

# AffinityWater

## Annual Performance Report 2023

### Non-financial line commentary



# Contents

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<b>Section 3: Performance Summary</b> .....	<b>4</b>
Table 3A - Outcome performance – Water common performance commitments . 4	
Table 3C - Customer measure of experience (C-MeX) .....	41
Table 3D - Developer services measure of experience (D-MeX) table .....	43
Table 3E - Outcome performance - Non financial performance commitments.....	44
Table 3F - Underlying calculations for common performance commitments - water and retail.....	59
Table 3H - Summary information on outcome delivery incentive payments.....	60
Table 3I - Supplementary outcomes information .....	60

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<b>Section 4: (Additional regulatory information – service level)</b> .....	<b>62</b>
Table 4A - Bulk supply information for the 12 months ended 31 March 2023 .....	62
Table 4Q - Developer services - New connections, properties and mains .....	62
Table 4R - Connected properties, customers, and population .....	63

---

<b>Section 5- (Additional regulatory information – water resources)</b> .....	<b>67</b>
Table 5A - Water resources asset and volumes data for the 12 months ended 31st March 2023.....	67

---

<b>Section 6 - (Additional regulatory information – water network plus)</b> .....	<b>71</b>
Table 6A - Raw water transport, raw water storage and water treatment data for the 12 months ended 31st March 2023 .....	71
Table 6B - Treated water distribution - assets and operations for the 12 months ended 31st March 2023 .....	75
Table 6C - Water network+ - Mains, communication pipes and other data for the 12 months ended 31st March 2023.....	82
Table 6D - Demand management – metering and leakage activities.....	85
Table 6F - WRMP annual reporting on delivery - non-leakage activities.....	88

---

<b>Section 11 - (Additional regulatory information -Operational greenhouse gas emissions reporting) .....</b>	<b>94</b>
11A - Greenhouse gas emissions reporting for the 12 months ended 31 March 2023 .....	94

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<b>Greenhouse Gas (GHG) Historic Emissions data request</b> .....	<b>100</b>
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# Annual Performance Report

## Non-financial line Commentary 2022/23

As part of our PR19 final determination for AMP7 we accepted 28 stretching performance commitments to help ensure we deliver customer outcomes.

Each of these commitments have financial rewards, penalties, or reputational incentives. Table 3A shows our financial performance commitments and table 3E shows our reputational commitments.

We have met 20 of our 28 performance commitments of which 9 are financial and 11 are reputational (this excludes C-MeX and D-MeX).

Table 3A shows we have received in-period rewards totalling £1.696m during 2022/23.

We have received in-period penalties totalling £8.083m for our performance on water supply interruptions, mains repairs and unplanned interruptions to supply over 12 hours.

This resulted in a net in period penalty of £6.387m which will be reflected in customer charges in 2024/25.

For more details on our operational performance in the year, please see detailed commentary in Sections 3-11 below, which also addresses the commentary required by Regulatory Accounting Guidance (RAG).

As discussed within the accompanying Audit Report, we can confirm that all performance commitments, both financial and reputational, have been reviewed by our (non-financial) external assurer Atkins.

All technical/non-financial lines within the APR have undergone audit by our external assurers, Atkins. Appendix A of their 2022/23 Annual Performance Assurance Report provides a detailed scope of the tables/lines reviewed as part of the annual assurance process, this includes the financial PCs (on a PC-by-PC basis).

Internally our performance commitments undergo significant scrutiny throughout the year. Each commitment is reviewed by its respective programme board and reported to directors monthly. We also undertake half year audits in preparation for the annual performance report audits.

Our ICG (independent challenge group) meet regularly. As the "voice" of water users, they challenge and support us as we develop plans and progress through the year. Performance is reviewed and queried to aid in direction of travel with our customers best interests in mind. The ICG also play a pivotal role in the sign-off of our Environmental Innovation Project performance commitment.

Our APR is published on our website for customers and other interested parties to review. A customer friendly digital summary of 'our year in review' is also located on our website with a pdf version also available for download.

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## Section 3: Performance Summary

### Table 3A - Outcome performance – Water common performance commitments

#### 3A.1 Compliance Risk Index (CRI)

Whilst we did not achieve the performance commitment level (PCL) of 0.00 in 2022, our score 1.09 was well within the deadband of 2.00 and consistent with our performance over the first two years of AMP7. We remain in the upper quartile of companies.

Year	CRI score
2020	1.31
2021	0.87
2022	1.09

The number of results that did not meet the relevant standard increased in 2022 to 46 from 29 in 2021, We attribute this to resumption of “normal” sampling after Covid lockdown affected years of 2020 and 2021. This number, 46, is similar to annual exceedances experienced during AMP6. Our investigations remained thorough resulting in very few recommendations from DWI.

Our continuing improvement programme focuses on issues that can affect CRI, such as reservoir inspections, sample lines, site hygiene and staff awareness. We continue to improve in these areas.

#### 3A.2 Water supply interruptions

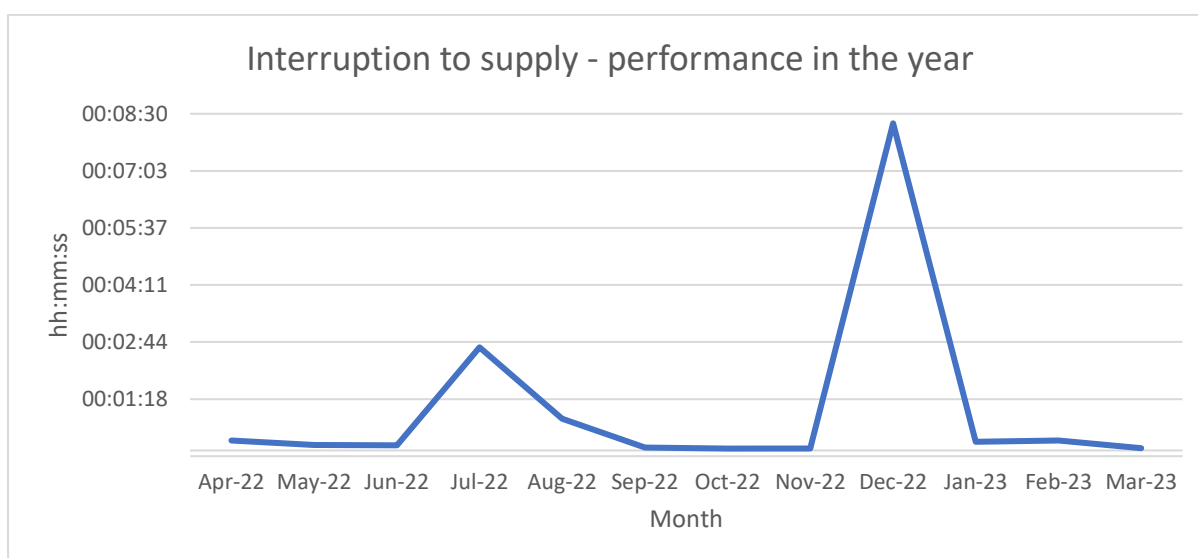
2022/23 prolonged summer temperatures and winter freeze thaw increased demand and increased burst rates, bringing significant challenges for managing interruptions to supply.

Our management of interruptions to supply has improved significantly as we have implemented the action plans set out in our PR19 business plan. Since 2017-18, where we reported over 32 minutes, our average interruptions have steadily reduced year on year. In 2021/22 we achieved our best ever performance of 3 minutes, 43 seconds, placing us 5th in the industry.

We know external factors such as weather and third-party actions can have a material effect on the metric and a single large incident has the potential to affect performance significantly. The two-week ‘freeze-thaw’ event in December 2022 alone added over 8 minutes to our performance score. This is over twice the interruption time seen over the whole of the rest of the year. Despite the year’s extreme weather events, our underlying performance remains strong and we continue to look to

improve our ability to manage exceptional weather events to minimise the impact to customers.

Cause of interruptions	Minutes in the year
Extreme hot weather	02:35
Freeze-thaw winter	08:07
Underlying performance	02:11
Total minutes in the year	12:53



We have extensively reviewed our approach to the 'freeze-thaw' event to understand its effects and ensure we enacted all emergency plans and contingency activities as effectively as possible. We published our review of the event on our website [Dec-22 Freeze-thaw report](#)

Despite successful management of the event and limited direct customer impact overall, the consequences of the weather for the interruptions to supply performance commitment are evident. Had the freeze-thaw event not occurred, we would have maintained our performance trend in line with the prior years' performance and achieved the reducing target for the year.

Despite our 2022/23 performance we are committed to achieving and maintaining upper quartile performance as we progress through this AMP and into the next.

We are reporting 'green' against all components in the reporting guidance 'compliance checklist'.

As noted under table 4R, in 2020/21 total connected properties reported at that time included supplies to cattle troughs, as Ofwat's revision to the definition for connected properties was not introduced until 2021/22. The change in connected property numbers does not change the 2020/21 hh:mm:ss outturn of 00:05:49.

We confirm we report supply interruptions that are equal or greater than three hours. Therefore, no revisions are required to prior years' figures.

### 3A.3 and 3A.4 Restatement of baseline figures for leakage and PCC

We continue to improve our compliance with the leakage and PCC convergence methodologies. This allows us to improve our accuracy of calculation and reporting of numbers.

Although we have made no alterations to the bottom-up leakage calculation methodology, we have previously highlighted inconsistencies in historical reporting of other areas of the water balance. Putting this right has altered the values used for leakage post the maximum likelihood estimation (MLE) process, and therefore amends our baseline start position, from which our 20% leakage and 12.5% PCC AMP7 reductions are calculated and performance to date measured. Full details of the amendments are included in 3F, 3H, 6B and the PCC & Leakage convergence component checklist below.

The tables below show our restated year values and baseline start position.

The impact of these changes for leakage has been to reduce the start position by 1.7 MI/d. The overall impact of this is very minor with just a 0.4 MI/d difference in the final 3-year rolling average value needed to achieve the 20% reduction.

Leakage (MI/d)	2017-18	2018-19	2019-20	3-year baseline	2020-21
Restated in-year values	178.7	203.9	178.7	187.1	167.9
<i>Previous in-year values</i>	<i>181.2</i>	<i>204.1</i>	<i>181.1</i>	<i>188.8</i>	<i>171.4</i>

The numbers above have been entered in 3F.5.

The impact of these changes for PCC has been to reduce the start position by 1.1 l/p/d. The overall impact of this is a 0.9 l/p/d difference in the final 3-year rolling average value needed to achieve the 12.5% reduction.

PCC (l/per/day)	2017-18	2018-19	2019-20	3-year baseline	2020-21
Restated in-year values	151.0	158.3	152.8	154.0	167.0
<i>Previous in-year values</i>	<i>151.5</i>	<i>158.8</i>	<i>155.0</i>	<i>155.1</i>	<i>171.6</i>

The numbers above have been entered in 3F.6.



The restated percentage reductions for leakage and PCC are given in the 3A.3 and 3A.4 commentary below. The restated detailed water balance and leakage components are given in the 6B.31-39 and 6B.58-67 commentary.

### 3A.3 Leakage

Our performance commitment is to achieve a 14% reduction in leakage from the 2017-2020 three-year baseline. After failing to achieve the target in 2020/21, a recovery plan was developed in 2021/22 that significantly increased our investment to bring us back on track to deliver our full AMP 20% reduction.

Although narrowly missing the 2021/22 reduction target, a significant reduction was nevertheless made which placed us in a good position to achieve our 2022/23 target.

We set out at the start of 2022/23 with a plan to outperform the performance commitment even in a harsh-weather year. The plan meant keeping the higher levels of resources in place that were used to create the transition in 2021/22. Outperformance was required to ensure a smooth and deliverable reduction profile for the remainder of the AMP to achieve the full 20% reduction. The three-year rolling average combined with actual performance creates an erratic undeliverable profile otherwise.

We have achieved our performance commitment in 2022/23.

Regulatory Year	20/21	21/22	22/23	23/24	24/25
Performance commitment - % reduction from 3-year baseline value	2.7	11.1	14.0	17.0	20.0
Actual performance - % reduction from 3-year baseline value	1.9	10.8	15.8		

#### In year challenges

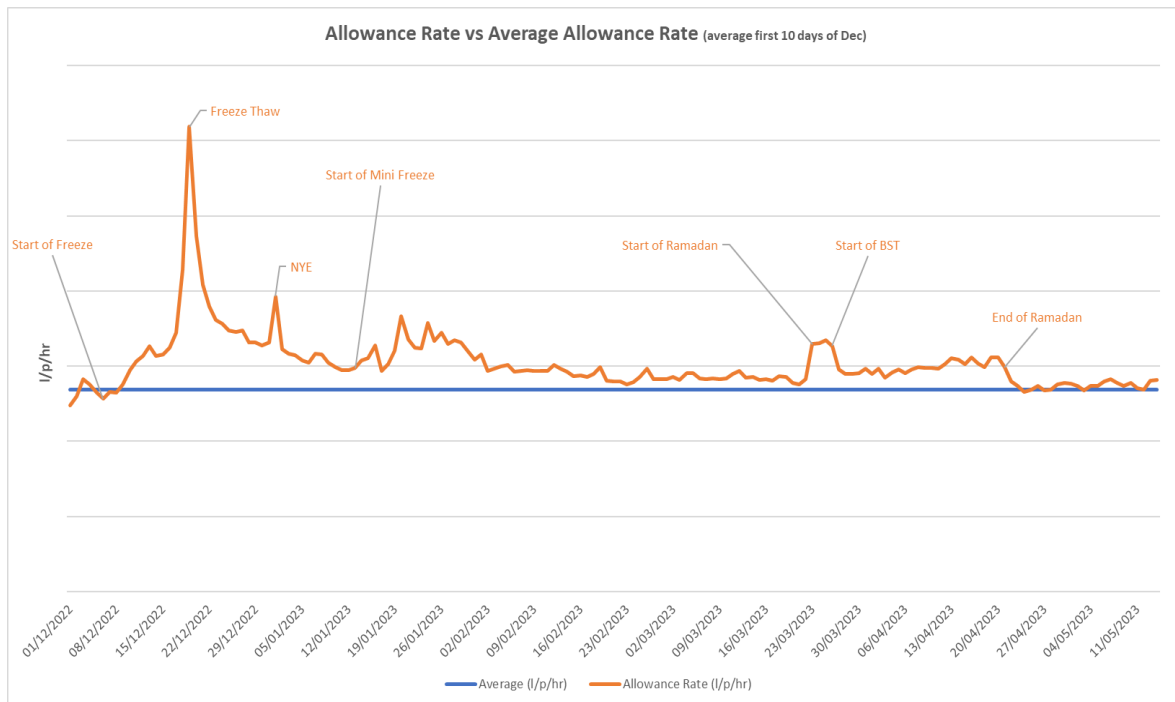
The weather was significantly harsh in 2022. We saw record temperatures in the summer leading to record demands and unprecedented stress on the network. This additional stress and higher than normal soil moisture deficit caused by the hot dry weather (indicator of ground movement) created a large spike in leakage occurrences over the summer.

The winter weather was also harsh. A significant freeze thaw in December, and then again (but of a smaller magnitude) in January also caused a significant leakage breakout. This was not isolated to our network and similar effects were experienced across the industry. We observed significant losses on customer assets through supply pipes and plumbing losses, we can see the prolonged impact on internal losses through to the spring in our night use analysis (see freeze-thaw night use chart below).

This freeze thaw was noticeably more significant than the 'Beast from the East in 2018. As in 2018, we saw significant impact on customer properties with increases in supply

pipe leaks but noticeably internal losses. The chart shows the average property night use profile from our night use monitor, you can clearly see the impact in December and again in January, and the long tail of recovery. By the end of March this had not recovered to pre-freeze thaw levels.

**Freeze thaw night use values versus average of first 10 days in December 2022.**



Despite this we were still able to reduce leakage by 3.6 MI/d compared to 2021/22 (year 2). However, to put the weather driven breakout into perspective, the same levels of resources achieved a 13.6 MI/d reduction the previous year.

**Convergence compliance**

The table below shows the summary of our convergence compliance. We have removed our last remaining red main component and have again improved our overall compliance. We have in place a water balance action plan to address the remaining components not yet at green.

Main component	2021/22	2022/23
Red	1	0
Amber	6	6
Green	9	10
Sub-component	2021/22	2022/23
Red	5	1
Amber	20	22
Green	67	69

The table below shows the compliance at both main component and subcomponent level. Showing where changes have occurred, the reasons for the changes and for components not yet green, the reasons why.



## Component checklist for leakage and PCC.

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
1. Coverage			Amber	N	N/A	The average coverage for 2022/23 was 90% against the guidance target of 95%. We have just completed year 2 of a 3-year programme to build new DMAs to meet the target. New DMAs in year 2 have added 30,000 properties by year end which equates to an annual average of 92%.
1a		95% of all properties have continuous night flow monitoring through the year	Amber	N	N/A	See 1.0
2. Availability			Green	Y	Improved availability from investment in failed DMA equipment. 90% annual average.	N/A
2a		At least 90% of all properties within continuous night flow monitoring networks available for reporting night flow data through the year	Green	Y	See 2.0	N/A
3. Properties			Green	N	N/A	N/A
3a		All properties mapped to defined zones or DMAs using geo-location or similar methods	Green	N	N/A	N/A
3b		Consistency of property numbers contained within DMAs or zones with company billing system. Valid differences explained	Green	N	N/A	N/A
3c		Properties that are defined as void excluded from night use allowances	Green	N	N/A	N/A

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
		unless evidence for use or losses from illegal occupation is available	Green			
3d		Leakage allowance applied for properties not within DMAs or monitored zones consistent with other leakage estimates	Green	N	N/A	N/A
3e		Property data updated at least annually	Green	N	N/A	N/A
4. Night flow period and analysis			Green	N	N/A	N/A
4a		Night flow data frequency at least every 15 minutes	Green	N	N/A	N/A
4b		Leakage derived from a fixed period during the night of at least a one-hour period and up to two hours	Green	N	N/A	N/A
4c		If the fixed period is varied during the year for some or all DMAs or zones to address significant changes to night use patterns such as during Ramadan evidence for this is provided	Green	N	N/A	N/A
4d		Leakage allowance applied for properties not within DMAs or monitored zones consistent with other leakage estimates	Green	N	N/A	N/A
4e		Data infilling for a single DMA or zone does not use more than six months of historic data before moving to area average	Green	N	N/A	N/A

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
4f		Data infilling where historic data is not available uses the area average in which the DMA is located	Green	N	N/A	N/A
4g		When a DMA is restored to operability, the subsequent leakage data is used to retrospectively update the data infilling interpolating between pre- and post- data over at least one month	Green	N	N/A	N/A
4h		Where NHH properties are continuously monitored, the actual values of flow over the night flow period are used in place of estimates within the night flow analysis	Green	N	N/A	N/A
4i		Weekly leakage estimates are used for annual reporting with no exclusions for summer months	Green	N	N/A	N/A
4j		Negative leakage values are used in compiling values of annual average leakage	Green	N	N/A	N/A
4k		The reasons for any prolonged periods of negative leakage are investigated and explained	Green	N	N/A	N/A
5. Household night use			Green	N	N/A	N/A
5a		The time period for HHNU is the same time period as used for night flow and NHHNU	Green	N	N/A	N/A
5b		Own data or shared data with proximate companies is used for HHNU	Green	N	N/A	N/A

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
5c		Plumbing losses are included and based on own data	Green	N	N/A	N/A
5d		Evidence that survey is representative (based on demography, property type or other factors) of the company as a whole	Green	N	N/A	N/A
5e		Sample size is sufficient to capture continuous and intermittent night use with reasonable confidence	Green	N	N/A	N/A
5f		Continual monitoring and maintenance of IHMs (individual household monitors) and SAMs (small area monitors)	Green	N	N/A	N/A
5g		HHNU is derived daily with regular, adjustment of values on a weekly or monthly frequency to reflect actual seasonal use. This may be done retrospectively	Green	N	N/A	N/A
6. Non-household night use			Amber	N	N/A	The model that derives the coefficients has not been updated since 2018. The representativeness of the current set of non-household sample properties was assessed and found to be unrepresentative of some of the cohorts and ABV distribution.
6a		The time period for NHHNU is the same time period as used for night flow and HHNU	Green	N	N/A	N/A
6b		Own data or shared data with proximate companies is used for NHHNU	Green	N	N/A	N/A

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
6c		1999 UKWIR methodology with the appropriate time window as used for the night flow and the published outcome of further methodology development is applied	Green	N	N/A	N/A
6d		Stratification of non-households to a number of groups and consumption bands is representative of the varying characteristics of commercial and industrial properties	Amber	N	N/A	See 6.0
6e		Sample size is sufficient to capture night use by stratification with reasonable confidence	Amber	N	N/A	See 6.0
6f		Reliable and representative average billed volume (ABV) model based on data logging of the representative sample sufficient to capture demand variations with further seasonal logging where relevant. Continuously logged properties not part of the sample.	Amber	N	N/A	See 6.0
6g		ABV model linked to billing system or replacement database of billed volumes. Average billed volumes updated at least annually	Amber	N	N/A	The ABV data used in the NHHNU model is derived from CMOS, which may include some estimated reads thus reducing the accuracy of the data. There is a lack of confidence in the MOSL CMOS data. However, as this is the only consumption data available for all commercial properties in the Affinity Water regions, this is currently the best data available to build the model. The data is updated each year, hence the yearly NHHNU models are based on recent data. The night use data used in the model is obtained from property level logging, which is updated every year. The accuracy of this data is high, and is therefore used in the model.

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
6h		Continuous monitoring of selected non-households is carried out where average demand of an individual non-household has a material impact on the ability for a DMA or zone to provide valid and consistent data within operability limits	Green	N	N/A	N/A
7. Hour to day conversion			Green	N	N/A	N/A
7a		The hour-to-day factor is derived separately for each DMA or zone using pressure logging within each DMA or zone. The factors are updated at least annually or where there are any significant changes to pressure regimes	Green	N	N/A	N/A
7b		As an alternative, hydraulic models reflecting latest network configuration and pressure changes, are used if they dis-aggregate in sufficient detail at sub-zone level	Green	N	N/A	N/A
7c		Evidence based N1 value used. Expected range is 1.0 to 1.20	Green	N	N/A	N/A
8. Annual distribution leakage			Green	N	N/A	N/A
9. Trunk main losses (only applicable if DMA level leakage assessment used)			Green	N	N/A	N/A
10. Service reservoir losses (only applicable if DMA level leakage assessment used)			Green	N	N/A	N/A
10a		Company-specific data is used to assess the value of service reservoir losses;	Green	N	N/A	N/A



Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
10b		Reservoirs with known high leakage, structural deficiencies or at risk of water quality failures are investigated on an individual basis	Green	N	N/A	N/A
10c		Drop tests (12 hour duration depending on size) carried out every five or ten years. All valves checked for tight close; and losses through overflows investigated. Appropriate monitoring arrangements in place to control and minimise overflow events.	Green	N	N/A	N/A
11. Distribution input			Amber	N	N/A	<p>Although we have a calculation, we do not yet have senior sign off that confirms that the data points used are correct.</p> <p>We do not have sign off that confirms that all meters are at appropriate locations and that any TWOU after the DI meter is deducted.</p> <p>We can only confirm that meters used in the calculation that are also abstraction meters have undergone verification.</p>
11a		Distribution input to the system is metered with at least daily readings at all defined locations	Green	N	N/A	N/A
11b		Meters are appropriate size for the flow to be measured and located at appropriate inputs to the network confirmed by record plans. Any treatment works take-off downstream of a meter are excluded from the DI calculations	Amber	N	N/A	See 11.0

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
11c		Data validity checks are carried out at least monthly	Amber	N	N/A	Data checks are currently conducted quarterly.
11d		Missing data is infilled using both pre- and post- data for the location over at least one month, extrapolated from pump hours or use of upstream or downstream meters	Green	N	N/A	N/A
11e		The data transfer systems from meter output to central database are checked and validated on a risk-based frequency from one up to two years	Green	N	N/A	N/A
11f		Flow checks are carried out on DI meters consistent with the principles of the document 'EA Abstraction Good Metering Guide' and in particular the frequency of flow checking defined in table 6.2 of the EA guide	Amber	N	N/A	We cannot confirm that all meter verification checks are up to date to meet the requirements of the "EA Abstraction Good Metering Guide". Only those that are subject to the EA requirement for Abstraction meter verification.
12. Measured consumption			Amber	N	N/A	We currently receive an automated report that gives us the measured HH values. This report was built several years ago, and there is no documentation that sets out the business rules used to determine the value. As a result, we are unable to confirm our compliance with this component guidance.  MUR has not been updated regularly to confirm the values used.
12a		Metered data is derived from own billing system or from CMOS for non-households	Green	N	N/A	N/A

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
12b		Estimate of supply pipe losses is included for internally metered properties consistent with own current assumption of supply pipe losses	Green	N	N/A	N/A
12c		Inclusion of any leakage allowance is included where a rebate has been applied to a customer's bill.	Amber	N	N/A	See 12.0
12d		Meter under-registration (MUR) is applied consistent with own estimates. Evidence of MUR available especially for MUR above 3%.	Amber	N	N/A	MUR testing has not been conducted regularly to confirm and provide evidence for an above 3% value. We now have a funded project in place to provide continuous MUR research on our meter stock.
12e		Meter replacement consistent with own replacement programme	Green	N	N/A	N/A
13. Unmeasured consumption			Amber	Y	We have reviewed the WATCOM IHM survey in depth. We have had external review as to its appropriateness. It has been confirmed that it is not as poor as has been previously thought and although needs some improvements in the number of participants, it remains a reliable source for this component. We have also reviewed other potential data sources such as the UMP but that has been shown to be unreliable.	We need additional valid properties in the IHM for certain ACORN groups, this is to reduce the uncertainty in those groups.
13a	4a	Monitors follow principles set out in the UKWIR Report 'Best Practice for	Amber	N	N/A	See 13.0

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
		unmeasured per-capita consumption monitors 1999' and the more recent report 'Future Estimation of Unmeasured Household Consumption', UKWIR 2017				
13b	4b	Consumption is derived from own individual household monitor or small area surveys	Green	Y	The WatCOM IHM data has been used.	N/A
13c	4c	Evidence that survey is representative (based on demography, property type or other factors) of the company as a whole; valid data available from at least 80% of monitors as an annual average measure	Amber	Y	See 13.0.	See 13.0
13d	4d	For companies using SAMs – SAM (small area monitor) comprises a representative sample of customer' characteristics. The sample size is sufficient to provide a statistically representative sample after allowing for outages. Where the proportion of metered properties in an area exceeds 50% of total properties then further data validity tests are applied. Or companies using IHMs – IHM (individual household monitor) comprises representative sample of customer characteristics. The sample is at least 1000 properties.	Amber	Y	The sample is stratified using ACORN to match the company stratification. The sample is of 1100 properties, however after validation checks the final number used was 873.	See 13.0
13e	4e	Uncertainty allocated to unmeasured household consumption is estimated and justified	Green	N	N/A	N/A

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
13f	4f	There is continual monitoring and maintenance of IHMs and SAM monitors	Amber	Y	The WatCom IHM has been passed over to the Water balance team to manage during APR23. As a result, we have started to monitor the IHM.	See 13.0
13g	4h	Meters are selected to provide sufficient granularity to detect low continuous flows indicative of plumbing losses or leakage short duration flow variations. The value of meter under registration is less than the company's average meter stock	Green	N	N/A	N/A
13h	4h	Estimate of plumbing losses is based on own data	Green	N	N/A	N/A
13i	4i	Where unmeasured non-household reported volume is less than 2% of total non-household demand, data from a per property consumption study is refreshed every five years	Green	N	N/A	N/A
13j	4j	Where unmeasured non-household reported volumes are greater than 2% of non-household demand, data from a property study is refreshed every two years	Green	N	N/A	N/A
14. Company own water use			Green	N	N/A	N/A
14a		All sewage treatment sites and other sites and assets supplied downstream of the DI meters using greater than 10 m <sup>3</sup> /d (0.01 Ml/d) are metered	Amber	N	N/A	See 11b

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
14b		An estimate of total company own use is included in the water balance, based on a clear methodology and actual data	Green	N	N/A	N/A
14c		Estimate of distribution operational use is evidence based and not greater than 0.6% of distribution input	Green	N	N/A	N/A
15. Other water use			Green	N	N/A	N/A
15a		Other use components are based on own data	Green	N	N/A	N/A
15b		Estimate of water delivered unbilled (legally and illegally) is evidence based and not greater than 1.8% of distribution input	Green	N	N/A	N/A
15c		Estimates are updated when there is a material increase or decrease to volumes	Green	N	N/A	N/A
16. Water balance and MLE			Amber	N	N/A	See 16e
16a		Fully measured components have a range from 2% to 4%	Green	N	N/A	N/A
16b		Mainly measured with some estimated adjustments have a range from 2.5% to 5%	Green	N	N/A	N/A
16c		Estimated using detailed and reliable methods have a range from 8% to 12%	Green	N	N/A	N/A
16d		Broad estimates not fully detailed or reliable have a range from 20% to 50%	Green	N	N/A	N/A



Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
16e		Water balance discrepancy: <2% = Green >2% and <3% = Amber >3% = Red	Red	Y	This is a calculated output. Imbalance for 2022/23 is 3.56%	<p>The imbalance is over 3% which in the guidance is a red.</p> <p>We believe that the deterioration from last year is caused by the harsh winter impact on customer properties. We can see from our night use analysis that customers saw an increase in night use due to the harsh weather in December and again to a lesser extent in January. We can also see that this has not returned to pre-winter levels. This indicates that plumbing losses that were caused by the harsh weather have not been fully resolved (see chart 2)</p> <p>We can calculate from our night use analysis against the same period last year that there is approximately 14.5 Ml/d of additional consumption from this winter period. This is only based on Central region properties, excludes non-households, and excludes any losses that breakout and are repaired in the day so is likely to be an underestimate of the true impact on consumption.</p> <p>Due to meter reading cycles not all the winter impact on demand will have been collected, therefore, will not yet appear in the measured consumption in both Household and non-household. We currently read at 6 monthly intervals. Assuming reads are evenly split across months (normally less are programmed for winter months for staff safety) Then there are 24 months' worth of consumption to collect. But due to the billing cycle only 8 months of this data would be collected so only 1/3 of the increased consumption would make it into the billing system and our reporting.</p> <p>If, therefore, we were to add 2/3rds of this additional consumption back into the water balance (measured consumption) this would return</p>

Leakage Line	PCC Line	Description	2022/23	Change from previous year (Y/N)	Reason for Change (If applicable)	Reasons for non-green component
						<p>the measure back to a similar value as last year and Amber. As stated, this is likely to be a conservative assessment.</p> <p>We have not accounted for this as part of our year end as it is not part of our methodology to accrue for lagged consumption data. Normally from year to year if conditions are stable this is not an issue, but when extremes occur like in this instance, they can have an effect on the data.</p>

## Materiality Assessments

As we are not fully compliant with the convergence guidance, we conducted a materiality assessment of the noncompliant components. This shows that the outcome of achievement of the year 3 performance commitment would not be altered.

Component	Adjustment	Revised post MLE 2022/23 Leakage (MI/d)	3yr rolling average leakage baseline (MI/d)	AMP7 Yr3 Rolling average leakage (MI/d)	Leakage performance level to compare against PCs (%)	Materiality to Leakage Pass/Fail
Leakage DMA Coverage	Add 5% of OSCM Leakage (0.78 MI/d) to Pre MLE Leakage upstream of DMA	151.3	188.8	159.0	15.8	No
	Minus 5% of OSCM leakage (0.78 MI/d) to Pre MLE Leakage upstream of DMA	150.0	188.8	158.5	16.0	No
Non-Household Night Use	Plus 5% of total NHH Night Use (0.81 MI/d) to Pre MLE Distribution Leakage	149.9	188.8	158.5	16.0	No
	Minus 5% of total NHH Night Use (0.81 MI/d) to Pre MLE Distribution Leakage	151.4	188.8	159.0	15.8	No
Distribution Input	Minus 2.79 MI/d from Pre MLE Distribution Input	150.2	188.8	158.6	16.0	No
Measured Consumption - Household MUR	Plus 5% on HH MUR (1.59 MI/d) on pre MLE HH Measured consumption	150.4	188.8	158.7	15.9	No
	Minus 5% on HH MUR (1.59 MI/d) on pre MLE HH Measured consumption	150.9	188.8	158.9	15.8	No
Measured Consumption - Non-Household MUR	Plus 5% on NHH MUR (0.74 MI/d) on pre MLE NHH Measured consumption	150.5	188.8	158.7	15.9	No
	Minus 5% on NHH MUR (1.59 MI/d) on pre MLE HH Measured consumption	150.8	188.8	158.8	15.9	No
Unmeasured Consumption - Household	Plus 5% (13.8 MI/d) on pre MLE HH unmeasured consumption	148.5	188.8	158.1	16.3	No
	Minus 5% (13.8 MI/d) on pre MLE HH unmeasured consumption	152.9	188.8	159.5	15.5	No
3% Closure on Balance. Return to Amber	Add 5.35 on Pre MLE distribution losses.	155.3	188.8	160.3	15.1	No
Same as last year closure on Balance	Add 10.5 MI/d to Pre MLE distribution losses leakage to achieve 2.46% imbalance as last year	159.8	188.8	161.8	14.3	No
Green balance	Using the estimated lag in winter consumption and then adding 5.3 MI/d to leakage to return to 1.99% (Green)	153.8	188.8	159.8	15.4	No

### 3A.4 Per capita consumption

PCC is a measure of customer consumption in the home. Across the industry we know this is significantly impacted by weather, the number of people working from home and in recent years Covid and its consequential changes in behaviour patterns. Commuter belt companies are particularly impacted by this as their customers are now using more water in the home than has been seen in the past.

The three-year rolling average target, whilst initially designed to smooth exceptional variations, also attributes underperformance from prior years into current performance and now has the unintended consequence of exacerbating the Covid effects. Increases seen during Covid lockdowns has a knock-on effect to subsequent years which are outside companies' ability to control and could not have been foreseen at the time of target setting.

We ended Year 3 with a 12-month 'spot' PCC of 157.0 l/p/d and a 3-year average of 160.6 l/p/d. This is an increase of 4.3% from 19/20 baseline against a target of a reduction of 7.3%. Therefore, we have not achieved our reduction target in the year.

Regulatory Year	20/21	21/22	22/23	23/24	24/25
Performance commitment - % reduction from 3-year baseline value	1.7	4.9	7.3	10.0	12.5
Actual performance - % reduction from 3-year baseline value	-3.5	-3.4	-4.3		

For 2022/23 we calculate total savings of 27.2 MI/d from demand management activities, including metering. The Covid-19 pandemic and lasting effects upon customer's behaviours, including hybrid working arrangements are significant contributing factors. Comparing post-pandemic performance levels against a pre-pandemic baseline is problematic at best and does not provide a realistic picture of our demand reduction activities.

Through the period we have looked to adapt our ways of working to ensure we can influence customers to achieve water savings. We continued to promote our Home Water Efficiency Checks (HWECs) and moved these to virtual meetings when in person visits were not possible. We have continued to provide this online service as many customers still prefer this option. In 2022/23 we conducted 20,894 HWECs, compared to 8,015 in 2021/22.

Launched in April 2021, our flagship 'Save our Streams' (SOS) campaign encouraged customers to use water more carefully. In 2022 we launched the second stage of SOS to expand on the initial phase of our campaign to maintain and continue customers on their water saving journeys.

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We targeted four key initiatives:

- Providing a bespoke water usage calculator tool to allow customers to understand their own water footprint, take steps to reduce their usage and claim free water saving devices
- A public relation and social media campaign working with local river and wildlife trust partners and an influential campaigner
- An awareness driving advertising campaign featuring “Duck,” from Affinity Water’s new brand identity, voiced by comedian Joe Wilkinson
- Data insights to help target and drive the message. These insights also allowed targeting of high-use audiences where more savings could be made.

### [Covid-19 Impact](#)

At the end of 2020/21 we commissioned PA Consulting and Frontier Economics to help us understand and evidence the effects of Covid-19 on our performance after accounting for background increases that would have been seen in a year with hot/dry summers anyway. Their conclusion was that for 2020-21 an additional 28MI/d of distribution input was used outside the prior 4-year average, only 10% of this additional water could be attributed to increases due to weather.

Since returning to a ‘new normal’, our Water Resources Management Plan team, Demand Management and Data Scientists have worked together to understand further the past, present and prospective effects of the Covid-19 pandemic on household consumption. The team reviewed the initial impact due to lockdowns which led to more time spent indoors and resultant consumption increases. They have also analysed the lasting effect of the pandemic on household consumption due to changes in working patterns such as hybrid working leading to more time spent at home in domestic properties.

Our calculations indicate for the AMP 7 years to date, PCC in 2020/21 was around 7 l/h/d higher, 4 l/h/d higher in 2021/22 and around 3 l/h/d in 2022/23. This is our early preliminary analysis of the impact of Covid-19 on household consumption which has been provided as an indication only. These numbers are not our final conclusions and are subject to change as we review, refine, and update our Covid analysis.

### [2023/24 and progress towards 2024/25 target](#)

In 2023/24 we are implementing an industry first rising block tariff trial. This will be a two-year trial focussing on dual goals; to see if it will reduce household water waste and improve affordability of water to those that need it. The trial will be focussed on a cluster of geographically close postcodes that contains a variety of CACI Acorn groups.

It will help affordability as the first block of 30m<sup>3</sup> water is free of charge to customers, meaning low users will see their water bill reduce. By increasing the price of water

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once people use over 245m<sup>3</sup> in the year, we incentivise customers to be more aware of their water use and if a Customer Side Leak (CSL) is discovered they will want to resolve it.

In 2023/24 we will continue to invest in our behavioural change campaign. In particular we will be focusing on raising awareness of customer side leakage, how to identify it and what customers can do to resolve it, empowering the customer to take responsibility.

We will continue our Home Water Efficiency Checks over the next two years offering water use behavioural conversations and internal devices to help reduce water use. An additional service that we are adding is that a plumber is sent out to fix the leak free of charge to the customer, if our technician identifies an internal leak that meets certain requirements.

In 2023/24 we will be looking at installing flow regulators. These can be installed in boundary or internal stop taps to reduce flow to the property whilst allowing sufficient through to avoid adverse customer experience.

### **3A.5 Mains repairs**

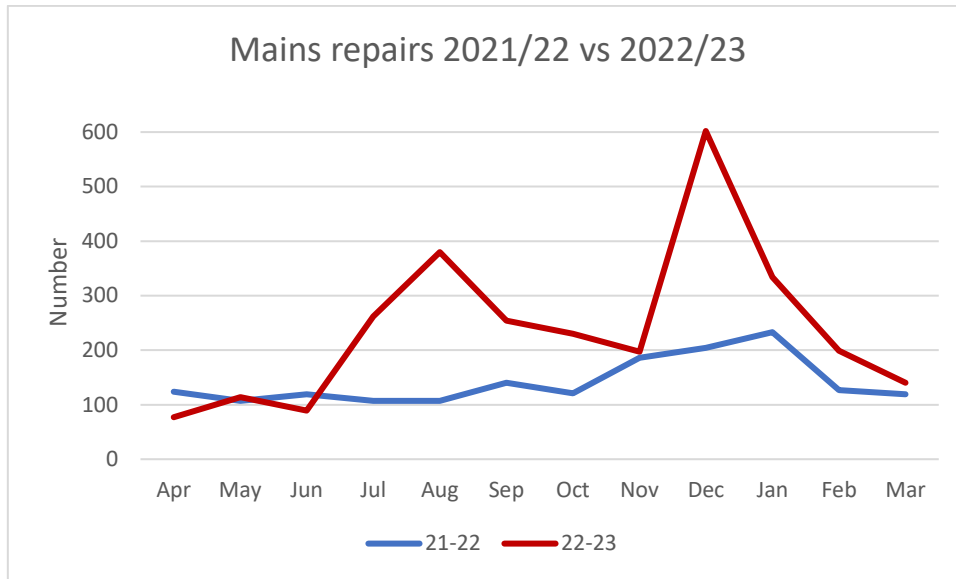
Mains repairs has been a reporting requirement for many years, and evidence shows performance in any given year will be affected, often significantly, by weather and soil moisture deficit.

We have not achieved our 2022/23 target of 146.5/1000km, with a year-end figure of 169.6/1000km (which is equivalent to 2,878 repairs). This is a significant increase on last year's performance of 100.20/1000km however it should be noted that 2021/22 was a benign weather year and is therefore not directly comparable to 2022/23. We attribute the increase in mains repairs in 2022 to two major weather events, hot and dry conditions in July and August and the freeze/thaw event in December.

We saw an unprecedented number of bursts during December 2022 due to freezing temperatures followed by rapid thaw. We were well prepared, putting into practise lessons learned from the Beast from the East in 2018. Operational readiness plans were enacted, increasing the number of repair gangs and availability of repair fittings to respond quickly to bursts. We put plans in place with our leakage control teams to prioritise larger bursts.

The graph below shows the number of bursts against the prior year. Individually either the extreme summer highs or winter lows would have caused a failure against the performance commitment, demonstrating the narrow margins on this measure.





Notwithstanding the volatility of this measure, we continue to work on initiatives that will help reduce our baseline burst rate and disruption to our network.

Following extensive root cause failure conducted last year, we have moved to almost real-time analysis burst tracking. This is undertaken by our new team of hydraulic experts in our control room who detect and remedy issues with pumps or PRVs causing transient pressure fluctuations. This enables proactive elimination of repeat bursts from clusters and 'hot spots' caused by underperforming assets. It also adds to our library of causality, continuing the work conducted last year.

Our work with the Met Office to utilise their Secli-firm tool has not yielded the results we expected. Whilst early indicators showed positive results, it proved ineffective in providing long range foresight of the freeze/thaw in December. We continue work to adjust the parameters of the tool to make it more sensitive to our supply region and demand patterns.

For 2023/24, we will commence a proof-of-concept six-month trial with Smart Actuation. This will enable us to record real time valve operations, update asset data and provide user information valve operations to avoid transients. The trial starts in June and we anticipate a review of the benefits during our internal mid-year audits.

Controlling main repairs is an ongoing challenge and reducing numbers year on year is increasingly difficult. With weather being one of the primary factors for success or failure we continue to look at other areas to improve our baseline performance such as network calming strategies.

We can confirm that we are 'green' against all the elements of the checklist contained in the Ofwat reporting guidance for mains repairs.

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### 3A.6 Unplanned outage

Our commitment for 2022/23 for unplanned outage was 2.34% as a percentage of Peak Week Production Capacity (PWPC). We have successfully achieved this with a performance of 2.09%. Whilst within committed performance levels, this is an increase on last year's result due to increased long term outages following a high demand summer, freeze thaw events during the winter and outages at our larger surface treatment works.

We have developed an internal target for planned outage of <3% of PWPC, which we are using to drive internal improvements in how we plan, manage and record planned site outages. Planned outage for 2022/23 was 4.96%, which was also an increase on prior year. This increase was due to reasons such as UV upgrades, statutory works, borehole replacements and a variety of other project works.

Following internal challenge and feedback from our auditors we have reviewed how we record the transition from unplanned to planned outage, and vice versa, to improve consistency of the assessments. Our new internal system to manage the capture of planned outage is now live and is designed to bring efficiency to operations, give a better view of Dynamic Operational Risk Assessment (DORA) and plan effective delivery with appropriate standards attached around capability and competency. It is part of our ongoing review and improvement process.

While the development of the Planned Work Portal (PWP) is a high priority, timely availability of unplanned outage performance data is also an area of continuous improvement, and we are building an exception reporting tool to enable site level data capture from our telemetry system. We have also developed an asset performance App which is used by our control operations team to capture failing sites and causes, which will link into the exception reporting tool.

All our performance data now comes from a single source, with standardised time stamping and flow recording as MI/d or m<sup>3</sup>/hr. "Resilience 21", which is bringing our three telemetry systems together onto one platform, is still in progress, with both Central and Dour (Southeast) regions showing on Serck SCX together, and the Brett (East) region due to be combined imminently.

With the completion and successful delivery of these key improvements, we will deliver greater automation with better consistency and timeliness of data provision.

While this measure is designed to allow an assessment of Asset Health, there is no guidance on how this is assessed so we have developed internal drivers around asset availability, from an operational delivery perspective. This feeds into DORA, which is an assessment of forecast demand against production capability, as an average and at peak. We use unplanned outage data in areas such as capital investment and capital maintenance. It also informs how we maintain and operate sites, how we model supply and demand to ensure a high-quality service for our customers and how we minimise disruption in the communities we serve.

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We have applied a continuous improvement approach to our unplanned outage activities. Between 2020 and 2022 we have delivered improvements in how we capture and report the measure and also how we use the insight to drive operational improvements.

We have convened an unplanned outage programme Board whose purpose is to:

- Review performance (leading and lagging measures)
- Help decision making
- Drive initiatives
- Facilitate escalations if needed

It meets regularly and incorporates all areas of the business that have an impact on unplanned outage, covering:

- Maintenance
- Operational Delivery
- Asset Performance
- Delivery Planning
- Data, Reporting & Insight

We are confident that we will remain within target for the rest of the AMP, however we have concerns over the change in methodology for the new AMP and how this will affect the outcome of this measure, where exclusions for water quality will no longer be permitted.

Shadow reporting has commenced to report water quality events to assess how we build and monitor this going forward, enabling us to build a better picture of future forecasting

### **3A.7 Environmental innovation - delivery of community projects**

We have a programme of works to deliver eight environmental innovation projects in AMP7 to improve our customers' knowledge, water use and water efficiency. The goal of the programme is to bring together sector experts, charities, community and environmental groups and other stakeholders to trial a range of innovative multi-party projects, linked to different environmental themes and water use behaviours.

The eight Environmental Innovation Projects are worth 14 project units and are to be delivered in the 2020-25 period. Projects vary in size and cost, with 7 projects each worth one unit and the remaining Lee catchment project worth 7 units.

In 2022/23 we delivered two full projects each worth 1 project unit and 4 project units out of 7 for the Lee catchment project. The benefits of the projects have been verified externally by an appropriately qualified external third party. Further information on each of projects together with a full copy of the third-party benefits delivered report can be found at the following link:

<https://www.affinitywater.co.uk/innovation>

The remaining projects are due to be completed in 2023/4 and 2024/5.

Project Name	No of Project Units	Internal delivery target
Affordable housing (Colne)	1	Completed (Y2)
Education methods (Misbourne)	1	Completed (Y2)
New Developments (Stort)	1	Completed (Y2)
Targeted campaign (Brett)	1	1 unit (Y3)
Targeted campaign (Wey)	1	1 unit (Y3)
Lee catchment project	7	4 units (Y3) 2 units (Y4) 1 unit (Y5)
Faith groups – Grey Water Recycling (Pinn)	1	1 unit (Y4)
Education smart meters in schools (Dour)	1	1 unit (Y5)

The projects aim to deliver innovative ways to engage with customers, stakeholders, and partners and deliver information and/or water efficiency knowledge and interventions. All the projects have findings that are or will be useful to ongoing company water efficiency and are being used to inform potential change to business-as-usual activities or informal aligned activities.

Our Independent Challenge Panel (ICG) have been instrumental in helping us develop the projects and ensuring the benefits delivered are incorporated into wider business and industry practice.

### **Targeted campaigns (Wey) and (Brett) - 2 project units.**

The customers in the Affinity Water region have one of the highest customer water usage levels in the UK, combined with a growing population, and less rainfall than many other parts of the country. It is important that together with our customers we take steps to use water efficiently. While we continue to invest in water saving devices, HWECs and metering, we recognised the need to dedicate additional effort into driving greater motivation and opportunity for our customers to save water. The two targeted campaigns in our Brett and Wey regions were designed to reach out to customers who had not yet engaged in water saving habits and bring about behavioural change in two of our high usage communities.

We deployed a programme of interventions adopting the 'Com-B' behaviour change model to give customers the capabilities, opportunities, and motivation to save water, save money and help improve the environment.

We have focused on behaviours with the biggest potential savings and easiest to change including shorter showers, eco mode on white goods and garden water

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recycling (identified through Kantar behavioural insights programme.) We used a range of engagement methods to provide education & inspiration through high impact advertising, social & digital media engagement, publicity featuring high profile ambassadors/influencers/and charitable partnerships and tailored email communications. This directed customers to a platform where they could register, use our new bespoke water footprint calculator to see their usage and order free water saving devices.

We followed up with further communication to sustain and influence water saving habits at key moments in the year. We developed a proprietary PCC impact methodology to isolate & measure the change in usage and MI/d savings underpinned by analysis of actual customer usage.

Our model suggests we achieved a higher level of MI/d savings than projected: 1.15MI/d (average PCC reduction 5.86 l/p/d per HH) in Brett v target 0.3MI/d and 3.18 MI/d (average PCC reduction of 5.62 l/p/d per HH) in Wey v target of 0.9MI/d

Research also showed that 49% of households are now taking awareness led water saving action in the regions. We achieved 6,729 registrations (8% of Households) in Brett and 15,972 registrations (7% of households) in Wey. The registration penetration and water saving device penetration (@77% in Brett & 67.5% in Wey v 50% in our central region) is higher amongst unmetered households which is encouraging as it means we are seeing action taken amongst those who are not currently measured.

We have therefore observed a positive water savings shift because of the integrated behaviour change campaign. We are set to continue the project over the next two years with learnings applied.

#### **Lee Catchment Management - 4 Project units**

We have made good progress in delivering the Holistic Lea EIP project completing four units across three of the work packages.

##### **WP2. Catchment opportunity mapping to protect water resources**

This work package is complete with final report with associated mapping across the whole Lee catchment provided by our delivery partner, the South East Rivers Trust with supporting GIS data.

##### **WP4. Catchment trading of ecosystem services and nature-based solutions**

We have completed four catchment trading schemes in the Lee catchment to understand different trading mechanisms to support development of future catchment trading approaches.

- Two cover crop funding schemes using EnTrade in partnership with Cambridge Water, and
- Two catchment trades through the Landscape Enterprise Network (LENS) East Anglia in partnership with 3Keel, Nestle Purina, Cargill, British Sugar, and Anglian Water.

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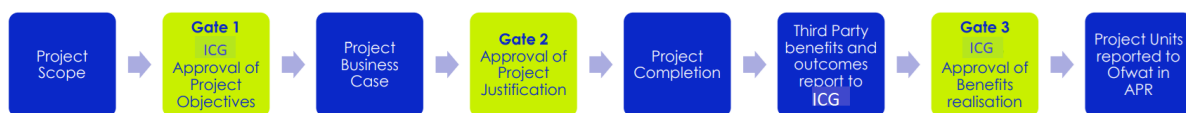
## WP5. Natural Capital (NC) Evaluation of Affinity Water investments in environmental schemes in a targeted sub-catchment of the Lee –

This work package is now complete. The River Beane catchment was selected for the assessment. As part of the work package, we created a Natural Capital (NC) baseline account for the Beane catchment. We carried out NC evaluations for all measures delivered including abstraction reductions, river restoration schemes, land management interventions (cover crop scheme) and our INNSOut scheme. Each measure has a separate report and an additional 'Our Catchment Contribution' report was produced detailing how our measures have increased natural capital in the catchment. Recommendations, approach, and outputs will be used to inform future schemes delivered across the Lee catchment under WINEP.

### Independent Challenge Group assurance

Our Independent Change Group (ICG) provides assurance that the process has been followed for project delivery and that each stage has been met and signed off and that the benefits realised have been supported by independent verification.

The below sets out their sign-off process.



## 3A.8 Reducing the total number of void properties by identifying false voids

Our void property rate was 2.02%, outperforming our commitment target for the year of 2.22%. We classify a property as void if it is within our supply area and connected to the water network but does not receive a charge as it is unoccupied.

To identify false voids and achieve this result, we have continued our proactive lettering to empty properties providing information on how to register, with follow up letters to suspected occupied 'empty' properties.

We use credit agency data where we do not receive responses to our letters after 4 weeks. For unmetered customers and customers where meter readings show consumption over 5m<sup>3</sup> (potential evidence of occupation), we use a third-party credit agency to ascertain if there is any credit activity at the property. Where there is credit activity, we obtain occupier details to bring the customer into charge. Where third party credit checks do not provide occupier details or the confidence score of occupation is low, our site investigators make physical visits to the property to establish occupancy and gather customer details.



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We have adjusted our ways of working between our site investigators and office-based teams, allowing more time for office staff to cleanse and analyse occupation data which has led to an increase of property visits undertaken.

The current void metric unfortunately only takes account of the number of properties which have been removed from the void list as false. This does not reflect the significant work we undertake confirming properties as true voids.

### **3A.9 River restoration**

We have completed 23 cumulative project units as of 31/03/2023 against our 2022/23 target of 21 units. Three project units were signed off by the Environment Agency through the year. Two project units were on the River Beane and one unit on the River Misbourne.

Our river restoration commitment is delivered in close working partnership with the Environment Agency (EA) who assist our activities and are ultimately confirm delivery of our performance. The unit of measure is an EA project unit. Projects are considered small (1 unit) or large (2 units). The definition of a small project is small activity, often river side, rather than to the river itself, for example tree works to improve light penetration on the river or tree pollarding.

Large projects involve morphological works and typically require hydrological modelling. Proposed changes may be in channel activity such as creation of berms or adding woody debris to banks to increase river sinuosity. It may also include the removal of older structures such as weirs that drive increased siltation of the rivers and prevent fish passage, or installation of fish bypass channels.

Through agreement with the EA, projects can accrue more than two units at an individual site where many different project aspects are being undertaken simultaneously. It should be noted that we operate across four different EA regional office areas. The rivers where units can be accrued from river restoration are all in our Herts and North London (HNL) EA regional office areas.

In AMP6 we worked on six rivers (Ver, Gade, Misbourne, Mimram, Lea and Beane) to undertake river restoration. As we moved into AMP7, these six rivers were nominated 'green' rivers, where due to the existing relationships developed through the previous AMP, there was more certainty in being able to deliver projects. The project units required through AMP7 are only accrued from green rivers.

As part of the WINEP for AMP7, there was a requirement to start work on 8 new rivers that had previously not had any works undertaken by us. It was recognised that due to the increased unknowns of the new rivers and lack of existing relationships in the catchments that there was more risk in terms of delivery on these rivers. As such the 8 rivers are classed as 'amber'. This means that there is a requirement to deliver river restoration activity upon them in line with our WINEP commitments (which was made legally binding retrospectively in 2021), but that a project unit approach does not

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apply to them. Affinity Water have amber rivers in each of the four EA regional office areas.

The requirement is to achieve 36 project units by the end of AMP7 across the 6 green rivers. The requirement is not specifically 6 project units from each of the 6 green rivers, but a 36-unit total spread across the 6 green rivers. This allows some flexibility to over deliver elsewhere if there is a risk of under delivery on a particular river or where the greatest benefit is available. Equally we recognise a desire to see river restoration improvement spread across the green rivers and are planning some level of delivery in each green catchment over the AMP. Full details are regularly updated and shared with the Environment Agency.

Affinity Water do not own the rivers, and we have no rights or enforcement powers to deliver river restoration projects. The riverbed and bank side are owned by the landowner(s) and there can be different land owners on each side of the river. River restoration activity can only go ahead with the express agreement of the landowner(s). As such river restoration delivery is highly focussed on a soft skills approach of negotiating and influencing to secure the necessary access permissions

Project completion is signed off by the Environment Agency, we give formal notification to EA, stating what activity was completed and the number of units claimed. The EA conduct a river walk on completed projects to inspect the work. Where they are satisfied that the project has been delivered to the agreed scope, then a senior officer will sign off to confirm the award of completed project units.

### Performance to date

We have a strong track-record of meeting or exceeding the river restoration performance commitment and are putting the right activities in place to continue this level of performance through the AMP and ensure the learnings inform the development and delivery of our PR24 WINEP programme.

	Year 1	Year 2	Year 3	Year 4	Year 5
	2020/21	2021/22	2022/23	2023/24	2024/25
PC cumulative unit total	7	14	21	28	36
AW cumulative performance	7	20	23		
AW forecast performance				28	36

While there has been some delays in the headroom time that was made at the end of year 2, we have exceeded the commitment for year 3, with 23 cumulative project units against a target of 21. These have been signed off by the Environment Agency.

The units have come from two different large projects called:

- River Beane – Walkern Road – 2 project units
- River Misbourne – Barn Meadows – 1 project unit.

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The Barn Meadows project consists of both tree works activity on the bank side and in channel activity. The tree works activity was completed, but the in-channel works were delayed by complications with the Flood Risk Alleviation Permit (FRAP) needed to be issued by the Environment Agency (EA). The EA have signed off the completed tree works worth a single unit. We expect that an additional unit will be awarded in 2023/24 for the in channel works when the FRAP is issued and construction can proceed. We continue to anticipate delays in the determination of FRAP's due to EA resourcing constraints and the requirement for some applications to now go through an Evidence and Risk process (which is a five- month determination period rather than two months. We had anticipated and planned to deliver an additional 7 project units in year 3. This proved impossible as the River Gade – Homeward Farm – (4 project units) had to cease after the landowner changed their mind about continuing the project. We have updated the EA throughout and they concurred that stopping the project was the best course of action in the circumstances.

In addition, further delays due to ground investigations have pushed a project: River Gade – Water End Road Bridge – 3 project units into the 2023/24 schedule.

In recognition of the risks posed by project delays and project abandonment, we have given urgency to a number of existing projects to build a stronger delivery plan for the remaining two years of the price control period. We have introduced and initiated new projects and project processes although as timelines are long, we may achieve delivery in 2024/25, or potentially the next price control period.

We therefore plan as a minimum, sufficient performance to meet the committed cumulative target. The total number of units initiated or brought forward is greater than the required commitment to recognise and mitigate project abandonment risks or reductions in scope.

### **3A.10 Abstraction reduction**

The abstraction reduction commitment target is zero for the first four years (2020/21 to 2023/24). We have met the target of zero in 2022/23. The WINEP measure completion date for all our AMP7 abstraction reductions is 22nd December 2024. Therefore, there have been no changes in reported performance compared to the annual targets. Due to the fixed targets of zero from 2020-2024 and a target of 27.33 MI/d in 2024/2025, no trend in performance over time has been, or will be, observed.

We are making good progress with delivering the assets and changes to our network required to implement the abstraction reductions in December 2024. Commissioning of Sundon conditioning plant is the priority enabling scheme that must be delivered ahead of December 2024 to allow the abstraction reductions to be achieved on time. We anticipate commissioning of the Sundon treatment plant by August 2024. We monitor progress through our sustainability reductions programme through monthly programme board meetings.

### 3A.11 Number of sources operating under the Abstraction Incentive Mechanism

The table below, shows our Abstraction Incentive Mechanism (AIM) performance scores since AIM came into effect in April 2016. Our target for each report year is 0 MI. Negative AIM scores signify improved performance compared to historic droughts, as they indicate that average abstraction was lower than the baseline when AIM was active.

Company-wide performance is based on the sum of scores for all the sources that are included within AIM. We included 23 sources in the mechanism in 2016, and reduced this to 19 in 2018, following sustainability reductions at three sources and removal of another source that was no longer deemed environmentally sensitive. Each AIM site has a trigger, typically set at downstream gauging stations in catchments where AIM sites are located.

The number of active AIM triggers varies each year with groundwater levels, meaning that scores between years are not directly comparable. Year-on-year variances are to be expected and it is not possible to infer improving or declining trends over time.

The table provides a short description of the annual scores, including the number of sources active during the respective year and a brief comment on the background groundwater level situation. A higher negative score was accumulated during 'dry' years (e.g. 2017/18 or 2019/20) where background groundwater levels were below the long-term average and the AIM triggers were active in most catchments. Background groundwater levels were lower on average during 2022/23 than 2021/22 so, there were more opportunities to accrue a negative score under AIM (-1277.03 MI vs -429.63 MI). In addition, proactive outage management which aims to minimise outages in the summer months helped us to maintain a consistent abstraction pattern below the AIM baseline at the AIM sites which were active in 2022/23.

The requirements from Ofwat changed from 2020/21 and we are no longer required to report the AIM performance per source. Therefore, only global AIM performance figures have been reported. No changes have been made in the reporting methods or assumptions since AIM was introduced in 2016.

Annual global AIM performance scores since 2016/17

Year	AIM score (MI - million litres)	Score description
2016/17	-1,622.21	AIM active in 7 catchments. GWLs: average to dry year
2017/18	-3,046.95	AIM active in all catchments. GWLs: dry year
2018/19	-2,383.84	AIM active in 5 catchments (10 sources). GWLs: dry year
2019/20	-2,057.70	AIM active in 10 catchments (16 sources). GWLs: dry year

2020/21	-304.31	AIM active in 2 catchments (3 sources). GWLs: above average; increasing trend from summer 2020
2021/22	-429.63	AIM active in 1 catchment (2 sources). GWLs: above average; declining trend
2022/23	-1,277.03	AIM active in 5 catchments (8 sources). GWLs: below average/average year

### Managing AIM performance

The Environment Agency communicate weekly to notify us if an AIM trigger(s) has been activated. We respond by checking that abstraction at the respective source(s) is below the volume/flow trigger point. We also have early warning triggers in place for each source which typically provide us with one month's notice of an AIM trigger being activated which helps our operational teams with planning.

We calculate and track AIM each month. We undertake assessment and assurance of data so we may detect and address erroneous data that may influence the calculation, both in our data and that provided by the Environment Agency. Overall, the river flow and abstraction data are classed as highly reliable and accurate. Daily abstraction is routinely checked, and instantaneous flow data is available on our telemetry system for additional checks if required. The abstraction flow meters should be accurate within  $\pm 5\%$  as these are the parameters required to pass the flow meter calibration.

### Bespoke performance commitments and reporting into AMP8

We operate in a water stressed region where chalk stream catchments are of significant ecological importance. Since 2016, to reduce our impact on the local environment, we have actively managed a number of our abstractions through AIM.

There are considerable benefits in continuing to manage and adapt the way we operate our assets in low flow conditions. AIM contributes to leaving more water in the environment and reduces recovery time of the aquifer. When AIM is active in the summer months, it discourages peak use of sources which may otherwise have been maximised. We have put AIM forward as a bespoke performance commitment target for AMP8 (2025-2030). This will allow and incentivise us to continue to reduce our abstractions and environmental impact during times when the environment needs it most.

## 3A.12 Properties at risk of receiving low pressure

As outlined to Ofwat previously, it is not possible for us to meet this performance commitment due to the nature of the reporting guidance and the high level of coverage of 'critical point' data loggers across our network.

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The provisions within the reporting guidance were written more than 30 years ago, at a time when knowledge and understanding of network pressures was limited. Network modelling and data loggers were still relatively new technology whilst permanently installed 'critical point' loggers were only just beginning to be installed and few companies had any. The guidance was written to what seemed like a sensible and pragmatic methodology at that time, nevertheless understanding was in its infancy in terms of practical application.

In the intervening 30-plus years, the guidance has not been revisited and revised in the light of companies' experience of working with it and the increasing accumulation of data and understanding of network pressures. There has never been a forum for discussing guidance, methodology and best practice. This is very much in contrast to other measures, most notably leakage and meant each company went its own way in developing a methodology. Overall, there has been growing divergence rather than convergence in companies' reporting methodologies. The number we have reported in this line are clearly not comparable with numbers reported by other companies and it is obvious that there is a wider divergence of reporting approaches across the industry

We now have more than 1,200 permanently installed, telemetered 'critical point' data loggers. This equates to one logger per 1,300 properties. These loggers are sited on our mains in positions that reflect pressure at the critical point in the zone, i.e. pressure to the worst affected property. This is a level of coverage, volume of data, and visibility of instances of low pressure that was never envisaged when the reporting guidance was developed in 1990.

For reporting purposes, 'low pressure' is a period of one hour or more when pressure in our pipe in the street is less than 15 metres head. This level of service is not necessarily reflective of what the customer's experience in terms of pressure at their tap; less than 15m head may be considered satisfactory for some customers, and not for others. The Guaranteed Standards of Service regulations treat low pressure as being less than 7 metres head in our pipe in the street.

The reporting guidance also takes no account of how often a property may experience low pressure. This means for example that a property that experiences low pressure continuously through the year is weighted the same as one that may experience low pressure for as little as six hours in the year. We are pleased that there is now growing recognition that the average time properties experience low pressure in the year is a better reflection of both asset health and service to customers. Average time is reported in tables/lines 3E.6 of the annual performance report.

During the year Ofwat asked that we change our reporting approach to be on the basis of the former DG2 measure, whereby a register is maintained of properties 'which have received and are likely to continue to receive pressure below the reference level when demand is not abnormal'. Although the measure is not intended to capture low pressures that result from abnormal demand, at the same time it allows us to exclude only a maximum of five days of abnormal demand in a year. 2020 and 2022 were (by historical comparison) extraordinary summers, with 28 and 23 days of



abnormal demand respectively. Therefore, the majority of current properties on the register are the result of abnormal demand in 2020/21.

Prior years' numbers for properties 'on the register' per 10,000 connections:

Year	Number
2019/20	35.284
2020/21	196.850
2021/22	155.466
2022/23	150.934

We recognise that water pressure is important to customers, and we are proposing to maintain the 'average time of low pressure' bespoke performance commitment through the 2025-30 AMP8 period. Further information on the average time measure is given under 3E.6

### 3A.13 Number of occupied properties not billed (Gap sites)

A property is considered a gap site if it is occupied but not billed. Reducing the number of gap sites results in fairer charging and lower bills for customers who already pay their water bills. In 2022/23 we successfully placed 65 gap sites into charge, outperforming our target of 50 sites each year.

We address gap sites primarily through site visits to establish the existence and occupation status of unbilled properties and outperformed our target by continuing to improve ways of working between our site investigators and office-based team. We also continue to prioritise activity towards properties likely to have the largest revenue yield, to maximise customer benefits from the resources we devote to gap site activity.

#### Audit and Assurance

As required in the FD, our external assurer has confirmed that in line with the reporting and assurance requirements, we have rigorous processes that are correctly implemented to identify and bill newly built properties.

#### **Assurance summary for APR Commentary for 3A.13 Number of occupied properties not billed (Gap sites)**

*The Company's methodology for reporting is robust, checks and controls are built into the processes and no issues were identified with the reporting.*

PC Ref.	Performance Commitment	Findings	Methodology	Data
3A.13	Number of occupied properties not billed (Gap sites)	The Company's methodology for reporting is robust, checks and controls are built into the processes and no issues were identified with its reporting.	Green	Green

### 3A.14 Unplanned interruptions to supply over 12 hours

Unplanned interruptions > 12 hours is our second supply interruption metric. The strong underlying performance in 'average minutes' has unfortunately not been reflected in this measure. Single large events in 2020 and 2021 added 468 and 422 properties to the count in those years.

2022/23 was similarly affected by extreme summer temperatures and a significant winter freeze-thaw winter period. We activate operational readiness plans in advance of any expected disruption to service. Our winter readiness plans were in place, operations optimised, and restoration and repair teams were fully resourced. This was not enough however to overcome the effects of the period. Despite the significant resources deployed over the period, 5,596 properties were affected by an interruption >12 hours in this two-week period alone.

Outside of the above-mentioned events, exceedances have typically been the result of bursts on large trunk mains. Whilst supplies were restored to wider areas, other areas with a 'single point failure' and/or little or no re-zone options were impacted. We took opportunities to provide alternative supplies where possible, but this was not sufficient to restore supplies. These areas continue to be at risk in future incidents, which we intend to mitigate through our resilience 'single points of failure' enhancement programme for PR24.

The number of individual properties affected by avoidable interruptions such as stop taps left off or meter failures remained low. These events do not materially affect the numbers.

Incidents	2020/21	2021/22	2022/23
Large incidents	488	444	Summer high temperatures 188 Winter freeze-thaw 5,596 Other 213
Other incidents and one-off properties (e.g., supply left turned off after changing a meter)	50	40	53

It is difficult to understand where we are relative to other companies as only two others have a comparable metric this AMP. However, (normalising by connected props) we achieved a reduced rate to both companies in 2021/22. For year 2022/23, information is not yet available to make comparisons.

### 3A.15 Customer contacts per 1000 population for Water Quality (taste, odour & appearance)

We met our performance commitment for customer contacts per 1000 population for water quality (taste, odour & appearance) with the contact rate being 0.56 against a target of 0.67.



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Performance was made up of 1349 (0.36) contacts regarding appearance and 755 (0.20) contacts regarding taste and/or odour. This is our best ever performance for this measure and resumes the downward trend observed until the first Covid related lockdown in 2020.

During 2022/23 we continued our mains flushing projects in a number of higher risk districts across our area to remove mains corrosion deposits and aluminium deposits that had accumulated in the mains network. This work has helped to keep customer contacts relating to discoloration low.

We anticipate that we will keep the number of contacts regarding water quality for the rest of AMP7 around the number experienced in 2022, by continuing flushing works and current operational practices.

### Table 3C - Customer measure of experience (C-MeX)

We are disappointed with our 2022/23 full year result of 14<sup>th</sup> as we aspire to become one of the leading water companies in the service we provide to our customers. We set ourselves a target and developed a clear action plan underpinned by robust data. Whilst we understand the root causes of dissatisfaction and have actions to mitigate these, it did not account for extreme weather events, and regrettably our performance was impacted by both the extreme hot weather and freeze-thaw over the last year.

We also note that there is a clear geographic split between company performance at the top and bottom of the table and consider that higher levels of occupancy turnover, transience and regional identity may affect the relative satisfaction scores.

Although our Service survey within C-MeX saw a decline in performance, we are encouraged with our Experience improvement, moving up the ranking from 14<sup>th</sup> to 12<sup>th</sup>. Our Service survey continues to be a challenge and we recognise we have significant work to do to improve our performance to give our customers greater confidence in our abilities and services. However, as C-MeX is a comparative measure, our 'league-table' position is also dependent upon the performance improvements that other companies make, and we have seen our Experience score improve whereas the industry Experience scores have declined.

Through engaging with customers and learning from our peers, we know that key priorities are resolving customer issues quickly and efficiently, keeping customers informed at the right time and doing what we say we will do. We have continued to work on training our staff to listen and resolve queries at the first point of contact. Despite significant investment in training, improving processes and engagement, we are not yet seeing these improvements manifesting themselves into changes in C-MeX survey scores.

For the year 2021/22 our overall score moved from 15<sup>th</sup> to 14<sup>th</sup> position, and we remain in 14<sup>th</sup> place for 2022/23. We have recently invested in a market leading real time

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customer satisfaction monitoring and analysis system (Qualtrics) which allows us to pinpoint areas of concern for customers, resolve and respond to issues quickly and improve our overall satisfaction scores.

We have a number of initiatives in progress aimed at improving the service customers receive:

- 5 Core processes, improvement to resolutions rate.

Customers are telling us that we need to deal with and resolve their queries faster.

We will achieve this through training staff to keep customers informed and speeding up back office and field functions.

- Digital enhancements and web improvements

Introduction of mobile app for customers where customers can view and be notified of actions relating to their queries and accounts.

- Performance management

Focus on lead wait times, WIPS, journey compliance, customer comms and right first time.

We confirm that we offered at least five communication channels for receiving customer contacts and complaints and at least three online channels throughout the reporting year.

### UK Customer Service Index

The UK Customer Satisfaction Index (UKCSI) provides an objective, independent perspective on the state of customer satisfaction in the UK, enabling organisations to assess their performance compared to others in their sector and against some of the UK's leading service organisations across a range of sectors

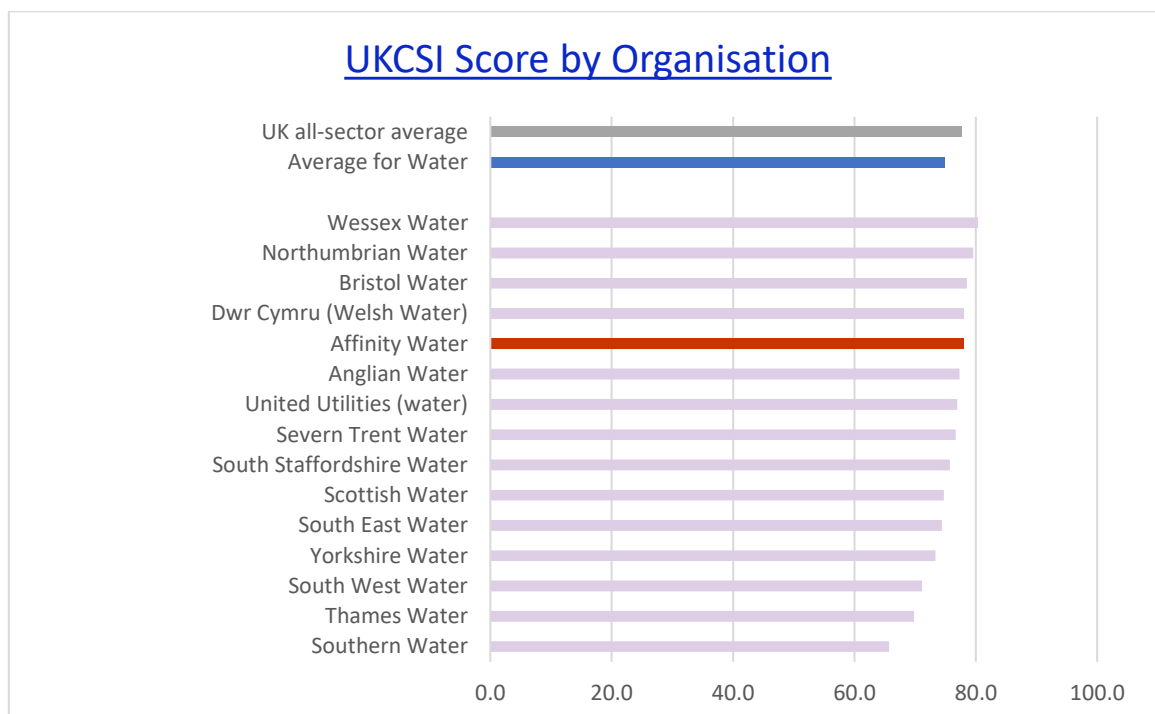
Despite a disappointing result in C-Mex we are encouraged to see our UKCSI scores for 2022/23 (report: January 2023) that show us as the top performing utility company out of 34 companies for responding to and dealing with problems and complaints.

We also see an improving NPS score from prior reports, with 4<sup>th</sup> place position out of 15 water companies. Overall, against water companies UKCSI rank us 5<sup>th</sup> (9<sup>th</sup> against the 34 utility companies as a whole)

The results allow us to understand where our standards are relative to other sectors and an understanding of ranking relative to other water companies rated by customers who have ranked customer service across a range of sectors. Not only does it compare us with other water companies, it also overcomes the potential regional biases inherent in scoring.

It is disappointing that there appears to be a disconnect in scores reflected through C-MeX and UKCSI. We are investigating this to understand the differences and why apparently opposing conclusions are drawn from performance measures of similar metrics.

Despite the disappointing C-MEX result, we are pleased to have achieved 1<sup>st</sup> place in complaint handling not just within the water sector but the whole utilities industry.



### Table 3D - Developer services measure of experience (D-MeX) table

Although we saw our D-MeX score increase from 2021/22, We are disappointed to achieve a 2022/23 full year industry league table position of 10<sup>th</sup>. We aspire to become one of the leading water companies when it comes to the service we provide our customers through Developer Services.

As we entered 2022/23, we identified that we needed system enhancements to support delivery for our customers within the Water UK metric service level agreement timescales (Water UK LoS). With the use of improved forecasting, jeopardy management, and a re-aligned operating model, we have seen an improvement to our quantitative performance. Moving from 99.76% in 2021/22 to 99.98% for 2022/23.

Across the bulk of the Water UK LoS metrics, we now deliver for our customers well before the set deadline dates. However, as the competitive element of D-MeX is improving quantitative performance across the industry, we are striving to do even more to maintain 100% performance on a monthly basis.

Through analysis of qualitative survey returns and regularly engaging with our customers, we highlighted that communication, timeliness and quality of information and offering value are key elements for our customers. With this in mind, we have:

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- Introduced enhancements to our online customer portal to improve the customer journey from start to finish,
  - Continued to work on training our people to help them deliver an exceptional service for our range of customer types, and
  - Streamlined processes to improve the customer journey and reduce time taken to provide our customers with information.

These enhancements have contributed to our qualitative score improvement from 71.32 in 2021/22 to 72.35 2022/23.

In 2023/24 we forecast to improve further on our D-MeX score and industry league position. We continued enhancements to our systems and processes in quarter 4 of 2022/23, giving us a front foot start for 2023/24. We are targeting quantitative performance to be 99.99%, maintaining the consistency we have seen in 2022/23. We are targeting qualitative performance to achieve year-on-year improved scores reflecting our team restructure and enhancements to processes and systems.

In 2024/25 we expect self-lay construction activity to increase such that self-lay organisations carry out more works than our contract partners.

In the next years, we will continue to use market insights, customer feedback and innovation to support our D-MeX performance and goals.

## **Table 3E - Outcome performance - Non financial performance commitments**

### **3E.1 Severe Restrictions in a Drought**

The performance commitment 'Risk of severe restrictions in a drought' is defined as the percentage of the customer population at risk of experiencing severe restrictions (for example, standpipes or rota cuts as part of Emergency Drought Orders - EDO) in a 1-in-200-year drought, on average, over 25 years. The population is considered to be 'at risk' if the supply-demand balance calculation in each water resource zone (as used for water resource planning) for the 1-in-200-year drought event results in a shortfall (deficit).

In our final PR19 submission to Ofwat, performance commitment levels were set for the 2020-2025 period. In their calculation the annual forecast, rather than the 25-year average, was used to calculate the expected future performance and associated targets. Future schemes that were selected in the Water Resources Management Plan 2019 (WRMP19) to manage supply and demand between 2020 and 2045 (25-year period) were also included with their expected benefits reported in future years. This inclusion resulted in the target falling to 0% by the start of AMP7 with the net movement of schemes and demand changes forecast in the WRMP keeping the target at 0% for each year of the AMP period.

Following scrutiny from our external auditors, this interpretation of the reporting guidance was challenged, and reporting conducted against the 'revised' methodology, taking on board the above revisions. This has resulted in the reported figure diverting from the way performance commitment levels were originally set at PR19. Therefore, it should be noted that the reported figures are not directly comparable with the commitment levels set.

In addition, the following data sources have changed since the performance commitment levels were originally set:

Revised data sources:

Element	Previous data source	Current data source
Outage	WRMP19 - Water Resources Planning Tables	Latest WRMP24 Outage Forecast
Target headroom	WRMP19 - Water Resources Planning Tables	Revised values from WRP Tables
Distribution input	EA Table (reporting year)	Water Resources Planning Tables – WRMP19 or EA Table (reporting year)
Transfers	WRMP19 - Water Resources Planning Tables	EA Table (based on capacities)

The use of the WRMP24 outage allowance has slightly worsened the Supply Demand Balance in certain zones while improving it in others, resulting in a negligible net effect when considering the performance for the company as a whole. The change to the 25-year average is mainly due to the exclusion of the expected benefits from future supply-side and demand-side schemes.

Given these changes, a new set of commitment levels have been calculated to assess what the equivalent targets would be, had we set them using the equivalent approach and data at PR19.

Commitments levels as set at PR19 vs set against reporting methodology:

Target levels	Unit	2020/21	2021/22	2022/23	2023/24	2024/25
FD PC levels set in PR19	%	0.0	0.0	0.0	0.0	0.0
Revised PC Levels - AR22	%	63.9	60.6	51.9	36.6	26.0

The PC performance at 34.2% fails year 3 due to high demand and leakage position, if compared with the PR19 target of 0%. If these high levels of demand are sustained

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in AMP7, the number of customers at risk will be higher than the performance commitment levels set in the Business Plan.

To mitigate this, several options are being 'fast tracked' to improve performance:

- the acceleration of a trading scheme,
- the acceleration of the second stage of Supply 2040 combined with a potential reduction of our bulk export to South East Water: and,
- non-household demand management activities.

For comparison, the two sets of performance figures calculated using the different methodologies are noted below:

Methodology	Year 1 (2020/21)	Year 2 (2021/22)	Year 3 (2022/23)
Final Determination (as per target setting)	44.0%	34.2%	41.5%
Revised methodology	67.7%	61.5%	67.7%

It is worth noting that 41.5% represents the year 3 annual performance. If the 25-year average were considered, the reported figure would be around 6.5%, which is much closer to the PR19 target of 0%.

It is important to stress here that the above figure does not represent the percentage of customers who are at risk of severe restrictions in a 1:200-year drought event in the current reporting year (2022/23). Rather, this metric takes a long-term approach and shows the proportion of customers at risk over a 25-year period. In addition, the methodology adopted is very conservative as planned future schemes selected in the WRMP do not contribute to the 25-year average supply-demand balance with their expected schemes. This has the effect of overestimating the percentage of customers who are and will be in a real risk of experiencing severe restrictions. Our overall security of supply remains robust, and we maintain that the security of supply that we provide to our customers is in line with our WRMP19 planned levels.

The performance commitment targets have not formally changed in line with the change protocol. We wrote to Ofwat in October 2022 to understand the change process. It was concluded that the change protocol would not be amended but the following advice was provided:

- *Companies should report PCs in line with the definitions and guidance. However, if your PCLs are based on final plan data then the performance data you report should follow the same methodology*
- *Where this is the case, you should clearly explain this in your commentary*
- *You may choose to show the difference e.g., using final plan, the 2021/22 data is XX but, using baseline, it is YY.*

We have therefore reported the numbers in 3A and 3E based on the revised methodology.

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### 3E.2-4 Priority Services Register (and other assistance available)

Supporting customers that need a little extra help is a key business objective and is of increasing importance in the current economic climate.

Ofwat's Cost of Living wave 3 survey (Published May 23) shows that bill payers are continuing to struggle when facing household bills with over half struggling fairly frequently. It is estimated that just under three in ten are aware of the support available. Through social media, web, bill and in person contact we have continued to increase the awareness of the PSR and other help available, substantially increasing customer uptake of the assistance offered.

We have achieved and exceeded the 3 PSR targets for the year.

#### PSR Reach

We continue to work to an internal stretch target, promoting the Priority Services Register (PSR) through a variety of channels. We add to the PSR register on average 500 households per week. Along-side promotion through our website, social media and bills a significant proportion are achieved by our front-line colleagues identifying triggers during the calls that could indicate a customer is in a vulnerable circumstance and will proactively offer the PSR to households.

We have data sharing agreements in place with both electricity Distribution Network Operators (DNO's) in our area (UK Power Networks (UKPN) and Scottish and Southern Electricity Networks (SSEN).

This will support our PSR reach and contribute to our attempted and actual contacts targets. Updates received from the DNO's will count as an actual contact for the purposes of our reporting. The data sharing arrangements are currently delayed pending further discussions between sectors to ensure correct compliance with GDPR. Once this is resolved data sharing will commence.

We achieved the YR5 target of 7.2% reach in August 23 and finished the year end at 8.33%. The internal stretch target we have set for 2023/24 is 9.58% and for 2024-25 approx. 10.83%. This is based on the current level of performance so confidence is high that we will achieve these figures.

We do not report the number of individuals on our PSR as we monitor households.

In the year 35,328 households were added to the register and 7,917 were removed.

We also track the number of households registered under the following categories and have exceeded the breakdown in all categories.



Categories	Achieved 2022/23	PR19 Business Plan forecasts
Communication	21,818	21,026
Mobility and Access	63,296	18,455
Other	8,599	5,435
Security	47,470	45,824
Supply	87,221	21,742

### PSR attempted contacts and actual contacts

We continue to reach customers by our scheduled contacting which is a continuous process of identifying customers as they approach the renewal date.

Scheduled contact attempts have been made by email and SMS throughout 2022/23.

A scheduled batch of letters were sent during December 22 and January 23 and customers received two letters 3 weeks apart if they had not updated their PSR or responded to an SMS or email. The scheduled letter activity is only undertaken when needed operationally.

For 2023/24, due to the growing number of households added to the PSR, (far exceeding where we originally forecast to be) we face a significant increase in the level of contacts required to achieve the standard in the Performance Commitment. We anticipate however that for the remaining years of the AMP we will continue to meet the targets for both attempted and actual contacts due to the scheduled contact activity.

### Social Tariffs and other assistance provided

We provide a range of services and forms of assistance which are available to our customers to improve affordability and accessibility for those that need it.

#### Reduced bill tariffs – Low Income Fixed Tariff

Our low-income fixed tariff (LIFT) is available to customers who are earning less than £17,005 a year or who are currently claiming certain benefits such as Universal Credit or Job Seeker's Allowance.

In 2022/23 the clean water bill was fixed at £107.20

In 2023/24 the clean water bill is fixed at £115.10

If a customer is eligible for LIFT and receives a council tax reduction or support, then they will be entitled to a higher rate discount and the clean water bill for 2023/24 is fixed at £76.70



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## Bill Cap Scheme – WaterSure tariff

The WaterSure scheme works by capping the customers charges so additional water usage is not chargeable.

Eligible customers are charged on a metered basis, in receipt of a qualifying benefit and either have 3 or more children under the age of 19 living in the property who are in full-time education or approved training, or one or more persons living in the property that suffers from a medical condition that involves the use of significant amounts of water.

## Wastewater charges

We have worked with the wastewater service providers in our area to streamline the process for reduced bill tariffs and to avoid the need for customers to fill out further application forms.

Where we have the correct information, we will automatically apply any wastewater discount that the customer is entitled to.

## Debt respite schemes

We partner with the charity 'Surviving Economic Abuse' to pilot the acceptance of an Economic Abuse Evidence Form which means that survivors of economic abuse do not have to repeat their story with multiple creditors. We will work with the debt advisor on the most appropriate solution for the customer.

We also offer a 'crisis fund' to provide immediate support to households facing a crisis (e.g., accidents, terminal illness, abuse, serious illness). As part of the application process, we will check to ensure that the household is receiving the most appropriate tariffs and signpost to other support.

We expect a 'payment matching' scheme to launch shortly and we are currently working with wastewater service providers on the details.

## Cost of Living Payment

We expect to support 30,000 households with a one-off payment of £50 credited to water accounts for customers identified as needing support. We have used segmentation data to identify households that may be feeling the strain financially and have proactively provided support to approx. 14,000 households so far. We have also worked with referral partners to identify other households in need.

## Data sharing agreements

We have data sharing agreement with the Department of Work and Pensions (DWP), and we use this partnership to proactively renew households in receipt of the reduced bill tariff and to identify households that are entitled to support. We also have local data sharing arrangements which mean we work with partners to place households on reduced bill tariffs without further applications being needed.

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## Community Partnerships

We have attended various local events focused on cost-of-living pressures and use this as an opportunity to promote water saving messages as well as reduced bill tariffs and the Priority Services Register.

### 'Water Save' (Rising block) tariff trial

In 2023, a 2-year charging trial will take place with a subset of customers to measure the effects of a new tariff on affordability and demand response. The effects will be measured by comparison of a trial group and control group, both made up of around 1,500 properties and matched as closely as possible for consumption and location.

The new 'Water Save' tariff is a rising block charge, providing free water for the first 30 and it is expected that at least two out of three households in the trial will pay less for their water than they do currently if usage remains unchanged.

At the end of the trial, we will publish an anonymised dataset to share results and findings with the industry and maximise learning.

## Accessibility

Making our site accessible for all is important to us and our website has been designed with accessibility in mind. As far as is possible, we try to ensure that it operates across multiple platforms and browsers and is accessible to everyone who wants to use it.

Its controls allow adaption to suit varying customer needs. A variety of settings can be chosen and saved for future visits. With standard, high contrast, blue and cream screen options available. Three text sizes are optional and wherever possible, links are written to make sense out of context. Content images use descriptive ALT attributes and decorative images include short ALT attributes. MyAccount app also includes a dark mode option.

Information is available in large print, braille, or audio on request via our call agents or through our priority services register page on the website.

Our site provides signposts to compatible accessibility software and services such as free text-only web browsers and British sign language video interpreters.

Information is also provided regarding independent advice organisations such as charities and services which may be able to assist our vulnerable and disabled customers.

## 3E.6 Average time properties experience low pressure

We have met the performance commitment level for the average time that properties experience low pressure. We have achieved this in each of the years of the current AMP period.

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This is a bespoke measure, intended to better reflect both the service to customers and the health of our assets, and to avoid the inherent weaknesses in the old 'properties at risk' measure – see line 3A.12 above.

Under this measure we make no exclusions for low pressure that result from asset failures such as mains bursts and pumping failures, nor do we exclude low pressures that are in consequence of planned maintenance work. These all affect the service to customers. The aim of the measure is to promote actions and investment that will resolve low-pressure problems that affect the greatest number of properties for the greatest duration.

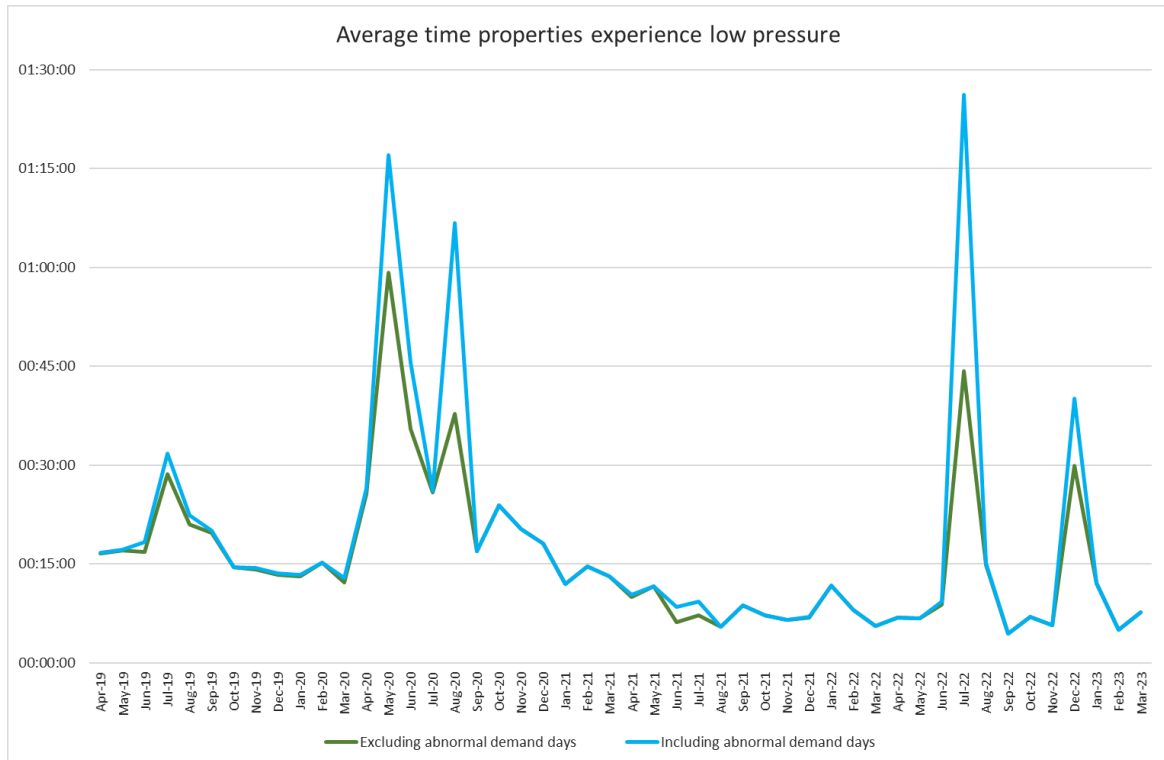
However, the measure does allow for up to five days of abnormal demand (measured at a zone level) to be excluded from the reporting. In hindsight, we recognise this was a mistake as it runs contrary to the intention of the measure and serves only to artificially reduce the reported effect on pressures caused by increased water consumption during exceptional weather conditions. We do not wish to retain this exclusion in the 2025-30 AMP period.

We have been measuring low pressure by average hours since April 2019. Performance each year is shown in the table below.

Average time (hh:mm:ss) properties experience low pressure

Year	Excluding five days abnormal demand (PC definition)	Without exclusions
2019/20	03:22:23	03:30:20
2020/21	05:02:48	06:01:00
2021/22	01:35:05	01:39:54
2022/23	02:33:26	03:26:22

However, performance is perhaps better understood when viewed monthly (April 2019 to March 2023):



The effect of extreme weather conditions can be seen clearly in the summers of 2020 and 2022, and the freeze-thaw of December 2022. Aside from these peaks, the underlying trend can clearly be seen to be downward and is reflective of the capital investment made in the current AMP.

### 3E.7-8, 11-12 Customers in vulnerable circumstances

We are committed to delivering an exceptional experience to all our customers, ensuring our services are available and inclusive to all. We offer a range of services, both for financial support (such as those receiving our Low Income Fixed Tariff) and for those registered on our Priority Service Register designed for those customers that may require extra help with communication, access, physical or other needs.

It is important we keep track of what matters to our customers and to ensure we are delivering the levels of service they expect.

We ask our customers to tell us about their experiences with us and to score us from 0 (very dissatisfied) to 10 (very satisfied). We also ask our customers to tell us how easy we are to do business with, again scoring us using the same scale where 0 is not easy and 10 very easy.

The survey results provide the responses to the following questions:

- How satisfied are you with the service you receive from us?
- How easy are we to do business with?

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We are delighted that we continue to meet our target of 90% satisfaction, ensuring our services and the experience we are providing our customers is meeting their needs and expectations.

Just because we are meeting our target it does not mean we are slowing down. We acknowledge that surveys scores have reduced year on year, and we are working hard each day to constantly review the service we deliver to ensure we remain relevant, open, and accessible to all of customers.

### Responses received

During 2022/23 we received a total of 45,555 survey responses following customer interactions, of which 13% were recorded as customers in 'Financially Vulnerable' circumstances and 21% as customers on the Priority Service Register (PSR). Overall >90% of customers scored us between 7-10 (0-10 scale) for "Customer service" and "Making it Easy", meeting our 90% commitment.

We survey customers through a variety of contact channels following an interaction with us. We also proactively contact customers who have not had contact with us for over 12 months. We aim to reach as many customers as we can to ensure the survey results provide a realistic reflection of our customer base and a robust sample size for reporting. The survey volume was over 10,600 for Customer Satisfaction and 9,500 for "Making it Easy".

### Platform upgrade

In 2022/23 we moved survey providers and insights from 'Rant and Rave' to Qualtrics to provide better analytics on responses we receive to our surveys.

### Contact Channels

The FD guidance sets out that surveys should be conducted through SMS, web, email, and end of call surveys.

For 2023/23 we identified that not all contact channels noted in the guidance were used.

Letter surveys were omitted from our contact channels in 2022/23. With the move to a new reporting platform, the letter surveys did not have the same facilities for vulnerabilities that our other channels have by design. As such our focus was on providing the very best customer experience, ensuring that the process for customers to provide feedback was as easy for them as possible, and the letter facilities designed with their needs in mind.

Along with providing the ability to complete a paper copy (and return in a pre-paid self-addressed envelope), our letters now include a concise and user-friendly http link to the survey and an accompanying QR code. This unfortunately took additional time to develop, and as such we were not able to implement the changes before the end of the 2022/23 report year.

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We believe the absence of sending out surveys via letter does not detrimentally affect our reported numbers. We have found through previous surveys that we typically receive a <1% return on lettering surveys vs a 15% return on SMS.

Letter surveys have however already been sent out in May 23 for 2023/24 reporting.

Web surveys were conducted to understand customer satisfaction, however in 2022/23 there was no facility to identify whether responses from customers visiting our site were from PSR or financially vulnerable customers.

Our website has subsequently been updated, asking customers to identify if they are on a social tariff or the PSR register and will allow identification for 2023/24 reporting.

### Proactive Survey

We proactively conducted our perception survey via SMS with customers who are on the PSR register or flagged as financially vulnerable but did not have contact with us during the year. Their responses have been consolidated into the relevant 'question' and the scores incorporated into our percentage results.

### Wording of questions

In line with our branding and tone of voice, the words 'we' and 'us' are used in place of 'Affinity Water' in the survey questions.

### Customers surveyed

We can confirm that only contacts relating to billing and financial queries have been included in the 'receiving financial help' surveys, further we can confirm that interactions relating to operational, or metering queries have been excluded as specified in the 'specific' exclusions within the guidance. We are unclear whether meter reading queries fall within 'metering', for the avoidance of doubt these have not been included.

The customers receiving non-financial help surveys have been conducted solely with customers on the PSR register who we have interacted with regarding a matter related to PSR services.

Vulnerable customer surveys were audited by our external auditor Atkins. The auditor confirmed that while we did not comply fully with the reporting channels as laid out above "we do not believe this has any material impact on the overall results."

In line with the requirements of the FD published results of the surveys can be found on our website at

<https://www.affinitywater.co.uk/docs/performance/2023/Additional-Services-2023.pdf>

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### 3E.9 BSI Accreditation

We have again achieved certification to British Standard 18477 for inclusive services provision, which is valid for one year. We have held verification of certification to the standard since Feb 2019.

Verification to the standard requires an independent assessment by BSI, to demonstrate that we have the required processes and policies in place for identifying and responding to consumer vulnerability. The outputs of these processes are put to the test during certification to ensure they are working in practice.

BS 18477 covers practices around the identification of customer vulnerability and inclusive design of products and services. Tied into the ongoing improvements we are making across all our customer metrics; BSI 18477 gives our customers confidence that we are committed to treating vulnerable customers fairly and ensures we maintain the standards set for accreditation.

Following an announcement from the British Standards Institution that BSI 18477 will be replaced with ISO 22458 in April 2024, all companies holding the BSI 18477 certificate will have the opportunity to transition to the new ISO and Kitemark scheme.

We are planning the following transition period to this new ISO standard:

- January 2023 – Audit completed - BSI standard 18477
- January 2024 – ISO 22458
- January 2025 – ISO 22458

In line with the requirement in the Final Determination, we will formally write to Ofwat to request a change to the BSI standard assigned to our performance commitment.

In order to transition successfully from the BSI standard to the ISO standard and the Kitemark requirements we have planned a 'gap analysis' against the Kitemark requirements in September 23.

The BSI Kitemark has been tailored specifically to demonstrate best practice for Water Provision. This includes alignment with Ofwat requirements including the Paying Fair Guidelines

### 3E.10 IT Resilience

The IT resilience metric monitors priority 1 & 2 incidents to ensure services are restored in a timely manner ensuring unplanned interruptions to services are kept to a minimum and therefore disruption to our customers.

The impact score for IT systems has improved year-on-year for the past 3 years. This continued reduction is due to the success of IT resilience initiatives that have been completed, including:

Migration to the 'cloud' - All company servers now reside in the cloud, a highly available, highly scalable, and resilient environment which has reduced the number of outages due to server failures.

- Adopting "Cloud 1st Ethos" with any new technologies we leverage SaaS (software as a service) offerings where possible.
- Our IT Resilience Programme - looks to continually improve upon our strong foundational platform, by enabling regular hardware refreshes, regular patch management and application product upgrades to ensure we maintain vendor support.
- Focus on risk mitigation, where we identify potential vulnerabilities and the measures to mitigate them, though implementing security controls and backup systems to establish continuity plans to address threats effectively.
- Heavily focused on security controls and measure to ensure we invest in tooling that proactively advises of potential cyber vulnerabilities allowing us to take swift remediation when necessary.
- Standard mandatory training across the organisation to improve technology awareness i.e., security best practises.

The reported impact score is a total score derived from the availability/ outages of all our key systems though out the year. A summary of availability for these systems for 2022/23 is shown below:

	Yearly (Apr22-Mar23)		
	Total Downtime (Minutes)	Total available uptime Since April 2022 (Minutes)	% Uptime for Period
Totals	2,361	8,386,560	99.97%

## Reporting and assurance

As required in the FD, we confirm that as part of our external assurance process IT resilience was audited by our external assurers, their statement is below:



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A summary overview of the above can be viewed in our APR Assurance report

### **Summary**

The Company's methodology for reporting is robust, with checks and controls built into the processes. We reviewed the post review assessment process it conducts after an IT incident, which identifies and puts in place preventative measures. Our recommendation is to document this process within the Company's procedure document.

### **Methodology**

The Company's methodology for reporting, resolving and mitigation is robust and in-line with the guidance set out in its Final Determination. The Company demonstrated that the systems it has in place captures all the required information to manage an IT incident, and the various way an IT incident can be raised.

The Company also demonstrated its post assessment review once an IT incident is resolved, detailing the lessons learnt and preventative measure put in place by the company to mitigate a repeat event. We highlighted that the Company had not included this within its process manual, and recommended that this be included, as this is an important step in the process and demonstrate the end-to-end controls it has in place. We concluded that the process is aligned to its Final Determination, however, the process manual was not explicit in the types of IT services, and we recommend that it is amended to align with the FD.

Furthermore, the Company has made several investments to improve its IT resilience e.g. Cloud, to ensure that it meets this Performance Commitment.

### **Data**

We were able to confirm that the Company is meeting its committed performance level. We were able to conduct audits on several Priority 1 and 2 incidents and found the data to be accurate. Each incident we reviewed was aligned to Company's Service Now system which records each incident.

This is not a complex reporting process, and the Company was able to demonstrate that its data and data controls were robust.

## **3E.13 Value for Money Survey**

Our value for money survey seeks to understand householders' overall satisfaction with value for money of our service.

As part of our Customer Perception Survey, customers are asked to rate the value for money of the services they receive from us. Customers score from 0 to 10, where 0 is 'very poor value for money' and 10 is 'excellent value for money'. The surveys are conducted each quarter by an external market research company and the 4 quarterly scores are averaged for the overall yearly result.

Our full year score was 7.34 based on 4 quarterly averages (Q1: 7.20, Q2: 7.54, Q3: 7.16, Q4, 7.47) compared to our commitment level of 7.70.

Whilst we are disappointed that we did not achieve our commitment level, we acknowledge this was particularly stretching against the backdrop of customers facing rising costs in living, post pandemic financial pressures. Customers often cite increasing household bills and being unable to compare price as reasons for lower scores. We are committed to improving our customer perceptions of us and the reflected value for money score.

In 2023/24 we are looking to move survey provider to gain greater insights into our customers perceptions, from which we can develop plans to enhance performance. The VFM question itself will however remain the same.

### 3E.14 WINEP delivery

We have met our 2022/23 commitment for WINEP and are on-track to meet the full AMP7 programme. We have completed 26 schemes to date, all of which have received formal sign-off by the Environment Agency. The schemes completed within 2022/23 are listed in the table below.

Scheme/ Investigation ID	Waterbody name / Scheme name	Project scope	Completion date
7AF100001	Chelmer (u/s Gt. Easton)	Investigation and Options Appraisal – Affinity Water to establish what extent planned abstraction and changes in the use of licences 8/37/31/*G/0042 and 8/37/35/*G/0023 might cause deterioration of flow / ecological status of the waterbody and to identify suitable options to ensure risk is removed.	30/01/2023
7AF100006	North Essex Chalk	Investigation and Options Appraisal - Investigate whether abstraction is causing a failure of the status of North Essex Chalk groundwater body. Ensure No deterioration due to planned abstraction	30/01/2023
7AF100042	Upper Bedford Ouse Chalk	Investigation and Options Appraisal - This is an investigation to determine whether increased use of groundwater abstraction will cause deterioration of the status of the groundwater body. If it is shown that increased abstraction causes deterioration of status, then the investigation needs to look at the costs of options to provide alternative sources of public water supply. It is the opinion of EA that increased use of the licence beyond maximum peak use between 2005 and 2015 rounded up to nearest 1000 m3 may cause deterioration.	07/03/2023

7AF10009 a and b	Stutton Brook	Investigation and Options Appraisal – Affinity Water to establish what extent planned abstraction and changes in the use of licence 8/36/17/*G/0082 might cause deterioration of flow / ecological status of the waterbody and to identify suitable options to ensure risk is removed.	30/01/2023
7AF100136, 7AF100137 and 7AF100142	Nailbourne and Little Stour	Investigation and Options Appraisal - Implement a Non licence change in AMP 8. Licence previously evaluated through the Little Stour ALF Scheme, but the Option being implemented was constrained by the Cost Benefit assessment. [despite peripheral location, verification of sustainability required - light touch anticipated].	30/01/2023
7AF100145	Upper Dour	Options Appraisal - Assessment of Dour MoU Time Limited Licences [March 2028].	30/01/2023
7AF200030; 7AF200031; 7AF200032; 7AF200033; 7AF200034; 7AF200035	Dour from Kearsney to Dover	Options Appraisal - of Dour MoU Time Limited Licences [March 2028].	30/01/2023
7AF200036 and 7AF200037	North and South Streams at Northbourne	Investigation and Options Appraisal - Licence not evaluated through the Dour ALF Scheme [verification of sustainability required]	30/01/2023

## Table 3F - Underlying calculations for common performance commitments - water and retail

### 3F.5 Leakage and 3F.6 Per capita consumption (PCC)

In line with the 3A.3 commentary, we are restating our leakage and PCC base year figures as below:

Line description	Unit	PCL - actual (2017-18)	PCL - actual (2018-19)	PCL - actual (2019-20)	Baseline (average from 2017-18 to 2019-20)	PCL - actual (2020-21)	PCL - actual (2021-22)	PCL - actual (2022-23)
Leakage	Ml/d	178.7	203.9	178.7	187.1	167.9	154.3	150.7
Per capita consumption (PCC)	l/p/d	151.0	158.3	152.8	154.0	167.0	157.9	157.0

The restated individual water balance and leakage component table lines are detailed in the 6B commentary.

## Table 3H - Summary information on outcome delivery incentive payments

The commentary to tables 3A and 3F above explain that we have re-stated our leakage and per capita consumption performance figures for prior years. One effect of this is to change the three-year average baselines against which performance and penalties are calculated. We calculate that the in-period adjustments based on previously reported performance in 2020/21 and 2021/22 have over-penalised the company by £120k for leakage compared to our revised position. In-period PCC incentives are unaffected since PCC is an end of period adjustment.

We propose that the leakage penalty be corrected in the ODI performance model for 2022/23, such that the correction is made in-period, in April 2024 charges. Our calculation below, which adjusts for the time value of money, yields a correction of £0.133m in 2017/18 prices, and is stated before application of inflation and tax.

	2020/21	2021/22
Change in Penalty amount (2017/18p)	0.048	0.080
Proportion Water Resources (%)	0%	0%
Proportion Water Network Plus (%)	100%	100%
Discount Rate (%)	2.92%	2.92%
Years of deferral (n)	2	1
Value of Adjustment Water Resources £m 2017/18p	0.00000	0.00000
Value of Adjustment Water Network Plus £m 2017/18p	0.05084	0.08234

If the correction is made, the effect on customer bills is relatively small, about 10p per customer. As we did last year, when setting charges for April 2024, we will be sensitive to the cost-of-living pressures being experienced by some of our customers and we will act to mitigate bill change effects.

## Table 3I - Supplementary outcomes information

### 3I.1 Planned outage

We have developed an internal target for planned outage of <3% of PWPC, which we are using to drive internal improvements in how we plan, manage and record planned site outages. Planned outage for 2022/23 was 4.96%, an increase on 2021/22. This increase was due to reasons such as UV upgrades, statutory works, borehole replacements and a variety of other project works.

Please see commentary under 3A.6 for unplanned outage.

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## 3I.2 Risk of severe restrictions in drought

Please refer to commentary given under 3E.1.

For columns 4 to 9 of line 3I.2, we have made the following assumptions:

- Col. 4 Deployable output - is reported as the declared baseline deployable output in the WRMP Tables without any impact from climate change, sustainability reductions, treatment losses, etc.
- Col's. 5-8 are reported as in-year figures rather than averages.
- Col. 9 Customers at risk is reported as the 25-year average, consistent with the percentage of customers at risk reported in Table 3E.

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## **Section 4: (Additional regulatory information – service level)**

### **Table 4A - Bulk supply information for the 12 months ended 31 March 2023**

#### **4A.1 to 4A.26 Bulk supply exports**

The total volume exported increased significantly from 2021/22, mainly through the export from Egham works to South East Water, which increased by 26%. The increase was due to high demand during the summer (July in particular) and the freeze-thaw event in December and January. The number of exports has increased by six from 2021/22 due to additional NAVs (New Appointments & Variations) that have been connected in our supply region. We are reporting on all connected NAVs, including three that are connected but awaiting final meter details and are therefore currently reporting zero volumes.

#### **4A.27 to 4A.52 Bulk supply imports**

The total volume imported also increased significantly from 2021/22. This is attributable mainly to the import from Grafham, which we increased by 18% from 2021/22. As with bulk exports, this was due to high demand during summer and the winter freeze-thaw.

### **Table 4Q - Developer services - New connections, properties and mains**

#### **4Q.13 Length of new mains - Requisitions,**

We are reporting 15.0km, which is similar to 15.9km in 2021/22 and 18.2km in 2020/21.

#### **4Q.14 Length of new mains - SLP's,**

We are reporting 30.5km, compared to 27.4km in 2021/22 and 13.8km in 2020/21.

In 2022/23 we have seen a small increase in the overall length of mains to serve new properties to 45.5km, compared with 43.3km in 2021/22 and 31.9km in 2020/21. This is consistent with continued pick-up inactivity after the Covid-related lows of 2021.

We continue to see the length of main laid by self-lay providers (SLPs) increase and length of mains laid under requisitions decrease, a trend which continues to reflect developers' desire to use SLPs to install water mains (alongside other services).

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We have resolved the delays in receiving SLP 'as-laid' records experienced in 2021/22 by improving administrative processes so that timely handover of SLP as-laid is achieved.

## Table 4R - Connected properties, customers, and population

### 4R.18 Total number of new business properties connections

The number of billed new connections increased from 130 in 2021/22 to 204. Overall, the number of new connections i.e., including those which are currently not being billed, increased from 282 to 320. There has been a considerable improvement in the time it takes to get new connections into charge by retailers.

### 4R.20 Residential properties unbilled at year end

24,993 properties have been identified as being uneconomical to bill and excluded from void calculations. These are properties that are listed as being billed as a measured property and have an occupancy status of empty/no named customer listed as bill payer in the billing system and where meter reads show that the consumption going through the meter is equal to or less than 5m<sup>3</sup> (as detailed in APR-21 queries AFW-APR-CA-003 and 005). The annual average equivalent used in annual average voids calculations is 24,776. There are no "other" unbilled properties recorded.

### 4R.21 Residential void properties at year end

See commentary on void properties under 3A.8

### 4R.23 - Business properties billed at year end

In accordance with the RAG at the time, the figures we reported in 2020/21 included supplies to cattle troughs.

Excluding cattle troughs, the 2020/21 figures would have been:

	(000's)
Unmeasured - no meter	7.966
Measured - no meter	0.006
Measured - basic meter	44.732
Measured - AMR meter	8.266
Total	60.970

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For both 2021/22 and 2022/23 we have reported our end of year business property figures to exclude Cattle Troughs

Whilst the number of billed measured properties has decreased, the number of billed unmeasured properties has increased. This is the result of a project started during 2021/22 and has continued into 2022/23 where we contracted a third party to visit all the void unmeasured properties and gathered information which was passed onto the retailer.

#### **4R.24 Business properties unbilled at year end**

We have 206 business properties which have been temporarily disconnected from supply due to lack of payments to their relevant retailers. We have excluded these from the overall property connections list. This is a large increase from last year, 60 properties.

We report these as 'Unbilled – Other' as these most closely align with properties that are unbilled in the guidance.

	Nr
Temporarily disconnected properties – measured – basic meter	149
Temporarily disconnected properties – measured – AMR meter	26
Temporarily disconnected properties – void	31
Temporarily disconnected properties – total	206

#### **4R.25 - Business void properties at year end**

The figures we reported in 2020/21 included supplies to cattle troughs.

Excluding cattle troughs, the 2020/21 figures would have been:

	(000's)
Unmeasured	1.736
Measured	10.106
Total	11.842

For both 2021/22 and 2022/23 we have reported our end of year business property figures to exclude cattle troughs.

#### **4R.26 - Total connected business properties at year end**

The total number of Business Properties in CMOS has decreased from 2021/22 by 319. This is due to the continued work around properties eligibility in the market and investigating meters which have not been read for a long period of time.



The overall number of Business properties has fallen from 2021/22 as work has continued in improving our data especially around meters which have not been read since before market opening in October 2016.

### APR-21 update

When reporting end of year figures in 2020/21 cattle troughs were not excluded from the count as the guidance at that time did not ask for this exclusion. Had cattle troughs been excluded we would have reported 72,812 business properties (as against 72,992 originally reported).

Excluding cattle troughs, the 2020/21 figures would have been:

	(000's)
Unmeasured	9.702
Measured	63,110
Total	72.812

For both 2021/22 and 2022/23 we have reported our end of year business property figures to exclude Cattle Troughs

## 4R.28 – Resident population

We have purchased from an annual population data update from CACI. The data set contains estimates for household, non-household (or communal population), and Hidden and Transient Population estimates. The data sources used for the assessment of household and non-household population can be seen below.

Data Source	Source
Population:	
2019 Local Authority Population Mid-Year Estimates	ONS
2019 LSOA Population Mid-Year Estimates	ONS
2018-2043 2018-based Local Authority Population Projections	ONS
2019-2069 2018-based Principal National Population projections	ONS
2011 Census OA split between communal and household population	ONS
Households:	
2019-2043 2018-based Local Authority Household Projections	ONS
2011 LSOA Census population and households	ONS

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The methodology used is as follows:

1. The 2011 census postcode head-count datasets are used to make initial estimate in each postcode.
2. Postcode and PAF change data are then applied to all postcodes and estimates are rolled forward.
3. ONS Mid-year estimates at Super Output Area level, apply PAF changes year-on-year.
4. Transfer postcode base estimates to most up-to-date geographies. Postcode populations are scaled to match the LA/UA projections. By comparison of PAF year-on-year, an estimate is made of the proportion of change in a postcode which is due to communal population, and the proportion due to change of population in households.
5. From postcode link to Water Resource Zone shapes which Affinity Water provided to CACI to derive the WRZ population figures.

As per previous years, an adjustment is made to account for the Hidden and Transient population within our water balance. This adjustment includes an estimate for:

1. Short term residents - Anyone living in England and Wales who was born outside the UK and who intended to stay for a period of between 3 and 12 months, for any reason
2. Second address within the Affinity Water operating area - An address at which a person stays for more than 30 days per year that is not a person's place of usual residence
3. Irregular migrants - The term 'irregular migrants' typically refers to the stock of migrants in a country who are not entitled to reside there, either because they have never had a legal residence permit or because they have overstayed their time-limited permit

An adjustment is made for fringe supplies sitting outside the Affinity Water boundary but supplied by Affinity, properties fed by a private well, and NAV properties. The data for this is provided by the records held on our GIS system.

## **4R.31, 4R.32 – Household measured and unmeasured population**

To split out this population the following steps are then taken:

1. Property numbers are provided by the water balance team
2. The AR22 occupancy rates are multiplied by the number of measured and unmeasured properties accordingly at a resource zone level.
3. This is then reconciled against the total household population generated, including hidden and transient populations whilst deductions are only made to the unmeasured population for the fringe, NAV and private well supplies
4. This means that the ratio of measured to unmeasured population numbers are maintained but the numbers are adjusted proportionally.

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## **Section 5- (Additional regulatory information – water resources)**

### **Table 5A - Water resources asset and volumes data for the 12 months ended 31st March 2023**

#### **5A.1-8 volumes abstracted**

The volume of water abstracted increased compared to 2021/22 in line with the increase in distribution Input. This was due to increased demand in the summer hot weather and the December freeze-thaw.

We have no abstractions under lines 5A.5-8 (and 5A.13-16).

#### **5A.9 - Number of impounding reservoirs**

As in previous years, we have classified Heron Lake and Queensmead Lake as impounding reservoirs. We consider this the closest category available for reporting these sources, although they may not strictly fall into that classification.

#### **5A.10 - Number of pumped storage reservoirs**

As in previous years, we classify our Chertsey works' river volume as pumped storage. The raw water reservoir receives water abstracted from the River Thames which is then pumped into the treatment works.

#### **5A.12 - Number of groundwater works, excluding managed aquifer recharge (MAR) water supply schemes**

Although the number in this line is the same as reported in APR-22, during 2022/23 Blackford site was decommissioned and Marlowes site was recommissioned.

#### **5A.17 - Total number of sources**

The total number of sources remains unchanged from 2021/22.

#### **5A.19 - Total volumetric capacity of water reservoirs**

The volumetric capacity has reduced by 85MI. This is due to Anglian Water providing updated information for Ardleigh reservoir, in line with their bathymetric survey report giving a more accurate reflection of the volume.

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## 5A.21 Total installed power capacity of intake and source pumping stations

The total installed power capacity has decreased from last year. This is due to pump replacements (Primrose, Slip End), and decommissioned pumps (one at Wall Hall, and all of Blackford source pumps as the site has been decommissioned). There have also been amendments to kW data in Maximo and APH alterations from last year which account for this decrease.

## 5A.22 Total length of raw water abstraction mains and other conveyors

The 0.96km length reported in this line is the balancing main from Heron Lake to Queensmead (length 0.96km).

## 5A.23 Average pumping head – raw water abstraction

The percentage of total lift at site/pump group level is derived from telemetry output and has been calculated using verified annual abstraction volumes (wherever in context with abstraction source pumps) from 2022/23.

		AWC	AWSE	AWE	Weighted Average
Average pumping head ~ raw water abstraction	2021/22	16.63	32.00	22.89	17.59
Average pumping head ~ raw water abstraction	2022/23	16.48	27.04	23.34	17.23

This 2022/23 rise in raw water abstraction does not have a significant impact on the APH reported across individual regions or the overall weighted average.

The percentage of measured data across the entire company for Raw Water Abstraction price control area was 91.2%, which is favourable to the average 80% threshold for all the price control areas.

Estimations were made on missing or insufficient data available. The estimation method for pressure data for the price control included using previous years' static head or accepting models from previous years, where there was no evidence of radical interventions at sites/pump sets. One exception was at Iver (our largest water treatment works), where up to date static data using local monitoring was used. Of the estimated calculation, 100% used engineering calculations to obtain a figure.

In Brett (East) region we have not reported any pumped storage volumes from Ardleigh Reservoir. As agreed previously with Ofwat, volumes will be reported by the Ardleigh Reservoir Committee (ARC) as the licence holder, rather than by Affinity Water and Anglian Water. However, this does not impact on the pumps associated

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with Ardleigh Reservoir and their head calculation remains part of the APH model for 'treated water distribution'.

## 5A.25 – 5A.28 – Raw water abstraction imports and exports

We do not have any raw water abstraction imports or exports.

## 5A.29 Water resources capacity

We measure water resources capacity in terms of water resources yield, which captures the annual average volume of water available from the environment and constrained by water resources control assets (network and treatment constraints).

The deployable output (DO) values used to calculate the water resources capacity figure are from WRMP14 and WRMP19 values (based on a 1 in 200-year drought). Where network and treatment constraints have been identified, the average DO values have been uplifted using expert judgement to account for the sources' full capability under drought conditions. The cumulative climate change impact is then applied.

Water resources capacity, and the resulting potential DO uplifts, constitute a theoretical scenario only. We have an agreed programme of licence capping and sustainability reductions in order to leave more water in the local environment. Therefore, we need to take a cautious approach to any increases in abstraction due to the removal of network and treatment constraints in catchments that are deemed environmentally sensitive.

Year-on-year changes to the water resources capacity reflect the WRMP climate change figures (which are cumulative), together with sustainability reductions which have resulted in a reduction or cessation of a source. The difference between the 2021/22 and 2022/23 figures is the climate change impact value applied, plus the implementation of a voluntary sustainability reduction at Chesham and Chartridge sources which reduced the DO at both sites to zero.

For 2022/23 reporting, we have removed from the calculation the DO value for Grafham (50 MI/d in AMP7; 91MI/d in AMP6), as this volume is accounted for already as a treated water import. Prior years' water resources capacity figures (without the inclusion of Grafham) are given in the table below:

Year	Water resources capacity (MI/d)
2018/19	1058.61
2019/20	1057.5
2020/21	981.94
2021/22	980.76
2022/23	973.21

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### **5A.30 – Total number of completed investigations (WINEP/NEP), cumulative for AMP**

We have completed a total of 26 schemes to date. Details of those completed in 2022/23 can be found under line 3E.14.

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## Section 6 - (Additional regulatory information – water network plus)

### Table 6A - Raw water transport, raw water storage and water treatment data for the 12 months ended 31st March 2023

#### 6A.1 - Total number of balancing reservoirs

We have increased the number of balancing reservoirs by one from the APR-22. The Mill End raw water break tank is now included as we identified that the tank is fed from its own onsite boreholes as well as four offsite boreholes from our Springwell site.

#### 6A.2 - Total volumetric capacity of balancing reservoirs

The volumetric capacity remains unchanged from the APR-22 submission. Although Mill End tank has been added as a balancing reservoir it is only 0.106MI. As the megalitre value for balancing reservoirs is reported as a whole number, the total overall remains unchanged at 133MI (although the actual value to 3dp has changed from 132.775MI to 132.881MI).

#### 6A.3 - Total number of raw water transport stations

The number of raw water transport stations has increased by one from 2021/22. As part of HS2 works, Chalfont St Giles site has been reconfigured and now goes to Amersham for treatment via three raw water transport pumps.

#### 6A.5 Total length of raw water transport mains and other conveyors

The 2.80km increase from APR-22 comprised 3.20km of new raw water mains, less 0.40km of existing main reclassified as non-potable water transport main for supplying customers (6A.12).

#### 6A.6 Average pumping head – Raw Water Transport

		AWC	AWSE	AWE	Weighted Average
Average pumping head ~ raw water transport	2021/22	18.78	0.39	56.03	19.84
Average pumping head ~ raw water transport	2022/23	19.86	0.39	57.44	20.28

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The percentage of raw water transport loss at site/pumping group level (where water abstraction site and water treatment works were not located at the same site) was calculated from telemetry output, pipework information from Infoworks, GIS and hydraulic models. Only one site uses an estimated calculation, this uses engineering calculations to obtain a figure.

There was a marginal increase in APH for raw water transport volume due to the increased abstraction volume.

The percentage of measured data for this price control area was 94.6%, which is adequate and above the 80% threshold of measured data ratio for all the price control areas. However, there were some estimations still necessary to make by proportionally splitting of data.

## **6A.8 - Total number of raw water transport imports**

We have one raw water transport import, which is received from Thames Water into our Iver site for treatment. This is included in table 4A.

## **6A.12 Total length of raw and pre-treated (non-potable) water transport mains for supplying customers**

5.5km of non-potable mains included in this line are mains that supply end customers with non-potable water.

All of the remainder are mains which convey treated water from a treatment works to a service reservoir, but the water in the main is not classed as potable until it has discharged into the reservoir (either because of chlorine-contact time or the need for the water to be blended with water from other sources).

The 0.4km increase from 2021/22 is attributable a change in the second category above.

## **6A.13 - All simple disinfection works**

Although the number in this line is the same as reported in APR-22, during 2022/23 Marlowes site was recommissioned and included as a simple disinfection works, whilst Lighthouse site has moved from a simple disinfection works to GW2.

## **6A.15 - W2 works**

The number has increased by one from 2021/22 as Lighthouse has moved from a simple disinfection works to GW2. The site now has a contact main and sampling is conducted post contact and has been changed from marginal chlorination to superchlorination.



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## **6A.16 - W3 works**

The number has decreased by one as Blackford site has been decommissioned.

## **6A.17 - W4 works**

The number of W4 ground water works has decreased by one, as raw water from Chalfont St Giles site is now transported to Amersham site for treatment.

## **Number of Works**

As per the revised reporting guidance (RAG4.11), we have calculated the number of treatment works in each band against peak week production capacity (PWPC). We have not included bulk imports or bulk exports, with the exception of export to South East Water as this is directly exported from Egham WTW.

## **6A.20 WTWs in size band 1**

The number has increased by two from 2021/22. Although Clandon and Chartridge did not run into supply in 2022/23, they are included in Band 1 against their available PWPC. This is in line with the Ofwat clarification of 05/05/22.

## **6A.21 – WTWs in size band 2**

The number has decreased by three from 2021/22. Although Causeway and Runleywood Chalk produced higher DI than PWPC, they are included in Band 2 against their available PWPC. Stansted PWPC was revised from 5.2MI/d to 3.12MI/d and is now included in band 2. This is in line with the Ofwat clarification 05/05/22.

## **6A.22 – WTWs in size band 3**

The number has decreased by two from 2021/22. Stansted, Causeway and Runleywood Chalk have been moved from band 3 to band 2. In addition, Chalfont St Giles is no longer classified as a WTW as its raw water is now transported to Amersham for treatment. Marlowes was returned to service in 2022/23 and is included in band 3. Although Chesham did not run into supply during the year, it is included in Band 3 against its available PWPC. This is in line with the Ofwat clarification 05/05/22.

The number has remained the same APR22 as we are calculating the number of treatment works in each band against Peak Week Production Capacity ( as per Ofwat RAG4.11 additional guidance for this line ) and no longer including bulk imports or bulk exports with the exception of export to South East Water as this is exported from Egham WTW. This is in line with the Ofwat clarification 05/05/22.

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## 6A.29 PWPC having enhancement expenditure for grey solution improvements to address raw water quality deterioration

The PWPC for the following treatment works are included:

Treatment works	MI/d
Iver	227.30
Egham	135.09
North Mymms	20.60
Stansted	3.12
Oughton Head*	0.00
Total	368.11

\*Oughton Head has no PWPC as the treatment works is currently not in service. We are carrying out works to bring the site back into use.

## 6A.30 PWPC having enhancement expenditure for green solution improvements to address raw water quality deterioration

We do not have any sites to report under green solutions

## 6A.31 Total water treated at more than one type of works

This is reported as zero volume as we do not have any works where water is treated at more than one type of works shown in lines 6A.13 to 6A.19.

## 6A.32 Number of treatment works requiring remedial action because of raw water deterioration

There are seven treatment works that require remedial action because of raw water deterioration. These are for metaldehyde at Iver, Egham, Chertsey, Walton, Ardleigh (DWI Ref AFW-2019-00002) and North Mymms (DWI Ref AFW-2020-00003), Cryptosporidium at Iver (DWI Ref AFW-2020-00005) and Egham (DWI Ref AFW-20209-00006) and microbiological parameters at Windmill Hill (DWI Ref AFW-2021-00004). This is the same as in 2022.

## 6A.33 Zonal population receiving water treated with orthophosphate

The population receiving orthophosphate dosed water is 2,979,255, which is a slight increase from 2022 because of population increase across our supply area. The

number of orthophosphate dosing plants has remained the same and these plants are supplying the same water supply zones as in 2022.

### 6A.34 Average pumping head – water treatment

		AWC	AWSE	AWE	Weighted Average
Average pumping head – water treatment	2021/22	13.44	13.14	0.00	12.74
Average pumping head – water treatment	2022/23	11.66	9.93	0.00	11.16

The percentage allocation of treatment head loss at site/pumping group level has been calculated by static height differences or by deducting the 'Pressure available before treatment' from the 'Head available before distribution' values. This data has been verified as part of the review of the APH calculation.

Using as much verified total lift and flow data as possible for abstraction or raw water transport price control areas, data thus also helps to indirectly validate the treatment losses for each site/pump sets. In 2022/23 there were some changes to treatment routes (due to HS2 intervention or other capital works) however the reported APH was broadly similar to the 2021/22 reported number.

Of the estimated calculation, 100% used engineering calculations to obtain a figure.

The proportion of measured data for this calculated treatment head losses was around 86.1%, achieving the 80% threshold, where the estimates were indirectly related to missing pressure data downstream at the process associated with raw water abstraction and transport price control areas.

- Digswell updated to actual data
- Increased monitoring allowing more accurate calculations

### 6A.36-39 Water treatment imports and exports

We do not currently have any water treatment imports or exports.

## Table 6B - Treated water distribution - assets and operations for the 12 months ended 31st March 2023

### 6B.2 - Total volumetric capacity of service reservoirs

The reduction of 0.5MI from that reported in APR-22 is due to improved information relating to our Arkley 3 reservoir.

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### **6B.3 - Total volumetric capacity of water towers**

The reduction of 0.1MI from that reported in APR-22 is due to improved information.

### **6B.4 Water delivered non potable**

We have a total of five non-potable service connections. The increase from 2021/22 in volume delivered is likely attributable to the hot summer of 2022.

### **6B.10 Proportion of DI derived from river abstractions**

This has not changed significantly from 2021/22. Following a review of the classification of sources, we have moved the Ladymead import (Thames Water) from river abstractions to groundwater works. The Ladymead import accounted for 2.07 MI/d of Distribution Import in 2022/23.

### **6B.11 Proportion of DI derived from groundwater works**

As 6B.10 above, the DI for Ladymead import is now included under groundwater works.

### **6B.17 Number of potable water pumping stations delivering treated groundwater into the treated water distribution system**

The number has increased by 5 from 2021/22. Although Blackford and Chalfont St Giles are no longer included, Marlowes has been added in 2022/23. Redricks Lane, School Lane, Stonecross and Wadesmill Road have now been identified as source pumps that pump into distribution (APH percentages were previously only indicating abstraction and treatment). Also, Hadham Mill and Watton Road have been reclassified as sources into distribution.

### **Line 6B.19 - Number of potable water pumping stations that re-pump water already within the treated water distribution system**

The number has decreased by four from 2021/22; Bower Heath, Chartridge, Edwarebury Lane and Blackford boosters having been decommissioned.

### **6B.21 - Total number of service reservoirs**

The total number of service reservoirs has reduced by two from that reported in 2021/22. When aligning our storage asset database with our storage data held in MAXIMO, the historic naming of reservoirs was found to have some inconsistencies,

and in two instances (Saltwood and Sherrardswood) reservoirs with more than one cell were incorrectly being labelled as separate reservoirs.

## 6B.24 Average pumping head – treated water distribution.

		AWC	AWSE	AWE	Weighted Average
Average pumping head ~ distribution	2021/22	82.44	86.76	29.42	79.91
Average pumping head ~ distribution	2022/23	84.69	77.22	29.20	82.34

We apply a percentage allocation where a pump set is associated with both 'treatment' and 'distribution', maintaining the split from previous years in most cases.

The proportion of measured data for the 'distribution' price control area was 88.0% (above the 80% threshold). The remainder has been taken from calculated or estimated data, typically small booster sites which have minimal impact on the overall calculation. An important factor to the reporting of APH is identification of telemetry data points to give actual performance data rather than having to estimate data, the switch to SCX for our Southeast (Dour) region in 2022 now means there is improved visibility of data across the business.

Of the estimated data:

- 44% used hydraulic models from previous years
- 31% used pump duty data from previous years
- 13% used engineering calculations
- 9% used last year's data, due to a loss of monitoring
- 3% lost monitoring, however, did not have any contribution to the APH calculation, i.e. 0Ml/d

Estimated data accounts for less than 1% of the distribution average pumping head.

Water that is exported to South East Water from our Egham Water Treatment Works has been excluded from our APH calculations.

To minimize assumptions made in reporting average pumping head, we have linked 'head available before distribution' to specific telemetry measurement points where recorded pressure could best represent the remaining head before distribution. Where this was not possible, we have used previous year estimations.

Overall, there has been a slight increase in the APH for distribution from 2021/22, however remains broadly in line with historic performance.

## 6B.25 - Total number of treated water distribution imports

This line has decreased by one from the 2021/22 submission as the Lowerfield import from Cambridge Water is no longer used. Our Cockfosters import from Thames Water

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is not included yet as there have been delays in commissioning due to poor water quality results from the site suction tank.

### **6B.26 - Volume of treated water distribution imports**

The volume reported is significantly higher in 2022/23 due to an increase in our Grafham import (mainly during the summer months and during the freeze-thaw event in December and January), in line with increased DI from 2021/22.

### **6B.27 - Total number of treated water distribution exports**

This line has increased by six from 2021/22. This increase is due to additional NAVs (New Appointments & Variations) that have been connected in our supply region.

### **6B.28 - Volume of treated water distribution exports**

The volume reported is significantly higher in 2022/23 due to additional NAVs (New Appointments & Variations) that have been connected in our supply region and the increase in our export to South East Water (mainly during the summer months and during the freeze-thaw event in December and January).

### **6B.29 – Peak 7 day rolling average distribution input**

Our peak 7 day rolling average typically occurs in June or early July prior to summer school holidays as although hotter temperatures can be seen at the end of July or August, a significant amount of our population leaves the area for summer holidays. In 2022, our peak week was on 19 July which was a period of hot weather the week prior to schools breaking up for summer holidays.

### **6B.31-39 Water balance and 6B.58-67 Components of total leakage (post MLE) – restatement of year 2017/18 to 2021/22**

In line with the restated figures given in 3A.3 and 3F.5, the table below gives the corresponding restated numbers for 6B.31-39 and 6B.58-67. These numbers supersede those given in the 'Enhancement and water balance information request' submission of 15/08/2022. They are also a follow-up to the information we gave in that submission in response to APR-22 query ref. AFW-APR-CA-002 - line 21

## Restated water balance and leakage component lines 2017/18 to 2021/22

Line description	Units	DPs	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	RAG 4 reference
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Water balance - company level									
Measured household consumption (excluding supply pipe leakage)	MI/d	2	247.07	266.34	281.75	316.43	313.15	325.83	6B.31
Unmeasured household consumption (excluding supply pipe leakage)	MI/d	2	306.17	298.40	289.17	326.81	297.77	285.77	6B.32
Measured non-household consumption (excluding supply pipe leakage)	MI/d	2	168.22	166.56	161.44	121.75	138.74	156.86	6B.33
Unmeasured non-household consumption (excluding supply pipe leakage)	MI/d	2	9.08	9.91	9.07	9.06	8.60	9.74	6B.34
Total annual leakage	MI/d	2	178.68	203.88	178.68	167.92	154.25	150.66	6B.35
Distribution system operational use	MI/d	2	0.60	0.68	0.62	0.46	0.78	0.81	6B.36
Water taken unbilled	MI/d	2	13.12	13.70	13.19	23.03	23.05	19.14	6B.37
Distribution input	MI/d	2	922.95	959.47	933.92	965.46	936.35	948.81	6B.38
Distribution input (pre-MLE)	MI/d	2	918.85	959.49	930.42	966.62	943.51	960.20	6B.39

Components of total leakage (post MLE) - company level									
Leakage upstream of DMA	MI/d	2	27.50	43.93	25.37	29.91	28.38	27.20	6B.58
Distribution main losses	MI/d	2	108.87	117.12	111.97	82.80	69.89	66.65	6B.59
Customer supply pipe losses – measured households excluding void properties	MI/d	2	12.72	13.78	14.52	19.93	21.25	23.50	6B.60
Customer supply pipe losses – unmeasured households excluding void properties	MI/d	2	25.87	24.99	22.84	29.50	28.97	27.73	6B.61
Customer supply pipe losses – measured non-households excluding void properties	MI/d	2	0.84	0.85	0.82	1.35	1.36	1.37	6B.62
Customer supply pipe losses – unmeasured non-households excluding void properties	MI/d	2	0.35	0.35	0.33	0.45	0.46	0.47	6B.63
Customer supply pipe losses – void measured households	MI/d	2	1.24	1.54	1.52	2.19	2.22	2.18	6B.64
Customer supply pipe losses – void unmeasured households	MI/d	2	0.90	0.88	0.83	1.16	1.11	0.96	6B.65
Customer supply pipe losses – void measured non-households	MI/d	2	0.33	0.37	0.40	0.54	0.54	0.52	6B.66
Customer supply pipe losses – void unmeasured non-households	MI/d	2	0.06	0.06	0.07	0.09	0.09	0.08	6B.67

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### Shadow years (2017/18 – 2019/20) water balances – restatement

After investigating the differences previously responded to in response to APR-22 query ref. AFW-APR-CA-002 - line 21, we undertook a deep dive into the water balances for each of the shadow years and rebuilt them all from the ground up in order to provide confidence in the restated numbers.

We took this approach as none of the colleagues involved in generating the shadow water balances at the time of submission now work at Affinity Water and therefore questions relating to components calculations could not be answered without making assumptions. We do not have records of the shadow reporting calculations. We have since improved our record keeping retaining back calculations and reasons for decision making, such that we are not reliant on any one individual's historical knowledge.

Where possible we have used the same approach to calculate each of the components based on our current methodology for the AMP7 balances.

### Measured household consumption 6B.31 – restatement

For each year we have recalculated the pre-MLE measured household consumption using the same data source as in the AMP6 balance (internal billing system), ensuring that it includes all the consumption for those properties which were counted as non-households in AMP6, but are now considered as household as part of the AMP7 methodology

We have used the same Household MUR that was applied in AMP6 for all the pre- MLE household measured consumption.

### Unmeasured household consumption 6B.32 - restatement

For each year we have applied the same unmeasured PCC value that was derived from our IHM, and used in the equivalent AMP6 water balances, and then recalculated the overall pre-MLE unmeasured consumption based on the updated unmeasured household property counts as per the AMP7 definition.

### Measured Non-Household Consumption 6B.33 - restatement

For each year we have recalculated the measured non-household consumption using CMOS data as per the AMP7 definition so all the households which were classified as non-household in AMP6 are excluded from this figure as they are now counted as households in AMP7. An uplift for each year has been applied based on comparison with known logged non-household property volumes.

We have used the same Non-Household MUR that was applied in AMP6 for all the pre MLE measured business consumption.



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### Unmeasured Non-Household Consumption 6B.34 - restatement

For each year we have used the same unmeasured non-household per property value that was used in the AMP6 water balances, and then recalculated the overall consumption based on the unmeasured non-household property counts as per the AMP7 definition.

### Total annual leakage 6B.35 - restatement

We have not changed the bottom up pre-MLE leakage figure as this was already compliant with the AMP7 convergence methodology.

Supply Pipe Leakage has been recalculated using the same SPL figures as were used in AMP6 but based on the property counts as per the AMP7 methodology.

### Distribution system operational use 6B.36 - restatement

We have aligned our figures for 2017-18 and 2018-19 to match those which were used in the AMP6 water balances. The figure for 2019-20 was already the same as that used in the AMP6 water balance.

### Water taken unbilled 6B.37 - restatement

As previously stated, this was originally set to 1.8% of Distribution Input. We have now recalculated these figures for each year using a consistent methodology of actual data.

### Distribution input pre and post MLE 6B.38-39 - restatement

For 2017-18 and 2018-19 we had previously pointed out that our pre-MLE number was different to that of the equivalent AMP6 water balance. This has now been corrected we have aligned them with the pre-MLE DI used in the AMP6 water balance reporting, 2019-20 is unchanged.

### Population (4R.30) - restatement

For AMP6 water balances we used an occupancy rate for both measured and unmeasured household population which was multiplied by the number of measured and unmeasured households. We have recalculated the population based on the same occupancy rates as used in the AMP6 water balances and then used the updated property counts as per the AMP7 definition.

### 2020-21 Water balance - restatement

Further to query AFW-APR-CA-002 there was an issue with the water taken illegally unbilled for 2020-21. As explained in our response, at that time we did not have a reliable value to update the balance. As set out, we were continuing to work on our compliance and would bring all amendments together, which now are set out in this

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document. For 2020-21 the void consumption had been omitted from the value. We have now been able to calculate the value for that period and have updated the water balance and restated the outcomes for that year. This does not change the outcome for leakage and PCC, both remain a failure of Performance Commitment in that year.

Other minor amendments as below have been made to align the 2020-21 water balance methodology.

#### Measured household consumption 6B.31 – 2021/22

The pre-MLE figure has been recalculated using our internal billing system data, as we discovered that the figure originally submitted contained void consumption, and there was an inconsistency in how the MUR was being applied.

#### Measured non-Household consumption 6B.33 – 2021/22

The pre-MLE figure has been aligned with our current methodology.

#### Unmeasured non-household consumption 6B.34 – 2021/22

The pre-MLE figure has been aligned with our current methodology.

## Table 6C - Water network+ - Mains, communication pipes and other data for the 12 months ended 31st March 2023

### Mains length – APR and PR24 reporting

Lengths of mains feature in a number of lines across the APR tables with a combination of total asset data lengths (essentially net balances after mains have been added, removed or amended), with subsets such as by age or size (5A.22, 6A.5, 6A.12, 6C.1, 6C.5-6C.17), as well as lengths that represent volume of annual activity such as new or renewed mains (4Q.13, 4Q.14, 6C.2, 6C.3, 6C.4).

For the asset data lines (5A.22, 6A.5, 6A.12, 6C.1, 6C.5-6C.17) to ensure a comparable year on year dataset a fixed value is taken on the 31st of March each year. This means any lag in data capture post this date is picked up in the following year, this is consistent year on year so a comparable snapshot.

For the annual activity volume lines (4Q.13, 4Q.14, 6C.2, 6C.3, 6C.4) these are reported as late as possible after year end but prior to the APR submission to ensure as much activity is captured as possible. This is to allow for additional as-laid drawings to be received and captured in data systems from requisitions, Self-lay providers and internal

commissioning processes for new, relined and renewed mains. This approach is consistent with previous APR submissions.

For the price review, we are intending to restate the lines extracted on the 31 March. This is to ensure that any future performance is based on the most up to date view of the asset base. This will mean a difference in the mains lengths between the two submissions. It will still only include mains laid in year 3, it will just pick up any laid during the year where the data is incorporated into our GIS systems post the 31st of March due to the lag as a result of commissioning and handover of information.

## 6C.1 Total length of potable mains as at 31 March

This is the length of potable mains as recorded on our GIS as at 31 March.

## 6C.4 New Potable Mains

In our Network Reinforcement data return of 30/08/2022, we pointed out a difficulty in reporting APR line 6C.4 in that information on mains laid up to 31 March year end is never complete by the time it needs to be collated and audited for the annual return. We said in future APRs we would, as a matter of course, restate the prior year's figure. The updated figure for 2021/22 is:

RAG4 ref	Line description	Units	DPs	2021/22
6C.4	Total length of new potable mains	km	1	70.5

Some 5.9km of main included in the 70.5km above relates to large diameter trunk mains which have been laid but will remain isolated from the 'live' distribution network until such time as the overall scheme is complete. This 5.9km is not included in the 6C.1 count.

## 6C.18-20 Communication pipes – numbers by pipe material

Figures given in these lines are calculated from a base-line estimate produced some years ago and adjusted each year to take account of new communication pipes and replacements.

We identified some errors in the adjustments for prior years. Corrected numbers are as below.

Line	Material	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
6C.18	Lead	323,896	320,773	315,623	314,269	313,227	312,153
6C.19	Galvanised Iron	247,285	247,093	246,799	246,684	246,362	246,165
6C.20	Other	455,459	471,344	490,749	503,504	514,082	522,631

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## **6C.21 Number of lead communication pipes replaced for water quality**

Our AMP7 lead communication and supply pipe replacement project in north Clacton and the surrounding area continued during 2022/23 and we replaced 157 lead communication pipes. Currently, DWI has not issued us with a legally binding instrument of works for this programme.

In 2022/23 we continued to identify lead communication pipe replacements from our works management system (Maximo) where the customer has replaced their lead supply pipe and has requested that we replace our lead communication pipe. It appears that a significant number of these customer contacts were initiated as a result of a "flow/pressure" issue but were then processed under Regulation 30(1) where, if the customer replaces their lead supply pipe, we are obliged to replace the communications pipe if it is lead. Consequently, we have included 305 of these communication pipe replacements in this line.

The last element to this line is lead communication pipes replaced after detecting elevated concentrations of lead in samples taken from properties. During 2022/23 we continued to replace lead communication pipes when sample results were above 5 ug/l but for the purposes of this line we have only included those communication pipes replaced when sample results were above 10 ug/l, as required by the line definition. We replaced 24 lead communication pipes following results above 10 ug/l. This gives a total of 486 lead communication pipes replaced for water quality reasons.

In line with our strategy, we also replaced 57 lead communication pipes where a sample result was between 5 ug/l and 10 ug/l. For the purposes of reporting against this line, these are not included in the total for 6C.21.

## **6C.22 Company Area**

We are reporting 4,515km<sup>2</sup>, which is the same area as we have reported in previous years. The RAG 4.11 line definition is explicit not to adjust for areas supplied by NAVs, so no adjustments have been made.

## **6C.23 Compliance Risk Index**

See commentary under 3A.1.

## **6C.24 Event Risk Index (ERI)**

Our ERI score for 2022 was 25.361. We had 10 events which were reported to DWI, three of which, the interruption to coagulation dosing at Egham WTW (0.617), a burst on a trunk main in Eastcote (3.38) and the effects of the freeze/thaw event in December on water supplies to Bishop Stortford (21.36), contributed the vast majority of the ERI score. The score was below the 2021 level (150.382) and back in line with the

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2020 level (24.181). We expect this ERI score to be well below the national industry average.

## 6C.25 Properties below reference level at end of year

See commentary under 3A.12 *Properties at risk of receiving low pressure (per 10,000 connections)*. This measure is the same as 3A.12; 23,680 properties being equivalent to 150.934 properties per 10,000 connections.

Prior years' numbers for properties 'on the register' are:

Year	Nr of properties 'on register'
2019/20	5,382
2020/21	30,311
2021/22	24,167
2022/23	23,680

## Table 6D - Demand management – metering and leakage activities

### 6D.6-7 Optant and selective meters installed

In the first three years of the current AMP, we have installed 133,576 meters against 280,000 proposed in our PR19 business plan for the full AMP.

### 6D.8 Number of business meters installed

These are where business customers have opted to switch to measured. We are not currently actively changing unmeasured customers to measured supplies.

### 6D.10 Number of business meters renewed

The majority (98.4%) of meters renewed are with an AMR meter. We have worked with our biggest retailer on meters which have not been read for a long time, and this has resulted in a higher rate of replacement than normal.

We aim to install an AMR meter as the replacement in all cases, but due to installation difficulties this was not possible in 17 instances.

### Smart meters

We have not installed any meters that utilise AMI technology. Currently wherever possible we install AMR (automated meter reading) meters, but these are not 'smart'

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meters. With AMR meters, we can obtain a reading from the meter by walking or driving past the property, without the need to lift a cover or enter the property. Some customers have been vehemently opposed to smart meters, and we have gone to some lengths to explain and reassure that AMR is not a smart metering.

We are looking to install AMI meters in AMP8 and have received accelerated funding for early start of this work.

### **6D.15 to 20 Metering – supply-demand balance benefit**

The benefit of metering activity to the supply-demand balance has been calculated using residential customer and business consumption data, extracted from [Temetra](#) (a meter management system), and has been run through predictive models, with the methodology outlined in the individual line numbers below.

#### **6D.15 New residential meters installed for existing customers – supply-demand balance benefit**

The benefits from new residential meter installations have been calculated using the average savings of selective and optant customers who had a meter installed in the reporting year 2022/23. Meter-read data has been extracted from Temetra for this period and analysed. The sample size of customers who have switched to a metered tariff between 2017 and March 2023 is 74,478. The savings for this cohort of customers is then extrapolated for the number of new meter installations (50,406 total for selective and optants 2022/23).

The benefit associated with new residential meter installation was determined by using our suite of PCC models. These models remove the effects on consumption of Covid-19 and seasonality, so benefits can be compared on a month-by-month basis in a fair and reliable way. Savings are calculated for new meter installations by comparing at a property level the median consumption prior to the installation and the median consumption after the installation.

#### **6D.16 New business meters installed for existing customers – supply-demand balance benefit**

To calculate the impact of new business meters installations on the supply – demand balance benefit, the list of new business meters installed during the 2022/23 reporting year have been calculated for line 6D.8. The total number of new business installations for the reporting period 2022/23 is 67.

The benefits from new business meter installations have been calculated using installations in 2022/23 supplemented with the inclusion of installations in 2021/22 to increase the sample size. The savings for report year 2022/23 is then extrapolated for the number of new meter installations in the year.

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The same methodology of calculating unmeasured use in line 6D.15 was used, but with non-household consumption analysed. To calculate the consumption of newly metered businesses, the unmeasured use of these customers is compared to the metered use, whilst also using our suite of PCC models to account of variances for weather, seasonality and the effects of Covid-19.

Due to the small volume of new business meter installs means that it may change from positive to negative year on year.

### **6D.17 Replacement of basic meter with smart meters for residential customers – supply-demand balance benefit**

The meter read data for these customers was extracted from Temetra, and the meter reads pre-renewal were compared to meter reads post-renewal. This figure was then adjusted to seasonality and weather changes, as well as being passed through the Covid-19 impact model, to account for changes in customer behaviour due to lockdowns or easing of restrictions.

The savings calculated under this line are all for the basic meters replaced with an AMR meter. We have not installed any 'smart' (i.e. AMI) meters.

The figure for savings can change year on year, going from negative to positives. One reason for this is due to not getting the granular detail of why the meter was exchanged. It could be due to the meter not recording consumption, giving incorrect readings or another reason completely, each that would lead to a different MI/d saving.

### **6D.18 Replacement of AMR meter with AMI meter for residential customers– supply-demand balance benefit**

We have not installed any AMI meters.

### **6D.19 Replacement of basic meter with smart meters for business customers – supply-demand balance benefit**

The process for this is the same as that for 6D.17 residential customers.

### **6D.20 Replacement of AMR meter with AMI meter for business customers – supply-demand balance benefit**

We have not installed any AMI meters.



## 6D.24 and 25 Per capita consumption (excluding supply pipe leakage)

As mentioned under 3A.3 and 4 and 3F.5 and 6, we have restated our baseline and 2020/21 leakage and PCC figures. The changes to historical PCC 'measured' and 'unmeasured' are given below.

Per capita consumption (excluding supply pipe leakage)	Units	2017-18	2018-19	2019-20	2020-21	2021-22	Line Ref
Per capita consumption (measured)	l/h/d	138.33	140.73	138.62	143.95	138.56	6D.24
Per capita consumption (unmeasured)	l/h/d	162.97	178.17	169.66	197.65	185.13	6D.25

## Table 6F - WRMP annual reporting on delivery - non-leakage activities

### Internal interconnectors delivering benefits in 2020-2025

We have one scheme, AFF-CTR-WRZ4-4001: Egham to Iver (Midway North Booster), which is captured under this category. This is for the installation of a new booster pump to enable an additional 17MI/d to be transferred from our Wey community to Pinn community.

- Capex: The reported Capex for 2020/21, 2021/22 and 2022/23 is based on actual spend. Future Capex expenditure has been estimated based on the project cashflow forecast.
- Opex: Expenditure has been based on an initial assessment reported carried out by Stantec. This estimate has been used to forecast the future annual opex expenditure. The scheme is expected to be delivered in October 2023 so half the opex has been included for that year.
- Benefit: The scheme will enable us to transfer 17MI/d at average and up to 30MI/d at peak. For the purpose of the tables the annual average capacity has been input.
- Interconnector: There is existing pipe infrastructure, but this scheme is to install a booster pump so that we can increase the capacity that can be transferred. Therefore, there is no new pipe or storage capacity. The pumping capacity to be installed is based on the assessment carried out by Stantec.

### Variance with table 4L

Within 4L Egham is included under "Supply demand balance improvements delivering benefits starting from 2026" as this is where spend has been allocated. As this is not a supply demand benefits scheme, we have retained reporting it under internal interconnectors in 6F.



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## Supply-side improvements delivering benefits in 2020-2025

AFF-RTR-WRZ7-0639: Deal Continuation After 2020: This is the continuation of an existing bulk transfer agreement. The transfer agreement only entitles us to use it under emergency conditions and therefore is not forecasted within our opex budget to be operational, so no opex has been included. There is no new infrastructure required so there are no capex costs associated with the scheme. The benefits have been included for all years at 0.07ML/d as per the terms of the agreement.

## Supply-side improvements delivering benefits starting from 2026

Sundon conditioning plant (Sundon Reservoir) is the work required to upgrade the existing conditioning plant at Sundon, with the upgraded plant scheduled to become operational in 2024/25. The delivery of this project will remove water quality constraints that currently prevent the full utilisation of our bulk import from Anglian Water into WRZ3 (Lee), enabling us to increase our use of the Anglian Water Grafham bulk supply up to its full 91ML/d capacity (pre climate change impact), which is currently capped at 50ML/d.

- Capex: The reported Capex for 2020/21, 2021/22 and 2022/23 are based on actual spend. Future Capex expenditure has been estimated based on the current estimate as per the cost report for the project.
- Opex: Based on an estimation by the contractor at the time of tender. It is based on an average flow of 50ML/D and an average chemical dose. This includes the increase in opex due to the conditioning process. It also accounts for the increase in utilization of the import by 33ML/d with a utilization factor of 0.1 to reflect the additional need under dry year conditions. The plant is due to become operational by January 2024, therefore a quarter of the opex increase has been applied for year 4;
- Benefit: The design maximum flow for the conditioning plant will be 109ML/D which is our maximum entitlement for the Grafham import via Sundon. The annual average entitlement is 91ML/d. Within the WRMP we capped current utilization to 50ML/d therefore the benefit has assumed to be 41ML/d to enable us to use the full annual average license.
- This scheme is not an internal interconnector, so the final set of columns have not been completed.

### Variance with table 4L

In 2021/22 Sundon was reported under Supply-side improvements delivering benefits in 2020-2025, we have amended this to align with table 4L and it is now reporting under Supply demand balance improvements delivering benefits starting from 2026. Sundon was originally allowed funding under the original PR19 code "long term enhancement", which no longer exists. The equivalent code is now Supply-Demand benefits from 2026.

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## Demand side improvement delivering benefits in 2020-2025 (excl. leakage and metering).

The supply-demand balance benefit (demand saving) is assumed to be a reduction in consumption and is recorded as a positive figure. Benefits relating to leakage reduction and benefits from metering are excluded from this line.

The benefits of these activities to the supply-demand balance have been calculated using customer data, extracted from [Temetra](#), and has been run through predictive models, with the methodology outlined below.

### Programme overview

Our Demand Management programme is split into five following workstreams (pillars):

Pillar 1 – Water Efficiency & Water Saving Devices

Pillar 2 – Smarter Targeted Metering

Pillar 3 – Our Customers' Journey

Pillar 4 – Campaign in Partnership & Community Incentive/Campaigns

Pillar 5 – A National Voice

### Demand saving benefits to date

Year	MI/d	MI/d cumulative
2020/21	0.56	0.56
2021/22	21.16	21.72
2022/23	25.63	47.35

### Demand saving benefits 2022/23

All the benefits associated with the projects below were determined through our suite of PCC models. These models remove the effects on consumption of Covid-19 and seasonality, so benefits can be compared on a month-by-month basis in a fair and reliable way.

Pillar	Project	Benefit (MI/d)
Pillar 1	HWECs	0.32
Pillar 2	AMR Trial	0.51
Pillar 3	Trigger Based Comms	0.96
Pillar 4	SOS Campaign	23.84
Pillar 5	N/A	N/A
Total		25.63

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## Home Water Efficiency Checks (HWECs) Benefits Modelling

We completed 20,894 HWEC visits in 2022/23, with technicians installing devices and offering water saving tips and advice to the customer. HWEC visits are completed across all Water Resource Zones and all customer types. This project is carried out in partnership with a delivery provider, Groundworks.

Savings are calculated for customers receiving a HWEC by comparing at a property level the median consumption prior to the delivery of the HWEC and the median consumption after that delivery.

Acorn segments that are displaying consumption savings as a result of the HWEC visit are then extrapolated by the number of customers in that segment, in order to obtain a mega litres per day (Ml/d) figure for each Acorn segment. The final Ml/d figure is calculated by totalling the savings across all Acorn segments that demonstrate a reduction in consumption.

The associated saving for HWECs in the reporting year 2022/23 is 0.32 Ml/d.

## AMR Trials Benefits Modelling

The AMR trial is a data-driven trial which allows us to assess the impact of varying levels of meter reads and communications on customers water usage.

The project involves a trial running from April 2021 – November 2022 inclusive. BAU (not UMP), AMR metered households in the Central region were randomised into three groups. Different groups received different levels of communication about their water consumption, with some customers receiving extra meter readings. These groups are:

- Group 1: Control - 66,783 customers
- Group 2: No extra meter readings, but an extra communication halfway between their 6-monthly bills (sometimes called a 'between-bill comms'). *Note: this comms is NOT a bill.* - 66,782 customers
- Group 3: Increase meter read frequency to quarterly and give a between-bill comms, similar to Group 2 but informed by the updated consumption data – 66,784 customers

Initial savings are calculated for each AMR group by comparing at a property level the median consumption prior to the customer receiving their first communication and the median consumption after that communication. Furthermore, in order to isolate the savings for the current financial year (i.e. what are customers saving in the current financial year), customer consumption in the previous financial year after the customer received their first communication/bill of the campaign is excluded.

The control group, AMR Group 1 did not receive a communication. To effectively calculate savings for this group, a randomised date of communication was created for each customer in this group in order to simulate these customers receiving a communication for the trial.

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AMR customers in group 2 and 3 have only been considered when they have received at least one valid communication and they have not moved out during the year.

The AMR trials control group (Group 1) at an Acorn segment level is compared with the group 2 and 3 at an Acorn segment level, and the difference is taken as the benefit associated specifically with the trial for each acorn segment.

Acorn segments that are displaying consumption savings for group 2 & 3 are then extrapolated by the number of customers in that segment, in order to a MI/d figure for each Acorn segment. The final MI/d is calculated by totaling the savings across all acorn segments within AMR groups 2 and 3 that are exhibiting a reduction in consumption.

The associated MI/d saving for AMR trial in the reporting year 2022/23 is 0.51 MI/d.

### Trigger Based Communications Benefits Modelling

The Trigger based comms project involves proactively sending customers communications with tips on water saving behaviors when certain events occur, for example, when especially hot weather is forecasted such as summer 2022.

The specific trigger-based communications that have been considered for benefits estimation are the summer communications sent to a cohort of customers across our three operating regions, and customers who have received draught and storage campaign communications between 8 July and 5 August 2022.

Initial savings are calculated for customers receiving summer trigger-based communications by comparing at a property level the median consumption prior to the customer receiving their first communication and the median consumption after that communication. We carefully exclude customers who were exposed to other campaigns during this period.

The associated MI/d saving for trigger base communications in the reporting year 2022/23 is 0.96 MI/d.

### Save Our Streams (SOS) Benefits Modelling

The continuation of our SOS behaviour change campaign was vital to encouraging customers to take an action to help reduce their household water consumption. This was done by reaching out to customers through many types of media such as social media, on demand and communications.

Savings are calculated for the impact of SOS by comparing, at a property level, the median consumption prior to the campaign and the median consumption after the campaign. Water savings for customers will be calculated in average litres per property per day and mega litres per day looking at two key aspects for the campaign.

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- Behaviour changes through registrations: Estimate consumption savings from registrations of customers who signed up to the campaign educated and motivated actions to reduce water use.
  - Behaviour changes from campaign awareness: Estimate the consumption savings for customers who have not signed up to the SOS campaign, their behaviour has been influenced at scale through advertising/PR/social and e-campaigns.

The benefits modelling calculates the savings for the following cohort of customers:

M1 - Customers who have signed up to the campaign during 2022/23.

M2 - Customers who have signed up in previous years if they have had a subsisting reduction in consumption in 2022/23.

M3 - All other customers impacted by the campaign e.g., via media channels (behavioural element) but have not signed up.

Further consideration when calculating savings for customer cohort M3 involves identifying these customers in the data by excluding known customers who have signed up to the campaign and customers who may be on other demand management campaigns. Survey data was used to understand the reach of the campaign amongst customers who have not signed up but have seen something about SOS campaign and are taking action to save water as a result of interacting with the campaign through advertising and media.

The associated MI/d saving for this project in the reporting year 2022/23 is 23.84 MI/d.

### 2023/24 benefits

The Year 4 Demand Management programme and its associated projects underwent a benefit evaluation in March 2023 to finalise the savings target.

The total Year 4 target savings are 32.67 MI/d, which added to the Year 3 roll over savings total 80.02 MI/d.

### 2024/25 benefits

The forecasted benefits in Year 5 in addition to the roll over savings from Years 1-4 total 97.92 MI/d.

### Variance with table 4L

Within 6F Customer Side Demand Management spend is included under capital expenditure as this is how it is funded. For statutory purposes however, within 4L a proportion of the spend has to be treated as opex. For consistency we have continued to report this under capital expenditure in 6F

Minor changes in the historic figures have been made to align Customer supply-demand within the allocations restated in 4L in February.

## Supply-side improvements delivering benefits starting from 2026

We have no schemes included under this category.

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## Section 11 - (Additional regulatory information - Operational greenhouse gas emissions reporting)

### 11A - Greenhouse gas emissions reporting for the 12 months ended 31 March 2023

#### Scope 1

The annual quantity of emissions resulting from activities for which the company is responsible (scope 1) is 5,913 tCO<sub>2</sub>e (2022: 6,283 tCO<sub>2</sub>e). Sources of direct emissions for the company include fuel emissions from burning of fossil fuels, the use of Natural Gas for the heating and cooling of our buildings, and fuels used primarily by generators at our water treatment works. Fugitive and process emissions include ozone used in the disinfection process and waste sludge recycled to land or landfill and refrigerant gases. Fleet fuel emissions result from the combustion of purchased fuel for fleet liveried vehicles.

#### Scope 2

The annual quantity of emissions in tonnes of CO<sub>2</sub> equivalent resulting from activities for which the company is responsible (scope 2) is zero tCO<sub>2</sub>e (2022: zero tCO<sub>2</sub>e), when reporting via a market-based approach. Purchased total grid electricity from 1 October 2021 is from 100% REGO backed renewable energy which we primarily use for the pumping and treatment of water and a small amount for office use.

When reporting using a location-based approach, scope 2 emissions in tonnes of CO<sub>2</sub> equivalent resulting from activities for which the company is responsible are 43,623 tCO<sub>2</sub>e (2022: 46,735 tCO<sub>2</sub>e).

#### Scope 3 (Operational Only)

The annual quantity of emissions in tonnes of CO<sub>2</sub> equivalent resulting from activities for which the company is indirectly responsible, which are 'operational' is 17,798 tCO<sub>2</sub>e (2022: 18,125 tCO<sub>2</sub>e). For 2022/23 the use of chemicals has been defined as operational rather than an embedded emission.

Our operational emissions as defined for the 2022/23 APR have reduced by 5% compared to 2022/21. This reduction has resulted from a combination of reduced fossil fuel use, increased use of regenerated GAC in water treatment and grid decarbonisation.

Our operational emissions as defined for the 2022/23 APR have reduced by 5% compared to 2022/21. This reduction has resulted from a combination of reduced fossil fuel use, increased use of regenerated GAC in water treatment and grid decarbonisation.

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## Chemical Emissions Estimation

For 2022/23 we have updated the method used to assess the emissions associated with our purchase of chemicals (not including GAC). The method has been updated to better reflect the differences in concentration of the chemicals we purchase compared to those used as a benchmark for understanding associated emissions.

For 2022/23 we estimate that there are 6,715 tCO<sub>2</sub>e associated with chemicals we purchase. We have also applied this updated method to recalculate the emissions associated with chemical purchase in 2021/22. We have reassessed the to be 6,399 tCO<sub>2</sub>e.

For 2022/23 the emissions associated with our purchase of GAC is assessed to be 4,142 tCO<sub>2</sub>e, giving a total 'chemical' use of 10,858 tCO<sub>2</sub>e.

Based on our updated understanding of emissions associated with chemicals and use of GAC we have recalculated the emissions associated with chemicals including the use of GAC for 2022/21 as 11,300 tCO<sub>2</sub>e.

### Method Used

For Scope 1, Scope 2 and operational Scope 3 GHG emissions, we follow the most common approach to calculate GHG emissions from emission sources, which is to take activity data (e.g. units of electricity consumed, or distance travelled) and convert the activity data into tCO<sub>2</sub>e. We have reported the common intensity metric for the Water Industry, which is Carbon tCO<sub>2</sub>e per MI, which is our tCO<sub>2</sub>e divided by water into supply (MI).

### Capital Projects

In line with the APR reporting requirements, we have calculated the cradle-to-build emissions for our capital programme. This builds on the voluntary reporting undertaken last year. For 2022/23 we estimated that the emissions associated with the delivery of our capital programme were 8,465 tCO<sub>2</sub>e. Although this is an increase on our 2021/22 estimate of 4,350 tCO<sub>2</sub>e the scope of projects included within 2022/23 reporting is significantly greater than in 2021/22. In 2022/23 we estimated the emissions associated with 47 projects, an increase from 11 projects in 2021/22.

Within the 47 projects assessed are 17 below ground asset (infrastructure) projects with the remainder a mix of above ground (non-infrastructure) projects, storage projects, minor works and lead replacement. We have included both constructing new assets and refurbishment where it is practicable to estimate this value.

### Method Used

To estimate our capital project emissions, we use a bespoke tool incorporating over 400 carbon models which utilise data from a range of sources including the Inventory of Carbon and Energy (ICE), CESSM workbook, Defra emission factors and directly from product manufacturers. We calculate carbon based on a cradle-to-built asset basis which allows us to understand the emissions arising from raw material extraction, manufacturing, transport to site and construction activities. Although the tool includes over 400 different, process, asset and unit rates models, some assets we construct, or



install are not included in the tool. We have not been able to estimate the emissions associated with our river restoration projects, some minor works, meter installations or traffic management activities.

### Purchased Goods and Services

2022/23 is the first year where Affinity Water has calculated emissions from purchased goods and services. We have completed this as part of a wider piece of work to develop a Scope 3 inventory. Emissions from purchased goods and services were calculated predominantly using purchase ledger data in combination with commodity specific emissions factors from the Comprehensive Environmental Data Archive (CEDA). The exception to this is the calculation of emissions from the purchase of chemicals where primary activity data (volumes of chemicals purchased) was used with chemical emissions factors from the Ecolnvent database. As the emission factors from Ecolnvent differ from those in the CAW, the reported emissions are different to those reported in APR Table 11a. The largest sources of emissions within purchased goods and services are outlined in the table below.

As would be expected, we have a high proportion of category 1 (purchased goods and services) arising from expenditure associated with the maintenance of our asset base. Emissions from outsourced services within operational emissions fall within the category of 'all other purchased goods and services' in the table below. The reporting for 2022/23 will form a baseline for comparison in the future. We will also explore opportunities to improve the accuracy of emissions reporting through moving to activity-based data where significant suppliers are able to facilitate this.

Scope 3 Category 1 - Purchased goods and services in detail (account description)	Emissions (tCO <sub>2</sub> e)
Network infrastructure maintenance agreement (NIMA) contractors' accruals	16,216
Grafham bulk water operational	3,355
Raw materials and supplies inventory	2,282
Chemical purchase	3,079
Network main subcontractor	1,567
Other subcontracting costs	935
Plant and equipment hire	798
Tools and small maintenance supplies	710
Consultancy services	674
Other contractors	611
Other operating expenses	602
All other purchased goods and services	7,578
Total	38,407



## Scope 3 Inventory

For 2022/23 we have developed a high-level Scope 3 inventory. Aligned to the Greenhouse Gas Protocol, we have used primary activity data to estimate emissions; Where this is not available, we have used proxy data such as spend based data to estimate and benchmark emissions. Developing a scope 3 inventory allows us to have a high-level understanding of our full carbon footprint and target engagement with our supply chain. The results can be found below.

Scope 3 Category	2022/23 (tCO2e)
Category 1: Purchased goods and services	38,406.9
Category 2: Capital goods	22,172.6
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)	16,212.0
Category 4: Upstream transportation and distribution	238.2
Category 5: Waste generated in operations	7,424.5
Category 6: Business travel	227.9
Category 7: Employee commuting	1,063.7
Category 13: Downstream leased Assets	208.7

Details of our Greenhouse Gas Greenhouse Emissions 2022/23 can be found on our website.

## Strengths, Weakness, Opportunities and Threats (SWOT)

### Operational Emissions SWOT

Operational Carbon	
Strength	Opportunities
<ul style="list-style-type: none"> <li>GHG accounting of Scope 1 and 2 operational emissions well understood and incorporated into business reporting.</li> <li>The data we use to estimate scope 2 emissions is primary measured data offering the best source of information.</li> <li>Our Carbon Programme Board meets monthly to review our progress and oversee the delivery of our Net Zero Strategy.</li> </ul>	<ul style="list-style-type: none"> <li>Nature based solutions have the potential to offer multiple benefits, with carbon reduction or sequestration as co-benefit, (but there is no standard approach to calculating their carbon footprint: see 'Weaknesses').</li> </ul>

Strength cont:	Opportunities cont:
<ul style="list-style-type: none"> <li>• Our senior managers and Board members are leading the business to reduce emissions.</li> <li>• We use the UKWIR Carbon Accounting Methodology through the Carbon Accounting Workbook (CAW) for operational emissions. This is an industry standard approach which is updated annually and is reflective of carbon reporting and emissions guidance from Defra.</li> <li>• 2022/23 was the first year in which we have developed a scope 3 inventory identifying at a high level all the indirect emissions associated with our value chain.</li> </ul>	<ul style="list-style-type: none"> <li>• We are developing carbon literacy within the business to support carbon reduction across all our operations.</li> <li>• Our solar programme continues, with several new sites being planned for during 2022/23.</li> <li>• Energy efficiency projects delivered during 2022/23 help us to reduce the energy intensity of our operations.</li> <li>• In 2022/23 we ordered our first four electric vehicles as part of our fleet transition programme.</li> </ul>
Weaknesses	Threats
<ul style="list-style-type: none"> <li>• Some areas of operational emissions are less well understood both globally and specifically within the UK Water sector. This includes the emissions associated with water treatments (process emissions) and the emissions associated with production of chemicals which are purchased.</li> <li>• There is no standard approach to calculating the carbon footprint of Nature based solutions or environmental work such as river restoration.</li> <li>• There is currently limited guidance on how to account robustly for inseting activities which have a role to play in managing residual emissions.</li> <li>• We have been unable to source emission factors for a small amount (~1% by weight) of the chemicals we purchase and have therefore been unable to report the emissions associated with these.</li> <li>• Changes to reporting requirements made by Ofwat have needed the use of tools other than the CAW in order to calculate the emissions arising.</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in external policy and/or regulatory requirements could have an adverse impact on our carbon emissions (e.g. as a result from having to move water a greater distance or increase levels of treatment).</li> <li>• In 2022/23 we saw how the impact of climate change through the summer heatwave could significantly impact the amount of energy our business requires to meet water demand.</li> <li>• As maturity in accounting and reporting of emissions increases it is likely to mean some emissions are currently under or over-estimated. Changes will require careful explanation and management as knowledge improves over time.</li> </ul>

## Embedded Emissions SWOT

<b>Embedded Carbon</b>	
Strength	Opportunities
<ul style="list-style-type: none"> <li>For 2022/23 we developed a scope 3 inventory identifying, at a high level, all the indirect emissions associated with our value chain.</li> <li>In 2022/23 we began using our first carbon estimation tool for assets, enabling us to estimate, benchmark and reduce the emissions associated with our capital projects.</li> <li>A working group, to establish the principles of PAS 2080 across our Asset planning and Capital Delivery directorate began in 2022/23</li> </ul>	<ul style="list-style-type: none"> <li>Our asset-based carbon estimation tool provides an opportunity to further develop our understanding of whole life carbon impacts our capital delivery programme and provides a tool to monitor emissions reduction.</li> <li>Increased supplier engagement will take place guided by the outcomes of the scope 3 inventory.</li> <li>Consideration of capital and operational carbon through the whole life of an asset can help identify opportunities for emissions reduction and financial efficiency. Moving to a multi capitals approach can help ensure a holistic approach is taken to asset management.</li> </ul>
Weaknesses	Threats
<ul style="list-style-type: none"> <li>Much of our scope 3 inventory (around 70%) is estimated using spend based approach, although this is sufficient to identify hotspots; future inventories should include improvements to data collection.</li> <li>Our asset-based emissions estimation tool is limited to providing estimates for cradle-to-built asset only, limiting our ability to report at different stages. We are exploring opportunities to report cradle-to-gate emissions subject to the costs associated with developing suitable models.</li> <li>We at the beginning of journey reporting embedded emissions, our methods and estimates are not as matures as for scope 1 and 2.</li> </ul>	<ul style="list-style-type: none"> <li>Management of scope 3 emissions is much more complex than for scope 1 and 2 emissions. Collaboration with our value chain is required to secure data and reduce emissions.</li> <li>Regulatory drivers have the potential to increase future GHG emissions. Effectively and consistently valuing of carbon across water companies and regulators is required to support decision making.</li> <li>Limited understanding of strategic whole life carbon consequences of decisions in the short-term may result in locking in of carbon consequences in future years.</li> </ul>

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## Greenhouse Gas (GHG) Historic Emissions data request

All historical emissions have been calculated using version 17 of the Carbon Accounting workbook (CAW). The emissions factors used are the UK Government's 2022 version as figures for 2023 had not been published at the time of calculation.

For emissions associated with chemical purchase we have recalculated using the default emissions factors in the CAW as per the reporting guidance and used an updated method to account for the concentrations of the chemicals we purchase. We have reported emissions associated with chemicals from 2019/20 onwards as this was the point at which we began capturing relevant data to enable emissions calculations. There are several chemicals for which emission factors are not available; however, they are not anticipated to account for 10% or more of emissions based on the volumes purchased relative to the total amount of chemicals purchased.

We do not have any plans in the 2025-2030 period to significantly change the quantity or number of chemicals used to treat water at our water treatment works. There may be some small changes due to variability of raw water quality or other exogenous causes, and some small increases related to the introduction of new treatment processes on a small number of sites, but we are not planning to implement any strategic change of chemical use during this period.

We have calculated emissions for outsourced activities from 2019/20 onwards as we began capturing the relevant data at this point.

From 1 October 2020 we moved to a REGO backed green tariff; for the following years we have therefore reported zero scope 2 market-based emissions for purchased electricity.

For all years we have noted a discrepancy in the CAW for the reporting of scope 3 emissions between activity (11A.23 11A.32) and scope 3 emissions by type (11A.32 - 11A.36). This discrepancy has resulted from the inclusion of SF<sub>6</sub> emissions within scope 3 by emissions type but not within the reporting by activity when using the CAW. We have manually corrected this discrepancy.