

Water resource management plan
annual review and data return
June 2021

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What does this Annual Review do?

This report, along with its accompanying data table, represents South East Water's annual review of water resources performance compared with the forecasts contained in our Water Resources Management Plan 2019 (WRMP19) during the 2020-21 regulatory year (from April 2020 to March 2021).

It is accompanied by an Annual Review data table showing the required information for each of our eight water resource zones under annual average and critical peak conditions during the year.

Need further information?

Please email wre@southeastwater.co.uk if you require further information or wish to clarify anything in this report.

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1.0 Introduction

This report, along with its accompanying data table, represents South East Water's annual review of performance compared with the forecasts contained in our Water Resources Management Plan 2019 (WRMP19) during the 2020-21 regulatory year (from April 2020 to March 2021).

The regulatory year 2020-21 is the first year of the Water Industry's seventh Asset Management Period (AMP7).

During AMP7 we have set ourselves a programme of schemes to deliver security of supply through a twin-track approach of demand reductions and development of new water sources.

This programme was developed with strong engagement and input from customers and our other stakeholders. We have also committed to carry out several feasibility studies during AMP7 for some of the larger long-term schemes in our preferred plan including new impounding reservoir developments and alternative water re-use schemes.

In accordance with the guidance provided for this annual review by the Environment Agency, this report summarises South East Water's annual performance against the WRMP19, as published in August 2019.

Water companies have a statutory requirement to produce an annual review and submit this to the Environment Agency and Defra as part of the WRMP process. In complying with this requirement we follow the Environment Agency's WRMP Annual Review Guidance from March 2021.

This commentary covers the content required by the guidance and the data table includes annual average day and average day peak week outturns in the reporting period for all our eight water resource zones.

All data presented in this report and accompanying data table are consistent with the WRMP19 and/or actual outturn data for the 2020-21 reporting year. These data have been subject to internal checks, reviews and approvals and have been independently audited as part of South East Water's annual performance reporting quality assurance process.

As in previous reviews, we have sought to improve our Annual Review by reviewing feedback received last year from the Environment Agency, and addressing any issues raised.

2.0 Summary of the supply-demand situation for our supply area during 2020-21

During the reporting year we received 107% of long term average rainfall across our supply area. The winter months were wetter than normal recording 139% of LTA rainfall, while summer months were drier than normal recording just 75% of LTA rainfall. May 2020 was exceptionally low, receiving just 6% of LTA rainfall. August 2020 was another outlier, with 162% of LTA rainfall recorded.

COVID-19 proved to have a significant impact on demand and on our overall supply demand position. Customer demand was markedly higher than our dry year forecast with per capita consumption 15.9% higher than recorded in 2019-20. 12.8% of the increase in per capita consumption was directly attributed to COVID-19, with the remaining 3.1% being predominantly due to weather impacts, and a lesser extent some unquantified COVID-19 impacts.

Our Customer Metering Programme concluded in March 2020 with 90% of homes now metered across the South East Water supply area. During the report year we have installed a further 329 optant meters at household properties.

Total reported leakage was 92.7 MI/d which is lower than the regulatory leakage target for 2020-21 of 95.2 MI/d. This means we have now met our leakage target for 19 consecutive years.

During the reporting year proactively contribute and engage with the WRSE regional modelling work, and we prepared a new draft Drought Plan in collaboration with customers and stakeholders.

Due to impacts of COVID-19 on demand we were unable to deliver a Security of Supply Index of 100%, with two of our eight water resource zones having an available headroom that fell short of the water resources zone target headroom requirement.

We have continued to focus upon our compliance processes, reviewing abstraction compliance alarm triggers, and abstraction meter policy and audit programmes.

For the first time, and in this annual review, we have adopted values using an independently audited year-end water balance fully aligned with the new Ofwat consistency methodology approach.

We have continued to review and progress our existing abstraction flow meter replacement and verification programme. As well as improving the auditability of licence compliance and abstraction data, this also supports annual reporting and the WRMP process.

This assurance process is being undertaken in parallel to continuing improvements to the company telemetry reporting and data archiving system. To further demonstrate our regulatory abstraction compliance we have continued to implement an internal process of producing pre-audit packs for each abstraction site collating all relevant documentation in a single folder ready to share with the Environment Agency abstraction auditors at site. This has proved successful so far and will continue when site visits restart following the COVID-19 easing of restrictions.

The operation of many of our supply sources proved more challenging than normal during the reporting year given the exceptional changes in demand seen in some areas due to the impacts of COVID-19.

Regrettably we experienced some peak day licence breaches at a small number of our sources during short periods of exceptionally high daily demands. We also experienced two annual licence breaches. Further details of the breaches were recorded in our GOR submission to the Environment Agency in April 2021.

Throughout the summer period we increased our dialogue with local Environment Agency area teams providing regular updates on compliance and operational performance risks. On the back of what proved a very challenging year we commissioned Atkins to undertake an independent review of the sources where abstraction license breaches occurred and identify any areas of improvement going forward. This report has been shared with the local Environment Agency area team and we will continue working together and tracking progress in the areas highlighted where we can make some improvements.

2.1 Rainfall

During 2020-21 we received 107% of long term average (LTA) rainfall. Across our supply area, an average of 139% of LTA rainfall was received during the winter months, with just 75% LTA rainfall received during summer months. May 2020 was exceptionally low, receiving just 6% of LTA rainfall. August 2020 was another outlier, with 162% of LTA rainfall recorded.

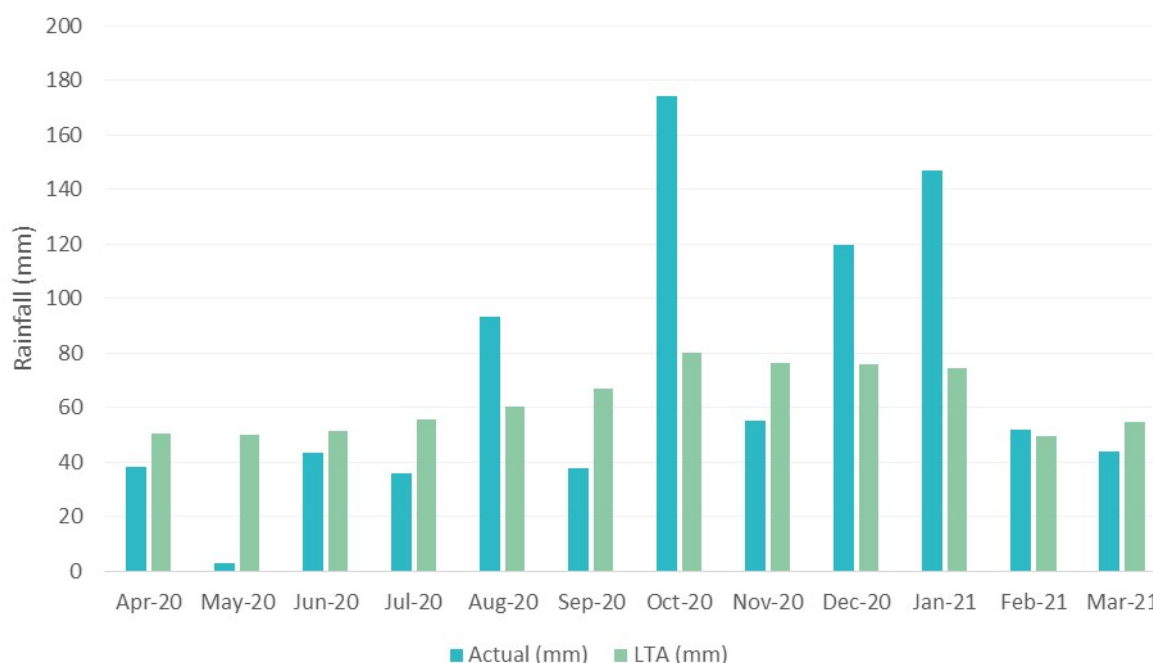
The first part of year started off relatively dry, with 76% of LTA rainfall during April 2020. May was then incredibly dry, while June and July rainfall was also below the LTA, with 86% and 64% of LTA rainfall respectively.

Although on paper August shows healthy rainfall above the LTA value, all of this rainfall came in the latter part of the month, with the early part of the month experiencing the drier weather observed in the preceding summer months. The dry conditions continued into September when we recorded just 57% of LTA rainfall.

By October we saw a marked change in the weather with a return to above LTA rainfall. October in particular was very wet, recording more than 200% of LTA rainfall. The remainder of the winter continued to be wetter than normal with December, January and February all returning figures above 100% LTA rainfall. This sustained wet period supported a rapid reduction in Soil Moisture Deficits (SMD), and led to very strong groundwater and reservoirs recovery. At the end of March 2021, and ahead of summer 2021, our water resources position is very good, with all our resource at our above normal levels.

We continue to monitor rainfall, aquifer groundwater levels, reservoir storage levels and customer demand carefully throughout the year, and convene regular water resources review meetings to implement and co-ordinate actions, as appropriate and in line with good practice and our Drought Plan normal monitoring and reporting requirements.

Figure 1: Monthly average rainfall through 2020-21 compared to long term average



2.2 Demand

During 2020-21 we experienced some very unusual and exceptional demand patterns due to COVID-19 lockdowns and restrictions. Non-household demand was much lower than normal, conversely household demand was considerably higher than normal. Overall we saw higher distribution input figures that were much higher than we forecasted for a dry year.

The impact of COVID-19 on household demand is explained by more people working from home (we ordinarily see a large part of our population served commuting daily to areas of work outside our supply area) and the restrictions on travel (particularly overseas travel) meaning people were at home more throughout the summer period in particular than would ordinarily be the case – these factors led to additional demand for water that ordinarily we would not have needed to meet, or planned for.

To better understand the changes in demand that occurred (and to consider which of these might be temporary or permanent in nature) we commissioned Artesia to review our data and develop some COVID-19 demand models and scenarios. Further detail is provided later below in section 4.2.

We also undertook customer surveys to gain a better understanding of how our customers were using water and how many were staying at home. These surveys confirmed a sharp reduction in nights spent away from home by customers in our area of over 70% - meaning more people were at home in our area throughout the year, and therefore using more water at home than they normally would.

Our assessment confirmed that demand changes did not occur uniformly across our water resource zones. The extent changes in demand varied between water resource zone, and more locally too. This is best illustrated in Table 1 and 2 below.

Table 2: reporting year average day demand compared to WRMP19 dry year forecast

Annual Average 2020-21	RZ1	RZ2	RZ3	RZ4	RZ5	RZ6	RZ7	RZ8	Total
Dry year distribution input (Ml/d)	32.2	66.1	55.1	158.7	37.0	61.8	21.6	85.8	518.3
Reporting year distribution input (Ml/d)	34.4	69.8	54.5	164.0	38.0	67.3	24.3	90.1	542.5
Difference (Ml/d)	2.2	3.7	-0.5	5.3	1.1	5.5	2.7	4.3	24.2
Difference (%)	6.8%	5.6%	-1.0%	3.3%	2.8%	8.9%	12.7%	5.0%	4.7%

Table 2: reporting year summer peak week demand compared to WRMP19 dry year forecast

Summer Peak Week 2020-21	RZ1	RZ2	RZ3	RZ4	RZ5	RZ6	RZ7	RZ8	Total
Dry year distribution input (Ml/d)	41.0	84.7	64.6	207.3	42.4	78.2	28.4	93.3	639.9
Reporting year distribution input (Ml/d)	39.8	84.8	61.5	197.5	45.3	78.4	31.6	104.9	643.7
Difference (Ml/d)	-1.2	0.1	-3.1	-9.8	2.9	0.2	3.2	11.7	3.8
Difference (%)	-2.9%	0.1%	-4.8%	-4.7%	6.8%	0.2%	11.1%	12.5%	0.6%

The wide variability in demand at local level created a number of localised pinch points that may not normally be experienced. The impact to our security of supply performance is described later below in section 3.1.

Average demand for the year was 542.48 Ml/d, which is 4.7% higher than the reporting year WRMP19 figure for a dry year average demand of 518.31 Ml/d.

The average day peak week demand was 643.73 Ml/d, and was recorded during the period of the 05 August 2020 to 11 August 2020. This compares with the dry year average day peak week figure in our WRMP19 figure of 639.91 Ml/d.

As illustrated by Figure 3 below, we experienced some extreme and variable shifts in daily demand patterns throughout the spring and summer period. At times these rapid changes in demand caused local parts of our water system to become stressed with demand accelerating and receding very rapidly.

This included abnormally high demands in August – before COVID-19 we would ordinarily expect demand in August to be lower with the onset of school holidays and large portions of the population we serve leaving our area each week to holiday in other parts of the UK and abroad. This did not occur during summer 2020 due to COVID-19 impacts.

While we expect the demand impacts of COVID-19 lockdowns and restrictions to be temporary, we have started a more detailed review on whether levels of resilience in WRMP24 need to be adjusted to better cope with pandemics and ensure we can more confidently manage these types of events in the future.

We also believe that the number of people working from home will remain higher after COVID-19 than was observed pre-COVID. We have started work to develop a forecast of the impact of more working from home on our demand forecast for WRMP24.

Figure 3: Daily Distribution Input for 2021-20

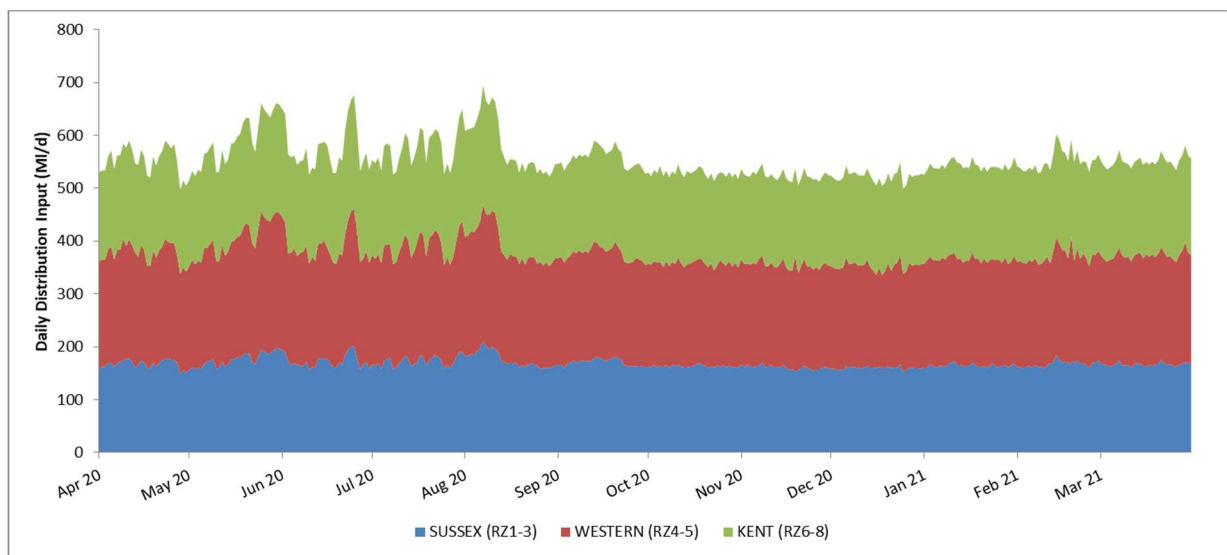
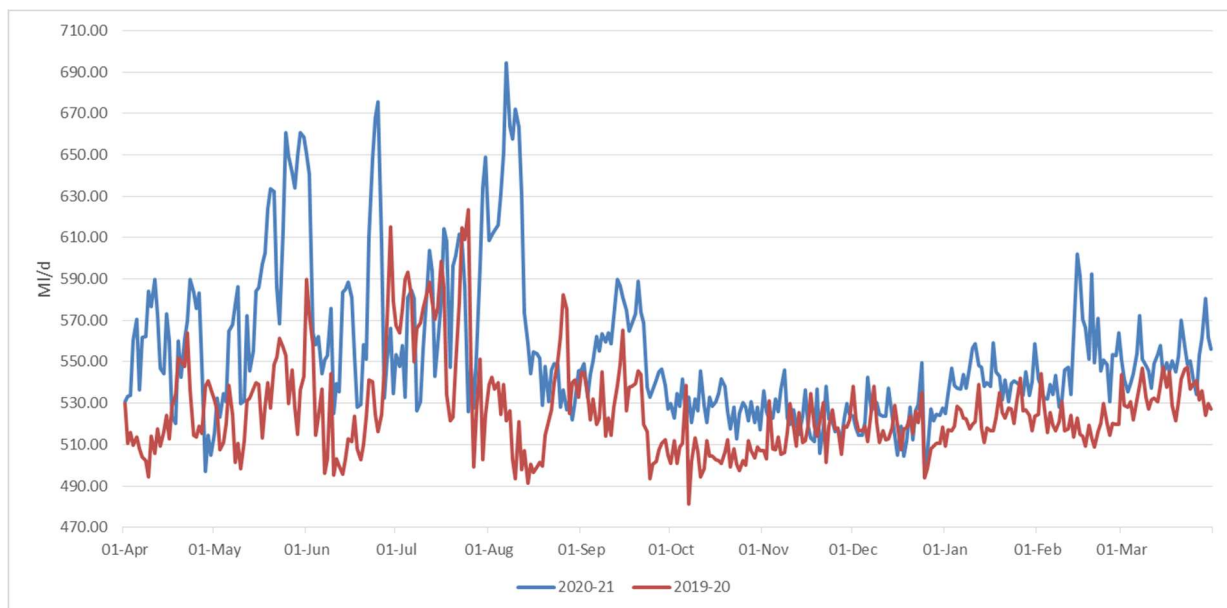


Figure 3: Daily Distribution Input for 2020-21 vs 2019-20



2.3 Water Resource Zones

Our operating area comprises eight resource zones within two separate regions (the Eastern Region and the Western Region).

As we start work to develop our WRMP24, we have completed a review of our Water Resource Zone integrity, and confirmed that the current setup of each zone remains compliant with the latest Environment Agency's guidelines for resource zone integrity.

In summary, following recent assessment work there have been no adjustments to resource zone boundaries during the reporting year; these remain the same as reported in WRMP19. The locations of these zones are displayed in Figure 4 below.

There has been no changes to the company's declared Level of Service adopted in WRMP19. These remain at:

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3.0 Progress in achieving customer outcomes and performance commitments of the business plan relevant to the delivery of the WRMP

3.1 Security of supply (SoSI)

The unusual and exceptional demand patterns caused by COVID-19 (as summarised earlier in Table 1 and 2) had an impact on the company's planned security of supply position.

The company was able to maintain a Security of Supply Index (SoSI) of 100% across six of its eight water resource zones under annual average conditions. Under summer peak week conditions the company was able to maintain a SoSI of 100% across seven of its eight water resource zones. In the two water resource zones that recorded less than 100% SoSI there was sufficient water to meet demand, but available headroom was lower than target headroom and so security of supply was recorded as less than 100%.

Consequently for this reporting year, at company level the annual average security of supply was 99%, and the summer peak week security of supply was 98%.

Tables 3 and 4 below provide a summary of reporting year available headroom compared with planned target headroom.

Table 3: reporting year average day available headroom compared to WRMP19 target headroom forecast

Annual Average 2020-21	RZ1	RZ2	RZ3	RZ4	RZ5	RZ6	RZ7	RZ8	Total
Target headroom (MI/d)	2.0	8.0	4.5	10.3	1.8	4.4	1.9	4.3	37.1
Dry year available headroom (MI/d)	2.1	8.1	4.6	46.4	13.6	4.4	0.8	4.5	84.4
Difference (MI/d)	0.1	0.0	0.1	36.2	11.8	0.0	-1.1	-1.8	45.2

Table 4: reporting year summer peak week available headroom compared to WRMP19 target headroom forecast

Summer Peak Week 2020-21	RZ1	RZ2	RZ3	RZ4	RZ5	RZ6	RZ7	RZ8	Total
Target headroom (MI/d)	2.6	10.9	4.6	10.5	1.7	4.2	2.6	4.6	41.7
Dry year available headroom (MI/d)	3.2	15.0	7.1	15.2	12.2	4.2	0.5	4.9	62.4
Difference (MI/d)	0.6	4.1	2.5	4.7	10.4	0.1	-2.1	0.3	20.7

There are a number of new resource developments that have been completed or are near completion that have improved position for the coming report year 2021-22:

- The upgrades to our Forest Row source are complete to provide an additional 2.5MI/d of water on average and up to 4 MI/d for the summer peak week period across water resources zones 1, 2 and 3 compared to 2020-21

- We have made good progress fast tracking our work to test the new Aylesford Newsprint sources for public water supply. We have installed a temporary treatment works and a Section 32 test pumping programme of the existing source boreholes has been agreed with the Environment Agency. Providing up to 8 Ml/d of new water to treat and put into supply during summer 2021, and offer more resilience across water resources zones 6, 7 and 8.

4.0 Progress against WRMP19

The regulatory year 2020-21 was the first year of the Water Industry's seventh Asset Management Period (AMP7).

During AMP7, we have set ourselves a programme of schemes to deliver security of supply through a twin-track approach of demand reductions and development of new water sources. This programme was set out in our WRMP19 and developed with strong engagement and input from customers and our other stakeholders. We also committed to carry out feasibility studies during AMP7 of some of the larger long-term preferred schemes and alternative scheme in our plan including reservoir development and water re-use.

Our WRMP19 builds upon work done in AMP6 and sets out a forward programme of schemes to deliver security of supply between 2020 and 2025.

In accordance with the guidance provided for this annual review by the Environment Agency, this review reports our annual performance against the WRMP19, published in August 2019.

4.1 Supply

4.1.1 Outage

The actual average reported outage during the 12 month period was 8.56 MI/d (compared to 18.51 MI/d in 2019-20), which is lower than the 18.36 MI/d reported in our WRMP19.

The outage used in the calculations stems from operational sites only where genuine events have occurred that have interrupted output, either as planned or unplanned events. These include major power failures, treatment and quality failures, control and process failures, and other emergency situations and follows our methodology set out for WRMP19 supporting appendices.

The control room logs provide information to understand these events, and also allow for the company to improve the management and control of such occurrences. The company considers that the controls in place through the control room protocols have demonstrated an improvement in our systems to manage and reduce these events. The level of outage being recorded is a reasonable reflection of the normal operational condition of our supply system.

In order to align with the ambitions of the regional planning objectives, WRSE has carried out work to develop a new outage methodology to provide a regionally consistent and improved approach for assessing outage and calculating suitable planning allowance. During the reporting year we have worked in collaboration with the WRSE group in to produce a new outage assessment to support the regional modelling ahead of WRMP24.

Information from the annual outage assessment is being used by the Assets department to assess which sites are most vulnerable, and which outages have resulted in the greatest impact on the network; and this is informing our prioritisation of future planned maintenance activities on all assets.

4.1.2 Sustainability changes

We haven't had any planned sustainability changes during the 2020-21 year.

An investigation in AMP5 concluded that the abstraction was having an impact on the SSSI Fen at Greywell and that the abstraction will cease when this does not present an undue risk to security of supply. Progress has continued towards ceasing abstraction at our Greywell site this year. We have completed an upgrade to a surface water source in the Thames area, however, the potential pipeline routes to move this water to the area currently supplied by Greywell are all environmentally sensitive and the most viable option goes through a wetland SSSI. Our scientific studies are continuing to minimise the environmental impact of implementing this sustainability reduction. Because of these complications, we have agreed with the Environment Agency and Natural England that we will continue to abstract at this site until 2023 to ensure a reliable water supply for our customers in the area.

We worked jointly with Southern Water and Affinity Water in AMP6 to deliver several work packages associated with river restoration on the Little Stour. The scheme was agreed with the Environment Agency to be extended into AMP7 for delivery for work package 2 (alteration to a mill structure to improve fish passage and low flows) to the end of November 2021.

In addition to the Greywell and Little Stour schemes, South East Water had another 22 schemes on our RSA WINEP3 programme. Seven of these schemes have been closed out and signed off by the Environment Agency that provided there is no growth of the source a no deterioration investigation is not required (Sheet, Greatham, Coombe, Clayton, Whitelands, East Meon, Waterworks Road) and another scheme had been closed out and signed off by the Environment Agency as there was no evidence of the abstraction impacting on the Environment (Goudhurst).

The other 14 schemes have started in 2020/21 and are progressing to meet the statutory deadlines of either 2022 or 2024/25 and are continuing to work closely with the Environment Agency to ensure that we consider any future sustainability changes that will be required in the future in WRSE regional scenarios and our next WRMP.

4.1.3 Deployable output

We have continued to make good progress with two supply schemes during 2020-21: Coggins Mill and Forest Row.

Forest Row did remain out of service for most of the reporting year, however commissioning work is now completed and the source is back in supply for summer 2021. Further monitoring and adjustments are expected during 2021-22 to improve performance and confirm reliability.

Work at Coggins Mill has continued during the report year and the full planned deployable output is expected to be available in the latter part of 2021-22. A new raw main has provided some benefit of yield from the Sharnden borehole, further work is required to clean and remediate the existing onsite boreholes before a final revised deployable output is confirmed.

The reporting year assessment of the Security of Supply Index took account of the delays to Forest Row and Coggins Mill.

The expansion of the Bray (Keleher) water treatment works is now complete, and the site was handed over to our operational team in June 2021.

For the reporting year - Deployable Outputs of our sources are consistent with our WRMP19 Appendix 4, net of adjustments for Forest Row and Coggins Mill as discussed above.

We are currently making preparations to commence a full and detailed review and update of our deployable outputs to support WRMP24, to be completed during 2021-22.

4.1.4 Existing bulk supply agreements

There have been no changes to the bulk supply agreements with neighbouring companies during the 2020-21 reporting year. We continue to work with Southern Water to review and modernise the existing bulk supply agreements and ensure they reflect current best practice. We anticipate several of our existing bulk supplies will be agreed with Southern Water using the new format in 2021-22.

We have made good progress with Southern Water during the reporting year, and we expect the first updated agreement will be approved and in place by September 2021.

In parallel we have implemented work that will enable the cessation of the Bewl to Darwell transfer, driven by INNS regulations, on time in 2025. We have also started discussions with Affinity Water and Southern Water regarding exports from our Water Resources Zone 8 to their neighbouring supply areas, in line with WRMP19.

Changes to bulk supplies planned for the future are documented in our WRMP19 Section 9.

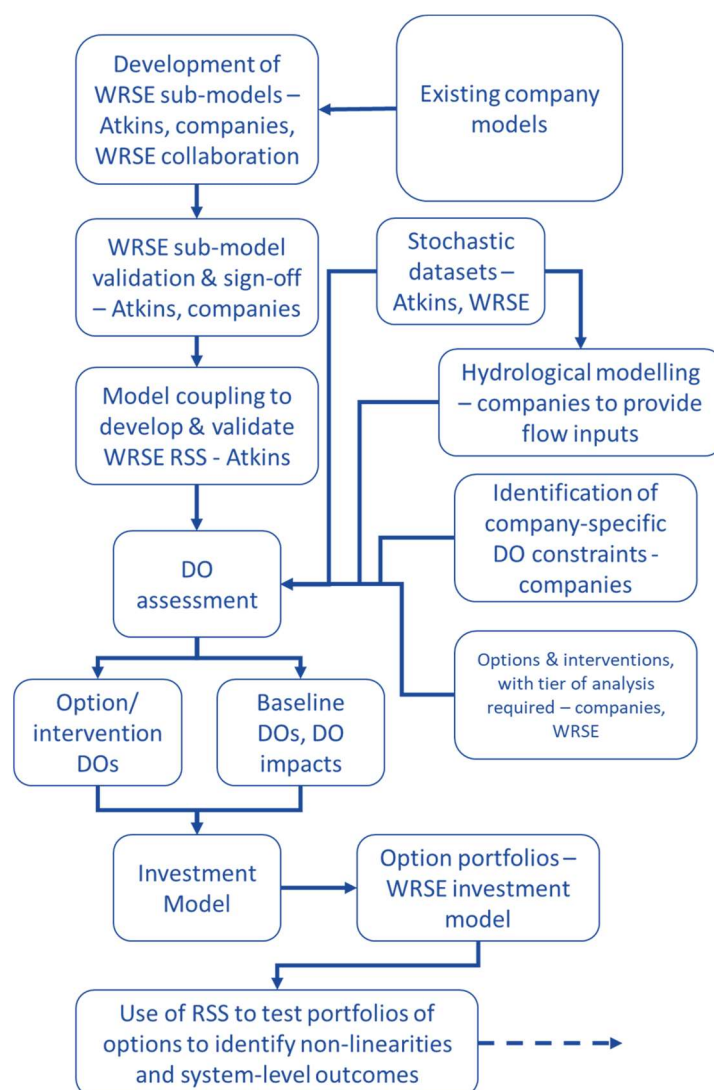
4.1.5 Other changes to our supply forecast, including any changes to assessment of impacts of climate change to supply

As we prepare for the WRMP24, and support development of the regional plan, WRSE (supported by HR Wallingford and Atkins) has produced a regional simulation model (RSS).

This is being used to assess the supply capability of the water resources systems in the South East, and to assess the implications of drought for customers and the environment, and examine the impacts that future changes and interventions may have on water resources systems and the environment.

For the regional plan to be most easily translated into WRMPs for water companies, outputs have been developed that are compatible with the requirements of the Water Resource Planning Guidelines and suitable as inputs to water resource planning tables. As such, WRSE supply forecasting methods are compliant with the guidance and analysis has been undertaken on a water resource zone (WRZ) level.

Figure 5: flow chart showing a view of WRSE modelling that is being undertaken.



To date, the regional simulation model has been used to produce values to feed into the WRSE Investment Model. Specifically, the outputs produced by the RSS model are:

- Baseline deployable output
- Impact of climate change on deployable output

The tables 5 and 6 below provide a summary of the deployable outputs derived from the RSS for 1:200 (200RP) and 1:500 (500RP) drought scenarios, and also a comparison against our company derived outputs from WRMP19.

Table 5: WRZ DYAA Results

WRZ	WRMP19 DO ¹	RSS DO 200RP	RSS DO 500RP
RZ1	45.16	42.18	42.38
RZ2	73.50	76.60	70.00
RZ3	77.00	76.94	74.79
RZ4	216.91	221.06	219.61
RZ5	53.92	54.12	53.97
RZ6	73.70	76.67	75.81
RZ7	21.22	23.18	21.61
RZ8	93.97	93.97	93.92

Table 6: WRZ DYCP Results

WRZ	WRMP19 DO ¹	RSS DO 200RP	RSS DO 500RP
RZ1	50.11	50.18	47.90
RZ2	91.41	91.45	82.90
RZ3	80.90	76.94	74.79
RZ4	257.60	261.37	260.10
RZ5	61.90	62.05	61.90
RZ6	81.24	86.27	85.36
RZ7	22.17	25.08	24.36
RZ8	109.57	109.82	109.67

1 – WRMP19 DO is 1 in 200 RP

Values from the RSS have been highlighted in green or orange depending on whether there has been a noticeable change from WRMP19. In summary, changes from WRMP19 to the RSS 200RP can be attributed to differences in the new model and assumptions used, and RSS 500RP shows the difference due to an enhanced 1:500 drought resilience.

At a company level, it can be seen that there is very little difference in our overall deployable output derived using the RSS for WRMP24 compared to our WRMP19 (for a 1:200 drought scenario).

As a further assessment into the reliability of the deployable output an investigation took place whereby the actual output of each site during the summer 2021 high peak demand period was compared with the peak deployable output figure in WRMP19.

Overall this exercise have been helpful confirming that the peak deployable outputs for our sources remain largely representative and robust. There were a very small number of sites that will require some further investigation to verify their full outputs are reliable at all times. Work will be completed during the next year and the final outcomes reported as part our Annual Review 2022.

4.2 Demand

In collaboration with the Water Resources South East (WRSE) group we have been restructuring and updating our company demand forecast. This work has enabled a new regional demand forecast to be produced that applies a more consistent set of data and assumptions basis across all the water companies in the South East region.

South East Water has used this opportunity to update the components of its demand forecast to be fully aligned with all the requirements of the new Ofwat leakage consistency methodology.

4.2.1 Per capita consumption (PCC)

For the reporting year we have provided per capita consumption figures that are consistent with our full alignment to the new Ofwat leakage consistency methodology approach. Measured household per capita consumption for the reporting year was 157.8 l/head/d,

unmeasured household per capita consumption was 214.3 l/head/d and average per capita consumption 165.9 l/head/day.

Compared to the previous reporting year (2019-20) we have seen a 15.9% increase in PCC during the current reporting year.

Using the new Ofwat consistency methodology the post MLE per capita consumption figure in 2019-20 was 143.1 l/p/d, compared to the post MLE per capita consumption figure for the 2020-21 report year of 165.9 l/p/d.

During the summer peak demand period, measured household per capita consumption was 188.4 l/head/d, unmeasured household per capita consumption was 313.5 l/head/d with an average per capita consumption of 206.3 l/head/d.

Early during the reporting year we anticipated a big increase in household demand and per capita consumption would occur due to the impacts of COVID-19, with more people working from home and less people travelling due to government restrictions.

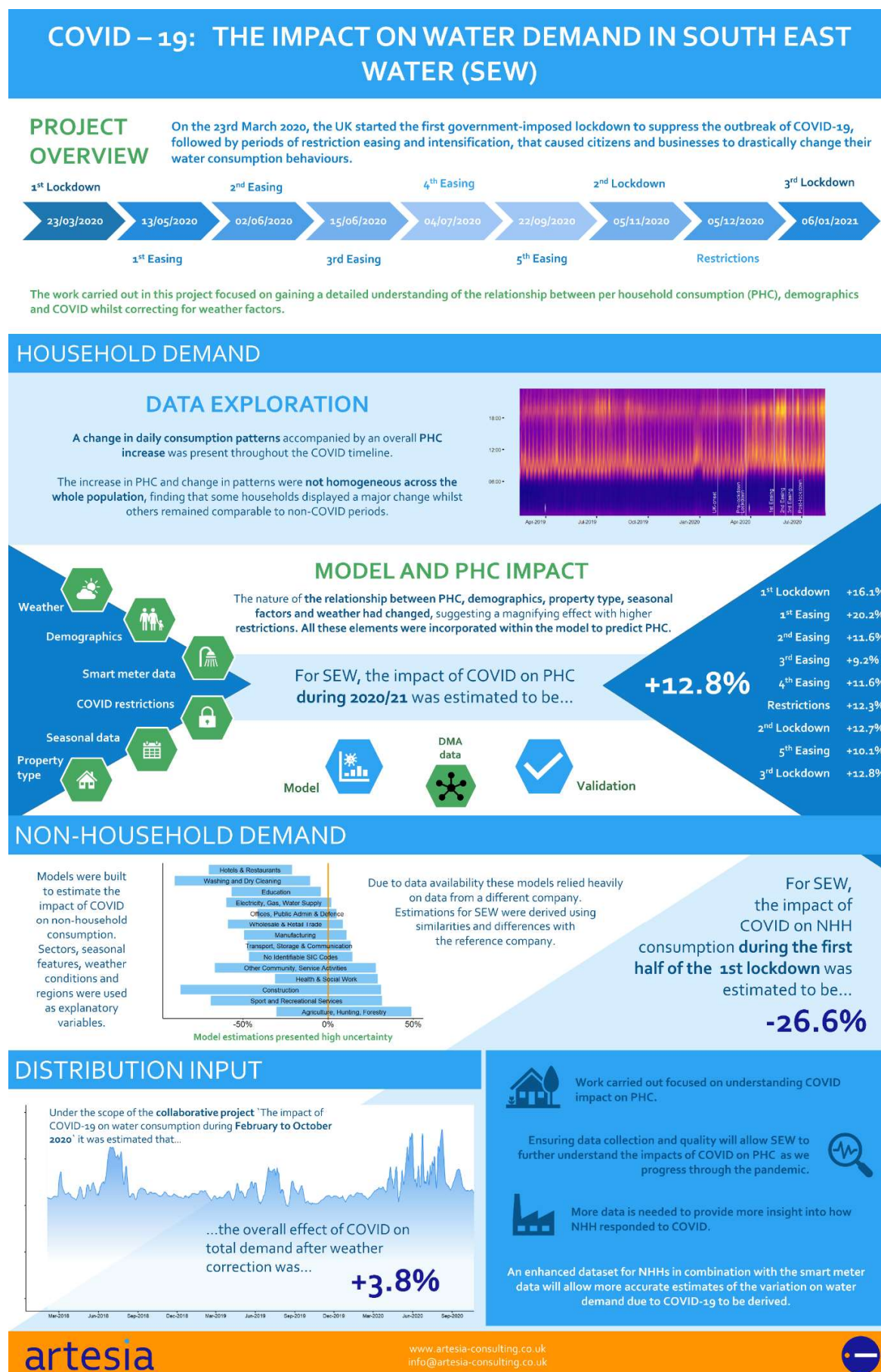
To ensure we understood the real impact of COVID-19 on household consumption we commissioned Artesia Consulting to undertake detailed analysis and modelling.

Using these models it was possible to confirm that at least 12.8% of the 15.9% increase is household consumption recorded during the reporting year was caused by COVID-19 impacts and travel restrictions. The remaining 3.1% being predominantly due to weather impacts and maybe to a lesser extent some unquantified COVID-19 impact too.

The infographic in Figure 6 below provides an overview of the work that Artesia has completed for South East Water.

At the time of submitting our Annual Return, we are in the process of finalising our Annual Performance Review required by Ofwat. This includes our per capita consumption shadow reporting submission which has been independently assured as part of our quality assurance process.

Figure 6: overview of the work that Artesia work to assess COVID-19 impact



4.2.2 Customer Metering Programme (CMP)

In 2018/19 we completed our compulsory metering programme and achieved our aim of having 90 per cent of our household customers on a water meter (not including voids), this has seen on average a 16 to 18 per cent reduction in water used for those properties moved onto the new charges.

While this has been a good result, we are now progressing our ongoing water efficiency strategy to help raise customers awareness of their water use and behaviour, and to save water at home and work – we aim to reduce customer demand by a further seven per cent between 2020 and 2025.

During the 2020-21 reporting year, we installed 329 optant meters at household properties.

4.2.3 Developing a water saving culture

During the first year of AMP7 we have seen the effects of the COVID-19 pandemic significantly impact the delivery of our planned WRMP19 water efficiency strategy. Our 2020-25 strategy relies heavily on the roll out and effectiveness of our sustained household water use reporting and behavioural change programmes to meet our water efficiency target.

During the COVID-19 pandemic the population was being asked to use more water as part of the fight against infection - priority messaging from the government was to use more water for hygiene purposes and to control contagion.

During periods of full lockdown there was great importance placed on outdoor spaces to support wellbeing, and this often went hand in hand with increased outdoor water usage too.

So it was not possible to fully implement our water usage comparison reports and use this as the basis of incentivising household to reduce their water use in the middle of a pandemic.

While the roll out of our long term water use behavioural programme was limited during the reporting year, we did continue to offer general water efficiency advice and promote free water efficiency devices for our customers.

In total 120,281 water efficiency devices were dispatched to customers within South East Water's supply area, and we estimate 93,652 will have been installed, including a range of 18 different categories of devices.

We estimate the devices installed will have saved at least 375 Ml of water during the reporting year equating to estimated reduction of at least 1 Ml/d. We expect some of the messaging and demand management campaigns we ran during the year will have achieved some further savings, albeit these are recognised as being difficult to measure and no assumption of savings from these activities has been included.

With the expected easing of lockdowns and restrictions during 2021-22 we have put in place plans to restart and relaunch our longer term water use comparison reporting and behavioural programme. Our ambition is to accelerate the programme and make good progress catching up with our planned savings as forecasted at the end of 2021-22.

We continue to encourage our customers to use water wisely whatever the weather. Our teams have adapted to the ongoing situation and have implemented online education events in collaboration with schools. We have also used a variety of routes including our website, local press, and social media and working in partnerships with other like-minded organisations.

Our innovative smart network trial has been a key part of the modelling exercise used to estimate the impact of COVID-19 in collaboration with Artesia. We used this information to carry out a more detailed analysis of customer water use patterns which enabled us to learn how different customer groups use water and tailor our future water use messaging accordingly.

At the same time we have continued with our focus on improving customer perception of leakage. This is often a customer perception that is heavily influenced through external media but we have continued to improve our 'In your area' messaging and specific communications with customers about leaks in their area. This will remain a high priority area for improvement but the work we have done has informed our plans in this area and enables us to track the success of future work.

These and similar activities contribute to achieving the long term reductions in water use.

We continue working in collaboration with Waterwise and other water companies to encourage water saving nationally and develop a stronger culture of water saving behaviour in the UK.

More details of these examples and others during the year can be found in our Performance, People and Planet Report for 2020-21 that will be published on a microsite on our website in July 2021.

4.2.4 Progress with leakage management and reductions

Total reported leakage for 2020-21 is 92.7 MI/d which is lower than our regulatory target of 95.2 MI/d. This meant that we have now met our leakage target for 19 consecutive years.

This year we have fully transitioned to the shadow reporting approach in relation to compliance with the Ofwat AMP7 shadow reporting guidance for leakage and per capita consumption, meaning a direct comparison between 2019-20 and 2020-21 is not possible due to methodology changes. Our WRMP19 leakage target for 2020-21 of 87.7 MI/d cannot be compared for the same reasons stated above.

During the first year of AMP7 we have continued deploying our leakage strategy focused on improving our understanding of the network, data, leakage monitoring systems and operational management. During this challenging year with travel restrictions and more people working from home we have maintained our focus on finding and fixing leaks on our pipe network across our supply area as well as replacing the oldest parts of our pipe network.

The data presented here has been audited as part of our Annual Performance Reporting assurance process and is the same data as is submitted to Ofwat and used by Discover Water.

4.3 Headroom

Target headroom offsets uncertainty in the Water Resources Management Plan. For the year 2020-21 in the WRMP19, headroom was 37.1 MI/d. No changes were made to Target Headroom during 2020-2021.

Revisions to the target headroom were modelled as part of the WRMP19 process and is documented in Appendix 6A of the WRMP19 (available on our website).

As part of our preparation for WRMP24, we are reviewing methodologies used by the WRSE partnership companies to inform this process.

4.4 Options

4.4.1 Options selection:

The options appraisal process for WRMP24 is underway and will build largely on the work for WRMP19, but further developed by continuing to proactively seek third party options, work collaboratively with WRSE to seek new regionally derived options, and utilise more sophisticated regional modelling techniques to select the options that will form our preferred plan for delivery.

When assessing which options could meet any deficit as part of the WRMP24 process, we continue to follow a multi-stage approach that screens every option against a pre-defined set of criteria. This currently remained unchanged for our final published WRMP19.

4.4.2 The delivery of options during 2020-21:

Table 7: our WRMP19 preferred plan supply side options for the period 2020 to 2025:

WRMP19 Option Title	1:200 Yield	Yield Available*
Aylesford Newsprint - use of existing groundwater sources	18.2MI/d	2023
Catchment Management Interventions at Woodgarston	3.0MI/d	2035
Bewl WTW expansion and transfer to Hazards Green	8.0MI/d	2025

*Note: This is yield available date as included in our final WRMP19. Actual completion dates for schemes may change to fit our AMP7 delivery programme.

A summary of progress of the remaining AMP6 supply schemes underway in 2019-20 has been covered earlier in the deployable output section of this annual review (Coggins Mill, Forrest Row and Bray (Keleher).

Our assessment of SoSI has made account for the status of these schemes, and we were unable to maintain a positive supply demand balance and 100% SoSI score for the 2020-21 reporting period.

4.4.3 Long-lead scheme investigations:

In AMP7 we are developing two long lead schemes, as per our WRMP19.

The key tasks planned and completed during the reporting year for Broad Oak Reservoir were:

- Working with our consultant HR Wallingford to develop an updated yield assessment for the reservoir.
- Working with our consultant WSP to develop a “route to consent” roadmap for the planning application, a “gap analysis” report to identify key tasks and programme to support the planning application and EIA, and completion of some early start surveys (bat roost) to fill the critical data gaps.
- On-going positive dialogue, liaison and meetings with Canterbury City Council.

The tasks planned and completed during the reporting year for Arlington Reservoir were:

- Working with our consultant Adams Hendry to support our liaison with the district council and respond to their local plan consultant process.
- On-going positive dialogue, liaison and meetings with Wealden District Council.

The two previous long-lead effluent reuse schemes at Peacehaven and Aylesford, although no longer preferred options in our WRMP19, remain as alternative schemes and we are continuing to develop these further, alongside Southern Water, as part of our planning for WRMP24.

4.4.4 Aylesford Newsprint groundwater scheme:

Work is already underway to develop a major new groundwater scheme on the former Aylesford Newsprint site, near Maidstone, this is due for completion by 2023-24.

We have made good progress fast tracking our work to test the new Aylesford Newsprint sources for public water supply. We have installed a temporary treatment works and a Section 32 test pumping programme of the existing source boreholes has been agreed with the Environment Agency. Providing up to 8 MI/d of new water to treat and put into supply during summer 2021.

It is expected that once existing and new boreholes are tested and equipped, and a permanent treatment works is constructed, the source will be able to provide at least 18.2 MI/d of new water.

4.4.5 Woodgarston Catchment Management:

During 2020-21, we engaged agricultural stakeholders in the Woodgarston catchment. Over 1283.9 hectares of farm land within the Woodgarston catchment we engaged with contributed to our Ofwat ODI performance commitment in 2020-21. This targeted catchment management scheme focused upon communication with landowners and nitrate use in field systems, which is considered to be the largest contributor in the catchment for nitrates found in the groundwater, in addition to small discharges (septic tank/cess pit) to groundwater, where applicable. On the ground advice around Nitrate Vulnerable Zone Regulations and best nutrient management practices was undertaken using catchment advisors. We also piloted trials on cover crops, and its ability to retain nitrates at ground level, aiding in a reduction in nitrate leaching to groundwater. Research has also been undertaken to investigate alternative markets for agricultural enterprises in the catchment, with the aim of reducing high nutrient demand agricultural products.

4.5 WRSE and Regional Work

As part of the development of our WRMP24, we are collaborating in an integrated way with the WRSE regional group to develop processes, methodologies and outputs that will allow us to achieve the requirements of the National Framework to produce a single regional plan that builds resilience to a range of uncertainties and future scenarios. The regional resilience plan will deliver a set of options that present the best value to customers, society and the environment, rather than simply least cost. These options will feed directly into our WRMP24 preferred plan.

The ambition of the WRSE regional group for WRMP24 is to identify and develop options that can drive a step change in water resource planning, these will focus around options that can:

- increase resilience to drought
- deliver greater environmental improvement
- achieve long-term reductions in water usage
- achieve significant leakage reduction
- reduce the use of drought permits and orders
- increase supplies
- move water to where it's needed

The overall programme and tasks to be undertaken by WRSE to formulate the regional plan are set out in Figure 7 below. During 2020-21, WRSE has completed significant work to develop the regional plan, which has included:

4.5.1 Regional demand forecast:

- Property and population growth forecasts
- Non HH growth forecasts
- Non-PWS growth
- COVID forecast completed
- Ox-Cam scenarios

4.5.2 Regional supply forecast:

- A new Regional Simulation Model (1200+ nodes)
- Coherent stochastic data set across the South East of England
- Deployable Outputs for a range of droughts, including 1:200yr & 1:500yr
- Climate change Deployable outputs
- Environmental forecasts

4.5.3 Regional options

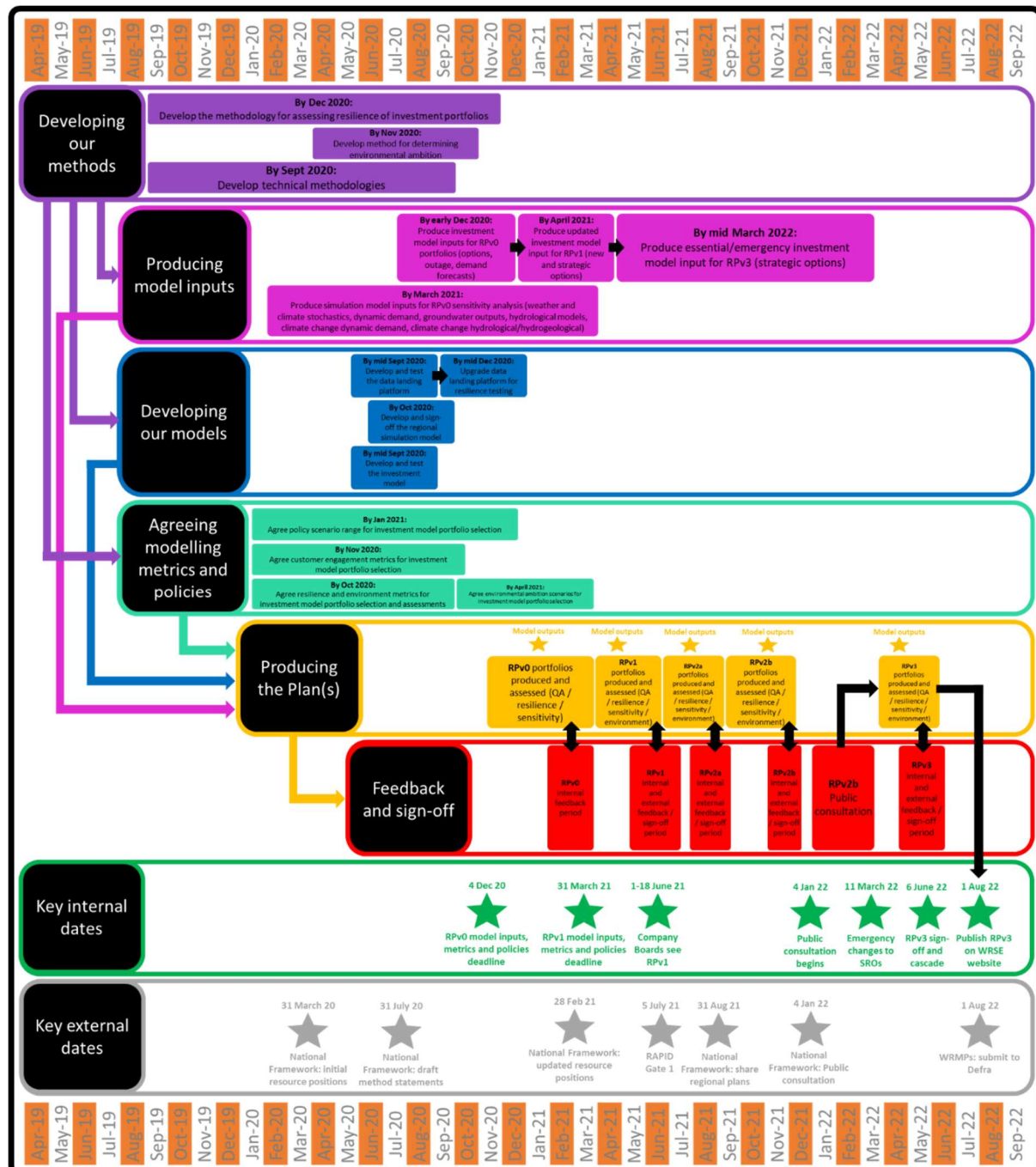
- Inclusion of the strategic resource options
- Increased number of transfer options within the region (included)
- More catchment solutions (96 catchment portfolios are added to our option sets)
- New regional schemes from Water Companies
- New integrated leakage and demand management portfolios;
- Third party options have been sought and we have 23 submissions;
- A consistent approach on how to cost schemes and the inclusion for optimism bias;

4.5.4 Best value plan

- Programme appraisal based on best value approach
- Completion of the core elements of a new investment model
- A resilience framework;
- An environmental assessment framework;
- A water quality framework;
- A best value plan framework and criteria;
- A central data landing platform to capture all of the data
- A regional reconciliation framework

- A set of method statements
- Customer engagement surveys
- Stakeholder meetings, and
- A coherent set of policies for TUBS and NEUBs.

Figure 7: WRSE Programme



5.0 Shadow Reporting of Leakage and PCC

The industry guidance, Consistency of Reporting Performance Measures (UKWIR 2017) recommends a consistent approach to the assessment of data and the estimation of leakage levels. This guidance was incorporated into the PR19 planning guidance by Ofwat for AMP7 reporting of leakage and per capita consumption. Its key aim is to provide a level playing field for regulatory comparison of leakage levels between companies. During 2020-21 we have made a number of data and methodology improvements to ensure we are compliant and are now fully aligned as we have transitioned to the new methodology.

The following subsections explain where we have either applied significant judgement and/or changed our methodology in completing a section or line in the table as well as where the value reported has seen significant change to values reported in prior years.

5.1 Compliance with leakage consistency reporting requirements

- Distribution input has increased on average by 20.99 MI/d from the reporting period 2019-20 (521.5 MI/d). This is due to the long period of warmer than average weather experienced across the region which coincided with COVID-19 and the lockdown period;
- We have seen a drop in potable water delivered due to COVID-19 resulting in a significant decrease in the billed measured non-household water delivered to non-households, which is c30 MI/d lower than in previous years the monthly meter read cycle has also meant that there is a lag in the volume reported for billed measured housed volumes, which due to COVID-19 and working from home restrictions results in a higher volume of water being delivered than the forecast for meters not read in the reporting period can allow for. To account for this, following a study by Artesia on the 'Impacts of the 2020 COVID-19 lockdown on water demand', a 12.77 per cent uplift was applied to domestic water meters that were not read in the reporting period. This work will be reviewed and updated next year if required;
- For the reporting year 2020-21 we have achieved a Post-MLE outcome for total annual leakage of 92.7 MI/d. This is below the annual target of 95.2 MI/d. This data is used to derive the three year average calculation, resulting in performance of 94.1MI/d and a 1.1 per cent reduction from our 2019-20 baseline;
- For the reporting year 2020-21, water taken unbilled was 10.28 MI/d, this is derived from water taken legally and illegally unbilled. Water take legally consists of volume from, standpipe hire schemes, trickle flow plugs fitted to new build properties, concessions and tanker filling points. The volume for water taken illegally is from a study conducted in conjunction with Thames Water;
- The value for average pumping head, treated water distribution is higher than last year due to the need to transfer water further across our network in order to meet higher demands as a result of COVID-19.

For the reporting year 2020-21, South East Water has reported its total annual leakage in line with the consistency in reporting measures guidance, this has been assured and there were two areas highlighted as reportable exceptions to compliance being:

- The size of the commercial night use monitor (element 6e) is currently insufficient, although it is representative;
- The size of the MLE water imbalance (element 16e) needs to be reported and explained.

The current commercial night use monitor is deployed across the region based on a completely random selection from properties with an average billed volume of < 36m³/d, everything greater than this is permanently logged according to the guidance. The loggers for the night use are recording and sending 15 minute flow data which is used for the calculation and have been in place for c2 years.

It was planned that following this period to capture seasonality they would be moved to another set of randomly selected properties for the collection of data, these would stay in place for a calendar year to encompass all seasons so as not to skew the resultant data.

However, due to the COVID-19 situation and working restrictions it has not been possible in the reporting year to conduct this activity, this has now been planned in for the 2021-22 reporting year.

For the reporting year 2020-21 the water balance gap was 4.1 per cent, this has increased from the 3.8 per cent observed in the 2019-20 reporting year. Although this is below the 5 per cent cap which allows the MLE to be applied, this is above the 3 per cent level and incurs a red status on the RAG assessment. We believe that this is largely due to the use of a low (3 per cent) meter under registration value. During the internal assurance process this was highlighted as a “potential risk to the water balance gap”. This figure is low by industry standards, leading us to strongly suspect that it is an underestimate.

The value will be reviewed during the reporting year of 2021-22 and a statistically relevant assessment made to update the meter under registration to an appropriate value. This may be complex due to the number of meters fitted in South East Water's region, and the common approach of removing meters for testing on a flow rig may not be feasible to achieve an under registration value with an acceptable confidence value, an appropriate approach for developing a statistically relevant sample will be derived from the c 815,000 meters during 2021-22 but may require removing meters for testing. It was not practical to carry this out during COVID-19 restrictions, but we hope that an updated value will be possible for 21-22 reporting.

5.2 Compliance with per capita consumption reporting guidance#

During 2020-21 we have looked at Per Capita Consumption using the new shadow reporting guidance to produce a PCC value in line with Ofwat's methodology. As part of last year's work we saw an initial 6% decrease using the new method in comparison with the previous methodology based on our analysis and alignment with the leakage consistency method at that time.

We have refined and improved our assessment and alignment for the leakage method during the reporting year and this has seen the difference between the old and new methodology narrow slightly from 6% to 4.3%.

Under the new reporting guidance per capita consumption is 165.9 l/head/day and the water balance gap is currently around 4%. As we learnt from last year's initial analysis, by fully aligning with the new Ofwat leakage consistency methodology we see an increase in our leakage figures, and a reduction to our per capita consumption figures.

On a like for like basis during the reporting year we saw a 15.9% increase in per capita consumption compared to 2019-20. 12.8% of the increase was due to COVID19 impacts, with the remaining 3.1 % being predominantly due to weather impacts, and to a lesser extent some unquantified COVID-19 impacts.

We are now fully aligned with the requirements for the new consistency methodology, and shall continue work in order to present an accurate representation of demand across our supply area.

6.0 Progress with feedback made in response to last year's annual review

Following our 2020 Annual Review, the Environment Agency wrote to us and made two recommended improvements. These are shown in Figure 8, along with the response provided to the Environment Agency at that time.

Figure 8: 2020 Annual Review recommendations from the Environment Agency

Environment Agency recommended improvements	Recommended water company progress to be demonstrated at the next annual review	South East Water commitment / response
<p>Total leakage and leakage at a zonal level</p> <p>South East Water (SEW) has reported total leakage at the company level as 86.4 MI/d, which is below its WRMP19 forecast of 87.7 MI/d. Three resource zones (WRZ2, WRZ6, and WRZ7) have outturn figures which are above the leakage forecasts for the 2019 WRMP.</p>	<p>SEW are committing to reducing leakage by 15% by 2025. The company need to ensure leakage is adequately reduced/controlled in all zones, in particular zones 2 and 6, to meet this reduction, which will reduce the impact on its supply demand balance/target headroom. This is especially relevant to WRZ2 due to issues of high demand during 2020.</p> <p>We will continue to work with SEW over the coming year ahead of the next annual review.</p>	<p>We have continued to make good progress with leakage reductions planned during 2020-21.</p> <p>In response to COVID-19 and higher demands, we did increase our leakage detection activity during 2020-21, particularly in WRZ2.</p> <p>We will continue to place a strong focus on meeting the percentage leakage reductions included in our WRMP19 at a water resource zone level and at company level.</p>
<p>PCC</p> <p>The company's average household PCC (149.5 MI/d) is above the WRMP19 forecast of 148.5 l/h/d.</p>	<p>SEW are almost on track to reducing average HH PCC, but are still slightly over forecast in a wetter than average year. The company need to keep on track with their PCC targets to enable them to meet the 6% reduction by 2025. The move to consistency reporting should reduce PCC, but due to COVID related high demand in 2020 may have little impact on targets.</p>	<p>During 2020-21 we continued work to roll out our water efficiency strategy designed to reduce per capita consumption in line with our WRMP19.</p> <p>But it has been a challenging year given the impacts of COVID-19 on household demand.</p> <p>In April 2020, we commissioned Artesia to implement a detailed</p>

	<p>We will continue to work with SEW over the coming year ahead of the next annual review.</p>	<p>monitoring and assessment of PCC during the year, so we can understand and explain what the impact of COVID-19 has been on household demand, and therefore per capita consumption.</p> <p>The assessment by Artesia will be completed in February 2021. We will share the findings with the Environment Agency and Ofwat and use them as part of our annual reporting.</p>
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The commitments we made in our response to the Environment Agency, as above, have been completed and reported as appropriate as part of this Annual Return.

7.0 Data table

The Reporting data tables are contained as Appendix A to this report.

8.0 Forward look

During 2021-22, we continue with the delivery of our AMP7 programme supporting WRMP19.

We will continue to work with the Environment Agency throughout the year and find our open dialogue both with our key contacts at the regional and national levels a positive and constructive way of ensuring we have a shared understanding of the challenges, opportunities and specifics of our sources and supply area.

We are committed to and engaged with the work programme being developed during 2021-22 for the WRSE group.

8.1 Our Dry Weather Plan (Drought Plan 2021)

We submitted our draft dry weather plan (draft drought plan) to Defra at the end of March 2021. Following approval, our draft plan was published for consultation on the 7th June 2021.

A summary of the timetable is provided below.

Stages	Dates
Pre-consultation	March 2020 onwards
Drought Plan Guideline Published	April 2020
Stakeholder engagement and collaboration to development our draft drought plan	January 2021
Submitted draft drought plan to Defra	Before 1 April 2021
Published draft drought plan for consultation	7 June 2021
Consultation closes	2 August 2021
Publish Statement of Response and revised draft drought plan	September 2021
Publish final Drought Plan	Autumn / Winter 2021 Within 30 days of Defra approval

We will provide an update on progress we have made with our dry weather plan as part of the annual return for 2021-22.

8.2 WRSE and Regional Work

During 2021-22 the main focus by WRSE will be to carry out the modelling and decision making work to produce the “Best Value regional plan”.

WRSE have set four objectives, see Figure 9 below, for the regional plan that will be used to assess how much additional value is delivered against each. These objectives have been informed by Government and regulatory policy, and developed through engagement with water companies, customers and stakeholders.

Figure 9: WRSE Best Value Plan objectives

Our regional plan must meet all the legal and regulatory requirements and policy expectations, including delivering ‘Best Value’ for customers. Its ‘Best Value’ objectives are to:



Deliver a secure and wholesome supply of water to customers and other users to 2100



Be deliverable at a cost that is acceptable to customers



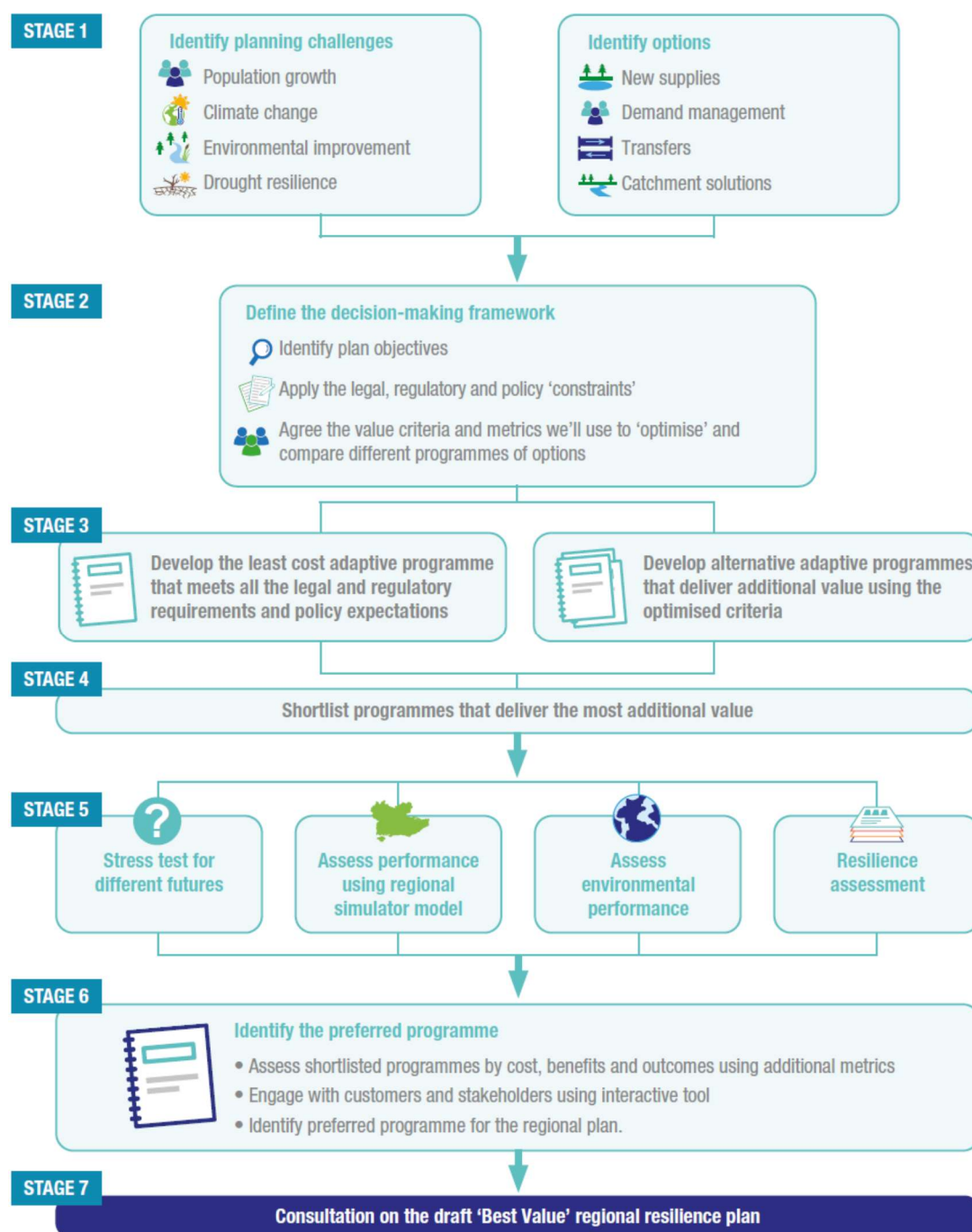
Deliver long-term environmental improvement and social benefits



Increase the resilience of the region’s water systems.

The overall seven stage process for how the Best Value regional plan will be developed is set out in Figure 10 below:

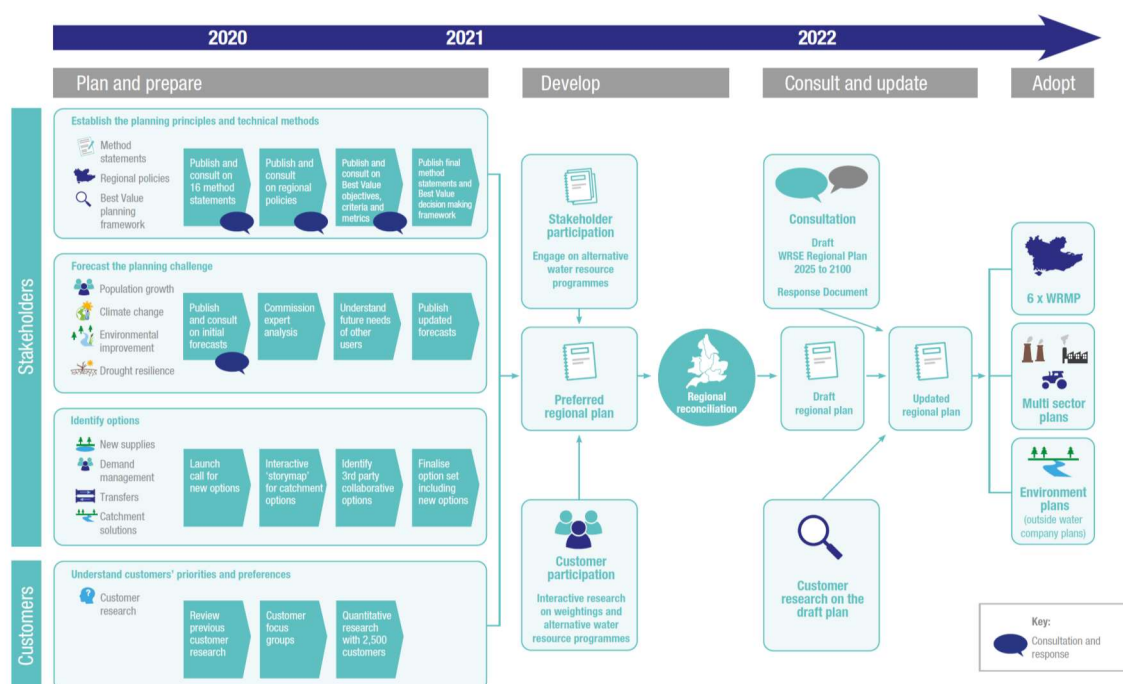
Figure 10: WRSE Best Value Plan process



Our Best Value Planning Method Statement provides further detail on each of these stages.

Once developed and following a process of alignment via reconciliation with other regions, the regional plan will be published in January 2022 to gather feedback via public consultation to allow the outputs to then feed into our company WRMP24 in August 2022. The engagement process WRSE are carrying out is extensive and uses a range of activities including qualitative and quantitative research, webinars, workshops and forums, digital content and consultations. It is being undertaken at each stage of the process so customers and stakeholders can input throughout in an open and transparent way. The approach and timelines are set out in Figure 11 below.

Figure 11: WRSE engagement approach



8.2 COVID-19 Impact

As reported in earlier sections of this annual review, household water demand was higher than forecasted due to more people working from home and the increase in people having to stay at home and unable to travel abroad.

In 2020-21 we commissioned Artesia to undertake some further analysis of the COVID-19 impacts and the findings have been shared with regulators, stakeholders and the industry. Further supplementary reports and information is available alongside our annual return for 2020-21.

Some of the modelling work completed by Artesia started to look at scenarios to better understand the impact on demand of a different 'new normal' futures e.g. impact on demand of more people working from home. These scenarios are still 'in development' but once completed will be included as part of our annual review for 2021-22.

8.3 Delivery of WRMP19 Options

8.3.1 Supply Side Options

During 2021-22, work will continue to develop a major new groundwater scheme on the former Aylesford Newsprint site, near Maidstone, this is due for completion in 2024.

We will continue our targeted catchment management in the Woodgarston area, it is hoped that this will help reduce nitrate seasonal peaks and improve raw water quality in the longer term, allowing us to retain our current yield of 3.0 MI/d without the need for the future renewal of our new nitrate removal plant at Woodgarston WTW when it reaches the end of its life in around 2035.

We will continue our work to allow the replacement the existing Bewl-Darwell bulk supply scheme and remedy the existing INNS risk that the current bulk supply presents. The work programme during 2021-22 will remain focussed on progressing the planning and delivery of improvements to our existing water treatment works at Bewl (to abstract and deliver an additional 8.0 MI/d) alongside network improvements necessary to support demand where it is needed.

8.3.2 Demand Management

During 2021-22 it is important that we accelerate our AMP7 water efficiency strategy to keep our AMP7 programme on track, and to achieve our performance commitment measure of reducing PCC by 1.1% (3 year average) by the end of the 2021-22 report year. Table 8 below describes the activities we will continue to implement during 2021-22.

Table 8: AMP7 water efficiency strategy

Activity	Activity type	Planned volume by end of 2021-22
Behavioural Report	Behavioural	800,000 properties
Free water devices	Water Devices	130,000 issued
New home packs and devices	Water Devices	4,800 issued
Leaky loo strips	Water Devices	200,000 issues
Efficiency audits	Efficiency Audit	(small volume)

We are progressing with a range of leakage management options. We will provide updates on progress to the Environment Agency though year as our normal progress meetings.