TMS58 PR24 Data Table Commentary - Costs (Wholesale) - Water

CW1 - Totex analysis - water resources and water network+ (post frontier shift and real price effects)

1. Atypical expenditure

- We are not reporting any atypical expenditure for FY24-30

2. Principal Use recharges

- We have followed the guidance for principal use recharges per RAG 2.09 and as set out in our Annual Performance report methodology. Where possible we have directly attributed capital expenditure and the corresponding depreciation to the price control units, and applied the principle use guidance for shared assets, primarily Digital and Group Services, apart from where relevant exceptions have been communicated by Ofwat.
- Set out in the table below is a summary of the capital expenditure movements associated with principal use rules, for FY24-30 in 22/23 price base

Principle Use Capex	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Water Network Plus	-6.857	16.310	-53.537	-44.640	-33.112	-28.311	-22.866
Water Resources	-3.105	-2.849	-7.261	-5.854	-4.086	-3.328	-2.656
Waste Network Plus	15.016	-13.953	109.344	89.519	57.732	43.755	35.596
Bioresources	-1.175	-0.909	-21.844	-17.128	-11.333	-9.271	-7.661

3. Significant Changes in costs

- Set out in the table below shows the year-on-year delta from FY23 through to FY30, with significant changes commented on

Data Table	Whole Table or Line	Commentary
CW1 and CW1a	Whole Table	All costs, profile, price control and upstream allocation are aligned with the forecasted FY24-30 totex costs.
	1.1	Base operating expenditure, the profile of opex from AMP7 to AMP8 reflects our recognition of the importance of making an early start in AMP8 to deliver our performance.
	1.2	Enhancement operating expenditure, aligned with CW3 profiling. AMP7 enhancement programme is reducing over FY24+25 with new schemes planned for AMP8 onwards.
	1.3	Developer services operating expenditure, refer to DS2e and DS3 commentary and explanation of APR23 restatement.
	1.5	Third party services, restated for 1) DS third party costs, refer to DS1e - DS5 methodology, and explanation of APR23 restatement. 2) Bulk supply costs as per APR23 Ofwat query TMS-APR-CA-012
	1.7	Grants and contributions - operating expenditure, refer to DS1e commentary, and explanation of APR23 restatement.

	1.8	Base capital expenditure, the profile of capex from AMP7 to AMP8 reflects that a lot of early design work has been completed to ensure delivery of performance and benefits at the start of AMP8. The Digital programme also follows this profile to ensure early delivery of benefits.
	1.9	Enhancement capital expenditure, refer to CW3 commentary.
	1.10	Developer services capital expenditure, refer to DS2e and DS3 commentary, and explanation of APR23 restatement.
	1.12	Third party services, restated DS third party costs refer to DS1e - DS5 methodology, and explanation of APR23 restatement.
	1.14	Grants and contributions - capital expenditure, refer to DS1e commentary, and explanation of APR23 restatement.
	1.16	Pension deficit recovery payments, as per the forecasted cash payments.

4. Equity issuance costs

- We are not reporting any equity issuance costs for FY24-30

CW1a - Totex analysis - water resources and water network+

See commentary for table CW1.

CW2 - Base expenditure analysis - water resources and water network+

1. Significant changes, actual and forecast

Set out in the table below shows any significant and material (question 2) changes between actual (FY23) and forecast costs (FY24-30)

Data Table	Whole Table or Line	Commentary
CW2	CW2.1	Power Following more granular analysis during the AMP8 forecast process, we have identified an element of cost in the AMP7 early submission tables, that resulted in an overstatement of power cost and an equal and opposite understatement of other costs. This has been restated and corrected in the full submission. AMP8 energy strategy sees a slight increase in energy import requirement being more than offset by the expected gradual decrease in wholesale prices and return towards the long term power price trend (albeit at a new normal) following the

		extenuating recent peaks in the market in FY23, resulting in a gradual drop over AMP8.
	CW2.4	Renewals expensed in year (infrastructure) in Water Network+ Decrease from FY23 to FY24 and then held generally flat from FY25 onwards as FY23 costs includes the insourcing of the activity from the Third Party provider which includes some duplication and overlap.
	CW2.6	Other operating expenditure Refer to CWW1.1 commentary for base opex
	CW2.7	Local authority and Cumulo rates Refer to CWW10 commentary for key changes. A restatement of cost has been made for FY24+5, which is now different to the early data table submission of PD8.
	CW2.15-17	Base Capital Expenditure Refer to CWW1.8 commentary for key changes.
	CW2.18	Projects incurring costs associated with Traffic Management Act in Water Network+ Our future job volumes are not broken down by type, size, or location, therefore we cannot fully predict the number of jobs that require traffic management fees. The forecast provided here is therefore formulaic based on historic information and average costs per job.

2. Material year-on-year variations

Refer to question 1 above.

3. Changes in methodology

A restatement of APR23 has been made following queries raised by Ofwat and carried forward for FY24-30.

- Third Party services in CW1.5, restated for the below changes which then impact CW1.1 base operating expenditure and therefore CW2.14 Total base operating expenditure.
    1. DS third party costs, refer to DS1e - DS5 methodology, and explanation of APR23 restatement.
    2. Bulk supply costs as per APR23 Ofwat query TMS-APR-CA-012

4. Equity issuance costs

- We are not reporting any equity issuance costs for FY24-30

CW3 - Enhancement expenditure - water resources and water network+

Use of Additional Lines 1-5

As some of our Annual Return (AR) makes use of additional lines, and we wanted to ensure alignment with the AR as far as possible, some of the additional lines in CW3 have different uses for AMP7 (22/23 - 24/25) to AMP8 (25/26 – 29/30)

Table Reference	Line Description	Values in AMP7	Values in AMP8
CW3.130, CW3.131	Additional Line 1	Not used	Crypto Enhancement Case
CW3.132, CW3.133	Additional Line 2	Not used	Trunk Main Basement Flooding
CW3.134, CW3.135	Additional Line 3	Not used	Asset Deficit
CW3.136, CW3.137	Additional Line 4	Unplanned outage improvements (Was Additional line 1 in AR23)	Digital Cyber Enhancement Case
CW3.138, CW3.139	Additional Line 5	Improving performance of London Water networks (was Additional Line 2 in AR23)	WINEP AMP7 Close

Following commentary relates to AMP7 costs for table CW3 (and CW9):

- Costs have been allocated to the different PR24 data table lines as stated in the methodology statement and guidance for this table.
- Not all lines have been used in the PR24 proforma where there is no spend driver applicable to the AMP7 plan.
- Costs exclude the impact of the frontier shift and real price effects and are presented in 2022/23 price base.
- Additional lines used in table CW3 / CW9 to capture AMP7 historic spend are: 'Asset Debt' – This contains spend for 'Unplanned Outage Improvements' & 'Improving Performance of London Water Networks' as there are not enough additional lines to itemise this spend separately when combined with the AMP8 plan.
- Where a project has both a base and an enhancement element this will be designated by purpose and the percentage allocation determined and ratified through rigorous internal governance before the project commences.

The table below shows the enhancement capex spend circa £79m (AMP7 Y3-5) that also has a Base driver in the plan, split by cost driver.

AMP7 Historic Spend (Y3-5) - Enhancement Spend that also has a Base Driver in the AMP7 Plan (This is Just the Enhancement spend element only)
2022/23 Price Base

water PR24 Data table	water PR24 data table lines	Raw water abstraction	Raw water transport	Treated water distribution	Water treatment	Grand Total
CW3.16	Water Framework Directive; (WINEP/NEP) water capex	93,377	-	-	-	93,377
CW3.28	Investigations; (WINEP/NEP) - desk based study only water capex	0	-	-	-	0
CW3.41	Supply-side improvements delivering benefits in 2025-2030; SDB capex	-	-	-	-	-
CW3.44	Demand-side improvements delivering benefits in 2025-2030 (excl leakage and metering	-	- 877	310,700	-	309,822
CW3.60	New meters requested by existing customers (optants); metering capex	-	-	9,332,389	-	9,332,389
CW3.63	New meters introduced by companies for existing customers; metering capex	-	-	41,628,874	-	41,628,874
CW3.66	New meters for existing customers - business; metering capex	-	-	-	-	-
CW3.97	Addressing raw water quality deterioration (grey solutions); enhancement capex	-	-	-	- 815	- 815
CW3.106	Lead communication pipes replaced or relined; enhancement capex	-	-	12,575	-	12,575
CW3.118	Resilience; enhancement water capex	-	-	- 1,154	539,841	538,687
CW3.121	Security - SEMD; enhancement water capex	-	- 1,487	-	-	- 1,487
CW3.134	Growth - DS	-	-	- 1,289	-	- 1,289
CW3.136	Unplanned Outage Improvements	-	-	-	- 2,414	- 2,414
CW3.138	Improving Performance of London Water Networks	-	-	27,180,374	-	27,180,374
Grand Total		93,378	- 2,364	78,462,469	536,613	79,090,096

- The Total amounts (£m) in Table 3 – Historic spend AMP7 do not align to the early submission table CW1. A correction to CW1 will rectify this so that tables 1 & 3 are in alignment.

The reasons for the variances between these tables are largely as follows:

1. Process methodology - CW1 identified Growth (that was not submitted under the Developer Services price control) as base. This has been reinstated as enhancement spend in CW3.
2. Updates to the data – The early submission table (CW1) used an earlier iteration of a control file that at the time had high level manual adjustments processed as the annual Budget was under review. CW3 has been populated using a later more detailed control file with these adjustments finalised and processed.
3. Updates to the data - The Metering enhancement programme for Y4 & Y5 had not been finalised (table CW7) when the CW1 table was submitted; plus, the control file at the time used to populate CW1 had a purpose code allocation error. A correction has been made to CW3 to reallocate metering enhancement spend in Y4 & Y5 of AMP7 from base to enhancement.

Following commentary relates to AMP8 only costs for table CW3:

- Cost have been allocated to the different table lines as stated in the methodology statement for this table. Not all lines have been used.
- Costs exclude the impact of the frontier shift and real price effects, presented in 22/23 price base.
- CWW3 is for wastewater and CW3 for water expenditure. All costs in these tables have originated from business solutions that are either 100% wastewater or 100% water. The only exception is on the additional lines relating to Digital Cyber enhancement case (CWW3.187/188 & CW3.136/137). Proportional allocation has been applied to shared assets for these lines, predominantly weighted to FTE in line with annual return historic allocations. In total 60% to wastewater and 40% to water.
- No solutions have been proportionally allocated between base and enhancement.
- Additional lines used in table CWW3 are:
  - Crypto Enhancement Case – no defined line in published template, separate enhancement case submitted.
  - Trunk Main Basement Flooding Enhancement Case – no defined line in published template, separate enhancement case submitted.
  - Asset Deficit - Base investment not included in CW1 & CW2. Individual defined case included in submission, across wastewater and water.

    - Cyber – All costs allocated to separate enhancement case submitted. Lines CW3.124 to 126 not used as these are just for compliance with Network and Information Systems regulations (NISR) 2018. The enhancement case is for compliance with NISR and the Data Protection Act (DPA), and to meet other drivers and therefore enhancement case costs have been kept whole on additional lines.
    - AMP7 WINEP Close - Separated these costs for AMP7 WINEP delivery from AMP8 WINEP delivery (lines CW3.1 to CW3.40). Individual defined case for AMP7 WINEP close included in submission.
- Lead Enhancement Case. Please note that there is a difference between the costs assigned to lines CW3.106 and CW3.115 and those in the enhancement case document. The overall totals between the data lines and enhancement case are the same, but it is the split between the two activity lines which are different. The enhancement case proposes an AMP8 programme of lead comms pipe replacements at the same rate as AMP7, with an associated customer side trial.
- Focus of profiling spend for the 5 years of AMP8 has been at a programme level

The following table is specific commentary on the individual lines:

Data Table	Whole Table or Individual Line/s	Commentary
CW3	Lines 16 to 40 EA/NRW environmental programme (WINEP/NEP)	• All spend relates to new AMP8 WINEP commitments and excludes completion of AMP7 WINEP commitments. • Not all lines have been used. • AMP8 defined enhancement case, for Low Flow drivers. • No specific PCD proposed. • Expenditure increases through AMP8 as schemes are defined and delivered.
	Lines 41 to 59 Supply-demand balance	• AMP8 defined WRMP enhancement case with Metering lines (60 to 68). • No specific PCD proposed. • Spend increases from 25/26 to 28/29 before reducing in 29/30. Peak spend in 28/29 from land payments relating to SRO.
	Lines 60 to 68 Metering	• AMP8 defined WRMP enhancement case with Supply – demand balance lines (41 to 59). • Contributes to Leakage, PCC & Business Demand PC's. • Consistent delivery profile during AMP8.
	Lines 106 to 117 Lead communication pipes replaced or relined	• AMP8 defined Lead communication pipes enhancement case. (See note above) • Specific PCD proposed. • Consistent delivery profile during AMP8
	Lines 118 to 120 Water resilience	• AMP8 defined WSSRP enhancement case being progressed through agreed conditional allowance stage gate process with Ofwat. • No specific PCD proposed.

		• Profile consistent with July 2023 stage gate submission to Ofwat.
	Lines 130 to 131 Crypto Enhancement Case	• AMP8 defined Crypto reduction enhancement case. • Specific PCD proposed. • Profile includes delivery of 2 schemes and development of 2 other sites.
	Lines 132 to 133 Trunk Main Basement Flooding Enh Case	• AMP8 defined Trunk Mains basement flooding enhancement case, including completion of LWICA (London Water Infrastructure Conditional Allowance) from AMP7 • Specific PCD proposed. • Early AMP8 spend focused on LWICA completion, with new sites being defined and delivered as the AMP progresses.
	Lines 134 to 135 Asset Deficit	• AMP8 defined case. • Additional investment above base tables. • Increase in spend during AMP8 as schemes move from definition into delivery.
	Lines 136 to 137 Cyber	• AMP8 defined enhancement case. • Addresses compliance with Network and Information Systems regulations (NISR) 2018 and the Data Protection Act (DPA); and to meet other drivers. • No PCD proposed. • Relatively flat profile during AMP8
	Lines 138 to 139 WINEP AMP7 Close	• AMP8 defined case. • Project level investment to complete AMP7 WINEP commitments.

CW4 - Raw water transport, raw water storage and water treatment data

Data Table	Whole Table or Individual Line/s	Commentary
CW4	CW4.13	No Works are Simple Disinfection on the Thames Water Estate.
	CW4.14	N/A
	CW4.15	No works classed as W1 on the Thames Water Estate.
	CW4.16	N/A
	CW4.17	35 W2 Works on the Thames Water Estate remaining for all AR periods.
	CW4.18	Water treated at GW2 Works increases from 202.97 Ml/d to 207.97 Ml/d effective AR30 due to Horton Kirby ASR Scheme increasing total water treated by 5 Ml/d (WRMP-driven).
	CW4.19	W3 Works drop from 14 to 13 from AR23 to AR24 as Old Chalford GWTW becomes classed as Disused. This then drops to 12 GW3 Works from AR28 to AR29 as Hawridge GWTW is removed from service (licence revoked, WINEP-driven).
	CW4.20	Please see supporting information for further commentary.

	CW4.21	No material changes
	CW4.22	No material changes
	CW4.23	Number of W5 Works drops to 4 from AR29 after North Orpington GWTW is removed from service. Please see further commentary for more information.
	CW4.24	Please see supporting information for further commentary.
	CW4.25	1 W6 Works on the Thames Water Estate.
	CW4.26	Water treated remains 0 for all years.
	CW4.27	No material changes
	CW4.28	No material changes
	CW4.29	No material changes
	CW4.30	No material changes
	CW4.31	No material changes
	CW4.32	No material changes
	CW4.33	No material changes
	CW4.34	No material changes
	CW4.35	No material changes
	CW4.36	No material changes
	CW4.37	No material changes
	CW4.38	No material changes
	CW4.39	No material changes
	CW4.40	No material changes
	CW4.41	No material changes
	CW4.42	No material changes
	CW4.46	Thames Water does not treat water at more than one type of works, this field is zero for all years.

This commentary is to supplement the information supplied for the PR24 CW4 Wholesale Water data table submission, Lines CW4.13-CW4.42 and CW4.46.

It has been devised with the help of System and Strategic Planning, Operations, and the Groundwater Resources Team.

AR23; 2022-23

The total number of WTWs has decreased from AR22, from 97 to 93. Britwell GWTW, Mortimer GWTW, Lewknor GWTW and Grimsbury SWTW are considered no longer considered Out of Supply, but disused and/or decommissioned.

The sites (11) that have not been used in the year but not decommissioned are as follows: Childrey Warren GWTW (GW4); Chinnor GWTW (GW2); Dancers End GWTW (GW2); Eynsford GWTW (GW2); Honor Oak GWTW (GW4); Merton Abbey GWTW (GW4); Hornsey SWTW (SW5); Ogbourne GWTW (GW4); Old Chalford GWTW (GW3); Southfleet GWTW (GW5); Thames Gateway WTW (SW6).

1. There are 3 GW2 OOS AR23, a reduction from 9 AR22.
2. There is 1 GW3 OOS AR23, an increase from 0 AR22.
3. There are 4 GW4 OOS AR23, an increase of 2 from AR22.
4. There is 1 GW5 OOS AR23, this is unchanged from AR22.

5. There is 1 SW5 OOS AR23, this is unchanged from AR22.
6. There is 1 SW6 OOS AR23, an increase from 0 AR22

This commentary was submitted as part of Thames Water's Annual Returns 2023 process.

All totals include those out of supply for that year but have not been decommissioned fully. This as per Ofwat guidelines:

"Companies should include water treatment works that have not been used in the year but have not been decommissioned and state in their commentary any instances where this is the case."

AR24; 2023-24

Total: 90

The total number of sites Out of Supply is 5.

Childrey Warren GWTW	GW4
Dancers End GWTW	GW2
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

Thames Gateway SWTW and Hornsey SWTW are back in supply as of AR24 as per the Production Plan and AMP7 Botex spending. Chinnor GWTW is expected to be in supply.

Honor Oak GWTW, Merton Abbey GWTW and Old Chalford GWTW have been declassified from 'Out of Supply' to 'Disused' sites; so no longer feature in the treatment works available to use. They are considered disused because they cannot be included in the Production Plan due to the current state of their assets.

AR25; 2024-25

Total: 90

The total number of sites Out of supply is 5:

Childrey Warren GWTW	GW4
Dancers End GWTW	GW2
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

Latton GWTW is reduced to an average daily output of 15Ml/d and a PWPC of 20Ml/d due to a WINEP-driven licence reduction.

AR26; 2025-26

Total: 90

Out of supply: 4

Childrey Warren GWTW	GW4
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

Dancers End GWTW returns to service due to an AMP7 Botex scheme, so out of supply sites drops to 4.

AR27; 2026-27

Total = 90

Out of supply: 4

Childrey Warren GWTW	GW4
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

AR28; 2027-28

Total sites: 90

Out of supply sites: 4

Childrey Warren GWTW	GW4
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

AR29; 2028-29

Total: 88

Out of Supply sites: 4

Hawridge GWTW and North Orpington GWTW are no longer in supply due to having their licence revoked because of a WINEP-driven scheme.

The loss of Hawridge GWTW reduce total water treated at GW3 Works from 177.23 Ml/d to 171 Ml/d from AR28 to AR29.

The loss of North Orpington GWTW reduces the total water treated for GW5 Works from 110.47 Ml/d to 104.13 Ml/d from AR28 to AR29 (CW4.24).

Childrey Warren GWTW	GW4
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

Due to an additional borehole and asset upgrades to get to licence, Addington GWTW will increase its average daily output to 7.35Ml/d from 5.61Ml/d. This is WRMP-driven work. This decreases the water treated at W3 works from 177.23 Ml/d to 171.97 Ml/d between AR29 and AR30 (CW4.20).

AR30; 2029-2030

Total sites: 88

Number of out of supply sites: (4)

Childrey Warren GWTW	GW4
Eynsford GWTW	GW2
Ogbourne GWTW	GW4
Southfleet GWTW	GW5

Horton Kirby GWTW +5 PWPC based on Horton Kirby ASR: 5 Ml/d additional resource during drought periods only (WRMP-driven scheme).

Line 6A.28 - Total water treated at more than one type of works – Thames Water does not treat water at more than one type of works, this field is zero for all years.

CW4a - Transition and accelerated programme - Raw water transport, raw water storage and water treatment data

This table is a Nil Return for Thames Water.

CW5 - Treated water distribution - assets and operations

Data Table	Whole Table or Individual Line/s	Commentary
CW5	Line 1 Installed power capacity of potable water pumping stations	Historic: The data has been derived based on the method used to calculate the "Total installed power capacity of potable water pumping stations" value submitted in the Annual Performance report 2023 table 6b line 1. Forecast: The process followed to enable identification of the total installed power capacity of potable water pumping stations is a 'bottom up' review based on current and planned capital programmes. Notable changes to KW ratings include; Reduction due to programmed site closures associated with AMP7 and expected PR24 WINEP

		programme, with changes planned as per current project or planned project timescales. AMP7 and PR24 Botex programme, include Developer Services delivered existing site enhancements or new site provision, using available design information associated with pump changes. Where design data for pump changes was not available due to lack of maturity of design, estimates were provided, based on calculated estimates derived for APR data returns. Other forecast estimates have been provided for expected new pumping stations, and their associated installed KW rating for low pressure management, based on historic run rates and associated KW ratings.
	Lines 2, 3, 21 and 22, Number and capacity of Service Reservoirs and Water Towers	Historic: The data has been derived based on the method used to calculate the Lines 2, 3, 21, 22 values submitted in the Annual Performance report 2023 table 6b lines 2, 3, 21, 22. Forecast: The process followed to forecast the number and capacity of any new Service Reservoir and Water Towers is a 'bottom up' review process based on current AMP7 Capital Programme & PR24 Business Plan. Notable change include; Forecast additional storage associated with AMP7 programme, and the associated delivery dates. Storage volumes taken from current design activity at the current level of project maturity. Where current design indicates replacement of existing structures, no net difference in the number of structures is noted, however any changes in associated volumes are calculated and provided. Where additional numbers and volumes are proposed as part of the PR24 programme, indicative programmes developed as part of the PR24 Planning phase have been used to identify delivery year where changes in number and volume are forecast.
	Lines 4, 35, 37, 38 & 59 Distribution Input, Water Delivered, total annual leakage, distribution losses, water taken unbilled.	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report. Lines 6B, 4, 5, 6, 7, 35, 37, 38 & 59. Note: Please note a correction for line 6B.37 within the AR23 APR will be made to reflect the PR24 value. The value initially supplied in the APR tables for Water Taken Unbilled was 77.66 Ml/d which

		includes supply pipe leakage. This number should have the supply pipe leakage removed. The revised figure (excluding supply pipe leakage 9.92 Ml/d post MLE) is 67.74 Ml/d post MLE, was confirmed to our Strategy & Regulatory teams on 27th July 23. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP): CW5.4 – 12.1FP CW5.35 - Leakage Values have been calculated from an operational forecast (2023/24-2024/25), and yearly changes in WRMP consumption values (2025/26 and beyond). CW5.37 - 21FP CW5.38 - Distribution input has been calculated from the sum of rows CW5.31-CW5.37 CW5.59** - 28FP* *Leakage Upstream of DMA has been removed from Distribution main losses. **An additional note on lines CW5.59-CW5.67: Values 2023/24 and beyond split the total annual leakage in proportion to the change in the equivalent WRMP lines as listed above, rather than the actual lines.
	Lines 5, 6, 7 Water delivered	Water delivered has been calculated from the sum of other rows within CW5. Specifically, CW5.5 (Water Delivered) = CW5.31-CW5.34 (Measured/Unmeasured HH/NHH Consumptions) + CW5.37 (Water Taken Unbilled) + CW5.60-CW5.67 (Measured/Unmeasured HH/NHH Void/Non-void CSPL). Similarly, CW5.6 has been calculated from other rows. CW5.6 (Measured HH Water Delivered) = CW5.31 (Measured HH Consumption) + CW5.60 (Measured HH CSPL). Similarly, CW5.7 has been calculated from other rows. CW5.7 (Measured NHH Water Delivered) = CW5.33 (Measured NHH Consumption) + CW5.62 (Measured NHH CSPL). Values in these rows are consistent with WRMP data tables: Table 2a.

	Lines 8, 9, 10, 11, 12, 13, 14, 15 Proportion of distribution input derived from reservoirs,	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report. Lines 6B, Lines 8-15. Forecast: To determine the forecast data, distribution input data from the past 5 years was compiled from the historical annual returns. This data was used to populate a table showing data from 2017/18 to 2022/23. An average of 2017/18-2022/23 was calculated; this is used as the forecast data.
	Lines 16, 17, 18, 19 & 20 - Number of potable water pumping stations that pump into distribution	Historic: The data has been derived based on the method used to calculate the Lines 20-24 values submitted in the Annual Performance report 2023 table 6b line 20-24 (Note line reference number changes between 2022 (originally lines 20 to 24) and 2023 (updated to lines 16 to 20). Forecast: The process followed to enable identification of new pumping stations associated within the relevant lines is a 'bottom up' review based on current & planned capital programmes. Notable changes include; Line 17 - Reduction in Groundwater pumping stations that are forecast to close associated with AMP7 and PR24 WINEP programmes. AMP7 Programme - North Orpington WTW, forecast closure in 2025/26. PR24 Plan. Bradfield WTW, forecast closure in 2029/30. (Note closure of Hawridge NOT included here, as no high lift pumps. Closure covered in RES1 Line 20) Line 19. A total of 24 new Potable Water Pumping Stations that repump within Distribution, summarised below; 2023/24 - 6 no. associated with AMP7 Botex (4 no.) and Developer Services (2 no.) programme. 2024/25 - 4 no. all associated with AMP7 Developer Services programme. 2025/26 - 1 no. forecast to support management of low network pressures plan. 2026/27 - 3 no. Forecast associated with WINEP (1 no.), management of low pressure (1 no.) and service reservoir resilience (1 no.) plans. 2027/28 - 3 no. forecast associated with WINEP (1 no.), management of low pressure (1 no.) and water supply resilience (1 no.) plans. 2028/29 - 1 no. forecast to support management of low network pressures plan.

		2029/30 - 7 no. forecast associated with network growth (2 no.), low pressure (1 no.), service reservoir resilience (1 no.), water supply (2 no.) and WINEP (1 no.) plans. No changes identified to number of Surface Water Pumping Stations or Stations used to pump water from a 3rd party within TWs network. All changes documented in supporting information files.
	Line 23 – Energy consumption	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report. Table 5A, line 24, Table 6A, Lines 7, 27 and 32, Table 7E, Line 6, 7 and 8. Forecast: The data has been derived based on line CW5.39, Table 6B, Line 39.
	Line 24 – Average pumping head	Historic: The data has been derived based on the calculation method used to calculate the "Annual Pumping Head – treated water distribution" value submitted in the Annual Performance report 2023 table 6b line 28. Forecast: Values for the years 2023-24 to 2029-30 are assumed to be as per AR23.
	Lines 25, 26, 27 & 28	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, lines 25, 26, 27 & 28. Note: Please note a correction for line 6B.25, 6B.26 6B.27 & 6B.28 within the AR23 APR will be made to reflect the PR24 value. This was a reclassification of what constitutes an import/export point compared to AR23 (but using the same data source). This change was made to better reflect the definition of import/export points. Forecast: CW5.25 and CW5.27 The same individual transfers are used as listed in the historical data. The volume data of few of these numbers come from the licence agreements between the different stakeholders. Some of these agreements have a paper trail and the remainder are run on a much older "handshake style" set up, meaning water is imported/export if/when it is required. It is understood that these transfers would continue on a need to use basis, so it is safe to assume the forecast volumes to be same as historical values.

		CW5.26 and CW5.28 This is taken from the annual return DI import/export component sheet included in the calculation of the WAF. This is the volume associated with the export points described above. The increases in 2025-26 & 2029-30 are as per the rdWRMP24 forecast values for Perivale transfer (10 Ml/d throughout) and Cockfosters transfer (5 Ml/d from 2030).
	Lines 29 – 7 day rolling average	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, lines 29 and 30. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP) Line: 45FP, within the DYCP version of the table.
	Line 30	The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 30. This is a calculated cell: Peak seven day rolling average distribution input divided by annual average distribution input.
	Lines 31, 32, 33 & 34 – HH & NHH consumption	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, lines 31, 32, 33 and 34. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP). Customer Consumption Values have been calculated from yearly changes in WRMP consumption values (2023/24 and beyond). They have been split out into measured/unmeasured in proportion with WRMP figures.
	Line 35 – Total Annual Leakage	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 35. Forecast: The data has been derived from NYAA operational forecasts for AMP7 (2023/24-2024/25) and yearly changes in WRMP leakage (2025/26 and beyond).
	Line 36 - Distribution system operational use	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 36. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP) Line 22FP.
	Line 37 – Water Taken Unbilled	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 37.

		Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP) Line 21FP.
	Line 38 – Distribution input	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 38. Forecast: Distribution input has been calculated from the sum of rows CW5.31-CW5.37
	Line 39 - Distribution input (pre-MLE)	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 39. Forecast: Pre MLE-Adjustment provided in Water Balance for AR23 (0.2%). Assumed this will remain constant over AMP8. CW5.38 value adjusted proportionally by this figure.
	Line 58 - Leakage upstream of DMAs	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, Line 58. Forecast: Leakage upstream of DMA not available. Leakage upstream of Flow Monitoring Zone (FMZ) to be used in its place, provided in Water Balance through the sum of service reservoir and trunk mains leakage. This accounted for 6.1% of total leakage in AR23. It is assumed that this value will remain constant over AMP8.
	Line 59 – Distribution main losses	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 59. Note: Please note a correction for line 6B.59 within the AR23 APR will be made to reflect the PR24 value. This change was after a review of the methodological approach where it was decided that Distribution leakage should be taken instead of total leakage when calculating this parameter. The affect is a reduction of 35.86 Ml/d to a value of 409.64Ml/d. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP) Line 28FP. This line is not inclusive of Leakage upstream of DMAs.
	Line 60, 61, 62, & 63 – Supply pipe losses	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 60, 61, 62 and 63. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP): CW5.60 25FP CW5.61 26FP

		CW5.62 23FP CW5.63 24FP An additional note on lines CW5.59-CW5.67: Values 2023/24 and beyond split the total annual leakage in proportion to the change in the equivalent WRMP lines as listed above, rather than the actual lines.
	Line 64, 65, 66 & 67 – Supply pipe losses - voids	Historic: The data has been derived based on the method used in the 2022-23 Annual Performance Report Table 6B, line 64, 65, 66 & 67. Forecast: The data has been derived based on the method used in the 2022-23 Water Resource Management Plan (WRMP): Forecast: Void CSPL total provided in WRMP Data Table 27FP. To be split in proportion to Water Balance breakdown in Void property types. An additional note on lines CW5.59-CW5.67: Values 2023/24 and beyond split the total annual leakage in proportion to the change in the equivalent WRMP lines as listed above, rather than the actual lines.

CW6 - Water network+ - Mains, communication pipes and other data

Data Table	Whole Table or Individual Line/s	Commentary
CW6	Lines 1-27	Calculations for all lines are included with explanation in Extrapolations_v0.xlsx in the Commentary Section. The RAG 4.11 Reference list is misaligned for the OFWAT v6 Table and v5 guidance regarding PR24 Table CW6. The correct values are in the correct positions, but the reference codes align to AR22 rather than AR23.
	Line 1	There are no significant variations or changes to the methodology. Line 1 includes forecasted growth via addition of CW6.4 (DS6.1,3) year on year. This is referenced in PR24 Table WS1, number of connected properties.
	Lines 2-3	The historical values for these lines are from the AR23 method without variation and include planned works from the remainder of AMP7. The forecast method is based on the current planned baseline rehabilitation programme and the Mains Rehab Cost Adjustment Claim and calculated based on historical trends as detailed in the method statement.
	Line 4	This line is from DS6.1 and DS6.3 and the commentary is included with this table. Expected growth is included in this method.

	Lines 5-8	Lines 5-8 are based upon the proportional percentage of current audited total (CW6.1) * new estimated total.
	Lines 9-17	From 1880 up to and including 1980, mains are assumed to be: 1) Replaced like for like in terms of abandoned = laid; 2) Replaced proportionally, aligned to Lines 2 and 3. From 1981 up to and including 2020, mains are assumed not to be replaced as these are within assumed asset life. Line 17 includes all new mains replaced from those removed from the 1880 – 1980 age bands.
	Lines 18-22	These values are aligned with the AR23 table and method and utilise the same method for forecasting, which includes expected contributions from planned mains replacement, communications pipe replacement, water quality and statutory replacements, and new connections. For each, the historical trends were used to forecast future values, and account for growth in terms of new connections. The planned enhancement case for lead pipe replacement was included, based on historical cost run rates and plan for a flat delivery programme to maintain replacement momentum.
	Line 23	Length of replaced lead communications pipes was not previously calculated during annual return and is therefore new. A previously submitted EIR requested a similar calculation which generated an estimated average length. This was used to calculate the replaced lead length. The EIR output is captured in EIR v1.1.docx and exampleoflengthofleadmains.xlsx in the Commentary Section.
	Lines 24-27	There are no current or future plans to replace pipes beyond the customer meter and as such these lines are returned as zero.
	Line 28	The growth of the company area is aligned with the AR23 method and table. Forecast values expect an increase population density and account for the expected population growth as detailed in the Edge 2022 Local Authority Planned Based HH Forecast but do not alter the boundary or company physical area. There is no significant change to this method or trends.
	Line 29	This value and method are aligned with the AR23 submission as well as PR24 table OUT1.2. Note the RAG 4.11 reference does not align with OFWAT Final Guidance Document v5 or the V6 table, which references CW6.22 rather than the correct CW6.23.

CW6a - Transition and accelerated programme - Water network+ - Mains, communication pipes and other data

This table is a Nil Return for Thames Water.

CW7 - Demand management - Metering activities

Data Table	Whole Table or Individual Line/s	Commentary

CW7	Whole Table	CW7.1 to CW7.5 includes the following cost categories; • meter device / tech uplift purchase • 'do job' activity directly related to property engagement, appointment booking and meter installation (external and internal) • Installation visits that result in property classified as 'unmeterable' • CSL relay and repair during meter installation CW7.1 to CW7.5 does not include the following cost categories. These costs are not part of the 'meter unit-rate' calculation, however are included in the PR24 WRMP Demand enhancement case and are core requirements of the AMP8 smart metering programme • Bulk meter purchase and installation • other meter programme or demand reduction support costs • Filed Investigations, • SMOC, • meter communications infrastructure, • HH and NHH reactive replacements CW7 does not capture the installation numbers / costs associated with Bulk meters. Thames will have a significant Bulk (large & small meters) meter installation programme in the AMP8 enhancement case. Green Economic Recovery (GER) We have asked Ofwat to consider adjusting the GER funding conditions in light of the affect that the summer drought of 2022 and subsequent freeze-thaw event has had on the achievability of our end of AMP leakage target. The outcome of these discussions will determine if we can proceed with the GER programme. A 22/23 price base is used, with a 13.3% D&PG applied to all installation costs. RPI and CPIH has not been applied.
	Line CW7.	Continuation of our Progressive Metering Programme, installing new AMI smart meters in previously unmetered households 100% of the 'New selective' meters in AMP8 are forecast to be internal installation only. Internal installations have a higher unit-rate cost than many external install types, due to the amount of customer engagement required and the high level of unmeterable properties that are encountered during the installation delivery process.
	Lines CW7.6-CW7.14	It is assumed that the complementary solution is in place from the start of FY 24/25 and there for all new and replacement meters will be AMI from 24/25 onwards

		CW7 does not capture the installation numbers / costs associated with Bulk meters. Thames will have a significant Bulk (large & small meters) meter installation programme in the AMP8 enhancement case.
	Line CW7.15	New residential meters consumption benefits are calculated using either: a) AR23 reported HH progressive metering numbers, multiplied by a consumption saving assumption (2022-23). b) AMP7 forecast progressive metering numbers, multiplied by this same consumption saving assumption (2023-24, 2024-25). c) Progressive metering savings, taken from WRMP table 8 (2025-30). Note the WRMP assumption of savings is over the final 4 years of each AMP. d) Different litres/day savings rates are used for GER installations (23/24 and 24/25), due to the housing type split forecast for Thames Valley. e) Ml/d benefits from new meter installations are split 10% for year of installation, and 90% following year – to account for 1-year billing journey post-installation. Only the usage demand reductions are included. The leakage benefits from meter installations are capture in other tables. GER Benefits are included for years 2023-24 to 2025-26. 2022-23 and 2023-24 are split by AMR/AMI meters in proportion to line CW7.7. CW7 does not capture the installation numbers / costs associated with Bulk meters. Thames will have a significant Bulk (large & small meters) meter installation programme in the AMP8 enhancement case.
	Line CW7.19	Replacement business meters consumption benefits are using adjusted WRMP values. Line 20 captures adjustments for PR24 caused by an accelerated business smart upgrade programme, previously forecast in WRMP to be delivered over AMP8 and AMP9, now over AMP8.
	Lines CW7.16-CW7.18, CW7.20	These lines are not populated as no AMR meters are expected to be installed/replaced.
	Lines CW7.22-CW7.23	PCC forecasts are taken from a) AR23 reported values (2022-23). b) WRMP forecasts (DYAA values) (2023-30). A large change between AR23 and WRMP forecasts has been noted, with 2022-23 consumptions effected (primarily on measured customers).

	Line CW7.24	Captures the total combined cost of all new smart meter installations, divided by the total number of new smart meters on residential properties. This cost per property captures an average meter installation unit rate only, and does not show the granularity of different costs associated with the different meter installation types. Line CW7.25 we are not installing new meters in business properties. Our AMP8 smart meter installations on business properties are all replacement of existing business meters.
	Line CW7.26	Captures the combined total cost of all replacement meter installations for residential properties, divided by the total number of replacement meter installs. This cost per property captures an average meter installation unit rate only, and does not show the granularity of different costs associated with the different meter installation types.
	Line CW7.27 and CW7.29	Captures the per meter cost allowance for 'technology uplift', which represents the additional cost on top of normal meter replacements, to enable AMI smart meter communications capability. This cost is consistent with PR19 and GER cost allowance for 'technology uplift'.
	Line CW7.28	Captures the combined total cost of all replacement meter installations for business properties, divided by the total number of replacement meter installs. This cost per property captures an average meter installation unit rate only, and does not show the granularity of different costs associated with the different meter installation types.
	Lines CW7.30 to CW7.41	E are not upgrading any existing meters on residential or business properties. We are only install new smart meters or replacing existing basic meters with smart meters.
	Lines CW7.42 and CW7.44-CW7.45	Benefits per savings are calculated from WRMP figures for 2025-30, with adjustments to CW7.45 for an accelerated business smart upgrade programme, previously forecast in WRMP to be delivered over AMP8 and AMP9, now over AMP8.
	Lines CW7.43 and CW7.46-CW7.51	These lines are not populated as no meters are expected to be installed/replaced.

CW7a - Transition and accelerated programme - Demand management - Metering activities

This table is a Nil Return for Thames Water.

CW8 - WRMP schemes (excluding leakage and metering activities)

Data Table	Whole Table or Individual Line/s	Commentary
CW8	Whole Table	This commentary addresses the CW8 Commentary requirements outlined in Ofwat PR24 Final Methodology

		submission table guidance – section 3: Costs (wholesale) version 5, 15th August 2023. https://www.ofwat.gov.uk/publication/pr24-final-methodology-submission-table-guidance-section-3-costs-wholesale/ The table sets out the Water Resources Management Plan 2024 (WRMP24) expenditure (£m) and benefits (Ml/d) for supply side and demand side (excluding leakage and metering) improvements. The CW8 scheme cost and benefits estimates are consistent with WRMP24 and data tables 4, 5 and 8, CW3 and SUP12. All costs and benefit forecasts included in CW8 are specific to Thames Water and therefore exclude for other partner water companies funding contributions. For further detail see the PR24 Enhancement Case: Water Resources supply and demand appendices (TMS27 and TMS28).
	CW8.1	Strategic Regional Option (SRO) - SESRO. 150Mm3 new reservoir resource shared between Thames Water, Southern Water and Affinity Water. Costs reflect assumption of project being delivered through DPC (or SIPR).
	CW8.2	Strategic Regional Option (SRO) - STT. Raw water transfer from the River Severn to the River Thames. Adaptive, alternative scheme for SESRO. Costs reflect the ongoing development of the scheme (in AMP8) jointly funded by Thames Water, Severn Trent Water and United Utilities. The interconnector is assumed to be delivered by DPC.
	CW8.3	Strategic Regional Option (SRO) – Teddington DRA. A new abstraction from the River Thames supported by recycled water from Mogden STW. Costs reflect the development and delivery of a 75 M/d option.
	CW8.4	Strategic Regional Option (SRO) – Beckton Water Recycling. Adaptive, alternative 100 Ml/d water recycling option to the Teddington DRA. Costs reflect assumption of project being delivered through DPC. AMP8 funding includes for the additional capital expenditure required to switch from Teddington DRA if required.
	CW8.5	Strategic Regional Option (SRO) - LTWLR. Potential new Lower Thames to West London Reservoirs (LTWLR) raw water transfer SRO. Costs reflect ongoing development of the scheme if the need is confirmed. Costs reflect assumption of project being delivered through DPC.
	CW8.6	Groundwater Addington. Groundwater scheme to be delivered in South London as soon as possible in AMP8.
	CW8.7	Didcot Raw Water Purchase.

		Temporary licence trade agreement with RWE for the period 2025-2030. The price of the trade is commercially confidential and therefore redacted from public documents.
	CW8.8 to CW8.21	Non-Strategic Regional Options (NSRO) delivering benefits post AMP8 (2029-30).
	CW8.22 to CW8.32	Demand side improvements – Water Efficiency: These options are consistent with those presented in WRMP Data Tables (4,5,5a,5b), and as described in the WRMP Section 8 report.

Supply side improvements (Rows CW8.1 – CW8.21)

1. WRMP24, CW3 & CW8 Enhancement totex alignment

Description for how the schemes agreed in the company final WRMP24 at both an option and programme level (for example WRMP24 data tables 4, 5 and 8) align with the enhancement totex presented in CW3 and CW8. Schemes should use the same reference in C8 as in the final WRMP24 for ease of tracking.

The scheme names and references are consistent between WRMP24 data tables 4, 5 and 8 and PR24 CW8 and SUP12.

The cost forecasts included in CW3, CW8 and SUP12 are derived from the same project capex estimates and opex rates used as the basis for the revised draft WRMP24 Table 5a. The estimates have been developed consistently for all WRSE water companies using the All Company Working Group Methodology (ACWG) Cost consistency methodology - https://www.wrse.org.uk/media/u4gf5pye/acwg-cost-consistency-methodology.pdf . The estimates include for optimism bias and quantitative risk.

The main variances between the respective WRMP24 and CW8 tables are caused by:

- Capital expenditure profiles: Table 5a is based on standard uniform profiles whilst CW8 reflects a more detailed profile for the SRO schemes based on activities contained within the development and delivery schedules included in the RAPID Gate 2 reports.
- Duration: Table 5a adjusts durations for the SROs to satisfy the requirements of the WRSE investment model whereas CW8 reflects the actual development and delivery schedules included in the RAPID Gate 2 reports.
- Coverage: Table 5a reflects the total scheme development and delivery cost; CW8 reflects the total development and reduced delivery cost for schemes delivered by the DPC/SIPR procurement route ie. construction costs have been excluded.
- Adaptive planning: CW8 includes for capital expenditure in the period 2025-2030 for the ongoing development of alternative SRO schemes for Teddington DRA and SESRO; additional expenditure has been included to enable a switch to the Beckton Water Recycling and STT schemes should they be required.
- Potential new SRO: CW8 includes for expenditure for a potential new Lower Thames to West London Reservoirs (LTWLR) scheme should the need be confirmed following the investigations from the 2022 drought event.
- PR19 funded schemes: WRMP24 preferred plan Table 4 includes for ASR Horton Kirby and Southfleet/Greenhithe (new WTW) NSROs which have been excluded from CW8 as they were funded as part of WRMP19/ PR19.

- Frontier Shift Efficiency (FSE): Table 5a expenditure is post-FSE whilst CW8 AMP8 & AMP9 is pre-FSE.
- Efficiency Overlay: an assessment of capex efficiency was undertaken for this enhancement expenditure. The resultant efficiency overlay has been calculated by applying a percentage reduction to the SRO and NSRO AMP8 Capex.
- Price base: Table 5a costs are shown at a 2020/21 price base whereas CW8 is at 2022/23 price base.
- Opex costs: Table 4 and 5a costs represent a regional model estimate of average and maximum utilisation; CW8 includes for an estimate of average scheme utilisation; the SROs average annual operating cost forecasts for after 2029-30 have been derived from an assessment of the schemes annual average utilisation as published in the RAPID Gate 2 reports (where available) or by calculating average utilisation in line with WRSE Input methods. For Teddington to QM Reservoir there was no G2 report and an assumed average utilisation was provide by the Water Resources team.

CW8 does not include for the SROs Thames to Affinity Transfer (T2AT) and Thames to Southern Transfer (T2ST). It is assumed that Thames Water will exit the partnerships with Affinity Water and Southern Water from the start of AMP8. Affinity Water and Southern Water have included for the required funding to develop these schemes from the start of AMP8.

There is a variance of £362,227 between data table CW3 and CW8, with the costs in CW3 being higher. This is because the CW8 costs exclude any repeat capex costs as the water resource supply schemes do not come into operation until post AMP8. The repeat CAPEX costs are included in CW3.

The variances between CW8 and SUP12 are caused by:

- SUP12 presents whole scheme costs whereas CW8 is the Thames Water funding contribution only.
- SUP12 reflects the total development and delivery CAPEX, excluding any AMP7 costs and AMP9/AMP10 delivery costs in managing the DPC/SIPR contract. CW8 reflects the total development and reduced delivery CAPEX for DPC/SIPR procurement route.
- SUP12 expenditure is post-FSE whilst CW8 AMP8 & AMP9 expenditure is pre-FSE.
- SUP12 expenditure is pre-Efficiency Overlay whilst CW8 AMP8 Capex is post-Efficiency Overlay.

2. Price bases

Description of how the costs have been uplifted to the correct price base for business plan submission. All costs in the business plan data tables, data table commentary and narrative should be consistently presented in the 2022-23 price base. Companies should inflate costs to 2022-23 prices using financial-year average CPIH.

We have used financial-year average CPIH (published May 2023) to inflate scheme costs to 2022-23 price base for PR24. Source CAPEX estimates were at a 2021-22 price base.

3. WRMP24, PR24 scheme variation

Explanation and justification for any other variation in schemes from those presented in the company's WRMP24. This should cover any variation in proposed schemes, their costs, benefits and delivery year. Note aligned with the final PR24 methodology this should be justified with compelling evidence in the company business plan.

Variation in Proposed Schemes: CW8 has included for the ongoing development of the Beckton Water Recycling and STT schemes in AMP8 only, as alternatives to the Teddington DRA and SESRO schemes. CW8 also includes for the LTWLR scheme should the need be confirmed by the investigations in progress since the 2022 drought event. Further detail to justify the inclusion of these schemes is set out in the PR24 Enhancement Case: Water Resources supply appendix (TMS27). CW8 has excluded for ASR Horton Kirby and Southfleet/Greenhithe (new WTW) NSROs as they were funded as part of WRMP19/ PR19. CW8 has also excluded T2AT and T2ST SROs from the start of AMP8 as the funding for the schemes is included in Affinity Water and Southern Water PR24 plans. CW8 has excluded for any catchment management or drought permit improvements.

Variation in Cost: please refer to section 1.

Variation in Benefits: There is no variation in benefits, the benefits reported in CW8 are aligned with WRMP24 maximum deployable output for new resources options or maximum capacity for network reinforcement/ conveyance options. No benefits have been reported for the Beckton Water Recycling and STT alternative schemes.

Variation in Delivery years: CW8 has been interpreted to be the Financial Year (FY) within which operations first commence whereas WRMP & SUP12 assumes the first full FY of operation.

4. Green recovery programme

Clear identification of schemes delivered as part of the green recovery programme and those commenced as part of the accelerated infrastructure delivery programme.

None of the schemes are part of the green recovery or accelerated infrastructure delivery programmes.

5. Opex for schemes in use prior to 2029-2030

For schemes entering use prior to 2029-30 there may be years where the forecast operating costs are representative of a period less than 12 months. In such cases the commentary should clearly identify this and the annual average operating cost for a 12-month period.

CW8 includes for operating expenditure for Groundwater Development – Addington (2.73 Ml/d) and Didcot Power Station Licence Trading (22.6 Ml/d) schemes which enter use prior to 2029-30. The Groundwater Development – Addington scheme includes for circa 50% opex costs for its first year in use in 2027-28 whereas the annual average operating cost for 2028-29 is £0.083m. The Didcot Power Station Licence Trading is a fixed annual fee commencing from the start of 2025-26.

6. Opex after 2029-30

We recognise there may be situations where operating costs recorded in 'After 2029-30' column could include costs incurred prior to the scheme entering use and the annual average operating cost. In such cases the annual average operating cost should be clearly indicated in the commentary. We expect the annual average operating cost to be calculated based upon the expected long-term average totex expenditure per annum for the option to the end of the WRMP planning period (or to decommissioning/end of life of option). This is calculated based on the average option utilisation for the period.

The operating costs recorded for schemes entering use after 2029-30 are based on estimates of long term annual average utilisation. The SRO schemes utilisation estimates are consistent with the assessments undertaken for the RAPID Gate 2 reports, the NSROs estimates have been informed by the WRMP regional modelling analysis. The LTWLR scheme utilisation has been estimated by the Water Resources team. The opex price of the London Licence Trade with Affinity Water is to be agreed, the trade is enabled via the delivery of the benefits of the Grand Union Canal (GUC) SRO benefits to Affinity Water.

7. Transitional expenditure

Clearly identify schemes that are being delivered to a different timescale as a result of transitional expenditure, in particular those that will have been completed (and able to provide additional water supplies) in 2023-24 or 2024-25.

No schemes are being delivered by transitional expenditure.

Demand side improvements (Rows CW8.22 – CW8.32)

Capex

Capital Expenditure has been confirmed as 0 across the planning period for all Water efficiency Schemes (CW8, Columns I-O). This is consistent with WRMP costs.

Opex

AMP8 (CW8, Columns Q-U).

Opex costs (£m) have been estimated by bottom-up calculations using unit-rate costs for each type of on-ground activity. The unit-rates for the water efficiency and wastage fix visits have been developed through long-term framework contracts with external partners, that have been secured through OJEU compliant tender processes. The digital engagement costs are based on service delivery unit-rate costs for each digital engagement. The other supporting and innovation work streams are costed using best estimates of new programmes, with input from multiple internal and external teams.

These have been confirmed to be in line with WRMP expectations, with some minor rounding errors between the two.

Opex costs (£m) have been taken from WRMP data Table 5a. Three adjustments have been applied below to bring them in line with the AMP8 values as described above.

- These have been adjusted to move from the 2020/2021 to 2022/23 price base as required.

- They have been apportioned out into base and enhancement expenditure in proportion to WRMP base/enhancement splits. (WRMP Table 5a does not make this distinction).
- Table 5a expenditure is post-FSE whilst CW8 is pre-FSE.

Note: two inconsistencies have been noted between CW8 OPEX costs and table CW3.

- CW8 considers the digital engagement tool costs to be entirely OPEX, whereas CW3 incorrectly totals them as CAPEX. This presents as a very minor difference in the total cost, due to an internal uplift for CAPEX costs.
- CW8 considers the "metering innovation" option to not be part of the "Demand Reduction (not including metering and leakage)" group, whereas CW3 includes them in this group incorrectly.

Post AMP8 (CW8, Column V).
The value in this cell is the average yearly cost for the remaining years for an option – i.e. the "NHH internal continuous flow fixes high" option has no enhancement costs post 2049/50, and so the Post-AMP8 costs are averaged over 2030/31-2049/50 (20 years).

Benefits
Benefits (Ml/d) has been taken directly from WRMP tables. These are using the cumulative sum of savings across the period (CW8, Columns X-AC).

1. WRMP24, CW3 & CW8 Enhancement totex alignment

Description for how the schemes agreed in the company final WRMP24 at both an option and programme level (for example WRMP24 data tables 4, 5 and 8) align with the enhancement totex presented in CW3 and CW8. Schemes should use the same reference in C8 as in the final WRMP24 for ease of tracking.

The scheme names and references are consistent between WRMP24 data tables 4, 5 and 8 and PR24 CW8 and SUP12.

Scheme Names are taken from WRMP data tables.

Totex costs in CW8 will be aligned from those within WRMP, but are subject to the three adjustments as applied above (price base, base/enhancement splits, frontier shift efficiency). There has been some variation in the categorisation of a small number of options which feature in CW8 between CW3 and CW8 meaning that some costs will be slightly misaligned.

2. Price bases

Description of how the costs have been uplifted to the correct price base for business plan submission. All costs in the business plan data tables, data table commentary and narrative should be consistently presented in the 2022-23 price base. Companies should inflate costs to 2022-23 prices using financial-year average CPIH.

WRMP price base is 2020/2021. We have used financial-year average CPIH (published May 2023) to inflate scheme costs to 2022-23 price base for PR24.

3. WRMP24, PR24 scheme variation

Explanation and justification for any other variation in schemes from those presented in the company's WRMP24. This should cover any variation in proposed schemes, their costs, benefits and delivery year. Note aligned with the final PR24 methodology this should be justified with compelling evidence in the company business plan.

Minor rounding errors have been introduced in the PR24 (AMP8 only) opex costs. As such this presents a slight misalignment with WRMP costs.

4. Green recovery programme

Clear identification of schemes delivered as part of the green recovery programme and those commenced as part of the accelerated infrastructure delivery programme.

None of the schemes are part of the green recovery or accelerated infrastructure delivery programmes.

5. Opex for schemes in use prior to 2029-2030

For schemes entering use prior to 2029-30 there may be years where the forecast operating costs are representative of a period less than 12 months. In such cases the commentary should clearly identify this and the annual average operating cost for a 12-month period.

Does not apply for Water efficiency options, these are assumed to representative of whole-year costs.

6. Opex after 2029-30

We recognise there may be situations where operating costs recorded in 'After 2029-30' column could include costs incurred prior to the scheme entering use and the annual average operating cost. In such cases the annual average operating cost should be clearly indicated in the commentary. We expect the annual average operating cost to be calculated based upon the expected long-term average totex expenditure per annum for the option to the end of the WRMP planning period (or to decommissioning/end of life of option). This is calculated based on the average option utilisation for the period.

The value in this cell is the average yearly cost for the remaining years for an option – i.e. the "NHH internal continuous flow fixes high" option has no enhancement costs post 2049/50, and so the Post-AMP8 costs are averaged over 2030/31-2049/50 (20 years).

7. Transitional expenditure

Clearly identify schemes that are being delivered to a different timescale as a result of transitional expenditure, in particular those that will have been completed (and able to provide additional water supplies) in 2023-24 or 2024-25.

No schemes are being delivered by transitional expenditure.

CW9 - Enhancement expenditure (cumulative) - water resources and water network+

Use of Additional Lines 1-5

As some of our Annual Return (AR) makes use of Additional lines, and we wanted to ensure alignment with the AR as far as possible, some of the Additional lines in CW3 have different uses for AMP7 (22/23 - 24/25) to AMP8 (25/26 – 29/30)

Line Description	Values in AMP7	Values in AMP8
Additional Line 1	Not used	Crypto Enhancement Case
Additional Line 2	Not used	Trunk Main Basement Flooding
Additional Line 3	Not used	Asset Deficit
Additional Line 4	Unplanned outage improvements (Was Additional line 1 in AR23)	Digital Cyber Enhancement Case
Additional Line 5	Improving performance of London Water networks (was Additional Line 2 in AR23)	WINEP AMP7 Close

Following commentary relates to AMP7 years only for table CW9:

- Costs have been allocated to the different PR24 data table lines as stated in the methodology statement and guidance for this table.
- Not all lines have been used in the PR24 proforma where there is no spend driver applicable to the AMP7 plan.
- Costs exclude the impact of the frontier shift and real price effects and are presented in 2022/23 price base.
- Additional lines used in table CW3 / CW9 to capture AMP7 historic spend are: 'Asset Debt' – This contains spend for 'Unplanned Outage Improvements' & 'Improving Performance of London Water Networks' as there are not enough additional lines to itemise this spend separately when combined with the AMP8 plan.
- Where a project has both a base and an enhancement element this will be designated by purpose and the percentage allocation determined and ratified through rigorous internal governance before the project commences.

The table below shows the enhancement capex spend c£79m (AMP7 Y3-5) that also has a Base driver in the plan, split by cost driver.

AMP7 Historic Spend (Y3-5) - Enhancement Spend that also has a Base Driver in the AMP7 Plan (This is Just the Enhancement spend element only)
2022/23 Price Base

water PR24 Data table	water PR24 data table lines	Raw water abstraction	Raw water transport	Treated water distribution	Water treatment	Grand Total
CW3.16	Water Framework Directive; (WINEP/NEP) water capex	93,377	-	-	-	93,377
CW3.28	Investigations; (WINEP/NEP) - desk based study only water capex	0	-	-	-	0
CW3.41	Supply-side improvements delivering benefits in 2025-2030; SDB capex	-	-	-	-	-
CW3.44	Demand-side improvements delivering benefits in 2025-2030 (excl leakage and metering	-	- 877	310,700	-	309,822
CW3.60	New meters requested by existing customers (optants); metering capex	-	-	9,332,389	-	9,332,389
CW3.63	New meters introduced by companies for existing customers; metering capex	-	-	41,628,874	-	41,628,874
CW3.66	New meters for existing customers - business; metering capex	-	-	-	-	-
CW3.97	Addressing raw water quality deterioration (grey solutions); enhancement capex	-	-	-	- 815	- 815
CW3.106	Lead communication pipes replaced or relined; enhancement capex	-	-	12,575	-	12,575
CW3.118	Resilience; enhancement water capex	-	-	- 1,154	539,841	538,687
CW3.121	Security - SEMD; enhancement water capex	-	- 1,487	-	-	- 1,487
CW3.134	Growth - DS	-	-	- 1,289	-	- 1,289
CW3.136	Unplanned Outage Improvements	-	-	-	- 2,414	- 2,414
CW3.138	Improving Performance of London Water Networks	-	-	27,180,374	-	27,180,374
Grand Total		93,378	- 2,364	78,462,469	536,613	79,090,096

- The Total amounts (£m) in Table 3 – Historic spend AMP7 do not align to the early submission table CW1. A correction to CW1 will rectify this so that tables 1 & 3 are in alignment.

The reasons for the variances between these tables are largely as follows:

1. Process methodology - CW1 identified Growth (that was not submitted under the Developer Services price control) as base. This has been reinstated as enhancement spend in CW3.
2. Updates to the data – The early submission table (CW1) used an earlier iteration of a control file that at the time had high level manual adjustments processed as the annual Budget was under review. CW3 has been populated using a later more detailed control file with these adjustments finalised and processed.
3. Updates to the data - The Metering enhancement programme for Y4 & Y5 had not been finalised (table CW7) when the CW1 table was submitted; plus, the control file at the time used to populate CW1 had a purpose code allocation error. A correction has been made to CW3 to reallocate metering enhancement spend in Y4 & Y5 of AMP7 from base to enhancement.

Following commentary relates to 2025 – 2030 years only for table CW9:

- Cost have been allocated to the different table lines as stated in the methodology statement for this table. CW3 profiles used as the start point to calculate the cumulative profiling for this table.
- Important to note that Opex spend in the enhancement tables is either:
    - A change in Opex directly resulting from Capex intervention investment, or
    - Intervention investment that is classified as Opex per IFRS.
- For this cumulative table only Opex intervention spend is included, as by definition change in Opex spend from Capex continues into the future.
- Not all lines have been used.
- Costs exclude the impact of the frontier shift and real price effects, presented in 22/23 price base.
- CWW9 is for wastewater and CW9 for water expenditure. All costs in these tables have originated from business solutions that are either 100% wastewater or 100% water. The only exception is on the additional lines relating to Digital Cyber enhancement case (CWW3.187/188 & CW3.136/137). Proportional allocation has been applied to shared assets for these lines, predominantly weighted to FTE in line with annual return historic allocations. In total 60% to wastewater and 40% to water.
- No solutions have been proportionally allocated between base and enhancement.
- Additional lines used in table CWW3 are:
    - Crypto Enhancement Case – no defined line in published template, separate enhancement case submitted.
    - Trunk Main Basement Flooding Enhancement Case – no defined line in published template, separate enhancement case submitted.
    - Asset Deficit - Base investment not included in CW1 & CW2. Individual defined case included in submission, across wastewater and water.
    - Cyber – All costs allocated to separate enhancement case submitted. Lines CW9.124 to 126 not used as these are just for compliance with Network and Information Systems regulations (NISR) 2018. The enhancement case is for

compliance with NISR and the Data Protection Act (DPA), and to meet other drivers and therefore enhancement case costs have been kept whole on additional lines.

- AMP7 WINEP Close - Separated these costs for AMP7 WINEP delivery from AMP8 WINEP delivery (lines CW9.1 to CW9.40). Individual defined case for AMP7 WINEP close included in submission.

The following table is specific commentary on the individual lines, please refer to table CWW3 for supplementary commentary:

Data Table	Whole Table or Individual Line/s	Commentary
CW9	Lines 16 to 40 EA/NRW environmental programme (WINEP/NEP)	• All spend relates to new AMP8 WINEP commitments and excludes completion of AMP7 WINEP commitments. • Not all lines have been used. • Benefits at a scheme level mapped to year in which they are realised.
	Lines 41 to 56 Supply-demand balance	• AMP8 defined WRMP enhancement case with Metering lines (60 to 68). • Includes multi-AMP SRO investment beyond AMP8, for these schemes no cumulative spend allocated in table CW9.
	Lines 57 to 87 Metering	• AMP8 defined WRMP enhancement case with Supply – demand balance lines (41 to 59). • Annual benefits for all 5 years as meters installed.
	Lines 103 to 114 Lead communication pipes replaced or relined	• AMP8 defined Lead communication pipes enhancement case. • Annual benefits for all 5 years as lead pipe risk removed. Trial delivers benefit in year 3 AMP8.
	Lines 115 to 117 Water resilience	• AMP8 defined WSSRP enhancement case being progressed through agreed conditional allowance stage gate process with Ofwat. • Benefits profile consistent with submission.
	Lines 127 to 128 Crypto Enhancement Case	• AMP8 defined Crypto reduction enhancement case. • Benefits delivering in year 3 and year 5 for x2 risk reduction schemes.
	Lines 129 to 130 Trunk Main Basement Flooding Enh Case	• AMP8 defined Trunk Mains basement flooding enhancement case, including completion of LWICA (London Water Infrastructure Conditional Allowance) from AMP7 • Benefits of LWICA mapped to benefit dates. • New schemes delivering benefits from year 2 to year 5 based off provisional project profiling.
	Lines 131 to 132 Asset Deficit	• AMP8 defined case. • Additional investment above base tables. • Annual delivery of benefits

	Lines 133 to 134 Cyber	• AMP8 defined enhancement case. • Annual delivery of benefits from multiple different initiatives.
	Lines 135 to 136 WINEP AMP7 Close	• AMP8 defined case. • Project level investment to complete AMP7 WINEP commitments. • Benefits delivering during AMP8 period. Data includes top down provisional profiling adjustment subject to further in-house refinement.

CW10 - Wholesale water local authority rates

Data Table	Whole Table or Individual Line/s	Commentary
CW10	Line 10.1	An explanation of the RVs used to populate line 1 are documented below. 2022-23 – based on the 2017 rateable value 2023-24 to 2025-26 – based on the actual 2023 rateable value as at the end of July 2023 2026-27 to 2028-29 – forecast value for CUMULO based on the turnover and allowed returns in the business and for Offices takes into consideration expected movements in building costs and land value using the 2023 RV as a base and including London Crossrail supplement. The significant increase in RVs is caused by the Rating Income being linked to RCV of the assets (ie increasing with CPIH as well as investment), whereas the Rating Costs are linked to the Net Book Value of the assets (ie do not increase with CPIH). This increasing gap between RCV and NBV drives RV to increase over time at a faster rate than CPIH. 2029-30 – forecast value for CUMULO based on the turnover and allowed returns in the business and for Offices takes into consideration expected movements in building costs and land value using the 2023 RV as a base and including London Crossrail supplement.
	Line 10.3	The basis for transitional relief included in line 2 are documented below. 2022-23 – based on the relief available in 2022-23. 2023-24 to 2025-26 – based on the transitional arrangement available for the period as publicised. 2026-27 onwards - transitional relief has been applied in line with publicised allowances for 2023-24 to 2025-26.
	Line 10.11	2023-24– actual movement between the 2017 RV and 2023 RV issued by the VOA.

		2026-27 – calculated for CUMULO based on the turnover and allowed returns in the business and for Offices takes into consideration expected movements in building costs and land value using the 2023 RV as a base and including London Crossrail supplement. 2029-30 – calculated for CUMULO based on the turnover and allowed returns in the business and for Offices takes into consideration expected movements in building costs and land value using the 2023 RV as a base and including London Crossrail.

CW11 - Third party costs by business unit for the wholesale water service

Developer Services lines – table CW11 and CWW11 general assumptions

Fair Value entries for Self-Lay adopted assets are excluded (consistent with our APR expenditure table submissions 4NOP and Ofwat removed the adopted asset line from DS1e in May23). Any Thames Water delivered activity on these jobs has been included in these tables. This is typically the Non-Contestable elements and any Project Management and Design activities that Thames Water has provided. Similarly, any contribution using the NRSWA or Deferment of Renewal assessment that Thames Water makes towards these Self Lay jobs has also been included in these tables. This is determined to be actual cash expenditure and therefore deemed as reportable in the expenditure tables. We consider this to be analogous to our treatment of SL schemes with non-contestable elements where we are treating the value of TW contribution within table definitions, and the value of fair value entries outside of table definitions for expenditure data tables, as adopted assets.

HS2 is being delivered under it's own act of parliament and so this activity is not covered under NRSWA and has therefore been included in "Diversions - other non-section 185 diversions - capex". Any HS2 Opex is for monitor only activity which does not result in a capex diversion and so has been reported in DS2e line 4 "Other site-specific developer services activities or DS3 line 9 "Other site-specific developer services activities" which sit outside the price control as it does not meet the definition of a diversion, as only monitoring equipment is used to ensure no detriment to the asset.

There is considerable programme uncertainty relating to HS2 which Ofwat are bringing inside price control and increases risk for end customers. We have challenged this further through our consultation response to Ofwat on the draft proposed licence condition B changes.

Consistent with how information has been historically presented within the Annual Performance Report, our capex information includes an apportionment of centrally capitalised overhead rates. However, our opex figures presented reflect the direct costs expected to be incurred in delivering activities and thus does not include any apportionment of central overheads (e.g. rent/rates). We acknowledge that at the time of writing there is an open consultation to this effect however we note that there has been no specific guidance issued in this area.

Values are stated in 2022-23 price base.

Our delivery contracts are either structured on a schedule of rates arrangement, or certain larger projects are individually tendered. Consequently, there are no differences between pre and post frontier shift adjustments for these tables.

Data Table Commentary

Data Table	Whole Table or Individual Line/s	Commentary
CW11	8-10 Opex Diversionary Activities	Represents an apportionment of the operating expenses of the back-office DS teams who support, but do not directly contribute towards, DS CAPEX scheme. The costs were allocated between the relevant diversionary (and non-diversionary in some instances) activities through using the total CAPEX spend forecast for each activity for that year.
	14 Other excluded charges opex	Costs disclosed within this line represent operating expenses for activities that meet OFWATs definition of developer services such as customer relationship managers (whose roles are more supportive in nature), however, cannot be directly allocated to any of the activities within tables DS2e.
	23 S185 Diversions	Approximately 1/3 of the Thames Water delivered jobs are delivered under our schedule of rates contract. We established unit rates based on our 2024-25 forecast and the volume of connections or KM laid volumes. These were then projected forward into AMP8 using the growth profile and adjusting for inflation to 2022-23 price base. The remaining 2/3 of these jobs sit outside our schedule of rates contract. The Non-Contestable elements of the self-lay jobs were also added in. For these activities we took the AMP7 forecast, converted it to 2022-23 price base and calculated an AMP average for the activities. These were then projected forward into AMP8 using the change in property growth profile.
	24 NRSWA Capex	These jobs sit outside our schedule of rates contract. The Non-Contestable elements of the self-lay NRSWA jobs are also included in this line. For these activities we took the AMP7 forecast, converted it to 2022-23 price base and calculated an AMP average for the activities. These were then projected forward into AMP8 using the change in property growth profile. The AMP7 profile reflects the expected delivery on named schemes. There are a small number of schemes c£1.5m each which are due to be delivered in 2023-24 and 2024-25 and this explains the fluctuation in profile.

		This profile is matched in table DS1e line 2 with a 90% assumed recovery rate under the NRSWA contribution rules. This is a weighted average of the scale between 7.5% and 18% to reflect assumed work mix.
	25 other non-section 185 diversions - capex	The Thames Water delivered HS2 Non-Contestable schemes are reported on this line, the majority of which will be completed in AMP7 reflecting the higher numbers compared to AMP8. The Non-Contestable elements of the Self-Lay HS2 programme are also reported on this line including the PMO activities and will continue into AMP8. The Self Lay profile is estimated by our PMO team, with very little detail from HS2 directly as to the impact of the recent government announcement that the HS2 programme will be slipped 2 years. This assumes schemes already in flight will continue to completion, and those not yet commenced will be impacted by the slippage. The PMO and Thames Water delivered Non-Contestable construction is 100% recovered from HS2, and the Self Lay construction elements assume 90% in line with our assessment of NRSWA cost sharing rules and deferment of renewal.

CW12 - Transitional expenditure - water resources and water network+

This table is a Nil Return for Thames Water.

CW13 - Best value analysis; enhancement expenditure - water resources and water network+

Following commentary relates to 2025 – 2030 years only for table CW13:

- Cost have been allocated to the different table lines as stated in the methodology statement for this table.
- Not all lines have been used.
- Costs exclude the impact of the frontier shift and real price effects, presented in 22/23 price base.
- See table CW3 commentary for details on proportional allocation and additional lines used.
- The Ofwat guidance for table 13 says in a number of places that the costs are for projects starting in AMP8. we have therefore excluded any projects which have started in AMP7, but are continuing to spend in AMP8. The impact of this is that the AMP8 columns on table 13 do not match the AMP9 totals on table 3.
- A worked example of how both the capex and Opex Present Value is calculated is available. The following section in this document describes the calculation which is based on the APS 'PV Revenue Requirement' calculation which is *"a representation of the Spackman approach which, instead of using one-off (or recurrent) capital peaks*

when investment is undertaken, replaces those with the cost of borrowing that capital and the depreciation (erosion of asset value) of the asset, year on year, based on its expected life. In terms of regulatory financial modelling this provide a more realistic depiction of the impact on business cashflow for which they fund through revenue (i.e. impact on customer bills)." (Quote taken from the suppliers of APS). The APS calculation aligns with the Ofwat table guidance and hence is recreated for use in table 13 as described in the following section.

Data Item	Example	Note
PV Base Year	2022	2022 is how APS represents the 22/23 reg year which is the base year for PR24. In the absence of other guidance, this year is used as the base year for the PV calc (ie the year to discount costs back to)
WACC	3.23%	The Ofwat methodology stated this value as 'Wholesale WACC', page 102 in PR24_ final_methodology_main_document.pdf issued Dec 2022 (and not updated in May 23)
Window Start Year	2025	Ofwat have asked for a 30 year window. The start of AMP8 is taken as the start of this window.
Window Duration	30	30 years is the default that Ofwat have asked for.

- There are two Capex categories (1201 Land and 9000 Assets Under Construction) which don't have an asset life, so those are treated as if they are Opex (costs hit the P&L in the year that the cost is incurred)
- The AMP9 data is repeat capex (due to short life assets needing replacement) and on-going opex impacts. There are no new interventions included.
- The AMP9 costs are only the tail-spend, or repeat/on-going costs associated with the new interventions that are starting in AMP8. As there are no new AMP9 inventions shown here the costs for AMP9 are substantially lower than those for AMP8.
- The overall confidence grade is assessed as A3. This data is based on bottom up cost data which costs have been generated at the asset class level, all with associated asset lives. These asset lives are used to create the PV.
- No specific line commentary for this table.

CW14 - Best value analysis of alternative option; enhancement expenditure - water resources and water network+

With the exception of WRMP, all of the enhancement cases are Least Cost, so CW14 is a mirror of CW13. Please refer to the commentary for CW13 for details.

Enhancement Case	Commentary
Water WINEP (Low Flow Alleviation)	The WINEP plan is already least cost, there are therefore no different schemes to report on this table than are on CW13.
WRMP (Resource Schemes)	The WRMP is already a least cost plan for the whole WRSE region. The only schemes within Thames Water that are not 'Least Cost' are the non-SRO schemes around raw water purchase and ASR. Refer to WRMP documentation for more

	details. These costs do not appear on this table as if we needed to do a 'Least Cost' plan we would not do anything. All the SRO schemes have already begun development so are already excluded from CW13, removing the Non-SRO schemes as well means there in nothing to report on in CW14. There are therefore no schemes to report on this table so CW14.73-76 (Supply demand balance improvements delivering benefits starting from 2031) is zero.
WRMP (Demand Schemes)	The WRMP Demand/Metering plan is already least cost, there are therefore no different schemes to report on this table than are on CW13.
Supply Resilience (WSSRP)	The WSSRP plan is already least cost, there are therefore no different schemes to report on this table than are on CW13.
Trunk Main Basement Flooding	The Trunk main basement flooding plan is already least cost, there are therefore no different schemes to report on this table than are on CW13.
Long Term Water Quality (Crypto)	The Crypto plan is already least cost, there are therefore no different schemes to report on this table than are on CW13.
Long Term Water Quality (Lead)	The Lead plan is already least cost, there are therefore no different schemes to report on this table than are on CW13.

CW15 - Best value analysis; benefits - water resources and water network+

CW16 - Best value analysis of alternative option; benefits - water resources and water network+

Key assumptions underpinning the benefit and present value figures

Our approach to benefits determination in CW15 and CW16 is about delivering public value and maximising the positive impact we have on customers, communities, and the environment, as we provide water and wastewater services. It is about being a force for good in our communities and the environment.

In each enhancement case we applied the Thames Water Public Value Framework, outlined in each enhancement case, to determine identify a range of benefits against the six capitals: natural, social, human, intellectual, manufactured and financial. From the identified benefits, we determined monetised benefits across the range of measures.

We calculated the present value of benefits using:

- A 30 year period
- A discount rate for benefits using HM Treasury's social time preference rate.

Consistent with our approach for the present value of costs, we had no reason to deviate from Ofwat's guidance in its final methodology. Please refer to the commentaries for CW13 and CW14 for how costs were determined.

Our benefits assessment methodology

To quantify the benefits for each enhancement case, the analysis must be meaningful and practical. This involves conducting the CBA across feasible options rather than evaluating all

possible solutions. By focusing on feasible options, the CBA can provide relevant insights and aid in decision-making criteria to determine the best option.

The following considerations were considered for each possible solution:

- Does this option meet the required statutory/ legislative obligation?
- Does this option meet the defined need of the case?

This approach ensures a comprehensive and practical analysis for informed assessment.

After screening for feasible options, we undertook a series of workshops for each enhancement case to identify and quantify benefits and units across the different options. This process aimed to determine where benefits varied or remained consistent across the options and why.

The workshops facilitated the following considerations:

- Measurability: The workshops focused on identifying measurable benefits associated with each option. This involved determining the metrics and indicators that could be used to quantify the benefits effectively. By establishing measurable parameters, the CBA could provide objective and reliable assessments of the options.
- Data Assessment: The workshops also involved evaluating the availability of relevant data for quantifying the benefits. This step included identifying the existing publicly available data sources and determining any additional data that needed to be collected or calculated.
- Performance Commitment Levels: Changes in performance commitment levels were considered when assessing the available data and calculating the benefits. This step involved examining the potential impact of the enhancement options on the performance commitments. By considering these changes, the CBA could capture the potential improvements or drawbacks in Thames Water performance resulting from the different options.
- Timing of Benefits: An assessment was made regarding when the benefits would be realised. This involved estimating the timeframes for the realisation of the quantifiable benefits associated with each option. By understanding the timing, decision-makers could prioritise options based on their expected short-term or long-term impacts over the 30-year forecast.
- Customer, community and environment: We assessed both the benefits and dis-benefits from the perspectives of customers, communities, and the environment. This broader perspective allowed for a comprehensive evaluation of the potential positive and negative impacts that each option could have on our stakeholders and the environment. By considering these different perspectives, the CBA aimed to assess the overall value and implications of the enhancement options in a holistic manner, aligning to the Thames Water LTDS and Public Value Framework.

During the CBA process, we recognised that certain benefits lacked a robust approach to estimate their quantified impact. As a result, only the benefits that could be quantified effectively by publicly available third-party sources or performance commitments were included in the analysis of each option. This approach ensured that the CBA focused on reliable and measurable quantifiable benefits, allowing for a more accurate assessment and comparison of the options. Benefits that did not meet this criterion were excluded to maintain the integrity and validity of the analysis.
We conducted the above methodology when there was more than one feasible option to consider. A CBA is not necessary or meaningful in certain scenarios:

- Enhancement cases are development to meet statutory guidelines, requirements or legislation that are prescriptive on how Thames Water should address the need. Least cost was typically the deciding factor in the solution development.
- If options, or a 'do nothing' option, fail to meet statutory obligations, a CBA may not be meaningful in assessing the alternative.

Sources of evidence used to inform benefit impacts

We have followed Ofwat's hierarchy for sourcing robust marginal benefit values from ODI rate research to WINEP and then to other publicly available, robust valuations.

Table 1 sets out the relevant valuations and sources for our business plan aside from performance commitment marginal benefits. DfT TAG data book refers to the UK Department for Transport (DfT) TAG (Transport Analysis Guidance) Data Book.

Table 1 – Benefit references

Benefit	Value	Unit	Price base	2022/23 value	Benefit Source	Valuation Date
GHG, transport distribution	£2.11	Carbon dioxide emissions per litre of fuel burnt / kWh used (petrol)	2022/23	£2.11	DfT TAG data book	May 2023
GHG, transport collection	£2.52	Carbon dioxide emissions per litre of fuel burnt / kWh used (diesel)	2023/24	£2.52	DfT TAG data book	May 2023
GHG carbon, construction	£241.00	tCO2e	2020/21	£271.78	HM Treasury Green Book: Table 3	Nov 2022
Water quality Land-use area: wetland or floodplain	£350.00	£/ha	2010	£445.89	WINEP Wider Environmental Outcomes Metrics 2022	Feb 2011
GHG emissions (operational and embodied)	£248.00	tCO2e	2020	£279.68	UK Gov paper "Valuing greenhouse gas emissions in policy appraisal": Appendix A Common Data	Sep 2021
Traffic & transport disruption, A road	£14,891.00	£ / day (value of time travelled)	2010	£18,970.71	Road Traffic Estimates - Great Britain 2019	Sep 2020
Traffic & transport disruption, B road, non commuting	£1,942.00	£ / day (value of time travelled)	2010	£2,474.05	Road Traffic Estimates - Great Britain 2019	Sep 2020

Level of uncertainty and sensitivity

Where applicable, we have explained the uncertainty for each reporting line in the following table and in the respective enhancement case.

Application to each reporting line - CW15 & CW16

Data Table	Whole Table or Individual Line/s	Commentary Key Assumption underpinning the benefits and PV figures
CW15 & CW16	Whole Table	• Best value equals least cost in each line in table CW15, therefore the lines in CW15 and CW16 table lines match exactly, and the commentary in this table is common between both tables.
CW15 & CW16	CW15.56-66, CW15.100-132 / CW16.56-66, CW16.100-132	Enhancement case: WINEP • These lines have intentionally been kept blank. • These costs are associated with investigations or no deterioration schemes. • No benefits assessment was undertaken as there were no alternative options or no material difference in benefits, and the driver is least cost.
	CW15.134-144, CW15.178-188 / CW16.134-144, CW16.178-188	Enhancement case: WRMP Supply • These lines have been kept blank, • These lines are driven by a statutory compliance enhancement case, where no alternative options are feasible. • This enhancement case has been determined on a least cost basis.
	CW15.145-155, CW15.192-211 CW15.214-300 CW16.145-155, CW16.192-211 CW16.214-300	Enhancement case: Demand reduction (WRMP) • These lines have intentionally been kept blank. • The benefits for this case have been carried forward from the benefits case completed in AMP7. The AMP8 approach is consistent with the best value option approved in this case. • We undertook a comprehensive assessment of demand reduction options to support the PR19 programme, which included a cost-benefit analysis in the form of both feasibility and Ml/d benefit per pound spent. This work was supported by independent external experts. • The AMP7 cost-benefit analysis identified that smart metering and water efficiency interventions were the most cost-effective demand reductions, and essential to underpin future business cases for new strategic water resource options. We therefore continued to use this same approach in our AMP8 case.
	CW15.190-191 CW15.212 – 213 CW16.190-191 CW16.212 – 213	Metering (WRMP) • The AMP8 cost-benefit analysis identified that smart and new metering interventions provided benefit to PCC and Leakage. • The performance improvement from enhancement was annualized to enter columns H- R. • The monetary impact is calculated using the ODI rates multiplied by the annualised benefit and entered into columns (W-AG).

		•
	CW15.334-344 / CW16.334-344	Enhancement case: Long term water quality strategy – Lead control • This line has intentionally been left blank • These lines are driven by a statutory compliance enhancement case, and the enhancement case has been determined on a least cost basis. • We assessed three options in the enhancement case; however, we determined that only one option was compliant with the conditions of the statutory requirements, as least cost was selected for the one viable option.
	CW15.367-377 / CW16.367-377	Enhancement case: Long term water quality strategy – Lead control • This line has intentionally been left blank • This line refers to a customer trial, which will be used to inform the future investment for the lead control programme.
	CW15.401-411 / CW16.401-411	Enhancement document: WSSRP • This line has intentionally been kept blank • No benefits assessment was undertaken under the PR24 guidance. The proposed AMP8 enhancement costs relate to the Gate 4 submission under our AMP7 conditional allowance for the WSSRP.
	CW15.446-456 / CW16.446-456	Enhancement case: Long term water quality strategy - Cryptosporidium • This line has intentionally been left blank • Through the benefits screening and quantification process, we determined that there was no significant quantitative variance across the two options that resulted in significant change in quantity across the monetised benefits for the two options. • The costs are fundamentally different between the two options, with Option 2 being about 22% more expensive than the cost of Option 1. • There is also significant uncertainty with the more costly ceramic membrane microfiltration option. This is a new and untested technology for Cryptosporidium removal in the UK and has not been used previously by Thames Water or any water companies in the UK to our knowledge. • We therefore selected the least cost option as the best value for customers and did not proceed with the benefits PV.
	CW15.457-467 / CW16.457-467	Enhancement case: Reducing the risk of basement flooding • This line has intentionally been left blank. • A risk-based approach was used to identify options for this case
	CW15.468-478 /	Cost adjustment claim: Asset deficit • This line has intentionally been left blank

	CW16.468-478	• This line references a cost adjustment claim, which is driven by least cost bottom-up programme development.
	CW15.479-489 / CW16.479-489	Enhancement case: Digital cyber • This line has internationally been left blank • No CBA was undertaken as this case is guided by compliance with the National Cyber Security Centre (NCSC) and the Center for Internet Security (CIS) Control framework. • The framework is driven by levels of risk reduction, with the options selected based not on benefits, but on the risk reduction appetite of the business in compliance with the requirements.
	CW15.490-500 / CW16.490-500	Document - AMP7 WINEP – (Check CW3 if the numbers are referenced) • This line has intentionally been left blank. • This line refers to funds required to close out the AMP7 WINEP programme, with the programme benefits, approach and funding agreed in the PR19 business plan.

Assumptions

- This Table is focussed on projects starting in AMP8
- Investment in AMP8 will deliver benefits in both AMP8 and the early years of AMP9 as the projects are commissioned.
- We don't have information about benefits beyond the end of AMP9 but we can assume that although no new benefits are claimed, the existing benefits are maintained though on-going base investment.
- The PV is therefore based on the valuation of benefits forecast to be achieved during AMP8 and AMP9.

Benefits values were provided in the units at which they are measured (eg Nr Incidents of Sewer Flooding), and showing cumulative improvement.

These were then normalised to the same units as used for the Common Performance Commitments (eg 'Number of incidents per 10,000 sewer connections reported') and as reported on OUT5.

Finally they were converted to annual changes (rather than cumulative). This give the number of units of benefit, which are copied into the first block of columns (H-R) in table15.

	A	B	C	D	E	F	G	H	I	J	K
1											
2	AMP8 Enhancement Spend Benefits (cumula						2025-26	2026-27	2027-28	2028-29	2029-30
3	**Internal sewer flooding**					Nr incidents	0	1	3	4	5
4	Internal sewer flooding					Normalisation	6507	6602	6691	6776	6856
5	Internal sewer flooding	PR24_ISF	PR24_ISF_TMS	Number	2	Cumulative	0.00	0.00	0.00	0.01	0.01
6						Annual	0.00000	0.00151	0.00297	0.00142	0.00139

Each row is then multiplied by a valuation to give a benefit value (£m) for these units of benefit.

	£m	%	£m
Internal sewer flooding	26.756	70%	38.22
External sewer flooding	11.979	70%	17.11
Bathing water quality	0.339	70%	0.48
Customer contacts	26.183	70%	37.40
CRI	2.605	70%	3.72
Water supply interruptions	2.440	70%	3.49
Mains repairs	0.279	70%	0.40
Unplanned outage	4.143	70%	5.91
Sewer collapses	2.369	70%	3.39
Total pollution incidents	2.463	70%	3.52
Serious pollution incidents	1.138	70%	1.63
Discharge permit compliance	2.819	70%	4.03
Storm overflows	0.310	70%	0.44
Leakage	0.365	70%	0.52
PCC	3.751	70%	5.36
Business demand	0.365	70%	0.52
River water quality	0.00066		0.00094

They align to the final values Ofwat issued in the ODI summary document (see appendix 3 of this PR24: Using collaborative customer research to set outcome delivery incentive rates - Ofwat).

Discounting is done via STPR as per the Green Book (3.5% for years 0 to 30). The base year (Y0) is assumed to be the PR24 base year of 22/23, meaning that year 1 of AMP8 (25/26) is Y3 for discounting purposes.

Each £m value across the 10 years of AMP8 + AMP9 are calculated as described aboved, and are discounted by the relevant amount each year.

	A	B	C	D	E	F	G	H	I	J	K
1	STPR Year	3	4	5	6	7	8	9	10	11	12
2	3.50%	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35
3	Discount Factor	=1/(1+A2)^B$1		0.841973	0.813501	0.785991	0.759412	0.733731	0.708919	0.684946	0.661783

The sum of the discounted values over the ten years is put into column AJ of table 15.

CW17 - Accelerated programme expenditure - water resources and water network+

This table is a Nil Return for Thames Water.

CW18 - Cost adjustment claims - base expenditure: water resources and water network+

See Technical Appendices TMS18 and TMS20.

CW19 - Demand management - Leakage expenditure and activities

Data Table	Applicable to Whole Table or Individual Line/s	Commentary
CW19	Line 19.1, 19.2, 19.3	The numbers provided are at net Opex level. Y3 figures are based on actuals, while Y4 and Y5 are based on the latest forecast

	Maintain, Reduce and Total leakage expenditure	submissions. AMP8 figures are based on the PR24 submissions with the relevant leakage benefits taken from WRMP. Mains deterioration and Capex Re-class have been added to the base line Capex is taken from the AMP7 plan and PR24 (AMP8) CAPEX submission.
	Line 19.10 Supply Pipe Cost	Costs associated with the delivery of Thames' Customer Side Leakage (CSL) programme. This is the Fix element (excavate, repair, reinstate) with Admin overheads added.
	Lines 19.13, 14, 15, 16 PMA's	Historic Netbase is used as the source of the pressure management areas (PMAs). Netbase has the hydraulic boundary of each PMA which is then used to determine the properties within the PMA. In Netbase the property allocation routines used for PMAs are the same as those used for District Meter Areas (DMAs). For cascading PMAs, e.g. where one PMA is downstream of another PMA, the upstream PMA boundary is "drawn" to exclude the area, pipes and properties of the downstream PMA. Waternet holds details of each pressure reducing valve (PRV) for each PMA, including maintenance, type of control, and control settings. Separately, new PMA schemes are monitored on the Capital Delivery benefits tracker sheet. This sheet has the date when a new scheme was commissioned, and the benefits of the scheme signed off. This has been used to determine new PMA schemes delivered in each year with the associated property count taken from Netbase. Forecast Calculation of 5 year average of leakage savings per PMA (Ml/d per PMA) divided by the forecast leakage savings attributed to pressure management in AMP8 (Ml/d) also apply 5 year historic averages for the number of properties per PMA and the ratio of fixed outlet versus active control to the AMP8 forecast number of new PMAs.
	Lines 19.25, 26, 27, 28, 29 DMA's	All historic data sourced from the Leakage 3R's weekly DMA targeting report with %'s calculated from this. The excel AVERAGE function is applied to the DMA property count column of the 3Rs report to calculate the average. PMAs (pressure management areas) and LCAs (leakage control areas) are smaller areas within DMAs for sub-DMA targeting. We also have a large number of "trunk mains tiles" which are used to target leakage control activity outside DMAs. These areas have not been considered in this reporting.

		Line 29: Thames Water use zones for regulatory leakage reporting. The availability calculation follows the rules defined in the March 2018 Ofwat Leakage Reporting Guidance document (Reference 2A in the compliance checklist). Zones can be unavailable for a number of reasons, such as network meter fault or a zone breach. Validation of the night flow data is undertaken both using automatic routines and weekly manual inspection with operational knowledge.
	Lines 19.40, 41,42 Trunk Mains	Line 40 is calculated by taking the total company mains length as reported in line 6C.1 "Total length of potable mains as 31 March" from which the sum of the mains length within DMAs and the Transfer Mains length is subtracted. The Transfer Mains length is the length of mains between the DI meters and the FMZ meters. It is already used in the Annual Return to calculate Trunk Mains leakage as part of bottom-up leakage in the Water Balance. Line 41 is calculated by taking the total mains length as reported in line 6C.1 "Total length of potable mains as 31 March" and subtracting the sum of the mains length within DMAs.
	Line 19.49 Smart Network Coverage	Acoustic logger data is taken from the 3Rs DMA targeting report. This report shows the number of Permanet acoustic loggers permanently installed in each DMA, and the total number of properties in each DMA. Thames Water's current policy is to install acoustic loggers across the full DMA to provide complete coverage. There are a few DMAs where full coverage has not been achieved but these are limited in number due to trying out different rollout strategies in Phase 1 of the acoustic logger programme. "Lift and shift" acoustic loggers are used across Thames Water but these have not been included in the reported numbers for this line. The 3Rs report also excludes trials of alternative permanent acoustic logger technologies such as those provided by Ovarro and Guttermann. Assumption is that the budget to double the acoustic logger estate remains in the PR24 submission
	19.52 Hours on ALC (Active Leakage Control)	Core detection hours are calculated based on 22/23 hours taken from weekly trackers supplied by detection partners across all 4 leakage detection contract Lots. Core Detection leakage – Due to a disparity between the total detection hours recorded in TESLA and the Detection Partners weekly trackers for 2022-23, the data from the Detection Partners weekly trackers has been used to calculate Active Leakage Control hours. The disparity is likely to have been caused by missing time sheets causing an under presentation of detection hours in the TESLA system. Using the detection hours recorded in TESLA for 2022-23, a percentage split has been calculated between Direct Hours (time spent on Active Leakage Control) and Indirect Hours (Annual Leave, Sickness, Training and Office etc). This is based on the

		assumption that detection timesheets entered into TESLA are correct, with the shortfall in global total hours in TESLA due to missing timesheets. Direct detection hours (ALC) has been calculated at 60% of total hours for 2022-23. Therefore, Core Detection hours for 2022-23 have been calculated on the assumption that the Core Detection Partners FTEs work a 40 hour week throughout the year, with 60% of that time attributed to Active Leakage Control (e.g. Average Weekly FTE On book * 40 (Weekly hours) * 52 (Weeks in year) * 60% (split between direct & indirect hours). The 60% split of direct hours to total hours is the equivalent of working just over 31 weeks of 40 hours solely on ALC (this is broadly in line, although slightly favourable to previous years; 2019-20: 58%, 2020-21: 59% and 2021-22: 59%).
	19.55, 19.56, 19.57, 19.58 Mains Repairs	Average run time figures for 19.57 and 19.58 have been taken from Leakage CALM Report and corporate SAP management system. Job code that activity is raised under differentiates between customer (Visible) and company (active) mains repair. Repair numbers for 19.55 and 19.56 have been taken from the Regulatory Mains burst data set which contains validated data from the corporate SAP management system. Job code that activity is raised under differentiates between customer (Visible) and company (active) mains repair. Forecast mains repairs are in alignment with the OUT4 table.
	19.67, 19.68, 19.69, 19.70 Mains Fittings Repairs	Repair numbers have been extracted from the Consolidated CaLM Weekly Measures dataset. CaLM Weekly Measures contains weekly leakage activity for each year, with the Consolidated CaLM Weekly Measures collating performance for each year. The repair data in CaLM Weekly Measures is ran from SAP Business Objects via a report called 'Field Complete Repaired'. CW19.70 Average run time for company detected mains fittings repairs has been inflated by a housekeeping exercise to close down previously completed jobs that were not closed down correctly on the system due to missing completion forms. As a result, 759 jobs were closed down during w/e 17th March 2023 and assigned a closure date during that week (due to previously missing a completion date). This meant that the 759 jobs closed during w/e 17th March had an average age of 230 days. If the average run time for the jobs completed during this week was excluded the average run time for company detected communication pipe repairs would reduce from 39.6 days to 29.9 days (which although still higher, it is closer to previous years performance). Other supporting information: typical weekly mains fittings repairs ranged from 24 -453 compared to the 759 above. Weekly

		average repair numbers were 233 excl. w/e 17th March / 245 incl. w/e 17th March.
	19.79, 19.80, 19.81, 19.82 Communication Pipe Repairs	Repair numbers have been extracted from the Consolidated CaLM Weekly Measures dataset. CaLM Weekly Measures contains weekly leakage activity for each year, with the Consolidated CaLM Weekly Measures collating performance for each year. The repair data in CaLM Weekly Measures is ran from SAP Business Objects via a report called 'Field Complete Repaired'. CW19.82 Average run time for company detected communication pipe repairs has been inflated by a housekeeping exercise to close down previously completed jobs that were not closed down correctly on the system due to missing completion forms. As a result, 835 jobs were closed down during w/e 17th March 2023 and assigned a closure date during that week (due to previously missing a completion date). This meant that the 835 jobs closed during w/e 17th March had an average age of 330 days. If the average run time for the jobs completed during this week was excluded the average run time for company detected communication pipe repairs would reduce from 60.4 days to 41.5 days (which although still higher, it is closer to previous years performance).
	19.91, 19.92, 19.93, 19.94,19.95, 19.96, 19.97 Supply Pipe Repairs	Repair numbers have been extracted from the Consolidated CaLM Weekly Measures dataset. CaLM Weekly Measures contains weekly leakage activity for each financial year, with the Consolidated CaLM Weekly Measures collating performance for each financial year.
	CW19.112 Historical minimum achieved levels	Weekly DMA leakage is reviewed over the last 5 years. The minimum over this period is then determined for each DMA separately and then these minimums are summed to provide a total. The average leakage for these DMAs over the last 5 years is also calculated. The sum of the DMA minimums is then divided by the DMA average leakage to produce a “minimum achieved level of leakage” factor. This is then applied to the company distribution leakage. Trunk Mains leakage and Service Reservoir leakage are then added to give a total company leakage consistent value.
	CW19.113 Volume of Leakage that needs to be saved to maintain current levels	This is calculated using Option B. The level of active leakage control activity has been derived from historic performance by identifying a period of time when leakage was held constant and determining the average level of active leakage control activity undertaken at the time. Added to this is the in-year activity for visible leakage repairs, which will be heavily influenced by weather conditions in the report year.

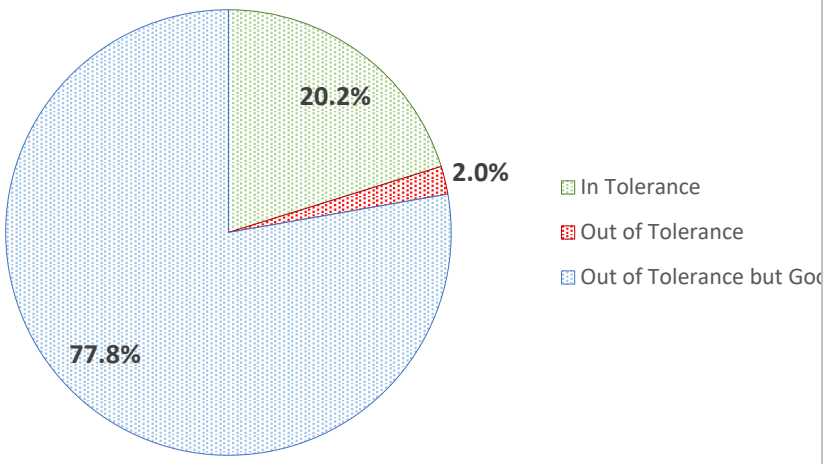
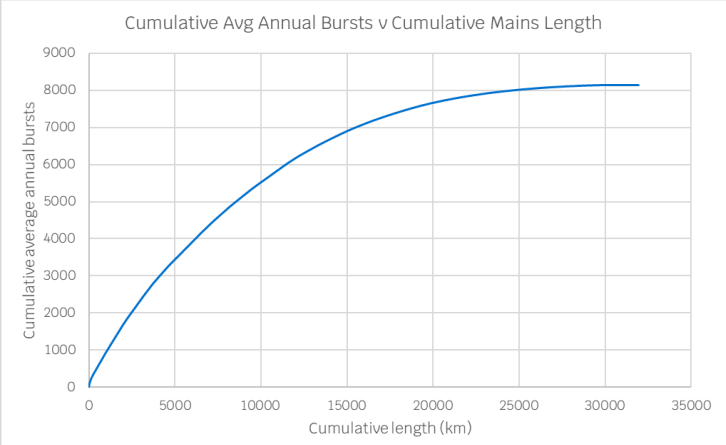
CW20 - Water mains; asset condition

Data Table	Whole Table or Individual Line/s	Commentary
CW20	Whole Table	• The methodology employed for this calculation adheres to the five grades recommended by OFWAT, and no sub-division of grading was applied. • The methodology applied does not involve any alterations in reporting methods or assumptions that would result in material changes in reported figures.
	Whole Table	<u>Total Length:</u> The total length of the network matches the length reported at AR23. There is a slight discrepancy between the length of Potable mains up to 320 mm and length of potable mains over 320 mm compared with AR23. This discrepancy arises due to RAG Methodology 4's practice of proportionally distributing mains with unknown or 'Null' diameter among the specified size categories based on each category's ratio to the total count. In this Data Table, it is necessary to treat the unknown diameter data as a distinct category on its own.

	Whole Table	<u>Analysis of Discrepancies in Burst-Pipe Matching Process:</u>
		
		During this calculation, which involves matching bursts with corresponding pipes, differences arise when comparing the total number of bursts in this computation and the number of bursts reported in the APR during April 2018 to 2023.
		
		There were instances of incomplete or missing data, which posed challenges in establishing a direct link between certain bursts and their corresponding pipes.
		
		• Total Bursts Reported in the APR (April) 2018-2023: 43,968 (AR19 = 10,388, AR20 = 7,798, AR21 = 8,559, AR22 = 7,109, AR23 = 10,114)
		• Bursts matching Pipes for this Calculation: 41,562
		• Difference between the two: 2,406
		• Breakdown:
		  • Bursts on Pipes Decommissioned by March 2023: 366
		  • Bursts that Remained Mismatched: 2,040

	Whole Table	<u>Infill process in Mains Installation Years:</u> Before running the main calculation, we ensure proper data preparation by running the RStudio Infill process. • This process fills and standardize the "MAINS_INSTALL" attribute in the "distributionMains" and “trunkMains” dataset, which represents the installation year of water mains.

		• The standardization of the "MAINS_INSTALL" column consolidates multiple installation columns from different sources into a single, uniform attribute to ensure a consistent and unique attribute for further calculations. • The process extracts specific columns related to main ID, material, installation year (in different formats), length, and other relevant attributes. • Using the "DATEBUILT", "INFERREDYEARBUILT" and "YEARBUILTCODE" columns to extract the year component and store it in the new column. • Then assigns the appropriate value for the "MAINS_INSTALL" column based on priority among "DATEBUILT_YEAR," "INFERREDYEARBUILT," and "YEARBUILTCODE_YEAR." If no valid year value is found, it calculates the statistical mode of the existing "MAINS_INSTALL". • By the end of the process, the "MAINS_INSTALL" column contains standardized installation years for water mains data.
	Whole Table	<u>Cohorts where it is not considered practical to arrange its size to fall within the defined tolerance:</u> In the context of the cohort analysis for this calculation, the grading methodology involves grouping water mains into cohorts with similar characteristics. Each cohort's expected total number of bursts per year is ideally within a tolerance of +/- 50% of the nominal size, as specified in table CW20.1. However, there are instances where arranging the cohort sizes to fit precisely within this tolerance might not be practically feasible. In our analysis, we encountered cohorts that fell outside of this tolerance range. The provided output illustrates the distribution of cohorts in various categories: Cohorts in Tolerance: These are cohorts where the expected total number of bursts per year falls within the tolerance range of +/- 50% of the nominal size. In our analysis, there were 885 such cohorts. Cohorts out of Tolerance: These are cohorts where the expected total number of bursts per year exceeds the tolerance range. There were 3,494 cohorts falling into this category. Cohorts out of Tolerance but “Good”: Among the cohorts that were out of tolerance, there were 3,405 cohorts that could still be considered acceptable or "good" based on the certain criteria that the Average annual bursts is less than Nominal expected bursts.

		This leaves 89 cohorts out of a total of 4,379 which fall outside of tolerance and are not deemed to be "Good," as the average annual bursts value is not less than the nominal expected bursts.  The decision to not further adjust cohort sizes to ensure that all of them fell within the specified tolerance range was based on practical considerations. Creating more cohorts to meet the tolerance requirement might lead to excessive fragmentation and reduced meaningfulness of the cohorts. This could also introduce complexities in data analysis and interpretation. Therefore, in alignment with industry best practices, we opted to provide a commentary on the cohorts that fell out of the tolerance range, explaining the rationale for not adjusting their sizes. This approach maintains a balance between adhering to the tolerance guidelines and ensuring that the cohort analysis remains insightful and meaningful.
	Whole Table	<u>Graph of cumulative annual average bursts (y-axis) versus cumulative mains length (x-axis):</u> 
	Whole Table	<u>An indication of the data quality provided:</u>

		The data provided is deemed to fall into the confidence grade B3 for both size bands. The data is largely reliable, comprising sound records and well-documented analysis. Minor shortcomings have been infilled where practicable. The data is reasonably accurate; however, some assumptions have been made where accurate data is not available.
	Comparison with PR09	In the PR09 asset inventory, we reported 23.4% (% of GMEAV) of potable mains up to 320mm as being in condition grades 4 and 5. Today, the mains in condition grades 4 and 5 are less than 15% by length. Total mains repairs have reduced since our PR09 asset inventory submission when we had a reference level of 11,000 per year and we peaked at 14,240 in 2008-09. The reductions are largely due to the completion of the Victorian Mains renewal programme (VMR) at the end of AMP4. The VMR programme from 2003 to 2010 replaced many of the worst-performing pipes in the worst-performing DMAs, affecting a reduction in failure rate. This reduction has been maintained though smaller more localised mains replacement programmes, pressure management and Calm systems interventions.

CW21 - Water - net zero enhancement schemes

Data Table	Whole Table or Individual Line/s	Commentary
CW21	CW21_1	Decarbonisation of life expired fleet. For this scheme the base costs of a like-for-like replacement of a fossil fuelled vehicle have been removed. For the purposes of the data tables, this scheme has been divided into a Water solution and a Waste solution and it has been assumed that should the bid be successful, then both solutions will be funded. Reductions in GHG emissions from this scheme were based on 2021/22 scope 1 and 3 transport emissions. The reduction in emissions was profiled in line with the capital spend for the project, which is based on the asset life expiry of existing vehicles, increases in electricity consumption from electric vehicles were considered. More detail is available in the Net Zero PR24 Bidding Case
	CW21_2	The natural gas and electricity consumption changes from switching to hybrid heating solutions at the corporate offices was assessed by our facilities supplier and converted to GHG emissions using the CAW v17. For the low carbon heating solutions at site offices, a similar method was followed, but energy consumption data was scaled from a supplier quote. More detail is available in the Net Zero PR24 Bidding Case
	CW21_3	The natural gas and electricity consumption changes from switching to hybrid heating solutions at the corporate offices was assessed by our facilities supplier and converted to GHG emissions using the CAW v17. For the low carbon heating solutions at site offices, a similar method was followed, but energy consumption data was scaled from a supplier quote. More detail is available in the Net Zero PR24 Bidding Case

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