to using the Copperleaf Value Framework and Optimisation Tool to determine the optimised projects and activities relevant to each scenario and how that has been used to define the core and adaptive pathways.

334. External assurance of the Company's approach to developing the preferred plan and quantifying the needs and service impacts for each area was provided by Mott Macdonald as set out in Appendix SES012A.

335. The Board supports the core adaptive investment pathway to 2050 that has been identified by the Company as that representing the optimal investment plan for the delivery of our ambition under current and most likely future conditions, considering the eight common reference scenarios provided by Ofwat (relating to climate change, demand, abstraction reductions and technology) and the two further bespoke scenarios identified by management as those that account for the company-specific factors of potential customer bad debt and potential supply chain disruption.

336. The Board supports the alternative adaptive pathways that have been developed, including our WRMP adaptive pathway (required if our WRMP deviates from the core pathway in 2035, as per our draft WRMP) and our high resilience adaptive pathway (required if we experience more adverse climate change).

The Board is satisfied that the LTDS has been informed by meaningful engagement with our customers:

337. Insight from the Company's multi-tiered customer research and engagement programme, and challenge from the customer scrutiny panel (CSP) and environmental scrutiny panel (ESP), helped set the outcomes we plan to deliver, the level of ambition, the investment options selected and the planned timing and sequencing of the future investment programme.

338. The Board has ensured that the Company has considered the collaborative industry research of Ofwat and CCW and engaged extensively with customers, customer representatives and wider stakeholders through their own bespoke research programme to ensure that our LTDS reflects their views.

339. The Board is pleased to note that the Company addressed the reported shortcomings in the customer research conducted at PR19 through the engagement of multiple external support agencies and increased research channels and processes, increasing the response rates that informed our future strategy.

340. The Board is satisfied that the approach to customer research ensured wide-ranging coverage of the demographic, socio-economic and age profile of the customer base, including future bill-payers and those classed as vulnerable, resulted in a strategy that is closely aligned to our true customer base.

341. The Board is confident that the bespoke research included genuine choices for customers in the areas of performance and investment that they could meaningfully influence, and that the final strategy proposed only includes costs that are over and

above those that satisfy minimum legal and regulatory requirements where there was clear evidence of customer support.

342. In response to customer feedback the Board has supported the delivery of a faster reduction in leakage than may have otherwise been proposed; a lead pipe replacement programme focused on areas of highest risk; and the delivery of a non-statutory enhanced environmental programme, as research confirmed those customer preferences. As there was low support for fast-tracking our carbon emission programme, that option will not be progressed.

343. The CSP report is set out in Appendix SES040 – Customer and Environmental Scrutiny Panels – Final Assurance Report and provides independent assurance to the Board that the LTDS has been informed by customer engagement.

The Board confirms that we have taken steps to secure long-term affordability and fairness between current and future customers, ensuring bills remain affordable for all:

344. In developing our LTDS, the Board has considered the level of performance the Company is aiming to achieve between 2025 and 2050 and the balance of the improvement that can be delivered from base expenditure versus the extra investment needed through phased enhancement expenditure.

345. In AMP7, the Board has supported the data-led approach being taken to reduce the number of void properties and an expanded debt recovery strategy that ensures we are billing all those that can and should pay, thereby ensuring fairness across all current customers; we will continue to promote this approach in AMP8.

346. Targeted customer engagement, including future bill payers, has been conducted to specifically consider the optional elements of the strategy, and the speed of delivery, and where customers were satisfied with the current level of Company performance, such as with supply interruptions, and had other higher priorities, the Board supported deferral of planned additional mains replacement to a future date.

347. The Board has considered the overall bill profile impacts of both the longer-term strategy and the immediate business plan and adapted the proposals for PR24 accordingly.

348. Our preferred business plan was tested for customer acceptability and affordability in line with the methodology specified by Ofwat and independent assurance from the CSP confirms “the company has done everything it can to drive outcomes informed by both long-term affordability and fairness” (Appendix SES040).

349. In support of our 2050 ambition of eliminating water poverty, the Board supports an on-going focus on identifying and supporting customers who need financial help, including the support of up to 25,000 customers in AMP8.

The Board has challenged and satisfied itself that the 2025-30 business plan implements the first five years of the long-term delivery strategy:

350. The Board is satisfied that the PR24 business plan for 2025 to 2030 includes performance targets that are consistent with the first five years of the glidepaths developed to deliver expected performance at 2050.

351. The Board has ensured that the business plan allows for the base expenditure and specific enhancement investment needed to deliver the core pathway identified and supported by customers.

B. Evidence of Board challenge

352. The Board has challenged the Company management in terms of the development of the LTDS and the evidence in support of that is largely captured through the detailed summary of Board meetings, minutes and actions, over the period of December 2021 to September 2023 SES053 PR24 Governance Framework, and in the external assurance evidence report produced by PA Consulting to accompany its assurance letter to the Board, included in Appendix SES012 External Assurance. Examples include:

- The Board has been closely involved in defining and challenging the long-term ambition that was considered in light of the scenarios prescribed by Ofwat and those identified by the Company in firstly determining and then refining, through the use of the Copperleaf decision making tool, the potential investment solutions; and
- The Board approved the optimal core pathway following the opportunity to review and challenge the key choices and associated recommendations to achieve our proposed long-term ambitions, and the process being followed to substantiate them, at a key Board meeting held on 7 February 2023.

353. In order to arrive at the view that its strategy is the best it can be, the Board has:

- Defined a clear ambition in support of a clear Company purpose and vision, and has ensured that the final LTDS sets out to secure outcomes that align to that ambition, whilst adequately considering the potential future risks to delivery through adaptive planning;
- Supported the engagement of external expert resources to assist with the development of the strategy and commissioned external assurance of key components;
- Challenged management to ensure the final strategy is proportionate to the Company size and resources available and builds on our historic performance and areas of proven innovation to ensure it is deliverable;
- Ensured that ongoing base costs have been benchmarked against Ofwat industry datasets and enhancement costs are aligned to the forecast changes in performance and project delivery in AMP8; and
- Ensured that the strategy reflects customer views and inputs and is both acceptable and considered affordable in the longer term.