

Southern Water's Water Resources Management Plan

Annual Review 2023-24

June 2024

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Blueprint for a water-efficient culture

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Executive summary

This reporting year represents a critical point in our Water Resources planning. Whilst we continue to progress our WRMP19 plan, we are also developing our next Water Resources Management Plan (WRMP24), which we will submit in June 2024. This Water Resources Management Plan Annual Review 2023-24 provides an update on progress against Southern Water's WRMP19. Where appropriate, we have included updates on if schemes have been updated in WRMP24 within the report.

2023-24 was warm but wet, leading to more stable demand and consistent supply compared to previous years. This meant that we maintained the supply- demand balance throughout the year in all water resource zones and did not need to enact any TUBs/NEUBs or apply for drought permits or orders.

Our WRMP19 sets out a programme of interventions to ensure we provide sustainable water supplies to our customers over a 50-year period, whilst protecting the environment. It included a broad range of interventions and schemes including leakage reductions, significant demand management and new resource developments, including our Strategic Regional Option (SRO) in our Hampshire region. The options selected at WRMP19 represented a complex and ambitious plan, with schemes that had not previously been delivered such as Water Recycling being introduced for the first time.

We have continued to progress delivery of our WRMP19 plan during 2023-24. Recognising that we are behind target in some areas, we have worked hard to improve our performance so that we can close out the AMP, and our WRMP19 plan, on a good footing and progress with WRMP24 in the best possible position. Considerable improvements in outage reduction in the last 2 years mean we are now very close to the company target set for outage at WRMP19. This year has seen us reduce outage from 76.6MI/d to 55.4MI/d in 2023-24, only 2.3MI/d above the company target of 53.1MI/d. This signifies an increased effort and focus on outage reduction, as well as managing required outages related to our capital programmes. We will continue with outage reduction improvements, targeted to the areas where they will achieve the greatest benefit.

We acknowledge that our leakage levels are not in line with WRMP19 forecasts, but through our PALM model (Prevent, Aware, Locate, Mend) we are driving our recovery plan to reduce leakage levels to achieve an appropriate entry point into AMP8. Leakage levels have reduced by 1.0MI/d, compared to the last Annual Review but it continues to be above target with an outturn of 107.48MI/d against a WRMP19 forecast of 84.9MI/d. Extreme weather patterns including drought conditions over the previous summer period and two harsh/severe winters have contributed to these increased levels of leakage.

Progression of our ambitious plan for Find and Fix during 2023-24, saw 90% of targeted number of leaks found, but only 76% of the leakage benefit delivered. This has led us to proactively move to prioritise higher leakage volume reduction vs number of leak repairs, to ensure the most effective and efficient use of resources to achieve leakage targets. This has seen the average leak size repaired increased by 50 l/d per leak. We have also increased the level of field detection resources, in line with our action plan to reduce leakage and aim to achieve our leakage target by 2025.

We are continuing our drive to reduce demand across the region. Both household and non-household consumption fell by approximately 3% compared to 2022-23, with reductions in household consumption of more than 5% in some areas. Our ongoing water efficiency initiatives have continued. We carried out 13,500 home visits in 2023-24, including an extra 2,000 in Hampshire. As part of home visits, we inspect for leaks and fit water-saving devices and outdoor water butts and tap jackets. We have started using behavioural science insights to improve uptake of home visits.

This year we have continued with significant delivery of our WRMP19 capital schemes and have been engaging the market on AMP8 projects. Monitoring and assessing programme risks, we faced critical decision

points this year in relation to the delivery of some of our schemes to bring in new water supplies. As we have progressed further into our schemes, our understanding of the scope and risks has matured. This has led to the delivery dates for several schemes being revised, with amended dates being reflected in WRMP24.

We continue with our commitments to the Western Area through our Water for Life programme, which is currently undergoing consultation. Amongst other schemes, we also continue to progress our Sandown Recycling scheme, which following options development, now has a contractor engaged and a single option selected to progress into detailed design.

In our Central area, we continue to progress our WRMP19 schemes as well as monitoring the risks in less resilient areas such as Sussex North. Our key water recycling scheme at Littlehampton WwTW has now progressed through detailed options development. The preferred process option selection has been completed and preparation of an outline design of the proposed plant has commenced. We have also continued pipe route selection and development, initiating discussions with landowners, and starting environmental surveys.

Whilst not a WRMP19 scheme, recognising the critically of water supplies in our Sussex North water resource zone our draft WRMP24 includes a new scheme to deliver a phased rebuild of Weir Wood WSW. This intends to deliver a works capable of supplying 5.4MI/d by 2025 and 13MI/d by 2027. Work has been underway to determine the WRMP19 schemes within our Eastern area schemes are progressing. A key scheme in this area, Medway water recycling scheme, is progressing, reaching options selection stage, with outline process design commencing. We continue to engage with regulators and landowners to progress this scheme.

In summary, this year has seen significant effort in outage and leakage reduction, demand management and progression of our WRMP19 schemes to further stages of delivery. We have maintained the supply-demand balance through 2023-24 and continue to monitor the forecast position as we enter 2024-25. As we have progressed our WRMP19 schemes further, we have obtained a better understanding of the risks and challenges we face in delivering these schemes, which has enabled us to better plan for these challenges and inform our rdWRMP24.

1 General

1.1 Supply-demand situation

The reporting year was warm but wet leading to more stable demand and consistent supply. The peak week was between 11/06/2023 and 17/06/2023 but saw no supply demand issues and the supply demand balance was positive for our reporting scenarios. We continue to focus on less resilient areas such as Sussex North and the Isle of Wight by tackling outage, leakage and resilience. Please see section 5.1 for further info on our outturn supply and demand balance.

1.2 Company Actions

We have started smart metering trials in parts of Southampton and Andover. Our home visits programme is progressing as well. Challenges presented by COVID-19 and a global semi-conductor shortage have hit the supply-chain that manufactures our water meters. As a result, we have deferred the increase in household meter penetration from 88% to 92% to AMP8 (2025-2030).

Technology improvements such as the use of automated pressure release valves has helped stabilise the network, reducing leakage. The Western area has fared better than other areas given its extensive chalk base; other areas typically consist of a clay based sub-structure. Clay based soils are more prone to ground movement which can increase the breakout of leaks.

Overall, water efficiency initiatives, with the exception of meter penetration, are progressing, albeit with revised targets driven by COVID-19 related to increased home working.

1.3 Action Plan

Progress in western area

Large strategic resource development

A full summary of our Western Area progress can be found in section 4.1.2.

A 2030 delivery date of our Strategic Resource Option (SRO), the Hampshire Water Transfer and Water Recycling Project (HWTWRP), is not achievable given the level of risk now understood in key areas of the programme. The analysis has indicated greater confidence in delivering the HWTWRP by 2033-34 with a benefit in 2034-35 This assessment is based on some key assumptions (e.g. that customers have greater acceptance of recycled water challenges as well as getting required consents and permits in line with the delivery timelines).

Our SRO option investigating the Thames to Southern Transfer project (T2ST), which is a transfer from Thames Water into our Western area to move up to 120MI/d is discussed in section 4.1.2.

1.4 Progress with all outstanding, company-specific actions – signpost to each section

Following submission of our 2023 Annual Review in July 2023 we received feedback on our Annual Review in August and October 2023. Our progress can be seen in Table 1 below.



Table 1: Progress on EA Feedback Letter Progress on EA Feedback Letter

Letter Theme	Progress
SDBI	<p>As noted in this letter, since publication of WRMP19, the supply and demand picture has changed dramatically across our region. We are at a key transition point from WRMP19 to WRMP24, as we close out the AMP it is imperative we monitor our SDB situation closely to ensure that all water resource zones remain in surplus, and the risk of deficits is reduced.</p> <p>In our response to your Annual Review Feedback letter, we provided the Environment Agency, DEFRA and Ofwat with a SDB summary and action plan. This action plan focused on the following three areas to ensure our water resource zones remain in surplus:</p> <ul style="list-style-type: none"> • Continue to progress our outage recovery programme. We have continued to deliver schemes that reduce outage and improve resilience across our region. Please see the outage recovery line below and section 2.2 for further information. • Drive leakage reduction through the guidance of the PALM model Leakage levels have reduced compared to the Annual Review 2023 by 1.0MI/d, but continue to be above target with an outturn of 107.48MI/d against a WRMP19 forecast of 84.9MI/d. Please see the leakage recovery line below and section 3.4 for further information. • Optimise transfers wherever possible and available. We have optimised our internal transfers in our outturn 2023 SDBI calculations, based on the forecast supply and demand balance for each zone. Ensuring that transfers are within the surplus of the donor WRZ and maximum transfer capacity. We have followed the SDBI and AR guidance and have incorporated these into the final SDB calculation and have detailed them in our SDBI adjustments template. <p>Please see Section 5.1 for details on our outturn SDBI. This aligns to our SDBI figures submitted in June 2024. We have engaged with the EA teams on the revised SDBI submission format, utilising the new adjustments table, which now splits out internal transfers.</p> <p>We committed to undergo 6 monthly meetings to discuss progress. The first session was held on the 19th of January 2024 and a second is scheduled for the 19th of June.</p> <p>Please see section 4.1.3.2 for an update on plans to rebuild Weir Wood WSW.</p>

Letter Theme	Progress
Leakage	<p>Leakage levels have reduced by 1.0Ml/d compared to the Annual Review 2023. Leak repairs numbers in 2023-24 totalled 23,076.</p> <p>Our ambition is to prioritise higher leakage volume reduction to ensure the most effective and efficient use of resources to achieve leakage targets and, as a result, the average leak size repaired increased by 50 l/d per leak. We are aiming for a spot level of 77.6 Ml/d for the last week of 2024/25. See Figure 1 below.</p> <p>One of the interventions has been to increase the number of acoustic loggers deployed on the network. Over the year an additional 3000 loggers have been deployed, taking the total number to around 12,000. We have also shifted the focus of these loggers from lift and shift to permanent deployment, especially in locations that are difficult to undertake traditional leakage surveys. Table 30 shows our leakage recovery plan.</p> <p>A focused effort to reduce leakage is being delivered via a detailed leakage reduction plan this is based on the PALM model which Separates the “leak life cycle” into 4 phases these include;</p> <ul style="list-style-type: none"> • PREVENT; A program of Advanced Pressure Management measures, PRV installations, the optimisation of the existing estate of PRV’s and water main transient mitigations, these actions will also impact the burst main and supply interruptions ODI measures, by calming the water network down. • AWARE; The installation of over 1,000 further pressure loggers for leak identification, improved DMA Operability, developments within our leakage reporting software to assist with the leakage targeting process. • LOCATE: Maintenance of our ALC detection resources, the deployment of an additional 3,000 semi and permanent installed acoustic loggers for early leak detection, innovation in leak detection activities with trials in Satellite and Thermal imaging techniques. Changes to the incentivisation model for the leak detection actives based on leakage reductions, allowing for high volumetric leaks to be promoted. Concentrated efforts to increase the customer side leakage elements of leakage reduction. • MEND; increase in the overall number of leak repairs, introduce processes to improve leak repair run times with the aim to repair burst mains within reducing time periods.
Outage	<p>We presented our outage recovery plan at our first joint regulator meeting on the 19th of January. Please see Section 2.2 for further details on our outage figures for this year, plus progress on our outage recovery programme.</p> <p>As part of our SDBI submission we detailed our planned outage levels. This is outage that is incurred completing capital works or maintenance, that we would be able postpone if we were in drought conditions. Exclusion of planned outage ensures that we complete essential works and maintenance and improve the resilience of our sites. Exclusion of planned outage has reduced outage levels reported in our SDBI submission. For more information, please see section 2.2.</p>
Supply Schemes	<p>To identify measures to mitigate the impacts of revised delivery dates for Havant Thicket Reservoir and the Hampshire Water Transfer and Water Recycling Project (HWTWRP) in our Western area and the Littlehampton recycling option in our Central area we have undertaken an assessment of options that could increase supply demand resilience in the short term (before the larger strategic schemes are delivered. We carried out this assessment in response to a WRMP24 letter from the EA sent in August 2023. This assessment has resulted in the acceleration of two new options (one in central and one in our western area) and the inclusion of two other WRMP supply options which were not selected in our dWRMP24. One of these resilience options is the short-term use of a bulk import of water from Norway via sea tankers. We describe this option and the assessment we carried out in annex 20 of the revised draft WRMP24 that we intend to consult on during 2024.</p> <p>We continue to progress our WRMP19 supply schemes, for further information please see section 4</p>

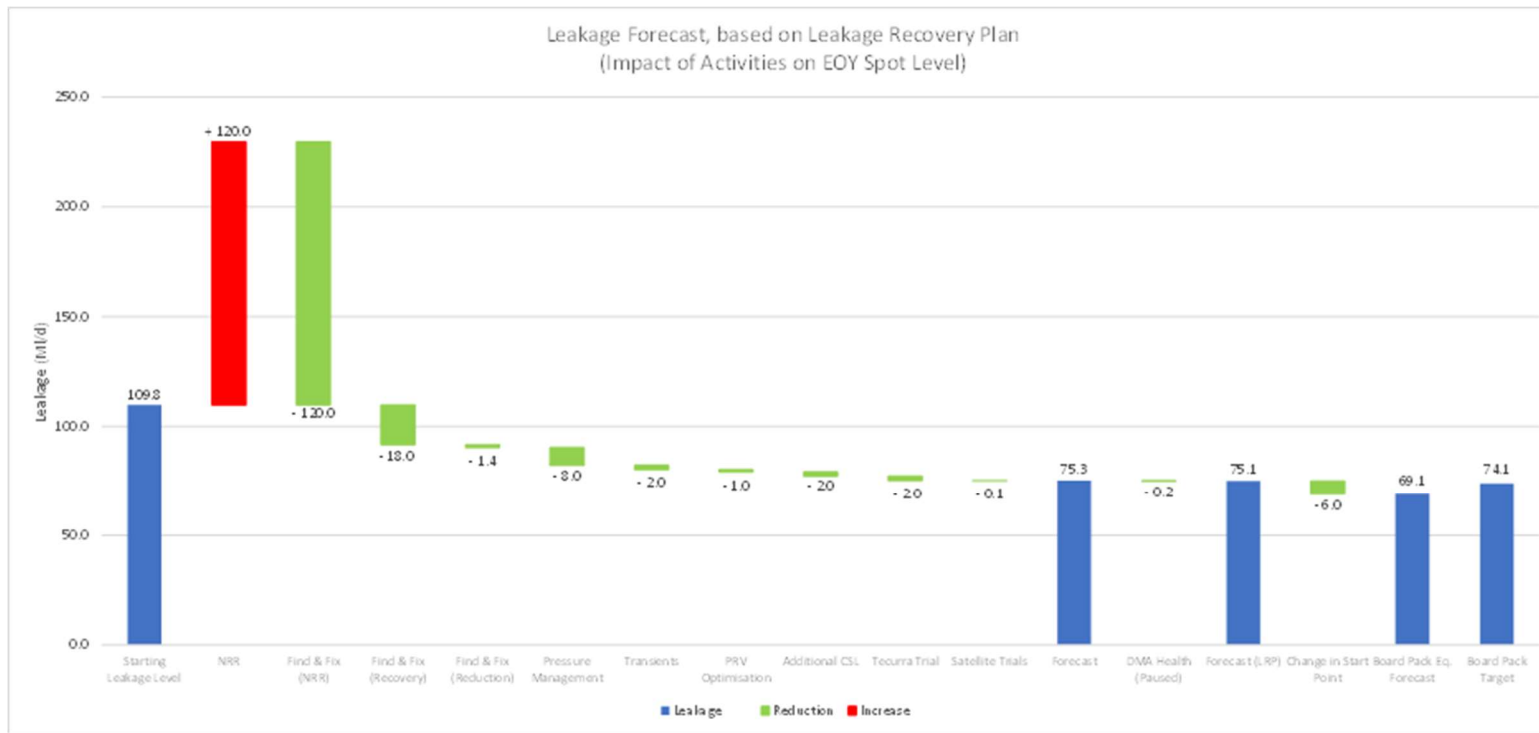


Figure 1: Leakage Forecast based on Leakage Recovery Plan

1.5 Water Resource Zone (WRZ) boundary changes

There have been no further significant changes or emerging supply risks to any of our other WRZs since our WRMP19 assessment and therefore we have made no changes to the way we have defined our WRZs in 2023-24. A map of our supply area showing our 14 WRZs and the main sources of water in each is shown in Figure 2.

1.6 Levels of Service

For the 2023-24 reporting period we experienced wet winters, which occurred across our supply area in both 2022-23 (subsequently affecting the summer of 2023) and again through the winter 2023-24. We have had a sustained and healthy water resource position throughout unaffected by drought. Therefore, in the period 2023-24 we have not implemented any restrictions upon water use and we have not applied for, nor have implemented any additional drought measures such as Drought Permits or Drought Orders (including emergency drought orders).

Our level of service performance for this period since the publication of WRMP19 remains broadly in line with our forecast target Level of Service (Table 2).

In WRMP19 we recognised that we would not be able to fully meet our above target levels of service in our Western Area in the short to medium term (over the next 5 to 10 years) since changes to our abstraction licences on the River Test and Itchen were made in 2019. Our level of service is therefore aligned with our Section 20 (S20) Agreement with the EA which forecasts a higher frequency of needing to implement restrictions on water use as well as drought permits and orders until alternative supply options are able to replace the lost DO become available. The forecast for reduced level of service is set out in Table 2.

Table 2: Comparison of target, forecast, historic and actual level of service for our Western area.

Level of service	WRMP19 Target Level of Service	WRMP19 Forecast 2020-2027	Historic Performance (1989-2018)	Actual Performance since 2019
Temporary Use Bans on different categories of water use	1-in-10 year probability	90% chance of occurring (1-in-4 year probability)	No events in period (better than 1-in-30 year probability)	Once (2022) in four years (1-in-5 year probability)
Drought Order (Non Essential Use Ban on different categories of water use)	1-in-20 year probability	34% chance of occurring (1-in-20 year probability)	No events in period (better than 1-in-30 year probability)	No events (better than 1-in-5 year probability)
Emergency Drought Order to restrict water use (rota cuts and standpipes)	1-in-500 year probability	2% chance of occurring (1-in-500 year probability)	No events in period (>1-in-30 year return period)	No events (better than 1-in-5 year probability)
Drought Permit/Order to increase supplies through relaxation of licence conditions.	1-in-20 year probability of application 1-in-200 year probability of implementation	Application – 90% chance of occurring (1-in-4 year probability) Implementation 34% chance of occurring (1-in-20 year probability)	No events in period (>1-in-30 year return period)	Applications (2019 and 2022) in period (1-in-3 year probability) No implementations in period (better than 1-in-5 year probability)

Where your water comes from today

We supply water to parts of Kent, Sussex, Hampshire and the Isle of Wight.

We supply water to parts of Kent, Sussex, Hampshire and the Isle of Wight. Where the water comes from, how it is supplied and how much is used varies across each county. We divide our supply area into 14 'water resource zones' which are shown on the map.

About 70% of the water we supply comes from groundwater. These water supplies are stored underground in rocks and soils called aquifers and we pump them up to the surface. The rest come from rivers and streams, some of which are supported by chalk-fed groundwater. In some areas, reservoirs store water that is typically pumped from nearby rivers when flows are high. Our natural water resources are split into catchments areas – we take water from eight catchments across the South East.



Western area

Much of the water supplied in the Western area comes from underground sources. In South Hampshire, the River Test and River Itchen provide the majority of supplies while on the Isle of Wight around a quarter comes from the River Yar.

Water is transferred from South Hampshire to the Isle of Wight to supplement its water supplies. Water can also be transferred from Portsmouth Water's area to South Hampshire.



89% of homes are metered in Hampshire

95% of homes are metered on the Isle of Wight

Average water use:
Hampshire – 129 litres per person per day
Isle of Wight – 131 litres per person per day

Western water resource zones

Hampshire Kingsclere	100% groundwater
Hampshire Andover	100% groundwater
Hampshire Rural	100% groundwater
Hampshire Winchester	100% groundwater
Hampshire Southampton East	52% river, 48% groundwater
Hampshire Southampton West	100% river
Isle of Wight	47% groundwater, 23% river, 30% transfers

Central area

Brighton, Worthing and surrounding areas rely predominately on the groundwater sources beneath the South Downs. Sussex North is supplied from a mix of water sources including the River Arun and the Western Rother, Weir Wood reservoir near East Grinstead and a transfer from Portsmouth Water. There are pipelines that allow water to be moved between our Sussex North and Worthing water resource zones in both directions, and from Worthing to Brighton.



84% of homes are metered

Average water use:
139 litres per person per day

Central water resource zones

Sussex North	35% groundwater, 51% river, 8% reservoir, 6% transfers
Sussex Worthing	98% groundwater, 2% transfers
Sussex Brighton	100% groundwater

The whole of South East England is classed by the Government as being seriously water stressed which means that the amount of water available is limited.

Eastern area

Our Kent supply areas take most of their water from groundwater. The rest comes from the River Medway, some of which is stored in Bewl Water reservoir before it is released back into the River Medway where it is abstracted. Hastings in East Sussex takes most of its water from Darwell reservoir which stores water from the River Rother and Powdermill reservoir which stores water from the River Brede. We can transfer water from Medway to Thanet and from Medway to Hastings.



88% of homes are metered

Average water use:
132 litres per person per day

Eastern water resource zones

Kent Medway East	100% groundwater
Kent Medway West	56% river and reservoir, 44% groundwater
Kent Thanet	79% groundwater, 21% transfers
Sussex Hastings	5% groundwater, 79% reservoir, 16% transfers

Figure 2: Southern Water supply area and Water Resource Zones

1.7 Performance commitments

Our three-year rolling average Per Capita Consumption (PCC) for the 2023-24 reporting year was 129.6 litres per head per day (l/h/d) and was behind target as seen in Table 3. Our Ofwat target is a three-year rolling average PCC of 120.3 l/h/d for 2023-24. Our three-year average and outturn annual PCC figures have both decreased since last year. We expect PCC to continue reducing over the remainder of the AMP as we progress our water efficiency programme. Further details of our water efficiency activities during 2022-23 are included in section 4.2.1

Annual outturn leakage in 2023-24 was 107.5MI/d. The three-year rolling average leakage has risen to 104.3MI/d against a three year rolling target of 87.9MI/d as also seen in Table 3. Details of our leakage reduction activities are included in section 4.2.4.

Customers at risk of severe restrictions in a drought continues to be 0% against target.

Table 3: Outcome delivery incentive targets

Performance Commitment	Measure	Decimals	Year 4 target	Year 5 target	Baseline 2019-20 outcome	Year 1 Actual	Year 2 Actual	Year 3 actual	Year 4 actual
Leakage (3 year rolling ave.)	MI/d	1	87.9	84.9	99.9	96.9	94.9	99.7	104.3
Leakage (in year)	MI/d	1			94.1	93.8	96.8	108.5	107.5
Per capita consumption (3 year rolling average)	l/h/d	1	120.3	118.8	128.0	132.2	133.6	133.7	129.6
Per capita consumption (in year)	l/h/d	1			128.1	139.0	133.6	128.4	126.7

1.8 COVID-19 Impact

1.8.1 Per Capita Consumption (PCC)

COVID-19 led to an increase in household demand during 2020-21 and 2021-22 as customers worked from home and made changes to their hand washing and personal hygiene routines. Consequently, we revised our AMP7 and 2024-25 PCC forecast (127.5l/h/d), which is higher than our starting position for the 2020-25 planning period.

PCC has reduced as people have returned to the workplace following the lifting of pandemic restrictions. Average PCC for 2023-24 reduced to 127.3l/h/d from the peak of 139.0l/h/d in 2020-21. However, a significant proportion of the workforce continues to work from home for at least part of the week. Despite our on-going programme of home visits and media campaigns, we estimate that we are 5 years behind the original behavioural change aspirations set out in the 'Target 100' programme.

1.8.2 Water efficiency

As report by Artesia, 'AR2604 Impact of shocks to PCC', concluded, 'that the ongoing impact of the pandemic and most notably working from home is likely to persist for the foreseeable future. This presents a concern not only for AMP7 and the proposed ex-post adjustment to PCC, but also for targets moving forward into AMP8, which would require a different level of adjustment.'

We plan to reduce non-household demand by 9%, by 2037-38, compared to our 2019-20 reported figure. We have allowed it to increase post 2037-38 in response to growth, although our forecast for non-household demand in 2075 is lower than at the start of the planning period. See section 4.2.2.

1.8.3 Leakage

The demand pattern for household and non-household customers remains more variable than it did pre-COVID-19 and therefore the water network is being stressed in areas that we have not experienced previously. We are continuing with our program of implementing new Advanced Pressure Management schemes and optimising existing schemes, reducing the number of transients within the water network, maintaining increased resources in find and fix, reducing key leak run-times, satellite and aerial surveys, meter under-registration studies, increased CSL activities and improving our acoustic logging capabilities. We are also continuing to develop our leakage reporting software, including developing leakage targeting tools aimed at increasing detection resource productivity.

We give more details on our leakage recovery plan and how we have increased leakage management resources in section 3.4.

1.9 Peak Demand

Table 4: Summary of Peak Demand

Asset/area	Risk	Mitigation
Darwell 800mm main	A significant leak has been identified on the raw water main from Darwell SWR to Beauport WSW and this requires repair. Failure of the main would result in loss of input to Beauport WSW and potential loss of supply for customers in the Hastings area of the network. Failure of this main was experienced in May 2024, leading customers to lose supply in the Hastings area.	Whilst repairs to the main are carried out, the following mitigation measures will be in place: WSR levels maximised prior to work commencing. Bottled water stations and tankers will be deployed in case of a loss of supply incident occurring. Following the incident in May 2024, the section of main that failed has been replaced, and we are in the process of developing a system-based resilience strategic assessment, to drive improvements across the next AMP
Midhurst WSW	Midhurst WSW is experiencing artesian well flow which is included in the abstraction licence. This is leading to multiple hourly and daily licence breaches.	This is being mitigated by limiting abstracted flows and relying upon supply from Pulborough WSW for Knightsfield and Rake WSRs. During peak demand periods there is a risk that reduced supply from Midhurst WSW, combined with input from Pulborough WSW, will not be sufficient to meet demand. We are developing a scheme within AMP8 to provide long term mitigation for this risk.
High nitrates in the Thanet zone	Nitrates in the Thanet zone have approached, and in some cases, exceeded the PVC of 50 mg/l. This has resulted in Flemings WSW being turned off, reducing input to Fleete WSR. At times, the nitrate	This is mitigated by maximising the input from the Selling to Fleete transfer to blend in Fleete WSR.

	levels in the Wingham zone also approach PCV. As a result flows from Wingham WSW to Aylesham and Adisham WSRs are stopped.	
Test Surface Water WSW (and the Hampshire South zone)	Test Surface Water WSW currently has high lift pump resilience challenges with two of the five potable high lifts pumps currently unavailable and two of the four industrial high lifts pumps currently unavailable. Failure of any one of these pumps would make meeting demand challenging.	We are investing circa £10m in delivering resilience improvements at Test Surface Water WSW and other sites, which will mitigate resilience issues caused by the high lift pumps. Whilst this is delivered to mitigate this risk, one potable high lift pump is currently with a contractor for repair and over-pumping will be put in place for one of the industrial high lift pumps. There is also the ability to transfer water in from the east of the zone via the Woodside Rezone, taking advantage of water from Itchen WSW. There are also further rezone options to bring in water from the Hampshire Rural zone to Test Surface Water if required.

1.10 Drinking water quality

We continue to work closely with the DWI on our AMP7 improvement plans for water quality and resilience of our water sites. We have 46 DWI legal instruments (6 Undertakings, 26 Notices and 6 Final Enforcement Order) associated with our assets and operations. We have also been issued with eight AMP8 Notices.

We have 10 DWI Notices and six Final Enforcement Order covering asset improvement works at our water supply works. One of these notices covers all our groundwater sites (Ground Water Hazrev SRN 3926). The Notices by site are listed in the tracker below.

As part of the programme of improvement works required by these Notices, water supply works have to be removed from supply to enable these works to take place and are managed through our outage strategy and production planning. In addition, there are a number of sources with drinking water notices that are currently long term out of supply due to a deterioration in water quality. We are actively managing delivery of improvement works related to our DWI notices, alongside delivery of WRMP19 schemes.

Table 5: Sites with drinking water inspectorate final enforcement orders (FEO) or notices

Drinking Water Inspectorate Notices and FEO's according to sites
Test Surface Water WSW (FEO)
Itchen WSW (FEO)
Sandown WSW
Pulborough WSW (FEO)
Brighton A WSW
Long Furlong B WSW
Brighton Water Supply Works: Housedean WSW, Newmarket B WSW, Newmarket C WSW
Romsey WSW (FEO)
Twyford WSW (FEO)
near Rochester WSW (FEO)
Weir Wood Forest Row WSW
Thanet Supply System: Beacon Lane Woodnesborough Water Supply Works, Flemings Road Woodnesborough Water Supply Works, Wingham Water Supply Works, Wingham (Fleete) Water Supply Works, Sparrow Castle Acol Water Supply Works, Lord of the Manor Water Supply Works, Minster IOT Water Supply Works, Deal Low Level Water Supply Works, Sutton Water Supply Works.

Beauport and Beauport WSW
Andover WSW
Whitchurch WSW

Table 6: Water Supply Works included in Groundwater HazRev Notice

Water Supply Works included in Groundwater HazRev Notice		
Littlehampton	Bush Road, Cuxton	Winchester
North Falmer A	North Cuxton	Hove B
Northfleet	Shoreham	Rochester
Arundel	Caul Bourne	Falmer
near Whitchurch	Meopham	Romsey
Overton	Sompting	North Worthing
Rottingdean	Newport	Ramsgate
near Basingstoke	Gillingham	North Shoreham
Brighton A	Lewes	Alresford
Barton Stacey	Long Furlong A	West Sandwich
Newchurch	North Arundel	Sandwich
Long Furlong B	Birchington	Chatham West
Bottom Pond	Deal Low Level	Twyford Moors
Petworth South	West Langdon	Hove
River Way, Andover	Durrington	North Falmer B
Worthing	Dover Road, Ringwould	Higham Newmarket C
Strood	North Dover	Ventnor New
Midhurst	Steyning	near Herne Bay
South Arundel	Eastling	East Worthing
Manston2	Hartlip	near Canterbury
Faversham4	North Deal	

For further information please see the link below to the DWI website:

[Southern Water Improvement Programmes - Drinking Water Inspectorate \(dwi.gov.uk\)](https://www.dwi.gov.uk)

1.11 Adaptive Planning

Our WRMP19 plan was built as an adaptive plan and included alternate elements for some of our key strategic options to address an uncertain future, these were particularly relating to the potential impacts of:

- Sustainability reductions (abstraction licence changes to protect the environment)
- Demand growth
- Climate change
- Solution uncertainty / change

Our WRMP19 supply-demand balance forecast was generated as a series of probability distributions representing a range of possible futures. As the branches are a combination of the probability functions of the key supply-demand uncertainties listed above it is not possible to say what any given branch represents (for example, we cannot say that branch A is a high sustainability reduction scenario, branch B high demand growth, etc.), however the outcome supply-demand balances do reflect the range of uncertainty across these impacts between more or less challenging futures.

Our WRMP19 plan branches diverged at a branching point in 2027. The selection of this branching point was based upon a number of factors but primarily it was driven by the point at which the large uncertainties in supply-demand balance relating to potential sustainability reductions were likely to be realised. We now have greater certainty about both the magnitude and timing of potential sustainability reductions that were considered uncertain at the time of preparing WRMP19. This has arisen from the following:

- The outcome of AMP6 Water Industry National Environment Programme (WINEP) investigations at Andover, Carisbrooke, Bowcombe and the Lewes Winterbourne has allowed us to avoid, defer or mitigate against potential sustainability reductions through a combination of detailed investigations and careful mitigation, underlining the value of the WINEP studies. Consequently, the loss of DO from these studies is smaller than forecast in WRMP19 resulting in an improved supply-demand balance in those zones.
- Our current AMP7 and AMP8 WINEP studies are driven, in many cases, by a “No Deterioration” Water Framework Directive (WFD) driver, the guidance for which sets out clear requirements and a timetable for when mitigation (e.g. a sustainability reduction) is required to prevent growth in abstraction that could result in deterioration in the status of a water body. Our WFD No Deterioration WINEP programme, and confirmed regulatory completion dates, is based on EA No Deterioration guidance (January 2018). We have completed Stages 1 and Stage 2 of the guidance which has informed the prioritisation of the WFD investigations. We submitted this information to our EA Area teams in November 2020. For the majority of our No Deterioration studies we have agreed alterations to our PR19 and PR24 WINEP programme to conclude investigation and options appraisal for the majority of our sources by 2027 with mitigation (including sustainability reductions through licence changes not now being implemented until after 2030).
- We have been able to screen out sources from further risk where no growth in abstraction is possible or likely, and in others where growth could occur our demand and water efficiency forecasts suggest that growth is not likely until the late 2030s or 2040s and hence mitigation could be deferred. Effectively this means that there are very few confirmed or likely sustainability reductions that will now occur in 2027 and hence the supply-demand balance impacts for 2027 are likely to be less than forecast in WRMP19.

Although our initial No Deterioration WINEP has provided an update to the potential timing of future licence changes the need for sustainability reductions, which could include application of licence caps, has not necessarily been eliminated. Rather the timing has been deferred consistent with No Deterioration Guidance into late AMP8 or AMP9 until after our current WINEP investigations and monitoring have concluded. By the middle of AMP8 this will have resolved much of the uncertainty about the scale of future licence changes (ready for WRMP29 planning).

The potential for further licence changes to protect the environment in the longer term, including alignment with our company environment strategy, is being considered through the environmental destinations we are developing for assessment within the Regional Plan and our WRMP24. Sustainability reductions are likely to remain a principal driver of future investment in the long term through achievement of our proposed Environmental Destination profiles.

Our WRMP19 strategies set out delivery decision points for some of our strategic water resource options and alternatives. In some cases, these decision points and future scenarios relate to the impact of sustainability reductions which were assumed to be implemented in 2027-28. In some WRZs this decision point has effectively been delayed until the WINEP investigations have concluded to determine the scale of mitigation required. This is to ensure that we make fact-based decisions, but we realise there are risks associated with this.

In the context of our Adaptive Plan there are changes to a number of schemes set out in our WRMP19 adaptive strategy (see Table 7). When producing our WRMP19, we had expected to receive a new bulk supply from both Bournemouth Water and Portsmouth Water, but both of these companies have now confirmed that these supplies are not available. The Bournemouth Water Scheme is no longer forecast to be viable as there is likely to be insufficient resource available in the future owing to updated information on the likelihood of future sustainability reduction for the River Avon catchment. The Portsmouth Water transfer (9MI/d) is also unavailable as exploratory borehole drilling and testing did not find the anticipated yield.

We will continue to track our key indicators ahead of the decision points set out in WRMP19 to determine if there is a driver to change the timing of scheme delivery.

In parallel we are continuing to develop our updated adaptive strategy for our revised draft WRMP24 which will also inform any decisions we make about the timing of scheme delivery.

Table 7: Summary of scheme status for strategic schemes included in our WRMP19 adaptive plan

Scheme	WRMP19 Decision point	Current Status
Leakage Reduction (15% by 2025)	September 2023/2024	We are not on track for our 2022-23 leakage target and are increasing resource to get back on track for future years leakage targets with additional funding to support.
Target 100 Water Efficiency	September 2023/2024	Average PCC for 2023-24 reduced to 127.3l/h/d from the peak of 139.0l/h/d in 2020-21. However, a significant proportion of the workforce continues to work from home for at least part of the week. Despite our on-going programme of home visits and media campaigns, we are 5 years' behind on our original 'Target 100' programme.
Shoreham Desalination	April 2023	Scheme cannot be delivered and has been removed from our revised draft WRMP24 No alternative solution delivers the 10MI/d benefit needed here (as per WRMP19) by 2027. We have reviewed alternative schemes with a new Lewes Groundwater Scheme for Sussex Brighton (up to 4MI/d) now selected in WRMP24 at a revised date.
Littlehampton Water Recycling	April 2024	Scheme delivery has been delayed to 2030-31 due to additional monitoring required and planning requirement. Our revised draft WRMP24 reflects this position but does not forecast any significant supply demand risks as a result of this delay
Pulborough Groundwater Licence Variation	n/a	Scheme on hold pending outcome of Pulborough Sustainability Investigations. This scheme has been removed from our revised draft WRMP24.
Sussex Coast Lower Greensand ASR	April 2023	Scheme cannot be delivered due to a lack of suitable site and has been removed from our current strategy/ revised draft WRMP24
Rehabilitation of West Chiltington	October 2022	Scheme has been delayed and is now expected to return to service in April 2027.

Pulborough Winter Transfer Stage 2	April 2023	Feasibility study ongoing to ensure that there is no impact from abstraction in relation to the water neutrality position statement
Medway WTW Indirect Potable Water Reuse	April 2025	Scheme currently on track but potential delivery risks which, if materialised, could lead to a delay of up to 23 months. We intend to deliver this scheme by 2029-30 in line with the first utilisation date as identified in the revised draft WRMP24.
Sandown Water Recycling	December 2023	Progressing with delivery date revised to 2029-30. Scheme determined to require full EIA and planning permission and was not suitable for permitted development
Petersfield	December 2023	Scheme has been delayed and is now expected to return to service in April 2027.

1.12 Water neutrality

In September 2021 Natural England (NE) issued a Position Statement for applicants of new development within Sussex North Water Supply Zone (the NE Position Statement). This confirmed that the existing water supply in the Sussex North water supply zone cannot be ruled out as contributing to the decline in wildlife within internationally protected sites in the Arun Valley, Sussex. As the detrimental impact on the Arun Valley site cannot be ruled out, Natural England has advised that developments within this zone must not add to this impact and must achieve 'water neutrality' for development to proceed. The Position Statement defines water neutrality as "the use of water in the supply area before the development is the same or lower after the development is in place".

We continue to proactively work with Government, the EA, NE and the local planning authorities to ensure the requirements of the Habitats Directive are met in our Sussex North WRZ (SNZ), to protect designated conservation sites and to facilitate new housing development. We welcome the focus on water neutrality, allowing a proper debate on key aspects of planning, development, demand management, use of sources and protection of the environment as well as whether alternative options may exist.

We have voluntarily reduced abstraction from our Pulborough Groundwater Source by more than 50% compared to the average abstraction in the first half of 2021-22. We are continuing to use alternative sources of supply and maximise the bulk import from Portsmouth Water wherever possible to reduce any potential impact on the designated sites. In addition to our bulk supply from Portsmouth Water we have also worked with SES Water and implemented a rezone enabling supply of some customers around Crawley to be fed from SES Water. We continue to explore further options for additional temporary rezones, which may benefit water neutrality in Sussex North, with SES Water.

We are building a modular water treatment plant for Weir Wood reservoir, as part of our strategic plan for the redevelopment of this asset. This will be completed in three phases, with the first phase, delivering 5.4 MI/d, planned to be operational by summer 2025. This will contribute to our supply baseline and help with long term resilience. Supply will further increase to 13MI/d in 2027-28 and 21MI/d in 2029-30.

We have an ongoing sustainability investigation into the potential relationship between our abstraction and the nearby designated sites, which will ultimately inform the determination of a new sustainable abstraction licence for the Pulborough groundwater source. The investigation is due to be completed in 2025. We have in place a steering group with the Environment Agency and Natural England included, recognising that this area is

sensitive to many stakeholders. We are committed to investigating concerns further, in order to ensure that our abstraction will not cause impact and is sustainable in the long term.

We have provided significant input to the development and completion of the water neutrality strategy developed by local authorities. This has included the provision of demand forecast data and details of our existing planned demand management strategy and area of service.

To ensure a collaborative approach to water neutrality we have regular engagement with the Local Authorities located in the Sussex North Water Neutrality area, via regular Chief Executive (CEX) sessions to discuss strategic positions. These sessions also include executive and senior representatives from Natural England, The Environment Agency, Ofwat, Defra, and the Department for Levelling Up Housing and Communities.

We are proactively engaging with key stakeholders engaging with government, regulators, local authorities, developers / land agents and their supporting consultants. We host regular water neutrality webinar sessions to improve awareness and engagement, particularly within the developer community.

In addition, we also have regular monthly engagement and support at officer level with the dedicated project manager who is employed by the Local Authorities to manage water neutrality from a Local Authority perspective, which includes the implementation of a Sussex North Offsetting Water Scheme (SNOWS) for developers. To enable water neutrality questions to be raised with us we have provided a dedicated water neutrality email inbox, where our customers can raise water neutrality questions with us to respond to. This is supported by a dedicated webpage on water neutrality, including recordings of webinars and copies of slide packs and Q&A responses. The page can be found here: [Water Neutrality \(southernwater.co.uk\)](https://www.southernwater.co.uk/water-neutrality)

Our Water Asset Strategy and Planning team now includes a Water Neutrality Lead role, as a focused support to the local authorities. The Water Neutrality Lead role is coordinating our internal activity, liaising with partners and taking the lead on technical aspects of water neutrality, including developing our own strategy for implementing water neutrality requirements when we are undertaking development of our assets in SNZ.

We are also supporting Affinity Water in a pilot project of a Water Savings Market, in collaboration with the Local Authorities within SNZ. A water savings market, when fully mature, could provide an opportunity for developers to offset their development through the purchase and sale of water credits to ensure they have a neutral impact on water scarcity within SNZ. The pilot will establish a market framework and a market operator who will match up buyers and sellers of water credits. Ahead of introducing the pilot, we are working with the local planning authority, developers, Natural England and other key stakeholders to consider how the scheme will interact with the planning process.

2 Supply

2.1 Weather

The total summer (April – September) rainfall and average summer temperature values from 1910-11 to 2023-24 are shown in Figure 3. 2023-24 was a warm year but also one of the wettest in the record.

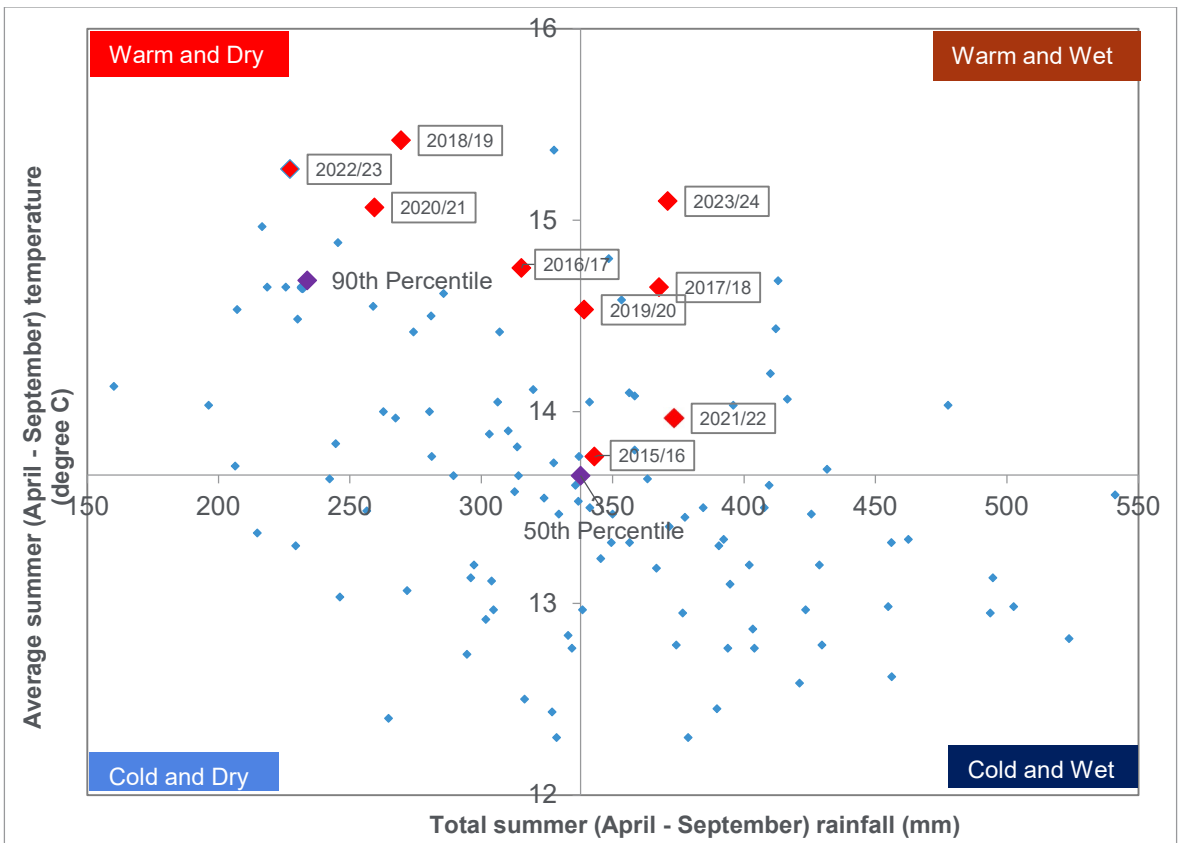


Figure 3: Rainfall and average summer temperature values from 1910-11 to 2023-24

The average monthly temperatures were higher than the long-term average in May, June, September, October, December, February and March with the other months being about average. This caused our peak week to occur in June this year (11/06/2023 to 17/06/2023).

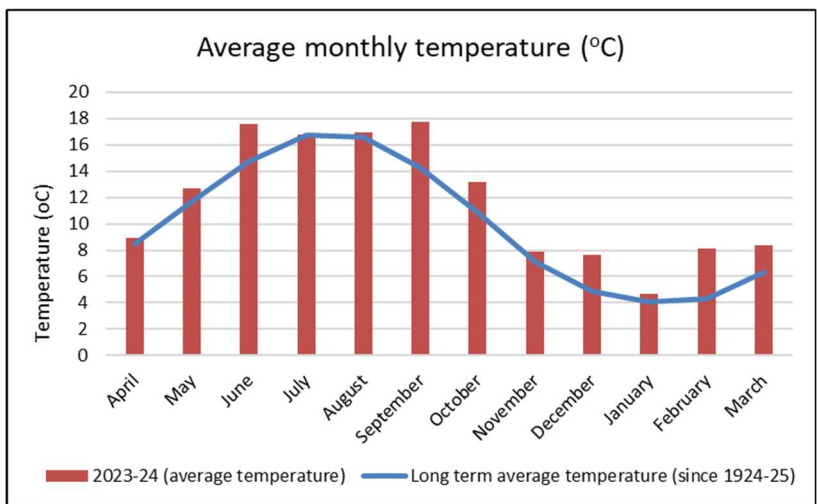


Figure 4 :Monthly average temperature for 2023-24 and its comparison with long-term average

The average monthly rainfall was considerably higher than the long-term average for most of the year with very wet months in July, and across autumn and Winter.

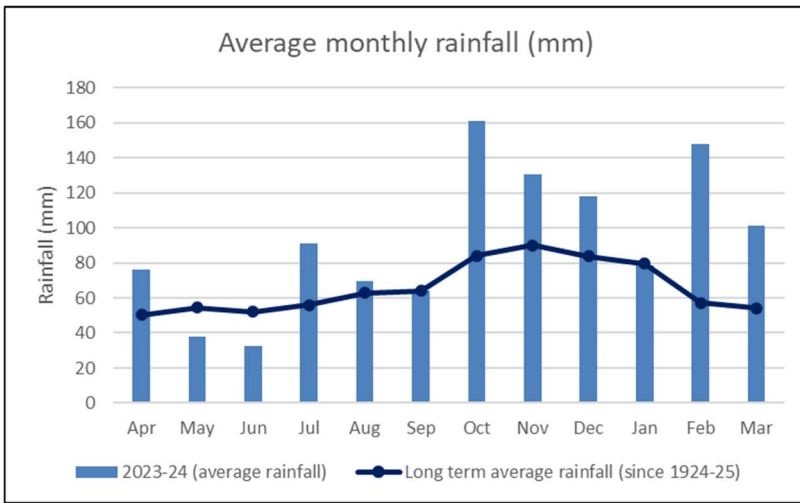


Figure 5: Monthly average rainfall for 2022-23 and its comparison with long-term average based on Met office data for South East England.

Owing to the wet Winter in both 2022-23 and again over 2023-24 we had no need to enact any TUBs/NEUBs, drought permits or drought orders during the year and our current drought risk remains low in all water resource zones.

The Hampshire Southampton West water resource zone with its single supply from the River Test is our supply area which is most vulnerable to dry weather and drought. As usual, we will closely monitor the flows in the River Test and use our forecasting model to track the flow recession against our drought triggers. Groundwater levels and river flows remain higher than usual in the catchment of the River Test, however, we may cross our 90-day trigger to 'prepare for drought' in late August or September. At this point would initiate our usual drought preparatory measures, however, we only expect flows to fall low enough for a drought permit application to be required if there was an exceptionally dry autumn and early winter.

2.2 Outage

More information our outage reporting can be found in Appendix G.

2.2.1 Outage

We have calculated three outage scenarios to reflect our WRMP planning scenarios. ADO outage is using annual average values against our Average Deployable Output. PDO outage uses the peak week outage values (2023-24 peak week was between 11/06/2023 and 17/06/2023) against our Peak Deployable Output. MDO outage uses outage values between September and November against Minimum Deployable Output values (MDO does not include Eastern area). This allows us to reflect supply-demand balance risk more accurately during our critical periods.

We will continue to report on the ADO, PDO and MDO outage figures in future annual reviews whilst reporting against the WRMP19. The WRMP24 however will only include an outage allowance for the ADO and PDO scenario as it will no longer consider the MDO scenario as a critical planning scenario. The ADO outage is

most reflective of previous outage reporting as it is the average over the year but will be a little higher due to predominantly lower MDO values versus ADO values.

ADO outage has reduced from 76.6MI/d last year to 55.4MI/d this year and has almost reached the company target of 53.1MI/d. There is variation within zones against the WRMP19 forecast due to changing zonal needs and we are continuing to plan further targeted improvements where they will achieve the greatest benefit.

We had planned works on several of our sites during our peak week.

- Pulborough WSW Surface Water where we raised and improved the headworks of borehole 12 as per our Drinking Water Inspectorate (DWI) requirements set out in the schedule of the works enforcement order.
- Otterbourne WSW Groundwater we removed borehole A from service for planned works.
- near Rochester WSW we removed GAC2 and GAC3 as part of ongoing work as per DWI requirements set out in the schedule of the works enforcement order.

We excluded both Pulborough WSW surface water and near Rochester WSW planned outage from our peak week supply demand index calculation.

Table 8: Outage by type for 2023-24.

Water supply area	AR 2023 ADO outage (MI/d)	AR 2023 PDO outage (MI/d)	AR 2023 MDO outage (MI/d)	WRMP19 2024 outage (MI/d)	AR 2024 ADO outage (MI/d)	AR 2024 PDO unplanned outage (MI/d)	AR 2024 PDO planned outage (MI/d)	AR 2024 MDO outage (MI/d)
Western area	34.7	40.7	31.4	6.5	15.2	4.06	6.11	11.7
Central area	18.0	28.4	18.3	12.1	16.1	16.57	6.47	14.7
Eastern area	23.8	43.3		34.5	24.1	22.38	5	25.4
Southern Water	76.6	112.4	49.7	53.1	55.4	43.01	17.58	51.8

Outage in Table 8 is split into ADO, MDO and PDO scenarios. It includes outage of the following types: full, partial, reactive asset, reactive raw water quality, planned and asset constrained/requires upgrade, as seen in Figure 6.

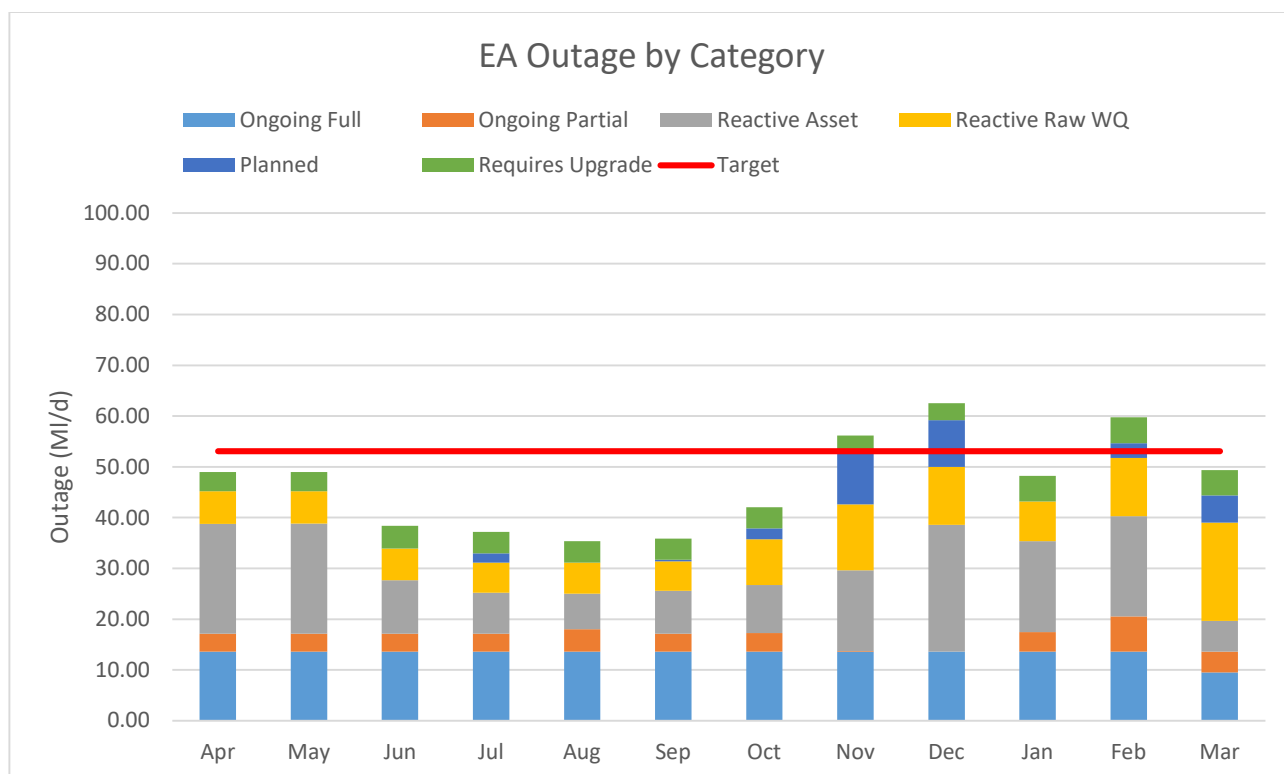


Figure 6: EA outage by category

Table 9: Outage type and category

Outage Type	Definition
Ongoing Full	Full outage of site requiring capital scheme
Ongoing Partial	Partial outage of site requiring capital scheme
Reactive Asset	Full or partial outage of site due to asset failure requiring Operational response
Reactive Raw WQ	Full or partial outage of site due to raw water challenge e.g. turbidity
Planned	Full or partial outage resulting from asset(s) being taken out of service for planned maintenance
Requires Upgrade	Site is unable to achieve target deployable output although no failed asset(s)

2.2.2 Outage recovery programme

We continue to deliver activities to reduce and prevent outage at our sites. Table 10 details our progress against our outage recovery programme.

Table 10: Outage recovery schemes to be delivered

Site	Water Resource Zone	Outage MI/d (PDO)	Commentary
Hartlip Hill WSW	Kent Medway East	1.2	Outage scheme completed October 2022 Reservoir clean and repair to be completed June 2024 to allow full outage to be removed.
Twyford WSW	Hampshire Southampton East	3.40	Assets delivered March 2023 Awaiting borehole return to supply.
Capstone Chalk WSW	Kent Medway East	0.35	Borehole pump and VSD install completed February 2024 Outage reduced to 0.09MI/d
Sompting WSW	Sussex Brighton	3.5	Work to be completed July 2024, with return to service date September 2024
Brighton B WSW	Sussex Brighton	3	Works have been completed by our Hazrev programme. Source is awaiting return to supply
Hartlip WSW	Kent Medway East	3.45	Outage recovered. Assets delivered April 2023. Permanent solution June 2024.
Littlehampton WSW	Sussex Worthing	0.94	Investigation completed by June 24. Further work required to recover outage.
Durrington WSW	Sussex Worthing	0.90	Investigation completed by June 24. Investigation has concluded that outage cannot be recovered easily, however already installed amazon connection points could be used to potentially reduce outage due to turbidity
Lewes WSW	Sussex Brighton	6.14	Outage reduced. Scheme to deliver further work due September 2024
Gillingham WSW	Kent Medway East	0.72	Outage has been reduced, scheme to complete CCTV and pump replacement due November 2024
Cuxton	Kent Medway West	0.70	Main station pump upgrade due November 2024
Shoreham	Sussex Brighton	0.55	Investigation completed. Outage removal TBC.
Total outage to be recovered by programme		24.85 MI/d	

Figure 7 shows the progress we have made against the outage recovery plan up to October 2023, alongside the schemes we will deliver. Progress has been colour coded as follows;

- Green - Outage recovery scheme has been completed
- Amber - assets have been delivered, but further activities required to return asset to supply
- Red- Scheme delayed
- Purple- Outage has been reduced, further outage reduction will take place
- Blue - outage recovery schemes to be delivered.

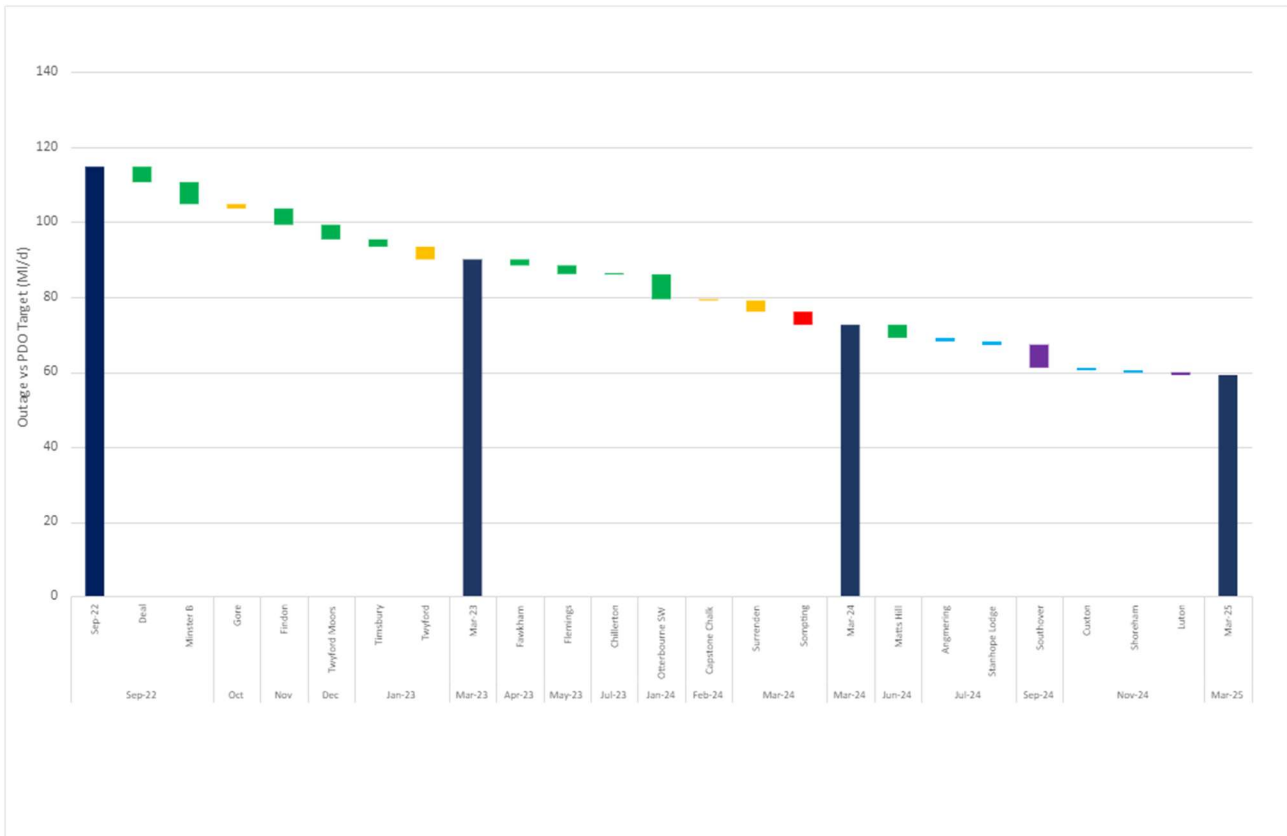


Figure 7: Progress against outage recovery plan

It is important to note that whilst we progress our Outage Recovery Programme, we do have a significant need for planned outage to enable the delivery of major investment programmes at our sites during the remainder of AMP7 and AMP8. We are currently delivering capital schemes at Pulborough, Itchen, Test Surface Water and near Rochester, as well as delivering our Hazrev programme and DWI notice activities. Due to the significant size of our supply works investment programme, we have in place a proactive approach to manage capital maintenance planned outages. Both short, and medium, term outage to complete works is managed through an internal group that meets weekly.

Operations and Capital Delivery teams actively plan and sign off outage interventions and durations and these are then monitored through our central production planning group. Through the PDO and MDO critical periods we give specific consideration to balancing outage against delivery of regulatory commitments, ensuring we maintain supplies across the region in these stress periods.

2.2.3 Strategic pump project

This year we have progressed delivery of our strategic pump project, recognising that it is critical to our supply and demand balance that we improve the repair time of failed assets across the region and recover reactive asset outage in a quick and timely manner.

We have procured 44 spare borehole pumps to be stored in a dedicated warehouse. We are implementing a new stock holding and dispatch tracker process. This holds pump information, health check and maintenance data, as well as storing technical information on each pump held, including pump curves.

This will enable our Operational teams to better understand what pumps are in stock and can be used in the event of an emergency pump outage. This will increase our ability to recover borehole pump related outage much more efficiently.

Pumps are stored as per manufacturers guidelines, we are now able to store horizontally which enables us to facilitate quicker delivery/packing times, reducing time to installation upon potential asset failure.

2.2.4 Process losses

Our calculated process loss figures for 2023-24 under our ADO, PDO and MDO scenarios and the water resource zone breakdowns can be seen in Table 11. This shows a comparison between the WRMP19 process loss forecast and calculated process losses in 2023-24. The PDO scenario is currently behind the forecast due to the Central and Eastern areas. The ADO scenario is on track.

In calculating the outturn process losses for 2023-24 we have used the following key steps:

- For all sites with separate abstraction and distribution input (DI) meters, the difference between abstraction & DI was used to estimate process losses at the works
- For sites without separate abstraction and DI meters we have estimated the process loss based on historic data (where available) and an understanding of the treatment processes and their assumed losses
- For any sites where DI was higher than abstraction (can occur occasionally where process losses are very low as meters are verified within a 5% error band), the process 'loss' is set to zero

It is important to note that step 1 in the method above will capture all losses at a site between the abstraction and DI meter which could be more than just the process loss (e.g. leaks, run-to-waste etc). This was considered the best method we could determine for treatment works losses given the data available.

At surface water treatment works, we have applied the percentage of measured process losses against the WRMP19 Deployable Output of the site, so that they reflect what the losses would be relative to WRMP19. The reason for this is because in our 1:200 year design drought, our abstraction is limited depending on DO constraints and drought measures.

Table 11: SDBI and Annual Return ADO, PDO and MDO process losses

Water resource zone	WRMP19 process losses 2023-24	SDBI ADO process losses	SDBI PDO process losses	SDBI MDO process losses
Hampshire Andover	0.13	0.13	0.14	0.13
Hampshire Kingsclere	0.08	0.08	0.08	0.08
Hampshire Winchester	0.09	0.09	0.09	0.09
Hampshire Rural	0.07	0.07	0.07	0.07
Hampshire Southampton East	2.33	1.22	1.30	1.41
Hampshire Southampton West	5.25	0.29	3.51	0
Isle of Wight	2.42	1.54	1.67	1.78
Sussex North	2.22	1.6	1.6	1.6
Sussex Worthing	0.84	1.23	1.28	1.42

Sussex Brighton	0.57	1.73	2.24	1.86
Kent Medway East	0.67	3.00	5.37	
Kent Medway West	3.83	5.43	2.6	
Kent Thanet	0.65	0.25	0.15	
Sussex Hastings	1.72	1.21	1.36	
Total	20.87	17.87	21.46	8.44

2.3 Abstraction summary

A summary of abstraction rates by Water Resource Zone for the year to March 2024 is shown in Appendix B as reported in our annual abstraction return, 2023-24. We abstracted a total of 238,318 Megalitres against a maximum licence total of 392,222 Megalitres.

The top 10 licences ranked by annual and daily abstraction as a proportion of the respective licence limits are shown in Appendix B. This shows the exceedance of the annual limit from Bewl Reservoir to South East Water on the River Medway Licence and exceedances of the annual and daily limits of the Rotherfield licence.

2.3.1 Abstraction licence compliance

Compliance assessment process and definitions

A potential licence exceedance is usually identified during our routine data checks where data indicates that a licence conditions has not been met. Potential exceedances are all reported to the EA within 2 working days.

For each potential exceedance, follow-up investigations are conducted to establish the root-cause of the potential compliance issue. The investigation will then classify potential licence exceedances as either a non-compliance breach, or a spurious data event. If it is a non-compliance breach, it will also be assessed whether it is an EPA breach.

A Non-compliance breach is a failure to comply with a condition on an abstraction licence.

A spurious data event is where data has been assessed as having falsely indicated an exceedance, but investigation showed this not to be the case. Examples include power outages causing data gaps and test signals from meter verifications.

An EPA abstraction breach is a non-compliance breach which falls within the scope of EPA reporting – currently daily and annual abstraction limits, and compensation releases (see section 2.3.2).

2023 (calendar year) performance

There were 31 reported potential licence exceedances of abstraction licence conditions during the 2023 EPA (calendar) year. Of these, four were confirmed as non-compliance breaches across 2 licences; Rotherfield and Weir Wood. One breach (Rotherfield) was also assessed as counting as an EPA abstraction breach. However, the EPA metric is a 'shadow metric' for this year, and so we expect our outcome for 2023 to be 100%; "green" band EPA performance for abstraction.

The other 27 out of the 31 potential exceedances were classified as spurious data events caused by issues such as power outages and meter verifications.

In addition to the above exceedances, there were more than 1,000 exceedances of the hourly limit on the Rotherfield Licence. This is a consequence of the Environment Agency requiring that the artesian flow component be recorded as part of the total abstraction.

To resolve the issue of repeated exceedances at Rotherfield it is necessary to redrill Borehole 3 and fully decommission the other boreholes at the site. This is being planned for AMP8 and, in the meantime, we will

apply for a variation to the Abstraction Licence to repurpose the artesian flows so they do not count towards the abstraction limits.

The under-release of Compensation flow at Weir Wood was determined to be a unique event, unlikely to reoccur. However, learning from the investigation, SWS have undertaken to install an Uninterruptable Power Supply (UPS) on the Hydromanager flowmeter and carry out routine checks on the flow from both release points to ensure consistency of releases.

An exceptional non-compliance breach occurred at Kingsclere when, during a site visit by the EA, it was determined that SWS were operating BH4 in accordance with the wrong Licence conditions; we were unaware that a separate Licence for BH4 had been issued in 1967. A VSD was obtained and installed in a very short time to make the site fully compliant and the EA recorded a CCS score of 3 with no further action.

2.3.2 Inclusion of Abstraction compliance in EPA Metric

The EA have introduced a new assessment for abstraction as part of the water and sewerage company Environmental Performance Assessment (EPA) methodology for 2021 to 2025. Up to January 2024 the assessment for abstraction licences was only a 'shadow' assessment and not fully implemented. From January 2024 the assessment may be 'live'. It is based on a calendar year (as opposed to the financial year which is used for most other licensing assessments and the Annual Return (submission) of daily abstraction data to the EA). For abstraction licences the daily and annual licence limits as well as compensation releases are the licence breaches considered to be counted in the metric. There is a 3% tolerance on the abstraction limits and 8% tolerance on compensation releases.

2.4 Abstraction licence changes

2.4.1 Licence changes completed this year.

More detail about our licence changes can be found in Annex E.

Sittingbourne and Faversham licences

Revised licences for Sittingbourne and Faversham group licences were issued on 17th of August 2023. The details of the changes are listed below:

1. Sittingbourne Group Licence
 - Millstead – new annual licence constraint at 500,000 m³/yr
 - Aggregate Daily (October – April inclusive) limit for all sources at 63 MI/d
2. Faversham Group Licence
 - Faversham1 and Faversham2 – new annual licence constraints at 1530 000 m³/yr in total
 - Aggregate Daily (October – April inclusive) limit for all sources at 50 MI/d
 - Seasonal limit (December to April) of 6,250 applies to all sources on the licence.

Sandwich and West Sandwich licences

Sandwich and West Sandwich licence variation for deployable output gain was issued on 5th October 2023. The changes are time limited to 31 March 2028 and are listed below:

1. West Sandwich

- Aggregate annual condition added, of 4,318,500 m³/y for West Sandwich and Sandwich
- Hourly limit 852 m³/h
- Daily limit still 11,365 m³/d
- Annual limit still 3,409,500 m³/y

2. Sandwich

- Hourly limit 375 m³/h
- Daily limit changed from 2,728 m³/d to 3,500 m³/d.
- Annual limit changed from 909,200 m³/y to 1,281,000 m³/y.
- Aggregate annual condition added, of 4,318,500 m³/y for West Sandwich and Sandwich

Pulborough Groundwater licence

The revised licence for Pulborough Groundwater source was issued on 12th January 2024. The main changes are as follows:

- Borehole 10 put onto the licence
- Borehole 6 renamed as Borehole 6A
- Remove unused points (1, 2, 8 and 9)
- Daily licence reduced from 36.36MI/d to 30 MI/d
- Explicit licence condition that GW abstraction ceases when flows in the Rother at Pulborough are less than 63.6 MI/d (HOF flow condition)

All other conditions remain the same, with an expiry date of 2030, but with explicit acknowledgement in the 'Important Notes' section of the licence that the outcomes of the Pulborough Basin Environmental Study may result in requirements for further licence changes in advance of this date.

2.4.2 Applications in progress

We have applied to renew Medway estuary licence which expired on 31 March 2024. The application has been assessed and accepted by the EA. Currently, LEV applied to the existing licence, until the new licence is issued.

We have also applied to renew River Arun licence and currently awaiting determination.

2.4.3 Future licence applications expected in 2024-25 and beyond.

In 2024-25 we are expecting to undertake the following actions:

- Apply to renew River Itchen licence. The current licence will expire in March 2025.
- Vary Bewl-Darwell transfer licence and Robertsbridge licence.
- The project to divert the Bewl-Darwell transfer to Beauport WSW and move the SEW abstraction from Bewl to Darwell mean we may also need to renew the River Medway Scheme licence by March; in any case expiry is Dec 2025.

2.5 DO/WAFU

See Section 2.7 and Section 5.

2.6 Bulk supply agreements

We haven't formalised any new bulk supply agreements with other companies this year.

As noted in section 2.3 the changes to the Bewl-Darwell system mean the bulk supply arrangements with SEW in this area will need to be revised and renewed.

Table 12: Inter-water company bulk supply contracts and 2023-24 utilisations

Inter-water company bulk supply contracts and 2023-24 utilisation					
Exports					
Bulk Supply	Total Annual Volume (MI)	Number of days operated	Max Daily (MI)	Min (non-zero) daily (MI)	Average daily (when operated)
Deal High to Affinity	10.33	21	2.03	0.19	0.49
Belmont Scheme (Matts Hill/Bottom Pond) to SEW	1766.11	365	9.25	1.16	4.84
Darwell to SEW	595.17	265	6.64	0.12	2.25
River Medway Scheme (RMS)- Bewl to SEW	4849.68	366	17.24	8.82	13.25
RMS- Burham to SEW	2536.63	359	12.69	1.85	7.07
RMS total to SEW	7386.31	366	29.93	1.85	20.18
Vicinity to Crawley to SEW	1012.78	366	3.31	1.97	2.77
Pitfield to SEW	0.00	0	0.00	0.00	0.00
Andover to Wessex Water	78.06	366	0.47	0.13	0.21
Bulk Supply	Total Annual Volume (MI)	Number of days operated	Max Daily (MI)	Min (non-zero) daily (MI)	Average daily (when operated)
Portsmouth Water to Hardham	828.84	366	9.51	0.28	2.26
Portsmouth Water to Gaters Mill	1214.93	181	20.30	0.05	6.71
Sutton and East Surrey to Crawley	492.32	366	1.95	1.06	1.35
Affinity Water to Napchester	0.00	0	0.00	0.00	0.00

2.7 Changes to supply forecast

We have recently revised our abstraction licences for the groundwater sources at West Sandwich and Sandwich in our Kent Thanet Zone. The licence change will allow us to abstract up to 3.5 MI/d at

Woodnesborough– and therefore represents an ADO/MDO benefit of 1.05 MI/d and a potential PDO benefit of 0.8 MI/d compared to our WRMP19 baseline. Now that this licence variation has been finalised, we expect that we will no longer require use of the West Sandwich Drought Permit as that Deployable Output Benefit is incorporated within the revised licence.

There have been no other changes to our supply forecast from last year's position.

2.8 New Schemes

During AMP7 we have progressed options as identified by WRMP19. Since publication however, a number of solutions have been found to be unfeasible and we have revised the delivery dates for some of the others. For example, the scheme to provide an additional 9MI/d import from Portsmouth Water that we had expected to receive in 2024-25 has been abandoned because Portsmouth Water can no longer provide the supply.

However, other schemes such as the West Sandwich & Sandwich WSW licence variation mentioned above is now complete and incorporated within our baseline supply forecast. Where we have had to update delivery dates this has often been to allow sufficient contingency time to adjust to potential planning, consenting and other challenges which emerge during project delivery and implementation.

We are not delivering any schemes in lieu of delayed schemes in AMP7. Lewes Road has been brought in to partly offset the impact of not going forward with Shoreham desalination scheme. It will be delivered in 2029-30 at the earliest.

3 Demand

3.1 Demand Forecast

We have not changed our WRMP19 demand forecast.

3.2 Per capita consumption

Both household and non-household consumption have reduced compared to 2022-23. Largest falls in household consumption were seen in Southampton West, Isle of Wight, Sussex Worthing, Kent Thanet and Sussex Hastings.

Table 13: Household and non-household consumption over the last three years

Water Resource Zone	Household consumption (MI/d)			Non-household consumption (MI/d)		
	2021-22	2022-23	2023-24	2021-22	2022-23	2023-24
Hampshire Andover	9.65	9.83	9.84	2.86	2.87	2.90
Hampshire Kingsclere	2.39	2.41	2.34	0.56	0.67	0.69
Hampshire Winchester	9.37	9.62	9.51	4.4	4.91	4.84
Hampshire Rural	3.81	3.85	3.86	1.12	1.12	1.16
Southampton East	52.43	51.77	51.74	16.15	17.81	17.80
Southampton West	21.45	19.88	19.19	6.69	6.85	6.68

Isle of Wight	19.11	17.43	16.83	6.82	7.43	7.29
Sussex North	37.53	36.96	37.55	9.61	10.33	10.82
Sussex Worthing	26.25	25.19	24.53	5.75	5.98	5.85
Sussex Brighton	51.97	50.83	50.64	13.77	14.72	14.79
Kent Medway E	42.33	41.29	41.27	9.62	10.16	10.00
Kent Medway W	25.09	23.79	23.74	8.58	10.36	10.24
Kent Thanet	27.52	27.19	26.36	7.91	8.36	8.22
Sussex Hastings	15.92	15.47	15.07	4.75	4.53	4.47
Southern Water	344.81	335.53	332.46	98.6	106.11	105.74

Our outturn Per Capita Consumption (PCC) for the year was 126.7 litres/head/day (l/h/d). The breakdown by WRZ is given in Table 16 along with a comparison of WRMP19 forecast PCC figures for Dry Year Annual Average (DYAA) conditions.

Table 14: 2023-24 PCC figures by Water Resource Zone and their comparison with WRMP19 forecast

Water Resource Zone	2023-24 PCC (l/h/d)	
	Outturn	WRMP19 DYAA
Hampshire Andover	129.74	118.41
Hampshire Kingsclere	142.07	159.93
Hampshire Winchester	123.29	130.04
Hampshire Rural	138.47	139.41
Hampshire Southampton East	121.28	125.71
Hampshire Southampton West	117.81	119.50
Isle of Wight	120.61	136.76
Sussex North	134.43	129.25
Sussex Worthing	128.18	136.26
Sussex Brighton	133.07	120.96
Kent Medway East	123.49	122.37
Kent Medway West	123.06	123.57
Kent Thanet	126.45	120.63
Sussex Hastings	136.53	130.68
Southern Water	126.72	125.90

Outturn PCC at the company level has decreased by 1.7l/h/d (1%) from 128.4l/h/d to 126.7l/h/d. Non-household demand has decreased to 105.7MI/d from 106.1MI/d (0.4MI/d decrease). The year from April 2023 to April 2024 was warm and wet with the peak week for our area ending on 17/06/2023.

Although the PCC has come down from last year, it is still higher than we had originally forecast. We expect PCC to continue reducing over the remainder of the AMP as we continue with our water efficiency programme.

As noted in last year's report, the effects of COVID on consumption are still yet to be fully understood. However, given changes in working practices such as flexible and hybrid working, if current trends continue, PCC is expected to remain higher than pre-COVID forecasts.

3.3 Household metering

We have started smart metering trials in parts of Southampton and Andover. Challenges presented by a global semi-conductor shortage have hit the supply-chain that manufactures our water meters. As a result, we have deferred the increase in household meter penetration from 88% to 92% to AMP8 (2025-2030).

Table 15: Meter penetration in 2023-24.

Water Resource Zone	Meter penetration (excluding voids)	Meter penetration (including voids)
Hampshire Andover	88.77%	86.89%
Hampshire Kingsclere	77.58%	75.96%
Hampshire Winchester	88.77%	86.52%
Hampshire Rural	89.72%	87.64%
Hampshire Southampton East	89.63%	86.99%
Hampshire Southampton West	94.77%	93.20%
Isle of Wight	94.69%	92.09%
Sussex North	85.72%	83.84%
Sussex Worthing	90.64%	88.55%
Sussex Brighton	80.07%	76.38%
Kent Medway East	89.01%	86.22%
Kent Medway West	87.91%	85.22%
Kent Thanet	85.72%	82.59%
Sussex Hastings	78.12%	74.55%
Southern Water	87.37%	84.66%

3.4 Leakage

Leakage levels have reduced compared to the Annual Review 2023 by 1.0MI/d but continue to be above target with an outturn of 107.48MI/d against a WRMP19 forecast of 84.9MI/d. We are aiming for a spot level of 77.6 MI/d for the last week of 2024/25 (see Figure 8).

We set an ambitious plan for Find and Fix for the year, with the aim of achieving a significant reduction in leakage. However, the pace of change in performance was slower than anticipated with the result that, although we found 90% of the targeted numbers of leaks we delivered 76% of the leakage benefit. This was largely due to the mix of work detected, with a higher volume of smaller leaks located. Targeted interventions improved the mix of work over the year with the mains mix (the largest leaks) increasing from 5% in the first quarter to 14% in the last quarter of the year.

Leak repairs numbers in 2023-24 totalled 23,076, compared to 24,977 in 2022-23. This is lower than the 24,226 leakage repairs in 2020-21 and 23,224 repairs in 2021-22 and largely reflects the impact of the milder winter of 2023-24 compared to these years. Compared to last year, we repaired nearly 1,000 fewer reactive leaks (customer driven) in 2023-24. This reflects less stress experienced by the water network.

On a proactive basis, our ambition is to promote slightly fewer leak repairs but prioritise those of a higher leakage volume reduction to ensure the most effective and efficient use of resources to achieve leakage targets and, as a result, the average leak size repaired increased by 50 l/d per leak.

One of the interventions has been to increase the number of acoustic loggers deployed on the network. Over the year an additional 3000 loggers have been deployed, taking the total number to around 12,000. We have also shifted the focus of these loggers from lift and shift to permanent deployment, especially in locations that are difficult to undertake traditional leakage surveys.

We have maintained the improvements in repair times delivered in 2022-23 with all mains repairs being completed, on average, within 3 days. In addition, we are now seeing benefits from the Advanced Pressure Management and Transient Detection programmes reducing burst rates, especially during periods of stress, such as colder periods in winter.

The winter of 2023-24 was milder than the previous couple of winters although we did experience a couple of cold snaps in December and late January/early February. Leakage peaked at 136MI/d in January 2024, 32MI/d higher than pre-winter levels (a 31% increase). This had largely been recovered by the end of the year and by the beginning of May 2024 leakage had been reduced to the lowest level in 9 months.

Table 16 sets out the planned deliverables for both 2023-24 and 2024-25 along with the delivered outputs for 2023-24. We have an ambitious plan for 2024-25 to reduce leakage to 77MI/d (as a spot value) by the end of the year which aligns with our WRMP24 plans for leakage reduction in AMP8. As of the end of May we are on track with this plan.

Table 16: Leakage recovery plan

		Leakage Benefit (MI/d)		
Prevent	Output	2023/24 (Plan)	2023/24 (Actual)	2024/25 (Plan)
Additional pressure management	60 schemes (Yr4) and 70 schemes (Yr5)	6.0	3.7	7.0
Booster flow and pressure control pilot	30 booster control systems	1.0	0.2	1.0
Transient Mitigations, inc. further surveys	27 transient sources eliminated p.a.	Burst Benefits	0.4	2.0
Optimisation of existing PRV's	160 PMA's optimised	1.0	0.0	1.0
Aware	Output	2023/24 (Plan)	2023/24 (Actual)	2024/25 (Plan)
DMA Health	Reduce leakage to 10% of demand in 10 DMA's	0.2	0.2	
Locate	Output	2023/24 (Plan)	2023/24 (Actual)	2024/25 (Plan)
Satellite leak location trials	Repeat assessment in Kent (highest leakage/km area)		-	0.10
Mend	Output	2023/24 (Plan)	2023/24 (Actual)	2024/25 (Plan)
Proactive Repair Orderbook	Repairs measured on estimated leakage values	133.2	94.4	129.0
Reduction Orderbook	Activity based on measured reduction	6.0	6.0	6.0
Targeting additional CSL	Additional customer side leakage repairs	-	-	2.0
Leakage Detection Trials	Targeting reductions through alternative approaches	-		2.0
Total (MI/d)		147.4	104.9	150.1

We continue to look at ways to improve the output of our Leakage Detection Partners so that we are able to find and fix more leak repairs. We are currently developing a Leakage Operations tool that will help target areas of interest within District Meter Areas (used to monitor leakage levels) to increase the speed of detection and increase output. This is being rolled out in the Kent region initially, which is the region of highest leakage.

We continue to focus on our efforts to reduce customer side leakage and have contributed and assisted customers to complete approximately 3,000 leak repairs within the reporting period. We have increased our capacity for proving customer side leakage with a view of further increasing repair numbers in 2024-25.

The breakdown of Annual Review 2024 leakage by Water Resource Zone is shown in Table 17, along with a comparison with previous years and the WRMP19 leakage targets.

Table 17: The breakdown of Annual Review 2024 leakage by Water Resource Zone

Water Resource Area	2020-21 outturn	2021-22 Outturn	2022-23 Outturn	2023-24 Outturn	WRMP19 leakage 2023-24	
Hampshire Andover	3.67	3.45	3.94	3.60	3.68	↑
Hampshire Kingsclere	2.08	2.18	2.51	2.22	1.47	↓
Hampshire Winchester	3.67	4.00	4.70	4.53	1.86	↓
Hampshire Rural	1.69	2.05	2.26	2.14	0.54	↓
Hampshire Southampton East	9.59	10.01	11.80	12.70	11.45	↓
Hampshire Southampton West	3.31	3.48	4.79	4.05	5.48	↑
IOW	5.38	5.32	5.63	5.30	2.82	↓
Sussex North	12.68	12.76	14.82	15.26	11.18	↓
Sussex Worthing	4.81	4.55	5.34	5.46	5.71	↑
Sussex Brighton	12.11	12.55	12.33	11.84	9.87	↓
Kent Medway East	18.07	17.01	18.44	17.50	13.54	↓
Kent Medway West	10.60	8.83	9.91	11.08	8.02	↓
Kent Thanet	7.21	7.30	8.19	7.97	8.50	↑
Sussex Hastings	3.54	3.31	3.80	3.83	2.89	↓
Water company total data	98.42	96.82	108.47	107.48	87.02	↓

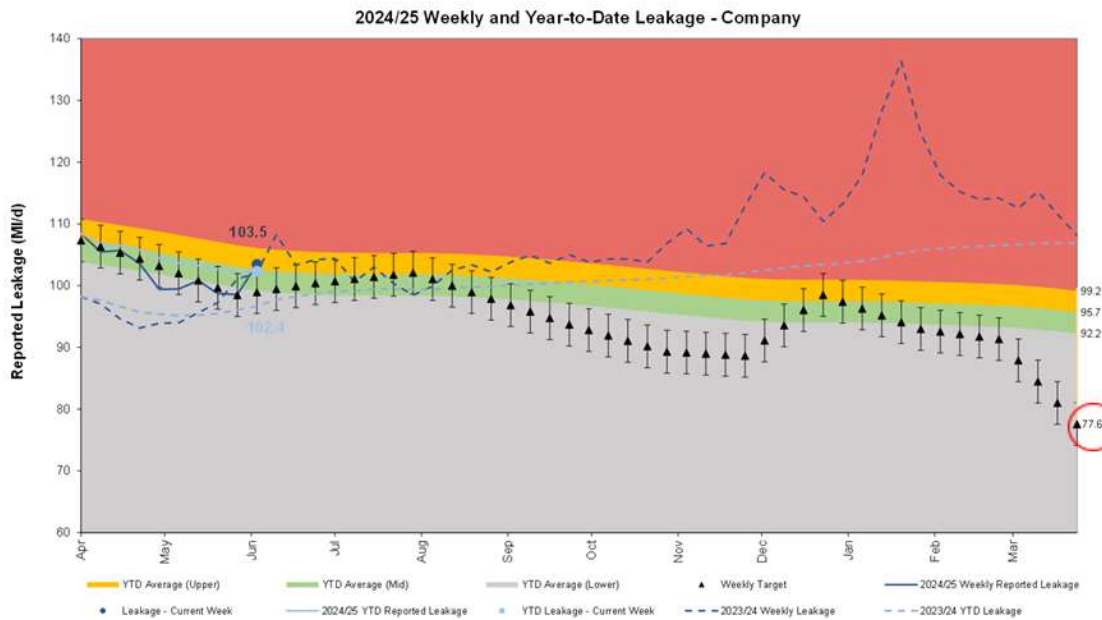


Figure 8: Weekly and Year-to-Date Leakage

3.5 Performance

There have been no differences between the reported figures in the APR and the Annual Review 2024.

3.6 Changes to demand forecast

Table 18: Comparison of 2023-24 outturn water balance figures with WRMP19 forecast under DYAA conditions

Water Resource Zone	Total consumption (M/d)			Total leakage (M/d)			Other use (M/d)			Distribution Input (M/d)		
	WRMP19 (DYAA)	Outturn		WRMP19 (DYAA)	Outturn		WRMP19 (DYAA)	Outturn		WRMP19 (DYAA)	Outturn	
Hampshire Andover	11.44	12.74	↓	3.68	3.60	↑	0.30	0.33	↓	15.42	16.66	↓
Hampshire Kingsclere	3.53	3.03	↑	1.47	2.22	↓	0.09	0.06	↑	5.08	5.31	↓
Hampshire Winchester	15.08	14.35	↑	1.86	4.53	↓	0.31	0.31	↓	17.25	19.19	↓
Hampshire Rural	5.72	5.02	↑	0.54	2.14	↓	0.12	0.13	↓	6.38	7.29	↓
Hampshire Southampton East	72.78	69.53	↑	11.45	12.70	↓	1.81	1.86	↓	86.04	84.10	↑
Hampshire Southampton West	27.18	25.88	↑	5.48	4.05	↑	0.63	0.59	↑	33.28	30.52	↑
Isle of Wight	26.39	24.11	↑	2.82	5.30	↓	0.87	1.09	↓	30.07	30.50	↓
Sussex North	47.20	48.36	↓	11.18	15.26	↓	1.21	0.84	↑	59.59	64.46	↓
Sussex Worthing	33.92	30.38	↑	5.71	5.46	↑	0.92	1.02	↓	40.55	36.86	↑
Sussex Brighton	66.64	65.43	↑	9.87	11.84	↓	2.04	2.48	↓	78.56	79.75	↓
Kent Medway East	51.29	51.27	↑	13.54	17.50	↓	1.42	5.63	↓	66.24	74.40	↓
Kent Medway West	31.81	33.98	↓	8.02	11.08	↓	0.72	3.09	↓	40.56	48.15	↓
Kent Thanet	34.35	34.58	↓	8.50	7.97	↑	1.05	1.01	↑	43.90	43.56	↑
Sussex Hastings	19.56	19.53	↑	2.89	3.83	↓	0.88	1.05	↓	23.33	24.42	↓
Southern Water	446.88	438.20	↑	87.02	107.48	↓	12.36	19.49	↓	546.26	565.16	↓

Overall, outturn consumption (household plus non-household) is 2% lower than the forecast for the organisation as a whole. However, within that, there is considerable variability, but no apparent pattern. Of the WRZs, the largest reduction compared to forecast occurred in Hampshire Kingsclere with a 14% lower outturn, and the largest excess above forecast was seen in Hampshire Andover with outturn 11% above WRMP19 DYAA forecast.

3.7 Target Headroom

Target headroom is the forecast uncertainty built into our WRMP19. It is made up of supply and demand components. During the year we have less uncertainty and so reduce the target headroom for the in-year actual DI supply demand balance index. We reduce the S6 component based on the volume of outage, the reason being if we have outage there is no uncertainty around how much volume we can get from the site. We remove the demand forecasting uncertainty (D2 component) as we have no uncertainty in year as it is outturn values.

The target headroom for both DYAA and DYCP scenarios can be seen in Table 19 and Table 20. In our SDBI submission we submitted the WRMP19 target headroom figures for the planned DI tables and the adjusted

target headroom figures for the actual DI tables. Further details on target headroom can be seen in the adjustment template.

Table 19: Target headroom for DYAA scenarios

Water resource zone	S6	S6 adjusted	S8	D1	D2	D2 adjusted	WRMP19 target headroom (MI/d)	Outturn DI adjusted target headroom (MI/d)
Hampshire Andover	0.28	0.28	0.11	0.20	0.10	0.00	0.69	0.60
Hampshire Kingsclere	0.06	0.06	0.05	0.04	0.04	0.00	0.19	0.14
Hampshire Winchester	0.45	0.45	0.00	0.15	0.16	0.00	0.76	0.60
Hampshire Rural	0.32	0.26	0.00	0.07	0.08	0.00	0.48	0.33
Hampshire Southampton East	2.07	2.01	3.81	1.96	2.44	0.00	10.29	7.79
Hampshire Southampton West	0.00	0	2.75	0.47	0.60	0.00	3.82	3.22
IOW	0.18	0.16	0.01	0.12	0.14	0.00	0.45	0.28
Sussex North	1.87	1.87	1.25	0.54	0.41	0.00	4.06	3.66
Sussex Worthing	1.53	1.46	0.35	0.58	0.86	0.00	3.33	2.39
Sussex Brighton	2.54	2.2	1.00	1.06	0.55	0.00	5.15	4.26
Kent Medway East	3.60	3.36	-0.02	1.21	1.20	0.00	6	4.55
Kent Medway West	0.71	0.69	-0.02	0.14	0.13	0.00	0.96	0.81
Kent Thanet	0.73	0.53	0.77	0.51	0.25	0.00	2.26	1.81
Sussex Hastings	0.62	0.58	-0.01	0.14	0.10	0.00	0.84	0.71
Total	14.96	13.91	10.05	7.21	7.07	0.00	39.29	31.16

Table 20: Target headroom for DYCP scenarios

Water resource zone	S6	S6 adjusted	S8	D1	D2	D2 adjusted	WRMP19 target headroom (MI/d)	Outturn DI adjusted target headroom (MI/d)
Hampshire Andover	0.33	0.32	0.00	0.24	0.12	0.00	0.69	0.56
Hampshire Kingsclere	0.06	0.06	0.03	0.04	0.04	0.00	0.17	0.13
Hampshire Winchester	0.33	0.33	0.00	0.13	0.15	0.00	0.61	0.46
Hampshire Rural	0.22	0.18	0.00	0.07	0.08	0.00	0.36	0.25
Hampshire Southampton East	1.41	1.34	5.19	1.24	1.56	0.00	9.40	7.77
Hampshire Southampton West	0.66	0.66	8.41	0.48	0.62	0.00	10.17	9.55
IOW	0.32	0.31	0.02	0.20	0.25	0.00	0.79	0.53
Sussex North	2.70	2.64	0.00	0.75	0.58	0.00	4.03	3.39
Sussex Worthing	1.74	1.66	0.50	0.64	0.96	0.00	3.84	2.80
Sussex Brighton	2.38	2.12	0.86	1.25	0.66	0.00	5.14	4.22
Kent Medway East	3.44	3.24	0.24	1.40	1.41	0.00	6.50	4.88

Kent Medway West	2.70	2.34	0.02	0.62	0.58	0.00	3.92	2.98
Kent Thanet	0.83	0.75	1.04	0.51	0.27	0.00	2.65	2.30
Sussex Hastings	0.95	0.92	0.00	0.34	0.25	0.00	1.54	1.27
Total	18.08	16.88	16.32	7.91	7.51	0.00	49.82	41.11

4 Implementation of supply-demand measures

4.1 Supply-side schemes

4.1.1 Delivery and progress on WRMP19 options

Since the Annual Review 2023, we have delivered the West Sandwich & Sandwich WSW licence variation. Please see our data table for a summary of progress for our supply schemes.

4.1.2 Western area

The background to the Western Area, alongside further information on the RAPID gated process can be seen in Annex D.

Progress in western area

Large strategic resource development

Our WRMP19 was prepared to meet supplies in a drought with a 1-in-200 year return period (1:200 year drought), which forecast an overall water resource deficit in the Western area of around 192MI/d during peak periods up to 2029-30. We planned to meet this deficit through leakage and demand reduction and through the development of several new supply solutions across the Western area, including a long-term and large-scale water resource solution.

One such large scale solution or Strategic Resource Option (SRO) is the Hampshire Water Transfer and Water Recycling Project (HWTWRP). We are currently in the pre-application period for our Development Consent Order (DCO) with our Statutory Consultation being carried out in Summer 2024. As the scope of the HWTWRP has matured, we have conducted testing of the delivery schedule, including a Quantitative Schedule Risk Analysis (QSRA) which has enabled a greater understanding of the project. This analysis has concluded that a 2030 delivery date is not achievable given the level of risk now understood in key areas of the programme. The analysis has indicated greater confidence in delivering the HWTWRP from 2033-34. This assessment is based on some key assumptions (e.g. that customers have greater acceptance of recycled water challenges). For water resources planning purposes, the benefit from this scheme will be available from 2034-35 and we have incorporated this in our rdWRMP24.

Another SRO option that we are investigating jointly with Thames Water is the Thames to Southern Transfer project (T2ST), which is a transfer from Thames Water into our Western area. This strategic pipeline could move up to 120MI/d and is dependent on Thames Water developing new sources of water, such as the South East Strategic Reservoir Option (SESRO), which are also being investigated through the RAPID gated process. This SRO is not anticipated to deliver water resources into the supply network before 2038 and it is dependent on other new and not yet consented or delivered sources. This scheme was selected in our dWRMP24 in 2039-40 in addition to the HWTWRP. For more information on the RAPID process visit www.ofwat.gov.uk/regulated-companies/rapid/.

Key changes since RAPID Gate 2

As mentioned in Annex D RAPID Gate 2 was submitted in December 2021. Work since then has continued at pace with the HWTWR project continuing to be developed to ensure alignment with WRSE regional modelling and alignment with the HTR delivery programme.

- **WRSE Alignment:** Regional modelling work undertaken since the RAPID Gate 2 submission has identified a regional need that impacts the size of the water recycling plant. This, alongside engineering requirements to maintain water quality, has caused the minimum initial water recycling plant size to be uplifted from 15MI/d to 20MI/d, and that it will potentially need to be increased in size to 60MI/d earlier than previously identified. This supports regional supply-demand-balance predictions, which include proposed Environmental Destinations, from WRSE. The implications of this modelling work and engineering investigations have been discussed extensively with Ofwat and RAPID since Q4 2022. Further, as part of the WRMP24 preparation, WRSE modelling identified that the Best Value Plan may require the water recycling plant to be constructed in a single phase, previously this was planned to be a two-stage construction to accommodate the phased need. These changes have been communicated with RAPID and Ofwat and will be included in the 2024 Statutory Consultation.
- **SRO Consenting Strategy:** In April 2022, in line with the HWTWR consenting strategy to progress the project through the Development Consent Order (DCO) regime, we submitted a request for a s.35 Direction to the Secretary of State. On 31 May 2022 the Secretary of State gave a s.35 Direction, meaning the selected option must now be consented under the DCO process¹. As project scope has since matured and changed in some areas (see HTR Alignment Works bullet), a revision to this Direction has been formally submitted to Secretary of State in April 2024 to ensure the consenting strategy remains sound and transparent. We did not receive a decision from the Secretary of State and we are awaiting a new Secretary of State, following the General Election in July 2024, in order to resubmit. This is a key factor in the timing of delivery.
- **HTR Alignment Works:** Significant collaboration with Portsmouth Water has been undertaken to integrate HWTWR with HTR which is now in construction. Key activities relate to incorporation of Southern Water pipework with Portsmouth Water pipework in a combined tunnel. This collaboration has produced a significant opportunity for customers, whereby benefits include net financial reduction to the SRO final estimate, less disruption to residents from progressing a single tunnel containing both sets of pipework, as well as carbon benefits. Other alignment work investigated and progressed includes design alterations to the HTR embankment to accommodate the additional pipework, and work on assessing quality of spring and recycled 'blended' water.
- **Stakeholder engagement:** Given the novel nature of recycled water in the UK, significant efforts have been made to engage with stakeholders on what recycled water is, and what it isn't. Joint activities between Portsmouth Water and Southern Water have been progressed with events on-line, in public spaces and with audiences at council events. During Summer 2022, HWTWR undertook a non-statutory consultation exercise along the c40km pipeline corridor between Havant and Otterbourne, informing and seeking feedback from customers and residents of proposed plans for the scheme. At the time of writing, plans were maturing for the Statutory Consultation commenced in May 2024.
- **RAPID Gate 3:** RAPID Guidance was received in August 2022 following a review period of a draft set of guidance, late Spring 2022. Whilst the guidance was extremely welcome, the impacts of receiving this when part way through delivery of what was previously understood to be required Gate 3 activities was that some activities had to be re-profiled (previously accounted for in Gate 4), other activities are 'new' and some activities had to be revisited. Inevitably, this came at a cost to HWTWR and contributed to pushing the Gate 3 RAPID submission to March 2024. Cost impacts were that further RAPID

¹ <https://www.gov.uk/government/publications/hampshire-water-transfer-and-water-recycling-project-section-35-direction-planning-act-2008>

allowance was required to be agreed within the gated period. This experience is unique to Southern Water given HWTWR is the first SRO to get to this stage (other SRO's being developed by other water companies will have received this guidance in advance of their Gate 2 submission). Through 2023, we worked with RAPID and their externally appointed assurance team and confirmed an uplift to the Gate allowance. Further, the Gate 3 submission was progressed, keeping RAPID informed along the process. Following a positive external assurance report, this was submitted to RAPID 'informally' at RAPID's request (late March 2024). At the time of writing, we are awaiting instruction from RAPID on making this a formal Gate 3 submission.

- **Direct Procurement for Customers:** DPC Control Points A and B were approved by Ofwat in April 2022. Since then, Ofwat has changed the DPC model from Control Points to Stages; with Stage 2 being the next milestone for HWTWRP. Progress towards Stage 2 continued within a successful second market engagement event in December 2022 involving 51 companies and potential joint ventures. This was followed up with 30 separate Q&A sessions through January 2023, where requested by the market. During Summer 2023, we undertook an exercise to assess DPC scope and operational model options with the aim to ensure best value for both Southern Water and customers whilst also considering potential operational risk impacts and interfaces between Portsmouth Water, Southern Water and the DPC CAP (Competitively Appointed Provider). Liaison with Ofwat on the conclusion of this exercise did not result in an outcome that aligned with the analysis findings. The schedule has also since been subject to a detailed risk assessment, with the emerging Stage 2 submission schedule now a year later than originally forecast, driven by a need for further market engagement. This market engagement is required given changes to scope to the potential CAP including items such as the combined tunnel referred to in the alignment works section above. The revised, risk assessed timeline provides increased certainty in its delivery, and whilst recognised as a delay within the overall programme, is not expected to impact the end date of the overall project. DPC must be developed back-to-back with the bulk supply agreement negotiations, for more on this see below.
- **Schedule Risk Analysis:** As HWTWRP scope has matured, testing of the delivery schedule has been conducted, including Quantitative Schedule Risk Analysis (QSRA) which has enabled a greater understanding of the project. QSRA analysis originally conducted in 2022 and updated in late 2023 concluded that a November 2030 delivery date is not achievable given the level of risk in key areas of the schedule. With an 80 percent confidence level (P80), the analysis outcome indicates that the operational ready date, following project completion and commissioning is now March 2034. This is reflected in our revised dWRMP24 and RAPID Gate 3 material. Key drivers influencing the QSRA include:
 - WRP sizing requirement: because of the impact of further supply-demand investment modelling and an updated forecast of future environmental destinations needs.
 - Development Consent Order: potential risks relating to submission, decision, or legal challenge.
 - Direct Procurement for Customers: the potential risks to complete an agreement.
 - Interface and consenting risks due to combination of the HTR project and HWTWR project.

Stakeholder and public engagement on this change of date and how we are planning to meet our supply need in Hampshire while protecting the environment until the project can be delivered, has taken place through consultation of our WRMP24 in accordance with our statutory obligations.

- **Back-Up option:** Given scope similarities between the selected option (HWTWRP) and Back-Up option, a significant proportion of development work up to the early to-mid Gate 3 period aligned to both options. The core difference between the two schemes is the environmental buffer lake, which for the selected option is HTR and for the back-up option a site yet to be identified near Otterbourne WSW. Given the progress in relation to HTR (construction of HTR has commenced on-site) de-risking the HWTWRP, and the cost and schedule implications of progressing the Back-Up in place of the HWTWRP, we have now formally suspended all activity specific to the Back-up option via the HWTWRP Interim report to RAPID in May 2023.
- **Bulk Supply Agreement Negotiations:** Discussions on how the joint HTR and HWTWRP 'system' will work from an operational control, water supply and commercial perspective commenced between Southern Water and Portsmouth Water in July 2023. Heads of Terms for the eventual BSA were

initially proposed in December 2023, and a regular cadence of meetings is currently underway to with the aim of agreeing a full draft of the BSA by Q2 2025.

4.1.2.1 Thames to Southern Transfer (T2ST) - SRO

We have been working with Thames Water to jointly investigate and develop the *Thames to Southern Transfer (T2ST) SRO*. When constructed and commissioned, this would see a supply of up to 120MI/d via a new c85km pipeline transferring potable water from Thames Water to Yew Hill in our Hampshire South WRZ. Two connecting spurs would also each supply up to 10MI/d to Thames Water and to South-East Water. T2ST is dependent on Thames Water developing a new reservoir (SESRO) in the Oxford area, which is currently in the early stages of project development. This raw water would be treated to potable standard prior to transfer at a new water treatment works currently proposed to be located within the footprint of Thames Water's SESRO site. Both T2ST and SESRO follow the RAPID gated process.

This SRO is not anticipated to deliver water resources into the supply network until c.2040 and because of this, along with its dependence on SESRO, which is not yet consented, T2ST is not being considered as an alternative to HWTWRP.

Since a joint Southern Water and Thames Water RAPID Gate 2 submission was made in November 2022, the lead developer role transferred to Southern Water in mid-2023. In early April 2024 the first of two planned interim Gate 3 reports were presented to RAPID. This detailed progress relating to environmental (groundwater, hydro-ecological risk, hydrological and water quality) assessments and studies to identify potential impacts on habitats along the pipeline route, including through national parks and national landscapes. Initial carbon desk-top assessments were also conducted and monitoring of non-intrusive visual site surveys have begun. Although most of the route is rural, a key objective at this stage of the project is to identify and mitigate potential pinch-points and develop potential construction methodologies to traverse the many railways, major roads, rivers, and areas of ancient woodland.

As a result of this work, project costs have matured and have been communicated with RAPID and incorporated into the development of PR24.

4.1.2.2 Non-SRO New Water Source Schemes

- **Import from Portsmouth Water 21 MI/d (dependent on Havant Thicket)** – A scheme to transfer 21MI/d of potable water from Portsmouth Water's new Havant Thicket Reservoir via their treatment works, using new pumping stations and pipelines. Modelling has completed allowing a preferred and potential alternative connection location in Southern Water's Hampshire network to be selected. As the Worlds End Project (see below) is not progressing, there is capacity in the existing pipe transfer, utilising this as part of this scheme is being considered. The delivery date is dependent on Portsmouth Water's Havant Thicket Commissioning of 2032.
- **Import from Portsmouth Water 9 MI/d (Worlds End)** – This project was to provide 9MI/d from Portsmouth Water using an existing pipeline transfer. However, Portsmouth Water formally notified us in March 2023 that this scheme cannot progress due to borehole testing concluding an insufficient yield. We have accommodated this shortfall within the sizing of the SRO.
- **Sandown WRP** – Also referred to as the Isle of Wight Water Recycling project (IWWRP), this scheme aims to provide a new Water Recycling Plant (WRP) to deliver 8.5MI/d benefit to the Isle of Wight. Following development of a short-list of solution options including process and discharge options (e.g. to an environmental buffer lake or to the River Yar), a single option was identified in May 2023. A WRP location has been identified and a contractor engaged to support detailed design, development and delivery by March 2030.
- **Newbury** – Once complete, this will provide Hampshire Kingsclere WRZ with a further 1.2MI/d supply. Ecology and geotechnical site surveys have progressed in parallel with successful borehole testing on an existing pumping station to confirm the viability to increase the flow capacity from 3.8MI/d to 5.0MI/d. A pipeline route has been identified and agreed with landowners. Overall, this has facilitated maturing of the scheme to outline design and contractor engagement.

- **Import from Bournemouth Water Transfer** - A new transfer of water from South-West Water to Hampshire Southampton West WRZ of up to 20MI/d. This scheme is not being progressed as South West Water have informed us that there is insufficient available water due to environmental obligations. We have accommodated this shortfall within the sizing of the SRO.

4.1.2.3 Non-SRO Resilience Schemes

- **Test Lake** – This is a scheme to redirect existing water to Hampshire Southampton East WRZ. Ecology and environmental site surveys have progressed facilitating an environmental impact assessment to be progressed and identification of a route for connection pipework. Further modelling work on the network has resulted in a minor change of need, and hence a scope amendment which is currently being worked up. Construction is still forecast to commence in late 2024.
- **Hampshire water grid bi-directional pipeline transfers** – Two transfer schemes to disseminate water through Hampshire WRZs:
 - Andover Link Main (ALM) aims to connect Winchester and Andover via a new pipeline (Crab Wood WSR to Micheldever Road WSR and River Way WSR to Micheldever Road WSR),
 - Southampton Link Main (SLM) aims to provide improved resilience between Test Surface Water (near Southampton) and Itchen (near Winchester).

Land access agreements have been agreed allowing significant ecology, archaeological environmental surveys and ground investigations along the identified transfer pipeline corridors. Various third-party approvals have also progressed relating to road, rail and river crossings along the route corridors. This work has supported the submission of two environmental screening opinions. The response received from Local Planning Authority and Secretary of State is that ALM is subject to a full EIA submission and SLM has been confirmed as not requiring full EIA submission. Therefore, elements of the SLM project will be delivered under permitted development rights. The current forecast for delivery completion is Q1 2029 for ALM and Q2 2029 for SLM.

The following table summarises progress on the WRMP19 activities in the western area:

Table 21: Progress on the WRMP19 activities in the western area:

Schemes	WRZ	Delivery year as per WRMP19	Progress
Demand management			
Water efficiency activity	All	From 2020	Progressing but with revised target
Leakage reduction (15% reduction by 2025; 50% by 2050)	All	From 2020	Progressing
Increase in household meter penetration from 88% to 92%	All	From 2020	Delayed until AMP8
Resource development and bulk supplies			
Additional import from Portsmouth Water (additional 9MI/d)	HSE	2024-25	Abandoned
Import from South West Water (20MI/d)	HSW	2027-28	Abandoned
Additional import from Portsmouth Water linked to Havant Thicket reservoir (21MI/d)	HSE	2029-30	Progressing to revised delivery deadline in line with Havant Thicket Reservoir delivery
Southampton coast desalination (modular to 75MI/d)	HSW	2027-28	Replaced
Sandown WwTW Indirect Potable Reuse (8.5MI/d)	IOW	2027-28	Progressing with delivery date revised to 2029-30
Hampshire grid - Andover Link Main (1) (reversible link HSE-HWZ)	HWZ & HSE	2027-28	Progressing with delivery date revised to 2029-30

Schemes	WRZ	Delivery year as per WRMP19	Progress
Hampshire grid - Andover Link Main (2) (reversible link HWZ-HAZ)	HAZ & HWZ	2027-28	Progressing with delivery date revised to 2029-30
Hampshire grid - Southampton link main (reversible link HSW-HSE)	HSW & HSE	2027-28	Progressing with delivery date revised to 2029-30
Romsey Town and Broadlands valve (HSW-HRZ reversible)	HRZ & HSW	2024-25	Progressing with delivery date revised to March 2025
Newbury WSW asset enhancement (1.2MI/d)	HKZ	2027-28	Progressing with delivery date planned for March 2027
WSW near Cowes - reinstate and additional treatment	IOW	2065 in 1 adaptive planning branch	Not yet progressing
Catchment management			
In-stream river restoration works on the Itchen	HSE & HWZ	2027-28	Delayed pending outcome of Water Framework Directive 'No Deterioration' investigations – AMP8 WINEP scheme proposed
In-stream river restoration works on the Test (upper reaches)	HAZ & HRZ	2027-28	Progressing
Pesticide catchment management / treatment - Sandown	IOW	2024-25	Progressing
Pesticide catchment management / treatment - Test Surface Water	HSW	2024-25	Progressing
Nitrate catchment management / treatment - Winchester	HWZ	2027-28	Progressing, continuing in AMP8
Nitrate catchment management / treatment - Romsey	HRZ	2022-23	Progressing, continuing in AMP8
Nitrate catchment management / treatment - Twyford	HSE	2021-22	Progressing, continuing in AMP8

4.1.3 Central area

Progress in the central area

The update on key WRMP19 schemes and DWI notices in the central area are outlined below:

- **Littlehampton WTW Indirect Potable Water Recycling:** This scheme has progressed through to detailed options analysis (R&V 3.2). Due to delays, this scheme is set to have a completion date of September 2029 with the benefit from 01/04/2030 (2030-31). See below for more detail.
- **Pulborough groundwater licence variation:** This scheme has been put on hold pending the outcome of the WFD No Deterioration investigations due in summer 2025.
- **Transfer to Midhurst WSW and Petersfield borehole rehabilitation:** Scheme to investigate the release of additional (DO) from Petersfield WSW. This scheme is now due to be delivered by 2027-28, with benefit from 2028-29. The boreholes onsite have been renovated and water yield and quality tests are scheduled for August 24. Once results are known then a preferred solution will be chosen from a selection of options for delivery This has been relabelled as 'Groundwater (SNZ): Petersfield refurbishment (1.6MI/d)' for this plan. Borehole rehabilitation has been completed and water quality testing will begin this summer.
- **Scheme to bring West Chiltington back into service:** Scheme to release additional DO from West Chiltington was selected as a preferred option in July 2020. This scheme is now due to be delivered by 2027-28, with benefit from 2028-29. A new GI Borehole has been installed and water quality tests are due to be carried out in August 24. Once results are known then a preferred solution will be chosen from a selection of options for delivery. This now labelled as 'Groundwater (SNZ): Reinstate West Chiltington (3.1MI/d)'. A test borehole has been drilled and water quality testing will begin this summer.

- **Sussex Brighton WRZ drought and resilience scheme (formerly Shoreham Desalination):** The need for Shoreham desalination, has been replaced with the delivery of Lewes Rd, as the result of a deep dive solution review completed in June 2022. The date for the required increase in available supply has been confirmed to provide a benefit by 2030-31. The developed investigatory work required to understand the available output and water quality (previous pesticide and PAH issues), has been re-scheduled due to the forecast delivery by 2030-31. The scope has been developed to allow mobilisation in AMP8.
- **SES Water Bulk Supply:** A new scheme to facilitate a bulk supply from SES Water (SESW) – This scheme has been split into 3 phases, based on the rezoning and reinforcement work required. The first 2 phases have been completed, providing a combined benefit of 1.3MI/d. The third and final phase to increase this transfer to 4MI/d has been promoted and discussions with SESW are about to begin.
- **Patching Nitrates:** A scheme to mitigate high Nitrates in Patching, Angmering and Clapham WSW. All works onsite have been completed and the site is in operation. Submission to the DWI to claim the output has been made.
- **Patcham Nitrates:** The programme started on site with an expected completion date of December 2023, this has been delayed due to the identification of badger setts.
- **Brighton East Nitrates:** A scheme to mitigate high nitrates within the Lewes Valley at Housedean WSW, Newmarket B WSW and Newmarket C WSW. Forecasting to complete in 2028
- **Aquifer Storage and Recovery in the Sussex Worthing WRZ:** This scheme is no longer being delivered as a suitable location with appropriate access, geology and network connectivity could not be obtained.

As discussed in section 1.8, we are working to deliver a large number of schemes under DWI notice. Key DWI notices in the central area are as follows:

- Pulborough WSW – We have worked closely with the inspectorate to develop a multi-AMP strategy for Pulborough, which will improve the site and mitigate identified risks.
- We currently have a companywide DWI notice that cover all our groundwater sites, relating to mitigating risks identified by our Hazrev programme.

The following table summarises progress on the WRMP19 activities in the central area:

Table 22: Progress on the WRMP19 activities in the central area

Schemes	WRZ	Delivery year as per WRMP19	Progress
Demand management			
Water efficiency activity	All	From 2020-21	Progressing, but with revised target
Leakage reduction (15% reduction by 2025; 50% by 2050)	All	From 2020-21	Progressing
Extension of UMP to take household meter penetration from 88% to 92%	All	From 2020-21	Delayed to AMP8
Resource development and bulk supplies			
Littlehampton WTW Indirect Potable Water Reuse	SNZ	2027-28	Delayed to 2029-30
Coastal Desalination - Shoreham Harbour	SBZ	2027-28	Abandoned
Pulborough groundwater licence variation	SNZ	2021-22	Scheme on hold due to sustainability investigations
Aquifer Storage & Recovery (Sussex Coast - Lower Greensand)	SWZ	2027-28	Abandoned
Transfer to Midhurst WSW & Petersfield borehole rehabilitation	SNZ	2025-26	Delayed to 2027-28
Scheme to bring West Chilmington back into service	SNZ	2024-25	Delayed to 2027-28
Winter transfer Stage 2: New main Shoreham/North Shoreham and Brighton A	SBZ	2027-28	Progressing pending completion of feasibility investigations
Catchment management			

Arun/W Rother - in-stream catchment management options	SNZ & SWZ	2029-2030	Delayed pending outcome of Water Framework Directive 'No Deterioration' investigations - AMP8 WINEP Scheme proposed completing 2030
Pesticide catchment management / treatment - River Arun	SNZ	2024-25	Catchment management progressing - linked to DWI undertaking
Pesticide catchment management / treatment - Pulborough Surface	SNZ	2024-25	Catchment management progressing - linked to DWI undertaking
Pesticide catchment management / treatment - Weir Wood Reservoir	SNZ	2024-25	Catchment management progressing - linked to DWI undertaking
Nitrate catchment management / treatment - North Falmer A	SBZ	2027-28	Catchment management progressing, and continuing in AMP8
Nitrate catchment management / treatment - North Arundel	SWZ	2027-28	Catchment management progressing, and continuing in AMP8
Nitrate catchment management / treatment - North Falmer B	SBZ	2027-28	Catchment management progressing, and continuing in AMP8
Nitrate catchment management / treatment - Long Furlong B	SWZ	2022-23	Catchment management progressing and continuing in AMP8. Nitrate blending solution delivered.
Nitrate catchment management / treatment - Brighton A	SBZ	2027-28	Catchment management progressing, and continuing in AMP8

4.1.3.1 Littlehampton WTW recycling

In response to regulatory feedback to our WRMP19 Annual Review 2022 we submitted a 'delivery roadmap' to regulators in February 2023. The roadmap provided an update on delivery dates and water resource benefits of WRMP19 supply-side schemes, and identified potential risks to the delivery of schemes and the steps we are undertaking to mitigate them. The roadmap highlighted a likely extension to the timing of the Littlehampton WTW Indirect Potable Water Reuse scheme caused by factors beyond our control, due to planning and consenting risks. The Environment Agency requires longer monitoring to allow discharge consents for this scheme and may not be able to fast track as the scheme, as it was not identified as an SRO at PR19. It is also likely that delays will also be caused by third party approvals covering planning, EIA and the HRA for the pipeline route which must cross a National Park. The roadmap included a more matured programme of delivery for the scheme, which accounted for these delivery risks, with a completion date of September 2029. This means that benefit from the scheme will be first available from 01/04/2030 (2030-31). This scheme is relabelled as Recycling (SNZ): Littlehampton with direct river discharge (15MI/d) in the dWRMP.

The water recycling schemes are some of the most technically advanced solutions under consideration within our current asset management period to 2025. Regulatory, customer, engineering and environmental challenges combine to present a unique collection of delivery dependencies to our roadmap. These are not simple capital solutions but complex water and environmental system interventions, including the delivery of new water quality standards, significant pipelines through the South Downs national park, a new approach to the blending of water sources, not to mention the controls to manage these new processes. We're currently working with all parties to maintain momentum and expect to complete this work by 2030.

We have continued engaging with the regulators on a regular basis. Sampling of the river catchment and source waters started in 2022 and is ongoing to understand the composition of the river for discharge permitting. Pipe route selection and development has continued with landowners being contacted to make them aware of the project and for gain access for environmental surveys. A number of environmental surveys have been undertaken along the proposed routes and further surveys are planned for the areas of the route that have been adjusted following initial survey work and constructability assessment. The preferred process option selection has been completed and preparation of an outline design of the proposed plant commenced. Work continues to compile documentation to support an Environmental Impact Assessment. Negotiations have commenced with a landowner for the purchase of a site for the proposed plant.

There are risks to delivery with common themes emerging across the programme of recycling schemes, environmental assessments and approvals, achieving full planning requirements, the use of new technologies and approval and regulatory advocacy for these. There is also the significant potential for social challenge and negative perceptions around the whole notion of recycled water solutions. We're breaking new ground in this space, so we knew that this was going to be a challenge. This is why we've put in place senior stakeholder and regulator engagement groups, who we're working with on many of these issues and we are part of a national group working with other water companies to develop engagement strategies with customers around this issue. It's clear that to deliver the programme efficiently we'll need to continue to work closely with these groups to both accelerate the delivery process and build a reputation for this type of water resource.

4.1.3.2 Weir Wood

We remain focused on delivering a rebuilt Weir Wood water supply works (WSW). A new scheme to deliver a phased rebuild of Weir Wood WSW was included in our revised draft WRMP24. This intends to deliver a works capable of supplying 5.4MI/d by 2025, 13MI/d by 2027 and 21MI/d by 2029/30.

4.1.4 Eastern area

Progress in the eastern area

In the Eastern area we are progressing our WRMP19 preferred options. The update on key schemes and notices in the Eastern area is below:

- **Bulk supply import from South East Water (Kingston source)** – We are working with South East Water to progress this scheme and currently working together to come up with the best solution. However, in May 2023 South East Water has indicated that it does not expect this import to be available until 2027 i.e. two years later.
- **West Sandwich and Sandwich licence variation** – the scheme was due to be implemented by March 2021, however, this was delayed. As referred to in sections 1.3.3 and 2.4, pump testing with environmental monitoring at West Sandwich and Sandwich was carried out in March 2023.
- **Licence variations at Faversham2, Faversham1 and Millstead sources** - (UGS) enabling up to 20% of existing summer volume to be made available for winter abstraction, providing it has not been used in the summer period. As mentioned in section 2.4, the Faversham2, Faversham1 and Millstead "summer sources" abstraction licence variation applications (variations to the Sittingbourne and Faversham Group licences) were submitted to the EA in March 2022 following pre-application discussions with EA and NE that resolved application approaches that appeared acceptable to the local teams. The applications are currently with the EA and we expect that they will be determined shortly.
- **Thanet nitrates** – The Thanet nitrates solution includes nitrate removal plant installations at near Canterbury WSW, Sandwich WSW and West Langdon WSW (treating raw water from Sutton WSW). These nitrate removal plants will over-treat water to provide very low nitrate water to blend within the trunk main system with high nitrate water from other sites. The nitrate removal plant at West Langdon WSW will include connections to West Langdon as well as North Deal to allow the additional resilience benefit of being able to treat water from either site. The detailed design is complete, planning permissions have been obtained and early procurement of nitrate removal plants and other long-lead items has taken place. Construction has commenced at all sites but PLC delays have meant we have not yet commissioned West Langdon – it is estimated that this should be online by the end of September 24. All other sites are on track to complete to their output dates currently.
- **Utilise the full existing transfer capacity of the Selling-Fleete pipeline** – This involves modifying both Selling & Throwley underground sources to allow more water to transfer to Kent Thanet WRZ. Design and survey work is in progress, design is to run to the end of AMP7 with early AMP8 delivery planned.

- **Medway WTW Indirect Potable Water Recycling:** Optioneering for this scheme took place in July 2022. A sampling programme has been established to inform the process requirements and sampling is underway. Following analysis of future flow regimes at Medway WTW, the DO benefit of this scheme has been revised to 14MI/d from 18MI/d. This scheme will be delivered by 2029-30 with benefits by 2030-31.

As discussed above, water recycling schemes are some of the most technically advanced solutions under consideration within our current asset management period to 2025. With this brings regulatory, customer, engineering and environmental challenges that combine to create a unique position, which must be monitored through the delivery of the scheme. The project has been advanced through the SW process of Risk and Value (R&V) to stage 3.2 (option selection). Engagement with regulators continue, with further engagement need to confirm option selection. The development of the outline process design has commenced, and the sampling programme of the river and source water is ongoing to understand the composition of the river and water bodies for discharge permitting. The land search for the site of the proposed plant has continued, identifying a preferred location for the plant. Discussions with landowners are ongoing, however the initial feedback has not been positive. Environmental surveys are in abeyance whilst waiting land access agreement.

There are risks to delivery with common themes emerging across the programme of recycling schemes, environmental assessments and approvals, achieving full planning requirements, the use of new technologies and approval and regulatory advocacy for these. There is also the significant potential for social challenge and negative perceptions around the whole notion of recycled water solutions. We're breaking new ground in this space, so we knew that this was going to be a challenge. This is why we've put in place senior stakeholder and regulator engagement groups, who we're working with on many of these issues and we are part of a national group working with other water companies to develop engagement strategies with customers around this issue. For example, we are chairing an All Company Working Group (ACWG) on water recycling schemes and specifically SROs covered by RAPID. It's clear that to deliver the programme efficiently we'll need to continue to work closely with these groups to both accelerate the delivery process and build a reputation for this type of water resource.

The following table summarises progress on the WRMP19 activities in the eastern area:

Table 23: Summary of progress on the WRMP19 activities in the eastern area

Schemes	WRZ	Delivery year as per WRMP19	Progress
Demand management			
Water efficiency activity	All	From 2020-21	Progressing but with revised target
Leakage reduction (15% reduction by 2025; 50% by 2050)	All	From 2020-21	Progressing
Resource development and bulk supplies			
Medway WTW Indirect Potable Water Reuse	KMW	2027-28	To be delivered by 2029-30
South East Water bulk supply near Canterbury	KTZ	2025-26	To be delivered by 2027-28
Utilise full existing transfer capacity (from Faversham4)	KTZ	2027-28	Progressing
West Sandwich and Sandwich WSW licence variation	KTZ	2021-22	Complete- Benefit included in baseline supply forecast
Catchment management			
Pesticide catchment management / treatment - Darwell Reservoir	SHZ	2024-25	Progressing

Pesticide catchment management / treatment - River Medway Scheme	KMW	2024-25	Progressing
Pesticide catchment management / treatment - Powdermill Reservoir	SHZ	2024-25	Progressing
Nitrate catchment management / treatment - Deal	KTZ	2022-23	Progressing, continuing in AMP8
Nitrate catchment management / treatment - West Sandwich	KTZ	2025-26	Progressing, continuing in AMP8
Nitrate catchment management / treatment - Manston	KTZ	2022-23	Progressing, continuing in AMP8
Nitrate catchment management / treatment - Ramsgate B	KTZ	2022-23	Progressing, continuing in AMP8
Nitrate catchment management / treatment - Birchington	KTZ	2022-23	Progressing, continuing in AMP8
Nitrate catchment management / treatment - North Deal	KTZ	2022-23	Progressing, continuing in AMP8
Nitrate catchment management / treatment - near Canterbury	KTZ	2025-26	Progressing, continuing in AMP8
Nitrate catchment management / treatment - Sandwich	KTZ	2027-28	Progressing, continuing in AMP8

4.2 Demand Management

4.2.1 Target 100

Our full target 100 strategy can be found in Appendix F. Below are the headline figures relating to our targets.

Meeting our efficiency targets

As part of our WRMP 2019 (WRMP19), we had set ourselves a target to reduce average PCC in our supply area to 100l/h/d by 2040 under normal year conditions ('Target 100'). COVID-19 led to an increase in household demand during 2020-21 and 2021-22 as customers worked from home and made changes to their hand washing and personal hygiene routines. Consequently, we revised our AMP7 and 2024-25 PCC forecast (127.5l/h/d), which is higher than our starting position for the 2020-25 planning period.

PCC has reduced as people have returned to the workplace following the lifting of pandemic restrictions. Average PCC for 2023-24 reduced to 127.3l/h/d from the peak of 139.0l/h/d in 2020-21. However, a significant proportion of the workforce continues to work from home for at least part of the week. Despite our on-going programme of home visits and media campaigns, we are 5 years' behind on our original 'Target 100' programme.

Home audits

Home audits (inclusive of fitting water-saving devices) are proven to reduce water consumption. This year (2023-24), we've undertaken over 13,500 home audits, reducing consumption by 300 cubic metres per day. Our home visits, which include providing behavioural advice, helped identify over 1,100 leaky loos that were fixed by local plumbers. We took 8,400 water samples from customer properties that helped identify a further 241 leaks. From speaking with customers, our engineers have referred 1,200 customers to our Affordability team who contact customers to discuss payment options. To further improve customer engagement and encourage high-consumption customers to sign-up for a home visit, the framing and content of email correspondence has been reviewed and optimised by a behavioural specialist.

Smart meter technology

Our smart metering trial commenced in July 2023. We installed clip-on devices in 1,500 homes across Southampton, Andover, Midhurst, and Brighton. The device was to test the assumption that by providing customers with daily consumption information, household water consumption can be reduced by 3-5%. The trial is now closed, and valuable lessons were learned that will enable us to prepare for the rollout of permanent smart meter technology from 2025-2030. This will improve the frequency and accuracy of meter readings and provide customers with more information to help monitor and reduce water usage.

We're on track with our plan to replace all our Visual Meter Read (VMR) and Automated Meter Read (AMR) meters with Advanced Metering Infrastructure (AMI) meters (1.36 million households) by 2030, delivering an average estimated 4% reduction in household demand. We have been market testing ahead of the AMP and we are in good shape to continue.

Tariffs

We plan to introduce differential tariffs such as summer/winter charges or a rising block, as a powerful incentive to cut water use. Our approach has been carefully planned across three phases: building awareness and readiness, smart meter roll-out alongside tariff pilots, and an evidence-based introduction to tariffs over time. We are engaging with other water companies to obtain and share any learnings and avoid duplication of trials.

Communications and marketing

We've formed our strategy, which divides the customer journey into three stages:

- Build awareness of water scarcity and the need to use water wisely.
- Make less water use socially acceptable.
- Celebrate and encourage behaviour change.

We launched a multi-platform, overarching awareness campaign 'Save a little water, make a lot of difference' (May 2023) that forms the backbone of the customer journey. It's designed to raise awareness of water scarcity, encourage people to use less and, importantly, provide useful tips on how. It focuses on the simple things people can do around the home and has been informed by behavioural science insights gathered from our ethnographic studies.

Our customer campaign included direct customer emails, social media posts and ads, press articles and radio and DAX (Digital Ad Exchange) advertising, as well as on buses. For the first time, we also used social media influencers to advertise water saving products such as tap aerators, water-efficient shower heads, etc. During 2023-24, we delivered over 90 million display impressions and our T100 website recorded over 600,000 customer visits.

We took a slightly different approach with the high consumption areas of Hampshire and Isle of Wight, with more targeted messaging about protecting the local environment, chiefly local rivers, and chalk streams.

We continue to have regular communications with customers, stakeholders, non-household customers and employees, keeping them up to date on restrictions, on the work we were doing to mitigate drought, and ways they could save water via direct communications including flyers, letters, and texts, press articles, social media, website updates, and adverts on radio, buses, and websites.

Despite extensive efforts, surveys indicate that only 4% of our customers in South East England consider water scarcity to be currently a significant problem and only 8% consider it to become a serious problem in the future. To further improve our messaging, we have engaged expert behavioural scientists who have completed a full audit of our campaign and materials and provided a framework to assist with composing future communications. We are training members of our Communications team on how to embed best practice behavioural science across all our messaging.

In May, we launched our new campaign that asks customers to 'Make One Change'. We will be also using the same three-word call to action to highlight Southern Water's actions in reducing water demand.

Education and community

In support of our drive to increase awareness of water scarcity and the need for behavioural change, we have engaged directly with schools, working alongside our education partners, We Are Futures and the South East Rivers Trust. We've launched new T100 educational modules as part of our educational programme New Wave. These are a set of curriculum-based classroom resources for teachers to help children to learn simple ways of saving water and protecting our local environment.

We're also working with the South East Rivers Trust on a joint school education trial called Our River, Our Water, aimed at primary schools. It's made up of class and outdoor sessions on the River Dour, River Dun and Gatwick Stream where children take part in a range of outdoor activities. The project aims to help educate the next generation on the need to save water.

During 2023-24, we have provided educational materials and experiences that have reached over 80,000 students. And between May and September 2023, we delivered 36 community events across our region, engaging more than 13,000 customers, providing them with water saving tips, free products, and advice.

Water-efficiency solutions

We have conducted frequent horizon scans to identify new product and technology solutions to help better equip our customers to use less water. Once identified, we utilise an engaged group of staff, known as Water Warriors to test novel products and provide feedback on user experience. To date we have tested a range of products with this group and with customers, including smart shower sensors, toilet odour neutralising tablets that reduce toilet flushing, a device to measure hose flow consumption and a smart watering device called Gardena that was found to reduce garden water consumption by up to 75% in one household.

Our testing approach ensures that products are tested and proven to save water, as well as deliver a good customer experience. When beneficial, we take the opportunity to engage with manufacturers to improve product design or we pivot to another solution without having invested too much time and money. By adopting this approach, our strategy is evidence based rather than assumptions.

For example, we are trialling a smart leak alarm device with 1,000 customers. The device, LeakBot, alerts customers to the presence of water leaks on the mains supply, and when taps have been left running for long periods. Early results are encouraging, the device has helped identify leakage in over 30% of homes. The average leak being 37 litres per day and the largest was over 364 litres per day.

Government interventions

The government has announced new mandates for manufacturers to label water-efficient domestic appliances, for developers to build water-efficient homes and for existing homes to be retrofitted with water-efficient devices. These feature in our plan and forecasts as will make the largest contribution to water savings.

4.2.2 Plan for non-householders

We intend to meet the government's goal of a 9% reduction by the end of 2037. The thrust of our strategy is to provide differing solutions for each business, suited to their line of work. The core tactic is to focus on water audits to either disconnect them from a potable supply by providing an alternative source such as rainwater harvesting or reduce their consumption by fitting water-efficient devices, reducing leaks or through grey-water technologies. Although, no consumption reduction targets were planned in PR19; we've set ourselves a target of 2Ml/d reduction by the end of AMP7.

We have pin-pointed six catalysts (the workstreams and interventions) for our non-household trials: trials and innovations, water audits, partnership funds, incentives and tariffs, smart meters, and communications.

Trials and innovations

Following the successful trial of our non-household audits, we will be completing 20-30 water audits and water-saving retrofits per month during 2024-25. We expect water audits to deliver a reduction in demand of 1.5 MI/d by March 2025. We forecast a further 0.5 MI/d reduction in demand will be achieved through the effects of our Business Partnership Fund.

We are an active member of the Retailer Wholesaler Group (RWG) and work collaboratively with Retailers within our region to provide water efficiency services to business customers.

Our Water Butt for Business Scheme is was launched in April 2024. This scheme, aimed at schools, community groups and not-for-profit organisations, provides a free water butt kit to help customers reduce consumption.

Water audits

We're prioritising public sector buildings and schools: targeting old, inefficient ones for greater water savings. As part of a pilot programme, we completed seven audits of non-household premises, including a school, leisure centre and football stadium, achieving savings in consumption of over 120,000 litres per day. A further 360 audits are planned between April 2024 and March 2025. We are also pursuing water audit opportunities within high water consuming businesses like hotels and leisure centres.

Partnership funds

Open to Retailers and organisations, our Business Partnership Fund is to support the implementation of new and innovative ideas to help reduce water use in businesses across the South East. In February 2024, funding was awarded to six applicants. The next round of funding launched in April 2024.

Incentives and tariffs

We intend to use tariff mechanisms in a smarter way to incentivise organisations to use less potable water. We'll need to do trials to understand the best mechanisms to reduce consumption and, in the meantime, have identified the following changes and innovations:

- Adopting site, area-based, charging for surface water drainage.
- Large user discount is no longer available.
- Changing to a volumetric measure for highway drainage charges linked to customer usage.
- Trialling extensively around new tariffs, including seasonal and rising block tariffs.

We are leading the way incentivising non-household customers to reduce consumption and sustain behaviour change. In 2022, we launched the first incentive scheme of its kind in the water industry designed to reduce water use and protect specific river levels during one of the UK's driest and hottest years on record. The scheme, called You Save. We'll Pay, was aimed at businesses in water-scarce Hampshire and the Isle of Wight. We gave businesses a discount of 10, 20 or 25% of their wholesale water charges when they saved the equivalent amount of water across three months. The scheme avoided any further restrictions after the temporary water use ban introduced in early August. Customers who took part in the scheme were overwhelmingly positive with the majority saying they'd do it again.

Smart meters

We plan to roll out a smart meter installation programme for non-household customers followed by interventions, based on accurate meter readings, to prompt less water use. We intend to run a pilot in 2024-25. Subject to approval of our WRMP and business plan, we plan to proactively replace existing basic and AMR meters with new AMI infrastructure area by area within AMP8.

Communications

We are using behavioural science to further improve awareness of water scarcity and the need to reduce business demand. Additionally, when carrying out our water audits, we will be taking the opportunity to speak with businesses about water use in washing fat, oil, and grease (FOG) down the drain and the impact on our region's sewers, and other services we offer to help protect and preserve our environment for a more sustainable water future.

4.2.3 Plan for developers

We've segmented developers because they play a significant role in introducing new water habits sustainable at an individual, social and cultural level.

We are developing strategic partnerships with key stakeholders, such as land promoters and developers to create fundamental shifts in how housing emerges, what our built environment looks like and the future resilience of our network. Working alongside developers, our intention is to continue to promote water-efficient lifestyles and to investigate opportunities to trial and build liveable water-efficient new homes. We're also proactively talking to local policymakers to bring about the changes we need to our networks, responding to water neutrality consultations and unlocking developments to make them viable for water efficiency.

We are working closely with local planning authorities in Sussex North and with developers to meet Natural England's requirement (as of September 2021) that new developments in that area are to require no further water abstraction. We've already reduced abstractions and demand, helped developers with potential strategic solutions, appointed a dedicated resource, and established better communications including a quarterly webinar, monthly newsletter, dedicated water neutrality email and a dedicated webpage.

To encourage developers to provide water efficient housing (100 litres per person per day) we have introduced the environmental incentive scheme for water. A three-tiered approach enables developers to claim incentives for taking action to reduce consumption and ultimately achieve water neutrality - total demand for water should be the same after new development is built, as it was before. That is, the new demand for water should be offset in the existing community by making existing homes and buildings in the area more water efficient.

4.2.4 Leakage Reduction

We continue to undertake the following leakage reduction measures:

- Advanced Pressure Management: Design and install 70 new pressure management schemes and 30 booster control schemes, delivering a total of 8 MI/d benefit.
- Transients Mitigation: Implement 50 variable speed booster solutions and 10 water service reservoir inlet valve control systems to reduce the impact of transients on the network, reducing burst frequencies and saving 2 MI/d of leakage.
- Pressure Optimisation: Review 200 existing schemes to identify further optimisation opportunities and save 1 MI/d of leakage.
- Leakage Reduction Trials: Undertake trials looking at alternative approaches to reduce leakage in areas that have proven difficult to reduce via the current approach, saving 2 MI/d of leakage.
- Continuing to undertake trials of new technologies, such as satellite detection, internal pipe condition analysis, no-dig repair techniques and using AI systems to locate leaks through the use of acoustic data.
- Improving Detection Productivity: Implementing a new, digital, approach to localising points of interest for leak detection and reducing the time taken to locate leaks.
- DMA Operability: Continuing to identify issues with District Meter Area level data and network configuration to improve the accuracy of leakage targeting.

4.3 Catchment Management

4.3.1 Catchment First

Catchment First is Southern Water's commitment to put the well-being of the environment at the centre of the decisions we make and the services we deliver. It represents a shift in focus from relying on traditional engineering solutions, to working collaboratively with partners to create long-term sustainable improvements to the environment on which our business and customers depend.

Our key strategic Catchment First projects aligned with WRMP to protect water resources include:

- **Sustainable abstraction** and mitigation programme: understanding the baseline condition of the environment and the potential impacts of our abstractions, and enhancing the waterbodies in which we operate, with a water resource and hydroecology focus. Instream Catchment Resilience Schemes (ICRS) are WRMP24 and WINEP schemes, which are multi-AMP with the AMP7 element being monitoring to establish an ecological baseline within a waterbody where we may be having an impact due to our abstractions. The AMP8 element is to implement targeted instream measures to reduce the write-down in abstraction licence quantity in agreement with the EA.
- **Groundwater nitrate reduction programme** – understanding the risk of nutrient concentrations (specifically nitrate) in groundwater sources and the resulting risk to drinking water compliance and source sustainability in the future. Implementing catchment schemes, working with agriculture and other land users, to ensure the resilience of the sources and assets in six key project areas: Hampshire, Worthing, Brighton, North Kent, Thanet North and Thanet South, collectively covering approximately 36 groundwater sources in AMP7 and increasing to 42 in AMP8.
- **Surface water catchment resilience programme** – understanding the nature of the river catchments and the risks to raw water quality at key abstractions, working with farmers, agronomists and catchment stakeholders to mitigate upstream water quality pressures whilst providing wider environmental outcomes for example for natural capital, carbon, flooding, soil health and sediment erosion. Key focus areas in AMP7 and into AMP8 are the Western Rother and River Arun catchments in Sussex, the River Beult sub-catchment to the River Medway in Kent, and the Eastern Yar catchment on the Isle of Wight.

Water Quality regulatory schemes and investigations

- We have successfully submitted 20 WINEP water quality investigations which have been reviewed and signed off by the EA.
- We are underway delivering our AMP7 DWI Undertakings and Notices obligations as required and have also brought forward delivery of many of the milestones in the AMP7 WINEP groundwater schemes.
- We are delivering nitrate reduction schemes in 36 groundwater catchments this AMP and this includes a number of nitrate catchment schemes in WRMP19 (Romsey, Twyford, Winchester, Near Andover (2), North Falmer B, North Falmer A, Steyning, Brighton A, Long Furlong B, North Arundel, Deal, Manston2, Ramsgate, Birchington, North Deal, West Sandwich, near Canterbury, Sandwich, Strood, Gravesend and North Dover). We are liaising with farmers, farmer clusters and stakeholders locally to undertake engagement on nitrate risk and fund a series of farm trials and nitrate reduction measures in specific catchments where nitrate risk is understood to be high. In many groundwater catchments across the supply region, we have already rolled out incentive schemes for nitrate reduction measures to protect drinking water sources for this financial year. As well as incentive schemes, we run a programme of farm visits, trials and engagement events.
- We are progressing our AMP7 plans for the implementation of WINEP pesticide schemes on the River Beult and the Western River Rother. In the River catchments for the Western Rother and Arun, we have been monitoring water quality, we've undertaken pesticide risk mapping and modelling, and have been engaging farmers on key pesticides featuring in the risk assessments. We have established and

continued to monitor closely the pesticide risk in both the River Medway and the Weir Wood catchment, with these data being used to target our communications and awareness raising activities around pesticide risk. We have also been working more intensively in the River Beult (sub-catchment to the River Medway) to engage farmers on pesticide use, monitor water quality and protect water sources from elevated pesticides. This has included monitoring, risk modelling and mapping, and engaging with farmers directly via our inhouse Catchment Officers. We have also established key partnerships with local Stakeholders, including working collaboratively with the Catchment Partnerships in 4 strategic river basin areas to codevelop catchment scale management plans.

- We have undertaken natural capital mapping exercise and are working with local stakeholders including the Arun and Rother Rivers Trust to engage farmers and identify target areas for environmental enhancements to protect water quality whilst delivering wider benefits.

Water resource regulatory investigations and schemes

- We are underway delivering our AMP7 WINEP investigations, with monitoring on going informing groundwater and ecohydrology links for the Kingsclere Brook, Candover stream, Itchen Wetlands, and North Kent marshes investigations.
- The AMP7 implementation scheme on the Upper Anton is progressing well, and Lukely Brook and Lewes Winterbourne are both complete.
- We have extended our Upper Anton WINEP scheme to become our CaBA Chalk Stream flagship project, delivering ecological resilience improvements to both the Upper and Lower Anton, in collaboration with catchment partners Wessex Rivers Trust, Test Valley Borough Council and the Piscatorial Society.

5 Supply-demand management

5.1 Outturn supply-demand balance

Our SDBI submission for 2023/24 was green (Table 24). We continue to run increased risk on Sussex North where we are building a modular treatment for Weir Wood to be operational by summer 2025 to help with the long-term resilience. Isle of Wight remains reliant on a transfer from Hampshire Southampton West and Kent Medway East relies on a transfer from Kent Medway West.

Assumptions remain largely the same as in the 2023 submission with only a few additions. We have delivered our West Sandwich and Sandwich licence variation in October 2023 and as a result benefit has been included for half of the DYAA scenario. We have removed planned outage near Rochester and at Pulborough groundwater from our DYPDO scenario as these are outages that we wouldn't carry out in a drought event. WRMP19 included a dummy option to come into supply in 2023/24 under peak week scenario In Kent Medway East, since this is a dummy option this has been removed from the baseline however outage has been reduced reflecting improvements within the zone since AMP6.

We have multiple transfers between zones as seen in Table 25. The WRMP19 assumes a volume between the zones and then we optimise the transfers based on the outturn data to ensure that our customers would remain in supply.

Table 24: Supply Demand Balance Index 2024 summary

Water resource zone	DYAA Surplus/ deficit (MI/d) WRMP demand	DYAA Surplus/ deficit (MI/d) actual demand	DYPDO Surplus/ deficit (MI/d) WRMP19 demand	DYPDO Surplus/ deficit (MI/d) actual demand
Hampshire Andover	7.16	6.02	5.77	4.60
Hampshire Kingsclere	3.31	3.13	3.06	3.18
Hampshire Winchester	5.92	4.16	5.37	2.12
Hampshire Rural	6.33	5.57	7.28	3.95
Hampshire Southampton East	18.15	22.59	30.95	35.18
Hampshire Southampton West	18.10	21.19	12.15	14.61
IOW	0.01	0.01	2.21	2.57
Sussex North	0.01	0.01	0.01	0.01
Sussex Worthing	3.70	3.56	9.75	2.69
Sussex Brighton	0.01	0.01	6.89	6.37
Kent Medway East	0.01	0.01	0.01	0.01
Kent Medway West	22.83	7.94	19.38	10.67
Kent Thanet	4.82	5.61	10.37	14.52
Sussex Hastings	0.22	0.01	5.45	4.59
Total SDBI score	100.00	100.00	100.00	100.00

Table 25: Transfers assumed in DYAA and DYCP SDBI outturn DI scenarios

Transfer	WRZ origin	WRZ received	DYAA 2024 total assumed volume	DYAA WRMP19 assumed volume	DYAA 2024 additional assumed volume	DYCP 2024 total assumed volume	DYCP WRMP19 assumed volume	DYCP 2024 additional assumed volume	Capacity
Current transfers from Southampton West to East	HSW	HSE				0.1	0.1		24.0 (cap)ri
Cross-Solent main export to IOW	HSW	IOW	7.0	5.9	1.1	8.3	6.9	1.4	18.0 (cap)
Romsey Town & Broadlands valve (bi-directional)	HSW	HR	3.1	3.1		3.1	3.1		3.1 (cap)
Romsey Town & Broadlands valve (bi-directional)	HR	HSW							3.1 (cap)
Abbotswood	HR	HSE							1.1 (cap)

Winchester South West	HSE	HW							7.5 (cap)ap
Bi-directional transfer between SN & SW	SN	SW							16.0 (cap)
Bi-directional transfer between SN & SW	SW	SN	14.9	0.0	14.9	12.4	0.0	12.4	16.0 (cap)
Export to SB at v6 valve	SW	SB				0.4	0.0	0.4	17.0 (cap)
Bewl-Darwell transfer	KMW	SH				12.5	11.7	0.7	35.0 (cap)
Faversham-Fleet main transfer	KME	KT	14.0	14.0	0.0	14.0	14.0		14.0 (cap)
Current transfers from KMW to KME	KMW	KME	10.5	0.0	10.5	19.3	11.0	8.3	44.7 (cap)

5.2 'Shadow' reporting of dry year uplifted data

See the annual return data template for the shadow reporting information.

6 Forward Look

We are working on our WRMP24. As such, this will be the last Annual Review reporting on our WRMP19.

We are submitting our draft WRMP24 to Defra in June 2024. We will then consult in the second half of 2024. The Statement of Response (SoR) will be written towards the end of 2024, with submission of the final plan in summer 2025.

We will continue to work closely with other water companies and the regulators to continue to manage and reduce the impacts of risk on delivery, through quality open an dialogue. We have regular updates already going ahead with both Portsmouth Water, South East Water and the Environment Agency.

Our WRMP24 will need to adapt to the changes in availability of water, it will need to protect the environment and look at alternative longer term adaptability of some of our supply solutions and to ensure we are in a good water resources position. We will continue to challenge delivery of leakage efforts and demand management activities.

Appendix A: Annual Review data return

See separate spreadsheet.

Appendix B: Abstraction returns summary April 2023 - March 2024

Table 26: Annual Abstraction Returns

Water Resource Zone	Annual Abstraction			Daily Abstraction		
	Licence (MI/yr)	Actual Abstraction (MI/yr)	% of Annual Total	Licence (MI/d)	Maximum Abstraction (MI/d)	Average Abstraction (MI/d)
Isle of Wight	18,754.500	9,051.390	48.3%	89.280	40.825	24.738
Hants Andover	9,312.150	6,196.759	66.5%	30.195	22.122	16.933
Hants Kingsclere	5,729.836	2,271.611	39.6%	19.182	3.961	2.389
Hants Rural	6,378.606	2,514.565	39.4%	18.638	9.934	6.866
Hants Southampton East	42,000.000	30,077.220	71.6%	150.020	101.161	82.153
Hants Southampton West	29,200.000	21,263.721	72.8%	80.000	75.310	58.106
Hants Winchester	8,705.762	7,027.824	80.7%	33.640	24.798	19.204
Sussex North	43,787.872	22,556.052	51.5%	124.168	76.762	61.645
Sussex Worthing	23,600.000	16,697.417	70.8%	99.500	57.359	45.613
Sussex Brighton	33,800.000	27,978.293	82.8%	186.650	90.471	76.433
Sussex Hastings	20,594.432	13,568.737	65.9%	118.238	80.907	37.099
Kent Medway East	36,779.900	26,872.653	73.1%	179.000	81.218	73.416
Kent Medway West	84,388.857	38,933.158	46.1%	672.092	316.529	106.428
Kent Thanet	29,010.433	13,261.279	45.7%	103.277	41.547	36.237
Gravesend STW	55.00	21.001	38.2%	0.340	0.179	0.057
Ham Hill STW	82.00	0.015	0.0%	0.320	0.001	0.000
Motney Hill STW	42.00	26.088	62.1%	0.120	0.109	0.071
Company Level	392,221.348	238,317.783	60.8%	1,904.655	844.378	647.388
Highest abstraction as % of annual limit		Highest abstraction as % of daily limit				
Licence	% of annual licence limit abstracted	Licence	Max daily abstraction as % of licence limit			
Midhurst Total	110.09%	Rotherfield Total	102.57%			
Bewl Reservoir	101.79%	Totford	98.02%			
Newport	99.05%	Newmarket Total	97.90%			
Lukely Brook	98.58%	Danaway	97.08%			
Darwell	90.66%	Madehurst	95.93%			
Powdermill	83.83%	Kingsclere	95.04%			
Winchester	82.89%	River Arun	94.30%			
Andover	81.61%	Test Surface Water	94.14%			
Sandwich	81.58%	Carisbrook	93.06%			

Barton Stacey	80.76%	Warningcamp	92.22%
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Appendix C: Scheme Delivery Tracker

See tracker.

Appendix D: Western Area

Our Western supply area consists of seven Water Resource Zones: The Isle of Wight; Hampshire Kingsclere; Hampshire Andover; Hampshire Southampton West; Hampshire Southampton East; Hampshire Winchester and Hampshire Rural. These are shown in Figure 2.

As a result of abstraction licence changes on the rivers Test and Itchen, and the risk that long-term reliance on drought permits and drought orders could pose to their rare and protected habitats and species, we have entered into an operating agreement with the EA (under s.20 of the Water Resources Act 1991) to enable us to continue to meet our water supply duty until we can develop alternative water resource solutions. In relation to our Western supply area, we have agreed to use “all best endeavours” to “implement the long-term scheme for alternative water resources set out in its final WRMP19, as may be revised by future WRMPs”.

Hampshire Water Transfer and Water Recycling Project (HWTWRP) - SRO

In WRMP19, the long-term water resource solution for delivering a new large-scale water supply to the Western area, was a 75MI/d desalination plant at Fawley. As WRMP19 was an adaptive plan, we also said we would progress alternative strategic options in parallel to developing Fawley desalination.

Our principal alternative scheme specified in WRMP19 was an indirect water re-use scheme (also called water recycling) to the lower river Itchen. However, following PR19 final determination and the creation of RAPID's ‘gated process’, Southern Water was required to consider additional alternative schemes not specifically included in WRMP19.

Water recycling options were considered including the use of environmental buffers (such as the creation of new lakes and wetlands to store water). Additionally, an enhanced use of the Havant Thicket reservoir (HTR), now under construction by Portsmouth Water on our behalf, was also considered. This enhanced use involves using a water recycling plant to produce highly treated water to supplement HTR maintaining reservoir levels, particularly during drought conditions, before transferring it to Hampshire via a new direct raw water pipeline for further treatment at Otterbourne WSW.

At this point and following identification and exploration of emerging challenges to consenting and delivering Fawley desalination, we tested potential alternatives schemes both included in WRMP19 and outside of WRMP19 as directed by the RAPID gated process.

Using a range of environmental, planning, consenting social and value-based criteria, legal and policy obligations and strategic objectives we undertook a robust Options Appraisal Process (OAP) to test options and consider their performance and delivery risks and opportunities against one another. We also considered known risks to our supply-demand balance and undertook a Future Needs Assessment (FNA). As a result, it was determined that a scheme capable of delivering up to 90MI/d into Otterbourne WSW in drought conditions would be required in our Western supply area.

The outcome of this exercise was that desalination at Fawley was no longer to be progressed and would be replaced with the highest-ranking option as our selected strategic resource option (SRO) for the Western

supply area. Our selected scheme is the Hampshire Water Transfer and Water Recycling (HWTWR) project, which can provide approximately 85.5MI/d into supply during peak operation.

In September 2021, we presented an Interim Update to RAPID, highlighting that Fawley desalination options ranked lowest in our OAP, and that the preferred location presented consenting difficulties. We stated that we no longer considered it appropriate to progress any further work on the desalination options. Regulators and other statutory bodies were engaged as part of the OAP and support for this approach was received from both the EA and RAPID.

In December 2021, within our RAPID Gate 2 submission, we presented outputs from our full OAP confirming the highest-ranking option as the HWTWR project (known at the time as Option B.4). The main components of this SRO at that time were as follows:

- Abstraction of final effluent from Budds Farm WTW;
- Treatment at a new Water Recycling Plant (WRP) to produce recycled water (15MI/d);
- Transfer of recycled water to Havant Thicket reservoir (c.6km);
- Abstraction (75MI/d) at Havant Thicket Reservoir and transfer (c.40km) to Itchen WSW; and
- Treatment at Itchen WSW.

In addition to our selected option, we also presented RAPID with a Back-Up option, which was the next highest-ranking OAP option that could be progressed in the event the preferred option became not feasible or not deliverable. The Back-Up option (known at the time as Option B.5) was a water recycling and transfer via a new Environmental Buffer Lake project; its main components are as follows:

- Abstraction of final effluent from Budds Farm WTW and Peel Common WTW;
- Treatment at a new Water Recycling Plant to produce recycled water (75MI/d);
- Transfer (c.40km) to an Environmental Buffer Lake at a location to be determined near Itchen WSW;
- Abstraction from the Environmental Buffer Lake (75MI/d) and
- Treatment at Ichene WSW.

In our 2021 Annual Review of WRMP19, we confirmed the OAP outcome; this included stating that the HWTWR project as the highest-ranking and selected option for the Western supply area, replacing Fawley desalination. We also confirmed the Back-Up option as being the next highest-ranking option and would be our alternative solution if our selected option could not be progressed.

Since then, the SRO for the Western area described above, has been significantly further progressed and developed. It has been incorporated in WRMP24 modelling in two separate component parts; a pipeline to transfer up to 90MI/d from Havant Thicket Reservoir to Otterbourne WSW, and a water recycling plant to provide Havant Thicket Reservoir with recycled water (the water recycling plant was considered with four different sizes 15MI/d, 30MI/d, 45MI/d and 60MI/d). All four variations were combined with a conjunctive use benefit of Havant Thicket Reservoir, which would also contain spring water originating from Bedhampton.

Working with WRSE, we used a high-level regional Python Water Resource (Pywr) model to review the current situation and generate a baseline understanding of the water resources need in the South East. This baseline was then used, together with proposed water resource solutions and possible future supply-demand balance situation. Our dWRMP24 selected the HWTWRP from 2030-31.

Subsequently, Southern Water and Portsmouth Water have taken the high level regional Pywr model for the Western area and Portsmouth Water supply areas to develop a more granular Pywr model, reflecting more detail in the network and known river and groundwater constraints. The aim of this exercise was to understand how the Havant Thicket Reservoir provides conjunctive-use benefit with the HWTWRP, at key time intervals (2030, 2040 and 2050) in the network development. As a result of this further work since the publication of dWRMP24, the size variants of the water recycling plant options at Budds Farm WTW have been revised to 20MI/d, 40MI/d and 60MI/d, with the initial minimum water recycling plant size being uplifted from 15MI/d to

20MI/d. The model enabled us to test whether it would select the larger sized WRP in a phased approach, however it did not, and the 60MI/d is selected as soon as it becomes available. The pipeline element of the scheme is selected at a 90MI/d capacity.

A Quantitative Schedule Risk Analysis (QSRA) was undertaken to test the reliability of the delivery date for the HWTWRP included in our dWRMP24. The analysis has indicated greater confidence in delivering the HWTWRP by March 2034 with benefit from the option first achieved in water resources year 2034-35 (i.e. from 01/04/2034). This date was tested in the model and is now incorporated into rdWRMP24, with the model selecting the scheme for 2034-35, i.e. as soon as it becomes available to the model.

For more information on the RAPID process visit www.ofwat.gov.uk/regulated-companies/rapid/.

Appendix E: Licence Changes

Sittingbourne and Faversham licences

Revised licences for Sittingbourne and Faversham group licences were issued on 17th of August 2023. The purpose of these licence changes was to remove the summer seasonal constraints on three sources at Millstead (Sittingbourne group), Faversham1 and Sittingbourne 2 (both Faversham group), to allow them to be used all year round, with the new annual limits constrained to what the summer volumes had previously been. Changes are time limited to 31 March 2028, one year beyond the WINEP WFD No Deterioration investigation. Whilst these changes haven't provided any 'additional water', allow us to use year round sources which were previously restricted to only being used in the summer and therefore they provide extra resilience. The details of the changes are listed below:

West Sandwich and Sandwich licences

West Sandwich and Sandwich licence variation for deployable output gain was issued on 5th October 2023. The licence changes were implemented as part of WRMP scheme to realise the potential to take more from Woodnesborough and increase the Deployable Output of the two sources by combining their overall abstraction allowance. The idea being that whilst Flemings is hydrologically constrained in a drought, the headroom on that licence meant there was potential to take more from the Sandwich source – but whilst ensuring that the aggregate annual limit for the combined licences remains the same as the previous annual limit in combination.

WRMP19 assessed the Deployable Output at Sandwich as being 2.45 MI/d at ADO/MDO, and 2.7 MI/d for PDO. The licence change will allow us to abstract instead at up to 3.5 MI/d at Sandwich– and therefore represents an ADO/MDO benefit of 1.05 MI/d and a potential PDO benefit of 0.8 MI/d.

Pulborough Groundwater licence

The revised licence for Pulborough Groundwater source was issued on 12th January 2024. This was seen as a mainly administrative licence change, with the main purpose of putting Borehole 10 onto the licence (it had been somehow missing from the licence for many years, despite having been in use).

All other conditions remain the same, with an expiry date of 2030, but with explicit acknowledgement in the 'Important Notes' section of the licence that the outcomes of the Pulborough Basin Environmental Study may result in requirements for further licence changes in advance of this date.

Appendix F: Target 100

Target 100

Water efficiency

The South East of England has been classified as 'water stressed' by the Environment Agency. Nearly 70% of our current supplies come from groundwater and the remaining from rivers, reservoirs, and bulk imports from our neighbouring water companies. To protect and enhance the natural environment, we are committed to reducing the amount of water we take from groundwater and rivers. Demand management is a key part of our strategy to ensure that we maintain uninterrupted supplies of high-quality water to a growing population and contribute toward economic growth.

To help protect and preserve our environment for a more sustainable water future, we created 'Target 100', our detailed water efficiency plan for individual, social and cultural behaviour change. Our plan has continued to evolve and is designed to achieve the significant reductions in consumptions outlined in HM Government's Environmental Improvement Plan (EIP) 2023².

EIP water efficiency targets for UK water companies include:

1. Reducing average Per Capita Consumption (PCC) to 110 litres per head per day (110l/h/d) under dry year conditions.
2. Reducing non-household demand by 9% by 2037-38 compared to 2019-20 reported figures by 15% by 2049-50.
3. Reducing total water use person in England by 20% by 2037-38 compared to 2019-20 reported figure.
4. Reduce leakage by 50% by 2049-50 compared to 2017-28 reported figure.

Meeting our efficiency targets

We have had one of the lowest PCC figures among UK water companies

In their feedback on our dWRMP24, several consultees encouraged us to retain the original 'Target 100' as outlined in our WRMP19. In view of the impact on COVID-19 on PCC and the target set in the EIP, we have reviewed our strategy and are now aiming to meet the EIP target of 110l/h/d under dry year conditions by 2045. This equates to a normal year PCC of 100l/h/d by 2045.

In their report, 'AR2604 Impact of shocks to PCC', Artesia conclude, 'that the ongoing impact of the pandemic and most notably working from home is likely to persist for the foreseeable future. This presents a concern not only for AMP7 and the proposed ex-post adjustment to PCC, but also for targets moving forward into AMP8, which would require a different level of adjustment.'

² HM Government, 2023. Environmental Improvement Plan 2023. First revision of the 25 Year Environment Plan. Department for Environment, Food and Rural Affairs.

We also plan to reduce non-household demand by 9%, by 2037-38, compared to our 2019-20 reported figure. We have allowed it to increase post 2037-38 in response to growth, although our forecast for non-household demand in 2075 is lower than at the start of the planning period.

Blueprint for a water-efficient culture

To achieve our target of 100l/p/d by 2045, we continue to explore ways to achieve a sustainable change in customer behaviour. Our blueprint is made up of three elements:

- Customer groups: householders, non-households, and developers.
- Catalysts: the workstreams and interventions that will accelerate our customer's change journey.
- Approaches: our working ethos is to innovate, be agile and utilise external partners and expertise that keep us up to date with best practice.

Appendix G Outage

We began reporting on full and partial outage events more than five years ago as the right thing to do and this initially led to a significant rise in reported total outage compared to our WRMP outage allowance. Field and study work has been undertaken since then to increase our understanding of the causes of outage, to distinguish between planned and unplanned outage and to implement an outage recovery plan to reduce the total outage levels that we were experiencing. We have set out below further information around our internal reporting and governance process highlighting the focus which we now place on monitoring and reducing outage:

Internal reporting

- The Water Production Planning team produce an internal monthly outage report
- The report is under continuous review to ensure there is a balanced view and clear metrics to address outage .
- The outage report covers a number of outage parameters such as MDO outage, Peak Week Production Capacity outage, greater than 90 days etc
- The outage report is shared with the Water Leadership Team (WLT) and key stakeholders

Outage review sessions

- Throughout the calendar month there are a number of outage focus groups such as the Unplanned Outage Review Working Group and the Outage Steering group
- The purpose of these focus groups is to review, understand and update our outage recovery plans
- The outage recovery plans consist of short term (operational) and long term (capital delivery) interventions.