



# Appendix – APR Supporting Commentary

Annual Performance Reporting 2022-23

from  
**Southern  
Water.** 

# Annual Performance Report 2022-2023

## Supporting Commentary

This document contains additional technical commentary and narratives on performance associated with Southern Water's 2022-23 Annual Performance Report (APR) data tables, and commentary addressing specific narrative requirements from Ofwat's Regulatory Accounting Guideline 3.14 (RAG 3.14). This includes the rationale for publishing our APR data tables as per IN 23/03 Expectations for monopoly company annual reporting 2022-23.

### Publishing Rationale

All annual report data for Southern Water, including downloadable copies of our submitted data can be found on the [Our Reports](#) section of the Southern Water Website. We have again published our APR data as a consolidated Excel file with the rationale that this is the most accessible format available to us at this moment, it provides key reliable and complete data sets. As mentioned in the Ofwat case study as part of the their H2Open report, we also continue to provide open data as part of our [Beachbuoy](#) initiative and are looking at other data sets which may benefit from publication and ways to improve data accessibility and availability.

We also work collaboratively with other water and sewage companies to collate all published data for internal industry comparison purposes and are working with them and WaterUK to understand the benefits of making this combined data set publicly available. We are already stakeholders in the "Stream" project on open data in the water industry and support the creation of an independent data institution for the water sector as a follow on from this.

We continue to explore options for sharing data with customers and stakeholders and will be making a statement later in the year on our Open Data roadmap.

### Required additional commentary – Narrative on costs

***4.23 The lines in Tables 4L and 4M generally correspond to the standard lines in the PR19 business plan tables WS2 and WWS2 respectively. Where lines from the business plan tables have no corresponding lines in Tables 4L or 4M it is because these lines were either not used by companies or by just one or two companies. Tables 4L and 4M have lines for companies to insert their own expenditure purpose categories. If companies would have allocated expenditure to any of the standard lines in the business plan tables that have not been copied across to RAG4.09 tables, they should instead allocate the expenditure to these 'freeform' lines. If these lines have been used, companies should provide commentary to explain them.***

In table 4L, an additional line has been used for impounding reservoirs.

In table 4M, we have used additional lines for the following:

WFD Manage uncertainty Special case

AMP 6 Bathing Water enhancement

NEP - Groundwater schemes

Plus the following with a nil balance:

AMP7 WINEP3 Chemicals NDLS Permits

NEP - Flow 1 schemes

**4.24 Companies should provide commentary to explain whether any costs have been proportionally allocated between expenditure categories in tables 4L and 4M or between enhancement and base expenditure. Companies should include details of how much has been subject to proportional allocation and which cost drivers they have used.**

N/A. No proportional allocation has been applied.

**4.25: In table 6A.13 to 6A.27 companies are required to report water treatment works that have not been used in the year but have not been decommissioned. Companies should provide commentary on any instances where this is the case**

The following are water treatment works that have not been used in the year but have not been decommissioned - Deal Low Level WSW, Keycol WSW, Lewes Road Brighton WSW, Lord of the Manor WSW, Minster IOT WSW, Shalcombe WSW, St Lawrence WSW, Ventnor New WSW and Wierwood Forest Row WSW.

**4.26: Companies should provide commentary on how they have calculated population and household growth in table 4R including how they have taken account of the 2011 census.**

The population forecast is created by Experian Analytics and takes account of the 2011 census and the Office for National Statistics' updated population projections. Each year the forecast is then compared against the latest published Office for National Statistics mid-year forecast to check accuracy.

**4.27: Companies are encouraged to provide commentary on how they interpret 'structurally refurbished' in completing line 7C.15. If a company is unable to identify the actual length of rising main that has been replaced or structurally refurbished, then it should submit an estimate and fully explain the methodology used and the assumptions made in the accompanying commentary.**

Two rising main replacements have been completed and post documentation provided during 2022/23. Structural refurbishment of rising mains comprises a permanent solution such as pipe replacement or bespoke in-pipe renewal such as lining with an expected design life exceeding 50 years. Refurbishment of part can be claimed but only where the affected length is greater than 50m in accordance with the Structural Sewer Rehab Policy document.

**4.28: Companies should explain the basis of its estimate for line 8A.4 of all the untreated sewage sludge (primary, secondary, tertiary) produced by in-area wastewater treatment processes in the report year, and which is produced as a result of treating non-appointed liquid wastes through appointed wastewater treatment assets**

The calculations for sludge Total Dry Solids (TDS) generated from non-appointed liquid wastes treated through our treatment works are based on the following:

- For domestic tankered waste a Population Equivalent (PE) has been established from the volumes received. These PEs have been applied to the receiving site's sludge make/PE to calculate the amount of sludge arising from these imports.
- The commercial tankered waste annual BOD data has been used and converted to a PE for each receiving site, assuming 60 gms/BOD/day. The calculated PE for these wastes has been applied against the sites' sludge make/PE to generate the amount of sludge from these imports.
- Other 3rd party imports are recorded via instrumentation. An assumed dry solids of 3% is used in the absence of data from process sampling

**4.29: In lines 8A.10 and 8A.13 we ask for a measure of intersiting work done by tanker. In line 8A.11 we ask for a measure of intersiting work done by truck. In lines 8A.15 and 8A.18 we ask for a measure of work done in sludge disposal operations by tanker. In line 8A.16 we ask for a measure of work done in sludge disposal operations by truck. If actual road distances are not available companies should estimate the road distance and state in the commentary if this is the case.**

Radial mileages for all data sets relating to haulage movements are taken from the actual radial mileage distances submitted by our waste and recycling contractor. These are converted to 'actual kms' by utilising a conversion factor from miles to km and then a factor of 1.6 to convert from radial distance to 'actual'. This is in line with previous reporting years.

**4.30: In table 8A where both the incumbent and a third-party service provider undertake different stages of sludge treatment, e.g., dewatering followed by lime stabilisation, sludge quantities should not be doubled-counted and should be reported either in line 8A.1 or line 8A.2, not both. Where this situation occurs, the companies should report on the quantity involved and the line to which it has been allocated in the commentary.**

N/A. Southern Water undertakes all its sludge treatment and dewatering activities.

**4.31 Companies should explain the basis of their estimate of total sewage sludge produced from non-appointed liquid waste treatment reported in line 8A.4.**

See commentary in 4.28 above.

**4.32 The default assumption will be that the population equivalents reported in lines 7D.17 to 7D.20 will be served by sewage treatment works (STWs) at which the required output has been delivered primarily by a capex solution. Where this is not the case companies should report the population equivalent benefitting from (primarily) Opex solutions in their commentary.**

As part of our reporting process, we check if schemes are delivered via capex solutions as opposed to Opex solutions. Anything delivered via an Opex solution is discarded from the reported figure and only population equivalent for capex solutions is included in these lines.

For Year 3 (2022-23), no WINEP schemes for tightened permits were required to be delivered for these drivers this year, so Southern Water were only required to complete Opex analysis and obtain new permits. 6 sites had new chemical permits, but no capex projects were required to meet the new limits, therefore omitted from the report.

**4.33 Where companies have used a different methodology to calculate non-resident population in table 4R they should provide details in their commentary.**

N/A

## Required additional commentary – Supply-demand balance and metering

**4.34 Tables 4L, 6D and 6F require companies to provide details of their expenditure and benefits delivered in the area of improvements to the supply-demand balance and development of strategic regional water resource solutions. We expect companies to include narrative commentary to report on progress and deliverables in these areas. This should include explanation of any variances from their business plan and water resources management plan proposals.**

2022-23 was one of the driest and warmest years in over 100 years, and whilst we did utilise a TUB (temporary use ban) in our Hampshire and Isle of Wight resource zones, these were withdrawn in late autumn, and despite exceptional weather conditions and we continued to reduce customer demand across our area, with a 12 month rolling average PCC of 128.4, without needing to implement drought permits or orders, maintaining the supply-demand balance throughout 2022-23.

Our WRMP set out a complex programme of schemes to ensure we provide sustainable water supplies to our customers whilst protecting the environment. This year, we have continued to make strong progress in delivering our plan, whilst continuing to test and assess programme risks. This analysis has allowed us to identify risks against delivery, prioritise actions and implement mitigations, and was shared in December 2022 in our delivery road map, and is supported by our Turnaround Plan for the remainder of AMP7.

Despite a hot summer, a severe winter, and an uncertain legacy of COVID-19, we continue to make progress with the delivery of our obligations and maintained the supply-demand balance through 2022-23. For any area that is not on track we have put credible recovery plans in place to safeguard customers and the environment which will give full details of in our WRMP annual review 2022-23.

We are aware that we remain off track from our PR19 business plan targets in respect of both leakage and PCC, despite an ongoing reduction in customer usage post-covid, and mitigating the leakage through our Advanced Pressure management schemes and ongoing investment to aid leakage detection and repair. We are committed to reducing leakage across our area, and further detail on this can be found in 4.35 below.

In respect of PCC, we are still feeling the significant effects of the COVID-19 pandemic has significantly changed how and where our customer's use water and the industry wide consumption rise, on average 10.4%. As part of our Turnaround Plan, we have refreshed our T100 strategy, full details of which including; our progress over the year, behavioural science insights, having identified seven catalysts that will accelerate behaviour change among householders (home audits, smart meter technology, tariffs, communications and marketing, education, water-efficiency solutions, and government interventions) and our plans to reduce annual consumption down to a 127.5l/p/d by the end of this AMP, can again be found in our WRMP annual review 2022-23.

**4.35 Table 6B requires companies to report their total annual leakage. This figure should be derived from the same leakage data that is used in both leakage performance reporting (as an input to the three-year average calculation) and annual water resources management plan reporting. Companies should include explanation of any variances from their business plan and water resources management plan proposals.**

Our annual leakage level for 2022-23 was 108.5MI/d, and we are aware this above target and that this has been contributed to by drought condition in the summer and the severe winter on 2022/23. Unpredictable demand patterns post-covid has also contributed to water network stresses in previously unaffected areas.

We are mitigating the leakage through our Advanced Pressure management schemes and through our ongoing investment into leakage software which will aid leakage detection and repair. We have made several interventions and significant investments during this year to drive leakage reduction despite the challenges presented by the weather experienced over the summer and winter. We have secured an additional £25m in funding and are on track to deliver against the 2-year plan to recover leakage to the targets set out in our Turnaround plan.

**4.36 Table 6D requires companies to provide detail of their smart metering programmes. We understand that several alternative smart meter technologies can be adopted by companies. Companies should include narrative commentary explaining the smart metering technologies it is utilising and the capabilities and benefits these provide.**

Our current smart meters in situ remain AMR ARAD meters with limited smart capability. However we've witnessed the quality of data that smart meters can offer via our 'clip-on' smart meter trial which began in summer 2022 to test the assumption that we can reduce water consumption by 3-5% simply by telling people (via data) how much they use by means of an online platform (Advizzo). As part of this trial, we installed clip-on 'smart' meter devices in 1500 homes, sharing the personalised usage data to the trial participants. Two thirds of the devices worked well and gave us an insight into the quality, granularity and frequency of the data from smart meters and we will continue monitoring them for in order to obtain further insight including findings of related data-led targeted contacts with customers.

We are now in the process of selecting a new AMI capable meter and having set up a dedicated Smart Metering project team, to lead the programme which will identify, procure and deploy Smart Meters across AMP8, and continued pilot schemes in 2023-24 and 24-25. We have finalised and are on track with our plan to replace all our Visual Meter Read (VMR) and Automated Meter Read (AMR) meters with AMI meters (1.36 million households) by 2030, delivering smart meters at 30% of our households by 2027, 60% by 2028 and 90% by 2029, so everyone will have personalised data to help them use less water and to meet the metering penetration targets set out in the WRMP and our business plan, with an average estimated 4% reduction in household demand.

**4.37 We expect companies to include narrative commentary to explain how the metering and leakage figures reported in Table 6D relate to their business plan and water resources management plan forecasts.**

Please see above commentary on 4.35 on leakage, and 4.36 on smart metering.

#### 4.40 Common performance measures

##### Leakage and Per Capita Consumption (PCC):

In line with Ofwat's instruction to maintain reporting in line with the baseline methodology, there has been no change to the RAG provided to Ofwat in association with the restatement of our leakage and PCC values for 2020-21, and in association with query number SRN\_APR\_IP\_001 provided in August 2021. All water balance data submitted in the APR has been produced in a way that is entirely consistent with the three-year rolling average baseline. We continue to run parallel reporting internally with amendments being done on the remaining amber elements. This parallel reporting is aligned fully to the AMP8 methodology and whilst we are yet to be fully compliant, further changes are being introduced to this shadow reporting with the aim of being fully compliant by the start of AMP8.

Below are the water balance calculations for 2022-23 under both methodologies:

Component (MI/d)	Ovarro method - consistent with baseline			Convergence method - shadow for AMP8		
	Pre MLE	Post MLE	Adjustment	Pre MLE	Post MLE	Adjustment
Household consumption (metered)	277.75	282.23	4.5	277.8	295.3	17.5
Household consumption (unmetered)	50.07	53.30	3.2	42.5	47.0	4.5
Non-household consumption (metered)	99.07	102.27	3.2	99.1	94.5	-4.5
Non-household consumption (unmetered)	3.61	3.84	0.2	3.6	3.5	-0.1
Distribution system operational use	2.89	3.08	0.2	2.9	3.0	0.1
Water taken unbilled - legally	7.76	8.26	0.5	7.8	7.4	-0.4
Water taken unbilled - illegally	4.15	4.55	0.4	3.5	4.6	1.1
Total leakage	103.47	108.48	5.0	110.6	101.1	-9.5
Distribution Input	571.53	566.00	-5.5	571.5	556.4	-15.1
<b>MLE error (MI/d)</b>			22.75			23.81
<b>MLE error (%)</b>			3.98%			4.17%

Per capita consumption (litres/head/day)	Pre MLE	Post MLE	Adjustment	Pre MLE	Post MLE	Adjustment
Unmeasured PCC	154.8	164.8	10.0	131.5	140.4	9.0
Measured PCC	121.3	123.3	2.0	121.3	123.4	2.1
Overall PCC	125.5	128.4	2.9	122.6	125.5	2.9

Additional lines	Pre MLE	Post MLE	Adjustment	Pre MLE	Post MLE	Adjustment
Leakage upstream of DMA	1.6	1.654	0.1	1.6	1.7	0.1
Distribution main losses	83.8	87.847	4.1	90.9	95.6	4.6
measured households excluding void properties	15.1	15.794	0.7	15.1	15.8	0.8
unmeasured households excluding void properties	1.8	1.904	0.1	1.8	1.9	0.1
measured non-households excluding void properties	0.6	0.668	0.0	0.6	0.7	0.0
unmeasured non-households excluding void properties	0.1	0.056	0.0	0.1	0.1	0.0
void measured households	0.3	0.314	0.0	0.3	0.3	0.0
void unmeasured households	0.1	0.137	0.0	0.1	0.1	0.0
void measured non-households	0.1	0.094	0.0	0.1	0.1	0.0
void unmeasured non-households	0.0	0.009	0.0	0.0	0.0	0.0

***Mains repairs:***

Southern Water remains fully compliant with the guidance with all elements of the RAG at green.

***Water supply interruptions:***

Southern Water remains fully compliant with the guidance with all elements of the RAG at green.

***Unplanned outage:***

In the 2021-22 APR, we reported, elements 3a (source data - programme of work) and 6b (evidence of water quality events) as amber, as a number of manual processes remained in place meaning that data had not been recorded for individual assets taken out of service unless they affected the sampling program, and as evidence of water quality events was not being recorded unless this caused full outage. Following the completion of the 2021-22 submission and RAG assessment this was addressed with all incidents of planned outage requiring full documentation, and for all water quality events from July 2022. As the data for April to June 22 was partially compliant, we have retained an amber status for 3A, with 6b as green as no incidents were recorded in the first quarter. All data and reporting from July 2022 is fully compliant with the guidance with all elements of the RAG.

***Internal sewer flooding:***

Southern Water remains fully compliant with the guidance with all elements of the RAG at green except for 5. Neighbouring properties. This remains at amber as whilst property checks are carried out, these are manually recorded and therefore subject to error.

***Sewer collapses***

Southern Water remains fully compliant with the guidance with all elements of the RAG at green.



## Data trends, anomalies, and additional commentary in relation to non-financial data

### 1F – Financial Flows

On completing the Average 2020-25 section of table 1F, we found a number of formulas in the Ofwat spreadsheet '2022-23-annual-performance-report-tables-excluding-tables-3A-3lv1.1' to be incorrect. These were all found in the section 1F.4 to 1F.8 and again from 1F.10 to 1F.15 (columns L and M of the spreadsheet). We have made corrections to the formulas where necessary.

### 3E Outcome performance – Non-financial performance commitment PR19SRN\_NEP01 WINEP Delivery

There are two types of schemes and investigations in the AMP7 Water Industry National Environment Programme (WINEP). These are “EPA” schemes and investigations and “non-EPA” schemes and investigations.

The EPA (Environment Protection Act) schemes are used by the Environment Agency (EA) in their Annual “Delivery of the Water Industry National Environment Programme (WINEP)” metric. This metric is based on a cumulative total of schemes delivered by each AMP year end. Southern Water needed to deliver 255 non-EPA Schemes by the end of AMP7 Year 3. All 255 have been delivered no on time so from an EA perspective we are “green” on the WINEP EPA measure.

In addition to the EPA schemes – we also need to deliver “non-EPA” schemes. These schemes are part of the WINEP but are not counted by the EA in their Annual WINEP delivery metric. In addition to the 255 WINEP EPA schemes Southern Water also had 639 non-EPA Schemes for delivery by the end of Year 3. These schemes cover EDM installations and investigations into flow measurement provision at our treatment works (U\_INV2 investigations). All of these non-EPA schemes were delivered on time to the EA this year.

However, as part of the delivery of the 190 U\_INV2 investigations, Southern Water has been asked to confirm delivery dates of improvements to on site flow measurement later this AMP. We are currently in negotiations with the EA Agency, and as these dates are unconfirmed they have not signed off the 190no U\_INV2 investigations as being complete, meaning that under the terms of the Ofwat metric, whilst all schemes have been delivered, as these are shown as complete on the WINEP tracker, this has been reported as Not Met and these schemes will not be marked as complete until we can resolve our ongoing negotiations with the Environment Agency.

### Information on the Reporting and Assurance requirements (PSR Reach and PSR Data-Checking) for Table 3F

We have achieved a PSR reach of 8.26% for 2022-23, this is a significant improvement to 2021-22 and means we have achieved the end of AMP Common Performance Commitment early. The significant increase has been driven by an amendment to our quality monitoring framework to push agents to offer PSR where appropriate and the introduction of proactive campaigns in the wake of water supply outages. Whilst we have achieved the target of reaching out to customers who have been on the PSR for two or more years, the level of actual contact was disappointingly low and demonstrates some of the challenges of data cleansing activity with disengaged customers.

PSR membership breakdown:

- a) PSR services for communication (needs codes - blind, hearing, language barrier, partially sighted, sight, speech impairment) - 10,069
- b) PSR services for support with mobility/access restrictions (needs codes - can't answer door, home lift/hoist, nebuliser, oxygen use, physical health, req. oxygen, hospital recovery, ventilator) - 52,286
- c) PSR services for support with supply interruption (all needs codes) - 166,384
- d) PSR services for support with security (password set up) - 230
- e) PSR services for support with other needs - (all other PSR customers) - 102,332

Customers added to the PSR - 85,795. Customers removed from the PSR - 1465



#### 4M Wastewater network+ enhancement expenditure

*Schemes to increase flow to full treatment:* The significant variance between actual costs to date and the final determination allowance is due primarily to timing. We have a significant number of schemes entering construction phase now and two very significant investments planned at our Budds Farm and Peel Common sites in Hampshire. There is an element of time delay at both sites which means that there is forecast to be a cost shortfall at the end of the AMP slipping into AMP8.

The Budds Farm site has an EA completion date of end March 2025. Detailed investigations have prompted an application to delay the EA completion by 2 years to March 2027. Current forecast expenditure for all schemes in this category to the end of March 2025 is £70 million with the remaining £72 million to be expended in 2025–26 and 2026–27.

*Schemes to increase storm tank capacity:* The significant variance between actual to date and allowance is due to timing. Most schemes have either started construction or soon will. Significant future spend is planned for Motney Hill at £6.3 million, Sandown £5.3 million and Queenborough £4.1 million. There are 7 more schemes with outturns in excess £2 million each, contributing to another anticipated £12.4 million future investment. All are due to completed by end March 2025.

#### 5A.18 Total number of water reservoirs & 5A.19 Total capacity of water reservoirs

Number and capacity have increased due to bankside storage now being included in this metric.

Additions are:

- 1) Church Farm Hardham
- 2) Testwood Lakes
- 3) Eccles Lakes

#### 5A.20 Total number of intake and source pumping stations

The following, in alphabetical order, were not in service for 2022-23.

- 1) Andover Borehole 2 UGS 103312
- 2) Broadwater Borehole 2 UGS 103342
- 3) Hardham Low Works 1 SWA 103395
- 4) Hardham Low Works 2 SWA 103620
- 5) Lessland Lane Bathingbourne Borehole 1A UGS 101458
- 6) Shalcombe Borehole 2 UGS 103479
- 7) Ventnor Spring UGS 103523
- 8) Ventnor Tunnel UGS 109418
- 9) Weirwood Forest Row SWA 114935
- 10) Whitchurch Borehole 1 UGS 103528

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

Capacity increase despite less sites because of changes in average:

type	Average 2023	Average 2022
UGS	69.9313369	68.369
SWA	301.1215	278.485
RWT	90.076	90.076

## 6B Treated water distribution assets

6B.1: Difference due to change in capacity from 2022 to 2023, new component added to existing sites, and average values

6B.2: Capacity change due to changes to Out Of Service (OOS) sites and improvements to the Altryx reporting workflow that runs this process. The following sites are recorded as out of service this year: Duncton WSR, Shalcombe Low Level WSR, Colstable BPT. Sites in service this year; Chilbolton WSR Cell 1 and Chilbolton WSR Cell 2, Broadfields Transfer WSR (This has been converted to a suction tank), Ashey WSR, Maze Hill WSR & Ticehurst BPT.

6B.16: This is total of 6B.17 + 6B.18 + 6B.19 + 6B.20, see comments below

6B.17: 4 fewer in service. The number has been adjusted to take into account WSRs that have been removed from service or returned to supply within the last year.

6B.18: Reduced by 1, as Weirwood long term out of service

6B.19: WBS Boosters reduced by 11 from last year as a result of updated asset data.

6B.21: Within year the number of reservoirs has increased. This is because in our WSP we have split WSRs where they have cells that are not hydraulically linked and have independent sample points. WSRs that have multiple cells that are interlinked continue to be treated as one WSR.

Clear Water Tanks have also been included.

6B.22: OOS Colgate and Whitchurch Towers were included.

## 6C.24 Event risk index

The DWI have provided an updated value for the previous year's score, which has amended to 729.909.

The score for this year of 5466.708 is a provisional score from the DWI, although unlikely to change significantly as all the events for 2022 have been assessed. The score will not be confirmed fully until April 2024. We are aware the extremely high ERI score for 2022 does not compare well to a provisional industry average of 833.148. The high Southern Water score was caused mainly by three events; the use of non-regulation 31 compliant washers on the GAC at Burham WSW, structural integrity issues at Patcham mid WSR and the loss of supplies event in Southampton caused by the freeze thaw. These events accounted for 98% of the score for 2022.

## 6D Demand management – metering and leakage activities

All of our metering costs are capitalised. Most of our customers were metered as part of our Universal Metering Project from 2010 to 2015. As a result of this, the number of new optant meters installed each year is relatively small. We do not record the costs of these installations separately from the overall meter renewal programme. To complete the table, we have pro-rated the cost of meter installation across the number of meters installed, resulting in broadly the same derived unit cost for each activity.

## 6F WRMP Annual Reporting

Ofwat guidance, in RAG 4.11, states that the classification of the Water Resources Management Plan (WRMP) schemes delivered should be one of the following four categories, and that their expenditure should reconcile to the same categories in Table 4L: Supply-side improvements delivering benefits in 2020–25, Demand-side improvements delivering benefits in 2020–25 (excluding leakage and metering), Internal interconnectors delivering benefits in 2020–25, Supply-demand balance improvements delivering benefits starting from 2026.

However, we do have a number of schemes that fall within those categories that do not form part of our WRMP, therefore a reconciliation is required to Table 4L.

Demand-side improvements do match and so do not form part of the reconciliation below.

	20-21	21-22	22-23
<b>Supply demand balance improvements delivering benefits starting from 2026</b>			
Table 6F	8.371	0.647	1.186
Table 4L	8.477	0.954	2.004
<b>Difference</b>	<b>0.106</b>	<b>0.307</b>	<b>0.818</b>
<b>Reconciling Items, Supply Demand Balance Improvements (SDBI)</b>			
Reclassification of pipelines between SDBI and Internal interconnectors	0.023	-0.023	0.000
AIM related costs that sit in SDBI but not related to WRMP	0.061	0.165	0.100
WQ Directive costs that sit in SDBI but not related to WRMP	0.021	0.004	0.063
Increase SE Water Bulk Supply costs that sit in SDBI but not related to WRMP	0.000	0.012	0.409
WRSE costs that sit in SDBI but not related to WRMP	0.000	0.149	0.352
Imports from Gaters Mill, previously in Strategic Regional Water Resources	0.000	0.000	-0.107
<b>Total</b>	<b>0.106</b>	<b>0.306</b>	<b>0.818</b>
<b>Supply-side improvements delivering benefits in 2020-2025</b>			
Table 6F	0.071	0.480	2.982
Table 4L	2.270	-0.011	6.010
<b>Difference</b>	<b>2.199</b>	<b>-0.491</b>	<b>3.028</b>
<b>Reconciling Items, Supply-side improvements delivering benefits (SSIDB)</b>			
Reclassification of pipelines between SSIDB Internal interconnectors	0.000	0.016	0.000
WRMP14 related costs that sit in SSIDB but not related to WRMP	0.099	0.539	0.875
Metering costs that sit in SSIDB but not related to WRMP	0.572	-0.170	2.347
Reclassification of Impounding Reservoirs	1.020	-1.020	0.000
Groundwater licence variation, 1in500 year event, in SSIDB but not related to WRMP	0.070	0.143	-0.193
Strategic modelling reclassified to Strategic Regional Water Resources	0.438	0.000	0.000
<b>Total</b>	<b>2.199</b>	<b>-0.491</b>	<b>3.028</b>
<b>Internal interconnectors delivering benefits in 2020-2025</b>			
Table 6F	0.023	0.606	3.061
Table 4L	0.000	0.613	3.061
<b>Difference</b>	<b>-0.023</b>	<b>0.007</b>	<b>-0.000</b>
<b>Reconciling Items</b>			
Reclassification of pipelines between SDBI and Internal interconnectors	-0.023	0.023	0.000
Reclassification of pipelines between SSIDB Internal interconnectors	0.000	-0.016	0.000
<b>Total</b>	<b>-0.023</b>	<b>0.007</b>	<b>0.000</b>

There has been a significant change in the forecast costs reported for the period after 2024–25. In previous years we were still investigating potential options, and so most of our forecast costs were related to studies and investigations. We now have more details of the proposed projects and associated costs for each of these categories and these are reported in the table for the first time this year.

## 7B.10 - Flow passed to full treatment & 7C.13 Volume of wastewater receiving treatment at sewage treatment works

Data from these lines is sourced from a single reporting process and many sites saw a >10% reduction in flow compared to the prior year. This is result of a significant period of months with low rainfall, and overall annual rainfall lower than previous 3 years. This is against a widespread increase in flows in 2020 compared to 2019 and if 2022 is compared to 2019, there are only 6 sites with >+/-10% difference.

## 7E.5 Number of odour related complaints

The 2022-23 figure of 1228 is 176 (14%) fewer than the 2021-22 figure of 1404, despite a written complaints increased from 29 to 125 and made up 10% of the total compared to 2% last year. This reduction is predominantly attributable to the odour scheme at Ashford WTW being completed including covering the reception tanks, new covers and odour unit at Bybrook WPS cess reception, storm tank cleaning system and using tractors and trailers for storage and loading of lorries.

## 7C.12 Volume of trade effluent

The TE volume this year is slightly up on the previous year by 4%. It is believed that this is due to some recovery following COVID which saw a significant drop in volume in the previous 2 years. Whilst the volume is higher than the previous year, the Population Equivalent is down 3% on the previous year from 102321.65 to 98994.18, meaning that the waste that has been discharged has been lower in strength.

## 7F Wastewater network+ -WINEP phosphorus removal scheme costs and cost drivers

This was a new table in 2021–22 and has been the subject of considerable scrutiny through the year. Specifically, there was a major data request to align information from the EA and check understanding of the schemes put in place to meet the new consents. This was returned to Ofwat in March 2023. Subsequently, Ofwat sought further clarification on specific elements of the data return under SRN-APR-CA-025 which was completed and returned on 19 May 2023. The table 7F for APR 2023 is, to the best of our knowledge, consistent with the data request and follow up query.

Forecasts Capital spend continues to be reviewed for our whole programme, including the phosphate schemes still in progress. Scheme forecasts have therefore been amended in line with our latest view.

Included are some schemes with more significant increases. For Netherfield (7SO200077), Mannings Heath (7SO200078) and Gratton Close (7SO300438), the anticipated dosing schemes were found to be far more involved and consequently prohibitively more expensive than assumed. As a result, the lowest whole life cost solution of pumping forward, which is still significantly more costly than the hoped-for basic dosing approach, has been adopted. Significant complications highlighted during the design phase has also suggested increased costs for Scaynes Hill (7SO200388), Godstone (7SO200102) and Barcombe (7SO200349).

These increases are largely offset by lower envisaged costs across the remainder of the live schemes and allowing for increase due to the price base movement.

Separately we have reported two schemes, with phosphate removal included as part of a wide remit, under their own heading of 'WFD Manage uncertainty Special case' on Table 4M.

## 8C Bioresources energy and liquors analysis

Our bioresources electricity sub-metering programme is still in progress, with a nationwide shortage of meters slowing our efforts. At 31 March 2023 we had managed to successfully submeter 61% of our bioresources electricity assets. This equates to 22,923 MWh of the 37,591 MWh (16,564 MWh generated, 21,027 MWh bought) electricity used in the Bioresources control, or 21.2% of total Bioresources energy consumption (electricity plus heat).

At 31 March 2022 we had no bioresources electricity submetering. The coverage declared for the 2021–22 financial year of 36.4% was in relation to our heat consumption. We have no specific heat meters, with the numbers derived from taking spot samples (which Ofwat recognised as being metered). Unfortunately, we were not able to take spot samples for the 2022–23 financial year.

### **8C.15 & 8C.16, BOD and Ammonia load of liquor or partially treated liquor returned from bioresources to network plus**

There has been a difference in the sludge liquor return volumes in comparison to last year through improvements in the reporting process, significantly the utilisation of a Subject Matter Expert (SME) to validate whether the actual volumes and concentrations reported were appropriate to the size of the site and expectations, and where this was not the case, we have utilised theoretical values. Last year theoretical values were only used for the 9 sites that had negative values for sludge liquor volume from our reporting, and in the absence of an SME, it was assumed that for all sites with a positive value for volume this volume was correct. The SME has reviewed volume and liquor concentration for all sites against the AM410 (the standardised Southern Water document for site capacity assessment) including the mass balance approach and process loading calculations for each site.

This year, as a result of this deeper review, 24 of the sites required theoretical sludge liquors values from the AM410s to be used as the flow data for calculating the sludge liquors did not have flow rate data for all days, or gave such a difference to the theoretical value for the individual streams and/or site that its validity was brought into doubt. Further, errors in entry of the 2021/22 data were identified.

We are aware that this is a significant change as result of the more detailed examination and validation by an SME of the source data, and this has been both peers reviewed and assured prior to submission to Ofwat.

Further reporting improvements have already been made, including setting up a monthly review of all source data to allow any issues with sampling and/or liquor volumes calculation data to be understood to be corrected during the year and rectified, and reviewing all data inputs. The raw data spreadsheets (STC Standard Spreadsheets) are already in the process of being rebuilt, and the AM410s are also under review.

We are carrying out a review of the data submitted for the 2021-22 and other historic data over the coming months, and will confirm any restatements in the 2023-24 APR, however we would also note that all data historically reported was at a confidence grading of C5, so will review the need to restate once a full review is complete.

## 11A Greenhouse gas emissions

The CAW17 v4.02 workbook, developed by Ricardo, was used to calculate emissions. The total operational emissions from the CAW17 amount to 109,549.55 tCO<sub>2</sub>e (Market based).

This figure is slightly higher than last year's figure of 81,888.86 tCO<sub>2</sub>e due to the inclusion of additional carbon sources by Ofwat, which includes emissions from chemicals, and electricity generation and transmissions and distribution well-to-tank emissions.

We appointed Mott MacDonald to calculate two other carbon sources this year, namely embedded emissions, and emissions from purchases. The estimated embedded emissions are 198,130.00 tCO<sub>2</sub>e and the emissions from purchases are 30,753.96 tCO<sub>2</sub>e. The operational emissions are divided as follows:

Location based (tCO<sub>2</sub>e):

- Scope 1: 60,111.97
- Scope 2: 84,726.45
- Scope 3: 71,602.85

Market Based: (tCO<sub>2</sub>e):

- Scope 1: 60,111.97
- Scope 2: 0.5
- Scope 3: 49,437.08

The total carbon emissions amount to 338,433.50 tCO<sub>2</sub>e (market based) and 445,325.23 tCO<sub>2</sub>e (location based), which encompasses SW Total Scope 1, 2, and 3 emissions.

The change in our emissions was affected by last year drought which reduced the amount of the water that was received by our catchments by 25% comparing with the year before which affected our water exports and the amount of sewerage that our wastewater treatment works receive, subsequently affecting our energy consumption.

Following the advice of our 3<sup>rd</sup> party assurance partners Jacobs, lines 11A-33-36 have been left blank as the specific amounts of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O cannot be obtained after the addition of new lines 25-30, as more carbon sources have been added to scope 3, which make the numbers from the CAW for these inaccurate.

## Greenhouse gas emissions SWOT report

<p><b>Strengths:</b></p>	<p>For Operational emissions:</p> <ul style="list-style-type: none"> <li>• SW as a company has a strong commitment to sustainability and reducing carbon emissions.</li> <li>• SW has achieved significant reductions in carbon emissions over the past few years through resourcing green energy and increasing its renewables generation.</li> <li>• SW efforts to reduce carbon emissions have helped to improve its reputation and standing with customers and stakeholders.</li> </ul> <p>For embedded emissions:</p> <ul style="list-style-type: none"> <li>• The sample size of project has been selected to cover all 4 workstreams and size of projects from small, medium and large value projects. They are also based on delivered projects in AMP6, therefore are representative of Southern Water carbon intensity of capital projects at a given point in time.</li> </ul>
<p><b>Weaknesses:</b></p>	<p>For Operational emissions:</p> <ul style="list-style-type: none"> <li>• The reporting processes may not be fully comprehensive, potentially leading to gaps in data or incomplete reporting. For instance, this year chemicals emissions have been added.</li> <li>• The company may face challenges in identifying and addressing all sources of carbon emissions, particularly those that are indirect or difficult to measure.</li> </ul> <p>For embedded emissions:</p> <ul style="list-style-type: none"> <li>• The sample size is limited in scale due to availability of project data and time available to complete assessments. The 20 sample projects only cover 1% of total AMP6 projects. The representativeness of sample projects does cover all four workstreams, however, further improvements could be made by breaking projects out further into portfolios delivered under each workstream</li> </ul>
<p><b>Opportunities:</b></p>	<p>For Operational emissions:</p> <ul style="list-style-type: none"> <li>• SW can continue to build on its successes in reducing carbon emissions, potentially setting ambitious targets for further reductions through generating more renewables and adopt green technologies.</li> <li>• SW can leverage its commitment to sustainability and carbon reduction as a competitive advantage, attracting customers and investors who prioritize these values.</li> <li>• SW can explore new technologies or approaches for reducing carbon emissions, potentially leading to cost savings or other benefits.</li> </ul> <p>For embedded emissions:</p> <p>Year 4 reporting can focus on live AMP7 projects as a source of sample projects, there is the potential to increase the coverage of projects to cover a greater % of year 4 spend. A longer-term programme to improve cost and carbon capture of as-built projects is underway to improve refinement of carbon accounting methods for capital projects over time.</p>
<p><b>Threats:</b></p>	<p>For Operational emissions:</p> <ul style="list-style-type: none"> <li>• SW may face regulatory pressures or mandates related to carbon emissions, potentially leading to increased costs or penalties.</li> <li>• SW may face reputational risks if it fails to meet its carbon reduction targets or if it is perceived as not doing enough to address climate change.</li> <li>• SW may face increased competition from other companies that are also prioritizing sustainability and carbon reduction.</li> </ul> <p>For embedded emissions:</p> <p>The coverage of the programme based on spend is considered to be complete, however, the limited sample size used significantly reduces the quality and representativeness of the assessment and there are significant opportunities to improve this.</p>