

**WSX54 - Long
term strategies
tables
commentary**

Business plan
2025-2030



Wessex Water
YTL GROUP

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WSX54 - Long term strategies tables commentary

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This supporting document is part of Wessex Water's business plan for 2025-2030.

Please see 'WSX00 – Navigation document' for where this document sits within our business plan submission.

More information can be found at wessexwater.co.uk

1. LS1. Forecast outcomes

1.1. Performance commitment profiles

The performance commitment (PC) positions are presented in the table below. Several align with our strategic direction statement (SDS) as detailed in the table. For PCs that are not directly aligned to the SDS outcomes, they are coloured red in the table and have been allocated to the most appropriate outcome area. The target is calculated from wider business investment plans (e.g. based on assumptions in raw water quality deterioration, investment forecasts for P removal and future legislation etc).

Table 1 – Performance commitment position

Performance commitment	Target in 2050	SDS outcome area	SDS target(s)
Water supply interruptions	0 minutes interruptions over 3 hours	Safe and reliable water	0 minutes interruptions over 3 hours 100% compliance, always
Compliance risk index (CRI)	1.5 (aligns with consistent expenditure in base maintenance)		
Customer contacts about water quality	0.97		
Unplanned outage	5.02		
Internal sewer flooding	Halve the number of incidents from the 2019/20 baseline – 0.66 for internal sewer flooding, 8.25 for external sewer flooding	Effective sewerage system	Halve the impact of supply interruptions
External sewer flooding			
Storm overflows	9.76		
Sewer collapses	9.78		
Leakage	50% reduction on 2017/18 baseline to 38.49 MI/d, or a 46.3% PC reduction	Safe and reliable water	100% compliance with abstraction licences

Performance commitment	Target in 2050	SDS outcome area	SDS target(s)
Per capita consumption	110l/h/day or a 21.9% PC reduction		
Business demand	Reduction to 67.33Ml/d, or a 17.4% PC reduction		
Mains repairs	179.0 to align with investment profiles.		
Total pollution incidents	0	Great river and coastal water quality	0 pollution incidents Total tonnes of phosphorus and nitrogen removed (linked to environmental regulations at the time)
Serious pollution incidents	0		
Discharge permit compliance	99.68		
Bathing water quality	86.4%		
River water quality (phosphorus)	80.87% - Number being calculated based on the environmental performance forecast on current permit requirements		
Biodiversity	2.21 – note that the overall ambition is to create 5,000 additional biodiversity units by 2050.	Biodiversity	Double our contribution
Operational greenhouse gas emissions (water)	82.09 tonnes	Carbon*	Net zero company
Operational greenhouse gas emissions (waste water)	-17,378 tonnes		

* Note the PC definition does not allow offsetting for example, so not directly comparable to a wider target in this area.

All the common reference scenarios meet these glidepaths as per the guidance.

However, one of our adaptive pathways will differ from these forecasts:

- Under AP5/LS3e – demand management strategy – the pathways presents a view of, if our investment in demand side activities (leakage, PCC reduction including smart metering, and business demand reduction) are not as successful as we hope, a lower level of delivery could be seen for these areas. This is detailed in our LTDS document WSX03 in more detail, but pasted in below for completeness.

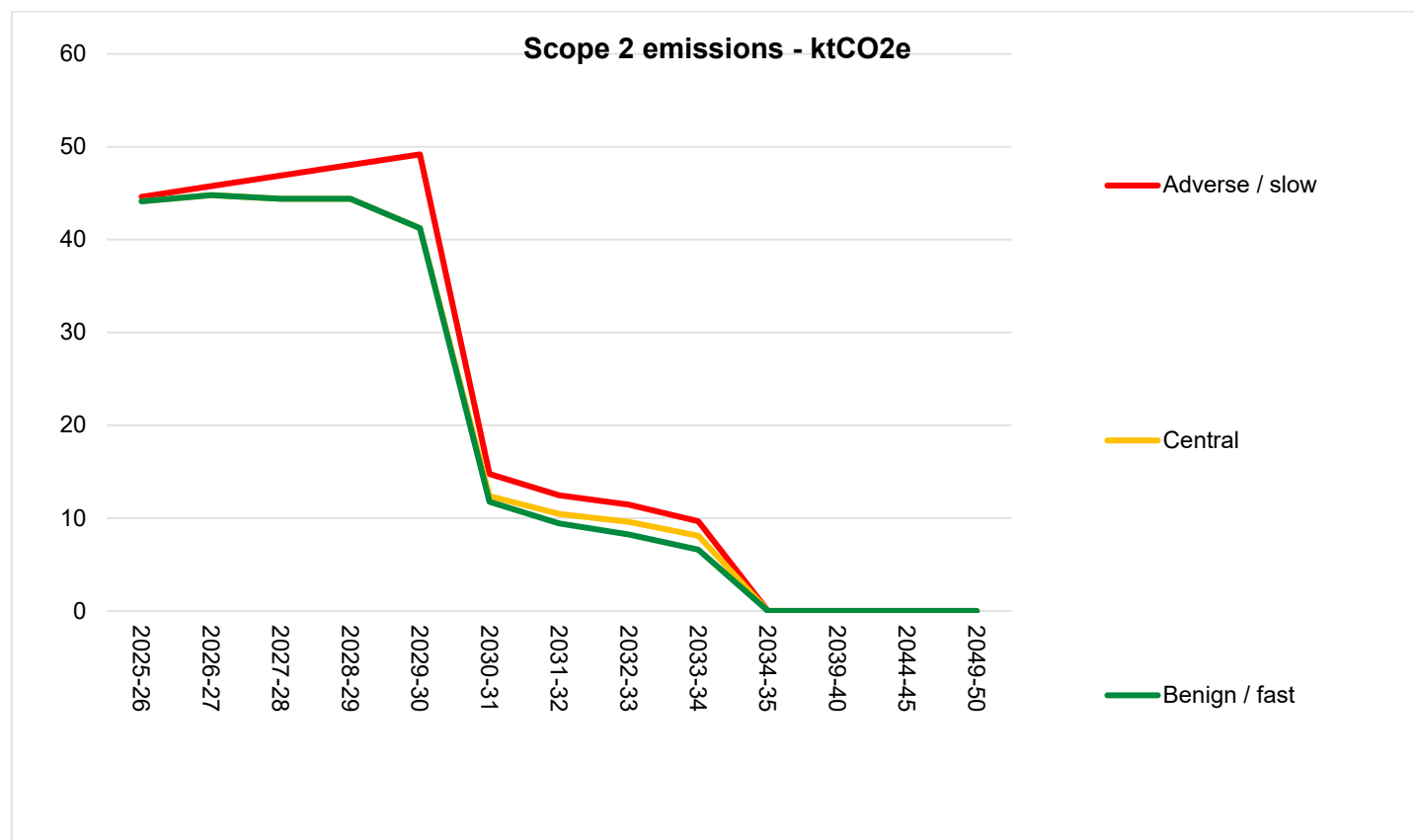
Table 2 – Leakage, PCC and Business Demand performance level forecast per year 2025-2050

Performance commitment	Performance level forecast per year												
	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2039-40	2044-45	2049-50
Leakage (%age reduction - PCC)	13.3%	13.4%	13.8%	14.2%	14.8%	15.6%	16.6%	17.7%	18.9%	20.1%	23.6%	26.7%	29.7%
PCC (%age reduction (PC))	-2.1%	-1.7%	-1.2%	-0.6%	-0.1%	0.5%	1.2%	2.0%	2.8%	3.6%	7.0%	8.6%	9.8%
Business demand (%age reduction – PC)	-0.3%	0.3%	1.1%	2.0%	2.8%	3.5%	4.2%	4.7%	5.3%	5.8%	6.8%	6.8%	6.9%

Please note that for C-P4/LS4j – carbon reduction, fugitive emissions – the profile for our waste GHG reduction PC could be slightly different as this profile is assuming that the current assumptions for nitrous oxide emissions industry wide increase. This pathway seeks to address that increase through additional investment and therefore mitigate the increase as soon as possible, hence not changing the forecast profile. This is detailed in our LTDS document WSX03 in more detail.

For the carbon performance commitment there is a noticeable step change between AMP8 and 9. This is because, as detailed in the carbon section of WSX03, there are three ‘phases’ to how we calculate grid electricity:

- For AMP8 – using 2022-23 grid emission factor as per the performance commitment
- For AMP9 – we have assumed Ofwat will recalibrate the grid emissions factor to the 2027-28 figure and current forecasts see quite a step change – the scope 2 emissions are shown in the following graph which illustrates this step change
- For AMP10 and beyond – this is calculated on the basis of Ofwat guidance in the LTDS which is to assume carbon free electricity from 2035 onwards.

Figure 1 – Scope 2 emissions – ktCO₂e 2025-2050

1.2. Forecast other outcomes

Supply side scheme benefit

For supply side scheme benefits, the numbers provided are for the core pathway under the WRMP. Each adaptive pathway/common reference scenario has a different set of supply side schemes delivered. The volumes are in the table below (units are all Megalitres per day (Ml/d) supply-side benefit delivered to the supply-demand balance).

Waste water networks storage volume delivered or avoid

For AMP8 storage equivalence, please see commentary for tables CWW20 and PCDWW5 APP3 more generally. In particular, these forecasts include WRC and network storage which is consistent with how we have populated CWW20 – please see the commentary for that table for more information.

We have undertaken limited PR24 appraisals for AMP9 and beyond schemes, so have used our DWMP modelling predictions where available. These assume either a 10 spills per year prediction (if not highest priority environment) or 5 spills (eg. if highest priority = RNAG and Chalk streams). If still unknown we have used an assumed average of 1000m³ storage per attenuation storage scheme improvement, and 1750 m³ for wetland solutions (as per PCDWW5 App 3 commentary).

We have populated this in an in year format, i.e. not cumulative volume delivered.

We have also in this commentary included an approximation of the changes we would see under the common reference scenarios for climate change benign and adverse and demand benign and adverse. This is in the table following the supply side scheme benefits table.

Table 3 - Outcome forecast – supply-side scheme benefit

Pathway	Outcome forecast – supply-side scheme benefit												
	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2039-40	2044-45	2049-50
Core - Enh	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Core – Base	0	0	0	0	0	0	0	0	0	0	0	0	0
AP1 - Enh	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00	5.00	14.50	14.50	14.50
AP1 - Base	0	0	0	0	0	0	0	0	0	0	0	0	0
AP2 - Enh	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00	5.00	50.00	61.70	61.70
AP2 - Base	0	0	0	0	0	0	0	0	0	0	0	0	0
AP5 – Enh	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00	5.00	50.13	50.13	50.13
AP5 – Base	0	0	0	0	0	0	0	0	0	0	0	0	0
AP6 – Enh	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00	5.00	32.90	32.90	32.90

Pathway	Outcome forecast – supply-side scheme benefit												
	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2039-40	2044-45	2049-50
AP6 - Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand Adverse - Enh	0	0	0	0	0	5	5	5	5	5	9	15	15
Demand Adverse - Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Environment Adverse – Enh	0	0	0	0	0	5	5	5	5	5	46	52	52
Environment Adverse - Base	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4 - Outcome forecast – wastewater network storage volume delivered or avoided

Pathway	Outcome forecast – wastewater network storage volume delivered or avoided												
	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2039-40	2044-45	2049-50
Core - Enh	0.0	13,878.0	23,130.0	58,343.0	68,193.0	82,301.8	82,301.8	82,301.8	82,301.8	82,301.8	23,693.0	132,199.0	86,107.0
Core – Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand benign -Enh	-	13,878.00	23,130.00	58,343.00	68,193.00	81,816.22	81,816.22	81,816.22	81,816.22	81,816.22	235,533.11	131,419.03	85,598.97
Demand benign - base	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand adverse - Enh	-	13,878.00	23,130.00	58,343.00	68,193.00	82,729.77	82,729.77	82,729.77	82,729.77	82,729.77	238,163.04	132,886.43	86,554.76
Demand adverse - Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Climate change benign – Enh	-	13,878.00	23,130.00	58,343.00	68,193.00	76,524.21	76,524.21	76,524.21	76,524.21	76,524.21	220,298.44	122,918.63	80,062.29
Climate change benign – Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Climate change adverse – Enh	-	13,878.00	23,130.00	58,343.00	68,193.00	82,301.80	82,301.80	82,301.80	82,301.80	82,301.80	255,032.53	142,299.00	92,685.57

Pathway	Outcome forecast – wastewater network storage volume delivered or avoided												
	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2039-40	2044-45	2049-50
Climate change adverse - Base	0	0	0	0	0	0	0	0	0	0	0	0	0

2. LS2. Forecast outcomes from base expenditure

2.1. Summary commentary

Our approach details enhancement investment. Note that we have forecast the improvement from base assuming that the enhancement opex from the preceding AMP gets allocated to base as per the query that was answered by Ofwat below which suggests that enhancement opex will be added to base in subsequent AMPs. However, we question how Ofwat will model this given their tables ask for totex only for the LS submission.

<p>QUERY – LS3-6 – For the financial years beyond 2030 we believe that the table is presenting the likely whole life costs of enhancement investment spanning across multiple AMPs. To obtain this true multi-AMP picture, we therefore believe that recurring opex costs and/or capital maintenance costs resulting from one AMP period should be included beyond the end of the AMP in which they occur as per guidance above for tables CW3/13/15 – please confirm</p>	<p>ANSWER - If the construction of an enhancement solution is completed within a price control period, then its associated operational costs will be captured in our base cost models in the following price control period. Therefore, beyond the period in which the solution is constructed, operational costs should not be included in the long-term strategies data tables, as these tables capture enhancement expenditure only.</p>
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Please note that this has meant we have provided our performance forecasts from base for those PC's with enhancement spend as follows:

- The AMP9 performance from enhancement becomes the AMP10 base performance as the costs will be assumed to then be reflected in future base costs.

However, for the following PCs these are forecast to be delivered entirely from base:

- CRI
- Customer contacts about water quality
- Discharge permit compliance
- Mains repairs (although influenced by leakage activity)
- Unplanned outage
- Sewer collapses.

Note that as detailed in our LTDS WSX03 and WSX 14 – Water Network strategy and investment document, our forecasts for customer contacts about drinking water quality are based on our PR24 submission for AMP 8 that is seeking a £20m uplift in base expenditure, continuing into subsequent AMPs, to deliver this step change in performance. We have not included this expenditure in the LTDS tables as Ofwat explicitly request that these are enhancement only. But this increase in base expenditure is required to deliver this performance level.

In our adaptive pathway AP S-P2 / LS4b we look at the impact that a ban on wet wipes would have on our expenditure to reduce blockages. This is forecast to have a reduction in our base costs of circa £10m per AMP from when the ban takes effect, but again as the tables require us to forecast only changes in enhancement expenditure this is not included.

3. LS3, 3a – 3i. Wholesale water totex enhancement expenditure by purpose

3.1. General

To inflate the AMP7 APR 4M costs from 2020-21 and 2021-22 to 2022-23 we have used the following indices from PD1

Table 5 – PD1 indices used to inflate the AMP7 APR 4M costs from 2020-21 and 2021-22 to 2022-23

Line description	Units	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
RPI: Financial year average indices	nr	251.7	256.7	259.4	265.0	274.9	283.3	290.6	294.2	311.2	351.2
CPIH: Financial year average indices	nr	98.6	99.7	100.2	101.5	104.2	106.4	108.2	109.1	113.1	123.0

Note that our cost tables assume that the enhancement opex from the preceding AMP gets allocated to base as per the query that was answered by Ofwat below. However, we question how Ofwat will model this given their tables ask for totex only for the LS submission.

<p>QUERY – LS3-6 – For the financial years beyond 2030 we believe that the table is presenting the likely whole life costs of enhancement investment spanning across multiple AMPs. To obtain this true multi-AMP picture, we therefore believe that recurring opex costs and/or capital maintenance costs resulting from one AMP period should be included beyond the end of the AMP in which they occur as per guidance above for tables CW3/13/15 – please confirm</p>	<p>ANSWER - If the construction of an enhancement solution is completed within a price control period, then its associated operational costs will be captured in our base cost models in the following price control period. Therefore, beyond the period in which the solution is constructed, operational costs should not be included in the long-term strategies data tables, as these tables capture enhancement expenditure only.</p>
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3.2. Alternative pathways expenditure in 2025-30

Supply side benefit schemes

Our AMP8 programme includes a range of investigations into supply side schemes to keep our options open for AMP9 delivery and beyond. These are detailed in WSX12 – Water Resources strategy and investment.

The alternative pathways detailed in section 3.4 give rise to alternative volumes for the LS1 supply side scheme benefit table as included in LS1 section 1.2 of this commentary. The information behind the combination of our supply side schemes is detailed in our final WRMP; at time of writing it was not published on our website yet due to review from DEFRA due to industry wide standard reviews, but will be in the near future.

3.3. Alternative pathways labelling

The table below summarises the coding used in the PR24 tables for adaptive pathways against the names used in our LTDS WSX03. Please note that we have not included every scenario from the WRMP. We have included the most likely pathway alongside:

- One flagging higher demand (AP2)
- One flagging what would happen if demand management – leakage, PCC reduction and business demand reduction – were to be less effective and some of our Hampshire Avon supply side options were not available for use (AP5)
- One showing the impact of additional demand/need from MOD sites and Veolia in addition to Hampshire Avon supply side options not being available (AP6).

Table 6 – Adaptive pathway labels

Table code	Wessex code	Wessex adaptive pathway name
LS3a	WTS-P2	Accelerated lead pipe replacement
LS3b	WTS-P2	Enhanced nitrate removal
LS3c	WR-P2	AP1 - WRMP most likely pathway
LS3d	WR-P3	AP2 – WRMP higher need scenario (in the WRMP called ‘High Alternative Need Pathway 1’)
LS3e	WR-P6	AP5 – WRMP Central Alternative Pathway 2 – Demand management less effective + Hampshire Avon options not available
LS3f	WR-P8	AP6 – WRMP Central Alternative Pathway 4 – Additional need from Mod and Veolia and no Hampshire Avon Options

3.4. Proportionate cost allocation and use of additional lines

When populating the AMP7 costs we have used a combination of tables 4L from the 2020-21 and 2021-22 APRs alongside CWW3. For tables 4L, the cost driver lines do not align exactly. Nor do the CW3 and LTDS table lines. For example, there is no line for Strategic regional resource solutions in LS3 (and LS3a etc) but there is in CW3. We have therefore added these SRO costs to ‘Water enhancement totex; Supply-side improvements’ as we believe this is the most appropriate place to add them in. Likewise for the CW3 line that considers supply side benefits beyond 2030.

For AMP7, rather than introduce costly and time consuming allocations we have allocated all the costs to a single driver in table LS3. The table below shows the lines from 4L and the LTDS drivers we have allocated them to. This was based on where most of the expenditure would have been allocated had the lines been in use in the APR reporting years.

Please note we have not included the lines that do not have a 4L/4M mapping as otherwise the table would be excessively long given the number of lines in the table.

The table below also summarises the additional lines we have utilised. Line 1 for AMP7 covers the lines from table 4L that did not have an appropriate match in the LTDs tables.

Additional line 1 has then been used to forecast future expenditure on supply interruptions from AMP9 onwards. This does not appear in our CW3 tables as we are not proposing any enhancement in the 2025-30 period, but in future AMPs there are activities that are forecast to deliver supply interruptions improvements and do not fit under any other driver line.

Table 7 – Summary of lines utilised from 4L and the LTDS drivers allocated to them

LTDS driver lines	2021 4L line match	2022 4L line match	Wider LS tables for AMP9 and beyond
Eels/fish entrainment screens	Eels Regulations (measures at intakes)	Eels Regulations (measures at intakes)	
Invasive Non Native Species	Invasive Non Native Species	Invasive Non Native Species	
Drinking Water Protected Areas	Drinking Water Protected Areas (schemes)	Drinking Water Protected Areas (schemes)	
Water Framework Directive	Water Framework Directive measure	Water Framework Directive measure	
Investigations; (WINEP/NEP) - multiple surveys, and/or monitoring locations, and/or complex modelling water totex	Investigations	Investigations	
Supply-side improvements	Supply-side improvements delivering benefits in 2020-2025 Supply demand balance improvements delivering benefits starting from 2026 Strategic regional water resources	Supply-side improvements delivering benefits in 2020-2025 Supply demand balance improvements delivering benefits starting from 2026 Strategic regional water resources	Supply-side improvements delivering benefits in 2020-2025 Supply demand balance improvements delivering benefits starting from 2026 Strategic regional water resources

LTDS driver lines	2021 4L line match	2022 4L line match	Wider LS tables for AMP9 and beyond
Demand-side improvements	Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering)	Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering)	
Leakage improvements	Leakage improvements delivering benefits in 2020-2025	Leakage improvements delivering benefits in 2020-2025	
Internal interconnectors	Internal interconnectors delivering benefits in 2020-2025	Internal interconnectors delivering benefits in 2020-2025	
New meters requested by existing customers (optants)	New meters requested by existing customers (optants)	New meters requested by existing customers (optants)	
New meters introduced by companies for existing customers; metering totex	New meters introduced by companies for existing customers	New meters introduced by companies for existing customers	
New meters for existing customers - business	New meters for existing customers - business	New meters for existing customers - business	
Replacement of existing basic meters with AMR meters for residential customers		Replacement of existing basic meters with smart meters	
Smart meter infrastructure		Smart meter infrastructure	
Improvements to taste, odour and colour (grey solutions)	Improvements to taste, odour and colour	Improvements to taste, odour and colour	
Addressing raw water quality deterioration (green solutions)	Addressing raw water deterioration	Addressing raw water deterioration	
External lead supply pipes replaced or relined	Meeting lead standards	Meeting lead standards	
Resilience	Enhancing resilience to low probability high consequence events	Enhancing resilience to low probability high consequence events	

LTDS driver lines	2021 4L line match	2022 4L line match	Wider LS tables for AMP9 and beyond
Security - SEMD	Security - SEMD	Security - SEMD	
Security - Cyber	Security - Non-SEMD	Security - Non-SEMD	
Additional line 1	AMP7 lines aggregated Strategic regional water resources Improvements to river flow NEP - Local priority NEP - CROW Act Ecological improvements at abstractions	Strategic regional water resources Improvements to river flow Ecological improvements at abstractions	Supply interruptions
Additional line 2		eCAF; enhancement water capex	
Additional line 3		Data and AI; enhancement water capex	
Additional line 4		Customer Access, Recreation, Education; enhancement water capex	
Additional line 5		New meters for new customers; enhancement water capex	

Cyber costs – proportionate allocation

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4. LS4, 4a-i Wholesale wastewater totex enhancement expenditure by purpose

4.1. General

To inflate the AMP7 APR 4M costs from 2020-21 and 2021-22 to 2022-23 we have used the following indices from PD1

Table 8 – PD1 indices used to inflate the AMP7 APR 4M costs from 2020-21 and 2021-22 to 2022-23

Line description	Units	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
RPI: Financial year average indices	nr	251.7	256.7	259.4	265.0	274.9	283.3	290.6	294.2	311.2	351.2
CPIH: Financial year average indices	nr	98.6	99.7	100.2	101.5	104.2	106.4	108.2	109.1	113.1	123.0

Note that our cost tables assume that the enhancement opex from the preceding AMP gets allocated to base as per the query that was answered by Ofwat below. However, we question how Ofwat will model this given their tables ask for totex only for the LS submission.

<p>QUERY – LS3-6 – For the financial years beyond 2030 we believe that the table is presenting the likely whole life costs of enhancement investment spanning across multiple AMPs. To obtain this true multi-AMP picture, we therefore believe that recurring opex costs and/or capital maintenance costs resulting from one AMP period should be included beyond the end of the AMP in which they occur as per guidance above for tables CW3/13/15 – please confirm</p>	<p>ANSWER - If the construction of an enhancement solution is completed within a price control period, then its associated operational costs will be captured in our base cost models in the following price control period. Therefore, beyond the period in which the solution is constructed, operational costs should not be included in the long-term strategies data tables, as these tables capture enhancement expenditure only.</p>
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4.2. Alternative pathways expenditure in 2025-30

None of our adaptive pathways require expenditure in AMP8.

4.3. Alternative pathways labelling

The table below summarises the coding used in the PR24 tables for adaptive pathways against the names used in our LTDS WSX03.

Table 9 – PR24 table coding for adaptive pathways against the names used in our LTDS WSX03

Table code	Wessex code	Wessex adaptive pathway name
LS4a	WT-P1	Waste treatment – climate change

Table code	Wessex code	Wessex adaptive pathway name
LS4b	S-P2	Sewerage – wet wipes banned Note that as per WSX02 the impact on enhancement expenditure here is £0 as the reduction is in base (£10m). However, we wanted to flag it as a key adaptive pathway.
LS4c	S-P6	Sewerage – DWMP most likely pathway- overflow elimination by 2050
LS4d	WRC-P2	Water recycling centres – enhanced nitrate removal
LS4e	WRC-P4	Water recycling centres – accelerated disinfection (bathing water acceleration)
LS4f	WRC-P3B	Water recycling centres – P and N permit extension, catchment based NBS deployment
LS4g	WRC-P3A	Water recycling centres – P and N permit extension, grey asset solutions deployment
LS4h	B-P2	Bioresources – Accelerated ATC (100% ATC products, 0% landbank)
LS4i	B-P3	Bioresources - Incineration (100% destruction, 0% landbank)
LS4j	C-P4	Carbon – Fugitive emissions capture / treatment

4.4. Proportionate cost allocation and use of additional lines

When populating the AMP7 costs we have used a combination of tables 4M from the 2020-21 and 2021-22 APRs alongside CWW3. For tables 4M, the cost driver lines do not align exactly.

Rather than introduce costly and time consuming allocations we have allocated all the costs to a single driver in table LS4. The table below shows the lines from 4M and the LTDS drivers we have allocated them to. This was based on where most of the expenditure would have been allocated had the lines been in use in the APR reporting years,

Please note we have not included in the table below the lines that do not have a 4M mapping as otherwise the table would be excessively long given the number of lines in the table.

Table 10 - Summary of lines utilised from 4M and the LTDS drivers allocated to them

LTDS driver lines	2021 4M line match	2022 4M line match	Wider LS tables for AMP9 and beyond
Event duration monitoring at intermittent discharges	Event Duration Monitoring at intermittent discharges	Event Duration Monitoring at intermittent discharges	
Flow monitoring at sewage treatment works	Flow monitoring at sewage treatment works	Flow monitoring at sewage treatment works	
Increase flow to full treatment	Schemes to increase flow to full treatment	Schemes to increase flow to full treatment	
Increase storm tank capacity at STWs - grey solution	Schemes to increase storm tank capacity	Schemes to increase storm tank capacity	
Storm overflow - increase in combined sewer / trunk sewer capacity	Storage schemes to reduce spill frequency at CSOs, storm tanks, etc	Storage schemes to reduce spill frequency at CSOs, storm tanks, etc	
Storm overflow - sewer flow management and control		WINEP - Monitoring of pass forward flows at CSOs	
Treatment for chemical removal	Chemical removals schemes	Chemical removals schemes	
Treatment for total nitrogen removal (chemical)	Nitrogen removal	Nitrogen removal	
Treatment for phosphorus removal (chemical)	Phosphorus removal	Phosphorus removal	

LTDS driver lines	2021 4M line match	2022 4M line match	Wider LS tables for AMP9 and beyond
Treatment for tightening of sanitary parameters	Reduction of sanitary parameters	Reduction of sanitary parameters	
Catchment management - nutrient balancing	WINEP - Catchment Nutrient Balancing		
Microbiological treatment - bathing waters, coastal and inland	UV disinfection (or similar)	UV disinfection (or similar)	
27 year environment plan		Partnership Working	
Investigations , total	Investigations	Investigations	
Restoration management (marine conservation zones etc)	Conservation drivers	Conservation drivers	
Sludge treatment - Other	Sludge enhancement (quality)	Sludge enhancement (quality)	
Growth at sewage treatment works (excluding sludge treatment)	Growth at sewage treatment works (excluding sludge treatment)	Growth at sewage treatment works (excluding sludge treatment)	
Reduce flooding risk for properties	Reduce flooding risk for properties	Reduce flooding risk for properties	
First time sewerage	First time sewerage	First time sewerage	

LTDS driver lines	2021 4M line match	2022 4M line match	Wider LS tables for AMP9 and beyond
Sludge enhancement (growth)	Sludge enhancement (growth)	Sludge enhancement (growth)	
Odour and other nuisance	Odour	Odour	
Resilience	Enhancing resilience to low probability high consequence events	Enhancing resilience to low probability high consequence events	
Security - SEMD	Security - SEMD	Security - SEMD	
Security - cyber	Security - Non-SEMD	Security - Non-SEMD	
Additional line 1	North Bristol Strategic Sewers	North Bristol Strategic Sewers	
	Network Growth	Network Growth	
		Storm overflow improvement (not storage)	
Additional line 2			Biodiversity and conservation; enhancement wastewater/bioresources
Additional line 3			Data and AI; enhancement wastewater/bioresources
Additional line 4			Sludge enhancement (quality); enhancement wastewater/bioresources
Additional line 5			Pollution reduction strategy; enhancement wastewater/bioresources

Cyber costs – proportionate allocation

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5. LS5 Wholesale water totex enhancement expenditure under common reference scenarios

Table LS5 has been completed by modelling, under the common reference scenarios (CRS) and the parameters specified, the costs that would be incurred to meet the requirements of the CRS assuming all other factors remain the same in the core.

Note that our cost tables assume that the enhancement opex from the preceding AMP gets allocated to base as per the query that was answered by Ofwat below. However, we question how Ofwat will model this given their tables ask for totex only for the LS submission.

<p>QUERY – LS3-6 – For the financial years beyond 2030 we believe that the table is presenting the likely whole life costs of enhancement investment spanning across multiple AMPs. To obtain this true multi-AMP picture, we therefore believe that recurring opex costs and/or capital maintenance costs resulting from one AMP period should be included beyond the end of the AMP in which they occur as per guidance above for tables CW3/13/15 – please confirm</p>	<p>ANSWER - If the construction of an enhancement solution is completed within a price control period, then its associated operational costs will be captured in our base cost models in the following price control period. Therefore, beyond the period in which the solution is constructed, operational costs should not be included in the long-term strategies data tables, as these tables capture enhancement expenditure only.</p>
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For the WRMP aspects of the plan, the table below details the adaptive pathways that meet the requirements for the CRSs and these numbers have formed part of the totals in LS5. For the remaining areas, they have calculated their own resulting investment to meet the CRSs which are then totalled in LS5.

Table 11 - Adaptive pathways that meet the requirements for the CRSs

Common reference scenario	WRMP adaptive pathway
Climate change benign	Core WRMP and core pathway (noting that the main driver behind our WRMP is not climate change, but abstraction reductions)

Common reference scenario	WRMP adaptive pathway
Climate change adverse	AP1 from WRMP
Technology benign	AP1 – our AP1 pathway assumes smart meters can be rolled out by 2035
Technology adverse	AP1– our AP1 pathway assumes smart meters can be rolled out by 2035
Demand benign	AP1
Demand adverse	Demand specific scenario created for the LTDS
Abstraction reductions low	AP1
Abstraction reductions high	Abstraction specific scenario ran for the LTDS

Nitrate levels in groundwater

This is covered by our adaptive pathway LS3b but includes as company specific scenario 1 for completeness. Further detail is given in our LTDS WSX03 , but in brief we are including a pathway that shows what investment would be required in 10 of our water treatment centres should our core pathway (low/no regrets approach) of catchment management be unsuccessful in reducing the nitrate levels in the groundwater feeding these raw water sources.

Acceleration of lead replacement

This is covered by our adaptive pathway LS3a, but includes as company specific scenario 2 for completeness. Further detail is given in our LTDS WSX03, but in brief we are including a pathway that shows what level of accelerated investment would be required if the Drinking Water Inspectorate were to increase their expectations for a lead free network to 2060 – currently no firm target has been set.

Note that for the avoidance of error or doubt we have included all of our adaptive pathways in this table. We have also included the full cost to deliver rather just the difference to the core as per the tables LS3a etc.

Our mapping is as per the table below.

Table 12 – Mapping of water enhancement totex lines to adaptive pathway tables

Additional Line	Equivalent Adaptive pathway table	Adaptive pathway name
Water enhancement totex – company-specific scenario 1	LS3a	Lead acceleration

Additional Line	Equivalent Adaptive pathway table	Adaptive pathway name
Water enhancement totex – company-specific scenario 2	LS3b	Nitrate removal
Water enhancement totex – company-specific scenario 3	LS3c	WRMP AP1
Water enhancement totex – company-specific scenario 4	LS3d	WRMP AP2
Water enhancement totex – company-specific scenario 5	LS3e	WRMP AP5
Water enhancement totex – company-specific scenario 6	LS3f	WRMP AP6

6. LS6 Wholesale wastewater totex enhancement expenditure under common reference scenarios.

Table LS6 has been completed by modelling, under the common reference scenarios (CRS) and the parameters specified, the costs that would be incurred to meet the requirements of the CRS assuming all other factors remain the same in the core.

Note that our cost tables assume that the enhancement opex from the preceding AMP gets allocated to base as per the query that was answered by Ofwat below. However, we question how Ofwat will model this given their tables ask for totex only for the LS submission.

<p>QUERY – LS3-6 – For the financial years beyond 2030 we believe that the table is presenting the likely whole life costs of enhancement investment spanning across multiple AMPs. To obtain this true multi-AMP picture, we therefore believe that recurring opex costs and/or capital maintenance costs resulting from one AMP period should be included beyond the end of the AMP in which they occur as per guidance above for tables CW3/13/15 – please confirm</p>	<p>ANSWER - If the construction of an enhancement solution is completed within a price control period, then its associated operational costs will be captured in our base cost models in the following price control period. Therefore, beyond the period in which the solution is constructed, operational costs should not be included in the long-term strategies data tables, as these tables capture enhancement expenditure only.</p>
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We have also included a company specific scenarios for areas all of our adaptive pathways (note these numbers are the same calculations as the adaptive pathways charts, but show the total expenditure per year/AMP whereas LS4a-j show the change from our core) as detailed in the following table

Table 13 – Wastewater enhancement totex to adaptive pathway tables

Additional Line	Equivalent Adaptive pathway table	Adaptive pathway name
Wastewater enhancement totex – company-specific scenario 1	LS4a	Waste treatment (climate change) (the same as the high climate change scenario)
Wastewater enhancement totex – company-specific scenario 2	LS4b	Sewerage – wet wipes banned
Wastewater enhancement totex – company-specific scenario 3	LS4c	Sewerage – DWMP most likely pathway-overflow elimination by 2050
Wastewater enhancement totex – company-specific scenario 4	LS4d	Water recycling centres – enhanced nitrate removal
Wastewater enhancement totex – company-specific scenario 5	LS4e	Water recycling centres – accelerated disinfection (bathing water acceleration)
Wastewater enhancement totex – company-specific scenario 6	LS4f	Water recycling centres – P and N permit extension, catchment based NBS deployment
Wastewater enhancement totex – company-specific scenario 7	LS4g	Water recycling centres – P and N permit extension, grey asset solutions deployment
Wastewater enhancement totex – company-specific scenario 8	LS4h	Bioresources – Accelerated ATC (100% ATC products, 0% landbank)
Wastewater enhancement totex – company-specific scenario 9	LS4i	Bioresources - Incineration (100% destruction, 0% landbank)
Wastewater enhancement totex – company-specific scenario 10	LS4j	Carbon – Fugitive emissions capture / treatment

7. LS7.

7.1. Total actual and forecast bill per year – all lines

AMP7 bills up to 2022-23 are our actual average bills reflecting Ofwat's definition. The bills for the remainder of the AMP reflect forecasts as at the time of the PR24 early data table submission.

7.2. Change in average bills per year & average change in average bills per year over period – all lines

We have created a model to calculate bill changes in line with the Ofwat guidance. Cumulative capex values implicit in the calculations for LS3 & LS4 are used to calculate a new enhancement RCV. A return rate in line with our PR24 submitted WACC of 4.38% is applied to new enhancement RCV to give an allowed return. New enhancement RCV is divided new by the average asset life of the expenditure, which is estimated as 26 years for water and 36 years for wastewater (in line with the run-off rates set out in RR2), to calculate new enhancement RCV run-off for each period.

We do expect to pay notional corporation tax and funding is calculated in line with the Ofwat guidance as per figure 1.

Figure 2: Corporation tax funding

$$\text{Corporation tax funding} = \text{Return on new enhancement RCV} \times \left(\frac{\% \text{ return on equity} \times (1 - \text{notional gearing})}{\% \text{ allowed return}} \right) \times \left(\frac{1}{(1 - \text{statutory tax rate})} - 1 \right)$$

Total wholesale long-term revenue requirement is calculated by summing operational enhancement expenditure (also implicit in the calculations for LS3 & LS4), return on new enhancement RCV, new enhancement RCV run-off and corporation tax funding.

Total wholesale long-term revenue requirement is multiplied by the retail margin of 1.01 to give the total long-term revenue requirement. This total long-term revenue requirement is split into revenue recovered from household and non-household customers, using the same charges splits as RR7.37-49 and RR8.22-33.

The bill impact is equivalent to total long-term revenue requirement recovered from household customers divided by the number of household customers (consistent with SUP1A).

The prescribed methodology for calculating bill rises for LS7 does not capture all the nuances of our headline bill profile. The measures we have taken to limit bill rises such as using IRE as slow money are not factored in for instance. This mitigation also has a knock-on effect to corporation tax paid calculations and there are other factors which mean the tax we pay is different in our PR24 financial modelling compared to LS7. As a result, core pathway bill rises do not align exactly with our PR24 bill profile.

Alternative pathways 7 to 10 are wastewater only, therefore for the combined bill section of these pathways we have used the core water pathway bill and the relevant alternative pathway wastewater bill.